Strategic decision making model for make or buy decisions

Article *in* International Journal of Logistics Economics and Globalisation · January 2015

DOI: 10.1504/IJLEG.2015.073894

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Abstract: *Purpose:* The aim of this study is to analyse factors that are related to make or buy decisions. Within this research, a tool is created for make or buy decision-making which can be used as a help to evaluate outsourcing analytically. *Design/methodology/approach:* This research is case study research to develop a make or buy decision making tool via literature review. *Findings:* The finding of the study is a model for developing make or buy decisions. The model is based on the make or buy triggers, competitive factors, McIvor's outsourcing framework, Tayles and Drury's outsourcing decision model and balanced scorecard. *Research limitations/implications:* This research is focused on making a decision making model in the manufacturing industry supply chain. In the future, more empirical study is needed. *Practical implications:* The results can be utilised when developing make or buy and outsourcing decision-making in the supply chain. *Originality/value:* The research results bring additional value to the previous studies regarding make or buy decision-making models.

Keywords: balanced scorecard; BSC; make or buy decisions; sourcing; purchasing; strategic decision making; supply chain management.

Reference to this paper should be made as follows: Sillanpää, I. (2015) 'Strategic decision making model for make or buy decisions', *Int. J. Logistics Economics and Globalisation*, Vol. 6, No. 3, pp.205–222.

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This paper is a revised and expanded version of a paper entitled 'Tool for make or buy decision making' presented at The 9th International Conference on Intelligent Manufacturing & Logistics Systems, Shanghai, China, 27 February to 2 March 2013.

1 Introduction

Purchasing should be accounted for as a significant function, which needs to be considered as a part of the corporate planning process to ensure that supply conditions are reflected in it (McIvor et al., 1997). Strategic approaches for a particular function, for example sourcing, need to be linked to other functional strategies, linked to strategies for particular business units and linked at the corporate level where there are perceived synergistic benefits. The make or buy issue has been under discussion since the industrial revolution. Yet, its strategic role has not been admitted until now, at the same time as the strategic role of sourcing has started to have been appreciated.

Probably the known and the most classical theoretical approach to a make or buy decision-making is transaction cost theory made by Williamson (1985). According to transaction cost economics, a company will make the outsourcing decision on the basis of reducing production and transaction costs. Production costs refer to the direct costs involved in creating the product or service and include labour and infrastructure costs. Transaction costs include the costs of selecting suppliers, negotiating prices, writing contracts, monitoring performance, as well as the potential for opportunism from suppliers. The main factors for bringing transaction costs out at markets are: bounded rationality, opportunism, small numbers of bargain and information impactedeness. (Williamson, 1985, 1981, 1991).

The research goal of this study is to analyse factors that are related to make or buy decisions. This research will help to understand how outsourcing and subcontracting can affect to company's business, operations and profitability. This research creates a tool for make or buy decision-making which can be used as a help to evaluate the reasonableness of outsourcing analytically. For the meantime this kind of tool has not been created and there is no systematically way to make these decisions. The research goal of the study is to: create a tool for make or buy decision-making.

The research questions are:

- What are the effects of the MOB to competitive performance?
- How to make MOB decisions systematically?

2 Theoretical background

2.1 Transaction cost economics

It is not possible to restrict the basis of make or buy decisions solely to economic or cost parameters even if they can be accurately and fairly assessed. Such an analysis takes no account of the possible future behaviour of the parties to the arrangement, or how the buying organisation sees its role in the marketplace (Steele and Court, 1996). Probably, the known and most classical theoretical approach to make or buy decision-making is transaction theory coined by Williamson. Transaction cost economics specifies the conditions under which an organisation should manage an economic exchange internally within its boundaries. According to transaction cost economics, a company will make the outsourcing decision on the basis of reducing production and transaction costs. Production costs refer to the direct costs involved in creating the product or service and include labour and infrastructure costs. Transaction costs include the costs of selecting

suppliers, negotiating prices, writing contracts, monitoring performance, as well as the potential for opportunism from suppliers (McIvor, 2000, 2003, 2008).

Williamson (1985) introduces a number of factors involving transaction costs. Main factors for bringing transaction costs out at markets are:

- *Bounded rationality.* People have limited memories and limited cognitive processing power. We cannot assimilate all the information at our disposal, we cannot accurately work out the consequences of the information we have.
- *Opportunism.* People will act in a self-interested way 'with guile'. People may not be entirely honest and truthful about their intentions, or they might attempt to take advantage of unforeseen circumstances that gives them the chance to exploit another party.
- *Small numbers bargaining.* Many bargaining situations are infrequent or involve small quantities where the cost of obtaining full information is prohibitive, i.e., as in an oligopoly.
- *Information impactedness.* The party which has more information and knowledge uses it and possible manipulates the other party (Williamson, 1985).

The central theme of transaction costs theory is that the properties of the transaction determine the governance structure. The transaction costs and the problems grow when the following variables are involved: *frequency*, *uncertainty* and *asset specificity.* These three variables will, according to the theory, determine whether the transaction cost will be lowest in a market or in a hierarchy (McIvor, 2003).

The issue in uncertainty is how hard it is to foresee the eventualities that might occur during the course of transaction. According to Williamson (1985), there are two kinds of uncertainties: uncertainty posed by environment where the company has no ability to affect and uncertainty derived from the behaviour of the contracting party.

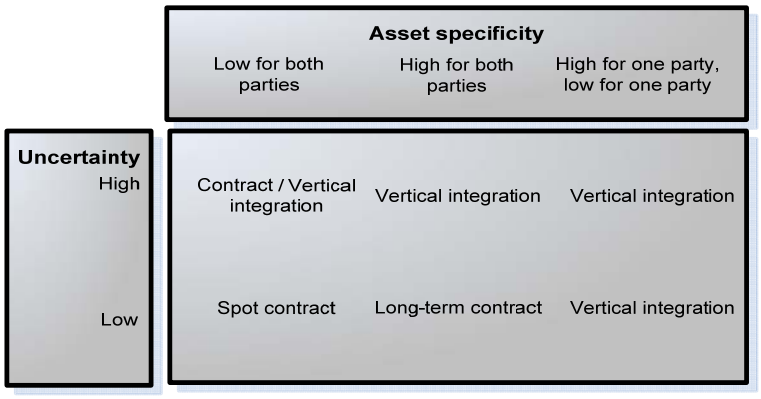
These two shapes of uncertainty are interrelating with each other. If external, environment caused uncertainty is zero or very little, the uncertainty derived from the behaviour of the contracting party is also very little. That is to say, the contracting party does not experience the situation as threatening and it does not have to act opportunistically. Uncertainty does not necessarily create transaction costs, if other variables are favourable. Closely related costs with uncertainty are for example policing and coordinating costs (Michael, 2007).

Asset specificity is perhaps the most important element in Williamson's theory. He argues that where transaction costs involve assets that are only valuable in the context of a specific transaction, transaction costs will tend to be reduced by vertical integration. Asset specificity can vary from general limitedness of the capacity to the product's individualised investment needs. If assets are highly specific the switching costs are high and suppliers often act opportunistically. Williamson (1985) recognised four different asset specificities:

- *dedicated assets* – specialised investments
- *physical asset specificity* – technology advantages
- *human asset specificity* – know-how advantages
- *site specificity* – resource immobility.

Williamson (1985) states that the above mentioned variables decide how transactions should be managed. Figure 1 gives a summary of the relationship between asset specificity, uncertainty and governance structure. Usually using markets such as traditional buying is the most efficient way to handle standard transactions. Vertical integration is the best alternative when demanded investments are highly specific. Between these alternatives there is a state where partnership should be supported (Williamson, 1985). As a result from Williamson's model it can be argued that in so far as the company cannot reach the lowest product costs without wide-ranging investments, it should outsource the function (McIvor, 2000).

Figure 1 Relationship between asset specificity, uncertainty and governance structure



Source: McIvor (2000)

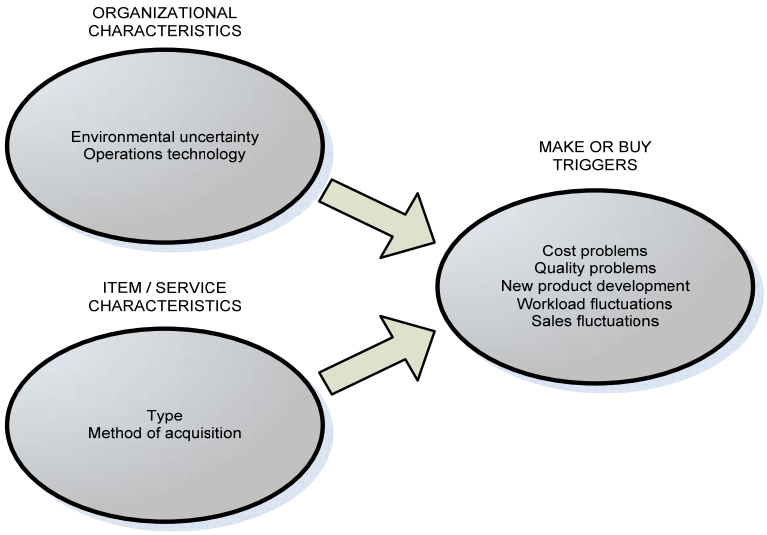
2.2 Make or buy triggers

According to Moschuris (2007), the most important make or buy triggers are cost and quality problems. Typically reasons for outsourcing may be lack of capacity, lack of knowing, economical issues, organisational culture issues, life cycle of the product or for example organisational changes. The conceptual model (Figure 2) highlights the relationship between the importance of each trigger and variations with organisational characteristics as well as with characteristics of the item/service under make or buy investigation.

Organisational theory suggests that firms organised to deal with reliable and stable markets will not be as effective in complex, rapidly changing and unpredictable environments. There are two apparently conflicting views of the relationship between environmental uncertainty and organisational structure. According to contingency theory, firms should adopt 'organic' structures that are less reliant on formal control, are decentralised and operate with fewer layers and narrower spans of control. In contrast, another view is that at high levels of environment uncertainty, organisational decision-making processes are characterised by a constriction of authority. This means decisions are made at higher levels of the organisation by a smaller number of organisational members. There are also controversial views about the importance of operations technology to organisational structure. Some researchers suggest that organisations should structure their activities in accordance with the demands of their

transformation technologies. Conversely, others say that operations technology is not very important to organisation structure (Moschuris, 2007).

Figure 2 Conceptual model (see online version for colours)



Source: Moschuris (2007)

Make or buy issues may be triggered due to quality problems, cost considerations, lack of capacity, unsatisfactory supplier performance, sales fluctuations, introduction of a new product and modification of an existing product (Moschuris, 2007). So the trend toward outsourcing activities in the value chain can be attributed to the following reasons (Mantel et al., 2006; McIvor, 2003):

- *Most competent source*. Outsourcing policy is based on the best available source (internal or external) being chosen to carry out the activity or group of activities.
- *Increased flexibility*. The company believes it can be more flexible by outsourcing more activities rather than performing activities internally by being in a better position to react rapidly to market changes and be more responsive to customer change.
- *Reduced risk exposure*. Through outsourcing, the company is reducing its level of risk (converting fixed costs into variable costs). It is argued that suppliers are better able to cope with demand fluctuations through economies of scale and have more scope for alternative sources for this excess capacity.
- *Cost reduction*. In some cases the activity can be performed at a lower cost by outside suppliers.
- *Supplier management*. It is argued that it is possible to reduce the level of risk associated with high bought-in content by employing effective supplier management and partnership building approaches.

2.3 Competitive factors

A company may articulate its position in the market in a number of ways. It might compare itself with a competitor or alternatively they might associate themselves with the needs of a particular customer group. In the end companies define their market position in terms of a number of dimensions, for example range, price, quality of service etc. These dimensions on which a company wishes to compete are called competitive factors. Different dimensions and type of operation and their relative importance will change depending on how the company wishes to compete. In Table 1, the competitive factors of two different operations are illustrated (Slack and Lewis, 2002; Slack, 2005).

Table 1 Competitive factors for two grouped under their generic performance objectives

Mortgage services Associated competitive factors include...	*Performance objectives*	*Steel plant Associated competitive factors include...*
• Professionalism of staff	Quality	• Percentage of products conforming to their specification
• Friendliness of staff		• Absolute specification or products
• Accuracy of information		• Usefulness of technical advice
• Ability to change details in future		
• Time for call centre to respond	Speed	• Lead-time from enquiry to quotation
• Prompt advice response		• Lead-time from order to delivery
• Fast loan decisions		• Lead-time for technical advice
• Fast availability of funds		
• Realiability of original promise date	Dependability	• Percentage of deliveries 'on time, in full'
• Customers kept informed		• Customers kept informed of delivery dates
• Customisation of terms, such as duration/life of offer	Flexibility	• Range of sizes, gauges, coatings etc. possible
• Cope with changes in circumstances, such as level of demand		• Rate of new product introduction
		• Ability to change quantity composition and timing of an order
• Interest rate charged	Cost	• Price of products
• Arrangement charges		• Price of technical advice
• Insurance charges		• Discount available
		• Payment terms

Source: Slack and Lewis (2002) and Slack (2005)

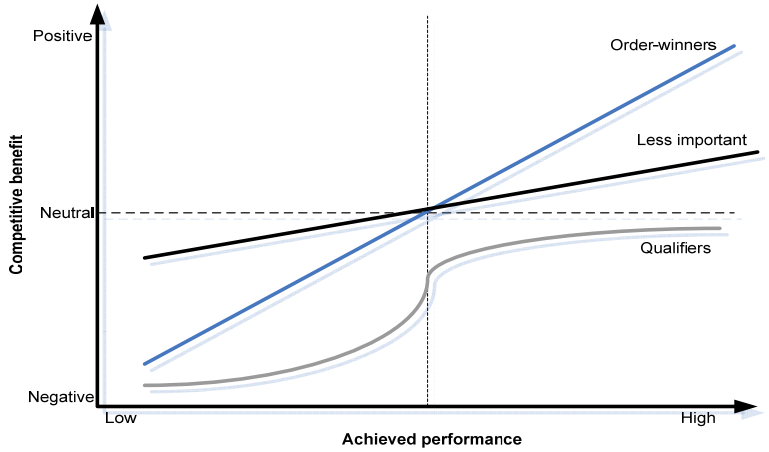
Different operations will see quality (or any other performance objective) in different ways, and emphasise different aspects. Each of the performance objectives represents a cluster of competitive factors grouped together for convenience. Different from other performance objectives is cost. While most competitive factors are clear manifestations of their performance objectives, the competitive factors of price are related to the cost performance objective. An improvement in cost performance does not necessarily mean a

reduction in the price charged to customers. Firms who achieve lower costs may choose to take some, or all, of the improvement in higher margins rather than reduced prices (Slack and Lewis, 2002).

The idea of generic performance objectives is that they can be clearly related to some aspects of external market positioning, through their connection with competitive objectives, and can be connected to the internal decisions which are made concerning the operations resources. It is also noticeable that different product groups require different performance objectives, which means that different competitive factors have a different priority level at different product groups (Slack and Lewis, 2002).

One way to determine the relative importance of different competitive factors is dividing the factors between order-winners and qualifiers. Different authors use different terms, so order-winners can also be called, for example, competitive edge factors, critical or primary factors, motivating factors and enhancing factors. Qualifiers also can be called, for example, hygiene factors or failure preventers. To put it simple order-winning factors are things that directly and significantly contribute to winning business. Therefore they are the most important aspects of the way a company defines its competitive stance. Qualifiers are not the major competitive determinants of success, but those are the factors where the operation's performance has to be above a particular level just to be even considered by the customer. So, even if order-winning factors would perform really well, the company will not win the business if qualifying factors are below this 'qualifying' level (Morash, 2001; Slack and Lewis, 2002).

Figure 3 Order-winners and qualifiers (see online version for colours)



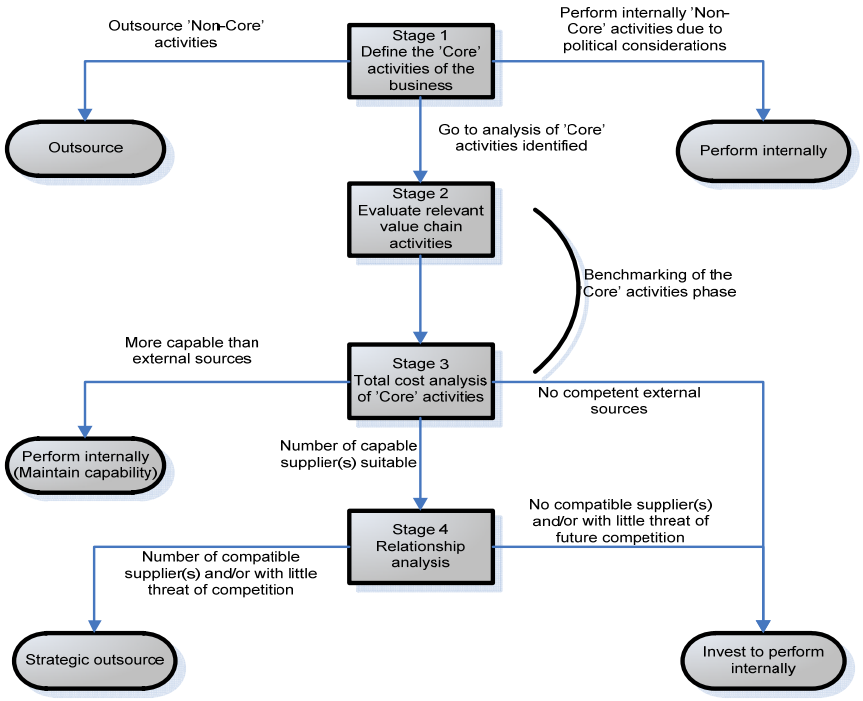
Source: Slack and Lewis (2002)

2.4 McIvor's outsourcing framework

There are only a few frameworks in the literature for the make or buy decision-making model. McIvor's (2000, 2003) outsourcing framework integrates three concepts associated with the decision-making process: value chain analysis, core competency thinking and supply base influences. The framework proposes that all non-core activities should be outsourced but that also core activities can be outsourced. It is important to

notice that the framework is not a panacea for all of the problems associated with making an effective outsourcing decision (McIvor et al., 1997; McIvor, 2003, 2008).

Figure 4 Four-stage outsourcing framework (see online version for colours)



Source: McIvor (2003)

The first stage is involved with identifying the core and non-core activities of the organisation. A core activity is perceived by the customers as adding value and therefore being a major determinant of competitive advantage. Distinguishing between core activities and non-core activities is a complex task. The process of identifying the core competencies and activities should be carried out by top management along with inputs from teams from lower levels in the organisation. Each team should encompass a broad section of members functionally, divisionally and hierarchically. The team has to identify the major determinants of competitive advantage in the markets, the industries, or the strategic groups in which the organisation competes or might wish to compete. The framework proposed above assumes that, in general, all non-core activities will be outsourced (McIvor, 2000, 2003).

After all the core and non-core activities have been identified, the next section is concerned with analysing the competencies of the company in these core activities in relation to potential external sources. So, the next stage is to evaluate the relevant value chain activities. Each selected core activity must be benchmarked against the capabilities of all potential external providers of that activity. This will enable the company to identify its relative performance for each core activity along a number of selected measures. Stage three, total cost analysis of core activities, involves attempting to measure all the actual and potential costs involved in sourcing the activity internally or

externally. It encompasses all costs associated with the acquisition of the activity throughout the entire supply chain and not just the purchase price (McIvor et al., 2000; McIvor, 2003).

The last stage, relationship analysis, is not included in the decision-making tool created in this paper but it is introduced here shortly. Several issues have to be addressed before outsourcing a core activity. The company may wish to maintain the knowledge that enables the technology of the activity to be exploited, even when it is being provided by another partner. Therefore, controlling the new product development and design process is important. The company may establish a buyer-supplier relationship ranging from partnership to competitive bidding. From this analysis of potential suppliers, the company will filter out any potential suppliers that are unsuitable (McIvor, 2000; McIvor, 2003).

2.5 Tayles and Drury's sourcing decision model

The Tayles and Drury's (2001) model ensures that wider issues are considered in a logical manner, that the process is transparent and that strategic thinking is transformed into practice. The biggest difference between this model and the model of McIvor's is that this model suggests that core activities or products are not outsourced in any situation. Only the non-core activities and products are nominated for outsourcing (Tayles and Drury, 2001).

Just like the decision model of McIvor's, this one starts with identifying core competence and continues with costs to make or buy because by implication the company should have the capability or be seeking to acquire the capability. If the cost to make is cheaper than buying, the next question is about investment, whether there is a need for capital spend. If no investment is required the company should make, but if investment is required it too must be financially justified due to the economic imperative of a good return. Where the return from investment is good the company should invest and make. For investments that fail to achieve the desired return, the company should consider whether additional volume could enhance the returns. If not, then the next logical question is to ascertain whether or not an external supplier is available. In cases where there is no alternative supplier there is no choice but to make. If an external supplier is available the strategic positioning of the process or component needs to be reviewed due to the lack of financial justification for it on its own merits. This forces the decision-process into a feedback loop to ensure that investments really are strategic and add value to the organisation as a whole. If the process or component is still deemed to be strategic on the second time round this loop the company should opt to invest and make (Tayles and Drury, 2001).

The model also goes through the decision process when the product is not about core competence. Then the next question is whether the company possesses the capability to perform the process or make the component. If the capability exists in-house to perform the process or make the component, the next question is to ascertain the current capacity in-house. If resources are available and their use is shown to be economical the company should proceed to make. If resources are not available and the cost of buying is not less than the cost to make, the question is then whether the missing resources can be acquired. This forces the decision process into a feedback loop again to ensure that resources are deployed as optimally as possible. The acquisition of resources will only take place after

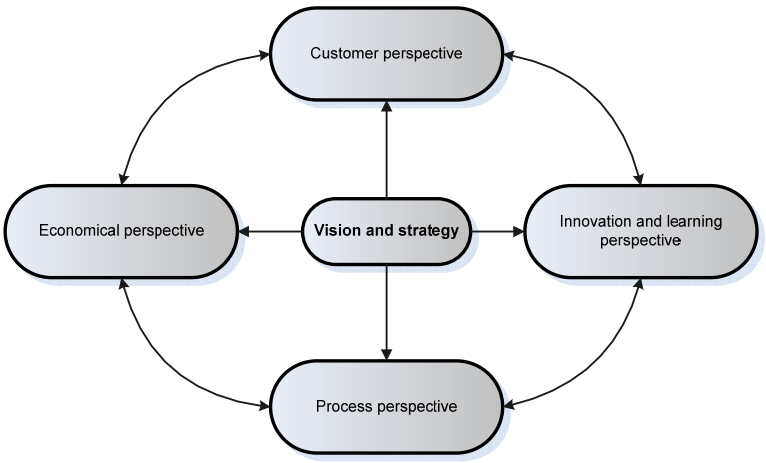
the second time round the loop when the 'trade-off' against other investment opportunities has been fully evaluated (Tayles and Drury, 2001).

2.6 Balanced scorecard

The term balanced scorecard (BSC) was born about 15 years ago in 12 projects, the aim of which was to improve performance measuring, that were executed mainly in USA and Canada. Kaplan and Norton are seen to be the creators of the BSC. BSC is a simple and easily outlined, but at the same time extensive indicator. With the help of it, it is possible to improve competitive advantage and broaden the examination of the business from short-term to long-term planning. The objective of the BSC is to measure those things on which success is depending. According to Kaplan and Norton (1992) the complexity of management requires managers to observe performance in several fields of business at the same time (Kaplan and Norton, 1992, 1996; Kaplan, 1993, 1996).

BSC includes economical indicators which reveal how well the organisation has done. Company must compensate economical indicators with operative indicators which relate to customer satisfaction, internal processes and organisation's learning. For companies operating in a market economy, economical indicators are kept the most determinant but three other perspectives are needed to give pre-signals about effects that are seen in market economy with delay. At the base of the BSC is company's vision and strategy. From those the essential perspectives, which are wanted to be followed and measured, are created (Figure 5). The necessity for company's operating and developing is economical success. The aim of the economical perspective is to measure those things that owners are interested in (Kaplan and Norton, 1992).

Figure 5 Perspectives of the BSC



Process perspective's indicators should measure those processes in which the company must perform excellently. So the processes are describing what should be done to identify customer needs and fulfilling them. Depending on competition strategies the measured processes may vary. Identifying all core and supporting processes is not reasonable. Strategy should define which processes are under examination and when (Kaplan and Norton, 1992).

Innovation and learning perspective's indicators should be able to answer questions: Is the organisation able to improve in the future? Is the organisation able to create value for its owners? This perspective should describe what kind of infrastructure the organisation should aim for, so that success would be assured also in the future. To put it simply, the organisation's learning consists of three factors: people, systems and the workings of the organisation. In practical applications exactly this perspective is considered as the most challenging one of the BSC (Kaplan and Norton, 1992).

The indicators of the customer perspective can be divided into two groups. Another group can be called as basic-indicators because those are very similar in different organisations. Market share, customer satisfaction, customer profitableness, customer loyalty and number of new customers are very usual indicators. Those indicators reflect the company's point of view of how well it has managed in markets and in customer interface. Another group of indicators in customer perspective is called as customer promise-indicators. Those should answer, for example, the next questions: What the company should offer its customers? How is it possible to achieve the desired market share? How to tempt new customers? These factors may be the characteristic of the products or service such as quality or price. From these, it should be clearly seen what it is that is going to lift the company into success in competition (Kaplan and Norton, 1992).

3 Research methodology

Eisenhardt (1989) defines case study research as a research strategy that aims at understanding the internal dynamic of an individual case. Case study research is aiming at understanding comprehensive and relevant phenomena of real life. In that case the endeavour is to study the phenomena in their genuine context. Interface between the phenomenon and context is not often clear, which complicates the work of a researcher (Yin, 2009).

Case-study research is one of the most challenging research methods. The method is used in psychological, sociological, and political as well as in business economy researches. The use of the method is not delimited in certain research areas. Case study research is suited for following through whole study and it can be easily adapted widely and in versatile research areas. Unlike it is often thought case study research method can include not only quantitative but also qualitative searching. The aim of the case study research is to widen and generalise theories, not to specify them (Yin, 2009).

There are three case study research models: explorative, descriptive and explanatory. In explorative research it is meant to get information about phenomenon, find new ideas and possible research problems. The idea is to collect and arrange existing information. In descriptive research it is meant to give as specific a picture of the phenomenon as possible. In this kind of research the connections and explanatory factors are not straight out, but only describing the situation. The purpose of explanatory research is to straighten out the causality of the phenomena and pilot the related hypothesis (Yin, 2009).

Case study research method is the recommended research method when (Yin, 2009):

- research problem is formed with questions 'how' and 'why'
- researcher cannot dominate the case object

- it is concentrated on coexistent events real time.

Case study research starts with research planning. According to Yin (2009), it would be good to include the following five components in case study research planning: research question, statement (if possible), unit of analysis, and logic on how to connect empirical data to the statement and criteria which are the base for interpreting empirical data. This should also include a theory section to be complete research. The researcher should create a framework for research to help planning. It is worthwhile to make the effort for the theory framework because it helps the research worker to decide what information should be gathered and analysed and how the results can be generalised (Yin, 2009).

Data for case study research can be collected in several different ways. Six commonly used ways to collect data are: documents, archive, interviews, straight perceptions, participatory perceptions and items/devices. None of the ways for data collection are better than the others but they all have their own function in the study. The ways can be used separately but it is not desirable because of reliability and internal and structural validity. Using several sources of information makes the final result of research more plausible and exact. One of the strengths of the case study research method is that several information sources can be used in the same research. Using several sources of information gives the researcher both historical and prejudiced as well as human behaviour-related information. While collecting information from various sources the aim should be that the collected information is promoting the same task or case. Using various sources of information may be expensive and challenging (Yin, 2009).

For the sake of reliability of the research, the filing of the collected data is important. To interpolate reliability the researcher should be able to constitute an evidence chain. Analysing the collected information is one of the hardest work stages. The analysing will succeed better if the researcher has an analytical strategy, which he uses when analysing. There are three commonly used strategies: theoretical presentation, competitive explanations and creating description of the case. The most popular strategy is to follow theoretical statements. The second analytical theory, competitive explanations, tries to define and test competitive explanations. The third possible strategy is to create a descriptive body, over which the case and analysing will be built. This strategy is used when the above-mentioned two strategies are not possible and the case is descriptive. The descriptive approach may help to identify different contexts thus objects for analysing (Yin, 2009).

Case study research is regarded as a good research method when the research problem can be described with the help of questions how and why. The method is very useful when a researcher cannot control the target. There are three types of case study research: explorative (seeking to find out more about a phenomenon) research, descriptive research and explanatory research. The purpose of explorative research is to obtain information regarding a phenomenon, find new ideas and possible research problems. In explorative research, already existing information is collected and sorted. The aim of descriptive research is to provide as accurate an image of an individual, group, situation or phenomenon as possible. In the research the focus is not on clarifying connections between phenomena or factors interpreting behaviour, but only in describing a situation. The aim of explanatory research is to explain causal relations between phenomena and testing related hypotheses (Yin, 2009).

The hermeneutic view perceives knowledge as soft, often subjective and experience-based as well as insights of a personal nature, whereas the positivist perceives knowledge as hard and real, and considers it possible to transmit knowledge in a tangible form (Burrell and Morgan, 1979). The hermeneutic view is approached in the study in the form of qualitative and quantitative research. Quantitative research refers to a study in which accurate and calculatory methods are used. Qualitative research is a method of inquiry practiced in humanities in addition to quantitative research. The aim of qualitative research is to understand the phenomenon being studied. The point of view of this study is a more qualitative one. In qualitative research, discretionary sampling is normally used. Only a small number of units is selected for the study and they are studied in depth which makes the quality of the data important. In this study, qualitative methods are used to collect information regarding the case under study. These methods include observations, interviews, questionnaires and reports (Burrell and Morgan 1998).

Inductive reasoning, a.k.a. induction is a method of reasoning that starts from an individual group of observations and forms a generalisation or a theory regarding it. Deductive reasoning a.k.a. valid reasoning is a method of reasoning in which the true premises are necessarily followed by a true conclusion (Ghauri and Grønhaug, 2005).

Table 2 The main methodological choices in this study

Research discipline	*Industrial engineering and management (IEM)*
Theoretical base	Transaction costs economics, make or buy triggers, competitive factors, McIvor's outsourcing framework, Tayles and Drury's sourcing decision model, BSC
Research paradigm	Hermeneutics
Research strategy and research approaches	Qualitative case study approach
Research methods	Qualitative methods: interviews, observations, questionnaires

Research process started with the literature review of main theory base of the research problem. Most relevant theory was selected for the literature review: transaction cost economics, make or buy triggers, competitive factors, outsourcing framework, sourcing decision model and BSC. This research paradigm is hermeneutics and the research is qualitative case study research. Research methods are qualitative methods like interviews, questionnaires and observations. Strategic decision-making make or buy model was developed first according to a literature review and then tested and validated in empirical case study. The empirical research was done during a two year research period when the researcher did several interviews with case companies operational, tactical and strategic management and several observations of how the case companies used the decision-making model. The researcher also did two similar questionnaires with the case companies to validate that the make or buy decision-making model is working. Table 2 presents the main methodological choices for this research.

4 Empirical case study to develop strategic make or buy decision-making model

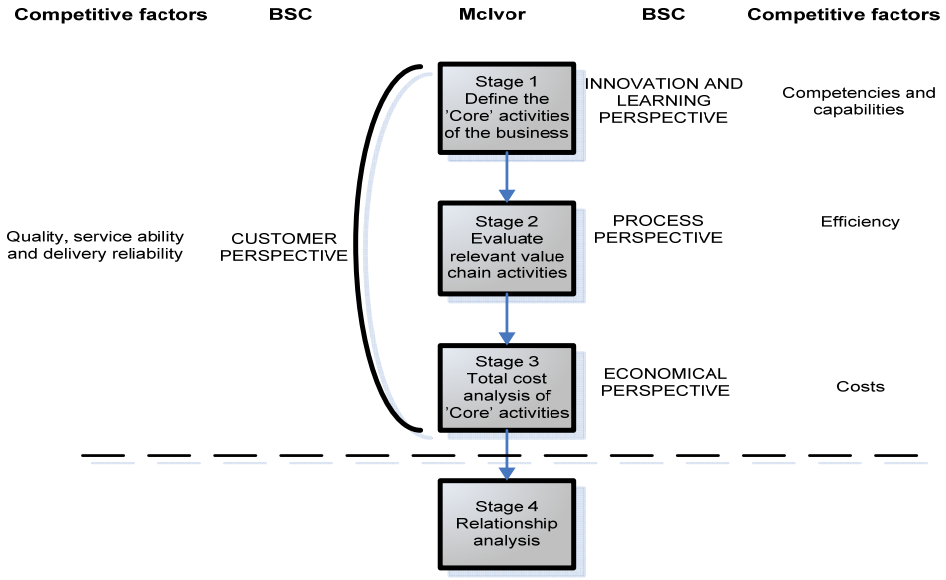
The principal reasons for undertaking make or buy-decisions are for example, price competition, lack of capacity, skills shortage, need to increase responsiveness, need to increase quality and need to reduce time to market. The main factors considered for make- or buy-decisions are for example, total acquisition costs, complexity, technologies and skills. The key characteristics of a practical decision-making tool and framework were need of easy usage and generic enough to cover a broad range of products.

The empirical case studies are small and medium-sized companies located in Europe and Asia. Both of the companies are operating in manufacturing industry producing sub-assemblies for engineering solution business globally. Typically companies produce products includes part manufacturing, welding, machining, painting and assembling. The products are tailor made and every product is customised according to customers' needs. Case companies supply chain strategy is to have their own manufacturing, which is concentrating on its core competencies and other items are sourced from a wide supply chain. The supply chains are managed globally because of the need to supply products to worldwide sales channels. Case companies were selected because these businesses represent the most challenging business environment where there is a need for strategic make or buy decision-making model. According to the literature review and empirical case study it is able to develop strategic make or buy decision-making model. The developed model was empirically validated in empirical case study.

McIvor's outsourcing framework consists of four stages. Because of the strategic role of the decision, it is essential to somehow measure the effects of the made decision. Model used as the measuring and evaluating base of this MOB decision-making tool are BSC and company's competitive factors. BSC suit make or buy decision-making not only because of its strategic role but also because it takes into account internal as well as external factors. By unifying the use of competitive factors and BSC it is possible to size up MOB decision-making more specifically and perceive the internal and external factors of the make or buy decision-making.

In innovation and learning perspective the company should define the core competencies and capabilities. In process perspective the used factors in make or buy decision-making are efficiency and value chain activities. In the economical perspective the competitive factors are cost and the total cost analysis of core activities. All of these perspectives should be analysed using BSC customer perspective at the same time as analysing other perspectives. Customer perspective is extremely important to have, because the customer is in many case extremely close involved and interested in those perspectives and factors. Competitive factors should be analysed also from quality, service ability and delivery reliability point of view. Finally stage is relationship analysis which will be the final conclusion of the model. Every approach and perspectives in the strategic make or buy decision-making model should be used as in original theory of McIvor, BSC and competitive factors. Figure 6 described the connections between McIvor's outsourcing framework, BSC and the competitive factors.

Figure 6 Strategic make or buy decision-making model (see online version for colours)



While making any decisions it is essential to know what company's competitive factors are and how the decision contributes to those factors and to the company's competitive advantage. The competitive factors are also indicators that should be measured and predicted while making make or buy decision. It is not likely that there is a possibility to make a make or buy decision which would improve all of the competitive factors. Making the right decision is about optimising. Some competitive factors may weaken and some will improve. The idea is to decide which of the competitive factors are critical and which the company wants to optimise. With a first-class management and prime suppliers it is possible also to gain the benefits of the make-alternative when outsourcing and in that way change the risks and drawbacks to become benefits. It must be emphasised that this kind of achievement requires a huge amount of work, control and collaboration, therefore it is a very challenging task.

The company's vision and strategy should be the base for BSC as well as for make or buy decisions. From the company's vision and strategy the essential perspectives, which are wanted to be followed, predicted and measured, are created. In this case the BSC is not only for measuring but also for predicting what may and will happen, if a certain decision is made. Of special interest is what happens to competitive factors. After the decision has been made and results and consequences are seen, it is possible to measure and evaluate the made decision and learn from it. The strategic decision-making model created in this research includes the same four perspectives as traditional BSC.

In the empirical case study it was stated that the company should think its make or buy decisions as a long term decision and make those decisions according to the company's business strategy:

- Should the company strive to maintain and build its capability in a particular technology or turn to the best-in-class source?
- Do the internal design and manufacturing capabilities lag behind potential suppliers?
- Will customers recognise a difference in the finished product if the company outsources some of its components?
- If there is a disparity between purchaser and supplier, how much investment is required internally to match the capabilities of the supplier?

Empirical case study contribution is that a major issue in make or buy decision making is to distinguish strategic and non-strategic parts. Generally, strategic parts are produced in-house for competitive reasons. Other strategic issues in make or buy include the cost of the updated technology required to continue manufacturing the part in-house, asset utilisation, the possibility that outsourcing might reduce significantly the barriers to entry (generating more competition), or reduce the company's leverage in the supply chain, and whether it would hinder or help time-to-market for new products. Organisational issues include the ability to change the firm in order to reflect any adjustments in the future supply chain, and the ability to cooperate with suppliers and to properly manage outsourcing function. Empirical case study validates strategic make or buy decision-making model.

5 Conclusions

Make or buy is one way to develop a more agile supply chain. Working in collaboration with suppliers and by outsourcing and subcontracting it is possible to achieve a more flexible, more efficient and more agile supply chain. The aim of this study was to analyse factors that are related to make or buy decisions and increase understanding on how outsourcing and subcontracting can affect a company's business, operations and profitability. Within this research a tool was created for make or buy decision-making which can be used as a aid to evaluate the reasonableness of outsourcing analytically.

The first step to make outsourcing analysis is usually identifying a company's core competence. Traditionally outsourcing decisions have been bounded between core and non-core competencies while the latter can be considered for outsourcing. However, this is a really simplified point of view for there are many companies which have successfully outsourced functions which are also crucial to their core business.

There are only few frameworks in the literature for make or buy decision-making models. McIvor's outsourcing framework integrates three concepts associated with the decision-making process: value chain analysis, core competency thinking and supply base influences. The framework proposes that all non-core activities should be outsourced but that also core activities can be strategically outsourced. Another sourcing model is made by Tayles and Drury. This model does not make the actual decision, but it rather develops a decision logically. While not seeking the automatic decision, it ensures that wider issues are considered in a logical manner, that the process is transparent and that strategic thinking is transformed into practice. The biggest difference between these two models is that Tayles and Drury model suggests that core activities or products are not outsourced in any situation. BSC is also introduced as a one framework for make or

buy decision-making. Its objective is to measure those things from which the success is depending and it includes indicators from four internal and external perspectives: customer, innovation and learning, process and economical.

Strategic decision-making model is based on BSC, McIvor's outsourcing framework and for competitive factors. The aim of the strategic model is to consider the make or buy issue via four perspectives of the BSC, so that all the factors relevant to decision are considered. Innovation and learning perspective covers core competency identifying and thinking, process perspective is about processes and resources and economical perspective covers the cost calculations and estimates. The fourth perspective, customer perspective, considers customer's interests: quality, delivery reliability and accuracy, service ability etc.

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