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Master's Programme in Business Administration

Supply Management

Master's thesis

**EARLY INVOLVEMENT OF INTERNATIONAL PURCHASING DEPARTMENT IN A
CONSTRUCTION COMPANY**

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ABSTRACT

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This thesis examines the departmental early involvement and integration possibilities in the context of a construction company, targeting to increase the total spend of international purchases within the case organisation. It uses participatory action research (PAR), structured interviews and internet survey as research methods to address the set of research questions.

The findings are divided into two categories: (1) implications for the case organisation and (2) theoretical implications on departmental early involvement within a construction project. According to the results, the case organisation needs to develop the interface between the departments by focusing on the tasks of the relevant parties according to the presented type-specific contract model. The model highlights the division of tasks and improvement of the communication and visibility of international purchasing department in internal context. The theoretical implications show that the contract type between the main contractor (MC) and its client has a significant impact on the early involvement period of the international purchasing department. To address the need for early involvement activities, a framework of early involvement antecedents was created. The study also fills the gaps found in the literature on early departmental involvement and early involvement of main contractor's supply chain.

FOREWORD

In my previous engineering master's thesis, I examined supplier relationship development in a construction company. During the thesis, I noticed that I was increasingly interested in supply management science, and therefore, I decided to apply to study it more. Luckily, I was accepted to study Supply Management at LUT University (LUT), and I also got double degree position later from University of Twente (UT), so I was privileged to get best-in-class education available for which I am truly grateful.

The process of writing this thesis started on the previous summer when my employer offered me a master's thesis topic within the area I have been interested in for a long time: International purchasing. With careful planning, I was able to coordinate my working in live construction projects, conducting international studies in the Netherlands and writing this master's thesis.

I would like to thank my LUT and UT supervisors, professor Jukka Hallikas and professor Holger Schiele for the essential comments and assistance in the thesis process. I also cannot overemphasise the importance the support from my family when aiding me during my studies and the thesis process. Thank you.

For the readers, I wish this paper provides new insights and research directions in the cross-functional environment of supply and construction management.

A handwritten signature in black ink that reads "David Niittinen". The signature is written in a cursive, flowing style.

In Jyväskylä 1.5.2019

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1 INTRODUCTION

Globalisation has brought both new opportunities and challenges for international purchasing in construction companies. A typical main contractor's (MC's) supply chain may consist of as much as 90% of outsourced items, while the MC is concentrating on management and coordination of the site (Karim, Marosszeky and Davis, 2006, 29). Increasingly more construction-related items are outsourced from foreign countries to provide new solutions and to build more cost-efficiently. The international purchasing department has been identified to have a significant role being a value driver in between the international supplier and the production and domestic purchasing organisations because the role of purchasing has gone beyond cost reducer towards value adding function (Chick & Handfield 2014, xi). Because the potential benefits are high, the function should be utilised as optimally as possible. This paper examines the performance and development possibilities in an organisational context, targeting increase the amount of international purchases through enhanced processes and departmental early involvement activities.

In a typical organisation model, the construction company features a procurement department or allocated procurement resources to make purchases required by the construction sites. These procurement professionals or site engineers usually outsource the planned and non-planned items from domestic markets. In the case of international purchases, the sourcing and the commercial tasks are usually left to sourcing professionals, who are specialised in these international purchases due to the increased risks and legal demands. To address this, large and especially multinational construction companies have established an international purchasing organisation which extends the companies' supply pool to chosen locations in foreign countries.

This thesis was commissioned by a case organisation which operates as the main contractor (MC) in large construction projects in Scandinavian countries. The case organisation's concern has been the sparsity of internationally procured items, measured by monetarily from the total internationally purchased spend versus nationally purchased spend. The critical problem is that the annual total spend requirements do not match with realised numbers. Currently, the realised spend is

around 40% less than planned, which is why the case company decided to take action by commissioning this thesis to find out the current inefficiencies and new ways to increase the international purchases. According to the case company, especially the interface between production, domestic purchasing and international purchasing departments need to be examined, which this thesis addresses. In addition to enhanced functionality between the parties, one possible solution, proposed by the case company's executive management, is to early involve international purchasing department for the project to enable early supplier involvement (ESI) which is often seen beneficial, especially in the manufacturing industry. In the case of the construction industry, the ESI is often referred to as early contractor involvement (ECI) while the latter also includes onsite activities from the supplier. In this study, despite the delivery form, the early involvement activities from the supplier side are called ESI.

The ESI activities are examined in this paper because they are considered to provide technological and commercial benefits, which may be drivers to increase the amount of international purchasing activities in the case company. These ESI activities are expected to fulfil the set internationally purchased quota requirement, while the benefits increase the attractiveness of using international purchasing department as a value creator. To initiate ESI measures in internationally-purchased items, *early departmental involvement* from the domestic purchasing's perspective is needed. This paper targets primarily to examine the possibilities for early departmental involvement in internal context to enable ESI from the supplier side. However, while these involvements are interconnected, the paper discusses them both. The early departmental involvement and early involvement of MC's suppliers and subcontractors is weakly studied area in the academic literature.

Due to the case organisation's buying behaviour, defined by the industry characteristics, the author decided to call the examined activities as "international purchasing". Trent and Monczka (2005, 24) define the difference between international purchasing and global sourcing as following:" International purchasing involves a commercial transaction between a buyer and supplier located in different countries. Global sourcing, on the other hand, involves integrating and coordinating common items, materials, processes, technologies, designs and suppliers across

worldwide buying, design and operating locations”. To illustrate this division, the five-level sourcing model is presented, where the international purchasing represents levels two to three, and global sourcing levels four to five (Figure 1) The case organisation’s relationships to its suppliers are identified to be mainly transactional, and the integration between the companies is generally low. Due to these facts, the term “international purchasing” describes the function and therefore the department better. However, the integration may be developed through the development proposals by this paper by enabling ESI activities by first implementing early involvement activities internally.

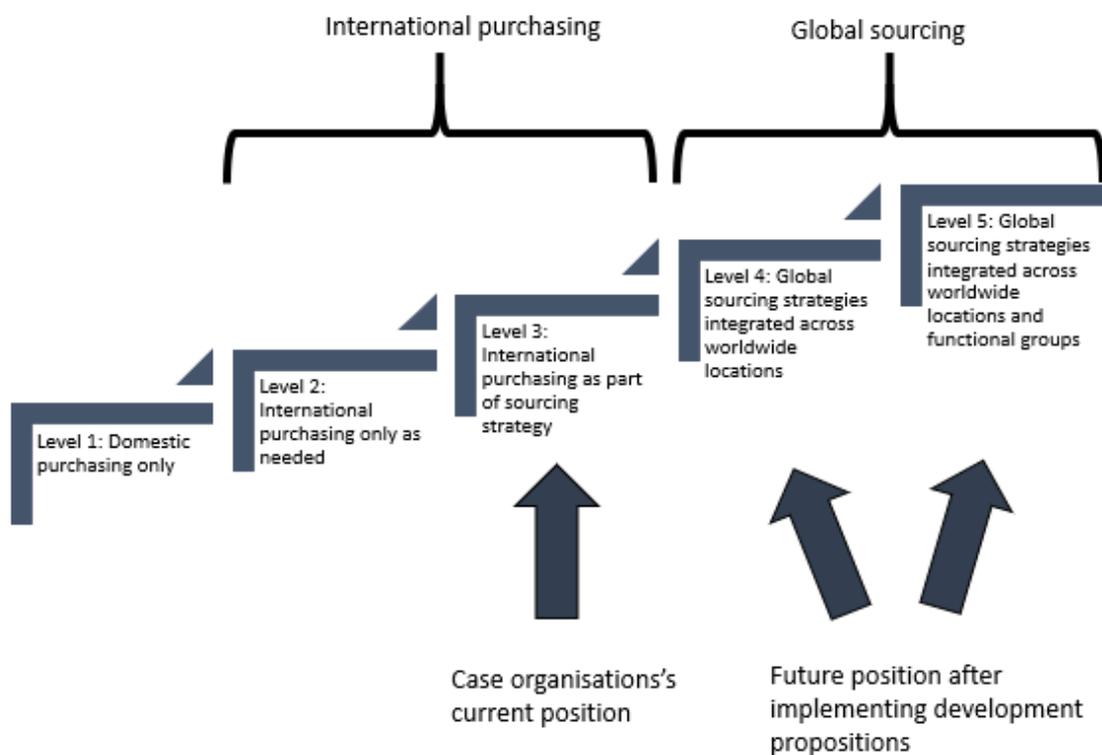


Figure 1 The case organisation's position on "Five levels of sourcing" (applied from Trent& Monczka, 2005, 28)

In the case organisation, the international purchasing department is its subsidiary. However, it is treated as an internal part of the case company, due to its departmental nature including:

- full resource dedication for the case company
- owned 100% by the case company

- key performance indicators (KPIs) bind to parent company's performance metrics
- international project support (IPS) organisation works in close geographical proximity with the case company's operations

The treatment as an internal part of the case company makes the provided development suggestions easier to implement, not needing any contractual arrangements to be presented. Therefore, the contractual arrangements are left out from this paper, while it concentrates only on developing the interface between the relevant parties.

The interface does not exist in a vacuum but is instead influenced by the characteristics of the construction industry and international purchasing (Figure 2). These characteristics are described more in detail in the following chapter to give the reader a picture of the environment to better understand the context of the analysis part and the proposed solutions. Primarily due to the one-off characteristics of the industry, some supply chain-related functions are more challenging to implement due to the discontinuity of relationships. The one-off characteristics may also be a key reason why the industry is criticised for its inability to produce value to its clients.

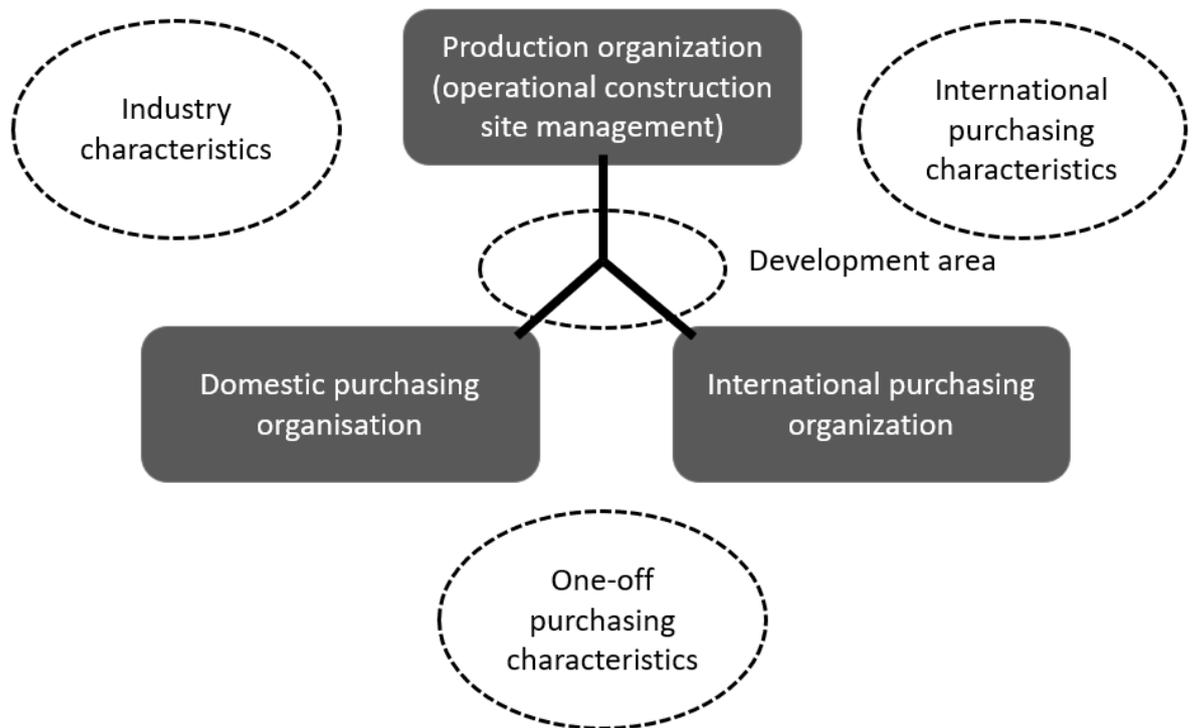


Figure 2 Development area

1.1 Purpose of the research and research questions

Even though near- or offshoring creates certain business benefits, it is seen as an underutilised asset in the case construction organisation, due to its difficulty compared to national purchases and too long time horizon needed for intense construction projects. The organisation claims that the process of early involving international purchasing department for the projects needs to be developed. Also, the existing literature supports the notion, where the early involvement of purchasing department is usually non-existing which hinders the integration between the relevant stakeholders (Keith, Vitasek, Manrodt & Kling, 2016, 35). For the reasons above, the case construction company has commissioned this thesis to examine development possibilities in the process between the relevant stakeholders (Figure 1).

The case company as a client of thesis was interested to (1) find the current state of the international purchases within the organization (2) examine how the interface between the parties could be developed and (3) identify possibilities to use early involvement tactics especially in the advanced project types, where the MC is

involved to the project earlier. The early involvement includes first the international purchasing department and then continues with the supply pool, where the latter is recognised as ESI in the academic literature. The early involvement was especially interesting for the case company because it theoretically increases the value of international purchasing department. The key research question of: *“What measures should be implemented to improve the joint performance of the departments to increase the international purchasing spend?”* was synthesised to address the research problem set by the case company. Parallel to the key research question, also the early involvement aspect is essential, which was considered to be a part of the solution for the key research question.

In parallel to the practical targets, the thesis also addresses the issues of “one-off” type of purchasing and other industry characteristics in order to create more integrated project delivery for the customer. These characteristics are discussed and elaborated in the next chapter. The integrated delivery was considered first needing an internal integration (in this case early departmental involvement), which then, enables increased external integration through ESI.

Due to the broad development area required by the case organisation, several research questions (RQs) are needed to cover the required topics. The research questions were formed in a meeting with the case organisation, where the scope of the study was agreed. The following RQ) were formulated to address the required scope of research:

- **RQ1a:** What is the optimal timeframe to involve international purchasing department for projects?
- **RQ1b:** Does the project characteristics, such as building type, monetary value or its special one-off project nature effect on international purchasing involvement?
- **RQ1c:** Does the contract type between client and MC affect the involvement of international purchasing?
- **RQ2:** Which inputs are needed from the international purchasing department to support projects sufficiently?

- **RQ3:** What kind of barriers are there and how should they be evaluated from the production department's point of view?
- **RQ4:** How could the risk-related transaction costs be mitigated?
- **RQ5:** How can the correct suppliers or "supply packages" be identified better in advance?

To address all the research questions, the thesis utilises a combination of research methods including structured interviews, internet survey and participatory action research (PAR). The methods are connected to each other, complementing the information for the following phases of the study, and therefore, the results need to be examined as an entity, as described in the concluding chapter.

1.2 Limitations

The thesis was limited to study international purchasing process only. The international purchasing deviates from domestic purchasing mainly due to its increased risks within the project. However, some of the analogies, such as the process of early departmental involvement, can also be derived to the area of domestic purchasing. In this case, the early departmental involvement can be enabled similarly than the paper proposes, involving even fewer steps, due to the decreased number of parties involved. The paper also does not examine the topic in extra organisational context but instead examines it within the organisational boundaries (Figure 3).



Figure 3 Research context

Because the paper examines the interface between the three presented departments, the case organisation needs to be a large multinational construction company to be applicable for the presented results. If the company operates only in the domestic context, only part of the results may fit the organisation, such as some of the presented early supplier involvement (ESI) antecedents.

The paper considers as a premise that international purchasing is delivering business benefits for the case company. Considering global sourcing activities, some scholars have noticed that some expected benefits, such as cost reductions may not be realised in reality. For example, Horn, Schiele and Werner (2013, 34) examined the cost reduction benefits in the automobile industry's original equipment manufacturer (OEM) supply chain and noticed that the benefits were not achieved due to the additional costs. To address these additional costs also reshoring activities are in some cases considered to fix the issue (Fratocchi, Mauro, Barbieri, Nassimbeni & Zanoni, 2014, 57). On the other hand, the benefits may not be directly measurable but instead occur indirectly, for example causing increased competition in the client organisation's business environment (Vos, Scheffler, Schiele & Horn, 2016, 344), which makes them more challenging to detect.

2 THEORY: CONSTRUCTION INDUSTRY IS A CHALLENGING WORKING ENVIRONMENT DUE TO ITS ONE-OFF NATURE

Even though the paper targets to examine MC's purchasing function from the internal point of view, an overview of the industry's characteristics and the various views of project purchasing function are first described to frame the subject. Therefore, this chapter is divided into four subchapters presented in Figure 4.

The first subchapter describes the critical challenges of the construction industry illustrating the reader the challenges created derived from its operating environment. The second part presents the special requirements for the construction industry's purchasing function from an external point of view. The third part presents the standardised Finnish construction model divided to project phases and their connection to international purchasing activities which combines the ESI requirements to the framework, pointing out the antecedents needed for early involvement activities. Fourth, this chapter describes the framework of international purchasing and the integration between the departments, which will be used later as a framework in the empirical part of the paper.

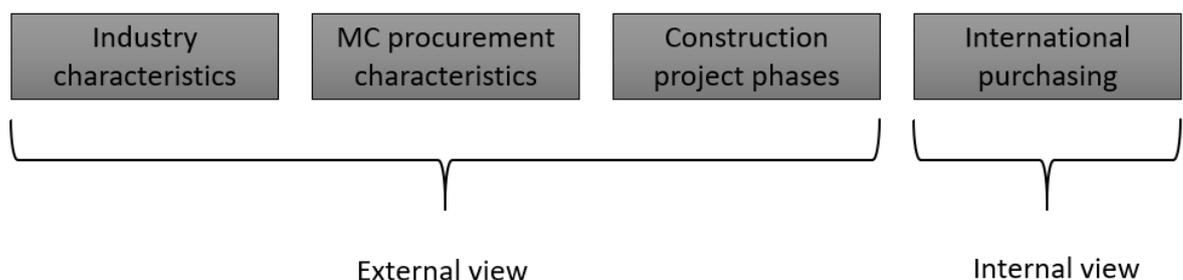


Figure 4 Viewpoints of the topics

2.1 One-off nature of the construction industry

The construction industry is characterised by its “one-off”¹ project type, where the projects are implemented once only, without continuity on supplier relationships. The second characteristic is the multiorganizational operational environment, which involves a new group of parties in each construction project. Due to both

¹ See Cambridge Dictionary (2018)

characteristics, the industry has been criticised for its incapability to harness its supply chain to deliver value for its customers compared to other industries (Latham 1994, 12, Table 1). The key recommendations for a client's project procurement were to create teams and contractual alliances, which are better able to create value for end customers (Latham 1994, 62). Egan (1998, 21) suggests an increased amount of partnering activities in the supply chain to create more integrated project delivery. In the report, value-based sourcing, SC innovation seeking, supplier development, incentivised supplier performance enhancement and capturing supplier's innovation are suggested to enhance value creation. The follow-up report on 2009 by Wolstenholme (25-26) depicts that the required changes have not been implemented in the British construction industry, and there is still much to develop. In the case of project procurement, the report proposes new business models, value-driven procurement decisions and supplier-led collaboration in the case of value co-creation. The report also states that the total cost of ownership (TCO) models should be evaluated in decision-making instead of the initial purchasing price. All three articles depict that the project-based nature without supplier relationship continuum in one-off industries hinders the mutual value creation. The problem seems not to occur just in the British context but is also present in the Finnish construction industry. Prof. Haapasalo encapsulates the problem with the following sentence: "The industry has not been developed, and the customer pays what the producer wants in any case" ²[author translation]. Also, several other Finnish papers present more integrated project models as a partial solution for the problem in case of decreased value delivery as the British papers did previously (Junnonen& Kankainen, 2007, 508; Pekkanen 2005, 119).

Reflecting on the research area of this paper, both issues address the problem of the disintegration of the supply chain. The ESI activities may help on the integration, while the suppliers are involved more already in the early phase, where the supplier's capabilities are better utilised in the project. The characteristics of ESI also include vendor lock-ins which may jeopardise the project delivery. Therefore, a

² See Rakennuslehti (2017)

trusting relationship with a high level of collaboration is needed (Vitasek, Ledyard & Manrodt 2013, 95)

The need for using collaboration to create value and mitigate risks reflects highly on complex and high monetary valued projects. Walker and Lloyd-Walker (2016, 78; 87) state that collaborative contracting models are to be used to address the complex demand and high cost-saving potential within these projects.

On the other hand, Jagtap, Kamble and Raut (2017, 9) elaborate that especially the client-driven collaboration increases the performance through mediated power from the client, which increases the demand of capable client. However, cultural differences in contracting (Hosseini, Haddadi, Andersen Olsson and Laedre, 2017, 1092-1094), loopholes in supplier incentivising (Allen, Herring, Moody and Williams (2015, 18-20) and reluctance due to the buyer's negative attitudes (Crespin-Mazet & Portier (2010, 237) often impede the needed collaboration. The early involvement of international purchasing requires external collaboration towards the end client and supply network but also internal integration to identify and implement the needed processes to make the external collaboration towards the supply network available. The following chapter present characteristics of industrial construction procurement and ESI reflected to standardised construction phase model, to illustrate the prerequisites for early international purchasing department involvement.

2.2 Characteristics of procurement in the construction industry and identified research gap

The one-off nature of the construction industry is also reflected in its supply chain management, where the purchasing type is mainly project purchasing. The term "project purchasing object" is described by Zijm, Klumpp, Regattieri, Sunderesh and Schiele (2019, 52) as "[...] a single purchasing situation used only for a specific product." In some industries, such as generally in the manufacturing industry, project purchasing is utilised in new product development (NPD) to drive innovation (Petersen, Handfield & Ragatz, 2003, 284-285; Wagner 2012, 37; 45-46; Parker, Zsidisin & Ragatz, 2008, 80; Yan & Dooley, 2013, 523; Butner 2010, 23) but the

construction industry tends to use project procurement to satisfy the needs of a single project.

Project purchasing in the construction industry is extensively studied due to its international representation and high industry volume. The literature review by Araújo, Alencar and Mota (2017, 357) show that within the sample of published articles between years 1973-2015, 56% of the articles were considering the construction industry. According to this literature review (2017, 356), the number of published articles was booming from the beginning of the 2000s, which also a search from the article search engine, Finna.fi (2019) proves, even though showing a slight decrease after 2015 (Figure 5).

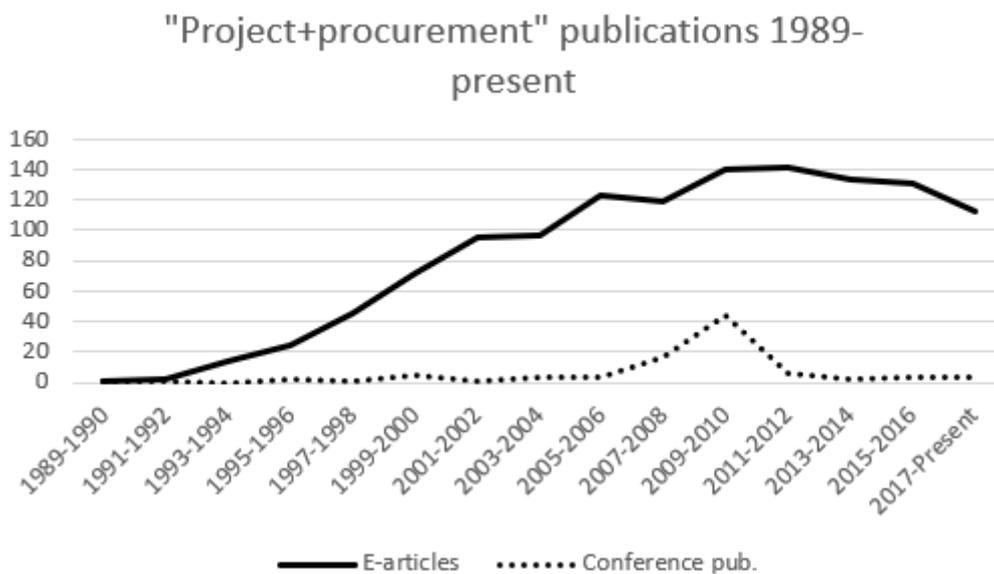


Figure 5 "Project + procurement" search results (Finna 2019)

While more than half of the articles reviewed represent the construction industry (Araújo et al. 2017, 357), two distinct viewpoints can be identified within the literature. Table 1 (more detailed in Appendix 1) presents a sample of articles (N=17) pointing out the two distinct perspectives found. 12 items represent the client’s perspective, four items MC’s perspective and one of the hybrid perspective, mixing the two previous perspectives.

Table 1 Sample of viewpoints

#	Reference	Related field of study	Page n:o
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1	Brahm, Tarziján (2015)	Mining (>100M USD projects), client's perspective	1859-1860
2	Walker, Davis & Stevenson (2017)	Infrastructure (construction), client's perspective	188-189
3	Hosseini (2018)	Infrastructure (construction), client's perspective	362-373
4	Lintukangas, Hallikas, Kähkönen, Bolander & Multaharju (2014)	Construction and machine assembly industries, the main contractor's perspective	46
5	Walker & Rahmani (2016)	Construction, client's perspective	167-182
6	Latham (1994)	Construction, client's perspective	12, 62
7	Egan (1998)	Construction, client's perspective	21
8	Wolstenholme (2009)	Construction, client's perspective	25-26
9	Jelodar, Yiu & Wilkinson (2016)	Construction, main contractor's perspective	1008-1009
10	Meng (2011)	Construction, client's perspective	189; 196-197
11	Yeung (2012)	Construction, both perspectives	235
12	Bildsten (2016).	Construction, main contractor's perspective	38, Table 2
13	Ruparathna & Hewage (2015)	Construction, client's perspective	310-312
14	Walker & Lloyd-Walker (2016)	Construction, client's perspective	78, (figs. 2,3 & 4); 87 (fig. 5)
15	Hosseini, Haddadi, Andersen, Olsson & Laedre (2017).	Infrastructure (construction), client's perspective	1092-1904
16	Jagtap, Kamble & Raut (2017)	Construction, client's perspective	1
17	Crespin-Mazet & Portier (2010)	Construction, main contractor's perspective	237

The first group of articles considers the supply chain from the client organisation's point of view and the second group considers it from the main contractor's (MC's) point of view. This paper uses mainly the latter perspective in its analysis section, where the case construction company works as a MC, but also the interview section involves the former (client's) perspective, where its supply chain also includes the MC. (Figure 6)

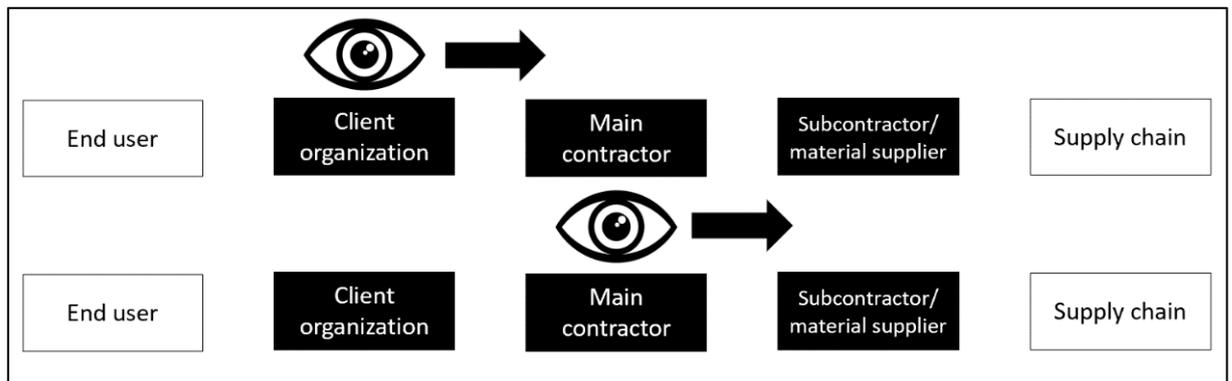


Figure 6 The distinct perspectives on typical one-off industry supply chains

Depending on the selected perspective, the presented areas of interest differ; the articles using the client's perspective concentrate increasingly on extracting increased value through collaboration and risk management, while the articles using the MC's point of view concentrate on co-engineering and cost reduction. However, both perspectives identify collaboration as a business and technical risk mitigation method, aiming to address the issues derived from the one-off nature of the industry.

The discontinuity of projects creates challenges for establishing steady relationships with suppliers, which instead challenges the operative project management in terms of increased costs and risks and decreased availability and flexibility of suppliers. Notably, international purchasing requires special attention in these cases, while geographical distance tends to be inversely proportional to supplier flexibility.

In this paper the early involvement practices towards MC's supply chain are one of the focus areas. The research area is inadequately studied creating a gap in the existing academic knowledge. Song, Mohamed and Abourizk (2009, 13) define the early involvement with the following sentence: *"a relationship between a contractor and an owner (client) or a designer that engages the contractor from the early design stage and allows the contractor to contribute its construction knowledge and experience to design"* which implies that the early involvement should be conducted between the client and MC organisation. However, this paper targets to widen the context to imply the relationships between the MC and its subcontractors. Loosemore (2014, 254-255) identifies the increased importance of subcontractors' capability use in project value creation. The article identifies the existing academic knowledge on the value creation between MC and the client organisation but notes

that the value creation between MC and subcontractor (or supplier) is less researched topic in construction projects, creating a research gap within the area. To address the gap the article suggests focusing on the relationship quality and possibility for early involvement activities between MC and its first-tier supplier. The early involvement in the construction industry is identified to provide multiple benefits, such as increased buildability, enhanced methods and more carefully selected materials (Rahman& Alhassan, 2012, 230). The early involvement activities are identified to build trust and enable supplier's capability usage (257), which is often blocked by the project's tight time table. To address the challenges of using early involvement practices, the following subchapter presents the standardised Finnish construction phase model and creates a framework for early supplier involvement in a construction project.

2.3 Construction project phases and antecedents for early involvement

Figure 7 presents the standardised Finnish construction phase model according to RT 10-11224 framework (Rakennustieto, 2016b, 1). It describes the standardised phases starting from the needs assessment, ending to warranty period.

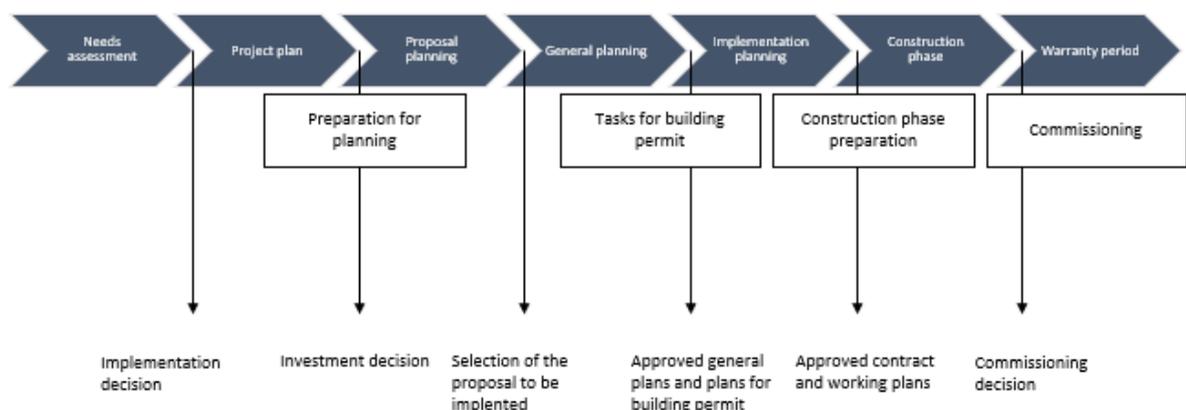


Figure 7 Construction project phases (Rakennustieto, 2016, 1) (author's translation)

The theory of early supplier involvement (ESI) or early contractor involvement (ECI) claims that from the client organisation's point of view the early involvement increases mutual value. Kähkönen, Lintukangas and Hallikas (2015, 157) state that the increased value is obtained by using ESI along with the inter-firm learning and supplier orientation capabilities. On the other hand, Goldberg and Schiele (2018,

99-100) emphasise the innovation possibilities of ESI requiring a combination of a good idea and good supplier to succeed.

In the traditional main contracting model, the construction company (in this case the MC) joins the project only in the point of construction phase preparation, where the critical decisions of implementation are already made. Some of the more advanced contractual models, such as design and build (D&B), engineering, procurement, construction management (EPCM) and alliance contracts involve the MC earlier than in traditional main contracts due to the increased planning responsibilities for the MC³⁴. From the MC's perspective, the earlier involvement of MC creates increased power and responsibilities, and therefore, better possibilities for the MC to leverage the solutions made during the planning phase. Therefore, it is expected that the early involvement of international purchasing department requires one of these kinds of project types, where the MC's purchasing department may be involved earlier than in the traditional model. In the traditional model, the MC is awarded with the contract in just before the start of the construction phase, while the advanced model involves MC already earlier; enabling early involvement activities internally and towards supply chain. Because the ESI actions are targeted to jointly develop solutions with suppliers, it is expected, that they should be done on the general planning or implementation planning phases (Figure 8). In the case of ESI, the provided benefits are often technical, which provide cost benefits in the production phase.

³ See Rakennustieto 2016a, 2-6

⁴ See Business Dictionary 2019

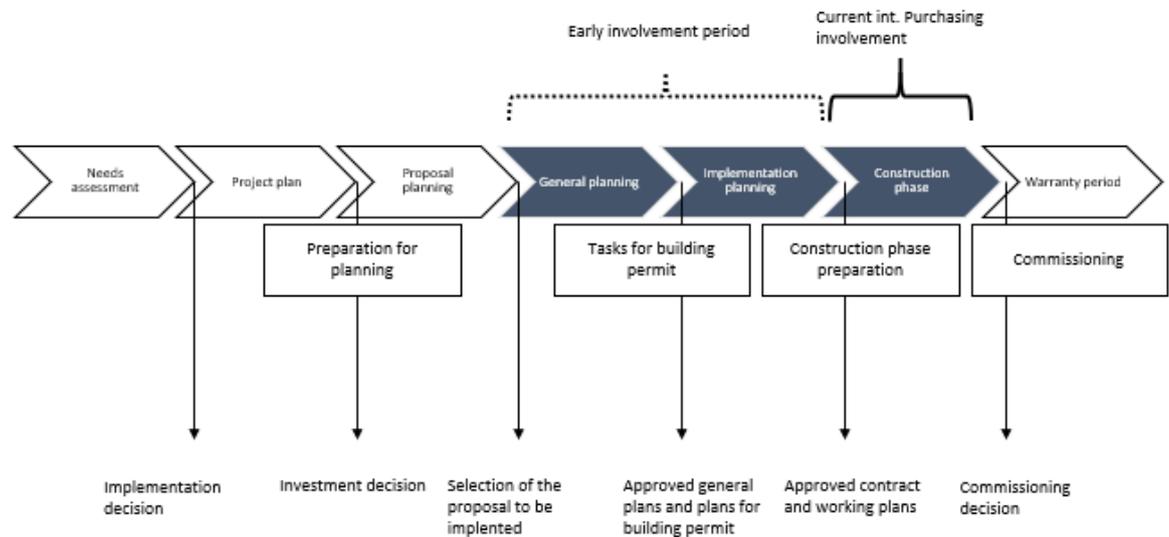


Figure 8 Early involvement (Rakennustiето, 2016, 1) (modified and translated by the author)

According to the literature, the projects requiring advanced contracting models are more complex or monetarily high valued. Brahm and Tarziján (2015, 1859-1860) explain that especially large mining projects (>100 M€) require EPCM projects to increase collaboration because the client-driven project management is seen to be commercially risky for the client due to the increased risk of additional costs. In this case, ESI brings benefits in the form of shared risk and decreased project cost. Despite the available benefits, Hosseini (2018, 362-373) notes that ECI also requires dedication and experience from the client company to support the project, while it causes vendor lock-in situations. This disabling effect may also be the driving reason for the client not to initiate ESI with the MC, which also prevents the early involvement of international purchasing department. Also, the negative obsessional internal attitudes may prevent using ESI from both MC or client side of the supply chain.

From the MC's point of view, ESI provides certain engineering benefits but may suffer from a similar lock-in situation that in the previous client case. For certain items, the ESI may also be too heavily administered. Therefore, the early involvement needs to be initiated only with supply categories requiring special attention. One option to make this classification is dividing the relevant (usually high spend) categories to four diversely-led commodity groups by using the Kraljic Matrix (1983, 110-111). According to Ellram and Olsen (1997, 105), the ESI should be

utilised for strategic item category, which is represented in the matrix. Park, Shin, Chang and Park (2010, 506) add that the strategic item group focus is not alone sufficient for a strategic relationship, but the relationship needs to be mutually attractive to succeed. On top of that, Schiele (2012, 48) elaborates that attractiveness is not solely enough, but the supplier also needs to be competitive to achieve the strategic supplier status.

Initiating ESI also requires access to supplier's resources. Pulles, Veldman and Schiele (2016, 1470) note that the client's (in this case MC's) selection and relational capabilities have a positive impact on the supplier's preferential resources allocation, which in turn, effects positively on the competitive advantage of the relationship. However, in the case of international purchasing obtaining the preferential resource allocation through preferred customer status may be difficult due to the increased geographical distance. In this case, the industrial clustering increases the possibility of getting the preferred customer status (Steinle & Schiele, 2008, 12)

To address the requirements of early involvement, the following list is created divided by construction project phase model (Figure 9):

1. The end client needs to choose a fitting contract type to allow the MC to take planning responsibilities, but at the same time allow the MC's leverage increase.
2. The project development phase should be long enough to enable the MC to implement its early involvement processes.
3. The project must include fitting items to be purchased internationally and developed (co-engineered) with international suppliers
4. The MC needs to be attractive to the supplier and vice versa for developing solutions together. Without mutual attractiveness, early involvement is useless due to the mismatch of interests. To create mutual attractiveness, the MC as a client needs to obtain the preferred customer status in order to gain dedicated resources from the supplier. To achieve this, relational and selection capabilities are needed.

5. The final antecedent relates to the MC's internal processes. These processes need to support early involvement. The required processes will be identified and tested in the empirical part of the paper.

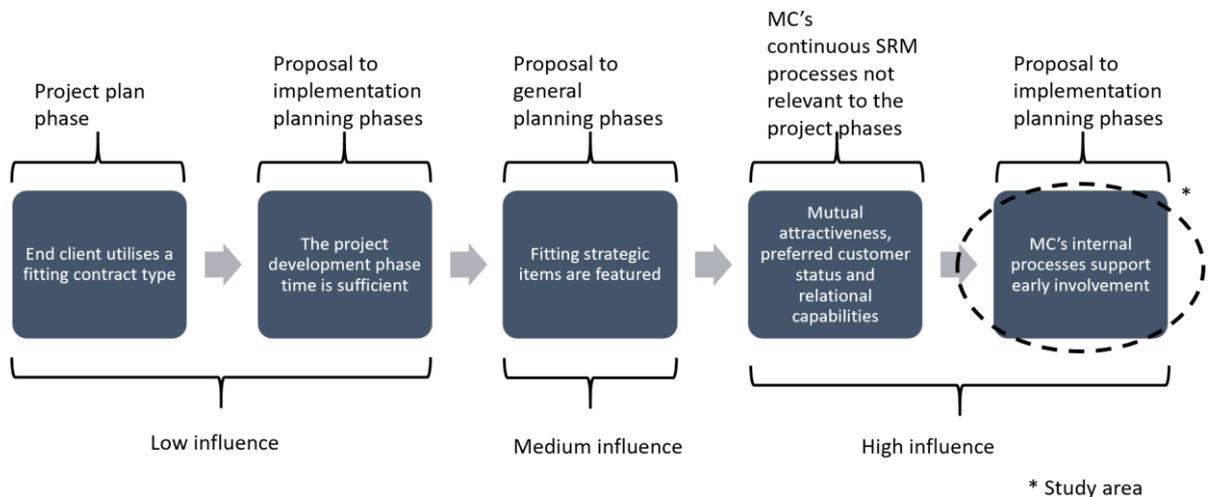


Figure 9 Project phase-specific antecedent for int. procurement department early involvement

2.4 International purchasing characteristics and departmental integration

International purchasing is mainly characterised by commercial and technical benefits, such as access to new goods and technologies and the best market price (Branch 2001, 5). It also includes certain increased risks. This chapter creates a framework for the empirical part of the paper, where the set of questions and propositions related to international purchasing are researched. The subchapter presents the essential requisites, the integration to other business functions and the framework of antecedents for international purchasing.

Characteristics and motivations

In 1993 Birou and Fawcett examined international purchasing in the United States. The reason for sourcing internationally was mainly the lower price and availability of products (34). The low price was crucial for approximately $\frac{3}{4}$ of the interviewed companies. The examined companies saw quality, availability and price as the top three factors within the international sourcing decision. Also, the aspects, such as delivery dependability, service and production technology were seen important (5,21-5,00 in 7-step scale). The paper by Rajagopal and Bernard delivers congruent

results to motivate international purchasing: lower prices, increased competition, better quality, increased number of sources and access to worldwide technology are seen the key benefits (1994, 9). The paper by Alguire, Frear and Metcalf (1994, 73) also finds the low purchasing price as the key benefit but argues that the access to better quality products and higher technology were not seen as important as the purchasing price.

While the research in the field of purchasing and supply management (PSM) developed, at the beginning of the 2000s it was noted that the whole value chain including the supply network and company's internal functions require an increased amount of integration to deliver expected benefits. In 2003 Trent and Monczka argued that international sourcing strategy needs to integrate also essential functions, such as engineering, purchasing, operations, logistics and marketing to deliver the benefits (627). The recommendation of increased integration was justified by creating a group of critical success factors where the international purchasing function's integration was represented in a key position, requiring enhanced information flow, cross-functional teams, executive management involvement, centralised procurement structure and participation for global contract development (2003, 620)

Integration to other departments

Integration is an essential part of the organisation's development requirements to support early involvement activities. It is seen important considering the whole project life cycle starting from identifying the right project, ending to the warranty and 10-year responsibility phase. Similarly as presented earlier in the Subchapter 2.2 regarding early involvement in MC's supply chain, there is a gap in academic literature considering early departmental involvement. The current PSM literature studies early involvement activities on interorganisational level, where the activities are applied for external resources management only, initiating them towards the supply network. Early departmental involvement, on the other hand, is absent at least in the sample databases. To fill the gap, this section examines academic literature related to organisational integration and applies the integration to the case study later in the paper.

Lawrence and Lorsch (1967, 11) define the term integration as follows: “[*Integration is*] the quality of the state of collaboration that exists among organisations that are required to achieve unity of effort by the demands of the environment.” To fit the term integration better to the operative industrial framework, Pagell defines integration in the context of purchasing as following “a process of interaction and collaboration in which manufacturing, purchasing, and logistics work together cooperatively to arrive at mutually acceptable outcomes for their organisation” (2004, 460). In this current research case, integration means that the procurement and production department’s processes should be functionally collaborative and fit into demands by the relevant external stakeholders, such as the client. Depending on the organisational model, the integration of the purchasing department is noticed to have improvement potential. Ellengaard and Koch (2013, 327-328) examined functional mechanisms between production purchasing and production department in a construction company. According to the paper, they found cross-functional units, general interactions, cross-functional influence, communications and alignment of performance indicators and incentives to be necessary for creating a joint performance. Notably, due to the particular requirement of cross-functionality, measuring and developing the international purchasing department’s interface might be difficult. On the other hand, it might provide unique opportunities to redesign the processes between the departments, while the processes might be dynamic due to the cross-functionality. Due to this reason, the paper observes the task/ process ownership between the departments within the various project types carefully in the empirical part.

Antecedents of international purchasing

To address both: the requirement for increased integration and the organisation-specific motivations for international purchasing, the thesis utilises the antecedent framework by Quintels, Pauwels and Matthyssens (2006, 173), where the drivers, facilitators and barriers are examined. The antecedents used in the paper are based on the earlier literature presented in Table 2

Table 2 Antecedents of international purchasing

Article	Key finding
Drivers:	
Rajagopal& Bernard (1993, 55)	<i>“Success in competitive procurement on a global scale has the potential to enhance the product offering, and thus lead to competitive marketing success.”</i>
Rexha and Miyamoto (2000, 33)	Greater propensity for international purchasing due to the geographical location and limited domestic resources
Leonidou, L. (1998)	The amount of international purchases has a positive correlation with firm’s performance
Facilitators:	
Birou& Fawcett (1993, 34)	Lower price and availability as the main drivers for international purchasing.
Fawcett& Scully (1995, 929-929)	Just-in-time (JIT) delivery strategy is able to compete with global competition.
Cavusgil, Yaprak& Yeoh (1993, 155)	<i>“[...] firms should also consider strategic and technological issues in conjunction with cost decisions.”</i>
Barriers:	
Frear, Alguire& Metcalf (1995, 66)	Trade requirements and barriers issued in local governmental level effect on international purchasing activities and decisions
Ghymn, Liesch& Mattson (1999, 212-213)	Variable purchasing behaviour of managers with different backgrounds regarding delivery risks

As can be seen from Table 2, the international purchasing is often seen monetarily beneficial but require special facilitation from the client organisation’s side. It also imposes specific risks, which may be turned into barriers. It can also be noticed that the antecedents are location and industry-specific. Because this type of framework was not found applied to the MC’s supply chain, this paper tests it in the empirical part for the case organisation. There the framework takes into account two views: the organisation’s internal and the supply network view, where the internal view is emphasised.

3 RESEARCH METHODOLOGY AND DATA COLLECTION PLAN

This paper uses a combination of selected research methods to support a wide range of research questions. First, the study is started by using participatory action research (PAR), where the author participated in a live construction project, which was on project development phase, consisting of general and implementation planning phases. The action research was used to answer the research questions 1a and 5. Parallel to action research, a set of structured interviews was conducted, including a set of questions for nine internal and one extra-organisational interviewee. After obtaining and analysing the results from the structured interviews, a set of hypotheses was created to test the robustness of the answers with a statistical survey, conducted in the autumn of 2018. The structured interviews and the statistical survey were used to answer research questions 1a-4 (Figure 10). This chapter describes shortly the used research methods and how they were implemented in this study.

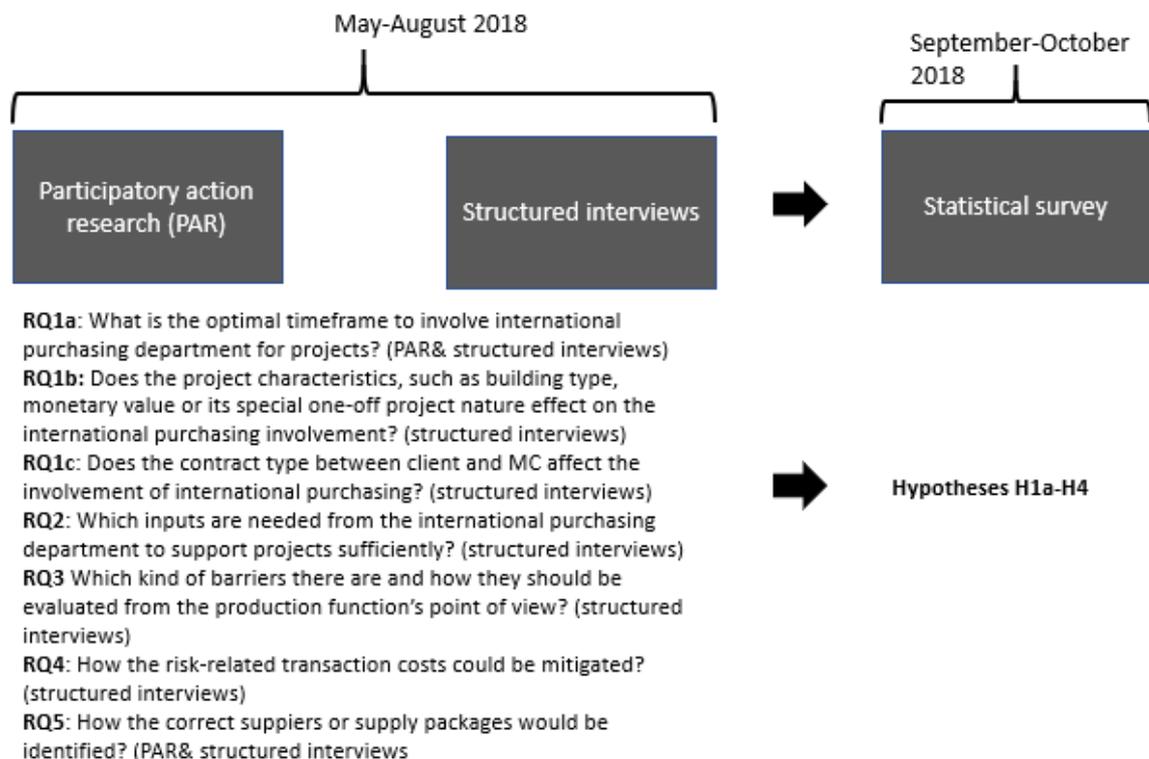


Figure 10: Data collection plan

Due to the heavy emphasis on structured interviews in this paper, the section is highlighted in the following subchapters, involving a broader methodology description.

3.1 Participatory action research (PAR)

PAR is a qualitative research method, which addresses the need for improving selected development areas (Bell, Borda, Maguire, Park, Reason & Rowan, 2011, 11) which in this case, consist of identifying the correct suppliers or supply packages better and optimising the timeframe for international purchasing department involvement (RQ1a and RQ5). The study uses the participatory version of the research method, participatory action research (PAR). Reason (1994, 329) suggests PAR being “*an alternative system of knowledge production*” based on the (1) the people’s roles in setting agendas, (2) participating in data gathering and (3) analysis and controlling the use of outcomes. By presenting this, Reason proposes that PAR is more comfortable to be identified as an ideology rather than a rigid research process (Reason 1994, 329; Shortstall, 2003, 225-226). Also, this paper utilised PAR relatively freely, by not including any strict processes or sub-methods to obtain information. The information is based on the author’s experiences and actions in the pilot project.

McIntyre (2014, 1) divides the purposes of using PAR to four categories: (1) “*a collective commitment to investigate an issue or problem*, (2) *a desire to engage in self- and collective reflection to gain clarity about the issue under investigation*, 3) *A joint decision to engage in individual and/or collective action that leads to a useful solution that benefits the people involved*, and (4) *the building of alliances between researchers and participants in the planning, implementation, and dissemination of the research process.*” This case study represents elements from the second and third categories, engaging a reflection to gain clarity about the case company’s purchasing processes in the development phase, and leading to a recommendation that benefits the case company.

Denscombe (2010, 126) defines four characteristics for action research, which are reflected in the case study in Table 3. The presented characteristics fit well for the case study which is conducted in a live organisation. The author’s background on

operational tasks provides a fitting premise for the operative tasks conducted in parallel of PAR.

Table 3 Characteristic of PAR in the case study

PAR characteristics by Denscombe (2010, 126)	Case study characteristics
<i>Practical nature:</i> Deals with real-world problems and issues, typically at work and in an organisational setting	Examines how international purchasing activities could be developed within a live project
<i>Change:</i> “Change is regarded as an integral part of research”	The study targets changing the organisation’s processes in the case of conducting international purchases
<i>Cyclical process:</i> Feedback loop created, where “findings generate possibilities for change, which are implemented and evaluated as a prelude to further investigation”	The study creates the feedback loop, where the possibilities are identified and examined as a possibility for new process initiation.
<i>Participation:</i> Practitioners have an active and crucial role in the study	The author participates the project as a researcher also conducting operational tasks. The operational tasks help to improve existing processes.

In the PAR the author participated in a live construction project and made the observations through hands-on tasks within the project by:

- participating in the meetings (project development, internal and planning)
- participating in domestic purchasing processes (such as creating an international purchasing package plan)
- being an internal link between production, domestic purchasing and international purchasing departments.

Due to these characteristics, the PAR study connects the author’s hands-on tasks by testing the relevant theories and a pilot project, such as the theory of early involvement time frame in a live project and the created early involvement antecedents. Also, PAR procedures report the obtained data back to the thesis material. (Figure 11)

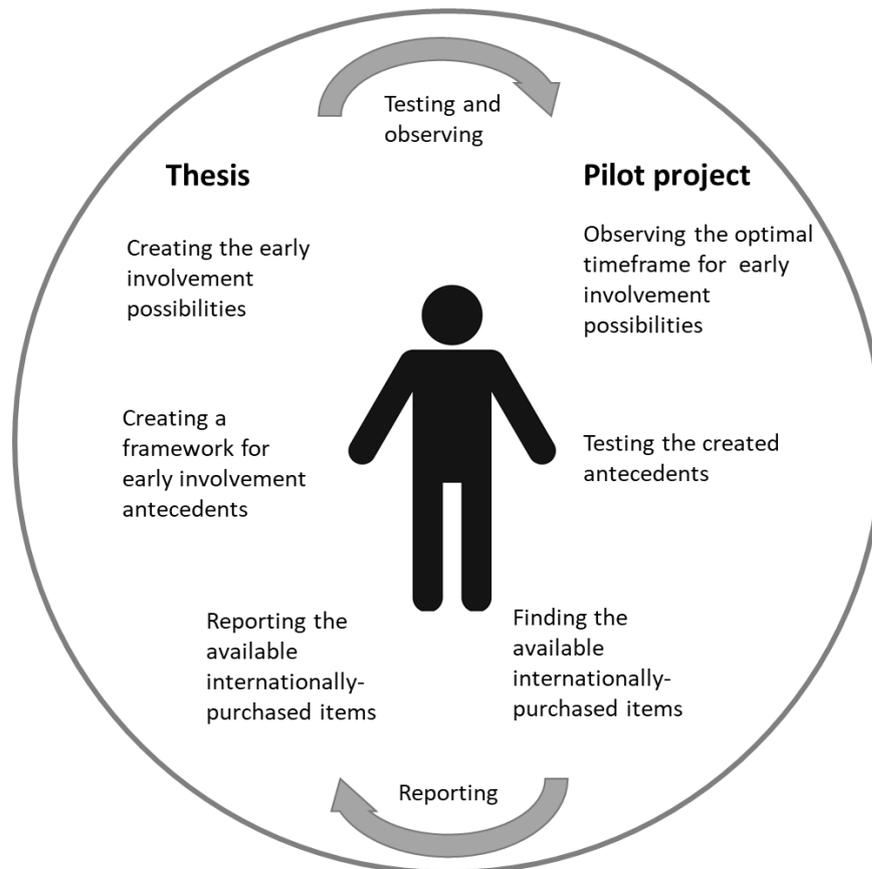


Figure 11 Thesis connection pilot project using PAR as a research method

3.2 Structured interviews

A structured interview (a.k.a. standardised interview or survey interview) is an interview method, which uses a set of selected and pre-limited questions to obtain generalisations and descriptive statistics (Fowler and Mangione 1990, 12). The obtained results are presented on a respondent group level (Hyvärinen, Nikander and Ruusuvuori, 2017, 67). Structured interview as a research method includes a mix of survey and interview elements. The interviews can be conducted via several interfaces, but this study uses face-to-face and Skype interviews, which are among of the most commonly used interview methods (Singleton and Straits, 2014, 17; Groves, Fowler, Couper, Lepkowski, Singer and Tourangeau, 2009, 45).

A structured interview deviates from the unstructured and semi-structured interview methods in its rigidity. The set of questions is structured, and the interviewer's behaviour is strictly limited (Ahola 1998, 259; Hyvärinen, Nikander and Ruusuvuori, 2017, 68). The case research has a rigid structure, where the strict interview

structure limits the question and the answer range, which may force the interviewees' responses to specific direction (Holloway& Galvin, 2016, 91) but on the other hand increases reliability due to the comparable and standardized replies (Singleton and Straits 2014, 108; Fowler and Mangione, 1990, 14; Groves 1989, 358). Using this method, it is essential that every question has precisely the same meaning for every respondent. Otherwise, the reliability of the research is jeopardised (Suchman & Jordan, 1990, 240; Berg& Lune, 2009, 105)

In this study, the benefit of using structured interviews is that the data can be obtained in a quantifiable manner. This output form helps to form the propositions for the next step (internet survey). Table 4 elaborates on the characteristics of the research and justifies them by discussing the literature behind the decisions pointing out the merits of structured interviews for the case study.

Table 4: Justification of Structured interviews as a research method for the case study

Target/ characteristics of the research method applied to the case study	Literature justification
Structured interviews held within a company to create quantifiable output	" Structured interviews are based on formal questionnaires that collect quantitative information in the interaction between the interviewer and an interviewee." (Hyvärinen et al., 2017,74)
Questions are explicitly set to only measure the performance of the selected area of procurement service.	"The goal of having all people answer exactly the same questions, interpreting them in exactly the same way, under as consistent conditions as possible, seems standardized the right one for maximizing consistent measurement. This is a key principle of interviewing "standardized interviewing." (Groves et.al 2009, 290)
If the interviewee loses focus or does not understand the question, the interviewer will guide him/her back to the topic	"Elaboration is disallowed. The interviewer completing a schedule of precoded questions is required to elicit a response that corresponds to one of the available response options." (Suchman and Brigitte 1990, 235)

The obtained data can be analysed by using quantitative tool pack (e.g. descriptive analysis between respondent groups)

"Because it [structured interview] collects information from respondents about the same characteristics and in a form that can be coded systematically, it is an ideal way of producing data that is suitable for quantitative data analysis." (O'Leary, 2003, 254)

Structured interviewing is an upfront research method requiring an increased amount of testing and planning before the actual interviews to test and develop questions in a manner that they support the required quantifiable output. To address this, the operational survey work utilises the framework by Singleton and Straits (2014, 83) which divides the process into four main steps and two quality functions. Some of the steps were not used in the case interview process due to its limited scope (marked with a dotted line on Figure 12).

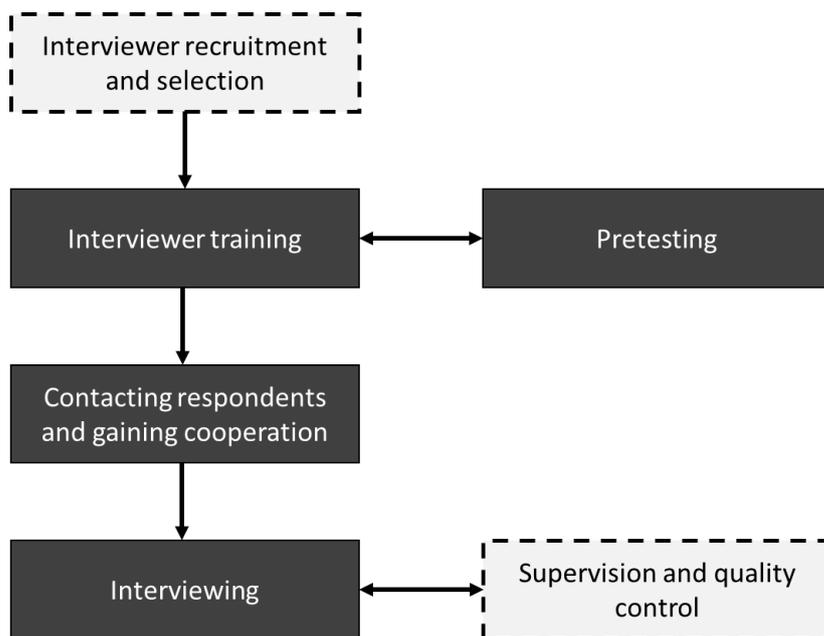


Figure 12 Structured interview process (modified from Singleton & Straits 2014, 83)

In this case study, the data for structured interviews were collected from three groups of respondents (Table 5):

- 1) Case company operations (production and purchasing), Finland (N=6)
- 2) Case company international purchasing (IPO, IPS), Sweden and Latvia (N=3)

3) Client organisation (N=1)

The first group of interviewees represent the production and domestic purchasing departments point of view. It is a general sample of experienced managers and senior specialists who work in operational purchasing management and project management tasks for live projects. They all have at least nine years of professional expertise from the field of purchasing and construction management. However, most of the interviewees (N=5) have more than 20 years of field experience. The sample represents all relevant areas of the project from three out of four relevant business areas (BAs) (*Office construction, housing, and areal functions rest of Finland*), which were used in the next phase where a statistical analysis was conducted.

The next group of interviewees represent the international purchasing's point of view of early involvement. It consists of three managerial level IPO and IPS interviewees, who have more than nine years of experience in the field of international purchasing management. The sample is a typical representation of international purchasing due to its presence in the target country (IPS) and in the source country (IPO).

Lastly, also a customer perspective on the early involvement of intl. procurement department was considered. For this interview, an executive manager from the client organisation's real estate management was selected. The interviewee has 19 years of experience in real estate and maintenance management tasks. The company is a large multinational retailer, which owns and manages most of its properties in Finland. The company is well-known for its strict building concept which limits the available design solutions but also enables the use of internal purchasing. The company also has its own supplier network for predefined items which is advised or required to be utilised within the projects. The company's strong building concept is well represented in the results analysis section.

Table 5 Interviewee profile

Interviewee	Position	Relevant working experience
Production #1	Project manager	30 years
Production #2	Production manager	23 years
Production #3	Project manager	29 years

Production #4	Project manager	20 years
Dom. Purchasing #1	Purchasing manager	12 years
Dom. Purchasing #2	Senior purchaser	29 years
Int. purchasing #1 (IPO)	Purchasing manager, Head of dpt.	10 years
Int. purchasing #2 (IPS Sweden)	Purchasing manager	14 years
Int. purchasing #3 (IPS Sweden)	Purchasing manager	12 years
Client organisation	Head of department	19 years

Three interviews were conducted in English and the rest seven questions in Finnish, depending on the interviewee background, to create convenience for the interview situations. The interview forms can be found group-specifically from the appendices 2-4.

Due to the generalised nature of the structured interviews (Fowler and Mangione 1990, 12) and the promise of interviewee privacy, the names or the companies of the individuals were anonymised. Only the relevant issues, such as work background was left visible. Before starting the interviews, the researcher presented the interviewees the background and purpose of the research, and the question profile shortly. The interview durations ranged from 1 hour 10 minutes to 1 hour 40 minutes, depending on the question profile. The question profile of domestic purchasing and production generally required a longer time due to the need to profile international purchases, which required more generalisation. The shortest interviews were conducted with the international purchasing department, where the replies seemed to be already evident.

The interview format is applied from Quintels et al. (2006, 173) framework, where the questions are under the following categories:

1. *Drivers* – How the presented issues further using international purchasing within projects?
2. *Facilitators* – Which types of project or personnel characteristics support using international purchasing?
3. *Barriers* – Which of the presented issues are preventing international purchasing use and how?

In addition to the presented categories, the interview also included a general category, where information about the international purchasing usage and satisfaction as well as popular items are asked. Before the content also the interviewee's background considering his/her working experience was discussed to ensure the reliability of the information source.

Due to the construction industry's project-based one-off nature, the interview needed to be modified from the model to use only the antecedent categories (product, firm/ management, network, industry/ competition and environment) needed in the survey. Quintels et al. (2006, 174) present these antecedent categories on a business strategy level, whereas this paper concentrates on the project level, targeting to reveal practical aspects of using international purchasing department.

The statistical nature of structured interviews as a research method enabled reporting the data in a quantified manner. Figure 13 presents the process and conditions of data analysis starting from pretested questions and invited interviewees to reporting the data for this paper. The first steps in the process include obtaining the exact answers from the interviews and the analysis section the quantification of repetitive answers revealing also the condition for reporting the data. To make the information quantifiable, the answers were worked into data files, where the amount of same or similar answers were gathered and reported if the sufficient proportion of repetitions was found (>50% similarity within the answers). Due to the small sample the analysis focused on dominant replies on the general level. In the last phase of the analysis process, the quantified repetitive conceptual appearances were translated back into sentences to report the results in this paper.

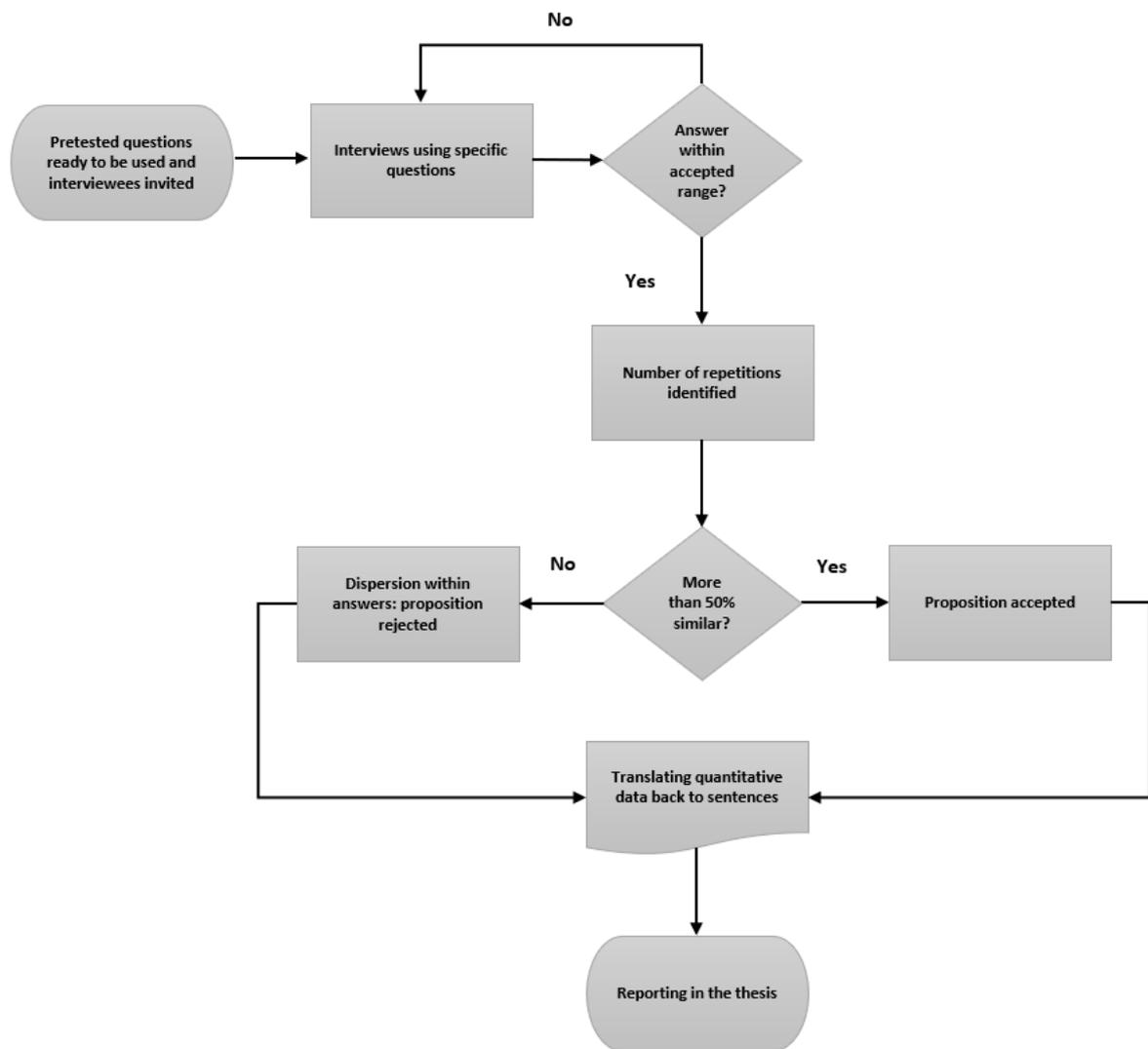


Figure 13 Analysis and reporting of structured interview data

3.3 Internet survey

The third research method used in the paper was an internet survey which was conducted for the case organisation's production and domestic purchasing departments. The Internet survey was found to be a useful way to test the hypotheses from the previous phase. The survey contained eight demographic questions and 23 propositions derived from Quintels et al. (2006, 173) framework about drivers, facilitators and barriers. It also contained a couple of qualitative questions to support the quantitative propositions.

According to Fink (2011, 2) survey represents “a system for collecting information from or about people to describe, compare or explain their knowledge, attitudes and behaviour. ” It has a statistic nature, which means that the obtained data can be “[..]quantified from a population for purposes of description or to identify covariation between variables that may point to causal relationships or predictive patterns of influence” (Sapsford 2007, 2). This paper used the data for the former reason, to describe the results and to compare them between various respondent groups.

Surveys tend to suffer high nonresponse rates, which was considered to be a threat for this survey. The non-response is generally defined as “failure to respond” or an “empty or unsatisfactory response”⁵ In the context of internet surveys, it refers to the respondents “[..] who are sampled but from whom the data are not gathered[..]”. (Goyder, 2008, 528). Berinsky (2012, 309-310) identifies two types of non-responses: “(1) the respondents which cannot be found by the poll’s sponsors” and “(2) respondents who decline to participate to poll”. This paper considers the second type majorly because the population was well-identified by inviting the respondents who had a power of attorney (PoA) to conduct purchases within the case company.

To increase the willingness to participate the survey, the selected group was persuaded by conducting a lottery of 2x2 movie cards, explaining the importance of the survey in the cover letter and sending a reminder for the who had not responded the survey within two weeks. Groves (2006, 670) proposes additionally that using auxiliary data mitigates the effect of nonresponse bias, which also this paper addressed by using two or more research methods to test the same question.

The coverage of the survey was considered to be appropriate while the invited participants represented the whole sample of persons who had the possibility to make purchases. According to Bilgen (2017, 02:05) the coverage error “occurs when the sample frame does not cover some of the units defined in the target population, or a sampling frame covers more units than what is defined in target population”. The latter was not considered as a threat for the survey.

⁵ Merriam-Webster (2019)

Figure 14 depicts the sampling process of the survey. The survey was sent to the group of production and purchasing employees having PoA (N=101), which presents the representative sample in this case. 39 of the sample responded to the survey, of which 32 of the respondents utilised the international purchasing and seven did not, which were phased out from the analysis. The respondents who did not utilise the international purchasing answered a couple of questions, to clarify why it was not utilised. The remaining 32 valid responses were analysed per business areas (BAs) and operational groups. In addition to the propositions, the survey also included a qualitative question of the respondents not using international purchases.

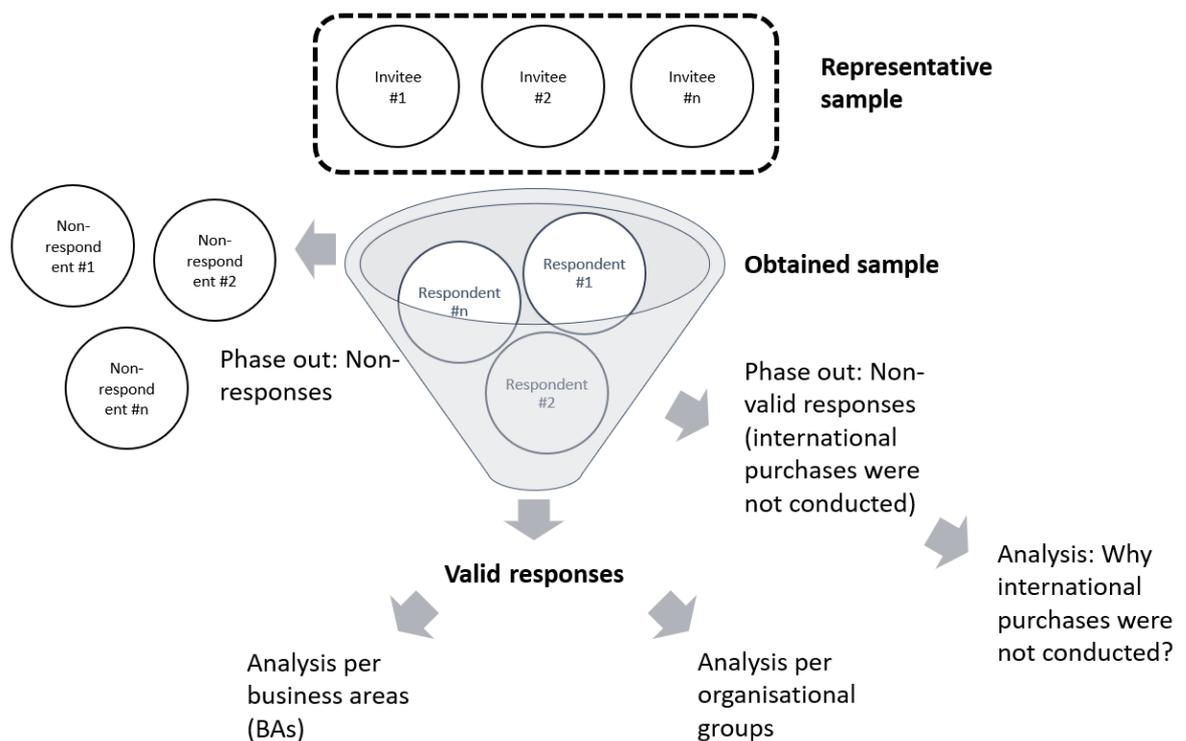


Figure 14 Sampling process

Due to the low number of the effective study sample, the regression analysis could not be made. The sample size should be at least $N > 50 + 8k$, where k is the number of independent variables (Wilson Van Voorhis & Morgan 2007, 47; Green 1991). In this case, the required number would be in the case of BAs $50 + 8 \cdot 4 = 82$ and in the case of operational areas: $50 + 8 \cdot 2 = 66$, of which both were above the sample size $N = 32$, which did not fulfil the condition in either case. Instead of regression analysis,

a univariate descriptive analysis was utilised. It is a method of analysis that is used for “[.] summarising the characteristics of some phenomenon in terms of distributions on variables” (Blaikie 2003, 47). It includes distribution, central tendency and spread (Kimball& Weisberg 2003, 1160). In the analysis, the central tendencies were measured by counting group-specific average numbers, which were compared between the respondent groups if the dispersion (the difference between highest and lowest value) was high enough. The results were presented descriptively, comparing the means between groups, when required by high dispersion.

Additionally, the numeric answers between groups were tested by using two variance analysis tools: ANOVA and T-test. The tools were used to find out, is there significant differences between the respondent groups. Analysis of variance (ANOVA) is “[.]a collection of statistical methods used to analyse the impact of one or more nominal variables as independent variables on a quantitative variable as the dependent variable” (Iversen, 2011, 13). It uses manipulation of independent variables to test if there is any dependency between dependent and independent variables (Field, 2011, 33). In this case research, it was essential to see if there is a significant difference between the four business area (BA) groups, which is what the ANOVA test points out. Because only one independent variable was compared to a dependent variable per time, ANOVA test was used instead of multivariate analysis test (MANOVA).

To test the difference between the operational groups (only two independent variables existing within the sample), a two-tailed T-test was conducted. The use of the T-test is similar than in the previous case, but it uses Student’s T-distribution to define if there is a significant correlation between the variables and therefore differences between the groups. If the results support, the hypothesised value (h_0) the results are within the normal Student’s T-distribution range (Elliot& Woodwart, 2011, 50-51). In this case, the differences are insignificant. If the results are not normally distributed, where ($p < 0,05$), h_A is supported, meaning that the differences between the groups are significant and, thus there are significant differences between the sample groups.

In this case study, the research utilised the independent samples t-test because the research included two independent groups, which means that they were compared together to see if they are significantly different (Nishishiba, Jones & Kraner, 2017, 175)

4 RESULTS

This section describes the results in three subchapters. The first subchapter presents the results from structured interviews, the second one from the internet survey and the third one from the participatory action research (PAR). The order differs from the chronological order, where the PAR was started first, because the PAR works best as a supplementary part of the research, answering the remaining research questions 5 and partially to 1a (in advanced contract types).

The research questions 1a-4 are analysed in two parts: first, the structured interview section creates an understanding of the current research problem, and six hypotheses (H1a-H4) were created. Next, the hypotheses are tested in the following internet survey section to verify the results. (Figure 15)

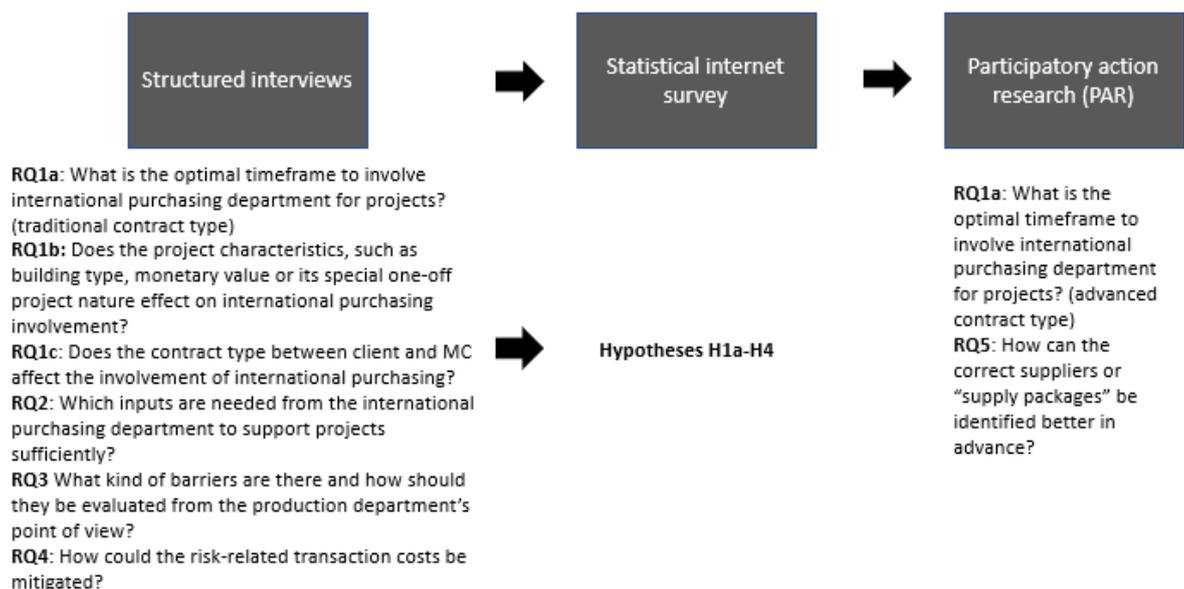


Figure 15 The analysis process in the chapter

4.1 Structured interview section

In this chapter, the questions are analysed in four categories starting from general questions and ending to risks and obstacles. In each category, first the case company organisation's, then the international purchasing organisation's, and lastly, the client organisation's point of view are presented, analysed and combined to form a sub-conclusion. The analysis is done by interpreting the categorised results, presented in tables within the chapters. The client organisation's point of view represents the qualitative side of the results, involving only one respondent, and discussing the usability of international purchasing from the external perspective. Parallel to presenting the sub conclusions, hypotheses are created according to the results. These hypotheses H1a-H4 were tested on the internet survey, which was conducted after this phase.

General questions

The first category contains general questions about international purchasing (Tables 6-8). In the case of *domestic purchasing* and *production organisations* (Table 6), the internationally purchased items are usually steel parts and structures, concrete casting works and prefabricated items. Overall, the interviewees state that the international purchasing department's visibility in the projects is low. Four of the interviewees claim that the international purchasing consists items purchased mainly from Estonian markets by domestic purchasing and the international purchasing is seen only as a supportive department, which makes the relevant legal checks (audits) for the suppliers. The third question inquires about success and failure experiences of international purchasing. Despite the high variance of the answers, the results show that international purchases are seen beneficial in larger projects, where the IPS support is present. The third question also confirms the results from the second question, where the international purchasing is seen as a regulative function checking the legal suitability of mainly Estonian purchasing items. Almost all of the interviewees note that the international purchasing department involvement is not systematic, meaning that the projects which have prospective internationally purchased items are not adequately connected to international purchasing department's services.

Table 6 General questions, interviewee group: domestic purchasing and production department

Antecedent category	General questions	Detailed description (if any)	Repetitive appearances	data
Firm/management	Have you used the international purchasing department in your projects during the past year? Which purchases were made?	N/A	Steel parts and structures (x4), concrete casting works (x3), prefabricated items (x4)	
Firm/management	How does the international purchasing currently work?	The quality of operations, the success of projects	The visibility of IPS is low (x6). The domestic procurement makes the sourcing and purchasing (x4) especially from Estonian markets (x3).	
All	Please mention three things, in which international purchasing department has succeeded and three where it has failed?	N/A	There is a variance in which types of purchases international purchasing should be used. The results show that the successful int purchases have been usually in larger projects, where the IPS support has been present. In many cases, IPS has provided legal data for suppliers at a good level for national purchasing, when the operative purchasing phase has been done by domestic purchasing. On the other hand, almost all of the interviewees (x5) see that the involvement of IPS is not systematic, and therefore the available benefits are not fully utilised.	

In the case of *international purchasing* two of the questions remained the same, but the question of success stories was replaced with future item category prospects to match the interviewee group's profile better. Regarding the frequently purchased high spend categories, steel products, prefabricated concrete elements and general subcontracting were represented in the list, which matches the purchasing profile of top purchases in Finland. In Sweden some categories, such as window products differ from the Finnish category purchases. The collaboration between international purchasing, domestic purchasing and production departments are at a higher level than in Finland. This difference may be the result from more mature and larger organisation in Sweden, which leads to enhanced processes and increased integration between departments. Two of the interviewees predict that the

collaboration between departments will increase in the future due to internal process development. The interviewees also predict that the amount of internationally purchased subcontracting will increase in the group-wide context.

Table 7 General questions, interviewee group: international purchasing

Antecedent category	Question EN	Detailed description (if any)	Repetitive data appearances
Product	What are the most relevant internationally purchased commodities in your business area (which IPO is providing)?		Steel products x3, prefabricated concrete elements x3, general subcontracting x3. NOTE: windows and some other country-specific products are not necessarily available in Finland
Product	Which commodities/commodity groups you predict to be increased in future in INT purchasing?		Subcontracting increases. Mixed results of item groups
Firm/management	How well does INT purchasing currently works?	Quality, level, and accomplished targets in projects	Collaboration between parties will increase. Finland is seen as an underdog considering implementation.

The *client organisation* is generally open-minded towards international purchases due to its own core businesses' international nature and certain product requirements towards its supply chain from the real estate project management perspective. The replies from the client organisation show that the MC's international purchasing department is valued by them due to certain items that the client requires to be purchased internationally, which is more convenient when the MC has a dedicated resource to do it. The client estimates that in their building repertoire, prefabricated insulation elements, roof material, façade windows, aluminium structures and cooling works will be increasingly purchased internationally in the future.

Table 8 General questions, client organisation

Antecedent category	General questions	Detailed description (if any)	Answer (single)
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Firm/management	How does your organisation concern international purchases	N/A	The case company purchases a high amount of purchases itself. Certain items needed are available in international purchases only. Also, certain items are required by the parent company to be purchased internationally. The interviewee mentions that the company's core business (foodstuff retailing) involves more than half of the total spend on international purchases.
All	Which kind of experiences do you have from international purchases?	Items purchased by the case company itself and by MC	Mainly positive, due to the parent company's requirement of purchasing certain items internationally. In the case of new build projects, some of the purchases are made by the client organisation and some by the main contractor's organisation.
Product	In which product groups international purchasing needs to be increased?	N/A	The prefabricated insulation elements, roof materials, façade, windows, aluminium structures, cooling works.

In summary, the *general questions* category reveals the case company's inadequate focus on the projects requiring international purchasing department's assistance on internationally purchased items in Finland. On the other hand, it reveals that international purchasing department has enabled the use of Baltic (mainly Estonian) suppliers and contractors by conducting the necessary audits and, therefore, fulfilling the legal and the case company's code of conduct (CoC) requirements to support operations. Considering the replies from international purchasing, the international purchasing department has a better focus on Swedish projects, where the revenue volume and organisational maturity is higher. Therefore, the critical development area is in the Finnish context, in which this thesis' development targets are set. According to the client interview, the international purchasing department is appreciated when the client requires explicitly (pre-defined) internationally purchased items in the projects, where the department delivers convenience for the project through experience on internationally purchased items.

Drivers

The *drivers category* examines why international purchases are used and for which types of projects they should be targeted. The interviews with *production* and *domestic purchasing organisation* show that the international purchases are conducted mainly for cost reasons, but also to increase resource availability and cost control through an extension of supply pool. The cost benefit is usually the primary driver for using international purchasing, but interestingly its significance is seen to have been decreasing over time. In parallel to purchasing price, the delivery security and product quality are seen as important factors to be considered when the supplier is to be chosen. When asked about the suitable project and building types for the international purchases, the responses can be split to two categories: two of the interviewees claimed that the international purchasing could be used in all kinds of project and building types, but the majority (four) of the interviewees state that the project should be an advanced type, such as project management or D&B contract, to support international purchasing. The appropriate building type remained unclear, but almost all of the interviewees said, that the monetary value of the project needs to be high to support international purchases. (Table 9).

Table 9 Drivers, interviewee group: domestic purchasing and production department

Antecedent category	Drivers	In detail	Repetitive data appearances
Product	In which kind of projects international purchasing should be used?	Project and building type	There was a variance between answers. Two of the interviewees saw that international purchases could be used in all types of projects, but rest of the interviewees (x4) saw that the project type should be partnering or design and build to be able to obtain the benefits of international purchasing activities. Nearly every interviewee stated that the monetary size of the project should be large to get the benefits, while the remaining one justified the irrelevance of project size in the established line-specific supplier pool, where the need for IPS functions is lower due to the international items, which are purchased by using national purchasing department.

All	What are the main reasons why international purchases should be used in project purchasing?	E.g. top 3 reasons	Mainly lower purchasing price (x5), increased competition due to the larger supply pool (x4), increased access to the resources (x3)
Product	How significant should the cost-benefit be that international purchases should be used for projects? What kind of other important factors besides the purchasing price are there?		Generally, there must be a cost advantage to use international supplier (x5). However, it has been noted that the cost advantage requirement is lower than earlier.
Product	Are the delivery security and the quality of the product significant factors when a decision of international supplier is to be made?		Delivery security and quality are one of the essential requirements when choosing suppliers.

The interviews by the *international purchasing department* deliver matching results for the questions of critical reasons international purchasing should be used, the required cost difference and the question about delivery security and product quality's importance. However, the interviews show mixed results on the suitability for a specific building and contract types, one interviewee recognising the requirement and two others not recognising it. (Table 10)

Table 10 Drivers, interviewee group: international purchasing department

Category	Drivers	Detailed description (if any)	Repetitive data appearances
Product	In which types of projects (=contract and building type) INT purchasing should be used?	Project and building type	Mixed information. Mostly no limitations in contract or building types.
All	What are the main reasons, why INT purchasing should be utilised?	e.g. TOP 3 reasons	Mainly to cut price and delivery fluctuations locally. Also, better value by eliminating middle hands.
Product	How much (in generally) the cost advantage should be that the production department would like to choose an international supplier? How is the cost advantage measured? Is it possible to get cost feedback from realised projects?	N/A	Generally, the attitudes to using INT purchasing has changed to a more tolerating direction. Still, the purchasing price should be >10% more affordable to match the risks and increased administrative demands (according to IPS)
Product	Is delivery security, quality of products and availability often significant factors, when the decision for INT	N/A	Generally, these are the most critical factors. Other significant factors include cost advantage and availability.

	supplier is made? What other significant factors there are?		
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From the *client's perspective*, the concept centricity of its business is the key driver to use international purchases, because certain items are required to be internationally purchased by its parent company. While its concept requires certain, pre-specified purchases to be done through MC's purchasing (purchasing responsibility on MC's side), the client appreciates MC organisation's international purchasing experience and dedicated purchasing resources. The benefits of using international purchasing (via the MC) for pre-specified purchases comes rather from availability, maintenance and active customer service than from pure price benefits. Usually, the internationally purchased specialised products outside of concept are not delivering any surplus value for the client, but in some cases, they might be used if the quality is sufficient and the client may obtain price benefits from the concept deviating choice.

The client organisation sees the MC organisation's positive attitude towards international purchasing and dedicated international purchasing resources as success factors to enable international purchasing. The interviewee notes that the MC organisation's size usually correlates with the availability of international purchasing resources – the bigger the organisation, the better the availability of the resources. (Table 11).

Table 11 Drivers, client organisation

Category	Drivers	Detailed description (if any)	Answer (single)
Firm/management	How do (the MC's) international purchases benefit the client organisation?	N/A	The international purchases belong to the case company's repertoire because the company's strict building concept requires them. The company provides a specific channel for the MC to order specific products. In every case, the responsibility for the required quantity is the MC's. While the items are clearly specified, the quality is also known.

			Considering a longer time perspective, also the warranty and maintenance issues are easier to manage.
Product/ environment	Is the benefit seen only from a cost perspective? Which other benefits exist?	N/A	The availability, maintenance, and dedicated contact persons are seen as essential aspects.
Firm/ management	Is providing internationally purchased products from a famous brand seen as image benefit? (e.g. high-quality facades, lounges, etc.)	N/A	The products are highly pre-specified according to the company's concept. The (second tier) supplier can be changed, but the price benefit needs to be there. The image benefit does not usually exist.
	Which kind of positive experiences do you have from international purchases by MC? What are the success factors?	N/A	The transparency towards the MC's supply chain is usually weak. The success comes from the MC's experience of international purchases. This is caused by the large size and the dedicated resources and the positive attitude of the key persons towards international purchases

The key *drivers* to use project purchasing seems to be very similar between the case company's interview groups and in the literature involving price benefits and increasing competition in local markets to access a larger pool of resources. The interviewed client organisation has different purposes for involving international purchases. Due to its specialised items, it requires international purchasing to be used in the projects. On the other hand, due to a large amount of internationally purchased items required, it has a positive attitude towards internationally purchased items generally. Therefore, it can be stated that also the customer's building portfolio and background has an effect on the internationally purchased items, and therefore the focus for international purchasing department's early involvement.

Facilitators

The facilitators category measures in which areas international purchasing department and its operating environment (domestic purchasing and production departments and the supplier pool) best supports the performance in projects. In the case of early involvement, the questions about project phase are the most essential in this category.

The interviews with production and domestic purchasing organisations show the need for the international production department early involvement. All the respondent show that it should be done as early as possible within the projects. Four of the interviewees see that importance of early involvement increases if the project uses advanced contract type, such as D&B, alliance or project management contracts. The remaining two interviewees state that the project type does not matter. The question measuring the current implementation of the early involvement splits the results in half: three of the interviewees say that the current state is sufficient and the remaining three claim that the international purchasing department should be involved for the projects earlier. The question about sufficient communication also divides the interviewees into two groups: three of the interviewees say that the communication is sufficient and three claim it to be insufficient, mostly due to the lack of dedicated resources in the international purchasing department.

While asking about the required capabilities of the international purchasing department, surprisingly, the capabilities of the domestic department appear within the replies. Due to the domestic purchasing's responsibility for the project purchases, the interviewees emphasised the importance of domestic purchaser as a middleman between production and international purchasing departments. Two of the interviewees state that the international purchasing department is not familiar enough for them. The results, however, point out that the connection between the responsible domestic project purchaser and international purchasing department should be stronger than between international purchasing department and production departments.

In the case of supplier audits, the respondents require only that they are completed stating that the additional value of the audits is usually low. In this case, only the legal and the case company's CoC requirements need to be fulfilled.

The author also wanted to ask about the interviewee's familiarity on the total cost of ownership (TCO) model to be used on evaluating suppliers based on the previous performance and additional transaction costs within the projects. This request was made because the case organisation suggested that TCO could be used to compare the quotations between each other better monetarily, and perhaps balance the much lower initial price requirement from international suppliers. However, the TCO model was not familiar to the respondents in the context of the construction industry. Four of the interviewees believe that it would be somehow useful, but two of the interviewees say, that in practice it would be too difficult to use due to its highly abstract nature. Regarding cultural differences, there was no clear cut on the answers. Usually, irregular working hours, cherry picking, language barriers and understanding local quality requirements were identified as problems. (Table 12).

Table 12 Facilitators, interviewee group: domestic purchasing and production departments

Antecedent category	Facilitators	Detailed description	Repetitive appearances	data
Product	How does the supplier audit effects the supplier selection process?	N/A	It is enough that the audit has been completed and accepted in the case company's supply base.	
Firm/ management	What capabilities should international purchasing department have that it could reach its project-specific goals?	E.g. Project-specific targets, service level and scope of service, and substance capabilities	The interviewees emphasised the importance of the domestic purchaser as a middleman between the production and international purchasing departments to control and regulate information exchange between departments (x4). The activity of domestic and international procurement departments is essential (x3) Two of the interviewees state that the IPS department is not familiar enough to them and require more information about the possibilities.	

Firm/ management	In which project phase international purchasing department should be involved that the benefits would be maximised?	N/A	Generally, as early as possible (x6). Some interviewees stated that if the project type is more advanced, involving the case company more (D&B, alliance and project management contracts) requirement of early involvement is increased (x4) and the rest claim that the project type does not matter (x2)
Firm/ management	Are the internationally purchased items sufficiently planned for the project?	N/A	The results are split in half. Three of the interviewees claim that the international purchases are sufficiently planned for the projects and the other three claims that these are not sufficiently planned.
Firm/ management	Is the communication between international purchasing and other parties sufficient for the projects?	N/A	Three of the interviewees claim that the support has been sufficient and the other three require more interaction between departments. Especially the lack of resources in international purchasing department has been seen as a critical problem in these cases.
Environment	How do cultural differences affect the construction phase? Are there clear differences between the purchased items?	N/A	No definite conclusion can be made due to the variance between answers. Cherry picking, understanding a foreign language and local quality requirements, and irregular working hours are seen to be challenges.
Firm/ management	Should the Total Cost of Ownership (TCO) model be used when evaluating quotations? How could this model be implemented?	TCO evaluates the purchasing price and additional transaction costs for the item.	TCO is not currently used (x6) but should be somehow used (x4). However, obtaining TCO data is seen as difficult and too abstract to be used (x2)

In this category, the interviews of *international purchasing department* give more congruent answers than the previous interviewee group of domestic purchasing and production departments regarding the early involvement and supplier audits (Table 13). According to the results, the international purchasing department should be involved already in the project tendering phase to find appropriate suppliers and to initiate the possible early involvement activities. The question about the current

implementation gave various answers. It seems that the implementation is on the sufficient level in the case of the Swedish organisation due to its size and maturity, but needs development in the Finnish context. The Achilles heel is a longer lead time for request for quotations (RFQs) due to the translation requirement, which often causes problems, while the main contract's tendering phases are generally short. The audits are also completed only to enable the use of international purchasing in the case of legal and internal CoC requirements. From the international purchasing department's perspective, the communication works sufficiently. The question of cultural differences also gives various answers. A similar point is the misunderstanding of the scope of work and working culture differences generally.

Table 13 Facilitators, interviewee group: international purchasing department

Category	Facilitators	Detailed description (if any)	Repetitive data appearances
Product	How does the supplier audit influence the order decision? How does the production department concern audit? Is it enough when it is only completed or is more content required?	N/A	The production may not know about audits. Usually, the audit usability is binary type: either to be able to use the supplier or not. Other than that, audit results have a low impact on projects.
Firm/management	What kind of capabilities IPS&IPO should have to reach its requirements (from the production department/ domestic purchasing)	Project-specific targets, quality and scope of service.	IPO's should be close to the supply base, IPS are more generalists, recognising the specific needs of projects.
Firm/management	In which project phase INT procurement should be involved for the projects to get better benefits for the case company? How does the chosen project type influence this?	N/A	Already in the tendering phase (x3). In partnering projects, the need especially increases (x2). Early department involvement creates benefits by finding better solutions through ESI.
Firm/management	Are INT purchases planned sufficiently in advance for projects? For which kind of projects should this be changed?	N/A	Increased variance between replies. Some indicate that the involvement is sufficiently early (in Swedish case), some say that the lead time is too short, especially when the tendering material needs to be translated.
Firm/management	Does the communication between INT purchasing and NAT purchasing and production work sufficiently?	N/A	Communication works sufficiently (Swedish IPS and IPO cases)

Environment	How do the cultural factors (similarities or dissimilarities) effect on the work? Do the commodities/commodity groups have clear differences between them?	N/A	Variance between replies. Working culture differences, longer adaptation, misunderstandings of the scope of work.
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Due to the interviewed *client organisation's* strong concept orientation, the facilitators involve diverse elements compared to the previous replies from the MC organisation. The strong concept causes highly pre-defined products and supply channels, where some of the delivery conditions are already agreed, but the actual operative purchasing work is still left for the MC for project responsibility reasons. From the client's perspective, the dedicated international purchasing resources and positive attitude towards international purchases are seen as facilitators. The benefits found in previous interviews, such as low initial pricing and increased availability, were not so strongly present during the client interview. Also, the questions of the most beneficial contract types do not apply to the interviewed client organisation very well because usually only the traditional main contract type is used. Referring to chapter 2.3 the main contract is considered as an unfit type of contract due to its non-existing possibilities for early involvement due to its limited timeframe for early involvement activities. (Table 14).

Table 14 Facilitators, client organisation

Antecedent category	Facilitators	Detailed description (if any)	Answer (single)
Management	How can international purchasing be furthered in planning guidance?	N/A	The ordering information for pre-specified products is given for the MC, which simplifies purchasing and planning management processes, but also, on the other hand, limits the possibilities of the MC. The MC can still leverage the supply chain itself, e.g. by ordering products directly from the (international) manufacturers.

Environment, product	What kind of contract types benefit international purchasing best?	N/A	Not relevant in the case of the interviewed company, due to the fact that the contracts are usually main contracts, [where the products are pre-specified by the client organisation]. If the specified products are changed, the MC takes the responsibility of the quality and compatibility.
Firm/ management, Environment	Do your internationalisation goals effect on the internationalisation level of your (construction-related) products?	N/A	The client company works as a good partner for internal purchases, due to its extensive international partner network. On the other hand, the client organisation also provides some international growing possibilities for domestic suppliers.
Firm/ management	In which phase of the project the international purchasing needs to be involved?	N/A	The international purchasing department should be involved already when the contract between the client company and the chosen MC is legally binding.

The results on this *facilitators category* show the need for international purchasing department's early involvement, which is currently lagging behind in the Finnish context. The responses about the sufficient planning of items for the projects, the current level of communication, and the cultural factors as facilitators were inconclusive. The domestic and international audit groups agree on the purpose of the audit, where it is seen only as an enabler, but providing no additional value while the appointment is made. Interestingly, the building type had only low significance on the early activities, while the contract type was seen as a more significant factor.

The client's perspective of facilitating international purchases does not fully support the case company's purpose, while the interests differ slightly, the client's purchasing profile being strictly limited due to its strong building concept. This high conceptualisation limits the MC's need in the early project phases, which rejects the advanced project models enabling international purchasing department's early involvement possibilities. On the other hand, the interviewed customer sees the existence of international purchasing department itself as a facilitator for successful projects due to the dedicated resources and previous experience of internationally purchased items. Due to the dissimilar interests of customers towards international

purchasing enablers, the customer's needs and their required product portfolio should be appropriately identified to see if there is a match of interests between the MC and the client organisation.

Barriers and risks

The barriers category concentrates on the risks and obstacles defining the factors hindering the international purchasing performance. When purchasing internationally, the risk perspective is often more present than in domestic purchasing, due to its lower controllability compared to domestic purchases. This perspective is also reflected clearly within the domestic purchasing and production answer group. The risk categories are divided according to their nature to technical, economic and legal risks.

During the *domestic purchasing and production* interviews, the technical risks were present more clearly, involving mainly the technical quality risks, where some of the interviewees emphasised the subcontractor's deviation on set national quality standards and others noted the expected quality by the MC or the client organisation. The question about economic risks and legal risks gave more diverse answers. The main commercial risks were the misunderstood scope of works (SOW), and the critical legal risk was the increased working hours per day required by a subcontractor. The increased working hours are seen risky and require the MC's health and safety management resources on site during the extended working hours according to Finnish legislation (Government Decree on the Safety of Construction Work 2009, 12-13§). The question of controlling risks had a high variance between the replies. Some of the interviewees would strengthen the communication between the parties in the tendering and audit phase while the others took an internal process development perspective by calling for enhanced supplier risk management in the corporate level or enhance the internal collaboration in general between domestic and international purchasing departments.

The questions about warranty and 10-year responsibility risks and stiffness of international purchasing divide respondents into two categories, which can also be seen geographically. Since the international purchasing in the case company

includes mostly items purchased from Estonian markets, the interviewees nearby the Helsinki metropolitan area did not recognise international purchasing as risky or stiff activity due to the geographical proximity. The proximity provides better change for continuity for the Estonian contractors, and therefore, these items are more agile and warranty wise more reliable from a southern Finland perspective. The increased geographical distance causes also increased lead times, which was seen from the interviewees' replies on the question about delivery times. The interviewees in the Helsinki metropolitan area did not recognise the lead time increase as a risk due to their proximity to the Estonian supply base, but the respondents from other geographical areas did recognise the risk.

Even though there is no clear view about obstacles for not using the international purchases for the projects, the majority of interviewees would require more internal interaction between the departments. The previous answers show the increased importance of a strong relationship between international and domestic purchasing departments. Therefore, the obstacles could be removed best by increasing the communication between the two departments. (Table 15).

Table 15 Barriers, interviewee group: domestic purchasing and production departments

Antecedent category	Barriers (risks and obstacles)	In detail	Repetitive appearances	data
All	What are the key reasons, why international purchasing should not be used in project purchasing?	e.g. top 3 reasons	No clear cut due to the variance. Misunderstanding quality requirements, language barriers and understanding legal requirements are seen as risks.	
Product	What kind of technical risks international purchasing causes for the projects?	N/A	Deviating quality standards may cause problems (x5) in fulfilling the expected or standardised requirements.	
Firm/management	What kind of commercial risks international purchasing causes for the projects?	N/A	Increased variance between answers. Risk of the misunderstood scope of works.	
Environment	What kind of legal risks international purchasing causes for the projects?	N/A	Increased working hours per day create extra risk and costs for the case company (x3)	
All	How could these risks be controlled better?	N/A	High variance between answers. Increased risk management through communication in the tendering and audit phase (x2). Better internal guidelines	

			of international supplier risk management (x2). Enhanced collaboration between international and domestic purchasing departments (x2).
Product	Are warranty and 10-year responsibility risks significantly higher when the items are internationally purchased?	N/A	The replies deviate into two categories: Three of the interviewees see that the warranty risks are increased while using international suppliers. The other three see that the warranty risks are similar in domestic purchasing.
Product	Is international purchasing experienced as a "stiffer" way of purchasing compared to domestic purchasing?	N/A	The replies deviate into two categories: Three of the interviewees experience international purchases as a stiffer way to purchase due to the language barriers and increased phases (and length) within the purchasing process.
Product	How the delivery times effect on international purchases?	N/A	Four of the interviewees find that the increased lead time requirement creates challenges for the projects. The other two the interviewees note that especially when the items are purchased from Estonia, the lead time is the same. Geographical differences can be seen here: Helsinki metropolitan area being less affected by increased lead times
All	How could the observed obstacles be removed?	N/A	Four of the interviewees require more active operative interaction from the international purchasing department. Especially finding new possible items is essential in parallel to operational support in an ongoing project.

The *international purchasing's interviews* provide similar answers for the questions about technical, commercial and legal risks than the domestic ones. The technical risks involve mainly misunderstandings of quality standards in product certifications level, commercial risks the misunderstood scope of works (SOW) and possible bankruptcy and legal risks the differences in labour policies. The legal risks were

considered to be generally low because the agreements were made according to the target country's legislative requirements. Miscommunication was seen as the critical factor leading to the realisation of risk, even though there was variation between answers. Besides the enhanced communication, risk mitigation could be done through pre-qualification of suppliers. The answers to the questions of international supply stiffness and increased warranty and 10-year responsibility risks follow the same pattern than in the previous interviews but for different reasons. The flexibility is higher due to the increased competition of the supply base, and the warranty issues are less risky due to the strong contractual binding and heavy sanctions of noncompliance. The interviewees also agree with the low geographical risks in the case of EU purchases, but they note that usually, the increased geographical distance increases the purchasing planning or preparation time, rather than the operational lead time (time from order to completion). (Table 16).

Table 16 Barriers, interviewee group: International purchasing department

Antecedent category	Risks and obstacles	Detailed description (if any)	Repetitive data appearances
All	What are the most common failures in international purchases?	e.g. TOP 3 reasons	Variance between answers, miscommunication, budgeting errors, too optimistic delivery times.
All	Why do these failures appear?	N/A	Variance between answers.; Miscommunication and errors in planning
All	Could these failures be eliminated for example by developing internal processes?	N/A	Variance between answers. More careful planning and communication
Product	What kind of technical risks will INT purchasing create to projects?	N/A	Inside EU: Mainly technical risks, covering certifications. Outside EU: differences in labour policies, which are needed to be covered within the audit framework (legal risks).
Firm/management	What kind of commercial risks will INT purchasing create to projects?	N/A	Variance between answers. The scope of works, bankruptcy.
Environment	What kind of legal risks will INT purchasing create to projects?	N/A	Generally, this risk category is low for the client, due to the fact that the risks are handled contractually according to the client country's legislation.

All	How could these risks be mitigated?	N/A	Prequalification of suppliers (x2)
Product	Are warranty and (10-year) responsibility risks higher in INT procurement?	N/A	Usually no, due to the strong contractual binding.
Product, network	Are INT suppliers/contractors stiff? How does this effect on site or in the pre-site phase (planning& negotiation)?	N/A	Generally, as flexible as locals, but more often flexibility benefits can be obtained due to the increased competition.
Product, network	How do the long delivery times effect on international purchases?	N/A	Inside EU: Similar than in domestic purchasing. Usually, the planning time is extended but the delivery time is reduced.

The interviewed *client organisation's* concept-centric profile is also clearly seen in the barriers interview sector. The organisation requires some pre-defined items to be purchased internationally from its fixed supply network. The usual issues of, e.g. warranty and delivery security are not seen as risks, due to the client organisation's strong asymmetric power status towards its pre-fixed supply network. On the other hand, the results of considering the MC's supply pool include some similar barriers than in previous interview groups can be found, such as language barriers, and differing working practices. The critical barrier hindering international purchasing use is the MC's lack of dedicated international purchasing resources. The client organisation sees the supplier audits organised by the MC essential part of supplier relationship management (SRM) because the supply failures also have a direct impact on the projects and the client's reputation. Considering the reputation, the client generally sees the domestic purchases less risky than international ones considering the purchases conducted by the MC. (Table 17).

Table 17 Barriers, interviewee group: client organisation

Antecedent category	Barriers	Detailed description (if any)	Answer (single)
All	Why should international purchasing not be used?	N/A	The domestic purchases are essential considering the image of the company. In the case of [the MC's] international purchasing, the stiffness effects the purchasing [in the case of warranty issues]. These warranty issues are not considered to be risk if the

			client company's own [specified] supply network is used due to the dominant power relation the client company obtains.
Product	In which items or item groups the number of international purchases should be decreased? Why?	N/A	Managing international purchases onsite requires more skills from the [MC's] site management due to the different working practices.
All	Which kind of negative experiences do you have from international purchases? Why do these appear?	N/A	Delivery failures in general, purchasing orders, where the client, that has more leverage may get access to the product in agreed time. On the other hand, the large client organisation creates positive power asymmetry compared to smaller ones. In the construction contracting there are sometimes language barriers. If the MC is a smaller organisation, international purchasing is often less convenient due to the lack of dedicated resources in the organisation.
Product	How the international purchases effect on the life cycle of the product?	e.g. maintenance and upgradeability	The pre-specified products make [MC's] international purchasing operations more convenient. After the initiation, obtaining the maintenance parts take longer time than in domestic purchases. On the other hand, warranty maintenance is more convenient due to the high purchasing volume for the specified network.
Other	Other important issues regarding international purchasing	N/A	The international supplier audit is seen essential aspect due to the potential risk of a bad reputation.

The barriers category examined the various types of existing risks and their impact on the construction projects from the case and client organisations perspectives. The interviews with the case organisation including international purchasing department gave coherent answers for the questions of technical and commercial risks. The critical technical risks are related to the product quality by not

understanding the local contractually obliged or standardised requirements. Both interviewee groups mention insufficient or misunderstood SOW as the critical commercial risk. Regarding legal risks, the domestic organisation (especially the interviewees from the production department) recognises the increased working hours as a legal risk, due to the national health and safety (H&S) requirements. The international purchasing department finds the legal risks generally low, as the international supplier is contractually obliged to follow local regulations. The interviewed client's perspective differs slightly, as its large and multinational background and strong concept define certain internationally-purchased items to be purchased from its network. Due to the strong asymmetrical power status towards its network, the risks are generally lower, and some of them are even turned into benefits, i.e. strong customer status enabling better warranty period service in internationally purchased items than in domestically purchased ones. On the other hand, when using MC's supply pool, the found barriers are somewhat similar than in the case organisation's interviews including warranty risks, language barriers and possible quality risks. The client organisation presents the MC's dedicated international purchasing resources as success factor while working for the client organisation's projects.

Created hypotheses:

Similarly than Jagtap, Kamble and Raut (2017, 15) present the early involvement motivations between client and MC organisations already in the project inception phase, the results indicate that the same logic for early involvement might also work in the MC's supply chain – the early involvement should be initiated as early as possible. However, the contract type limits the time frame of early involvement. If the client chooses a traditional contract type, in this case, the traditional main contract, the early involvement would be initiated on project tendering phase when the technical project price is calculated. However, according to the results, the tendering phase is often limited by available time for the early involvement while the international department's request for quotation (RFQ) processes towards its supplier candidates take more time than in the case of domestic ones. If the project type is advanced, involving the MC earlier for the project, the project development

phase is the right phase to be involved in, where the technical decisions are made. To test these, the following hypotheses were created:

- **H1a:** *The optimal timeframe for the early involvement is in project tendering phase on main contract types and project development phase in advanced contract types.*
- **H1c:** *International purchasing department should target its services on collaborative project types*

Addressing the early involvement activities for the collaborative project types is expected because ESI requires trust, which the collaborative (advanced) project types can provide, which differs from traditional main contract types. To support this collaboration requirement, Meng (2011, 189; 196-197) claims that closer supplier relationships are needed to support successful project delivery in the construction industry. To support the argument behind hypothesis H1c, Walker and Stevenson (2017, 1859-1860) identify collaboration to decrease ambiguity and uncertainty, which decreases the transaction costs which is a motivation for the case organisation.

If the international ESI is initiated in the early phase of the project, there are more possibilities to leverage the technical solutions, and therefrom the purchasing price through product optimisation. Brahm and Tarzijan (2015, 1859-1860) claim that the project requiring advanced contracting models are typically complex or monetarily high-valued. Similarly, Crespin-Mazet and Portier (2010, 237) indicate that collaboration is needed to satisfy the needs of complex and high-valued projects. To test these theories in the MC's supply chain in international purchasing context, a hypothesis of **H1b:** *Project size or its special one-off nature effects on the project types, the international department needs to target its services to is created.*

According to the results, all kinds of projects need international purchasing, but their item portfolio and internal service requirement may be different. For example, in the case of housing projects, the required services include supplier audits, but the operational sourcing and purchasing work is done by the domestic purchasing organisation's staff. On the other hand, larger industrial projects require international purchasing's resources for the operational tasks, such as new item category

sourcing and purchasing activities. However, instead of the building type, the key driver of the early involvement is the building project's high monetary value. Logically, the high value also creates more interest on the ESI actions also from the supplier's perspective, and from the MC's organisational perspective the higher value project can support a higher amount of managerial resources related to international purchases.

Especially the interviewed case organisation identified the increased need for internal communication between the parties and visibility of international purchasing department as development areas. The interviews reveal that the communication needs to be stronger between international and domestic purchasing departments, than between international purchasing department and production department. Therefore, the hypothesis of "*The current level of visibility and communication of international purchasing department is low towards the domestic purchasing department*" is created (**H2**).

The barriers preventing international purchases were evaluated through technical, commercial and legal risks. In the case of technical risks, the supplier's understanding of local quality (either contractually obliged or standardised) requirements was one area of improvement by all interviewee groups. The legal risks were identified majorly from the case organisation's side. They were related to the national health and safety legislation, where managerial presence during the extra working hours was required. The misunderstood SOW increasing the unexpected costs within the projects was identified as a significant risk in the commercial risk sector. The latter points out the need for a system which would somehow measure total costs. The research question of the risk-derived transaction costs was targeted to be solved by asking about the usefulness of the TCO model, which would take account the transaction costs in addition to the purchasing price from the previous projects to evaluate the total price of the current project. The answers show that the proposed model would have been welcome, but currently, it would be too theoretical to be used especially in the construction industry, which is characterised by its one-off nature. This nature decreases the possibilities for the specific cost comparison and transaction cost forecasting between the past and current projects. Instead of using the TCO model, the current internal

communication performance should be evaluated to enhance SOWs and description of required quality level and local legislation requirements in the field of health and safety regulations.

To address the results of two distinct views between international purchasing and domestic organisations, a hypothesis of *Practical interests between respondent groups deviate between each other (H3)* was created. This hypothesis tests the consistency of goals between production, international and domestic purchasing departments. In the case of transaction cost mitigation, a hypothesis of *When facing challenges, the project-specific support is inadequate (H4)* is created, because the results indicate that especially the production department requires better project support when facing challenges.

In the case of the interviewed client organisation's own supply chain management, the results mostly differ. It has a strict building concept, where the internationally purchased items are specified, and the supply chains are already prepared and specified, even though the MC is responsible for the ordering process. Due to its position, the organisation is able to use leverage in the relationship upstream (towards the MC and its pre-specified supplier) in the supply chain in the specified items. Due to the low level of confluences on international purchasing between the two organisation types, the client organisation behaviour is not examined further,

Figure 16 presents an overview of the hypotheses. The created hypotheses target to obtain results for both: the early involvement activities and current operational performance of the organisation.

Early involvement activities	H1a: The optimal timeframe for the early involvement is in project tendering phase on main contract types and project development phase in advanced contract types.
	H1b: Project size or its special one-off nature effects on the project types, the international department needs to target its services to
	H1c: International purchasing department should target its services on collaborative project types
Current operational performance	H2: The current level of visibility and communication of international purchasing department is not sufficient towards other relevant internal parties
	H3: Practical interests between respondent groups deviate between each other.
	H4: When facing challenges, the project-specific support is inadequate

Figure 16 Overview of created hypotheses

4.2 Statistical survey

The statistic survey was created to measure the performance of the case organisation by firstly testing the given hypotheses 1a-4 from the previous chapter and secondly seeks to find insights especially between the four business areas (BAs) and two operational respondent groups.

Respondent groups divided by business areas (BAs) and their relative size:

- 1) Rest of Finland (RF) (30%)
- 2) Office construction, Helsinki metropolitan area (OCH) (27,5%)
- 3) Housing, Helsinki metropolitan area (HCH) (22,5%)
- 4) Renovation, Helsinki metropolitan area (RCH) (20%)

Respondent groups divided by operational areas and their relative size:

- 1) Domestic purchasing and support departments Finland (45%)
- 2) Production Finland (55%)

However, 20% (N=8) of the respondents had not participated in the international purchasing process during the past two years and were taken out of the sample. The key reason why no international purchases were made was that no supporting

items for international purchases were found in projects. The analysis continued with the rest of the interviewees, (N=32), who had participated in process during the past two years, and was, therefore, valid to answer the questions. From the remaining 32 participants, 17 worked in production and 15 in purchasing operations. The business area distribution was the following: eight respondents worked in the area Rest of Finland (RF), ten in Office construction (OCH), eight in Housing (HCH) and six in Renovation (RCH) business areas. The sample size was relatively low, including several groups, so therefore no regression analysis could be done. Instead of regression analysis, the study uses descriptive analysis and analysis of variance tests as described in the methodology chapter

There were altogether 23 questions, which were divided into four categories (general questions, drivers, facilitators, and barriers) according to the Quintels et al. (2006, 173) similarly than in the previous study phase. The questions are presented in Appendix 5, and they are analysed in the following subchapter area-specifically. After the analysis, a sub-conclusion was made to gather-up results to test the hypotheses H1a-H4. All the numeric questions measure the answers by using a Likert scale (1= totally disagree, (5= totally agree). Within every category, the questions are presented per the average grade given, including all respondent groups (business and operational areas).

Variance analysis

To test if there is a significant variance between the replies an ANOVA-test and a two-tailed T-test were conducted. The ANOVA-test was made for the first group of four different BAs, and the T-test to assess the variance between the two operational areas (dom. purchasing & supportive departments vs production departments).

The ANOVA test was conducted using the following hypotheses:

- Null hypothesis, h_0 = the groups are not significantly different
- Alternative hypothesis, h_A = any group differs from the sample significantly.

The results for the ANOVA test show that $F(3,88) = 0,27$, where $p = 0,86 > 0,05$ (NS), supporting h_0 , which indicates that there are no significant differences between the groups.

Also, the T-test was conducted using similar hypotheses, but the comparison was made between two groups in this case:

- Null hypothesis, h_0 = the groups are not significantly different
- Alternative hypothesis, h_A = there is a significant difference between the two groups.

The T-test was made by using an Excel T-test function by using the following settings:

- Test direction: two-tailed, which means that the F-result may be on either side of the probability curve.
- Variance of errors: heteroscedastic, while the variance of errors or the model may not be the same for all observations

Also, the results for the T-test show that the difference is not significant, the P-value being 0,49, which also indicates the randomness of results, p-value being more than 0,05.

Both of these tests show that none of the tested groups are significantly different between each other. Therefore, the analysis continued with univariate comparison method, where the averages for each question were compared in the following analysis on the question level.

The highest differences between options per BA groups are discussed in the subchapters if the deviation between the groups is more than one unit between the highest and lowest group grade (group min-group max >1). These deviations were low between organizational areas (highest= 0,9; average= 0,4) and moderate between BAs (highest= 2,0; average= 0,9). Between the BAs, the business area renovation construction (RC) deviated most, which was noticed in seven questions. Overall, deviations were present in eight questions. The analysis of these deviations helps to detect the possible target groups for further development.

General questions

Figure 17 describes the average results for the general question group. For most of the respondents, international purchasing was relatively familiar activity. The

international purchasing department was less familiar than international purchasing activity itself, meaning that the production or domestic purchasing department conduct international purchases by themselves. Comparing the BAs, especially RCH does not recognise the department as well as RF, which is surprising, while the IPS sub-department is situated in the metropolitan area geographically. The RCH's item profile may have an effect on this unfamiliarity. The question of understanding of possible internationally purchased items for the projects also had moderate results (grade 3,25). Generally, the respondents would like to have more information about possible internationally purchased items (grade 3,48), even though RCH denies needing it (grade 2,8) and housing (HCH) needing it most (grade 3,9). The last question tested the origin of the supply pool. Generally, the respondent's pool includes a broader pool than just Estonian purchases. Even though the variance between the group is low (0,3 between highest and lowest BA groups), it is interesting to notice that the BA RF has the highest score in the category, meaning that it includes most of the Estonian purchases within its international items, even though the result is still low (2,9).

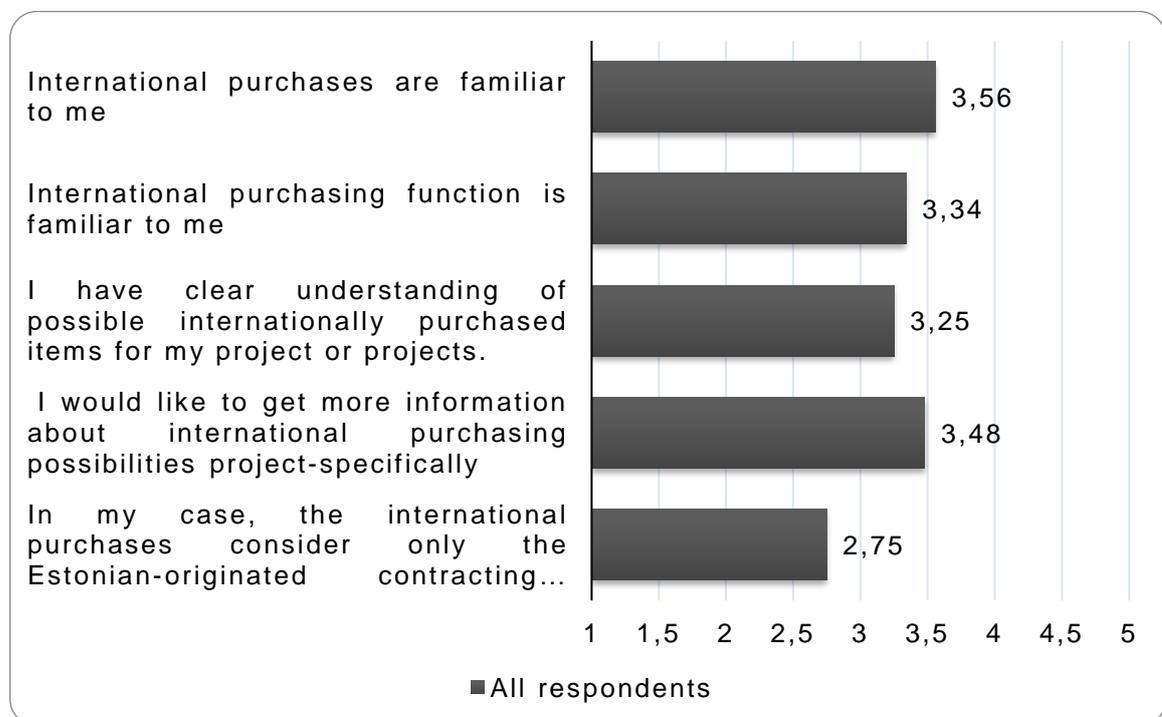


Figure 17 Question category: General questions, all respondents

Drivers

The *drivers category* tests four propositions of the factors that can further international purchases in the case company (Figure 19). Firstly, the respondents generally believe that international purchasing would increase the competitiveness of the case company. More specifically, 62,5% of the respondents see that project-specific cost advantage is the key driver to increase the competition, which correlates with the results of the previous chapter (Figure 18).

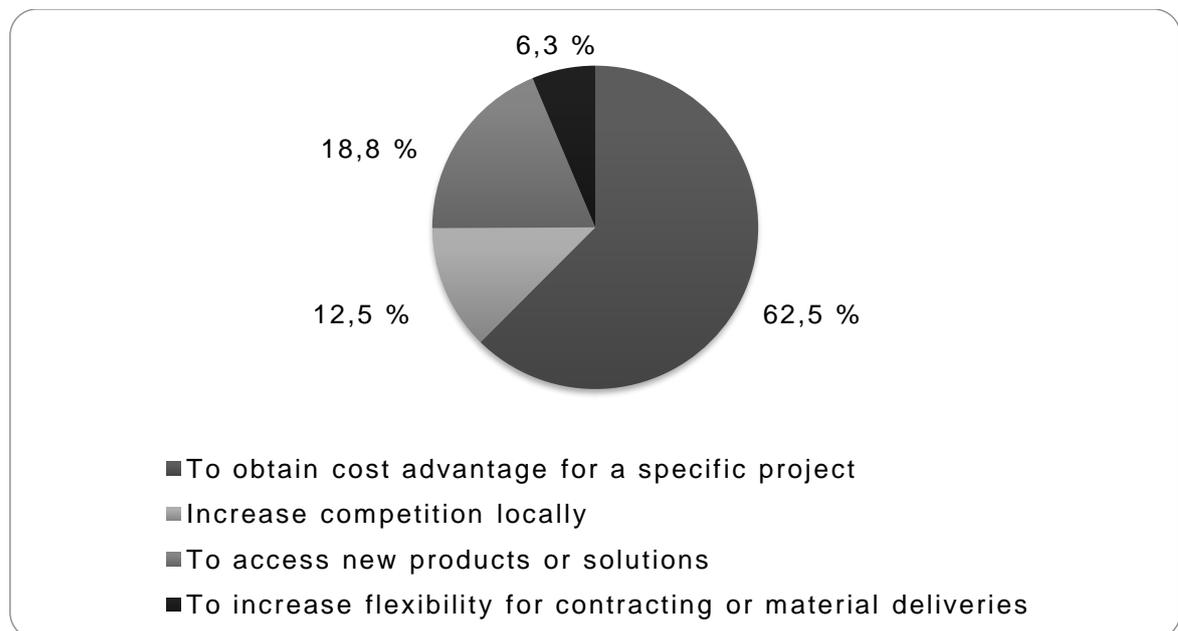


Figure 18 Key reasons to purchase items internationally

The question of the effective use of international purchasing gives mediocre scores. Comparing the score to the other results within this category, it can be stated that the scores are lower, and therefore, international purchasing is seen as an underutilised asset. Also, the question about the timing of internationally-purchased item planning gives mediocre results (3,4). However, almost all the respondents believe that international purchasing should be initiated already in the project tendering phase to obtain more competitive (pre)quotations. The high result of initiation already in the tendering phase is a clear sign that at least in the traditional contract models the international purchasing should be involved as early as possible. However, it does not prove the need for early involvement in advanced project types, which is left for later inspection in the PAR section.

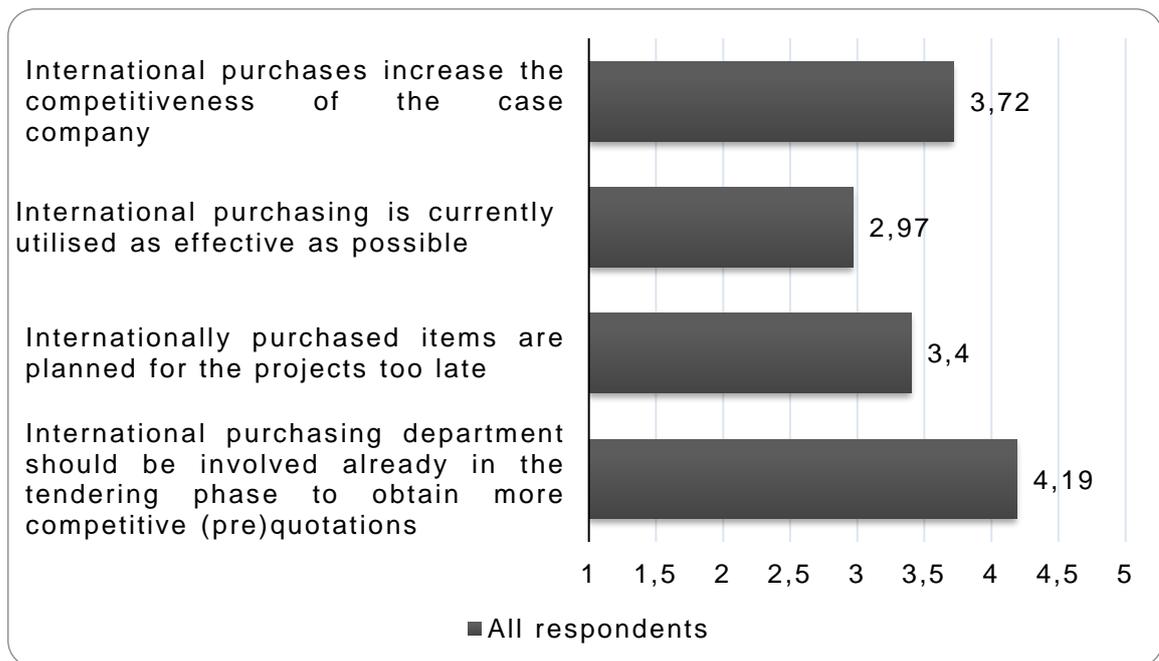


Figure 19 Question category: Drivers, all respondents

Facilitators

To facilitate the international purchasing's task in the supportive department, it should have adequate resources and use them efficiently, the level of communication should be sufficient between the parties, and suitable project types should be found. The facilitators subchapter tests these conditions with ten propositions presented in Figure 20.

From the internal customer's perspective, the most visible sub-department inside international purchasing department is the IPS sub-department. However, the respondents experience that the international purchasing department has insufficient resources to perform adequately. There is the highest variance between the BAs for the answer in the survey. Especially RF experiences the lack of resources increasingly (grade 1,7), compared with the other BAs (grades between 2,4-3,7). The question of resource utilisation gives a little bit higher, but still not sufficient scores (average grade 2,75). The question about the adequacy of communication between parties gives similar results, the average being 2,86.

The next question of international purchases impact on the case company's competitiveness was a triangulation question, testing the reliability of the replies. The result (3,53) is close to the previous question which is content wise equal but

differently formulated (“International purchases increase the competitiveness of the case company”), resulting in the score of 3,72. The difference between the answers is 0,19, which represents 3,8% error in proportion to the five-point Likert scale. The capability of finding a relevant supplier is mediocre, the average being 3,04, which also points out the development possibility in the area.

The following four questions examine to which contract types international purchasing should be targeted. The answers reveal that the advanced and collaborative contract types are propitious for international purchasing (averages 3,38 and 3,46), but the international purchasing should still not concentrate solely on those (averages 2,81 and 2,67). The results are contradictory, but still can be explained that the different kinds of project types require different kind of attention from the international purchasing department. There was also variation between the replies on the propositions of fitting contract types – In both cases, the BA HCH recognises better the advantage of these contract types (results 3,7 and 4,2) compared to RCH (results 2,7 and 3,0). The reason for the variation is not known.

The last question of the category proposes targeting international purchasing activity only to special one-off contracts, such as large hospital projects. Interestingly, the respondents do not support the proposition (result 2,1), while there are some differences, RF supporting it more than Metropolitan BAs (OCH, HCH and RCH). The result also supports the previous postulate that international purchasing department should provide services for all types of projects even though some of them, such as D&B and project management types, may be more beneficial. The key difference here may be the distinct scope of services provided for different types of projects, which is not covered in this paper.

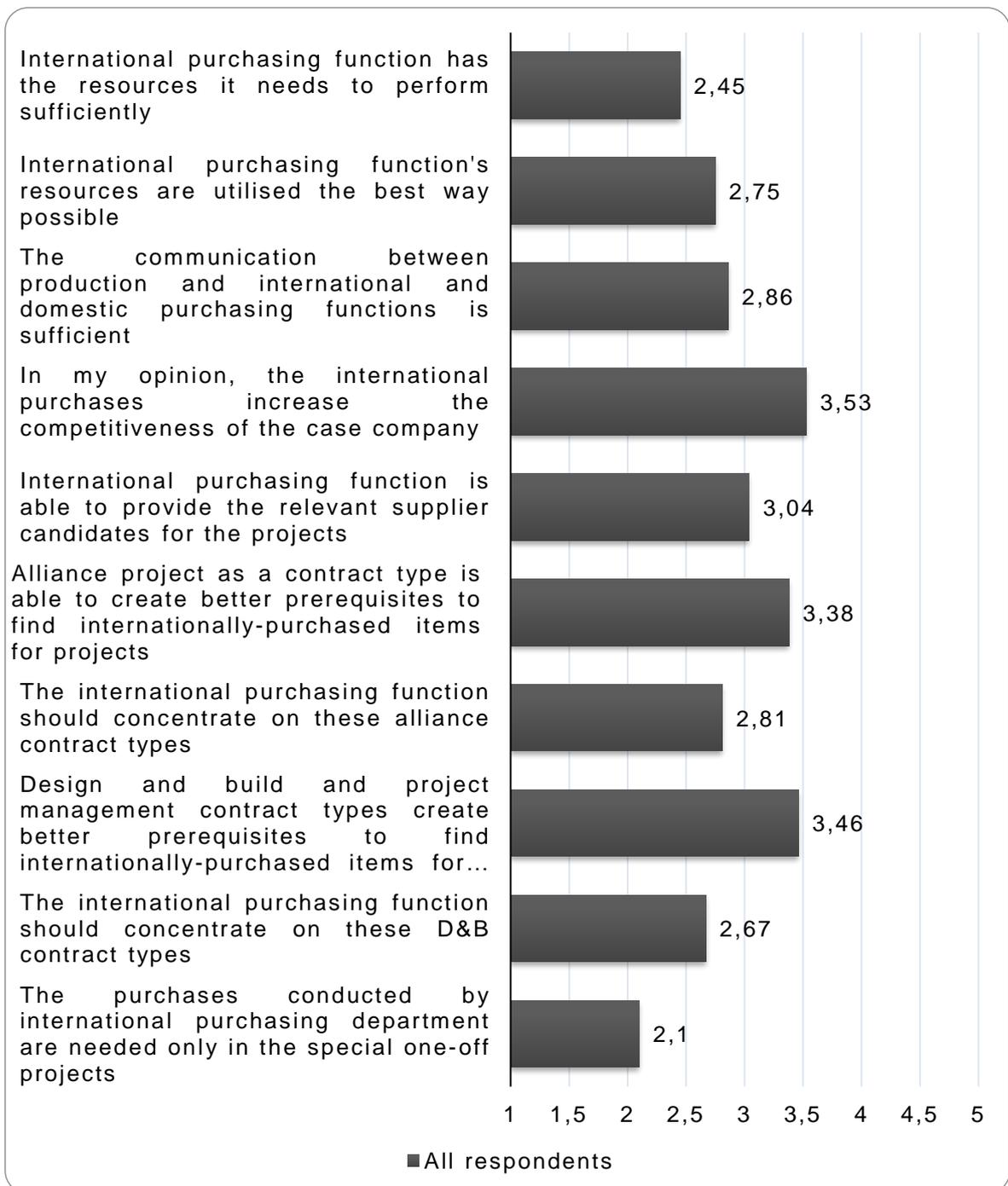


Figure 20 Question category: Facilitators, all respondents

Barriers

The barriers category measures the risks in general and warranty-period level and how international purchasing department is able to respond to the possible risks (Figure 21). On average the international purchasing is considered to cause more challenges compared to domestic purchasing. This question has a high variance

between BA groups RF, HCH and RHC. RF and HCH acknowledge the higher amount of challenges (grades 4,1 and 4,0 respectively) while RHC considers the risk of being mediocre (grade 3,0). The question considering the increased risk in the case of warranty and 10-year responsibility issues provides similar results with the average being almost precisely the same as for the previous question, but in this case, the difference between the BA groups is lower (0,7 between highest and lowest). The international purchasing department is considered to fix the issues on an average level, the results being 2,85 considering all challenges, and slightly better (3,12) considering warranty and 10-year responsibility challenges. Considering the latter, the BA HCH states that the support for warranty and responsibility problems is a lot worse (2,5) than assessed by BA RCH.

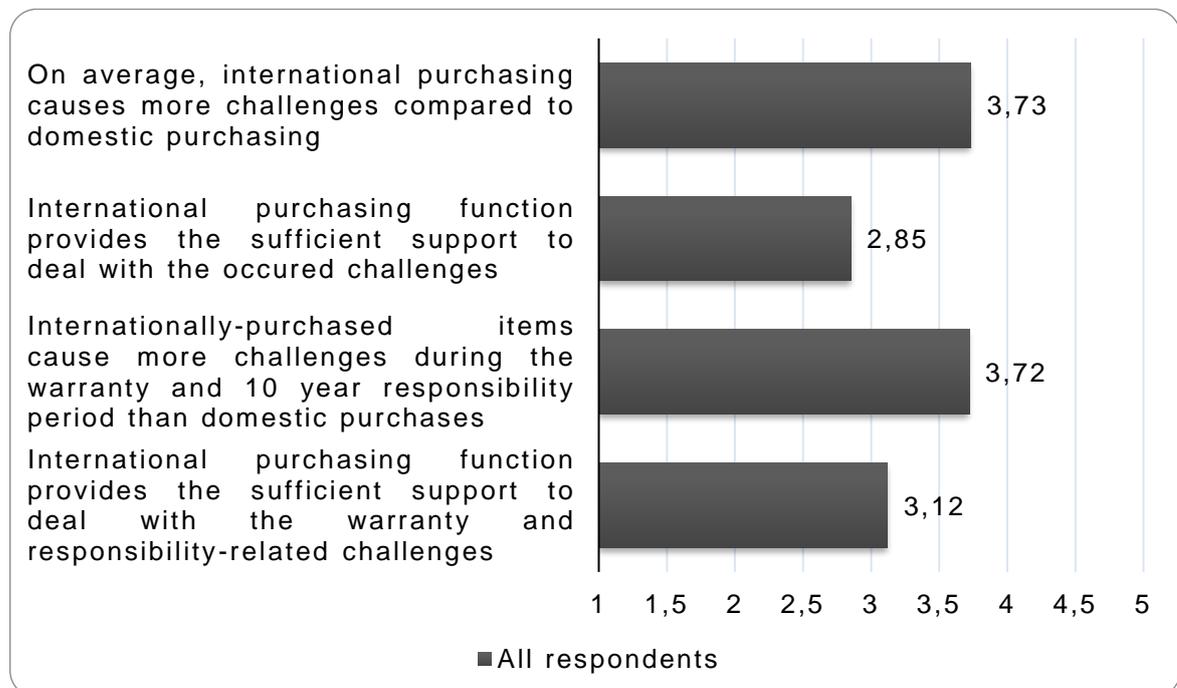


Figure 21 Question category: Barriers, all respondents

Tested hypotheses

This section tests the created hypotheses with the information obtained from the internet survey. Table 18 at the end of the chapter summarises the results presented below.

As for the conclusion for hypotheses **H1a** and **H1c**, the international purchasing department should be involved as early as possible in the project in the case of

traditional project type. The effect of advanced project type was not tested in this phase, as the research sample consists mainly of operational managers, who may not have experience in the project development phase. This issue was believed to create bias, and therefore the second part of advanced project types was left for the PAR research phase.

The second hypothesis (**H1b**) tests the better suitability of large, monetarily high-valued projects for international purchasing activities. The hypothesis proposes targeting international purchasing activities for these projects. The hypothesis was rejected, pointing out that international purchases should not be targeted solely for these particular type of projects. The question about targeting international purchasing services to collaborative project types gives various answers. The respondents note the increased fit of collaborative and advanced project types for international purchasing activities, but still, deny the proposition of concentrating these project types solely.

The visibility and communication between the parties are seen to be mediocre (**H2**). There is some variance between the BAs, but generally, the visibility should be increased. The same result is repeated in the case of communication. The increased communication might help on the presented issues of incomplete SOW and insufficient understanding of quality standards from the supplier side.

The hypothesis 3 tested if there are differences of interest between the operational respondent groups, which was identified in the previous phase of the study, where an example the international purchasing department believed that the legislative risks on site are low due to the robust contractual binding from the case company's side. However, the domestic respondents, especially the production identified the increased working hours as a critical risk. In this survey, the risks were not identified differently between operational groups, and the hypothesis was rejected.

An important research question in this paper considered the possible ways to mitigate transaction costs. The challenges during and after the project are seen to increase those costs. The final hypothesis (**H4**) tested, how the respondents receive the project-specific support if the international purchases bring challenges. The hypothesis was accepted because the results show that the support was generally

low and the international purchasing indeed are more vulnerable to those costs than the domestic purchasing. Some of the business areas, such as housing (HCH) see increased risks and requires more assistance in these situations.

Table 18 Results on hypotheses

Research questions	Hypotheses	Result
RQ1a: What is the optimal timeframe to involve international purchasing department for projects?	H1a: The optimal timeframe for the early involvement is in project tendering phase on main contract types and project development phase in advanced contract types.	Partially accepted. According to the results, the department should be involved as early as possible for the project in the traditional contract types. The advanced type could not be tested.
RQ1b: Does the project characteristics, such as building type, monetary value or its special one-off project nature effect on international purchasing involvement?	H1b: Project size or its special one-off nature effects on the project types, the international department needs to target its services to	Rejected. The purchases conducted by international purchasing should not solely focus on special one-off projects.
RQ1c: Does the contract type between client and MC affect the involvement of international purchasing?	H1c: International purchasing department should target its services on collaborative project types	Partially accepted. The international purchasing department should target its operational support on these project types but still maintain its supply pool support (audits, SRM-functions) on all types of projects
RQ2: Which inputs are needed from the international purchasing department to support projects sufficiently?	H2: The current level of visibility and communication of international purchasing department is not sufficient towards other relevant internal parties	Accepted. The current levels of visibility and communication are mediocre.
RQ3: What kind of barriers are there and how should they be evaluated from the production department's point of view?	H3: Practical interests between respondent groups deviate between each other.	Rejected. There are only small differences between operational areas.
RQ4: How could the risk-related transaction costs be mitigated?	H4: When facing challenges, the project-specific support is inadequate	Accepted. Generally, the support in the case of challenges towards projects is low to mediocre. In the case of warranty challenges, the BA HCH requires more assistance.

4.3 Participatory action research (PAR)

The PAR was the lightest part of the research, involving only a few weeks of the researcher's resources on the study. It targeted only to answer the research questions 1a "What is the optimal timeframe to involve international purchasing

department for projects?” and RQ5 “How can the correct suppliers or supply packages be identified better in advance?”. Answering the research questions was done by observing the pilot project according to McIntyre’s category two framework, engaging in self- reflection “to gain clarity about the issue under investigation” (2014, 1). The researcher’s previous working experience on similar projects is used as an advantage while reflecting the practice into theory.

The case research was conducted by observing a live construction project at Tampere, which was at that time in the project development phase. The project was a new build office building project, including also some retailing space on the ground floor. The project was commissioned by an investor, which rented the office and retail space solutions for its customers.

In the case of research question 1a, the need for early involvement for traditional project types was already proved on the previous phase, and the second part of the question was left to be solved in this phase. The assumption is similar than the results show in the previous phases: the international purchasing department should be involved as early as possible also for the project. In this case, the difference is that the early involvement possibilities are available much sooner than in a traditional project, as the MC is able to participate in the project earlier (Figure 22). The question is: when and how the involvement should be initiated?

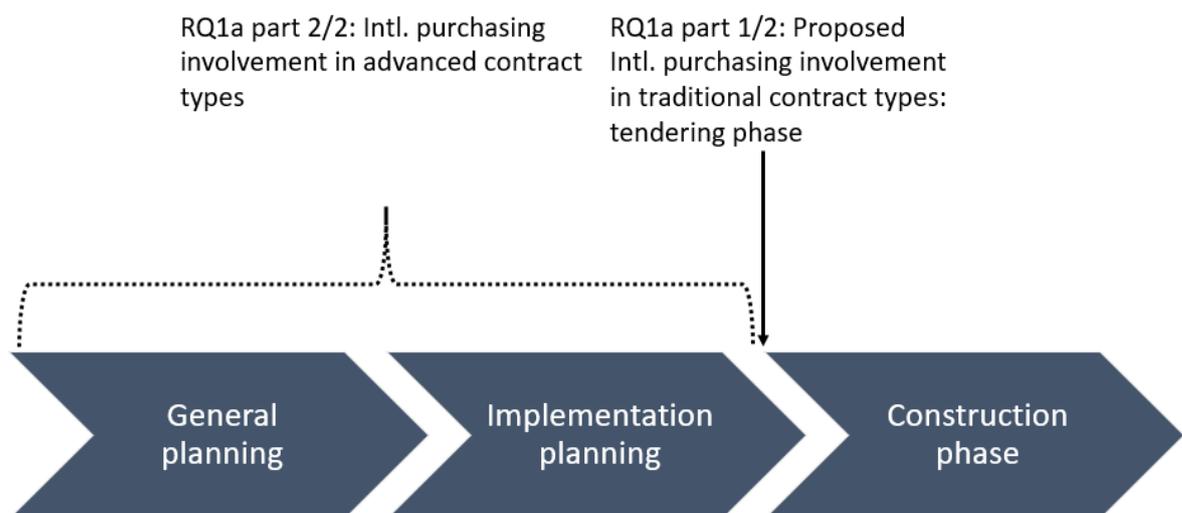


Figure 22 Early involvement of intl. purchasing department in advanced and collaborative contract types

The second relevant research question seeks to identify how the relevant supply packages or suppliers could be identified already in an early phase of the project. Due to the limited resources of international purchasing – acknowledged already in the previous chapters, the key stakeholder here is surprisingly not the international purchasing, but the domestic purchasing department. The key problem preventing early involvement seems to be that the relevant projects are not identified by the international purchasing department, probably because of the limited resources, and the domestic purchasing and production departments use only external (supplier) resources on a domestic level for ESI, while the international support appears to be missing. This problem causes the situation where the early involvement capabilities are non- or underutilised.

Optimal timeframe

While analysing the case project with the antecedents presented in chapter 2.3, it was noted that the project did not fulfil the conditions for early involvement of international purchasing department and ESI. The required conditions were (1) the end client utilizes a fitting contract type, (2) the project development phase timeframe is sufficient, (3) Fitting strategic items are featured, (4) Mutual attractiveness, preferred customer status and existing relational capabilities and (5) MC's internal processes support early involvement. Table 19 describes the status of these conditions in the pilot project, denying the early involvement possibilities.

The value of the project was over 25 million Euros, and therefore it was expected to be attractive for international suppliers. Also, the project had a project development timeframe of four months (Figure 23). Therefore, it theoretically had possibilities for early international purchasing department involvement. However, in reality, there was no contract existing between the client and the case company in the first two months, which prevented making actual contracts between the case company and its suppliers, enabling only conditional contracts, which hindered the early involvement possibilities. Despite the project's relatively high project value, the used planning solutions were not especially strategic, because some of the used solutions were already locked in the client's specifications, where the used technical solutions

were already existing and did not necessarily need co-engineering. The mutual attractiveness, the preferred customer status and the relational capabilities could not be tested as the early involvement measures were not initiated. Generally, the MC's internal processes would have been able to support the early involvement measures, as this project was chosen as a pilot.

Table 19 Conditions for early involvement in the case project

Condition		Status
End client utilises a fitting contract type		The end client is using a project management contract type, which allows early involvement measures
Project development phase timeframe is sufficient		The timeframe of 2+2 months would be sufficient but is practically hindered by the contactless state
Fitting strategic items are featured		The solutions are highly pre-defined and technically non-demanding, which are, therefore, non-strategic.
Mutual attractiveness, preferred customer status and existing relational capabilities		Could not be tested, while the early involvement measures were not initiated.
MC's internal processes support early involvement		The internal processes would have supported the ESI in the case project due to the agreed prototyping.

If all the five conditions would have been fulfilled, the ESI actions would have been possible for the project. While the previous phases of this paper indicate the importance of early international purchasing department involvement, it was also noted that an existing quantity data would have been beneficial to wake up the interest of selected suppliers towards the project. The interest towards early RFQs is higher when the quantity data is attached in the request.

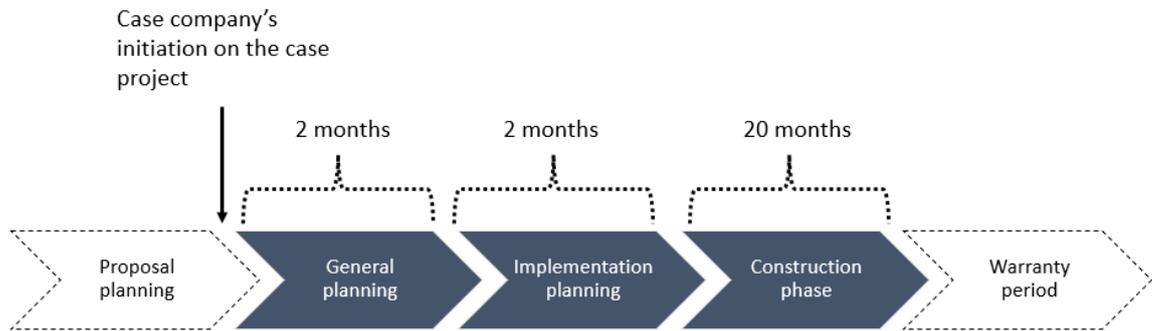


Figure 23 Approximate timeframe of the case project

If the ESI would have been initiated, the optimal timeframe of involving international purchasing department first time would have been already in the general planning phase, if there were items, that effect on the external aesthetics of the building, such as façade solutions or require technical approval from the local authorities. These criticalities are required for the building permit. If the items provide only non-critical and internal aesthetic solutions, the involvement could be implemented during the implementation planning or even as traditionally in the construction phase (Figure 24).

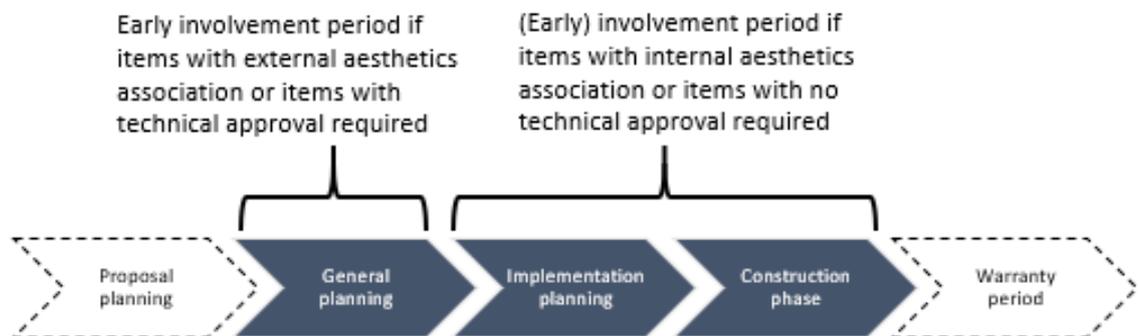


Figure 24 Proposed early involvement periods

During the project meetings, it was noted that the early involvement of international purchasing department requires the actual presence of neither international purchasing nor domestic purchasing departments in the meetings before the construction phase. The production department's project management's knowledge of possible internationally purchased items is essential in this phase. When the construction phase begins, then the relevant knowledge should exist in the domestic

purchasing department, which is responsible for managing project purchases, including creating a purchasing plan.

Correct suppliers or supply packages

Because the actual ESI with international (or domestic) suppliers could not be initiated in the case project, the researcher proposed making an international purchasing plan for the project instead of initiating early involvement activities. In the proposed model, the international purchasing plan could be done efficiently without the physical presence of the international purchasing department.

Creating a purchasing plan for internationally-purchased items is described in Figure 25. It starts first by creating a general purchasing plan, including only domestically purchased items. The plan somewhat follows the used framework by Junnonen and Kankainen (2001, 34) where the purchasing items or packages, quantity data, and responsibility are listed on rows, followed by the horizontal schedule. The items are usually coded according to Talo 80 framework, where the first two numbers indicate the item group of the building, e.g. 58 means paint and wallpaper works, which is under category 5, the surface structures. The appropriateness of proposed items and the purchasing task timeframe is communicated with the production department. After creating an early version of the general plan, the internationally-purchased items can be added to the plan.

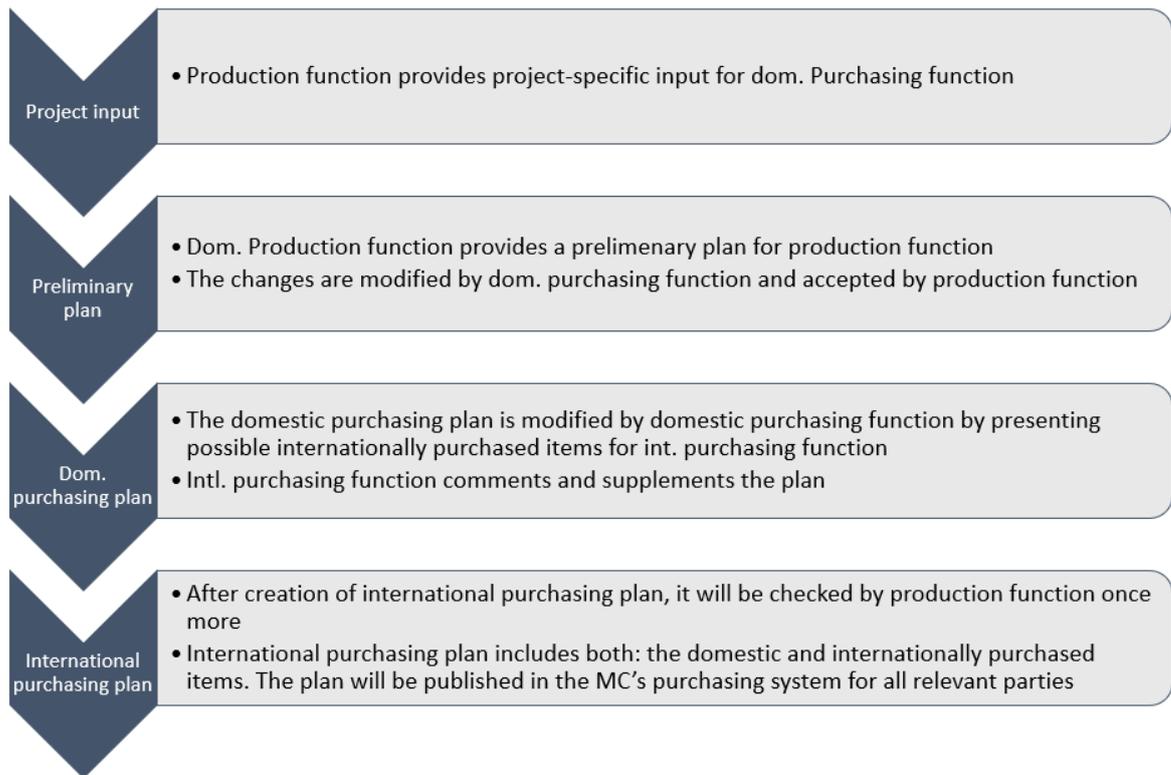


Figure 25 Proposed process of creating international purchasing plan

If the domestic purchasing department has an adequate understanding of possible internationally-purchased items, it can predefine the items and also possible suppliers. After the definition, the proposed plan should be checked by using for example internet services, such as Microsoft Skype, to present it for the international purchasing department. This preparation and dialogue between domestic and international purchasing departments in early project phase help to identify the fitting items for the project. The proposed proper understanding of the possibilities for internationally-purchased items is based on the enhanced visibility and communication of the international purchasing department, which were proposed as development targets in the previous chapter.

To illustrate the international possibilities in the case project a purchasing plan was created by the researcher as described earlier. Table 20 shows the international purchasing items on the item group level in the pilot project. The identified items are concentrated into categories (columns) 3-6. From these categories, those appropriate for ESI initiation might be the precast elements on categories 32-34 and category 55, external wall surface materials. In both cases, the ESI measures

should have been initiated in the general planning phase to obtain the appropriate approvals from building permit authorities.

Table 20 Identified possible internationally-purchased categories in the case project (applied and author translated from Talo 80 framework)

0. project management expenses	1. Earthmoving and foundation works	2. Foundations and external structures	3. Frame and roof structures	4. Complementary structures	5. Surface structures	6. Fixed furniture, fittings and devices	7. Technical installation works	8. Site operating costs	9. Site-specific general costs
01 N/A	11 Demolition	21 foundation base works	31 N/A	41 Windows	51 Roof	61 Fixed furniture	71 PHC works	81 Temporary structures	91 On-site management
02 Finance expenses	12 Earthmoving works	22 Ground walls, beams and columns	32 Load-bearing internal walls and columns	42 Special windows	52 Internal wall surface materials	62 House equipment	72 Ventilation and air conditioning works	82 Temporary installations	92 Assisting construction works
03 Design and consultation analysis	13 Mining and	23 Load-bearing floor	33 Vaults and beams	43 Doors	53 Ceiling surface materials	63 Devices and household appliance	73 Electricity works	83 Site-specific devices	93 Special costs from international operations
04 Condominium reinforcement works	14 Foundation and reinforcement works	24 N/A	34 Flight of stairs	44 Special doors	54 Stairwell surface materials	64 Other furniture installations	74 Transfer engineering	84 Site-specific tools and mobile machinery	94 Additional winter-related works
05 Project management and supervision	15 Underground drains and canals structures	25 Air-raid shelter structures	35 External walls	45 Non-load bearing partition walls	55 External walls surface materials	65 N/A	75 N/A	85 Operating supplies	95 Contract price changes
06 HVAC interface costs	16 Land filling works	26 Slab-on-grade	36 External platforms and balconies	46 Special partition walls	56 Floor surface materials	66 N/A	76 N/A	86 Fuel and energy	96 Contract-derived special costs
07 Marketing	17 Ground structures	27 Special structures	37 Attic and roof structures	47 Railings, planes and bridging structures	57 Surface materials for assisting rooms	67 Air-raid shelter equipment	77 N/A	87 On-site transportations	97 Additional labour costs
08 International operational costs	18 External equipment	28 External structures	38 Prefabricated room elements	48 Conduits, fireplaces, ducts and chimneys	58 Paint and wallpaper works	68 N/A	78 Client-related assisting works	88 Special costs from international operations	98 Employee social security expenses
09 N/A	19 N/A	29 N/A	39 N/A	49 N/A	59 N/A	69 N/A	79 N/A	89 N/A	99 N/A

5 CONCLUSION

The conclusion chapter was divided into five subchapters to present the results for the seven research questions. The division was needed, due to the broad research scope, in which the questions cannot be explained under the same chapter. The results from the previous chapters are combined and outputted into a conclusion form under this chapter. Even though the results are from the various areas, some relating more to the organisation development and some to the early involvement theory, it can be concluded that the contract type between the MC and its client have a significant impact on the required international purchasing processes within MC organisation. The conclusions also include the case organisation-specific development proposals and a new framework of optimising the international purchasing department's resources through the new process, involving domestic purchasing and production organisations upfront in the project.

5.1 The optimal timeframe for early international purchasing involvement depends on the contract type between the MC and its client (RQ1a and RQ1c)

The optimal timeframe to involve international purchasing department for projects depends on the project type (Figure 26). According to the results from the first two quantitative surveys, the timeframe in the traditional contract type would be already in the project tendering phase, which using this contract type, is the first possible timeframe for the MC to be involved in the project. According to the interviews, the tendering phase often has a tight timetable, which limits the international purchasing department's possibilities in the project due to the increased amount of parties and tasks in the process chain.

The advanced project types, such as alliance, D&B and project management contracts create better possibilities for early international purchasing department involvement and ESI, but the project characteristics might hinder or prevent its usability. The case project tested the five antecedents for early involvement in a live case project, which initially appeared to meet the criteria, but the more in-depth analysis on the live project showed that the required antecedents were not met. Even though the framework could not be tested on the case project, the author

believes that if the antecedents are met, the early involvement measures can be initiated. The five-step criteria work for domestic purchases as well, but in that case, the final step's internal requirements from the MC are different due to the broader scope of parties and processes if international purchasing department is involved.

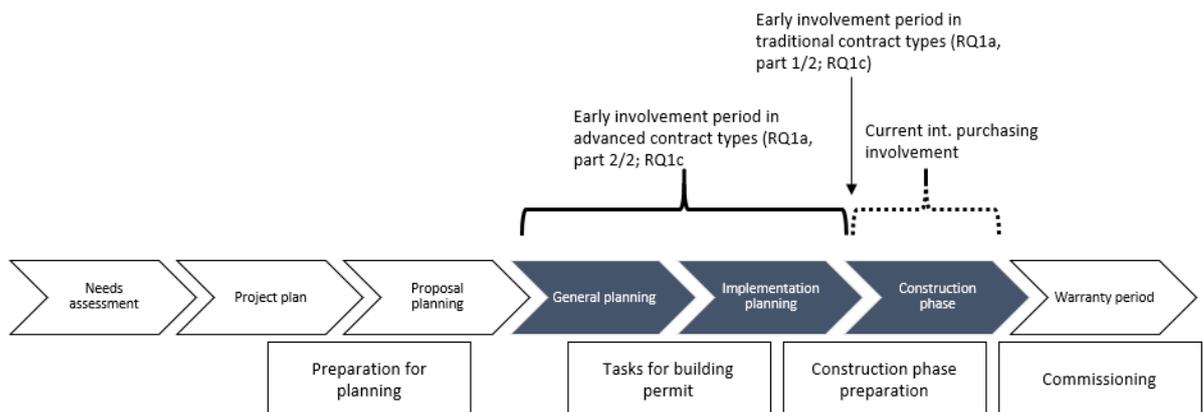


Figure 26 Early involvement periods in both contract types

5.2 The project characteristics define the type of support needed from the international purchasing department (RQ1b)

Interestingly the project characteristics, such as building type, monetary value and its unique one-off nature have a low impact on international purchasing department involvement. The survey interview part provided mixed results, but the internet survey asking whether international purchasing department should concentrate only on these projects revealed that the international purchasing department needs to be involved in all types of projects. However, the author suspects, that the level of involvement differs between these types. If the project has a high monetary value and involves one-off characteristics, the international purchasing department should be increasingly involved, but if the project value is low and it is serial production type, it is enough that the international purchasing department only delivers the necessary supportive functions, such as supplier audits. In this case, the domestic purchasing department would be able to conduct operational purchasing tasks. This proposal should be tested in a supplementary study by specifying the questions in a way that would reveal the scope of services required per type.

5.3 Enhanced visibility and communication are required from international purchasing department (RQ2)

The interviews were examining the needed inputs from international purchasing department. They revealed that mainly the visibility and communication should be enhanced in the Finnish context. The enhanced visibility would also support the proposed solution, where the international purchasing department would establish two focus areas for its field of services: (1) administrative support for the projects, including SRM functions and supplier audits and (2) operational support, where the department would be involved in a selected scope of projects. The first focus area needs better visibility to the international purchasing department, while the domestic purchasing and production departments need to know the relevant possibilities for internationally-purchased items. The demand is explained through the new early involvement model, presented in the last subchapter.

5.4 Using international purchasing can be evaluated through three categories of risks which can be mitigated through new enhanced communication and support in complex situations (RQ3 and RQ4)

International purchasing is often evaluated through its additional risks compared to domestic purchasing. If international purchases are not utilised because of the increased risks, the risks turn to barriers. Therefore, during the interviews, these were divided into three different categories of risks: technical, commercial and legal. The identified critical technical barriers are related to the underperforming of set quality standards in a standardised or contractually obliged level. The main commercial risk was misunderstood SOW, which is also a standard risk in domestic purchases in the construction industry. The critical legal risk was the extended working hours per day required by the supplier. The risk of increased working hours relates to health and safety legislation, which generally does not recommend working extra hours, but also requires site management on site during such hours. The common factor in mitigating the identified risks is to improve communication in the chain between all the required parties: production, domestic purchasing, international purchasing and the supplier. If the client organisation involves also planning responsibilities, it should also be included in the chain. The proposed

development of communication between parties helps effectively in the case where the international purchasing department is involved in the operational purchasing activities. If the involvement is only administrative (e.g. consisting only supplier audits), the effect is smaller as the responsibility of SOW is on domestic purchasing and production departments only.

5.5 The correct suppliers or supply packages can be identified through a new process model involving upfront tasks for domestic purchasing or production department depending on the main contract type (RQ5)

The project type effects strongly on the identification of correct supply packages. If the contract type between the MC and the client is advanced, the identification of correct supply packages need the expertise of the production department's project management team, but in the case of traditional contract types, the identification can be made by the domestic procurement department.

In the case of advanced contract types, this identification needs visibility from international purchasing department's side, so that the domestic purchasing department would identify the possibilities for international purchases. The identification does not need to include all the relevant suppliers or supply packages, but more importantly, it should work as a "game starter" between the departments. The created involvement process is shown in the previous chapter, in Figure 26, where the process is similar to regular domestic purchasing situation by starting from obtaining the input by production department, continuing with preliminary purchasing plan to accepted domestic plan. However, after the creation of the regular (domestic) purchasing plan, the internationally purchased items will be proposed to the international purchasing department, and the international purchasing plan is done in collaboration with the international department. This proposed model differs from the currently used model by involving domestic purchasing department more while proposing the possible internationally purchased items to the international purchasing department. The model requires visibility from international purchasing department and also challenges to consider the relevant items by both domestic and international purchasing departments. The previous

chapter also described an example of internationally purchased categories for the case project, where the author was proposing the items for the international purchasing department. This model is proposed to be applied in the case company to address the issue of a limited resource in the international purchasing department and a growing demand for internationally purchased items.

6 DISCUSSION

The discussion chapter first presents the theoretical and practical contributions and then discusses about the limitations and future directions in PSM and engineering-related research on the topic. Even though the target of the thesis is highly practical, it also provides new knowledge for a scientific community in the case of early involvement possibilities in the MC supply chain and the effect of contract model between the MC and its client.

Overall, the paper connected the little-studied MC's supply chain perspective to early departmental involvement activities, where the MC is expected to increasingly reap benefits through increased international supplier integration in future which opens new research possibilities in business and engineering contexts. Due to the broad scope of research, it also included some limitations including only limited possibilities to concentrate on a single topic.

The thesis connects theoretical and practical contributions

The obtained results can be divided into theoretical and practical contributions, presented in Figure 27. The practical contributions help to solve the case organisation's original problem of "*What measures should be implemented to improve the joint performance of the departments to increase the international purchasing spend?*". The theoretical contributions are helping to construct a scientific theory about the researched topics on early involvement activities.

The *practical contributions* were obtained by using a set of research methods, which measured the current joint performance of the department and tests early involvement possibilities in a live project. The practical relevance for the case company was high, but also other same-sized companies, having an international purchasing department, benefit from the results. Actually, most of the results can also be used in the context of domestic purchasing, which is perceived to involve fewer risks and stakeholders.

Even though the research has highly practical premises, the topic revealed new *theoretical contributions* to offer for the supply management research area for four specific reasons.

1) Most of the literature was proved to consider purchasing processes as a continuum, where it is conducted in a process environment, and therefore, the SRM functions are easier to manage in a stable environment, compared to the construction industry, which is characterised by its one-time purchases. This study concentrated on the construction industry's purchasing, where the industry's "one-off" characteristics define the purchasing processes in a different way than the majority of the literature does.

2) The paper focuses on two literature gaps in the field of early involvement: firstly, the concept of "early departmental involvement" was found to be absent, and secondly, the early involvement of MC's first-tier suppliers is only superficially researched (Loosemore, 2014, 254-255). More specifically:

- *Early departmental involvement* is MC organisation's internal process, needed to initiate early supplier involvement (ESI). Instead of being in a vacuum, it is influenced by various contract types between the MC and the client organisation, which are divided into two main types according to their nature: traditional and advanced contract types. When the department is involved in the project early enough (from the internal perspective) the ESI possibilities are enabled towards the organisation's supply network.
- In *early involvement of MC's first-tier suppliers*, their capabilities can add value for the project by using their technical knowledge to increase buildability (Rahman & Alhassan, 2012, 230). However, the current literature examines the early involvement activities mainly from the client's perspective creating a gap for the MC's chain. This gap has been addressed by examining the MC's side of the supply chain which reveals opportunities to utilize subcontractor's or supplier's capabilities to create value for the project.

3) As described in Chapter 2, the construction supply chain's integrity has been tested by Latham (1994) Egan (1998) and Wolstenholme (2008) in a British context. All of the reports point out the slow progress of the integrity between parties, requiring better more integrated supply chains among the other suggestions. The thesis addressed this issue by creating a framework to enable ESI measures, which integrates the supply chain, e.g. by enabling supplier's product optimisation

activities. This product optimisation, in turn, increases the value production downstream in the supply chain.

4) Lastly, it founded a theory of five antecedents for early involvement in a construction project. The framework is created from the current literature by combining the construction industry's requirements to the supply management's requirements. After the creation, the antecedents were tested in a pilot project.

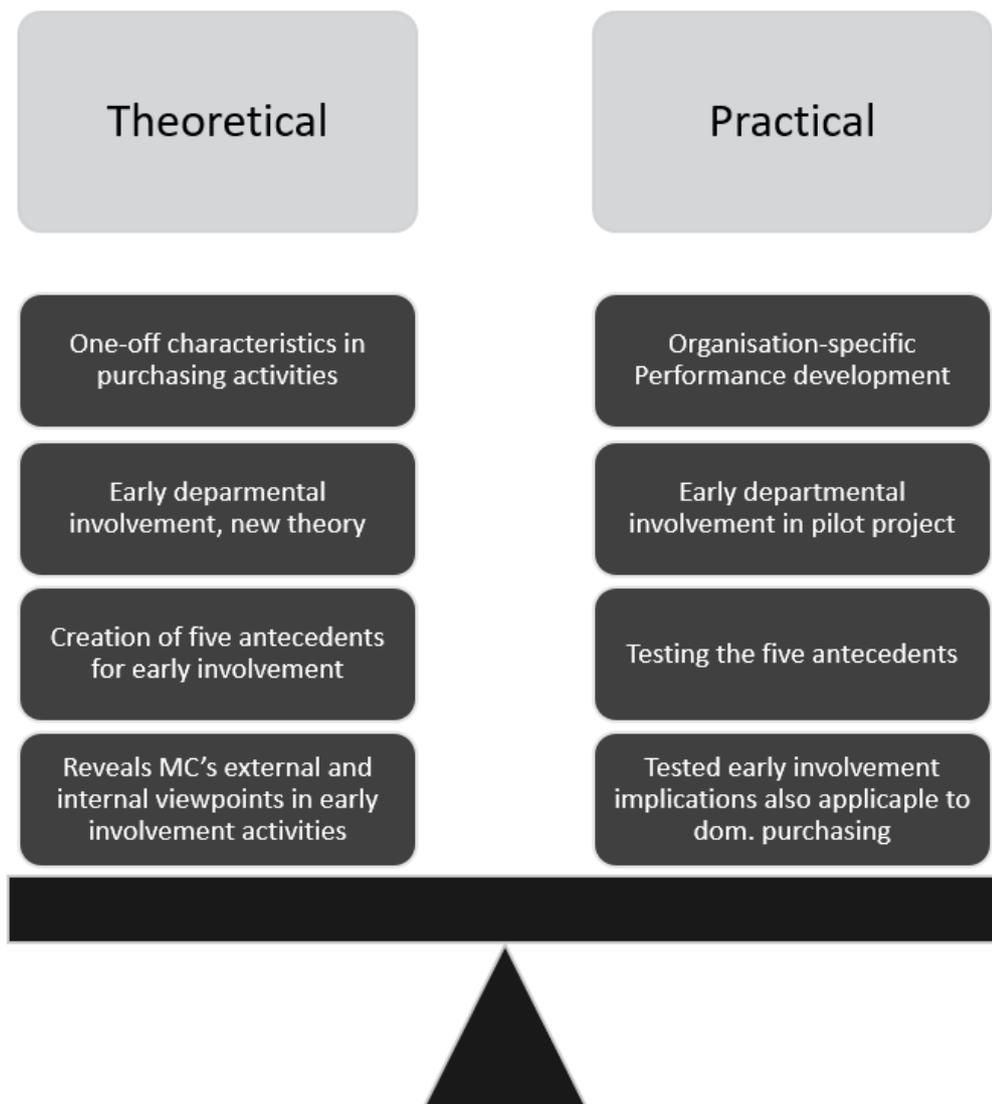


Figure 27 Theoretical and practical implications

Lessons learned for future research

The broad scope of research works itself as a limitation. Due to its broadness, there are limited possibilities to discuss each topic thoroughly due to the limited workload

put into the master's thesis. The thesis' primary target was to develop the interface between the departments in internal context, but also external issues, such as the contractual connection to supply chain parties and industrial characteristics heavily influenced on the study. The external influencers were described in the methodology chapter, but still, some contextual knowledge of building project and various contract types were required. The influencers were noticed to have a high effect on the operational characteristics, even though they have not been studied in academic literature, but only acknowledged to exist.

In the case of construction contract types, the thesis divided them roughly to traditional and advanced contract types depending on the leverage of MC within the project, but they were not elaborated further. The future studies might benefit on elaboration between these specific contract types, while they have individual differences in the MC involvement period, decision-making leverage and planning responsibilities which effect on the early involvement possibilities. When examining these contract types more deeply, unique early involvement opportunities are expected to be found which work differently between the advanced contract types.

Two major gaps were identified in current literature regarding early departmental involvement and external early involvement in MC's supply chain. Due to the broadness of the study, the latter one was studied only lightly to ground the theory for the early departmental involvement. However, the external involvement was identified to have significant potential to be further studied due to its supporting role on more integrated project delivery proposed by Latham (1994), Egan (1998) and Wolstenholme (2009). This early involvement could also be made in parallel of lean processes, where Pheng, Gao and Lin have identified ECI (or ESI) activities supporting lean principles (2015, 850). The topic area of departmental integration could also be further investigated in the field of PSM, which has been traditionally concentrating on external resource management.

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Appendix 1: Literature review concept table

#	Reference	Related field of study	Key finding(s)	Page n:o
1	Brahm, F., Tarzján, J. (2015). Does complexity and prior interactions affect project procurement? Evidence from mining mega-projects. <i>International Journal of Project Management</i> , 33(8), pp. 1851-1862	Mining (>100M USD projects), client's perspective	(1) Project complexity increases the use of engineering firms to implement the project, (2) Need for EPCM (engineering, procurement, construction management) types of contract (similar than Design and build) increases when project complexity is increased, (3) if ESI initiated, project type is EPC more likely, 4) EPC shall be used for simpler projects => learning-to-contract gained	1859-1860
2	Walker, D., Davis, P., Stevenson, A. (2017). Coping with uncertainty and ambiguity through team collaboration in infrastructure projects. <i>International Journal of Project Management</i> , 35(2), pp. 180-190.	Infrastructure (construction), client's perspective	Decreasing ambiguity and uncertainty through collaboration. Ambiguity and uncertainty increase the tasks and costs within a company	188-189
3	Hosseini, A. (2018). Early contractor involvement approaches in public project procurement. <i>Journal of Public Procurement</i> , 18(4), pp. 355-378	Infrastructure (construction), client's perspective	Identified barriers and success factors of Early Contractor Involvement (ECI) in public infrastructure procurement.	362-373
4	Lintukangas, K., Hallikas, J., Kähkönen, A.-K., Bolander, I., Multaharju, S. (2014) Tampereen Teknillinen Yliopisto, L. t. & Lappeenranta Teknillinen Yliopisto, T. B. R. C. / L. U. o. T. . Supply network risks and costs in Finnish project business. Lappeenranta University of Technology	Construction and machine assembly industries, main contractor's perspective	Mitigation methods of risks, (additional) cost creators and barriers in project purchasing business. The increased complexity and monetary value of project create demand for enhanced risk management	46
5	Walker, D., Rahmani, F. (2016). Delivering a water treatment plant project using a collaborative project procurement approach. <i>Construction Innovation</i> , 16(2), pp. 158-184	Construction, client's perspective	Collaborately purchased construction project (one-off purchasing consortium model) may have friction in interests and operation models between the client parties. A performance taxonomy model was established to measure the performance in 16 project procurement management areas	167-182
6	Latham, M. (1994). <i>Constructing the Team. Final report if the government/ industry review of procurement and contractual arrangements in the UK construction industry</i> . London: HMSO. ISBN 978-0-11-752994-6 [referred 16.12.2018] Available: http://constructingexcellence.org.uk/wp-content/uploads/2014/10/Constructing-the-team-The-Latham-Report.pdf	Construction, client's perspective	Construction industry's ability to create value to its customers	12, 62

7	Egan, J. (1998) Rethinking Construction: Report of the Construction Task Force, London: HMSO. [referred 16.12.2018] Available: http://constructingexcellence.org.uk/wp-content/uploads/2014/10/Wolstenholme_Report_Oct_2009.pdf	Construction, client's perspective	Follow-up article for Latham's constructing a team (1994). Proposes partnering the supply chain and production of components	21
8	Wolstenholme, A. (2009) Never Waste a Good Crisis: A Review of Progress since Rethinking Construction and Thoughts for Our Future. <i>Constructing Excellence</i> . [referred 16.12.2018] Available: http://constructingexcellence.org.uk/wp-content/uploads/2014/12/Wolstenholme_Report_Oct_2009.pdf	Construction, client's perspective	Follow-up report for Egan's Rethinking construction report (1998). Represents a pessimistic view of the development. Suggests that contractors and subcontractors are driving the industry demands, not clients (as traditionally).	25-26
9	Jelodar, M., Yiu, T., Wilkinson, S. (2016). A conceptualisation of relationship quality in construction procurement. <i>International Journal of Project Management</i> , 34(6), pp. 997-1011	Construction, main contractor's perspective	Usual relationship attributes like commitment, a fitting strategy, teamwork and trust are supported with seven attributes needed for the buying organization. These attributes are: 1) individual and attitude modifications, 2) procurement strategy, 3) clarity and joint goal formulation, 4) joint evaluation, problem solving and continuous improvement, 5) Sharing culture and win-win approach, 6) education, training and culture synchronization, 7) incentivising and power.	1008-1009
10	Meng, X. (2011). The effect of relationship management on project performance in construction. <i>International Journal of Project Management</i> , 30(2).	Construction, client's perspective	Construction industry need closer supplier relationships to increase delivery quality and -time.	189; 196-197
11	Yeung, J. (2012). Defining relational contracting from the Wittgenstein family-resemblance philosophy. <i>International Journal of Project Management</i> , 30(2), p. 225	Construction, both perspectives	There is five core elements included in construction relationship contracting, which are: commitment, trust, cooperation and communication, common goals and objective, and win-win philosophy. There are also seven non-core elements, which supplement the core elements in construction contracting: 1) Agreed problem resolution methods, 2) continuous improvement, 3) facilitated workshops, 4) equity, 5) a joint declarations statement 6), real gain-share-pain-share and 7) formal contract.	235
12	Bildsten, L. (2016). Purchasing in Construction Companies. (Doctoral dissertation) Lund University, Sweden. Retrieved from: http://portal.research.lu.se/ws/files/7557344/Purchasing_in_Construction_Companies.pdf	Construction, main contractor's perspective	Project purchasing team is widely involved in new-buy purchasing situations. Construction industry is characterized by newbuy situations	38, Table 2
13	Ruparathna, R., Hewage, K. (2015). Sustainable procurement in the Canadian construction industry: Current practices, drivers and opportunities. <i>Journal of Cleaner Production</i> , 109, pp. 305-314.	Construction, client's perspective	In Canadian environment project purchasing in construction industry sustainability initiatives are not fully utilized. All the relevant inter-organizational stakeholders should taken consideration in project purchasing process. Government regulations is the main sustainability driver.	310-312

14	Walker, D., Lloyd-Walker, B. (2016). Understanding the motivation and context for alliancing in the Australian construction industry. <i>International Journal of Managing Projects in Business</i> , 9(1), pp. 74-93.	Construction, client's perspective	Establishment of framework for relationship-based project purchasing (RBP). RBP needs the consideration within three elements: 1) Platform foundational facilities, 2) behavioral factors driving normative practises and 3) processes, routines and needs	78, (figs 2,3 & 4); 87 (fig 5)
15	Hosseini, A., Haddadi, A., Andersen, B., Olsson, N., Laedre, O. (2017). Relational base contracts – Needs and trends in Northern Europe. <i>Procedia Computer Science</i> , 121, pp. 1088-1095.	Infrastructure (construction), client's perspective	The case study shows that the studied countries divide in two groups in case of alliance contracts: 1) countries that consider alliance contracts as attitude-based (Sweden& Denmark) and countries which are more dependent on formal regulations (Finland, Norway, UK& Netherlands)	1092-1904
16	Jagtap, M., Kamble, S.S. and Raut, R.D. (2017) 'An empirical examination of the procurement-led supply chain in the construction industry', <i>International Journal of Procurement Management</i> , Vol. 10, No. 1, pp.1–20. <i>INDERSCIENCE</i>	Construction, client's perspective	Risk can be mitigated by integrating client and contractor by sharing risks within the project	1
17	Crespin-Mazet, F., Portier, P. (2010). The reluctance of construction purchasers towards project partnering. <i>Journal of Purchasing and Supply Management</i> , 16(4), pp. 230-238	Construction, main contractor's perspective	The article uses the perspective of end-client by purchasing construction projects from construction companies (main contractors). The article argues that construction partnering is needed in client's purchasing projects to satisfy the needs of complex and high value purchases. The results indicate that the partnering is rarely utilized by private client companies, which use rather short-term cost reductions than long-term partnerships which is detrimental for long-term strategic relationships. The reason for this is claimed to be lack of trust and common-objective sharing when the interests of the parties do not align.	237

Appendix 2: Questions, domestic purchasing and production departments.

	Applied from Quintels et. Al. From drivers, facilitators and barriers (2006, 1790-181)	
Category	Question	In detail
Antecedent category	General questions	In detail
Firm/ management	Have you used international purchasing department in your projects during the past year? Which purchases were made?	
Firm/ management	How does the international purchasing currently works?	The quality of operations, success of projects
All	Please mention three things, in which international purchasing department has succeeded and three where it has failed?	
Antecedent category	Drivers	In detail
Product	In which kind of projects international purchasing should be used?	Project and building type
All	What are the main reasons why international purchases should be used in project purchasing?	E.g. top 3 reasons
Product	How large the cost benefit should be that international purchases should be used for projects? Which kind of other important factors besides the purchasing price there is?	
Product	Are delivery security and quality often significant factors, when the decision of international supplier is made?	
Antecedent category	Facilitators	In detail
Product	How does the supplier audit effects the supplier selection process?	N/A
Firm/ management	What capabilities international purchasing department should have that it could reach its project-specific goals?	E.g. Project-specific targets, service level and scope of service, and substance capabilities
Firm/ management	In which project phase international purchasing department should be involved that the benefits would be maximized?	N/A
Firm/ management	Are the international purchased items sufficiently planned for the project?	N/A
Firm/ management	Onko KV-hankinnan kommunikaatio riittävää projekteille? Is the communication between international purchasing and other parties sufficient for the projects?	N/A
Environment	How does the cultural differences effect on the construction phase? Are there clear differences between the items?	N/A
Firm/ management	Should Total Cost of Ownership (TCO) model be used when evaluating quotations? How this model could be implemented?	TCO evaluates the purchasing price and additional transaction costs for the item.
Antecedent category	Barriers (risks and obstacles)	In detail
All	What are the key reasons, why international purchasing should not be used in project purchasing?	e.g. top 3 reasons
Product	Which kind of technical risks international purchasing causes for the projects?	N/A
Firm/ management	Which kind of economic risks international purchasing causes for the projects?	N/A
Environment	Which kind of legal risks international purchasing causes for the projects?	N/A
All	How these risks could be controlled better?	N/A
Product	Are warranty and 10 year responsibility risks significantly higher when the items are internationally purchased?	N/A
Product	Is international purchasing experienced "stiffer" way of purchasing compared to domestic purchasing?	N/A
Product	How the delivery times effect on international purchases?	N/A
All	How the observed obstacles could be removed?	N/A

Appendix 3: Questions: International purchasing

	The questions are derived from Quintens Pauwels, Matthyssens (2006, 170-181) framework from drivers, facilitators, and risks and obstacles.	
Category	Question EN	Detailed description (if any)
Product	What are the most relevant internationally purchased commodities in your business area (which IPO is providing)?	N/A
Product	Which commodities/ commodity groups you predict to be increased in future in INT purchasing?	N/A
Firm/ management	How well does INT purchasing currently works?	Quality, level, and accomplished targets in projects
Category	Drivers	Detailed description (if any)
Product	In which types of projects (=contract and building type) INT purchasing should be used?	Project and building type
All	What are the main reasons, why INT purchasing should be utilized?	e.g. TOP 3 reasons
Product	How much (in generally) the cost advantage should be that the production department would like to choose an international supplier? How the cost advantage is measured? Is it possible to get cost feedback from realized projects?	N/A
Product	Is delivery security, quality of products and availability often significant factors, when decision for INT supplier is made? What other significant factors there are?	N/A
Category	Facilitators	Detailed description (if any)
Product	How does the supplier audit influences the order decision? How does the production department concerns audit? Is it sufficient, when it's only completed or is more content required?	N/A
Firm/ management	Which kind of capabilities IPS&IPO should have to reach its requirements (from production department/ NAT purchasing)	Project-specific targets, quality and scope of service.
Firm/ management	In which project phase INT procurement should be involved for the projects to get better benefits for NCC? How does the chosen project type influences this?	N/A
Firm/ management	Are INT purchases planned sufficiently in advance for projects? For which kind of projects this should be changed?	N/A
Firm/ management	Does the communication between INT purchasing and NAT purchasing and production work sufficiently?	N/A
Environment	How does the cultural factors (similarities or dissimilarities) affect on the work? Does the commodities/ commodity groups have clear differences between each other?	N/A

Antecedent category	Risks and obstacles	Detailed description (if any)
All	What are the most common failures in international purchases?	e.g. TOP 3 reasons
All	Why do these failures appear?	N/A
All	Could these failures be taken out for example by developing internal processes?	N/A
Product	What do you consider to be the most risky purchasing categories in INT purchasing?	N/A
Product	Which kind of technical risks INT purchasing will create to projects?	N/A
Firm/ management	Which kind of commercial risks INT purchasing will create to projects?	N/A
Environment	Which kind of legal risks INT purchasing will create to projects?	N/A
All	How these risks could be mitigated?	N/A
Product	Are warranty and (10 year) responsibility risks higher in INT procurement?	N/A
Product, network	Are INT suppliers/ contractors stiff? How does this effects on site or in pre-site phase (planning, negotiation)?	N/A
Product, network	How do the long delivery times affect on international purchases?	N/A

Appendix 4: Question, client organisation

	The questions are derived from Quintens Pauwels, Matthyssens (2006, 170-181) framework from drivers, facilitators, and risks and obstacles.	
Category	Question	Description
	General questions	Detailed description (if any)
Firm/ management	How does your organisation concerns international purchases?	N/A
All	Which kind of experience you have from international purchases conducted by MC?	items purchased by the case company itself and by MC
Category	Driver	Detailed description (if any)
Firm/ management	How (the MC's) international purchases benefit the client organisation?	N/A
Product/ environment	Is the benefit seen solely from cost perspective? Which other benefits exist?	N/A
Firm/ management	Does providing internationally purchased products from a famous brand seen as image benefit? (e.g. high quality facades, lounges, etc)	N/A
	Which kind of positive experiences do you have from international purchases by MC? Which are the success factors?	N/A
Antecedent category	Facilitators	Detailed description (if any)
Management	How the international purchasing could be furthered in the planning guidance.	N/A
Environment, product	Which kind of contract types benefit international purchasing best?	N/A
Product	In which product groups the international purchasing needs to be increased?	N/A
Firm/ management, Environment	Does your internationalisation goals effect on internationalisation level of your (construction-related) products?	N/A
Firm/ management	In which phase of the project the international purchasing needs to be involved?	N/A

Antecedent category	Barriers	Detailed description (if any)
All	Why the international purchasing should not be used?	N/A
Product	In which items or item groups the amount of international purchases should be decreased? Why?	N/A
All	Which kind of negative experiences do you have from international purchases? Why do these appear?	N/A
Product	How the international purchases affect on the life cycle of the product?	e.g. maintenance and upgradeability

Appendix 5: Propositions, internet survey

General
International purchases are familiar to me
International purchasing function is familiar to me
I have clear understanding of possible internationally purchased items for my project or projects.
I would like to get more information about international purchasing possibilities project-specifically
In my case, the international purchases consider only the Estonian-originated contracting and material deliveries.
Drivers
International purchases increase the competitiveness of the case company
International purchasing is currently utilised as effective as possible
Internationally purchased items are planned for the projects too late
International purchasing department should be involved already in the tendering phase to obtain more competitive (pre)quotations
Facilitators
International purchasing function has the resources it needs to perform sufficiently
International purchasing function's resources are utilised the best way possible
The communication between production and international and domestic purchasing functions is sufficient
In my opinion, the international purchases increase the competitiveness of the case company
International purchasing function is able to provide the relevant supplier candidates for the projects
Alliance project as a contract type is able to create better prerequisites to find internationally-purchased items for projects
The international purchasing function should concentrate on these alliance contract types
Design and build and project management contract types create better prerequisites to find internationally-purchased items for project
The international purchasing function should concentrate on these alliance contract types
The purchases conducted by international purchasing department are needed only one-off project types
Barriers
On average, international purchasing causes more challenges compared to domestic purchasing
International purchasing function provides the sufficient support to deal with the occurred challenges
Internationally-purchased items cause more challenges during the warranty and 10 year responsibility period than domestic purchases
International purchasing function provides the sufficient support to deal with the warranty and responsibility-related challenges