



Management accounting and decision making: Two case studies of outsourcing



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ABSTRACT

Studying the outsourcing decision in two substantial manufacturing companies, the paper explores the use of management accounting information in a complex and strategically significant decision-making setting. The setting involves multiple decision participants with potentially conflicting preferences, constrained information provision capabilities and uncertainties in respect of the financial outcomes of alternative decision options. The two case studies reveal two different methodological approaches to decision-making: analytical and actor-based. These approaches incorporate substantially different ways of managing information uncertainty, fostering interaction among the coalition of decision-participants and making use of management accounting. The findings show that management accounting information and techniques do play an important role in relation to organisationally complex and strategic decision situations. The revealed methods provide potentially educational examples from which other organisations can learn. The findings address the simplistic nature of the conventional management accounting literature on decision-making (e.g. outsourcing and “make or buy”).

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1. Introduction

This paper is concerned with the role of management accounting in the making of important organisational decisions. It is based on two comparative and contrasting case studies of how management accounting contributes to outsourcing decisions. The aim is to explore the inadequacies of rational and quasi-rational models of organisational decision-making as a representation for understanding not only the form of management accounting but also how it is deployed in this contemporarily important organisational decision-making setting. Exploring how practice has developed provides a first step towards explaining and understanding how decisions of this type are made and how management accounting supports those making the decisions.

Decision-making is well established as one of the key rationales for management accounting (e.g. Simon, 1955, 1956, 1959, 1976; Horngren, Foster, & Datar, 2005; Hall, 2010). The conventional wisdom of management accounting practice in this respect has traditionally been heavily based on the calculated rationality approach (March, 1978; Scapens, 1991). This suggests that intelligence in decision-making involves, “intelligent individuals making calculations of the consequences of actions for objectives, and acting sensibly to achieve these objectives” (p. 592). Within this calculative genre, management

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accounting has been particularly influenced by the normative standard of rational choice rooted in microeconomics (e.g. Keen & Morton, 1978; Demski, 1980; Sprague & Carlson, 1982; Scapens, 1991). The decision maker is assumed to act rationally by making choices that maximise his utility function. This requires knowledge of all alternative courses of action and information on their consequences (March, 1978, p. 587). The implicitly assumed role of information (including management accounting information) is to support the attainment of optimal decision outputs and to this end management accounting has been complemented and supplemented in practice by economic, statistical and operational techniques (Simon et al., 1986; Scapens, 1991).

However, many aspects of this calculative approach to rational choice decision-making have been challenged (e.g. Simon, 1955, 1956, 1959, 1976; March & Simon, 1958; Simon & Newell, 1971; Cyert & March, 1963; Kahneman, Slavic, & Tversky, 1982; Leibenstein, 1976). The quality of information accessible to decision makers does not allow for optimisation, nor do decision makers hold the innate information processing capability to leverage information to optimise their decisions (Simon, 1976). To overcome these limitations decision makers operate with bounded rationality involving that they “isolate from the rest of the world a closed system containing a limited number of variables and a limited range of alternatives” (, p. 82). Compounding this criticism is the fact that much of the calculative rational economic analysis (and indeed the bounded rationality approach as well) is founded on analysis of individual decision-making (Cummings, 1982; Simon, 1976). Claims have been made that this is not a sufficient basis for identifying how decisions are arrived at within organisations (Pfeffer & Salancik, 1974; Kleindorfer, Kunreuther, & Schoemaker, 1993). An organisation is a coalition of decision makers who hold different and conflicting values, subjective preferences and goals which can be fuzzy and change over time (March, 1962; Cyert & March, 1963). Consequently, more realistic models of organisational decision-making have to address, “how collections of individuals make complex choices in the face of ambiguity not only of information but even in objectives” (Pondy, 1982). Subscribing to the stakeholder view, some researchers have advocated the systemic rationality approach as an alternative form of intelligent decision-making. They assume that there is intelligence in decision-making, based on principles such as balancing the stakeholders’ interests, sensible adaption or reaction to changes in the environment and selecting the rules and routines of the fittest (March, 1978, p. 593; Pfeffer & Salancik, 1977; Dane & Pratt, 2007; Hall, 2010). However, the organisational context of the decision maker may be complex, problematic and challenging to the point of having decision makers operating in an anarchic and chaotic context (Cohen, March, & Olsen, 1972; March & Olsen, 1984). While research on the role of management accounting for specific decision-making is limited, the studies undertaken demonstrate that management accounting in organisations is often compromised by the internal politics following managerial power groupings. Additionally, these studies testify how the innate behavioural constraints and technical limitations prevent economic rationality as a convincing explanation for the organisational decision-making process (King, 1975; Cooper, 1975; Berry et al., 1985; Lueg & Nørreklit, 2012).

These issues accentuate the need for the development of decision models that can address the limitations of calculative rational choice models. The first step is to find out what is currently done in practice (as attaining the full rationality objective is not possible in the real world). This can be achieved by empirical decision-making studies on the integration of accounting information in decisions related to complex organisational tasks that involve multiple decision participants with potentially conflicting preferences, constrained information provision capabilities and uncertainties in respect of the financial outcomes of alternative decision options. Specifically, we raise the following research question:

Confronted with a complex, strategic decision situation involving information uncertainty and a coalition of decision-participants, how do companies structure their decision analyses and incorporate management accounting information into it?

This study is designed to answer this question. Consequently it is inductive in nature. Rich data from the two case companies is used to establish models of how coalitions of decision makers structure the analysis of complex decision problems and embed management accounting¹ into their outsourcing decisions. The induced models are, therefore, designed to identify how management accounting can play different roles in guiding organisational action (March, 1978) as opposed to predicting decision behaviour and decision consequences. The study reveals two methodological approaches to decision-making that have substantially different ways of handling information uncertainty about decision alternatives and of interacting with the organisational coalition of decision-participants. These methodological findings advance the decision-making theory of management accounting beyond the taken-for-granted models of microeconomics and conventional organisational theory. They illustrate how the ‘make or buy’ decision can be strategically contextualised. To our knowledge the conceptualisation of methods for decision-making is novel within the field of management accounting research².

¹ In this paper it is assumed that the management accounting function exists to assist management attain organisational objectives. This is achieved by the provision and interpretation of information, mainly financial, designed to support the profit objective and facilitate sustainable management. It thus involves a broader range of information than financial accounting as it covers both the financial implications of managerial decisions (strategic and operational). As management accounting is created and used by people and impacts on organisational participants, philosophy and social sciences such as economics, organisational studies, psychology and sociology have all contributed theories which have provided a cross disciplinary base for explaining and understanding the practices of management accounting.

² Empirical studies on decision-making within management accounting research have been concerned about such issues as how contextual factors shape accounting information for decision-making (Carr et al., 2010), how various types of accounting information relate to decision-makers’ behaviour (Hopwood, 1972; Otley 1978), and how decision-makers use accounting to legitimate decisions (Covaleski and Dirsmith, 1991) Normative research drawing on agency

The paper is structured as follows. In the next section the literature on the outsourcing decision is reviewed and the need for greater conceptual development established. The research method is explained and the findings presented together with individual conclusions on the management accounting implications of each case. A case comparison is then made and finally some overall conclusions are drawn on applying two different methodological approaches for producing and using accounting in relation to complex decision situations.

2. Literature analysis of the outsourcing decision

Outsourcing decisions have become increasingly important for many organisations (Sibbet, 1997; Fill & Visser, 2000). While outsourcing may have proven profitable for some companies, history has shown that it is certainly not the right choice for every company (Barthélemy, 2001; Bettis, Bradley, & Hamel, 1992; Bryce & Useem, 1998; Gove, 2009). Indeed, the high failure rate of outsourcing relationships suggests that many companies base the decision to outsource on insufficient information and a general lack of understanding. Despite its practical significance, management accounting research on the outsourcing decision-making process is rather limited³. Outsourcing is also a potentially complex decision as it often involves strategic as well as operational issues, possibly with significant impact on financial performance. Furthermore, it may have external implications for local and national communities and through its impact on employees, it may influence trade union relations and staff morale. This section reviews key literature relevant to the outsourcing decision. It highlights both the potential complexities of outsourcing and the limited conceptual development of the topic within the current management accounting literature.

The management accounting literature on outsourcing decision-making is firmly rooted in the calculative rational choice model. Higgins (1955) and Gross (1966) stress the importance of proper cost comparison since the lower alternative cost applicable to either make or buy is believed to have the greatest impact on management's final choice, simply for the reason that the company's main objective is to maximise long-term profit. The cost comparison also plays a dominant role in the textbook treatment of make-or-buy during the 1960s–1970s. For instance, the early versions of *Cost Accounting—A Managerial Emphasis* take the perspective of a manufacturer confronted with the question of whether to make or buy a product (e.g. Horngren, 1967). However, Horngren (pp. 415–416) emphasises how opportunity cost can be operationalised and incorporated into the make-or-buy analysis as the measurable sacrifice in rejecting an alternative at constrained capacity. Horngren (1967) also highlights the problems of information uncertainty and the quality aspects of make-or-buy decisions, but he provides no explicit directions on how they should be incorporated into the analysis. Moving to more recent times reveals that the textbook treatment of make-or-buy in management accounting has remained almost identical to that of the 1960s–1970s. Indeed, the treatment in Horngren et al. (2005) has only been extended to consider activity-based costing in determining the relevant cost of the make alternative. Still, the integration of qualitative and strategic factors into the costing analysis is largely ignored and remains an understudied subject in the accounting literature.

In the business literature, in contrast, we see an emergence of several theories of the firm taking a systemic rational approach on outsourcing decision-making (Williamson, 1975; Porter, 1980; Wernerfelt, 1984; Prahalad & Hamel, 1990; Barney, 1991). One example of this approach is transaction cost theory (Williamson, 1975, 1979, 1981, 1985) which has implications for cutting operational costs and obtaining efficiency and competitiveness by contracting out non-core business processes. The preferred sourcing alternative is the governance structure that minimises the combined production cost and transaction cost. Indeed, Williamson defines transaction cost to be the cost of planning, adapting, and monitoring task completion under alternative governance structures (, p. 2). Therefore, when outsourcing decision-making is framed by transaction cost theory, the fundamental unit of analysis becomes the individual transaction and the costs of making this transaction under either make or buy. The literature on the total cost of ownership offers prescriptive guidelines as to the way transaction costs can be incorporated into the costing analysis in outsourcing decision-making (Ellram, 1993, 1995; Ellram & Maltz, 1995). But it still remains generally unclear how a cost estimate based on total cost of ownership impacts the outsourcing decision-making process in a transaction cost economics context (Nielsen, 2012).

The industrial view of managerial decision-making is also within the systemic rational genre (Porter, 1980, 1985). In this view, cost efficiency is no longer the main objective of outsourcing. Rather, companies outsource in pursuit of external skills, competences and knowledge to enhance the value of more complex and strategically important organisational processes. In the industrial view, the fundamental unit of analysis for outsourcing decision-making is the economics of the individual entity. Costs may still play a part in deciding between make and buy, yet the intangible, strategic aspects arising from a combination of external industry conditions and internal company circumstances are incorporated into the decisional context in a much more structured way than found in conventional management accounting analysis and are thus given a more central position in the overall analysis. The value chain framework following from the industrial view has, however, been incorporated in the management accounting literature under the name of strategic cost management (see e.g. Bromwich, 1990; Shank & Govindarajan, 1989). Generally, strategic cost management embraces the idea of incorporating strategic reflections on competitors, customers and suppliers into cost analysis to contribute to the development of superior strategies that can

theory is concerned about designing incentives for self-interested individual agents to provide accounting information for accomplishing decision-making in goal coherence with the principal (Demski, 1980).

³ A more comprehensive review of the outsourcing literature can be found in Nielsen (2012).

help the company to gain sustainable competitive advantages. Nevertheless, in the management accounting literature this idea has, so far, only been sporadically touched upon in case study illustrations while a comprehensive scholarly work linking strategy and accounting at a theoretical level has still to emerge (Shank, 2007; Langfield-Smith, 2008).

Finally, the boundaries of the firm can be defined by the resource-based view of the decision (Barney, 1991; Conner, 1991; Prahalad & Hamel, 1990; Wernerfelt, 1984). Here, the combination and deployment of resources internal to the firm are highlighted as the key drivers of firm profitability and strategic advantage (Barney, 1991; Conner, 1991; Prahalad & Hamel, 1990; Wernerfelt, 1984)⁴. A resource with the potential to create sustained competitive advantage for the firm must not be outsourced. The resource-based view represents a further level of abstraction to those of transactions and activities. Its adoption implies that the intangible, strategic aspects are emphasised as the most important factors when deciding in favour of make or buy. However, only rather vague reflections on accounting are available in the prior literature in relation to the resource-based view (e.g. Bromage, 2000; Kralovetz, 1996; Rogers & Blenko, 2006; Stacey, 1998).

The review of the literature above provides evidence that, as the fundamental unit of analysis has increased in complexity with the emergence of new and more strategically focused theories of the firm, the costing analysis portrayed in the management accounting literature has not changed significantly and has, therefore, gradually lost ground as an outsourcing decision support instrument. Strategy based theories of the firm have come to dominate the management literature on outsourcing decision-making, yet management accounting's role is underdeveloped and does not offer much guidance on how to be used in combination with the more complex treatment of outsourcing decision-making found in these management theories⁵. Overall, the systemic rational approach has come to dominate the management literature while the calculative rational choice aspect has retained its primacy in management accounting.

Thus, the review of the outsourcing literature exposes a need to explore other types of decision models that can overcome the short-comings of the existing calculative rational choice approach. A study of how the outsourcing decision-making process is done in practice can provide a starting point for developing such models through a process of induction from the empirical evidence.

3. Research method

Given the aim of understanding outsourcing decision-making processes in established and successful organisations, the research approach adopted in this paper is inductive and practice-oriented. Consequently, an important dimension of the study was to obtain rich data on how outsourcing decisions took place in the case companies. But we are concerned not only with depicting the structural steps of the outsourcing decision-making process, but also with the organisational managers' intentions, reflective thinking and action in relation to the decision-making process and the incorporation of management accounting information into it.

Ontologically, we consider an organisation as a social construction created by human beings (Arbno & Bjerke, 1997; Nørreklit, Nørreklit, & Israelsen, 2006; Nørreklit, Nørreklit, & Mitchell, 2010). Individuals and groups of individuals have ways of understanding and thinking through which they alone respectively together create and control activities in interaction with the particular social and material environment. Making cooperation possible, organisational managers aim to organise a common way of understanding and thinking to be shared by a group of employees in relation to the particular tasks of their activities. Conceptual models for decision-making are tools that can help managers to organise a commonly functioning practice. However, there is no one to one link from theoretical modelling to practice modelling. The dominating managers' way of understanding and thinking shapes not only the types of decision model that are used but also how they are used. Whether the managers' conceptual model of understanding and thinking shapes an effective functioning decision model in a particular organisation depends on the model's ability to encompass and hence facilitate management of a complexity of the vital material and human matters that comprise the organisation and its environmental "situation" (for further elaboration see e.g. Nørreklit et al., 2010; Nørreklit, Nørreklit, Mitchell, & Bjørnenak, 2012). There are different paths to obtaining a functioning result in a particular situation, i.e. equi-finality rather than one optimal model to be derived from specific contingencies (Arbno & Bjerke, 1997). Functioning practice is not given by nature and cannot simply be managed from the vantage point of certain contingency factors.

The focal point of our study is therefore the dominating managers' ways of shaping, reflecting and creating meaning of the decision-making process in relation to the environment. As these individuals' ways of understanding and thinking do not exist objectively in the world, we excluded a positivistic research approach. Instead, elements of an actor-based research method were employed to ensure sufficient detail in the descriptive material collected as to ways of thinking and acting by the organisational members within the space of the outsourcing decision (Nørreklit, 1986; Arbno & Bjerke, 1997). The

⁴ Also taking a resource-based view, the mainly consulting-oriented literature on the core competence approach (Peters & Waterman, 1982; Prahalad & Hamel, 1990) argues that the company has to obtain, create and develop certain capabilities in order to stay competitive (McIvor, 2005). Organizations should focus on core activities while simultaneously leveraging external resources and capabilities (e.g. Peters & Waterman, 1982; Prahalad & Hamel, 1990).

⁵ Also, the literature concerned with outsourcing decision-making relations has paid only minor attention to the factual decision-making process (Langfield-Smith and Smith, 2003; Meer-Kooistra and Vosselman, 2000; Nicholson, Jones, & Espenlaub, 2006; Seal, Cullen, Dunlop, Berry, & Ahmed, 1999; Thrane & Hald, 2006; Widener & Selto, 1999).

ambition of the actor-based research method is not to test a hypothesis or an a-priori theory or model, but to obtain insight into the particular type of engagement and model of thinking that govern individuals and group of individuals.

An actor-based method involves interaction, reflection and conceptualisation. Applying the actor-based method consists of three iterative phases: (1) pre-understanding, (2) understanding and (3) post-understanding. Throughout this process, we as researchers alternate between interacting and reflecting over the collected material (Arbner & Bjerke, 1997, p. 9) with an aim to obtain a penetrating conceptual insight of the study phenomenon. We collected data primarily through interactive interviews, which, at least partially, enabled the capture of the companies' complex decision-making processes as represented by the governing managers' way of perceiving and thinking about that process (Arbner & Bjerke, 1997, p. 16; Nørreklit, 1986). The research methodic (the structuring of the project from research ambition to conclusion) and the use of methodical procedure (the way in which the creator of knowledge incorporates research techniques in the various stages of the methodic) are explained below.

3.1. Pre-understanding: Background study and case selection

From the very beginning, the focus was kept on uncovering the outsourcing decision-making process in two case companies which had extensive experience in outsourcing. However, the preparatory phase involved reviewing the prominent thoughts on outsourcing found in the strategy and accounting literature (e.g. Porter, 1985; Barney, 1991; Prahalad & Hamel, 1990; McIvor, 2005). The debate on outsourcing in professional magazines and regular newspapers (e.g. Ho-Lanng, 2009; Monahan, Bossche, & Tamayo, 2010; Weiss, 2010) was also examined. Furthermore, to refine and reflect upon our theoretical framework from intelligence on practical outsourcing, we conducted semi-structured background interviews with key employees in three consulting firms. These interviews were only used as pre-understanding for shaping our interview guide and have not been included in the analysis presented in this paper.

The background studies emphasised that outsourcing decision-making in contemporary companies is not simply based on a comparison between internal costs and quotation prices of a component or service. Instead, it rests on a complex, interdependent process of problem-solving that links the domains of strategy and management accounting together. In this paper, we therefore conceptualise outsourcing decision-making as the decision process that shapes the company's entire supply chain configuration for a given product and determines whether individual parts or services are to be kept in-house or contracted out. That is, it is a set of interrelated make-or-buy decisions that need to be processed in combination and in interaction with strategy. Accordingly, it represents a complex decision situation where a collective of individuals are involved in the development and use of accounting information in relation to a strategic choice situation.

Also as part of the pre-understanding stage, we searched for case companies. The two companies SWE and DEN were chosen as case companies for several reasons. First, SWE was selected because outsourcing was planned to play a particularly decisive role due to the significant size of the company and because a new corporate strategy launched in 2010 intended to clean up the organisation and focus the company on its core activities. Interviews were held with key SWE staff members on the outsourcing decisions involved in this new strategy. Additionally, left with a fundamental restructuring problem where many outsourcing decisions were directly related to the core of the business, SWE made an interesting counterpart to DEN. DEN was chosen because it is a company of high reputation and considerable size with extensive experience in strategic outsourcing and offshoring. It has also performed relatively well over a long period of time, thus signaling an ability to swiftly adapt its supply chain to changing industry conditions. Furthermore, good access was available to detailed company information. Specifically, a close contact at the company helped us identify and gain access to senior staff members who had leading roles in the company's previous and current outsourcing engagements.

3.2. Understanding: Two case studies

Given the nature of the phenomena under study, semi-structured, interactive interviewing was used to gather data. The interviewees were all allowed some freedom to explain their thoughts on the outsourcing decision-making process and to emphasise their areas of particular interest or expertise. The interactive form of interviewing made it possible, through dialogue, to be open to the particular case company's way of reasoning around outsourcing decision-making. Moreover, the form made it possible to question certain responses in greater depth to fully capture the complexity of the issue.

All of the information collected in the pre-understanding stage, as well as available background information on the cases, led to the design of the interview guides for our two case studies. Appendix 1 provides an example of an interview guide used for SWE and DEN. The questions listed were used to direct attention in order to ascertain that every key issue was discussed. Overall, the interview guide was carefully directed towards the main issue, identifying the nature of the outsourcing decision-making process. Based on a two-part grouping of questions, the first part was concerned with the company's strategic framework while the second part focused on the outsourcing decision-making process and the collection and use of accounting information. At the end of the interview, interviewees were deliberately encouraged to raise additional issues not previously addressed in the interview to make sure that no important pieces of information had been left out. Internal documents describing the decision-making process and publically available documentary company information were also provided to us.

In both DEN and SWE, interviews were conducted on site with two senior managers with significant involvement in their companies' outsourcing decision. Both of the case company interviews were conducted one day at each company site

in spring 2010. The interviews in each company lasted approximately three hours and were subsequently transcribed for sign-off by the interviewees⁶. No major disagreement was apparent between the interviewees.

3.3. Post-understanding: Conceptual framework and research questions

In the phase of post-understanding, we were concerned with diagnosing the theoretical aspects of the findings and inducing notions of the way in which management accounting was involved in the actual outsourcing practice. Although, clear, a priori, about the focus of our study, the conceptual framework for interpreting the case study material was phenomenologically based, meaning that the theoretical framework explaining the observations was chosen inductively from the empirical data outlining the decision-making process (Strauss & Corbin, 1998).

In consequence, the cases were analysed by identifying the structure that organised the decision process as well as the generation and use of accounting information within the steps of the decision process. This highlighted how managers address some of the fundamental issues of information uncertainty in respect of the decision complexity and how they interact with the coalition of decision-participants. Specifically, it was apparent from the analysis that two considerably different methods of organising and effecting outsourcing decision-making exist in the case companies. Leveraging the work of Arbnor and Bjerke (1997) on business methodology, we found that the outsourcing methods in SWE and DEN were rooted in two different methodological approaches for knowledge creation: an analytical method and an actor-based method.

The paper therefore follows the view of Arbnor and Bjerke (1997) that methodology has direct implications for the judgements made and actions taken, not only in the activities of research projects, but also in the knowledge creating activities of company practices. However, the difference in methodological stand of the outsourcing model adopted by each case company has been conceptualised a posteriori by linking the company's applied reasoning for producing information for outsourcing decision-making to methods of creating business knowledge (Arbnor & Bjerke, 1997).

3.4. Generalisation

From our qualitative study, we conceptualise two methodologies for outsourcing decision-making that function in practice. It is not known how widely these specific methodologies are used nor is it possible to specify what alternative methodologies currently exist in practice. Nevertheless, by formulating an outsourcing decision-making process and the incorporation of management accounting information into it as a methodology, a depiction is created in a form that makes it possible for anyone interested to trial in another context. Thus, although the study is based on outsourcing decision-making, it is reasonable to assume that the revealed methodology can be applied to other types of decision-making situations. Furthermore, a description of the strategic and organisational context of the cases provides the reader with knowledge of the sites to which the methodologies are applied. In this way a pre-understanding is provided of whether it is reasonable for the reader to assume that "generalisation can, and cannot, be extended" to another setting (Payne & Williams, 2005, p. 310).

As indicated above in explaining the ontology of the research approach, there is not an acceptance that procedures of human practice pass unchanged from individual to individual (Barnes, 2001). It is not the same collective managerial procedures that are repeated by human beings across time and space. Rather it is individual human beings who develop their own existing knowledge about procedures and enact their local practices (Barnes, 2001). Accordingly, organisational managers will at least implicitly, always have to enact and develop a decision-making methodology in relation to the particular decision situation.

4. Empirical findings

In this section, we describe and analyse the outsourcing decision-making method in the case companies, SWE and DEN. In a manner similar to the creation of research knowledge, a methodological approach to the creation of business knowledge (Arbnor & Bjerke, 1997) involves the linking of method to the problem of investigation. Accordingly, in the case companies, strategy is used to frame the object, i.e. the outsourcing decision-making problem. Conditioned by the strategic framing of the problem, the outsourcing decision-making method for each firm outlines the structuring of the knowledge creation process for outsourcing decision-making from problem to conclusion (i.e. the outsourcing decision methodic). Using this framework, the techniques used throughout the decision process for producing and using accounting information as a basis for decisions (i.e. the methodical procedure for outsourcing decision) can be identified and appreciated in context.

Below, the empirical analysis is structured in four parts. Initially, a short case introduction outlines the contextual framing of the company's outsourcing decision. Next, we frame the knowledge creation method used for outsourcing decision-making and describe the process steps included. Following this, it is shown how accounting information is produced and used as part of the financial evaluation of decision alternatives within this outsourcing decision-making method. Finally, conclusions are drawn on each case study.

⁶ SWE did not allow us to reproduce interview quotes explicitly.

4.1. Case: SWE

4.1.1. Contextual framing of the outsourcing decision problem

SWE is a family-owned European company with approximately 29,000 employees. It develops, manufactures and sells mechanical and electronic components for several industries around the world. The company has 101 factories situated in 24 countries in addition to 139 sales companies and 470 distributors worldwide. Before 2008, the company was growing rather rapidly due to expanding markets as well as to mergers and acquisitions. However, the financial crisis in 2008 severely impacted the company's financial performance, reducing growth to only 2%, followed by a negative growth of 12% in 2009. As a consequence, the company's financial performance changed: several years of satisfactory financial results turned to losses in 2008–2009.

Until the crisis, product innovation in SWE was an unstructured and uncontrolled bottom-up process chiefly driven by the technological enthusiasm in the company (internal focus) without much consideration given to profitability. The activities were automatically kept in-house based on the unproven belief of the decentralised managers that the company's ability to handle things was superior to that of third-party suppliers. Hence, key factors in SWE's financial difficulties were the company's broad scope and manufacturing depth, as these aspects prolonged the ramp-down time of stock and machinery. Therefore, the main objective of the new strategy launched in 2010 was to focus the company on its core competences as well as to reduce the complexity of the product portfolio.

In an attempt to respond to these problems, SWE's organisational structure was changed. Before 2010, the company was organised around three autonomous divisions with a broad scope. Today, the organisation consists of two segments: one that encompasses the business activities deemed to be core areas, grouped into five separate divisions, all of which focus on developing and manufacturing communication equipment, and one containing the remaining business activities currently ranked as non-core areas of the company. Based on this new structure, the intention is to clean up the company and determine which parts of the organisation should not be kept in-house.

Overall, SWE faces a fundamental clean-up process in which the boundary discussions relate to transforming the company from being purely manufacturing driven to being a supply chain company powered by innovation. This strategic clean-up process makes up the outsourcing decision-problem. The objective is to draw up guidelines for a comprehensive clean-up in which unprofitable, feasible products already contained in the portfolio are eliminated, and the supply chain configurations for the remaining possibilities are improved.

In charge of overseeing and handling the development of a model for working on the clean-up decision problem is the corporate function *SWE Corporate Analytics* (SCA), which is governed by a cross-functional board that includes the heads of the five new divisions within the core segment along with senior staff experts in innovation, operations (supply chain), and sales and marketing. The mandate of SCA is the development and support of common tools and processes that can help systematise the analysis of whether company processes/activities should be outsourced or not.

4.1.2. The knowledge creation method for outsourcing decision-making

Fig. 1 depicts the method of SWE's clean-up process. Overall, the structuring of the outsourcing decision and the construction and use of accounting information follow an *analytical method*. The method involves analytical stages, whereby the managerial outsourcing team moves from problem definition over designing data collection procedures and collecting and analyzing data, to result through a one-way, step-by-step knowledge-accumulating process (Arbnor & Bjerke, 1997, p. 50). Through these stages, the method is concerned with observing and describing the situational components as objectively as possible using quantifiable terms whenever possible.

More specifically, to reach the strategic clean-up objective, the methodic underpinning SWE's transformation includes two phases of decision-making governed by the accounting information produced: (i) a divesting decision-making phase and (ii) an outsourcing decision-making phase.

The *first phase*, divesting, is concerned with regrouping the company's business areas into segments to identify the core and non-core business areas, respectively. The core and non-core segments are identified by assessing the market potential and profitability of the company's technological segments. This phase is a broad clean-up (elimination) process, during which many non-core business areas are sold off.

The *second phase* is focused on examining the core segments of the firm. The purpose of this phase is to evaluate the supply chain configurations for each product within the core segment and to clarify which processes/activities, when contracted out, will enhance financial performance. Solving the problem, the decision-making process follows a one-way, step-by-step knowledge-accumulating methodic (see Fig. 1). The process starts by breaking down an existing supply chain configuration for a product into the problem of evaluating the value-creating processes, based on a market view and an in-house view. The idea is to resolve the previous problems of unfocused innovation and inappropriate manufacturing depth by first identifying which customers are important for improving ongoing business. As a result, engagements with inconsequential customers are slowly phased out and handed over to other suppliers. Following this, SWE's supply chain configuration for the product is reviewed in light of the needs identified among important customers. The problem of evaluating the value-creating processes is further divided into the problem of categorizing activities as being either generic or capable of providing differentiation. Finally, a make-or-buy analysis is broken down into concurrent studies of costs, technology, competences, and manufacturing and logistical flow, along with risk. Complex quantitative information is constructed as different supply chain configurations

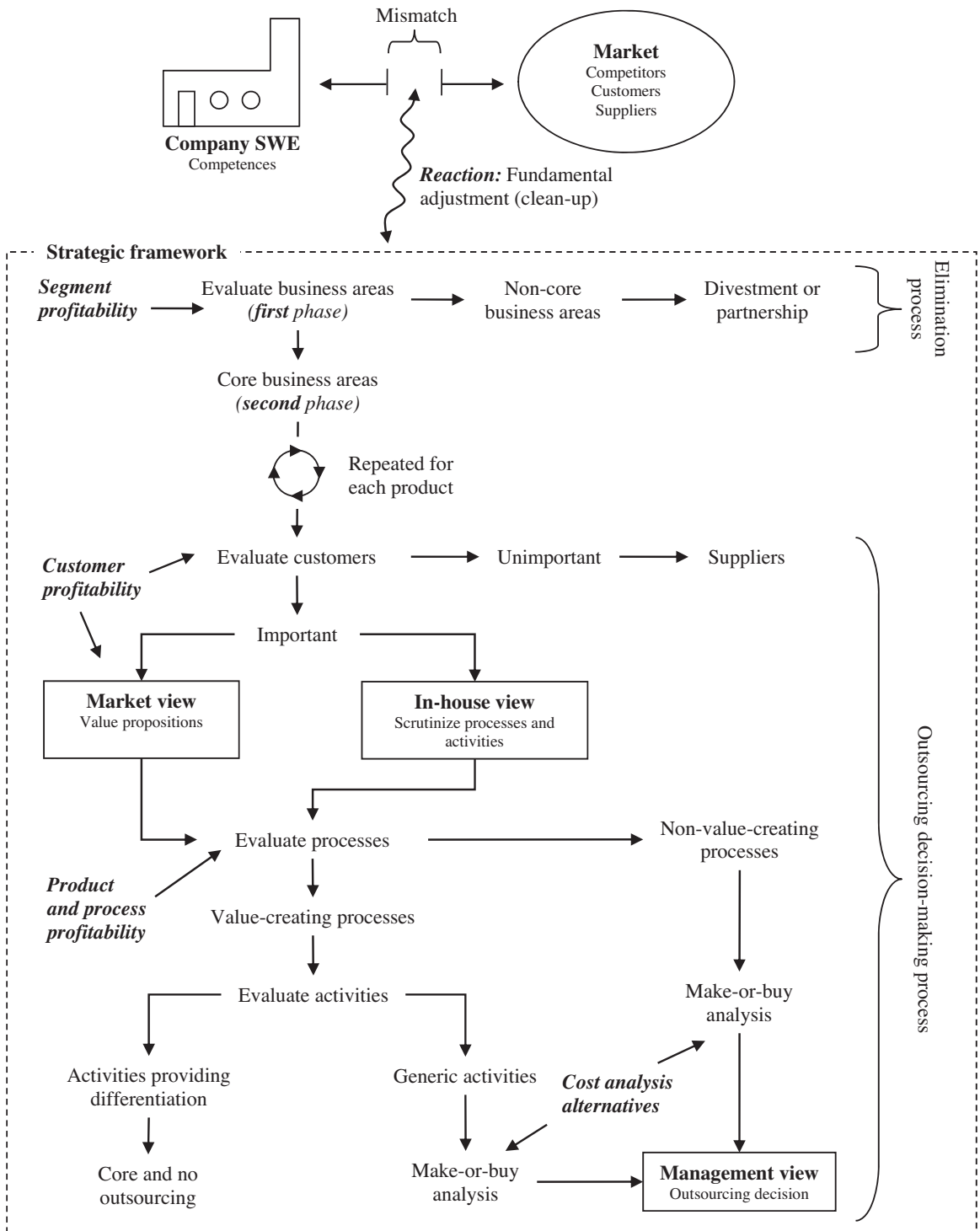


Fig. 1. SWE's divesting and outsourcing decision methodic.

are simulated and evaluated in the make-or-buy analysis. Finally, this information is reported to the board of directors, which uses the information to make the definitive decision on how the supply chain is to be reconfigured for the given product.

4.1.3. The decision method's production and use of accounting information

As indicated above, various forms of accounting information and techniques are used in the successive stages of analysis. The company has established fairly advanced costing and data capture methods throughout the manufacturing process.

Thus, the company uses activity based costing principles to assign substantial overhead costs to cost objects. For example costs of goods sold (COGS), defined as the costs attributable to the production of the goods sold, include both the direct costs and the overheads that can be linked to the production of the goods. Also, the electronic information system SAP provides a wide range of information, including accounting information. Consequently, historically based cost analysis can be carried out with high precision. At no stage is the accounting department directly involved in the outsourcing decision-process. However, it is involved in the development and maintenance of the accounting information systems which are utilised by those making the outsourcing decisions. Fig. 1 gives an overview of the various steps in these decisions and indicates the use of accounting information at each step. Below, we elaborate on the content of each step in more detail.

Entering the first phase, the accounting contribution is based on the establishment of conventional key financial indicators (ROI, EBIT/net sales and market potential) to be used in justifying the elimination of non-core business areas.

Entering the second phase, where focus is on the core segment, the revenue size, turnover ratios and profitability of the customers are evaluated to help identify which customers are financially important and should be the future centre of attention. Based on this financial analysis rooted in accounting information, non-significant customers are passed on to distributors. As a result, complexity is reduced while the key customer base is maintained.

Following this, the selected customer base is analysed from a *market view* (see Fig. 1) as value propositions are developed for each customer category to pinpoint essential needs along with the most appreciated features in the current product portfolio. Thus, product turnover ratio, sales volume and profitability are used as a means of identifying purchasing preferences. Furthermore, customers in the various customer categories are interviewed and asked to complete questionnaires to clarify their specific needs and help uncover the common trends among larger customer clusters. In this way, the reasons why customers buy SWE's products and the features they are willing to pay for are explored. Also, effort is spent on untangling the sales interdependencies between different products.

Building on the value propositions developed, an *in-house* view of company processes and activities is taken (see Fig. 1). In particular, it is determined which processes (e.g. machining, manufacturing or logistics) are vital in delivering the perceived customer value. This includes a qualitative assessment of how tightly the processes are linked to the value-creating features identified in the value propositions. The processes labelled as non-value creating are immediate candidates for outsourcing whereas the value-creating processes move on to yet another round of analysis. In this second round, attention is paid to the activities – or competences – within the processes for the purpose of pinpointing those providing the company with *differentiation* compared to that of competitors. More specifically, each activity is evaluated against the supplier market to determine whether it is firm specific or readily available and thus *generic*. If it is generic, the activity will be carefully considered for outsourcing.

Consequently, a *make-or-buy analysis* of whether an activity should be outsourced can be applied to both non-value-creating and value-creating generic activities (see Fig. 1). Essentially, SCA attempts to model SWE's supply chain configuration as it would look under the make alternative or the buy alternative, respectively. Initially, the focus is on the cost side where the cost of goods sold (COGS) is estimated if the generic or non-value-adding activities are kept in-house. In this respect, a detailed analysis of the in-house costs is prepared, specifying the effect on direct labour, raw materials, overhead costs and on the balance of variable and fixed costs related to the production. Leveraging activity based costing principles, overhead costs are allocated to activities which do not provide differentiation for SWE, i.e. generic and non-value-adding activities. Following this, the market is screened to determine the COGS if the activity is outsourced. Consequently, suitable suppliers are evaluated on the basis of a thorough analysis of the total cost of ownership (TCO) established from quotation prices and workshops with the suppliers involved.

Since freeing up financial resources currently tied to the labour and capital used for in-house production makes the company more flexible, outsourcing is seen as a strategic instrument that can help transform parts of COGS from fixed into variable costs. Therefore, as part of the cost analysis when modelling the supply chain configuration of the make and buy alternatives, SCA has developed econometric models for estimating the *cost of being flexible*. Specifically, this involves analyzing the cost of reaction time when production needs to be ramped up or down to meet fluctuations in demand. For instance, in considering ramping down, SCA takes into account such factors as severance fees and redundancy costs to employees laid off. Where appropriate, attention is also directed to calculation of the costs of closing a factory.

Adding to the costing analysis, a *qualitative assessment* is made of the loss or gain in technology and competences along with the impacts on the logistical and manufacturing flow through the supply chain. In relation to this, SCA has developed a number of tools for weighing the information produced for these intangible aspects equally with the cost analysis. For instance, in considering outsourcing of a factory's activities, employees or other stakeholders with expert knowledge on relevant issues (e.g. logistics, manufacturing, sales and marketing or management) are asked to fill in a questionnaire concerned with the importance of the qualitative aspects as well as the costs for a concrete outsourcing situation. Specifically, the questionnaire is based on a Likert-scale scoring system, for which the meaning of the numerical levels is carefully defined and explained to the respondents in advance. The results of the questionnaire are subsequently discussed at a forum during which each respondent is asked to justify and explain his/her particular answer on given issues in front of the other respondents as well as a selected group of outsiders invited for the purpose of challenging the scores from an external and independent point of view.

Based upon the results of the questionnaire, a final score is calculated for each of the intangible aspects and cost aspects as relative weights are assigned to the individual questions. The final scores thereby indicate the relative importance of the separate aspects in the concrete make-or-buy situation.

Finally, since SWE seeks to anticipate the optimal response strategy, the outsourcing analysis includes a *risk assessment* of outsourcing a particular activity/process. In this respect, a significant risk of outsourcing can be supplier dependency if opportunism comes into play. Consequently, SWE attempts to safeguard against this risk by diversifying the outsourcing of a part (e.g. of the factory's activities/processes from before) to several suppliers or the knowledge involved in an activity/process to several places. However, it also entails keeping certain generic activities or non-value-creating processes in-house just to maintain control of the supply chain. Still, this is a risky situation since reducing supplier depth is also a priority. Accordingly, the company looks for suppliers with whom it can build long-term partnerships that will enhance productivity as well as reduce the risk of opportunism.

In total, the information produced from the make-or-buy analysis quantifies the multifaceted consequences for the supply chain configuration for the particular product/process, should this activity/process be outsourced. For this reason, the final outsourcing decision on the supply chain configuration is made by the board of directors at SCA based on the accumulated material from these make-or-buy analyses (i.e. the *management view* in Fig. 1). Nevertheless, during the conclusion of the decision process, it is recognised that any member of the board may bring "special" knowledge to the table conflicting with the information already produced by SCA. For the board to include this information as a part of the basis for the decision, however, the arguments have to be substantial.

4.1.4. Conclusion SWE

The case emphasises that the outsourcing decision should not simply be treated as a discrete event. In SWE it is constituted as part of a carefully staged methodical process that is analytical in nature. Outsourcing decisions at SWE are, therefore, part of a highly structured process designed to support current strategic objectives. The process is logically staged through a one way, step-by-step analytical knowledge accumulating process and draws upon established information set to support the decision maker. Formal and practiced evaluation occurs at each stage and leads ultimately to the decision outcome. Thus, at the core of this process is a fundamental belief that the best decision information is derived when detached from the individual's subjective experience and engagement. In short, this process is concerned with techniques for the establishment of facts.

Accounting information features in several ways and at different stages in this process. In the early stages, when uncertainty is high, it is used to identify the sources of value creation in the company. Customer profitability analyses are used to pinpoint customers that must be retained and lead to a search for the internal activities that are important to them. These activities are key revenue drivers and preserving them becomes a priority. It is thus unlikely for these activities to become outsourcing candidates. However, activities not linked directly to market success are highlighted for outsourcing consideration. In this way, accounting information is used to direct the attention of management and trigger outsourcing decision targets. At the stage of making outsourcing decisions, accounting information also features. Conventional revenue and cost implications are identified. Costing features as a key support system for the decision and the use of activity-based costing principles are partly driven by the strong focus on accuracy in identifying avoidable costs (Shillinglaw, 1972). Special simulation-driven analyses are also conducted to estimate revenue impact and additional increments/savings in costs when assets are disposed of following outsourcing (e.g. factory and building closures).

SWE illustrates Horngren's (1967) recognition that non-financial strategic aspects of the make or buy decision are needed to supplement the conventional accounting analysis. The decision situation at SWE is profiled by an information set relating to considerations such as quality, competence preservation, customer service and retention, risk alongside cost and revenue impact. To facilitate judgment, given the range and possible disparities in this information set, subjective but managerially agreed weightings have been developed for each component. The accounting analysis is rather conventional (although also modern in the sense of using the contemporary ABC approach) but it is only one consideration and does not dominate the decision. It is quite possible that a decision taken will not be that indicated by the accounting figures alone. Thus, accounting information plays an important but not defining role in the outsourcing decision.

Finally, it is notable in SWE that accountants are not directly involved in the outsourcing decisions. They simply provide information as requested by the managers directly involved in the decision and their role is thus to maintain the accounting information system rather than use its outputs. It is the decision makers who drive the information supply in SWE. Thus, the accountant subscribes to a neutral position as advocated by the analytical method.

4.2. Case: DEN

4.2.1. Contextual framing of the outsourcing decision problem

DEN is a large Danish company with approximately 7500 employees that sells products and services to people with medical problems in more than 65 countries. Its primary shareholder is a family fond, established by the founders of the company, which currently owns 46% of the shares corresponding to 68% of the total shareholder votes. For more than half a century, the company and its employees have developed core competences and technologies around the core value of making life easier for people with a particular illness. In addition, sustainable profitability and operational stability are core values.

The company is structured around four main executive areas: (1) *Global R&D* with responsibility for developing new products and services; (2) *Global Operations* comprising all manufacturing activities along with the logistics and the design, assembly and technical maintenance of machinery; (3) *Global Marketing* with the primary responsibility of obtaining

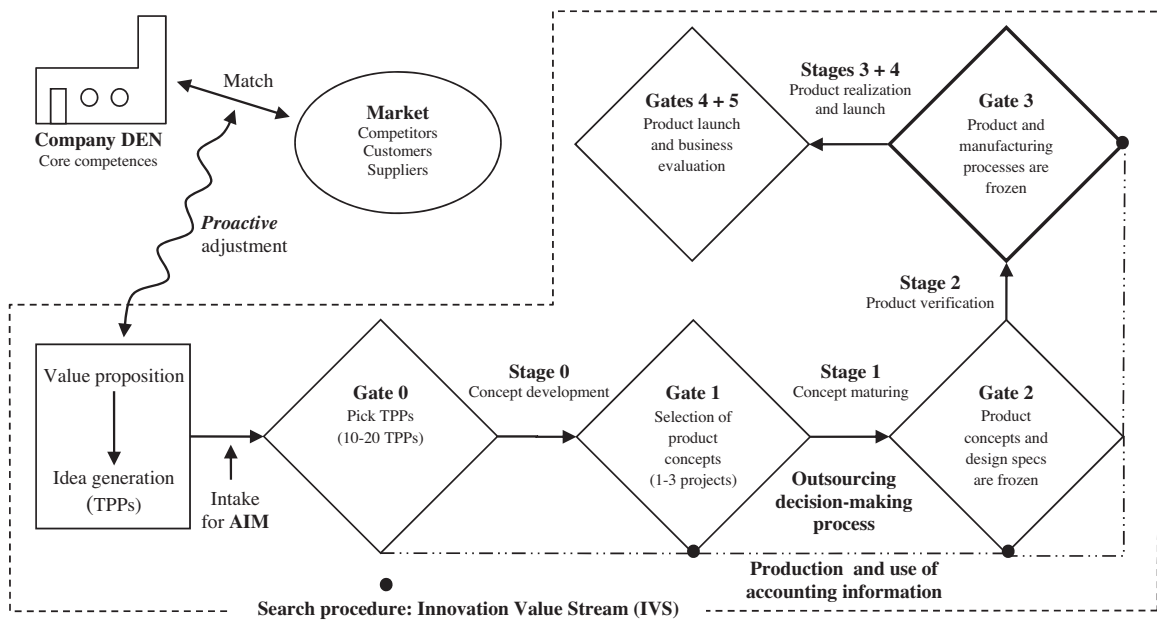


Fig. 2. DEN's innovation and outsourcing decision methodic.

feedback from customers and developing strategies for future product launches; and (4) *Sales Region* focusing on sales, export and customer services worldwide. The core values are an integral part of communication and reflection at all areas and levels in the company.

The total sales can be grouped into three main business areas, each of which is characterised by steady growth and high customer loyalty. The forecasting of future sales for already established products can thus be done rather precisely. Furthermore, most of the products sold are publicly subsidised, which explains why fierce price competition is largely avoided. Manufacturing in DEN takes place at its facilities in Denmark, Hungary, China and the US. As such, the production facilities in Denmark and the US – known as *Technical Competence Centers* (TCCs) – are primarily intended for the research and testing of new products on a small scale requiring the design and assembly of prototype machinery. Once product development has been completed and the production processes have been thoroughly tested, production is normally moved to China or Hungary and increased in scale.

DEN makes use of outsourcing when establishing the supply chain configuration for a newly developed product. The boundary discussions are shaped by a self-perception within the company that revolves around the core competence approach and the idea of being innovation driven. Products produced around core competences are highly profitable, and the opportunity costs of outsourcing these competences are considered to be unacceptably high.

Building on the core competence approach, an Innovation Value Stream (IVS) is in place to ensure a structured facilitation of product innovations related to the core competences, matching the company's overall strategy. Essentially, the IVS is a funnel that structures product development from the early stages of idea generation to the final stages of full scale production of a single product. It is during the IVS funnel that outsourcing becomes a relevant instrument to consider as the company plans the future supply chain structure for manufacturing and distribution. In particular, preliminary reflections on outsourcing have already been made in the early phase when ideas are transformed into concepts, and they are further substantiated as the concepts mature into a single product ready for manufacturing. It is therefore essential to understand that DEN makes use of outsourcing in a very proactive way due to the continuous strategic adjustment function that the IVS funnel serves.

Overall, outsourcing decision-making is thus an integral part of DEN's self-perception as a company propelled by innovation from its core competences aimed at constructing technically and commercially feasible and profitable product solutions. In what follows next, we will elaborate on how the outsourcing decision is framed and analysed in DEN, and how accounting information is produced and used in support of the decision.

4.2.2. The knowledge creation method for outsourcing decision-making

Fig. 2 illustrates the main characteristics in DEN's perception of itself and its business environment (i.e. constructed strategic problem) and how the IVS funnel is intended to help adjust the company to the current market trends by means of identifying supply chains that can underpin core competence-driven innovations. A new development project sets off with Target Product Profiles (TPPs), which specify the needs and potentials that the products are expected to satisfy/target if manufactured. Every quarter, an intake of ideas is made among the TPPs, and the ones selected subsequently enter a so-called *Accelerate Ideas to Market process* (AIM) within IVS, which divides the product development into five manageable

stages: concept development, concept maturing, product verification, product launch and realisation. As an integrated part of the innovation process, the outsourcing decision-making method takes place in several reflective stages and relies on knowledge of the production process that aims to reach successively higher states of knowledge certainty (Arbnor & Bjerke, 1997). In effect, both the innovation process and DEN's outsourcing decision-making method are rooted in an *actor-based approach*⁷. Specifically, product development comprises several stages of reflective and iterative activities in which the employees involved aim to construct realistic possibilities and delimit the non-real possibilities. At the initial stages of the funnel, great uncertainty exists with respect to product specifications, thereby leaving many open-ended questions on both the supplier side and the customer side. However, the innovation project becomes increasing factual as it is continuously shaped and refined at the different stages of the innovation funnel. Throughout the entire decision process, focus is on the assessment of not only operational feasibility, but also financial feasibility of possible product constructs. Indeed, and most basically, the IVS funnel is all about a coalition of employees making a product work.

During the stages of the IVS funnel, the activities are organised around cross-functional teams, in which the individual actors' expertise and reflections in interaction with others get involved in the construction of possible products fulfilling the core values. The teams' establishment of organisational knowledge, including accounting information for decision-making, is organised around the following three integration processes: subjectification, externalisation and objectification. Specifically, as a point of departure, each team member (actor) brings to the table specialised expertise, observations and experience from previous engagements—all of which shape their personal view of the project and decision information (*subjectification*). In interaction with others, a process of *externalisation* occurs in which the various understandings of the project, including information such as sales and cost estimates on sales as well as product specifications, are *communicated* and challenged individually and in comparison with each other. In this way, the individual participant's understanding of the project situation is advanced through dialogue and reflection. The team members are creatively, logically and factually challenged to form conceptual models and then to test them against their current understanding and observations of the company situation. As an outcome of the process, project specifications and information become *objectified* as a set of organisational beliefs and knowledge systems that become established. Accordingly, this knowledge can be used for decision-making at the subsequent gate and as a starting point for the initiatives taken during the next stage.

Moreover, to ensure ongoing quality control, every stage is succeeded by a decision gate at which the project is reviewed by a cross-functional group of senior staff members from each executive area. A critical evaluation takes place related to whether the technical product requirements, financial objectives and core values are in accordance with those that have been set out as objectives. If a project does not meet the financial objectives at a gate, it will not move on to the next stage. Either the project will be cancelled or sent back to earlier stages for further development. Accounting information is given great importance in DEN as it can veto the progress of an outsourcing proposal. Also, the objectified information of an earlier stage is questioned at later process gates. At the initial stages, the accounting data is very uncertain, but as the project is shaped, the data becomes increasingly factual. Overall, the innovation process, the construction of outsourcing alternatives and the production of information can be defined as part of a reflective learning process. Accordingly, due to uncertainty embedded in the projects, a major challenge is to establish credible information for decision-making at each gate. In what follows next, we outline how a team of decision-participants produces accounting information with ever increasing diagnostic certainty for use in decision-making about the financial feasibility of product alternatives through the entire IVS funnel.

4.2.3. The outsourcing method's production and use of accounting information

In the IVS funnel, DEN draws on accounting information at each of the innovation stages. For decision-making at each gate, a financial model is used to calculate the financial implications. The model is used for all types of decisions (e.g. buying new machinery, evaluating an investment project or outsourcing a product) and has been developed by the Accounting Department in collaboration with Global Operations, which means that the parties agree on the validity of the tool. The model normally outlines three alternatives for a time period of 5–10 years: (1) the proposal, (2) the "as is" situation, and (3) the best alternative proposal. The model includes key accounting figures such as changes in revenues and direct costs, impact on cash flow, net present value and rate of return as well as incremental gross profits. The direct cost is based on all direct variable costs related to materials/components and labour hours used along with wastage rates. The volume estimates are updated as the concept passes through the decision gates in the IVS funnel and materialises into an actual product.

Specifically, a high-level business case is outlined as soon as a TPP is selected for the AIM process within the IVS funnel. Thus, at the intake for the AIM process (decision gate 0), approximately 10–20 TPPs are selected, based on an early evaluation of attractiveness that focuses mainly on a preliminary individual sales forecast, the resources available for R&D and a narrative expression of the TPP's fit with the overall corporate strategy.

During stage 0, prototypes of the product concept as well as the required manufacturing machinery are developed and tested for each alternative. The results from these prototype tryouts are used to revise and elaborate on the business case in order to describe the revenue and cost implications as bases for the performance expected for each project. The evaluation criterion is a target cost profile, determined at a higher level in the organisation, specifying the contribution margin required in order to ensure profitability when additional overheads (e.g. marketing) are accounted for later on.

⁷ Overall, the innovation process sets out with a pre-understanding of the project, which is followed by reflective processes of understanding, objectifying and materializing the project, and ending by an evaluation of a product that makes up the post-understanding.

In particular, when determining the revenue side of the business case, Global Marketing cooperates with the sales regions to prepare early country-specific forecasts of the expected sales volume if the product concept were to be brought to market. Thus, sales estimates are produced by local sales personnel. Also, a group of statisticians and market modelling experts repeatedly assess and challenge these estimates for every country using hard-headed analyses based on historical market trends for similar products. The two views are fused and the sales forecast is advanced through reasoning and reflection (externalisation) intended to produce a forecast one can agree is realistic (objectification):

That is, they [statisticians and market modeling experts] would say: You [Global Marketing] have estimated that England can have an uptake of the product looking like this. If we consider the launch of earlier products with similar characteristics, we can see that we usually have an uptake that looks different. Why is it that this product can have a greater uptake—do you consider this to be realistic? Hence, Marketing needs to investigate this and explain why exactly this product will have a better uptake than the last three products launched within the same area (key employee in Global Operations).

Global Operations starts in stage 0 to prepare the costing side of the business case to provide an early indication of whether the concept at hand can ever be produced at reasonable costs. At this stage, the direct cost estimates are largely determined in collaboration with the TCCs by engineers, who develop the machinery for manufacturing the concepts since they have extensive knowledge about output per hour as well as number of people needed to operate the machines and handle the product throughout the manufacturing process. The accountants are involved as sparring partners when cost-estimates are made. Specifically, two different costs are usually calculated to imitate both the early phase in Denmark, when the product is manufactured in small numbers, and the final phase, when the production is moved to facilities in either Hungary or China and increased in scale.

Furthermore, the supply chain department is charged with obtaining offers from alternative suppliers for each non-core item considered for outsourcing. Hence, already at stage 0 in the AIM process, Global Operation employees interact with engineers to simulate several configurations or scenarios of the supply chain to get an indication of which parts of the production could potentially be contracted out. In this respect, the target cost profile and the estimated cost price of the concept play important roles.

Additionally, safeguards are put in place to ensure that no elements of high strategic importance nor directly related to the core competences are suggested for outsourcing and that only proficient suppliers are chosen as outsourcing partners. Relatedly, the strategic decision to protect core values essentially specifies the parts of the supply chain that are to be exempt from further outsourcing analysis. Additionally, the potential risk of becoming too dependent on a supplier that might even turn into a competitor later on is assessed. Still, although taken very seriously, the prevailing understanding within Global Operations is that this kind of risk is difficult to quantify and for this reason the considerations are kept very simple.

Risk is evaluated on the basis of a very simple little matrix that measures business impact and probability. That is, you can invent all kinds of complicated tools, but the result is never better than the inputs used. And presumably these inputs are relatively uncertain in either case (key employee in Global Operations).

This should be considered in connection with the fact that DEN has a long history of working with the same suppliers on many parts, which naturally reduces the risk of opportunism. In this manner, several make-or-buy decisions are predetermined and can be settled early at stage 0.

Subsequently, the business case developed for each product concept is assessed at decision gate 1. At this stage 1–3 concepts are selected for further maturing within the AIM process and the profitability of the product concepts is brought into clearer focus. A concept that is not profitable is given up or is sent back to stage 0 for further development.

Essentially, stage 0 is repeated during stage 1, i.e. where the concepts are refined and matured to provide better and more realistic estimates of the aspects in the business case including the calculation of the financial implications. Thus, the stage entails updating the volume estimates and revisiting the planned configuration of the supply chain and the parts intended for internal production. The interaction between actors (externalisation), including external suppliers, is used to increase the realism of the information produced for decision-making. It allows for a meaningful reduction in the complexity and number of decision parameters to be considered as the parameters are reflected upon from different angles and weights against each other.

At stage 1, the decision of keeping core competences in-house is chiefly of a strategic character. The considerations on whether to make or buy non-core competences and technology are, by and large, based on a traditional comparison of in-house production costs with supplier quotation prices. Also at this stage, idle-capacity is taken into account when considering whether to make or buy non-core competences.

At decision gate 2, the number of concepts is narrowed down to one and the design specifications are frozen while parts of the supply chain are put in place. Again, if the design is not profitable, it is either given up or sent back to an earlier stage for further development. After gate 2, the product design is verified from a technical as well as business perspective. Additionally, the process specifications for manufacturing are finalised and the financial model is revised based on updated specifications and estimations. Consequently, at decision gate 3, all product and manufacturing process specifications are locked in, equipment for in-house production is procured and supplier contracts not already established at decision gate 1 or 2 are settled. In this respect, decision gate 3 represents the point of no return. It is where the money is committed.

Gate 3 coincides with stage 3, when actual production capacity is purchased, the supplier contract made and the manufacturing of products is started. However, realised sales remain unknown until after the supply chain structure has been affected. Because sales affect cost structure, some uncertainty remains. Therefore, to reduce the risk of choosing an improper supply chain setup scaled for a production level that later on turns out to deviate from actual demand, and to decrease the uncertainty of the sales forecasts, DEN deliberately tries to delay the “full-blown” investment decisions at gate 3.

We look at what we have, how flexible we can be, and hence how long we can wait before spending the money. And that is about all that we can do. This is where we can try to be sensible—that is, to delay the investments as long as possible while taking into account that if the predictions [sales forecasts] actually hold—i.e. we have some kind of blockbuster—we will be able to keep pace. Because this is also important; we cannot play too safe and thus be incapable of delivering the volumes forecasted by Marketing if these estimates actually hold true (key employee in Global Operations).

Hence, although extensive preparations and analyses precede decision gate 3, DEN remains cautious and increases its investment level only gradually. In order to handle the uncertainty, different ways of manufacturing the product are considered including outsourcing. For example, some components may start out being produced semi-manually by a supplier, i.e. outsourced before the full-blown investment is made in-house. However, they carefully attempt to balance the lower risk of flexibility by the initially higher variable costs. Overall, in dealing with the time lag between costs and revenues, employees intervene by postponing a major investment decision to further improve the precision of sales estimates as product samples are tested on customers. In other words, to reduce information uncertainty, the company aims to obtain a high degree of certainty in the sales estimates before the investment decision is made.

The full launch of the product takes place at decision gate 4. During stage 4, production is, in many cases, offshored to facilities in either Hungary or China. Since most of the product specifications have been frozen and the supply chain has been put in place at stage 2 of the funnel, the complexity and, hence, uncertainties related to establishing the remaining parts of the supply chain are reduced considerably. For this reason, information production for the financial model is basically reduced to mechanically updating cost and sales estimates as the final product specifications and supplier quotation prices become known.

Finally, the business project is evaluated and closed at decision gate 5. This gate thus marks the end of the IVS funnel and functions as a feedback mechanism that can help improve the configuration of the supply chain and the outsourcing analysis for future innovations. Consequently, the market position achieved is evaluated and compared to the forecast position. Moreover, information on actual sales, costs and quality is reported back to the respective executive areas where it can be used for future projects as described above. As such, the forecasts are, as far as possible, based on historical information available for similar products since DEN, in collaboration with its competitors, has installed a system in hospitals around the world that keeps track of the products sold to customers. Also, to ensure that the forecasts provided by Global Marketing are realistic, incentives are provided through the compensation structure so that bonuses partly depend on how accurately forecast sales mimic actual sales. In this way, the employees in Global Marketing are held accountable for their actions and have no incentive, *ceteris paribus*, to deliberately boost the estimates.

Overall, there is a learning dimension embedded in the method that proves valuable and reinforces the learning process as the models and databases used for costing and forecasting have been repeatedly tested and refined by previous projects. The information produced in the initial stages does not represent facts in a very strict sense, since correspondence to already established facts is impossible due to the lack of a physical product and actual customers. Nevertheless, through the experience and expertise of the individual actors and the coherence established across disciplines, the information produced is broadly anchored in the company's business reality. It, thus, provides some assurance of that the feasibility of the consequences envisaged. This precision is further strengthened by the incentive system put in place as it holds the employees accountable for the estimates produced and encourages them to strive for “realistic” costs and revenues.

4.2.4. Conclusion DEN

Within DEN, outsourcing decisions do not stand alone. Instead, they are embedded within a broader strategic process designed to ensure that the company maintains and enhances its innovative capabilities. In total, outsourcing decisions in DEN are, therefore, an important component of a highly structured process designed to support innovation and new product development. The decision process in DEN can be termed actor-based in nature. While structured, the process emphasises human interactions between decision participants to fully leverage all key managerial specialisations in the company. This involves observation, listening, assimilating information, suggesting and appraising modifications and amendments, reviewing, as well as discussing and arguing. Indeed, it is an ongoing reflective and interactive process for the participants to verify the accuracy and credibility of the information used in the outsourcing decisions.

Accounting information plays an important role (alongside other types of information) in this process and accountants are included in the cross functional teams that drive it. In the early stages of the process ideas are scoped, including outsourcing possibilities, and are, in part, defined by high-level estimates of their financial impact. These estimates include revenues, costs, profits, cash flows and, where appropriate, rates of return and net present values. This information is used to assess the viability of product innovation ideas, often including the possibility of outsourcing certain parts of the supply chain. Accounting can therefore be considered to contribute to the initial screening of suggestions. However, as projects and ideas are progressed and evaluated by the team, the role of accounting information changes. It becomes a support for the ‘what

if options that are on the team agenda. Indeed, responsiveness to alternative possibilities comes to be a key aspect of the accounting contribution. Over time, and as the project evolves, the reliability of accounting data gradually increases to the point where it is considered as credible financial indicators of pursuing alternative courses of action.

It becomes 'hardened' and 'trusted' and gradually reaches a state where it is considered a realistic expectation. Thus, accounting information is not a given in the decision situation. It is shaped through team interaction and as the project materialises. The project financial estimates are compared to a set of benchmarks set out as target costs, predefined profit margins and rates of return. These comparisons can drive further modifications to projects to make them financially viable. Hence, financial information plays a significant role in project revision or rejection. In this sense, accounting can be viewed as having the power of veto in outsourcing decisions.

A further role for accounting information in DEN is its use in ex-post review of projects following implementation. These reviews are part of the learning process at DEN as they ensure that teams are exposed to the actual results of their decisions, partly through the accounting impact of their decisions. Finally, accounting is used to incentivise the team. Achieving financial projections (frequently revenues) on which decisions are made is the basis for the managerial bonus system.

4.3. Case comparison

Significant differences and similarities are apparent in the relationship of accounting to outsourcing decisions in the two case companies.

In both companies outsourcing is a component of a strategy process and accounting plays an important part in strategy implementation. However, there is a marked difference in the nature of this contextualisation of the decision. In SWE it is an integral part of a 'clean-up' strategy aimed at focusing internal activity on the retention of core competencies. In DEN it is embedded in the process designed to maintain and enhance product innovation. It is through this contextualisation that the role of management accounting in the outsourcing decision evolves in the firms. The inherent nature of these decision processes in the two cases also differs markedly. In SWE the approach is highly analytical and staged with accounting information informing the analysis undertaken. In contrast, in DEN it is the interaction and activity of the people involved that define what is a heavily actor-based process. Viewing the decision in a stand-alone manner does not, therefore, lead to an accurate appreciation of how and why accounting takes a particular form and is used in a particular way in outsourcing. Considering the nature of the decision-making process and its strategic contextualisation may, therefore, provide a basis for categorizing the outsourcing decision in respect of accounting information roles and needs and for evaluating accounting success in respect of this purpose.

The form of management accounting has certain consistencies in the two cases. In both cases, at the point of decision-making, the conventional accounting information on incremental costs and revenues is made available. However, its relative importance to the decision differs in the companies. In DEN it is only one part of an information set, while in SWE, it alone can lead to the vetoing of a decision. While much of the accounting information is traditional in nature, there is evidence of some use of strategic management accounting. In SWE customer profitability analysis is used to ensure that the competencies appreciated by leading customers are identified and not outsourced, and activity based costing is introduced to increase the accuracy of measuring cost changes. In DEN information is product centered and target costs are employed to stimulate successful innovation. The cases also reveal that accounting information is not simply used at the point of decision. It is also used to screen possibilities (SWE), to set hurdles for proposals (DEN and SWE), to review decisions (DEN) and incentivise decision-makers (DEN). Finally, the accounting function has a different relationship to the decision-making process in each case. In SWE it acts at arm's length from outsourcing. It maintains the information system that the decision makers draw upon but it does not participate in the decision. In contrast, in DEN members of the accounting function are participants in the team that makes the decisions and their role closely resembles that of a business partner to the other managers (Burns & Baldvinsdottir, 2007).

5. Conclusion

This study has explored how two organisations, each facing a complex strategic decision situation of information uncertainty and involving a coalition of decision-participants, structure the analysis of their strategic decision issues and incorporate accounting information into it. The findings show that in their outsourcing decision-making, the two companies intentionally produce accounting information to calculate the consequences of the alternatives constructed. Both companies draw upon conventional management accounting information and techniques. However, the way the two companies organise, produce and use accounting information differs substantially.

Both companies have established a methodologically-based decision-making procedure that is tightly integrated with their particular strategic task environment. Thus, confronted with a particular strategic decision (i.e. outsourcing), the cases reveal two different methodological approaches to decision-making. Each company has a different way of handling information uncertainty and of interacting with the coalition of decision-participants.

In one case, outsourcing is used as an instrument for radically cleaning up the organisation and reconfiguring the supply chains for the existing product portfolio as a reaction to financial difficulties. In this organisation, an analytical method is adopted for both the structuring of the outsourcing decision and the production and use of accounting information. The essential elements of this analytical method are one centralised decision-maker who formulates the decision-problem, a

methodic of a one-way knowledge-accumulating process plus calculative techniques (including accounting) playing important roles in information production. Lower level and decentralised managers and employees are not actively engaged in the decision-making process, but are mainly regarded as information ‘automatons’ from which quantitative data can be extracted for subsequent modelling purposes. Relevant, quantified information is assumed to be available by the decision-maker. Accounting information sanctions the definitive decision made by the centralised top management.

In the other case, outsourcing is used proactively to establish new supply chain configurations for product innovation. The production and use of accounting information are integrated parts of the innovation process. In this case, an actor-based approach is evident in the production and use of accounting information. This actor-based methodic involves numerous iterative stages where multiple levels of managers and employees interact in the construction of decision alternatives and the production and revision of accounting information when choosing between alternatives. Throughout the innovation process, the product configurations and their financial implications are produced by knowledgeable and reflective actors from the main executive areas. They remain in dialogue with each other and potential suppliers. Due to a reflective learning process achieved by confronting expectation with factual outcomes, accounting knowledge with increasing diagnostic certainty is produced for decision-making through the entire innovation process. The actor-based method in the production of information for decision-making allows the organisation to adjust the level of human intervention when critically assessing estimates. In this way, it produces information that manages uncertainty at the various gates of the decision-process. This information use strengthens the credibility of the make-or-buy decisions at the gates⁸.

By identifying some of the roles that accounting information plays in the outsourcing decision-making process, this study contributes to the contemporary management accounting research on decision-making that is rooted in the calculative rational choice literature. However, as mentioned in the introduction, the calculative rational choice view has been heavily criticised by the systemic choice literature. The crux of the disagreement between the two views is whether accounting information can be produced to sufficiently describe and calculate the consequences of alternatives in a complex practical context, or whether it can fit into an organic process in which decision-making is more qualitative. The analysis in this article shows that accounting can indeed be produced and used in relation to complex strategic decision situations. Management accounting can, therefore, be sufficiently developed to link to the more systemic argumentation that is embedded in strategy.

By identifying two different methodological approaches to outsourcing decisions, the study extends the management accounting apparatus. The analytical method shows how a complex system of advanced management accounting techniques can be organised into a whole for calculative rational decision-making in a context of centralised goals and established products and processes. Similar to the conventional wisdom of calculative choice, the method does not deal with the issues of goal ambiguity and does not involve any questioning of information quality. It is a centralised decision model and it inherently assumes that objective information is available. The actor-based method extends the existing apparatus to organise accounting in relation to a coalition of managers and employees actively engaged in developing alternative configurations and in producing information for evaluating these alternatives. In particular, it shows techniques for interacting with goal ambiguity. Also, the actor-based method addresses the issue of how to deal with information uncertainty in respect to the alternatives under study and how the actors establish credible information for decision-making. Through the methodic steps, the actor(s) develop(s) an increasingly higher insight and diagnostic certainty of the financial implications of making the decision and implementing the project.

Accordingly, this study indicates that taking a methodological approach to research on the outsourcing decision-making process facilitates an explanation of the ways in which accounting can be practically integrated into strategic decisions. However, further research is required to enhance the understanding of the circumstances in which a particular methodological approach to decision-making is most appropriate. The cases indicate that the appropriateness of a methodology is a matter of strategic and organisational context rather than simply the type of decision. Some decision contexts may be suited for the use of an analytical approach while for others an actor-basis is the preferred alternative. The conditions influencing the successful development of the different approaches also merit study. For example, how can the co-operative and constructive interaction among managerial groups necessitated by the actor-based approach be successfully developed? Supplementary longitudinal studies focused on how the strategic frameworks and decision-making approaches evolve would be particularly relevant as part of answering this question. Finally, it may well be the case that different methodological approaches to decision-making are employed in other organisations. Further empirical research to identify these issues will contribute to a greater understanding of the different ways in which accounting and decision-making can be linked.

The findings of this study demonstrate that the forms and roles that management accounting takes in practice can be different, dynamic and complex. This suggests that concept of equifinality (i.e. practice outcomes in management accounting are derived from different starting points involving different views of business operation and they are achieved by following different paths to their resolution (Gerdin, 2005)) facilitates the understanding and explanation of practice. The strategic significance accorded to the outsourcing decision in DEN and SWE illustrates well the different, complicated and involved ways in which management accounting can be used in the real world. This approach to understanding management accounting practice contrasts significantly with the more common contingency theory approach which proposes that accounting should fit optimally with certain organisational (e.g. structure and technology) and external (e.g. market competitiveness) factors to produce the best practice outcomes (Gerdin & Greve, 2004; Gerdin, 2005).

⁸ We see the contours of a learning theory of truth (see Nørreklit, Nørreklit, & Mitchell, 2007).

Finally, the paper reveals that studying decision-making through an actor-based method to get “inside” organisational practices, one can explore reflective managers in their construction of the functioning models that support organisational practice (Nørreklit et al., 2006; Nørreklit et al., 2012). In this way, the study differs from the dominating organisational and sociological perspectives of accounting rooted in system theory (March, 1962; Cyert & March, 1963; Pfeffer & Salancik, 1974), structuration theory (Foucault, 1969; Bourdieu, 1990; Giddens, 2013) and actor network theory (Latour, 1987). These approaches to the study of management accounting are concerned with the question of how social and material structures shape the structures, agencies and routines in a certain field (Schatzki, 2001). Their prime focus is, therefore, more on how the way managers and organisations are shaped and less about the way managers, through reflective and innovative thinking, construct the reality in which they operate. To place management accounting practice in its contemporary context we need further research drawing on actor-based methodology to reveal the innovative conceptual models that are currently being used in managerial decision-making practice.

Appendix A. Appendix 1

This appendix presents the guide used for interviewing in the case companies.

- What is your background?
 - Education and work experience?
 - How long have you been with the company?
 - How long have you worked with outsourcing?
- **Company background**
- How is the company organised?
 - What is outsourced?
 - Which outsourcing destinations are used?
- Does the company have an underlying outsourcing philosophy?
 - Is outsourcing mainly seen as a strategic tool (access to new competences, closer alignment with customer needs or close proximity to customer facilities)?
 - Is outsourcing primarily seen as a tool to cut costs and improve the logistics?
- Does the company have a long track record of working with outsourcing?

Outsourcing decision-making process

- What does the decision-making process look like?
 - What is the time frame?
 - How detailed is the analysis—is speed a key issue (trade-off)?
 - How much weight is the decision-making process given compared to the subsequent implementation process?
 - Do you have a model that frames the way you consider and analyze the outsourcing situation?
- Is there a specific structure for the decision-making process (steps)?
- Who is taking part in the various steps. Is it interdisciplinary?
- Suppliers, management, accounting, engineers etc.
- **Strategy model:** How do you view the company and its surroundings in relation to the outsourcing situation?
- Do you have an underlying framework for analyzing the company and the industry?
- Porter: Value chain analysis and industry analysis?
- RBV: Core competences and resources?
- What is driving the process?
- Is it an internal perspective where efficiency determines what should be outsourced?
- Is it an external perspective where the customer (market) determines what should be outsourced?
- What is your reason for deciding to use this exact approach to outsourcing?
- Are there any issues that you do not catch with this approach (blind spots)?
- How do you address issues that you are aware of having left out by approaching the problem in this way?
- How do you assess the realism of the model?
- Is it based on the company's own experience from previous outsourcing engagements? Or is it based on what other companies have used with success?
- Have you made wrong outsourcing decisions earlier on where you subsequently found out that you had made miscalculations?
- Have you incorporated this experience into the analyses that you are conducting now (learning)?
- **Accounting model:** How do you calculate the financial implications?
 - What dimensions do you analyze, and how are they made operational? Which models are you using?
 - What type of data enters into the model—how are these data collected?

- Customer value–revenue:
- Do you quantify customer value?
- What data do you rely on?
- How do you collect these data?
- Cost of *making*:
- Production costs
- Opportunity costs
- How do you collect these data?
- Cost of *buying*:
- Quotations
- Transaction costs
- Risk (loss of competence or control of the supply chain)
- How do you collect these data?
 - How do you weight the financial assessment compared to the strategic considerations not incorporated into the financial evaluation?
 - Are you conservative when estimating costs?
 - Is there anything in relation to the decision-making process–besides the issues already discussed–that you feel is important to address?

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