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Henri Luhtala

**CASE STUDY: THE BENEFITS AND CHALLENGES OF
INSOURCING IN A TECHNOLOGY COMPANY**

Examiners: Professor Katrina Lintukangas

Professor Veli Matti Virolainen

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Henri Luhtala

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Tämä opinnäytetyö keskittyy osta tai tee (make or buy) päätökseen, prosessiin, jota kaikki yritykset ja organisaatiot toteuttavat jollakin tasolla. Tarkemmin sanottuna painopiste on ulkoistamisen vastakohtassa, insourcingissa, jonkin tietyn tuotteen valmistuksessa tai hankinnassa sisäisesti. Tämän opinnäytetyön tavoitteena on ymmärtää, mitä etuja ja haasteita tee- päätöksellä on teoriassa ja case-yritykselle, tukeutuen transaktiokustannusten taustateoriaan.

Näiden teorioiden pääkomponentit tai tekijät esitetään eteenpäin tärkeinä osina, jotka vaikuttavat osta tai tee päätöksentekoon. Opinnäytetyössä esitetään ulkoistamis- ja insourcing-strategiat osta tai tee- prosessin näkökulmasta. Eri tieteellisten lähteiden valitut mallit ja strategiat käsittelevät prosessia (hankkia ulkoa tai ei) tietyillä sisällön, prosessivirtaan vaikuttavien tekijöiden vaihteluilla. Make or buy prosessia verrataan transaktiokustannustalouden avulla yhteisten tekijöiden tunnistamiseksi, jotka vaikuttavat päätöksentekoon make or buy prosessissa.

Opinnäytetyössä syvennyttään insourcingiin ja pyritään tuomaan esiin sen etuja ja haasteita, jotka löytyvät akateemisesta kirjallisuudesta. Insourcingin teoriaa ja vertikaalisen integraation motiiveja käsitellään case yrityksen taustateorian muodostamiseksi. Tämä opinnäytetyö on itsessään laadullinen tapaustutkimus, jossa tutkitaan yhtä anonymia teknologiayritystä. Nimeä tai merkittäviä tunnistettavia piirteitä ei mainita yrityksen edustajien toiveiden vuoksi.

ABSTRACT

Lappeenranta-Lahti University of Technology LUT
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Henri Luhtala

Case Study: The benefits and challenges of insourcing in a technology company

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This thesis focuses on the make or buy decision, which is something all companies execute on some level. To be more specific, the focus is insourcing, the act of manufacturing or procuring something internally. The goal of this thesis is to understand, what are the benefits and challenges for insourcing in theory and for a case company by relying on the background theory of transaction costs as well as transaction cost economics. Key components or factors of these theories are presented and brought forwards as important parts affecting the make or buy decision. The thesis presents outsourcing and insourcing strategies, from the make or buy perspective. The chosen presented strategies from different authors all deal with the make or buy process (to insource or not) with some variations in content, process flow and impacting factors. The make or buy process is compared through the lens of transaction cost economics, in order to identify common factors, which impact decision making in the make or buy process.

The thesis delves deeper into insourcing, its benefits and challenges found in academic literature. Insourcing theory, the motives of insourcing and vertical integration are processed in order to provide background theory to the case research. This thesis is of itself a qualitative case study, studying a single anonymous technology company. The name or significant recognizable traits are not mentioned due to the wishes of the company representatives.

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1. INTRODUCTION

The modern-day companies wrestle with several different key-decisions, concepts and options that have been created by the constantly changing world of globalization. The borders of countries have become more open, thus increasing the trade between countries. The breakdown of these barriers has allowed for companies to outsource their production abroad to achieve benefits in costs, quality, as well as other factors.

Globalization and competition has lead for many organizations to acknowledge the difficulties of skill and expertise development and maintenance in order to compete with success.(Langfield-Smith and Smith, 2003, p. 281) Organizations are looking towards gathering performance improvements outside the traditional company boundaries due to increasing competition which has forced companies towards continuous improvement (McIvor et al., 2009, p. 1025–1026).

Outsourcing can be defined as a business practice where a company hires an outside party to perform services and create goods (Twin, 2019). Outsourcing is itself not a new phenomenon and almost anything can be outsourced (Reiss, 2015, p. 38). Outsourcing can affect several different functions and areas from customer support to manufacturing and was first recognized as a business strategy in 1989 (Twin, 2019).

Corporate managers are looking constantly more into outsourcing in order to meet the challenges of value creation (Quélin and Duhamel, 2003, p. 647). Outsourcing has moved from the focus of minor activities into much more critical activities, such as manufacturing, design and logistics. It is seen as a powerful way to drive costs down and to provide improvement to performance.(McIvor, 2009, p. 45)

Though outsourcing has gathered popularity the last few decades, organizations have had mixed results in regards to outsourcing and have failed to achieve desired performance improvements, due to not understanding the full implications of outsourcing (McIvor et al., 2009, p. 1026). The challenges related to outsourcing

provide the opportunity to insource production that has been previously outsourced, to bring several different benefits which were not realized by outsourcing.

In sourcing, which essentially means conducting the defined function, for example, the production within the company instead of outsourcing to another company, can provide several different benefits. These benefits can be recognized to be for example flexibility, control and costs savings (Gamble, 2011, p. 58). In sourcing can be an opportunity for companies in the case of increased capacity, while mitigating the risks related to outsourcing (Gold, 2017, p. 5).

Companies and organizations alike have arrived to the point, where make or buy decisions, to outsource or insource, need to be conducted, different factors need to be considered to make the right decision in short- and long-term. The make or buy decision problem is one of the most widespread issue, which impact company processes, relationships and core functions (Padillo and Diaby, 1999, p. 3203).

In sourcing is studied in this thesis as the main topic to gain a perspective into the benefits and challenges of insourcing in theory and to see how much these findings correlate with a case company perspective into insourcing. In sourcing as a phenomenon is more recent than outsourcing, at least in academic research and studies. The research into the benefits and challenges of outsourcing is a much more studied concept than insourcing, which is why it is important to bring forth the findings of this insourcing phenomena as an alternative to outsourcing.

This study has the potential to provide perspective into insourcing as an option for management. The benefits and challenges of insourcing provide crucial concepts that need to be taken into the make or buy decision making process, to have a better perspective on which key performance indicators matter in the evaluation. From theoretical perspective this study offers a point of view different from the traditional '*outsource or not*' perspective,

This study aims to bring awareness to insourcing as a valid option, its benefits, challenges and the concepts that need to be examined when conducting an insourcing vs. outsourcing decision in the real world. The theoretical concepts and frameworks behind this study provide the

theoretical background that separates from the outsourcing-based literature to focus on the concept of insourcing.

1.1 Research objectives & questions

Regarding research questions of qualitative studies, they typically position to certain cases or phenomenon, trying to find patterns of relationships. (Stake,1995, p. 41)

The research objectives and questions aim to bring light to a part of scientific literature which has been overshadowed by its counterpart outsourcing. The following aspects of this thesis regarding insourcing are studied and analyzed. Here are listed the research questions related to the topic of this study.

Main questions:

1. What are the benefits and challenges of insourcing?
2. When is insourcing preferred over outsourcing?

Sub questions:

3. What kind of benefits can a technology company gain from insourcing?
4. Which criteria are prioritized in a make or buy decision in technology company?

The main questions aim to bring answers to the grand topic of this study, which are the benefits and challenges of insourcing, recognized from theory regarding the subject. In addition, this study aims to answer when insourcing as an option is more beneficial or favorable when compared to outsourcing. What kind of situations lead towards insourcing as a better method compared to outsourcing and which factors influence this sourcing strategy.

The sub questions are related to the qualitative case-study into a high-mix low-volume technology company. The aim is to recognize the real world benefits the company aims to gain with insourcing decisions. The question is answered with the case study conducted in a technology company, by recognizing the real-world benefits using different qualitative data-gathering methods. In addition, the second sub-question focuses on the criteria of prioritization regarding the make or buy decision in a technology company, which factors are seen to be more important than others.

1.2 Theoretical framework

A theoretical framework explains the path a research follows and grounds it within theoretical constructs. (Adom et al., 2018, p. 438) It is an foundation from which knowledge is formed of in the metaphorical and literal sense for a research study (Grant and Osanloo, 2014, p. 12).

The theoretical framework chosen for this study presents the existing theory related to the field of study. Adom et al. (2018, p.438) say that ‘ *The theoretical framework guides and should resonate with every aspect of the research process from the definition of the problem, literature survey, methodology, presentation and discussion of the findings as well as the conclusions that are drawn.*’ Research study without a theoretical framework provide an unclear structure and vision, while a research plan that includes a theoretical framework allows the study to be strong, structured and organized (Grant and Osanloo, 2014, p. 13). The theoretical framework chosen for this research presents the core concepts used in the following chapters. Transaction Cost Economics acts a theoretic background providing perspective to these unique concepts. Its own properties and concepts are used to provide theoretical view on insourcing & outsourcing, as well as to provide the general view used in scientific research regarding the subject. The key-concepts Transaction Cost Economics are used to provide information, comparison and to help the recognition of risks & benefits regarding insourcing, both in theory as well as in the empirical part of the study regarding the case company.

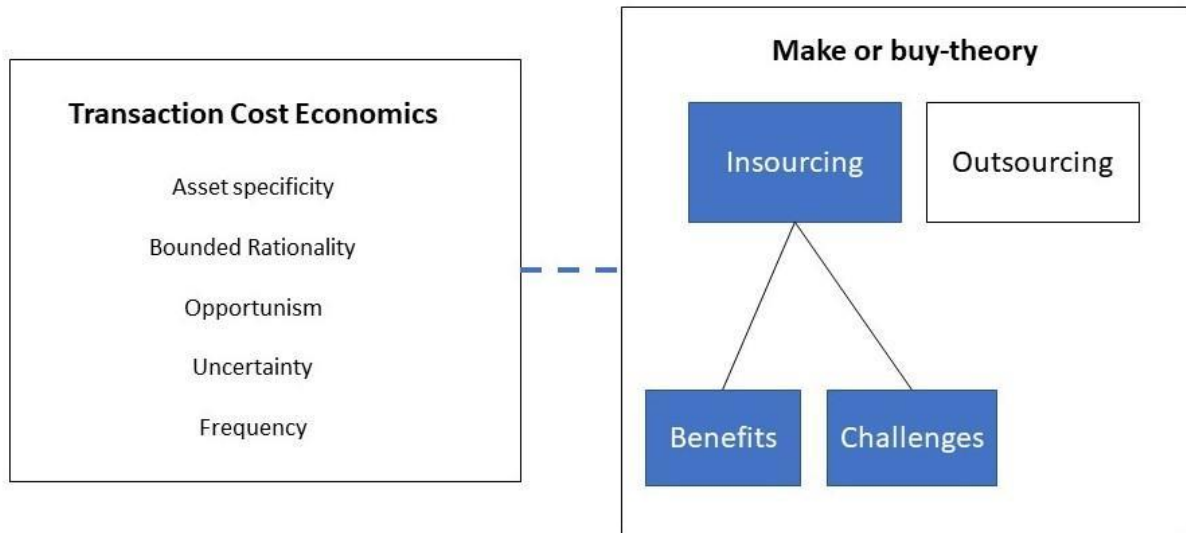


Figure 1. Theoretical framework

1.3 Literature review

The literature related to sourcing strategies is expansive with a large focus on outsourcing, with a limited view towards insourcing. The scientific literature related to insourcing is often handled in relation to outsourcing, for example in the context of make or buy decisions, where insourcing and outsourcing are seen viable alternatives. The terminology used in previous scientific research varies from vertical integration, make or buy, sourcing and strategic sourcing. Different terminology is used to describe issues of the same theme.

Majority of the scientific articles regarding the subject have been published after 2006 and for two decades, the research for make or buy decision has evolved to favor outsourcing as the main option (Serrano et al., 2018, p. 137-138). However, the dominating perspective regarding the field of research has been the focus on financial factors (Padillo and Diaby, 1999, p. 3204).

The theories of transaction cost economics (TCE) and the resource-based view of the firm (RBV) are the most influential regarding the study of outsourcing (McIvor, 2009, p. 45).

According to Padillo and Diaby, (1999, p.3204) the literature regarding the insource or outsource decision has been disseminated to industrial organization, corporate or business strategy, purchasing or supply management, strategic operations management, operations research and managerial management or cost accounting. Each of these fields provide different perspective from their own areas into the make or buy decision.

By studying the published literature of the make or buy decision, Serrano et al. (2018, p.139) have classified the empirical studies into five groups which are field studies, multiple case studies, studies with a mixed case and field methodology, single case studies as well as content analysis studies. Qualitative methods have been the go-to method of research regarding the make or buy decision.

This placement of these sourcing strategies as opposing methods is quite common and understandably so, as they are opposites of each other in a way, manufacture within or delegate outwards. Although in the scientific literature related to insourcing and outsourcing, there are also methods where the line is blurred, sourcing strategies having the properties of each other, where the level of commitment and cooperation define the relationship. These kind of sourcing strategies are not simply insourcing or outsourcing.

This study is in a rather unique position, as it deals with the benefits and challenges of insourcing, when most studies of sourcing strategy benefits and challenges have been focused on the concept and sourcing strategy of outsourcing. When reviewing other thesis work, insourcing has been studied as a part of the make or buy decision, often focusing on the steps and factors leading towards choosing either insourcing or outsourcing.

This thesis work is focusing the research on both the factors influencing the decision to insource, as well as the realized results related to this make or buy- process, which can be recognized as the challenges and benefits.

1.4 Research Limitations

This Thesis work is limited to the study of challenges and benefits of insourcing. While other sourcing methods are presented, they are simply brought forward to provide perspective into the variety of sourcing strategies. Other sourcing strategies are not inspected to such a degree, except for outsourcing, which acts as a valid opposite and is required to provide context for this research. This is due to the fact, that this study aims to focus on insourcing as a research objective, which requires more attention compared to for example outsourcing, which itself has plenty of research done of.

This Masters' thesis employs the theory Transaction Cost Economics. This theory has been chosen to provide a framework and a perspective, from which this study is conducted from. Other theories from outsourcing or insourcing literature are not used as a framework and are outside of the scope of this research. The choice for this approach has been conducted to provide better and more valid perspective into this research of a limited topic by embracing the most common theory with a lot of scientific and academic research behind it.

The Case-Study of this thesis is limited to a single technology company. This is due to the unique opportunity presented to gain perspective into the challenges and benefits a technology company faces, by interviewing extensively within the chosen company. This study focuses more deeply to the research questions, than in Case-Studies handling several companies. The make or buy decision is studied from a company-wide aspect, without focusing on a specific field of perspective. The data gathering has been conducted from second-hand data, interviews and a workshop study. Due to the extensive amount of data, it has been deemed necessary for the study focus to be on a single company.

1.5 Research methodology

The research methodology chosen for this thesis is qualitative research. Methodology can be defined as a general approach to studying research topics (Silverman, 2000, p.88) Qualitative research provides meaning through systematic deduction and induction, which is essential for the pursuit of knowledge (Sale and Thielke, 2018, p. 129). The characteristics of qualitative research include interactive and humanistic methods, emerging data and interpretive nature (Cambell, 2014, p.1).

Qualitative research includes a variety of different approaches (Silverman,2000, p.12)

Qualitative research can be identified to contain five different strategies of research. These are grounded theory, narrative research, phenomenological research, ethnographies and case study (Cambell, 2014, p.1).

The method chosen for this thesis to be used in research is the method of Case Study.

Qualitative case study seeks to understand the case better, appreciating the uniqueness and complexity of the case (Stake, 1995, p16). The Case study method is chosen due to the nature of the study conducted in the chosen company matching with this qualitative method. It makes sense to choose pragmatically which research approaches should be used depending on the research problem (Silverman, 2000, p.12) The main uses of case study can be defined as obtaining descriptions and interpretations from others (Stake, 1995, p.64).

In this Case study most of the data is gathered from interviews in the case company, second-hand data from company systems and other sources of information. The interviews are conducted with experts of their own expertise, who have gathered experience and information regarding insourcing and outsourcing within the case company. For these interviewees, a set of questions are presented regarding insourcing, make or buy decision and other important factors related to the matter that is being studied.

The second-hand data is in nature both quantitative and qualitative, including data with properties of both types. The files include data in for example excel- and powerpoint-format. From this data qualitative factors are recognized, the analysis on the data is conducted by

interpreting the data and is then generalized it to different concepts used in the theory-part and analyzed.

Regarding the validity of the research, the answers for the research questions are formed using the case study method to the best of purposes. The aim is to provide correct data bound in theory, while interpreting the real world subjective and combined material from the case company. While this study focuses on a case company in technology industry, the findings can be used to recognize similar factors and decisions affecting insourcing in other industries as well. However, it should be noted that while the findings of this study apply for the case company, differences may occur in the chosen industry. The case study is made to simply recognize answers for the chosen research questions in a single company.

1.6 Key concepts and definitions

In this section are listed the key-concepts regarding this study. Understanding these concepts are important to internalize and comprehend the core of this thesis and the case-study.

Transaction cost

Transaction costs are costs that are formed during trading in the process of both purchasing and selling (MBN, 2019). Transaction costs contain for example the costs of discovering market prices and costs of writing and upholding contracts. These are the costs involved in the exchange of goods and cash. (OECD, 2003) Another definition for transaction costs is the costs related to the execution of a business transaction, such as search & information costs, bargaining & decision costs and policing & enforcement costs. Transaction cost is a crucial element to take into calculations in a make or buy decision. (MBN, 2019) Transaction cost can be defined to be financial factor, inconvenience factor or a factor affecting time (Pettinger, 2013).

Transaction cost theory

Transaction cost theory is a theory that leads towards the idea that the growth of companies happens by the need to reduce transaction costs and to concentrate production within the company. The growth of the company due to these needs are seen as partly explained reasons. (Pettinger, 2013) Transaction Cost Theory aims and predicts when certain activities should happen in a company and when in the market. (Williamson, 1991, Greve and Argote, 2015)

Transaction cost economics

Transaction cost economics developed by Richard Coase & Oliver Williamson suggest that organizations characterized by economic behavior appear from cost-minimizing behavior in a world of opportunism and limited information (OECD, 2003). The theory, while created by Oliver Williamson roots from Ronald Coase, who thought that if the trading costs of market transactions are relatively high, transaction-parties should work together within a company instead of trading in regular markets. (Terviö, 2010, p. 104)

Transaction cost economics joins economics with aspects of organization theory, relying on comparative analysis (Williamson, 1979, p.261). The key concepts regarding Transaction Cost Economics are asset specificity, bounded rationality and behavioral nature. These concepts are also known to be of technical, human and behavioral nature. (Groenewegen, 1996, p.1)

Insourcing

Insourcing can be defined as delegating a function within a company. (Business Dictionary, 2019) According to Kenton (2019) *“Insourcing is used to describe a function that a company could outsource to a third party”*. For example, this can be done when a company has previously delegated a function, like manufacturing of a product, to an outside company.

Other definitions for insourcing are the following (Collinsdictionary, 2019):

1. Subcontracting work to another company under same ownership.

2. Subcontracting work to a company in the same country.

There are several different definitions used for the term insourcing. In this thesis, the insourcing is defined as conducting a function, for example manufacturing, inside specific organization or company, without regards to the sourcing history (outsourced previously or not) of said function.

Outsourcing

Outsourcing as a concept has several definitions. It is a form of strategic alliance. (Langfield-Smith and Smith, 2003, p. 281) Espino-Rodriquez et al. (2006, p. 52) summarize outsourcing based on several definitions:

“ Outsourcing is a strategic decision that entails the external contracting of determined non-strategic activities or business processes necessary for the manufacture of goods or the provision of services by means of agreements or contracts with higher capability firms to undertake those activities or business processes, with the aim of improving competitive advantage. ”

The definition states that outsourcing is a strategic decision part of company strategy, companies must identify the outsourced activities and be developed by supplier of superior capabilities and that it includes the concept of business processes. (Espino-Rodríguez and Padrón-Robaina, 2006, p. 52) Outsourcing can be defined as purchasing a product, component or services from an outside party (Reiss, 2015, p. 38), process of paying to have a part of company work done by another company (CambridgeDictionary, 2019) or the procurement of goods and services from foreign suppliers (MerriamWebster, 2019). The term was first defined in 1980s regarding subcontracting information systems. (Espino-Rodríguez and Padrón-Robaina, 2006, p. 50)

2. TRANSACTION COST ECONOMICS

This chapter focuses on the theory of transaction cost economics. Transaction cost economics acts as a theoretic background for this study, providing aspects from which to inspect the concepts of both insourcing and outsourcing. Transaction cost economics and its properties highly influence the conducted Case-study on the technology company, by providing properties from theory, having an effect into the make or buy research and to the study related questions.

2.1 Transaction cost economics

Transaction cost economics (TCE) is a concept that has been used to analyze economic organizations for decades, and is centered around governance structures and transaction costs (Schneider et al., 2013, p. 243) Transaction occur when goods or services are transferred from one party to another. (Williamson, 1981, p. 552) Transaction costs aim to integrate the managerial and economical aspects of business by providing the full cost of providing a product or a service (Ruffo et al., 2007, p. 24). The concept of transactions as a unit of economic analysis was brought forward by John R. Commons in 1934. (Williamson, 1981, p. 550)

TCE proposes that the main purpose of an organization is economizing, which is accomplished by the alignment of governance modes with transactional attributes. (Williamson, 2014, p. 8) The theory developed by Richard Coase & Oliver Williamson suggest that organizations characterized by economic behavior appear from cost-minimizing behavior in a world of opportunism and limited information (OECD, 2003) The concept has its origins in the concepts and regularities of organization theory, which has had massive influence into TCE. (Williamson, 1993, p. 108)

Ronald Coase brought transaction costs to the research of companies and market organizations in for the first time 1937 (Williamson, 2010, p. 215). Coase introduced the concept of transaction costs in his paper 'The nature of the firm'. (Williamson, 2014, p. 7) Coase's paper

in 1960 ‘*The problem of social costs*’ presented that externalities would be gone in the case of zero transaction costs. (Williamson, 2014, p. 7) Coase argued, that differences in transaction costs between markets and hierarchies were responsible for the decision to use markets or hierarchical forms of organizations. (Williamson, 1988, p.569)

Williamson was drawn to the concept from the question provided by Coase in 1937: ‘*what efficiency factors determine when a firm produces a good or service to its own needs instead of outsourcing the functions?*’ Williamson seek to understand the boundaries of the firm by focusing on concepts such as vertical integration, formulating the previous question to the form of a contracting problem (Williamson, 2010, p. 215. 224)

TCE examines individual transactions (Williamson, 2008, p. 5). TCE takes the transaction cost into a basic unit of analysis instead of the neoclassical lens of choice, which emphasizes price, output, supply and demand. (Williamson and Ghani, 2012, p. 76) Groenewegen (1996, p.1) describes the general strategy of TCE as characterizing transactions and finding the governance structures most potential for transaction cost minimization. Williamson (1996, p. 151) describes transaction cost economics as relentlessly comparative, microanalytic, discretely structural and preoccupied with economizing.

Williamson (1985) defines transaction costs as ex ante (based on forecast) and ex post (based on results). These ex-ante costs are:

1. search and information costs
2. bargaining, drafting and decision costs
3. costs of safeguarding and agreement

The ex-post transaction costs are:

1. Monitoring and enforcement costs
2. haggling and adaptation costs

3. bonding cost

4. maladaptation costs

Williamson (1988, p.571) defined Transaction Cost Economics is derived from the imperative to align transactions with governance structures in a discriminating way. The main idea of TCE is that transactions differing in their attributes are aligned with governance structures that differ in cost and competence to effect an economizing result. (Speklé et al., 2007, p. 107) To put it simply, TCE tells that transaction costs favor different structures of governance depending on the costs.

Governance structures

TCE views firm and market organizations as alternative orders of governance, where the governance acts as means to provide order, realize gains mutually and to mitigate situations of conflict. (Williamson, 2014, p. 7; Williamson 1988, p.569) It is the means to provide operational content to organization and governance. (Williamson, 2010, p. 215) Transactions which differ in attributes are aligned with governance structures, which differ with strengths and weaknesses to accomplish a transaction cost economizing result. (Williamson, 2008, p. 9) The ability to achieve alignment can be said to be shaped by the interaction between the organizational structure and the characteristics of the decision making problem. (Bidwell, 2009, p. 373)

In Transaction Cost Economics from the perspective of Coase, markets and hierarchies are the two main governance structures, from which companies choose the most efficient option. (Blomqvist et al., 2002, p. 1) Williamson however describes three main modes of governance which are markets, hybrids and hierarchies. (Williamson, 2014, p. 7) Williamson (1979, p. 248-251) describes the Governance structures as Classical (Market), Neoclassical (Mixed) and Relational contracting (specific).

Market governance is described as the governance structure of non-specific transactions. Non-specific transactions are generally seen to be efficiently organized by markets, without regard to the rate of occurrence (Williamson 1979, p. 248,259).

Neoclassical contracting is for transactions described as of mixed kind. (Williamson 1979, p.249) However, the coined term used in this research is Hybrid. Hybrid governance structures are described as partnership, which are interpreted as individual contracts between parties, with the aim to create joint surplus through co-operation and beneficial sharing. These hybrid structures emerge in volatile environment. (Blomqvist et al., 2002, p. 1,12)

Williamson (1979, p. 259) claims that the level of development for a transaction-specific governance structure is dependent on the rate of transactional recurrency, entailment of idiosyncratic investment and the level of uncertainty.

Markets, hybrids and hierarchies have different mechanisms of control regarding contracting, markets rely on free competition, hierarchies rely on authority and hybrid forms of organizations rely on long-term contracts. (Langfield-Smith and Smith, 2003, p. 285) According to TCE, different instruments available for activities related to governing, depending on the form of governance (Bidwell, 2009, p. 363).

2.2 Key Concepts

Transaction cost economics has several key attributes which can be defined as asset specificity, bounded rationality, opportunism, uncertainty and frequency. (Williamson, 2008, p. 8; Groenewegen 1996, p.1) These are the critical dimensions of characterizing transactions.

Opportunism & Bounded rationality

Regards to transaction cost economics, the issue of contracting only arises if both the concepts of bounded rationality and opportunism are present. (Foss and Weber, 2016a, p. 61)

Opportunism is a central concept in transactional cost research and is significantly important for the economic activity regarding transactional investments of human and physical capital. (Williamson, 1979, p. 234) Opportunism is defined by Williamson as '*self-interest seeking with quile*', leading for buyers being unable to differentiate opportunistic or non-opportunistic behavior before the signing and implementation of a contract. (Lonsdale, 2001, p. 23) The

decision to behave in an opportunistic manner according to transaction cost theory is a result of economic calculus concerning cost and benefits. Opportunistic behavior is seen to manifest much more often, when the relationship between buyer and supplier is relatively new (Jap et al., 2013, p. 216,218) Transaction cost economics does not specify the dimensions which cause opportunism. (Huo et al., 2018, p. 155) Opportunism can be reduced by internalizing specific assets, where the more flexible governance structure minimizes haggling related to partners. (Bidwell, 2009, p. 363)

Bounded rationality assumes that decisionmakers possess constraints on cognitive capabilities and have limits to rationality. (Rindfleisch and Heide, 1997, p. 31) Bounded rationality is defined as a form of rationality, in which actors are assumed to be intendedly, yet limitedly rational. Limits of rationality arise from the human frailty. (Lonsdale, 2001, p. 23). Bounded rationality can be divided into three components, processing capacity, cognitive economizing and cognitive biases. (Foss and Weber, 2016b, p. 63) Transaction cost economics perceives, that humans are subject to bounded rationality and are given to opportunism. (Williamson 1988, p. 569) According to Williamson (1988, p. 569) incomplete contracting is a consequence of these two factors.

Uncertainty

Uncertainty means the extent to which transactions are subject to different disturbances (Schneider et al., 2013, p. 244) It refers to the degree of the performance and predictability of the environment within a contract is executed (environmental uncertainty) and to the problems experienced in performance monitoring (behavioral uncertainty). (Speklé et al., 2007, p. 105) It is considered the most critical attribute of the TCE concept. (Williamson,1979, p. 239)

Uncertainty can be divided into environmental and behavioral uncertainty. Environmental uncertainty deals with the degree of ex ante specifiability of the desired performance and predictability of the environment of a contract. Higher uncertainty favors governing structures providing smooth adaptation to changing conditions. (Speklé et al., 2007, p. 107) One of the

common problem related to environmental uncertainty deals with the difficulty of adaptation to change in surrounding conditions.(Rindfleisch and Heide, 1997, p. 31)

Behavioral uncertainty associates with moral hazards and information asymmetry. (Speklé et al., 2007, p. 108) It refers to opportunistic effects on transactions processed through incomplete contracts.(Vázquez, 2004, p. 464) The effect of behavioral uncertainty deals with the problem of performance evaluation or the verification of issues regarding compliance. (Rindfleisch and Heide, 1997, p. 31)

Asset specificity

Asset specificity refers to investments in rather specific resources. (Murray et al., 1995, p. 187) The used term specificity does refer to asset specificity and human capital specificity. (Arnold, 2000, p. 25) Specific assets are resources that are a lot more valued in their use at the moment than in any alternative uses (Speklé et al., 2007, p. 105). These can be for example equipment, tools and procedures made for specific use. (Heide and John, 1990, p. 27).

The level of asset specificity, or level of technology regarding a product has an effect in the costs of the investment. Special purpose technology with high asset specificity requires larger investments in durable assets. Williamson (1983, p. 522) Objects of low asset specificity can be outsourced to external organizations, in order to consolidate demand and enable the use of economies of scale.

Transactions that require high asset-specific investments should be insourced according to TCE (Bidwell, 2009, p. 363). Products or services containing high level of specificity cannot be employed in other transactions without including significant additional costs.(Arnold, 2000, p. 25) Organizations prefer hierarchies in the case of high asset specificity according to TCE. (Speklé et al., 2007, p. 109)

Specificity as a concept is related to the strategic importance of transactions.(Arnold, 2000, p. 25) According to Williamson (1991, p. 83) asset specificity creates bilateral dependency and creates contracting hazards. There are several types of asset specificity recognized in academic literature regarding Transaction Cost Economics. These are for example, site-specificity,

physical asset specificity, human asset specificity, brand name capital, temporal specificity and dedicated assets. (Williamson 1983, p. 526; Williamson 1991, p.281)

Site-specificity is described as stations located in relation to economize on inventory and transportation expenses. Physical asset specificity is described as assets specialized for example the production of a component. Human asset specificity is described as learning-by-doing. Dedicated assets are seen to represent discrete investment adding to production capability. (Williamson 1983, p. 256; Williamson, 1981, p. 555; Williamson ,1991, p. 281)

Frequency

Frequency means the rate of occurrence for a transaction. (Schneider et al., 2013, p. 244) It represents the value and volume of different transactions over a period of time (Speklé et al., 2007, p. 105). Frequency refers to how often a transaction occurs (Vázquez, 2004, p. 465) As frequency rises, firms prefer to lean towards in-house sourcing regarding lower levels of asset specificity. (Speklé et al., 2007, p. 110)

2.3 Transaction cost economics criticism

A main contributor into Transaction Cost economics- research Williamson points out that TCE has many applications in the fields of economics. Labor, public finance, economic development- and systems, as well as accounting. (Williamson, 2014, p. 10) Transaction cost economics has had plenty of ramifications and influence into antitrust and regulation regarding public policy applications.(Williamson, 1996, p. 154) However, regarding the criticism into TCE, according to Williamson (1996, p. 154) transaction cost economics require more and better empirical research, though the empirical work into transaction cost economics can be categorized to be in better shape than empirical work in industrial organization generally.

Transaction cost economics has been criticized for the too many degrees of freedom, because of the lack of definition. (Williamson, 1979, p. 233) The lack of formalization is explained by

Williamson, (2010, p. 223) that transaction cost economics has gone through the natural progression, where formalization occurs during the progress and premature formalization may risk disconnection from the phenomena. The informal stage of TCE was the literature of the 1930s, pre-formal work in the 1970s, semi-formal work from the 1980s and full-formalization is still under work (Williamson, 2010, p. 224).

Schneider et al. (2013, p. 250) claim that according to their study the claim that following the TCE principles predict superior performance is not entirely supported. They claim that the difference in performance is dependent on transactional variance rather than organizational structuring, which complements previous critique into TCE, suggesting that TCE should not be used as a leading concept to act as a guide in decision-making processes. (Schneider et al., 2013, p. 250)

According to Ghoshal and Insead (1996,p 13, 40-41.) claim that TCE is ‘*bad for practice*’, claiming that the relation of asset specificity and internalization do not demonstrate causality and demanding long-term efficiency as a criterion for the study of complex organizations. The authors claim that TCE is organizations are not simply substitute for market failure and that TCE as a theory is dangerous for corporate managers because of the prescriptions drawn from it.

3. OUTSOURCING AND INSOURCING STRATEGIES

3.1 Make or Buy decision

The make or buy decision is about the choice of conducting a process or activity within a company or to buy it from suppliers. This decision has moved from reactive function to a big part of a business strategy. (Nikolarakos and Georgopoulos, 2001, p. 161) Companies can be seen to have three choices, to make the technology they need, to buy it from outside or to utilize the combination of both (Veugelers and Cassiman, 1999, p. 73).

The decision to make or buy is a problem several organizations face. As companies have finite amount of resources, they cannot always rely on in-house sourcing. (Cánez et al., 2000, p. 1313) It is one of the most challenging decisions, one that affects the overall performance of a company and has impact on determining the future of an organization. (Nikolarakos and Georgopoulos, 2001, p. 161) Analysis on the make or buy decision is strategically important as it determines the investment levels a company will commit to in future (Birch, 2001, p. 36).

For suppliers, the make or buy issue a company faces can be a threat or an opportunity. If a customer of a supplier seeks to insource previously outsourced production, the supplier faces potential competition. Then again, the make or buy decision can represent an opportunity to the supplier to sell products or services to the company which has previously insourced. (Moschuris, 2015, p. 14)

The decisions regarding make or buy have been made purely based on cost for several years. (Cánez et al., 2000, p. 1313) Organizations conducted buying in the basis of getting the best price, while not taking in to account the factors such as delivery reliability, technical and cost capability, or the financial stability of a supplier. Companies adopted a short-term perspective and are searching for mostly short-term cost reductions by attempting to measure all the costs of both the make or buy decision. These attempts to measure often fail due to inadequate costing systems, leading to inaccurate results. (McIvor et al., 1997, p. 169-170) Analysis into make or buy alternatives has been limited to financial performance, though it is not the only important factor to be taken into consideration (Padillo and Diaby, 1999, p. 3204).

Strategic view beyond cost factors have been researched in literature which have provided several different guidelines to take into consideration regarding the make or buy decision (Cánez et al., 2000, p. 1314). According to McIvor et al (1997, p.169) The make or buy decision is a strategic decision and has implications for the corporate strategy of a organizations, which is why the decisions is given more consideration.

Companies often have no basis of evaluating the make or buy decision. They fail in considering issues such as existing capacity, internal design and manufacturing capabilities as well as investment requirements.(McIvor et al., 1997, p. 170)

The decision to make or buy cannot be completely solved by a single theory, combination of several theories are required in order to address contradictions and to complement each other. (Serrano et al., 2018, p. 144) This is the reason why in this study several theories regarding make or buy decision are employed, to bring a through image of the concepts regarding the theory and to accurately present the factors and properties of the theory.

Canez et al. (2000, p. 1322) created a framework to graphically represent why decisions regarding make or buy are made. The framework provides and captures the relevant factors regarding the make or buy decision.

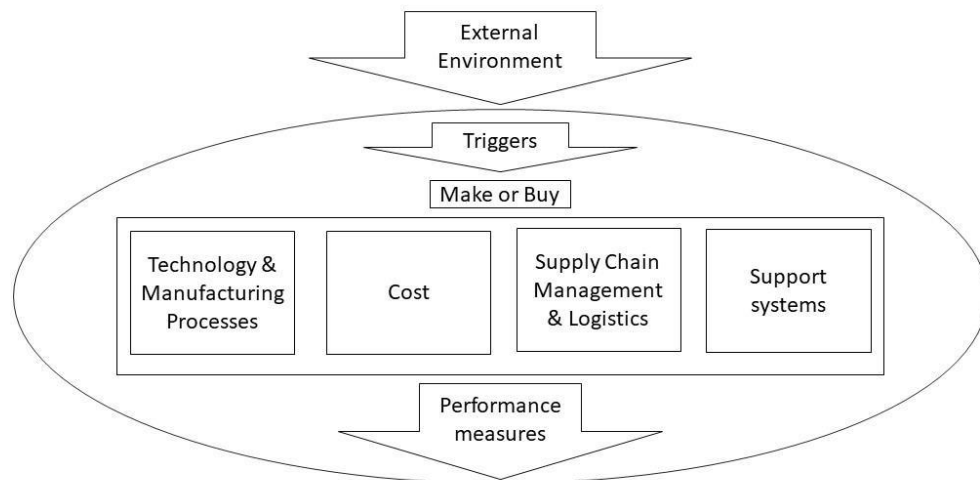


Figure 2. Make or buy framework, adapted from Canez et al. (2000, p. 1322)

According to the framework the external environment launches the make or buy analysis. Factors such competition, supplier availability, political and social elements lead towards the need to evaluate the current policy. These external factors affect the triggers of the make or buy decision, which are for example cost reduction, lack of capacity, need to increase quality or to reduce the time to market. (Cáñez et al., 2000, p. 1321)

According to the framework developed by Canez et al. (2000, p. 1321), there are four areas of business relevant for the make or buy decision. These are Technology & Manufacturing Processes, Cost, Supply Chain Management & Logistics and Support requirements. Each of these areas contain factors that are related to the make or buy decision. These factors exist to provide criteria for evaluation of the triggers target level achievement. Performance measures such as cost savings, quality and capacity utilization are linked to the triggers of the make or buy decision and they extend outwards to show the non-static nature of make or buy as well as to feed back into the external environment. The make or buy framework aims to fill the gap in the make or buy literature in order to capture the relevant factors in make or buy decision. (Cánez et al., 2000, p. 1328)

3.2 Decision making criteria

Make or buy decisions have much concentrated on costs as a major factor, even though there are other important factors to be considered. Including criteria besides cost into the make or buy decision making process has potential to influence company decision (Padillo and Diaby, 1999, p. 3204). In this chapter different decision-making criteria found from academic literature are presented in order to provide larger perspective to the make or buy decision.

Insourcing and outsourcing are decisions that are conducted by the strategic functions of purchasing and supply management (Gulbrandsen et al., 2009, p. 89). The question to make in-house or contract externally is an important one (Bidwell, 2009, p. 362). Decisions regarding insourcing and outsourcing prove the effectiveness of these functions as they are results of a process of evaluation to provide efficiency. (Gulbrandsen et al., 2009, p. 89)

The sourcing decision depends on the ratio of the total value added of the activity under consideration represents in competitive advantage. Activities deemed to have low potential should be considered for outsourcing. Full vertical integration of an activity or process should

be considered when the activity or process adds remarkable value for the company in the form of competitive advantage. (Nikolarakos and Georgopoulos, 2001, p. 162)

Decision making is problematic in the case when a single decision has implications for the abilities of different units of the organization to achieve their specific goals (Bidwell, 2009, p. 377). The information regarding the key factors that affect make or buy decisions is essential for the effective performance of purchasing and supply management. (Gulbrandsen et al., 2009, p. 89) Concepts such as information asymmetry, misalignment of incentives and separation of related decisions among organization create disconnection, leading to the use of criteria that differs from the ones that should be used (Bidwell, 2009, p. 2009).

Serrano et al. (2018, p. 143) recognized several factors from existing literature to be the determinants of the make or buy decision. Here are listed factors deemed to affect the make or buy decision. These are costs, strategy, capabilities, uncertainty, monitoring, external forces and information. In addition, Moschuris (2015, p.10) recognized several criteria, such as time, experience, financial position, design secrecy and workload to have a measurable impact into the make or buy decision.

Costs include the organizations performance efficiency, transaction, agency and hidden costs and were identified to be the most significant criteria for make or buy decision. Strategy is comprised of analysis of strategic significance, strategic importance and fuzzy focus, being the second most important criterion for make or buy decision. (Serrano et al., 2018, p. 143) Moschuris (2015 p. 10) who studied the make or buy decision making criteria of Greek industrial companies recognized that cost and quality are major factors related to make or buy decisions.

Capabilities deal with capabilities in manufacturing, technical capabilities as well as vendor capabilities. Uncertainty deals with several root sources, such as market or product uncertainty, as well as unexpected or undesirable results. Monitoring contains the concept of control, where the issue of being unable to control external providers rises. Costs related to

control provide the capability to become much higher in the case of outsourcing and should be addressed before the decision of make or buy. (Serrano et al., 2018, p. 143)

External forces deal with factors which are highly likely to influence supplier prices of market items. These external forces deal with concepts such as consumer demand, regulations and challenging competition. Information deals with relationships regarding an organization or a company, covering information related concepts such as sustained innovation and dependency. Asymmetric information can lead to failure, when the balance of information is leaning on the other side. (Serrano et al., 2018, p. 143)

Minh (2011, pp. 650–652) found five strategies that were used as main criteria for the make or buy- decision making process in Japanese automobile industry. These criteria were formed from the interviews of six Japanese automobile companies, varying from middle to large and including different department heads from organizations, such as R&D, engineering, quality, marketing, finance, accounting and factories. These criteria were Product strategy, Quality strategy, cost and finance strategy, Manufacturing technology strategy and Supply chain and logistics strategy. The main criteria and sub criteria were prioritized for each project individually.

3.2.1 Core competence

Core competencies are results of collective learning manifesting in different processes and activities (Hafeez et al., 2002, p. 29). They are the combination of technologies, knowledge and skills owned by a company. (Petts, 1997, p. 552)

Core competencies are the source of competitive advantage. Core competencies have attributes such as complexity, invisibility, inimitability, durability, appropriability, non-substitutability and superiority. (Petts, 1997, p. 552) They are valuable capabilities with collective and unique properties, while contributing towards sustainable company success.

(Hafeez et al., 2002, p. 34) Core competence is a ground basis for several products and services a company provides (Petts, 1997, p. 552). Analysis on core competencies allow to enhance customers perceived value of sold products as well as to create a make or buy strategy for a company (Birch, 2001, p. 36)

Analysis on core competence is a process that need to be reviewed thoroughly by a full audit into existing areas of business (Birch, 2001, p. 36). Distinguishing between core and non-core activities is a difficult task and must be conducted in order to ensure the strategic considerations of the long-term (Nikolarakos and Georgopoulos, 2001, p. 173).

According to Nikolarakos and Georgopoulos (2001, p. 166) core competencies vital for companies' survival and competitive advantage should be kept inside the company. Traditionally core competencies performed in-house can be divided to three areas. These are activities crucial to business performance, activities that create potential business advantage over competitors and activities that drive future growth and innovation. (Birch, 2001, p. 36) Arnold (2000, p. 24) developed an outsourcing model to present the company core and the related activities in regards which functions to outsource.

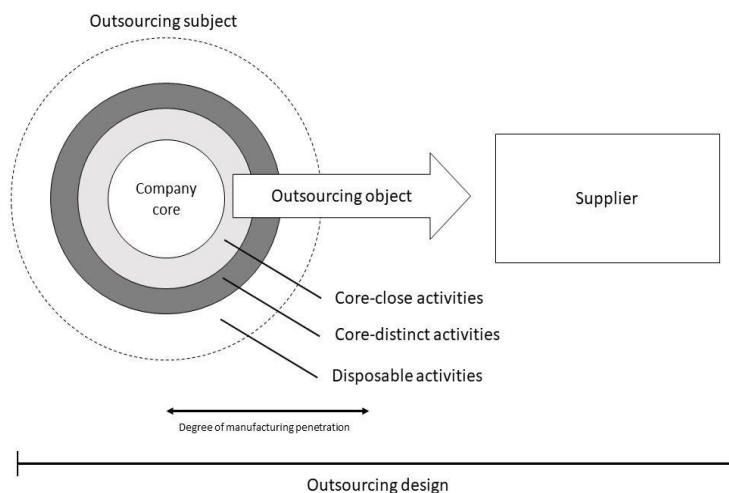


Figure 3. Outsourcing model related to company core, adapted from Arnold (2000, p. 24)

In the model, company activities are distinguished into the company core, core-close activities, core distinct activities and disposable activities. The distinction of core and non-core have been used to justify the conduction of activities externally or internally, non-core activities have become proper candidates for outsourcing (Bengtsson and Berggren, 2008, p. 317). Outsourcing as a concept has evolved to the point that companies outsource core functions such as engineering, R&D and marketing (Lim and Tan, 2009, p. 369).

However, if every function or process defined as non-core are outsourced, there are risks of damage to the core competence due to the systematic dependency between core and non-core activities or processes (Bengtsson and Berggren, 2008, p. 317). If a company loses its strategic core through outsourcing, it risks losing its core competence to its suppliers. Essential resources should not be outsourced. (Lonsdale, 1999, p. 4) Even though is quite challenging to imitate buyers core competence, suppliers in such position may be capable to acquire necessary expertise in order to successfully imitate the buyer, gaining the ability to compete (Lim and Tan, 2009, p. 372).

If a company chooses to outsource its core competence, it is possible for the company to use its brand equity as a deterrent against a possible market entry of a supplier or to protect itself against the suppliers' imitation attempt. For a supplier to recreate these processes and designs themselves, while trying to achieve similar image or brand takes a great effort. (Lim and Tan, 2009, p. 381)

Hafeez et al. (2002, p. 31) created an architecture for core competence identification. The figure shows the perception of the authors on how resources, capabilities and competencies may be interconnected. The framework consists of three stages which are the identification of key capabilities, determination of competence and determination of core competence.

In the first step capabilities most important to business success are identified by benchmarking business functions, creating a value analysis while relying on both financial and non-financial

measures. In the second stage competencies are determined by assessing the integration of key capabilities in the company. In the third stage core competences are determined with operational flexibility by analyzing and scoring recognized capabilities. (Hafeez et al., 2002, p. 31-33)

3.3 Transaction cost economics perspective to make or buy

The theory of Transaction cost economics has been used to justify the strategic decisions regarding outsourcing. Uncertainty, asset specificity and frequency of transactions determine the structure of governance for an organization (Dekkers, 2011, p. 935,938)

Regarding make or Buy from the perspective of transaction cost economics, a transaction is the basic unit of analysis. (Williamson, 2008, p. 5) According to Williamson (1996, p. 151) the decision to make or buy, to insource by producing to its own needs or outsource by procuring a good or service from an outside supplier turns largely on the transaction costs of managing the transaction compared to mediating a transaction through the market.

Williamson, (2010, p. 224) sees the issue of make or buy as an efficiency and a contracting issue. Regarding the issue, minimizing transaction- and production costs are key criterion in the decision-making.(Espino-Rodríguez and Padrón-Robaina, 2006, p. 56)

The route of transactions depends on the attributes of the transactions. Making or buying a component or product assume sourcing either general purpose technology or a special purpose technology. Higher asset specificity regarding products or components can be seen to lead towards bilateral dependencies, providing incentives for continuity while safeguarding investments (Williamson, 2008, p. 9).

According to Transaction Cost Economics, companies achieve discriminating alignment by internalizing transactions which require great investments into specific assets (Bidwell, 2009, p. 367). The choice to make or buy according to Williamson (1981, p. 558) depend on the governance costs related to asset specificity, markets have advantages on production costs and governance costs regarding non-specific assets.

According to Gulbrandsen et al. (2009, p. 90) asset specificity is a major determinant for the make or buy-decision. In the case of low asset specificity, components available on the market are often at lower cost than if procured internally. (Murray et al., 1995, p. 187) These costs however rise in the case of high asset specificity. Item complexity or in this case asset specificity impacts the considerations in make or buy decision making process in the case when complexity increases, leading to increasing emphasis on capacity considerations. (Moschuris, 2015, p. 14) Efficient market exchange serves well if assets are lacking specificity and are generic, however bilateral dependency and hierarchy have the advantage in the case of higher asset specificity. (Williamson, 2010, p. 218)

In the case of low asset specificity, external sourcing is an option without depending on the frequency of the transaction. In the case of high asset specificity, occasional transactions from market can be beneficial, however if a transaction is recurrent the company should vertically integrate. (Williamson, 1983; Murray, 1995 p. 187)

The make or buy decision making process is impacted in the case of unstable environment (Moschuris, 2015, p. 13). From the perspective of TCE, outsourcing activities relying on specific resources can impact company performance negatively. Opportunistic behavior leads to the possible threat of contract termination due to the dependency and balance of power. (Klein et al., 2009) Opportunistic suppliers can use the buyers' dependence to renegotiate terms, secure a better contract or reduce performance levels related to quality or delivery. Information asymmetry increases opportunism. When a company outsources a business process or activity, the supplier becomes more learned in the matter than the buyer. (Lonsdale, 2001, p. 24).

In situations such as this, vertical integration is a possible, more preferable alternative to avoid transaction costs following opportunism. Dependence to a supplier and post-contractual threat are possible risks of outsourcing from the TCE perspective (Espino-Rodríguez and Padrón-Robaina, 2006, p. 56) According to Serrano et al. (2018) Transaction Cost Economics claim, that the make decision should be conducted in situations where opportunism is high and the option of buy being more preferable in the case of low opportunism.

TCE claims that boundaries of a firm and the levels of vertical integration are explained by governance costs, which are the costs related to acquiring inputs for a operation. These are the costs of searching, bargaining, negotiating, contracting and contract management. (Gulbrandsen et al., 2009, p. 90) In the case when transaction costs are negligible, buying rather than making will normally be the most cost-effective means of procurement. External procurement in scale-economies avoids the hazards of internal procurement. (Williamson 1979, p.245) Regarding outsourcing, transaction costs such as purchasing orders, transfer of goods , control and quality inspections have to be accounted in the strategic decision-making. (Dekkers, 2011, p. 938)

However, if the trading costs of market transactions are relatively high, transaction-parties should lean towards internal procurement instead of trading in the markets. (Terviö, 2010, p. 104) Organizations should integrate activities (make) when external governance costs due to outsourcing are higher than internal governance costs when insourcing. (Gulbrandsen et al., 2009, p. 90)

3.4 Make or buy decision making models

Regarding the make or buy process, several models have been made to provide a framework and to help guide the decision-making process. Companies may find difficulties in conducting the make or buy process efficiently and in taking into consideration the proper criteria and organizational functions. This chapter focuses on presenting several make or Buy process models from the theory regarding the make or buy decision.

'' The make or buy decision process should be structured, documented and conducted by a multi-disciplinary team. '' (Serrano et al., 2018, p. 145) The decisions to insource or outsource, make or buy, are results of a continuing process, where organizations evaluate factors that provide the most efficient operations (Gulbrandsen et al., 2009, p. 89). To make or buy is a decision that must be treated as a problem including multiple criteria, where essential issues are included in a systematic way into a analytic model (Padillo and Diaby, 1999, p. 3209).

According to Serrano et al. (2018, p. 145) staff involved in the process of make or buy should be qualified and trained.

Mcivor process model

McIvor et al. (1997, p.172) formulated a model for an effective make or buy decision.

According to Mcivor et al. (1997, p.171,177) the model attempts to defeat the issues related to the make or buy decision. The main purpose of the model is to involve the strategic elements related to the make or buy decision. The first stage deals with defining the core activities or competence in the company. The value adding activities derived from core activities bring competitive advantage.

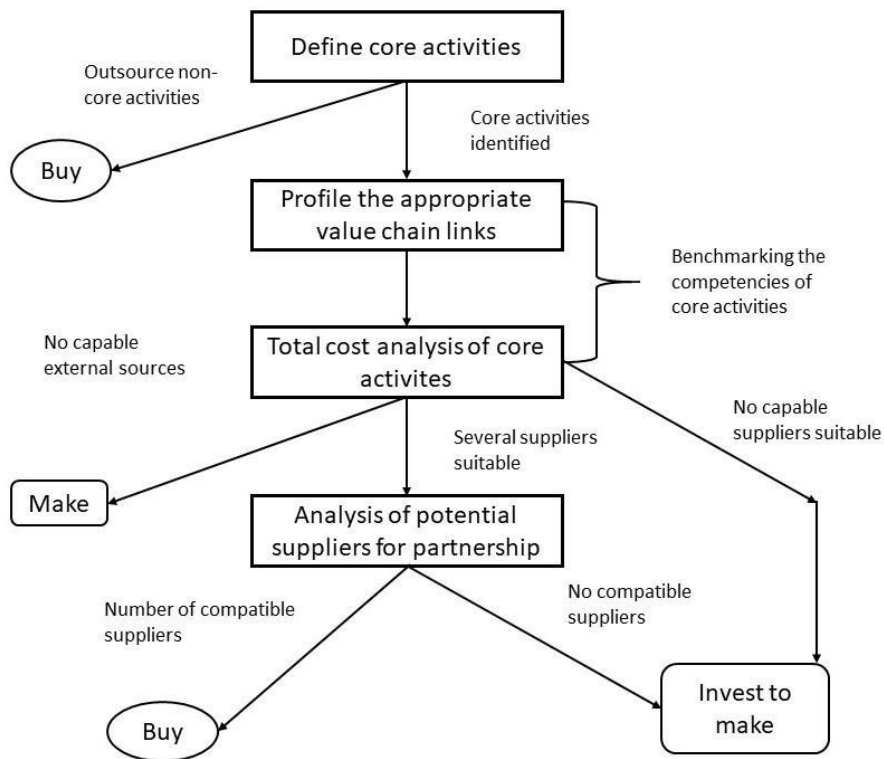


Figure 4. Conceptual framework for evaluating make or buy decision, adapted from Mcivor (1997, p.172)

After the definition of these activities, in the second stage non-core activities are outsourced and the core activities are provided with a profile related to the appropriate Value Chain Links. Core activities are benchmarked in relation to suppliers and competitors. (McIvor et al., 1997, p. 173-174)

In the third stage total cost analysis on core activities is conducted. The stage includes measurement of both real and potential costs related to the insourcing of the activity. Based on the results, the company should make the decision based on two scenarios. If the company is more competent than any other external organization, the company should either insource or outsource strategically. Strategic outsourcing in this context regards the outsourcing of certain parts of the core activity. (McIvor et al., 1997, p. 175)

In the second scenario, where external organizations are more competent, a company may either invest to make, which means investment into the technologies related to the activities. The other option is to strategically outsource the core activity. (McIvor et al., 1997, pp. 175–176)

In the fourth stage occurs the analysis of potential suppliers for partnership. McIvor et al. (1997) describe this process crucial, as the relationship with a strategic partner is an ongoing relationship for extended periods of time. In case no compatible suppliers with the threat of future competition, the model proposes the invest to make decision. If there are compatible suppliers with little threat of competition, the model proposes the buy decision.

Canez process model

Canez et al. (2000) formulated a process model or a framework for the factors that should be considered in the make or buy decision. The process is divided into four stages.

In the first stage a team and a team leader are formed for the conduction of the analysis. The included subjects of the analysis are identified and the teams are briefed. In the second stage the data is collected from three different workshops. The attributes which are to be analyzed are first generated and then weighed, giving each attribute comparable scoring, highlighting their relevant scoring. After this the attributes are rated. (Cáñez et al., 2000, p. 1327)

In the third stage the data is analyzed, creating scores for in-house production and for the supplier. And lastly in the fourth stage, a feedback session is organized, including concepts such as the feasibility, usability and the utility of the study. (Cáñez et al., 2000, pp. 1327–1328)

In comparison to the previous make or buy process model, Canez et al. (2000) developed a more practical model divided into simple stages with a rational division of work. According to the authors, the model aims provide a graphical form for the make or buy process with relevant factors related to the process, providing a structure for the investigation. (Cáñez et al., 2000, p. 1328)

Van der water & van peet process models

Van der Water & van Peet (2006) developed a support model for the make or buy decision making process regarding manufacturing. The model itself is divided into three phases, where phase one aims to determine the customer value discipline the objectives related to performance. In this phase, the performance objectives are ranked based on the value for the customer. The second phase defines the relevant core activities in the value chain, examining the value potential and the various skills of the certain company. In phase three the type of relationship with the supplier and the company is determined based on the earlier two phases. (Van de Water and Van Peet, 2006, p. 262-265)

3.5 Insourcing theory

Companies must make wise decisions regarding the governance models of their supply chain, both in order to grow and survive. Current situation of outsourcing forces several supply chains to become more specialized, emphasizing the integration of company boundaries even further. (Guan and Rehme, 2012, p. 187)

This chapter deals with the concept of insourcing and vertical integration. These concepts are handled as similar and synonymous concepts and literature regarding both concepts are applied together, due to the fact, that much of the literature regarding insourcing uses the concept and term of vertical integration to describe. The aim of the chapter is to provide thorough view into insourcing motives, the benefits and challenges.

3.5.1 Vertical integration

Vertical integration can be defined as combining technologically distinct functions, such as production, distribution and selling within a single company. (Nikolarakos and Georgopoulos, 2001, p. 163) Another definition for vertical integration is defined as the share of in-house production of in the total value creation related to a product (Drauz, 2014, p. 346). Successful vertical integration requires cooperation of several strategic business units. (Harrigan, 1984, p. 638)

Vertical integration is a strategy where a company owns or controls its supply chain. (Kenton, 2019) It can mean for some companies to own nearly the entire supply chain from production to distribution and logistics (Guan and Rehme, 2012, p. 187). It is a critical and often preferred method of exchange in manufacturing and used widely in capital intensive industries characterized by high concentration of buyers and sellers (MacDonald, 1985, p. 331) Vertical integration aims to achieve improved marketing, technological intelligence, control of environment as well as realized advantages in product differentiation (Harrigan , 2003, p. 3).

Vertical integration can occur forwards towards the retail operations or backwards towards the supply chain activities.(Lin et al., 2014, p. 19) Vertical integration itself can be divided into several degrees of integration. These are full integration, tapered integration where some portions of inputs and outputs are insourced and non-integration. (Harrigan, 1984, p. 645)

Vertical integration relates to organizational economics strategic supply chain management in the form of a corporate strategy (Guan and Rehme, 2012, p. 187). It is a fundamental corporate strategy in the field of strategic and organizational economics.(Mahoney, 1992, p. 6) As a

strategy it can be divided into four dimensions: the breadth of integrated activities, the number of stages of these activities, the degree of internal transfers of each linkage and the form of ownership. (Harrigan, 1984, p. 641)

3.5.2 Motives of insourcing and vertical integration

Vertical integration or insourcing is conducted in order to gain several different benefits. It is often used in order to attain greater environmental control, to penetrate or to add value to the product. (Harrigan 2003, p.4) The motive of vertical integration relies on the specific type of production, the depth of transaction costs, the number of specific assets, the level of market power of the production stages, the division of activities and the quantity of uncertainty regarding costs and prices (D Aveni and Ravenscraft, 1994, p. 1168). Competitive edge is a motivation that pushes companies towards vertical integration. (Lin et al., 2014, p. 19)

Leading motives into vertical integration arise in the case when the opportunity to do so is right, the to-be insourced activity is closely related to current know-how and that acting on the situation by insourcing can provide a stabilized net income. (Harrigan 2003, p.5) For example re-insourcing production, which has been insourced and afterwards outsourced derives motivation from under-utilized capacity. (Drauz, 2014, p. 351) Though it should be taken into consideration that the know-how of a company can be drastically different in the cases of insourcing and re-insourcing.

3.5.3 Benefits of insourcing

The purpose of this section is to study the perceived benefits of insourcing or vertical integration in related academic literature, find the benefits linked to insourcing and explain these benefits, their general properties and relation to insourcing.

From the perspective of vertical integration several benefits can be realized. These benefits are the economies of integration. (Harrigan 2003, p.3) output and price advantages deal with profit maximization and uncertainties in costs and/or prices involve uncertainty in supplier pricing. (Mahoney, 1992, p. 5) Information asymmetries with suppliers may lead to the endangerment of mutual benefits and the risk of opportunism.

Transaction cost theory recognizes several benefits of vertical integration in the form of profit, coordination and control, resource and audit allocation, motivation and communication. (Mahoney, 1992, pp. 18–19)

Harrigan (1984) divides the achievable benefits of vertical integration into internal benefits and competitive benefits. Internal benefits include:

1. Integration economics that reduce costs by getting rid of unnecessary steps and duplicate overhead, as well as cutting technology related costs
2. Improved activity coordination that reduces inventory and costs
3. Elimination of time-consuming tasks related to communication, negotiation and price comparison

Harrigan (1984) forms the competitive benefits from the following concepts:

1. Foreclosure avoidance of inputs
2. Improved marketing and technological intelligence
3. Increasing value add due to product differentiation
4. Superior control
5. Product credibility
6. Coordination synergies

There are several different benefits, specific for each industry or company, that are prioritized in the decision making. The effectiveness of vertical integration manifests in the form of allowing new opportunities regarding existing technologies when gaining new knowledge (Li

and Tang, 2010, p. 408). Vertical integration backward enables manufacturers to control the decisions in quality.(Lin et al., 2014, p. 23) Controlling the retail end of the supply chain can enable improving brand perception.(Lin et al, 2014 p. 20) The below listed are often brought up examples of benefits that are wanted to be achieved in the make or buy decision.

Quality

One benefit or factor that needs to be considered in the insourcing decision is the quality of the product. Vertical integration can provide competitive advantage when insourcing components critical for customer perception of quality. Higher degrees of vertical integration are critical when competitive advantage can be achieved by controlling the inputs and precision of manufacturing. (Harrigan 2003, p.28) According to Lin et al. (2014, p.20) vertical integration in either forward or backward in the supply chain results in better quality.

Vertical integration allows for a company to conduct R&D activities in a more efficient manner, which provides more in depth knowledge related to specific areas of technology (Li and Tang, 2010, p. 408). Owned in-house R&D activities are seen to reduce the associated inefficiencies and challenges related to external acquisition, allowing for modification and improvement within the organization (Veugelers and Cassiman, 1999, p. 76).

Costs

Vertical integration provides the opportunity to lower reduce coordination costs and raw materials prices, as well as provide higher margins (Harrigan 2003, p.18). According to D'avena and Ravenscraft (1994, p. 1195) the most intense benefits of vertical integration come in the form of overhead- as well as transaction related-costs. Vertical integration reduces the retail price of the product by removing the number of profiting participants, easing double marginalization (Lin et al., 2014, p. 20). By creating a beneficial gap in the supply chain regarding external as well as internal input prices, a company can gain portions of the market share as well as the profits of its supplier (Zanchettin and Mukherjee, 2017, p. 28). The

market share is often relate to grander reduction of costs and better profits (D'aveni and Ravenscraft, 1994, p. 1194).

Cost reductions are made possible by providing improved coordination of activities. (Harrigan 2003, p.3) This reduces any hold-up problems associated and enhances investment incentives for up- and downstream levels of the supply chain (Liu, 2016, p. 90). According to Drauz (2014, p. 347) re-insourcing in the case of under-utilized capacity can lead towards lower unit costs.

Control

Control is one of the perceived benefits of insourcing found in related academic literature. According to Lin et al. (2014, p.19) the forward integration towards retail operations provides higher control of pricing and allowing faster response to demand changes in the market. Backward integration toward the supply chain allows the manufacturers to have better control over its materials and the final products.

The choice of integrating forwards or backwards in the overall supply chain is dictated by supply and demand elements. According to Lin et al. (2014, p.32) The forward facing integration is chosen when the perishability of products is a manner of a distinct concern for a company. The backward integration towards the supply chain is preferred when product quality is a greater concern.

3.5.4 Challenges of insourcing

Although vertical integration or insourcing can provide several different benefits compared to outsourcing, there are still several risks and challenges that should be considered. In some cases, insourcing can be more costly than the benefits gained from it (Harrigan 2003, p.4). The threat of insourcing from the perspective of a supplier is a threat to be preempted, by making insourcing or vertical integration unprofitable for the buying company (Zanchettin and Mukherjee, 2017, p. 28).

Companies may use vertical integration in situations where it is not the best suited option. (Harrigan, 1984, p. 638) When seeking to insource technology, risks may lie within the company's own competences. Absorbing external technology requires proper organizational structure (Veugelers and Cassiman, 1999, p. 76). In addition, changes of the environment, technological progress or the changes in the goals of a particular sourcing method may change, leading to the initial objectives not to be fully accomplished (Joha and Janssen, 2010, p. 241).

Vertical integration or insourcing when seeking to achieve better coordination can result in not achieving the wanted results if innovation is not taken to consideration. (Liu, 2016, p. 112) The idea that vertical integration would indeed increase the speed of the supply chain and eliminate hold-up problems may in fact be the other way around. According to Allain et al. (2016, p. 19) having vertical separation and competition may infact eliminate the hold-up problem. This could be in the case when harsh competition pushes suppliers to better performance. According to Li and Tand (2010, p.408) The initially positive effect on innovation turns negative at higher levels of vertical integration.

Transaction cost theory recognizes the following disadvantages related to vertical integration: Bureaucratic costs, strategic- and production costs. Bureaucratic costs have proven to have negative affect, due to the difficult and inaccurate estimations. (Mahoney, 1992, p. 20-21) Outsourcing companies can react to uncertainty in methods that does not pump up bureaucratic overhead costs, respond to demand uncertainty by eliminating overheads and decentralizing the organizations structure.(D Aveni and Ravenscraft, 1994, p. 1174)

Strategic costs deal with asymmetric information and flexibility (Mahoney, 1992, p. 20-21). Greater uncertainty or unpredictability does require additional administrative effort to deal with the problems of unused capacity in mixed number of stages related to the value-added chain in regards to vertical integration (D Aveni and Ravenscraft, 1994, p. 1174). Production costs deal with cost advantages, capital drain and high production costs (Mahoney, 1992, p. 20-21)

Harrigan (1984, p. 639) divides the disadvantages of vertical integration into internal costs and competitive dangers. Internal costs deal with increasing requirement of overhead for vertical

integration coordination, excess capacity creating burden by technologically dependent minimum efficiency scale and poor organization leading to not acquiring synergies for the higher cost compensation.

Harrigan (1984, p.639) forms competitive dangers from increase in the length of obsolete processes, mobility barriers, linking to unhealthy business adjacent to the insourced business and losing access to critical information from suppliers. The competitive dangers may also be too highly assessed synergies that are estimated to be derived from vertical integration and managers not assessing the best method for integration.

One of the highest risks regarding a high degree of vertical integration is the loss of asset inflexibility. The realization of the benefits of vertical integration can be challenging in the case when, products or items which are highly unique and customized are insourced.

Producing standard components is likely to be more cost-effective. (Harrigan 2003, p.15,28).

4. CASE STUDY: THE BENEFITS AND CHALLENGES OF INSOURCING IN A TECHNOLOGY COMPANY

This empirical section of the study is focused on studying the benefits of insourcing, as well as the challenges posed by insourcing production or other functions. In addition, this section of the study involves the previously introduced theory of the make or buy decision, which is connected to the real-life examples of the make or buy decision in a high-mix low-volume technology company. High-mix low-volume essentially refers to make-to-order manufacturing, where high variety of products are manufactured in small quantity (Matics, 2021). For this Case study, employees and experts of the case company were interviewed and a workshop study was conducted.

4.1 Study background

This Case study was made in a High-Mix Low-Volume technology company. The Case company is kept secret due to the request of the company representatives. The Case company was founded mid- 20th century and has a few thousand employees. The company functions in industry, which can be described to consist of manufacturing of high-tech devices for specific purposes. The turnover of the company from 2018 reached a quarter billion euros.

The main goal of the Case study was to answer the following research questions:

- What kind of benefits can a technology company gain from insourcing and what challenges does it involve?
- Which criteria are prioritized in a make or buy decision?

4.2 Methodology

The data for the study was collected by interviewing 4 experts within the case company, who are involved in the Make or Buy decision from their own unique position. The identity and the details of the interviewed personnel are not disclosed due to the request of the company representative. The selected experts work in the functions of production management, factory management and project sourcing. The interview was conducted face to face in a reserved room. The questions were not provided beforehand and open discussion was allowed during the interview regarding different subjects.

In addition to the interview, a workshop was conducted to select the most important criteria for a make or buy decision to be used in an example case of a make or buy decision. Eight experts for different parts of the company from sourcing, quality, engineering and manufacturing took part in the workshop. For these selected criteria for make or buy decision, benefits and challenges were added by the participants regarding an example case technology.

Participants were split into pairs of two, each given one selected category and tasked to find benefits and challenges regarding insourcing in the given category.

4.3 The make or buy Decision in a technology manufacturing company

During the interviews with the selected experts, questions were asked related to transaction cost economics. This was done in order to survey the impact of the key concepts of TCE in a real-world company.

4.3.1 Transaction cost perspective

The drive for greater efficiencies and cost reductions has forced many organizations to specialize in a limited number of key areas (McIvor, 2009, p. 45). As in the Transaction cost economics core competence acts as a major factor for the choice to insource or outsource, the same is applied for the case company. As High-mix Low-volume technology company, the core competences are significantly impacting regards to the make or buy decision.

The Case company has divided several technologies and functions to its core technologies. Due to the wishes of the company representatives, identifying technologies are not mentioned in this empirical part of the study, however the more general core competences related to the industry are presented from the interview material. The Case company in broad terms sees core competence as all the phases that have an essential impact to the performance of the technology. Product technology, calibration, product development, manufacturing, assembly and mass customization are seen as core competence.

One of the major categories that impacts a company's decision to outsource or not is the desire to focus internal resources on core competencies. (Le Bon and Hughes, 2009, p. 404) The Case company seeks to keep its core competences inside the company, in accordance to the

company strategy. Regards to the make or buy decision, specific technologies are part of the company strategy to keep insourced. This holds true even in the cases of core competence being outside the company as well.

During the interviews with the selected experts, questions were asked related to transaction cost economics. This was done to survey the impact and use of the key concepts of TCE in a real-world company behavior.

Literature concerning opportunism suggests that multiple source outsourcing, commitment level of relationship, monitoring and reputation can act as safeguards against supplier opportunism in the form of transferring or salvaging learning and assets from the buyer (Lim and Tan, 2010, p. 368). To protect itself from opportunistic risks the Case company seeks to make use of strategic manufacturers, which the Case company has established a good relationship and trust with. The need to act in a opportunistic way can be mitigated by the relational concerns. (Jap et al., 2013, p. 217) Product related information is shared together with strategic manufacturers. Supplier cooperation is a major factor. The case company seeks to establish a relationship of mutual commitment, with trust in the center of it. This requires thorough understanding of the supplier, its industry, markets, competitors and history. While commitment and trust are in the center of the supplier relationship, opportunism related risks are mitigated as well with using several selected suppliers, not relying on a single supplier for a specific technology.

Asset specificity are seen as serious and compelling part of sourcing decisions (Speklé et al., 2007, p. 102). Regarding the specificity of assets in the make or buy decision of the case company, the concept holds influence over the company. Asset specificity is taken to account regarding the make or buy decision. However, this does not mean that products or items with high asset specificity are insourced or are chosen for future insourcing. According to interviewees, the higher the asset specificity is, the more critical the relationship with the supplier is.

4.3.2 Make or buy decision making process

“The make or buy process in the company follows a simple model, consisting of the gathering of data, analysis, proposition and the decision-making forum.” (Case company X, 2019).

The make or buy process in the case company can be divided into two cases. First is the make or buy decision for new products. Second, is the same decision for existing products. In the case company, the decision to make or buy is much more utilized for new products than already existing ones. The make or buy decision for new products is derived from the need to make the decision. *“Regarding new products, the make or buy process is initiated by starting to build the supply chain, which components are insourced and which outsourced”* (Case company X, 2019). The volume and amount of transactions impact the make or buy decision, whether the case company decides to invest into either solution.

The make or buy process of the case-company can be divided into six different phases:

1. The first phase of the make or buy process is the identification of the need for the decision. For existing and new products, the process is practically the same, data and input is gathered for this phase.
2. The second phase is the analysis of the gathered data. The only differences between the cases regarding new products and existing products are the personnel involved in the decision making.
3. The third phase is creating a presentable case for the decision, based on the collected data.
4. The fourth phase is about collecting records or testimonials for the case and the proposal of the make or buy decision, with collected arguments for both paths.
5. The fifth phase is the actual decision making, where all necessary personnel gather to cover the case in order to understand the possibilities and consequences of each decision.
6. The sixth phase is transmitting the made decision to relevant teams and parties.

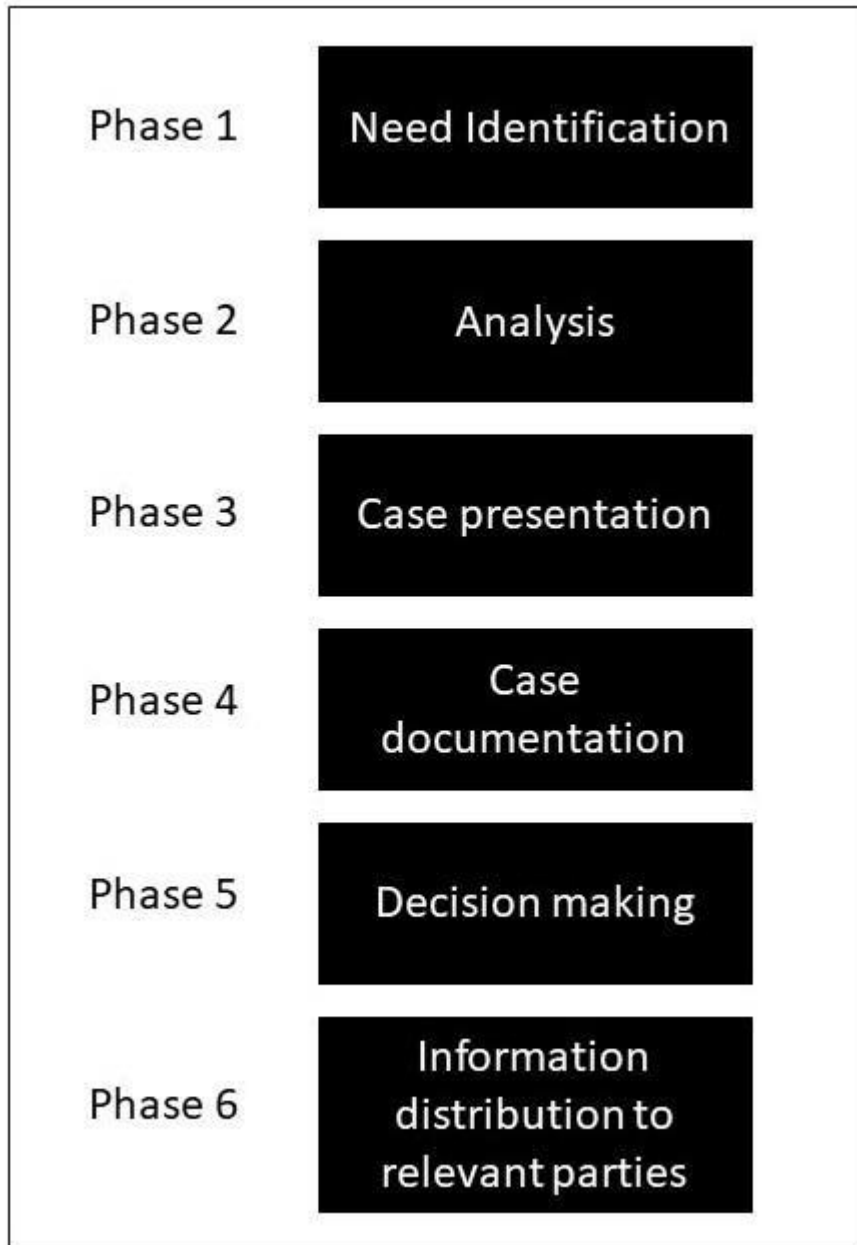


Figure 5. Case company Make or Buy-process.

During this product process the make or buy decision is conducted to accurately define the supply chain of the product and the possible sites of manufacturing, inside the company or at suppliers. The main difference between the cases of new products and old products are the responsibilities and who are the decision makers. Lower spend categories have less

management and oversight need than higher spend categories. When a new product contains technology, which have been previously outsourced or insourced, the same principle is often applied for the new product.

The make or buy decision in the case company follows a determined process, which to put it simply, starts from the guiding strategy. If the technology is seen as a part of core competence, the technology is insourced. If it is not core, it is outsourced. If there is no clear decision regarding whether the technology is part of core competence or not, the process proceeds forward.

The options to make or buy are analyzed. Data is gathered for both options, calculating costs for example volumes, storage and buffers. The case company and the supplier are compared in the selected metrics. The data is presented in a point-based method, where for each critical area, the insourcing and outsourcing decisions are given each a point value. Then the process proceeds to discussion and consultation with the Business Controller. The data is then presented at a decision-making forum. The parties present in the forum are from the areas of manufacturing, sourcing, product development and quality. Each area manages its own field related to the product, providing input from their perspectives. Regarding new products, challenge arises due to the necessity of making the decision fast.

After the make or buy decision has been conducted, the case company often does not measure or track the make or buy decisions after they have been made, except by the company's own standard performance related systems. *“ The make or buy decisions are not measured afterwards in any way, the case is made and the decisions are documented. If tracking was part of the make or buy decision, it would be incorporated into a part of the process”* (Case company X, 2019).

According to the interviewees, the make or buy process is not regularly conducted for the same products. Instead, the decisions validity is measured when faced with challenges in supplier side or inside the company, acting in a more reactive way. *“ Regarding existing products, it is considered how much workload do we want to give to the employees, if the current supplier is not trustworthy or quality is not acceptable, we want to analyze if we can do it different way.”* (Case company X, 2019).

Component types or technologies which have been previously outsourced as components for other products, are most likely to be outsourced as well, increasing the business into the direction of the selected suppliers and providing the benefits of consolidating business to the case company. These benefits can be economies of scale, advantage for price negotiation and rewarding the supplier with great performance.

When previously insourced technologies have been used with other products and the need arises to a make or buy decision for a new product, the decision is likely to favor insourcing. When the case company sees the technology as a core competence, it is most likely to be insourced, as components of the same technology for previous products already are. Guidelines and previously made decision hold much power over the decision to make or buy. Strategy directs which technologies are outsourced and which are insourced.

Although the strategy provides the initial direction for technologies to be insourced or outsourced, there are however factors which influence the decision. Regarding existing products when technology has been outsourced, supplier performance is taken into consideration. Fluctuations in supplier quality, delivery and overall trust to the supplier are factors that are analyzed and have an impact to the situation, which can lead to outsourcing to the other supplier.

For new products, technical capability is a major factor. Does the case company have the necessary equipment, technical expertise, are investments required, what are the safety concerns, these all have an influence to the decision to make or buy. These are all related to the core competence of the case company.

4.3.3 Recognition of the perceived benefits and challenges of insourcing

This section of the case study focuses on the perceived benefits and challenges of insourcing in a technology company. With insourcing decisions, the case company aims to achieve several benefits when possible. According to the interviewees concerns related to quality, cost, flexibility, competence and support are some key factors which are taken into consideration

when insourcing. Quality improvement and cost reductions are vital for the company, as higher quality and reduced costs benefits the company, as well as its image and brand. Cost reduction enables fewer overhead expenses and improved productivity. Due to the high-mix low-volume nature of the company and its products, placing manufacturing where the core competence lies, in the company or at a supplier is seen greatly beneficial for product development and reducing issues in the manufacturing phase.

The case company has not had many insourcing cases, however the few that they have had have been deemed successful. The perceived challenges are centered to the risks in the make or buy decision and often linked to the potential benefits. *“Challenges faced in the make or buy decision can be from the lack of process understanding, manufacturing processes and knowledge”* (Case company X, 2019). According to the interviewees, competence in manufacturing processes related to workload or quality are some faced challenges when insourcing. Correct estimates of competence, costs, quality and other factors are required for the decision making. *“The make or buy analysis provides high workload and creating a good analysis in order to make a risk-free decision requires plenty of expertise of different areas. The gained benefit could be minimal compared to the initial estimation.”* (Case company X, 2019).

The data gathered from the first interviews formed a rough idea for the perceived benefits and challenges of insourcing. However, in order to gain better understanding on what are the benefits of insourcing that the company aims to achieve, and which challenges are faced in the related decision, it is important to see the question from the perspective of all the relevant parties taking part in the make or buy decision. This is the reason why a workshop study was conducted.

4.4 The workshop study – an example case for insourcing

In this workshop study, several professionals around the case company were involved. These were people from various backgrounds, each working in relation to make or buy cases. They presented the areas of direct sourcing, sourcing product management, production technologies, component management and supplier quality. The main goal of the workshop was to identify factors which are seen important for insourcing decisions and which perceived benefits and challenges are linked to these factors.

The first phase of the workshop study consisted of choosing the most valued decision-making criteria in insourcing decisions by employing a relevant research to form a basis for the selection. The second phase was an fictional example for a insourcing case regarding a previously outsourced technology, where participants were asked to form ideas of the possible benefits and challenges of insourcing per each category previously chosen.

In preparing for the workshop, a large sheet of paper was printed which included the top 10 make or buy decision making criteria for tactical make or buy issues for industrial firms in Greece (Moschuris, 2015). Moschuris interviewed 300 industrial companies, each interviewee ranking the importance of several make or buy decision making criteria from 1 to 5 (1 lowest, 5 highest) (Moschuris, 2015, p.8-10). The participants were allowed to add additional criteria as well, and the criteria of flexibility was added. Each participant was given four votes and only one vote for each criteria, allowing for the votes to spread and not be focused on just few criteria. Regarding ties in voting categories, another vote was made to define the priority. After the voting was done, a discussion was conducted for each criteria, allowing for participants to express their opinions why they voted specific categories.

Cost	Workload
6 Votes	
Quality	Design secrecy
6 Votes	
Time	Production control
	4 Votes
Experience	Environmental protection
3 Votes	
Financial position	Legislation
	Flexibility
	7 Votes

Figure 6. Top 10 decision making criteria derived from Moschuris (2015) study, with added criteria of flexibility by participants.

For the results of the votes, the following criteria were chosen by the participants, ranking from top voted:

1. Flexibility
2. Quality
3. Cost
4. Production control
5. Experience

In the second phase of the workshop study an example for technology was chosen in order for the study to present a real-world scenario. The basis for this scenario was that the insourcing of the example technology was completed in the case company, normal production mode established and conducted for five years. For the research question, participants were asked to think which would be the likely or possible benefits and challenges the company had perceived during the fictional five-year period. Each participant was allowed to give input for each of the top five make or buy decision making criteria. However, due to the limited allotted time, the top three criteria were provided perceived benefits and challenges. The participants were divided into pairs, each pair chosen for the category consisted of personnel whose expertise were related to the specific category. The participants presented the benefits and challenges they thought of in pairs for the top three categories, after which there was open discussion for additional input for the benefits and challenges.

The criteria of flexibility, voted highest among the criteria, was seen containing the following benefits in this scenario. Faster acquisition of the manufactured technology was seen providing improvements for the supply chain delivery, providing products to customers on an even faster rate and enabling possible higher customer satisfaction. Flexibility in the form of allowing for changes to be made to the product in a smoother manner was deemed beneficial from the product change management perspective in the insourcing case. Concerns were raised for the flexibility related challenges by the participants: managing product change could

also prove to be a risk, if the factors of competence and know-how were lacking. While insourcing does provide the additional flexibility to product delivery, it presents the need for larger workspaces and storage.

The fact that quality voted for the second highest criteria, proves that the case company takes quality related issues seriously. For the quality related benefits, the participants recognized process prowess. According to the participants, insourcing enables for the company to improve the whole manufacturing process and gathering process data for the specific technology in question. It allows for the better control of handling- and shipping-damages, better proximity to product designers and manufacturing, and while slightly overlapping with flexibility, the speed of reaction to quality related issues. From the quality criteria related perspective, there are additional challenges which may provide problems. Quality related competence requires documented information when it concerns high-tech products. Insourcing a previously outsourced technology may lead to finding that supplier has kept poor documentation or most of the information is kept by the manufacturing personnel. Obtaining the crucial information may prove difficult. In addition, if the insourced technology contains numerous suppliers, gathering the information needed for insourcing may prove a high workload.

Cost for insourcing was seen as major criteria for the decision by the participants. The cost related benefits were seen in relation to other factors, transportation costs would be reduced, impacting the environmental impact of the case company. The possibilities for better, consolidated and unified supplier base were seen as cost related benefits. The perceived cost related challenges were greatly focused on the potential cost of personnel, costs of new workspaces and possible effects requiring other areas such as sourcing to incorporate new suppliers into the chain. The cost structure of insourcing would require deeper analysis in order to perceive that are the cost related impacts beneficial or negative.

	Benefits	Challenges
Flexibility	+ Supply chain delivery improvement + Faster product changes	- Risk in product change management if knowledge-based competence is incorrectly estimated
Quality	+ Process data gathering and better utilization + Better control for product related faults or damages + Better proximity for designers and manufacturing + Faster response to quality related issues	- Poor supplier documentation or hidden knowledge - Workload issues on data gathering from several suppliers
Cost	+ Reduction of transportation costs & environmental impact + Possibility for more consolidated supplier base	- Overhead costs, new workspaces - Need to incorporate new suppliers to the supply chain

Figure 7. Summary table of perceived benefits and challenges for top 3 categories.

4.5 Case study results analysis

The make or buy process of the case company contains elements of Mcivors (1997, p.172) make or buy decision making model. While the definition of core activities is the first step of Mcivors model, the case company conducts the identification of core activities and core competences before the process, leading to the fact that technologies to be considered for the process are identified to be at least partial to the company competence. The technologies identified to be distinctively not of core competence are outsourced before conducting the process. The second and third phase of Mcivors model, profiling the value chain, is conducted in the analysis phase of the case company's process. The case company gathers the data,

calculating costs and compares them to selected supplier metrics, much like the benchmarking in Mcivors process.

The case company's process focuses much on the actions of the process, such as presentation, documentation, decision making and the final information distribution to relevant parties.

While these are not directly mentioned in Mcivors process, they can be assumed to be part of the process. The results of the analysis guides to make or buy in the Mcivor process, based on if the analysis supports either side of the decision. Mcivors model seeks to handle the make or buy issue with strategy in the process, while the case company's model is itself based on the strategy which directs the issue before starting the make or buy process.

The case company's process model resembles the Canez et al. (2000) practical model in its presented form. While the model of Canez et al. (2000, p. 137) does go more in detail, for example in the way each phase is defined, the case company's model is practical in the way that it proposes it as a company process from start to finish.

The results of the workshop case provided evidence to the fact that the case company in its decision making holds similar priorities as concluded in previous studies regarding the make or buy decision. Quality and costs are major factor for the decision, however, the importance of flexibility for the relevant decision makers provided and interesting aspect into the criteria. Flexibility which was not a dominant factor in related academic literature found its dominance for the case study. This can be seen to derive from one of the key factors for competition in the company product related market which differentiates companies in the industry: The speed of customer delivery. Fast deliveries to customers in a high technology industry with high-mix low-volume as a dominating part, allows companies to succeed.

Regarding the workshop study, the relevant participants were chosen in order to provide a larger and more realistic aspect into the make or buy decision in the case. By including experts from different areas of the company who each take part in the make or buy decisions, allows for the case study to reflect reality and to provide a perspective which can differ from the interviews of company representatives. These close-to-reality statements on example case study allows to see deeper than the surface criteria of the make or buy decision. However, it needs to be stated, that due to the qualitative nature of the study, the results can't be

generalized and is in this case, company and industry specific example of an example technology. The importance of each criteria could vary between technologies and in the opinion of different experts.

5. CONCLUSIONS AND DISCUSSION

This thesis handled the concepts of Transaction Cost Economics, make or buy decisions and insourcing in order to answer the presented research questions. The goal was to derive the benefits and challenges from affiliated academic research and seek to understand when insourcing is preferable compared to outsourcing. The case study focused on the perceived benefits the target company seeks to achieve, in order to understand how these benefits are prioritized in reality, which factors are taken into consideration compared to related research and how the case company approaches the question of Make or Buy.

Insourcing can be seen preferred over outsourcing when the benefits the target company aims to achieve weigh towards insourcing in the make or buy decision. Both in the presented theory and the case study, several factors are analyzed in the make or buy decision. The importance of the factors may vary from company to company, but the presented academic research suggests specific factors which are taken into consideration when companies conduct make or buy decisions. Considerations regarding of costs, strategy and market situation influence the decision.

Core competence is a key factor in the presented make or buy models. If the target technology in question regarding the make or buy decision is near the company core or related expertise, the decision leans towards insourcing from that perspective. There are however other factors which influence the make or buy decision.

From Transaction Cost Economics perspective, the inclination towards insourcing and outsourcing can be derived from the transaction costs of the specific operation to explain the preferability towards insourcing, leading towards markets when costs are low and towards internal procurement or manufacturing when the costs are high. High asset specificity prefers integration, as well as high risk of supplier opportunism. Higher rate of transactional

frequency uncertainty of the market leans towards in-house sourcing, Cost analysis of core activities in the Mcivor process model have a similar leaning into the make or buy decision.

Regarding factors such as costs, quality, control, the benefits and challenges insourcing deal with two sides of the same coin. In successful insourcing project the benefits are realized and when not, the project may prove that outsourcing brought these wanted benefits in a better way. The key to successful make or buy decision lies in thorough and extensive analysis. If important factors related to competence, capacity, workload and the previously mentioned factors in this chapter are not accurately analyzed in the decision-making process, the results could prove the insourcing decision to be more costly and difficult to execute.

However, if the make or buy process is conducted in thorough manner, taking all important factors into considerations and involving key members input in the process, the benefits of insourcing can be realized. Internal benefits such as overhead reductions, improved coordination and elimination of time consuming, as well as competitive benefits of product credibility, improved technological intelligence and superior control over product tasks provide cost benefits, as well as others benefits indirectly, when insourcing.

When insourcing previously outsourced products or components, new opportunities arise in regard to existing products. Better control over quality allows for companies to consider innovative new designs, track component performance and other critical inputs in manufacturing. Removing supplier from the equation reduces the margins of the supply chain, allowing for a company to keep competitive pricing.

In the case study section of the thesis, the benefits pursued by the case company were identified. Both from the general interviews of the area related experts within the case company, as well as the workshop study, where an example case of insourcing was studied. The factors of TCE: core competence, asset specificity and opportunism were identified as factors affecting the company's make or buy decision making and strategy. Risk of high supplier opportunism, the ability of the case company to produce specific technology and the related assets hold great influence when the company is faced with the make or buy decision. The description of the case company's make or buy process follows a standard model when referencing other studies on the subject. The phases from need identification, analysis,

presentation to the decision itself went through the basic tenets of a make or buy model, having correlation with the make or buy models of Canez et al (2000) and Mcivor (1997).

The workshop study provided with real world criteria from the perspective of a technology company, that are seen to be prioritized in a make or buy decision, providing examples of benefits and challenges related to these criteria. Much of the academic and scientific literature has been long focused on the topic of outsourcing, however, it seems that in recent years the trend has started to shift towards insourcing as a viable option. The Covid-19 pandemic showed the world the risks of disruptions in the supply chains, major increases in demand of outsourced components leading towards higher than normal delivery dates.

This thesis provides aspect to the real-world case of a company involved in the make or buy decision. As a suggestion, the case company could integrate into their process the tracking and comparison of the made decision. In the interviews it was discovered that the case company does not effectively or periodically track the success of the made make or buy decision, as the conducting of the make or buy decision for existing products or technologies is in fact much more rare when compared to new products.

The case study was limited into a specific company in a specific industry. While this study does provide new perspective and findings, the results can not be generalized, although theory suggests that the findings are indeed more common. The literature regarding the make or buy decision handles the issue with examples of different industries, creating a vast quantity of data for deciphering and identifying benefits and challenges for insourcing. This thesis could have been improved by focusing on the specific industry of the case company. However, due to the wishes of case company, identifying remarks were excluded.

Regarding this study, the results could be different in a different industry or a company position in a different part of a supply chain. In order to improve this study, it should be done with quantitative data, gathering and comparing from different companies in a variety of industries. A most interesting continuation for this research would be related to the benefits and challenges of insourcing, as well as studying the differences of the importance of different factors impacting the make or buy decision in larger scale, ranking them by industry, company size or location. In addition, following the preference of the factors in the make or buy process

develop with time, could be an interesting topic to study, if wishing to understand the development of the make or buy issue.

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APPENDIX

Appendix 1: Interview questions

1. Core competencies:

- Which functions in the company are divided into core competencies?
- On what basis is the classification made?
- Is core competence outsourced in any way?
- How are core competencies taken into account in make or buy decisions?

2. Make or buy:

- What are the reasons for make or buy decisions?
- How does the company's make or buy process take place? What steps?
- Who is involved in decision-making?
- Is make or buy decision making an ongoing activity or part of another business process?
- How are make or buy decisions measured / monitored? If so, on what indicators are used?
- What kind of process model does it follow?
- What factors influence the most make or buy decisions?

3. Insourcing:

- What factors influence the make or buy decision?
- What are the company's achieved benefits of insourcing? How do they differ from the intended benefits of outsourcing?
- What benefits have been achieved through insourcing? New product vs old product?
- What risks have been identified in make or buy decisions?

- What challenges are / have been identified in insourcing? Or make or buy in decision making?

4. TCE:

- How does the company seek to protect itself against opportunism and other uncertainties / risks in outsourcing decisions?

- Does the asset specificity affect the make or buy decision? Does the company strive to insource specific product related technologies?

- Does the number and volume of transactions affect make or buy decisions?