

**DYNAMIC CAPABILITY OF VALUE NET MANAGEMENT
IN TECHNOLOGY-BASED INTERNATIONAL SMEs**

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Turku, 20th August, 2013

Taina Eriksson

TABLE OF CONTENTS

1	INTRODUCTION	9
1.1	The challenges of dynamic operating environments for technology-based SMEs	9
1.2	Positioning of the study	12
1.2.1	Dynamic capabilities	13
1.2.2	SME internationalisation	15
1.2.3	International management	18
1.2.4	Synthesis	22
1.3	Problem setting.....	27
1.4	Structure of the study.....	29
2	RESEARCH STRATEGY	33
2.1	Research approach.....	33
2.2	Research process	35
2.2.1	Overview of data collection.....	35
2.2.2	Phase I: Development of key concepts with systematic literature review.....	37
2.2.3	Phase II: Empirical study among technology-based SMEs.....	39
2.3	Empirical data collection	41
2.4	Analysis of empirical data	49
2.5	Evaluation of the empirical study	52
3	THEORETICAL POINT OF DEPARTURE.....	59
3.1	Global factory structure in technology-based SMEs	59
3.1.1	Liabilities in international operations.....	59
3.1.2	International technology-based SME as a global factory.....	61
3.2	Business model and value in a small global factory	63
3.2.1	Business model – value creation and capture	63
3.2.2	From value chain thinking to value net thinking	65
3.2.3	Value in the value net.....	67
3.2.4	Business model and a small global factory structure.....	68
3.3	Dynamic capabilities approach to the small global factory	73
3.3.1	Organisational capabilities.....	73
3.3.2	Dynamic capabilities as process	75

3.4	Managing the value net in a small global factory business model	77
3.4.1	Dynamic capability for network management	77
3.4.2	Modes of value net management in the small global factory..	80
3.5	Synthesis of managing the global factory in dynamic contexts	84
4	VALUE NET MANAGEMENT AND CAPABILITIES IN THE SMALL GLOBAL FACTORIES	87
4.1	The global factory structure and business model in the SMEs	87
4.2	Value net management practices in the case firms	94
4.3	The dynamic capability for managing the value net.....	99
4.4	Synthesis and verification of research findings.....	104
4.4.1	The empirical research model.....	104
4.4.2	Verification of the research findings.....	108
4.5	Theoretical contribution of the study	111
4.5.1	Contribution to the dynamic capabilities approach	111
4.5.2	Contribution to the discussion on SME internationalisation	113
4.5.3	Contributions to international management	115
4.6	Managerial implications of the study.....	117
	REFERENCES	121
	APPENDICES	139
Article 1Processes, antecedents and outcomes of dynamic capabilities Eriksson, Taina <i>Scandinavian Journal of Management</i> (in press, electronically available, 2013)	143
Article 2	Critical review of methodological issues in dynamic capabilities research Eriksson, Taina <i>Baltic Journal of Management</i> , 8 (3), 306–327	163
Article 3	Dynamic capabilities in small global factory Eriksson, Taina – Nummela, Niina – Saarenketo, Sami <i>International Business Review</i> (in press, electronically available, 2013)	187
Article 4	Value creation of an internationalising entrepreneurial firm – the business model perspective Sainio, Liisa-Maija – Saarenketo, Sami – Nummela, Niina – Eriksson, Taina <i>Journal of Small Business and Enterprise Development</i> , 18 (3), 556–570.....	201

LIST OF FIGURES

Figure 1	Theoretical positioning of the study.....	12
Figure 2	Relationships between focal concepts.....	21
Figure 3	Data collection process.....	36
Figure 4	Conceptual hierarchy of resources and capabilities.....	74
Figure 5	Conceptual framework of the study.....	86
Figure 6	Empirical research model.....	105

LIST OF TABLES

Table 1	Concepts similar to value net management capability.....	25
Table 2	Summary of the four publications.....	31
Table 3	Use of the data	37
Table 4	Case company facts.....	41
Table 5	Interviews	45
Table 6	Unrecorded meetings with Delta	47
Table 7	Participants in the verificatory focus group	48
Table 8	The codes for analysis of the 2009 Delta interviews.....	51
Table 9	Comparison of global factory structures in the cases	88
Table 10	Cross-case comparison of the means of value net management.....	98
Table 11	Cross-case comparison of the dynamic capability.....	103

1 INTRODUCTION

1.1 The challenges of dynamic operating environments for technology-based SMEs

International trade has changed dramatically over the past couple of decades as globalisation has changed in volume and composition. As a result, organisations have become deeply integrated in geographically extensive and complex production networks (Dicken 2011, 7). This new situation is quite challenging for most of them.

On the other hand, recent developments have changed the manner in which internationalising firms of all sizes operate (Nummela & Saarenketo 2011). First, the role of services has become highlighted in nearly all sectors (see for example Möller et al. 2008; Vargo & Lusch 2004). Second, developments in technologies have had a significant impact on, for example, the means and cost of communication, and hence on international operations (Jean et al. 2008). In fact, technological developments have been argued to reconstitute the nature of international business (de La Torre & Moxon 2001). Third, the role of location has been changing in the globalising world. Figuratively speaking, the world has been shrinking for centuries. Revolutions in transportation and communications have led to the diminishing significance of distance (Cairncross 1997; Dicken 2011, 83). Therefore, the role of location has been challenged. However, economic activity continues to be concentrated in specialised as well as generalised clusters (Dicken 2011, 70), which shows that the significance of location has not disappeared (Florida 2005). Rather, location plays a different role than before, and its significance differs between activities. This sets new requirements for the management of internationally operating firms as well as academics who try to understand the operations and dynamics of these firms.

In the 21st century, the pace of technological development is higher than ever before and, as a consequence, product life-cycles are generally shortening (Dicken 2011, 98). Especially, this puts technology-based firms in a situation where they have less time to capture value from a product and to recover product development costs. It is common to try to lower development costs through cooperation and to seek additional sales in foreign markets. Global reach has become important for companies of all sizes.

As a consequence of the changes described above, organisations have searched for new ways of achieving competitive advantage and efficiency. Global operations have been traditionally linked to large multinational corporations. These firms have focused on finding a balance between global and local strategies, including decisions on the degree of product standardisation and internalisation versus outsourcing (Buckley & Ghauri 2004, 86). Recently, however, multinationals have found new ways of organising their operations as they have started to regard internalisation and outsourcing as complementary instead of alternative strategies, and have found ways to locate activities in their optimal locations in a very fine-grained manner. A new kind of organisational structure, a global factory, has emerged (Buckley & Ghauri 2004; Buckley 2009a; Buckley 2009b). Firms from both advanced and emerging economies are dispersing their value creating operations globally to control costs and to leverage capabilities (Mudambi 2008, 699).

Nonetheless, global operations are nowadays also achievable for smaller firms. Small and medium sized enterprises (SMEs), which are an important part of the globalising world, have their ways of achieving global reach (Gabrielsson & Kirpalani 2004). International SMEs are very different from multinationals as organisations; hence, their focal strategic decisions also differ. Although the issue of standardisation versus adaptation is also relevant for SMEs, decisions on whether to engage in foreign direct investment or not are typically beyond the scope of smaller firms. Additionally, when internationalising, SMEs are at a disadvantage due to the liabilities they confront (Jarillo 1989; OECD 2005). The liabilities of foreignness (Hymer 1976), newness (Stinchcombe 1965), smallness (Buckley 1989) and outsidership (Johanson & Vahlne 2009) pose various challenges to international expansion¹.

For an SME, an important means of tackling the challenges has been inter-organisational cooperation (cf. Möller & Törrönen 2003). The capability² to develop and strengthen relationships is argued to be a significant factor in enabling business opportunity exploitation (Johanson & Vahlne 2009). As a matter of fact, the ability to control resources instead of owning them has become increasingly important to the competitiveness of firms (Buckley 2009b). By building partnerships, an SME is able to gain access to resources and capabilities beyond its own organisation. This is important, as the versatility of technologies utilised has been continuously increasing, and one organisation can only have world-class capabilities in a limited set of

¹ These liabilities are discussed in detail in section 3.1.

² Capabilities are defined here as the abilities to put resources into productive use (cf. Penrose 1959) and discussed in more detail in section 3.3.

technologies. Additionally, knowing how to operate in numerous different markets would be impossible for smaller firms without partners. Having partners enables an SME to benefit from world-class know-how in areas that are beyond its own scope. It has been predicated that networks, and especially strategic nets³, are key to the flexibility of small firms (Jarillo 1989; Jarillo 1988; Parolini 1999). For SMEs that acquire benefits from their flexibility, it is imperative to avoid developing rigidities (cf. Leonard-Barton 1992); partners also play an important role in this regard.

Despite offering numerous benefits, operating intensively with partners also poses various challenges to international SMEs. The firms are in a constant struggle to manage the network (Söderqvist 2011; Tolstoy 2010). When internationalising with partners, SMEs need to tackle, for example, the following issues: screening new markets for key actors, evaluating existing partners, and finding appropriate means of communication and coordination (Tolstoy 2010). Drawbacks can stem, for instance, from differing personalities, unreliability of a partner, bureaucratic relations or conflicting visions (Söderqvist 2011). Many challenges have been recognised in the extant literature. Nevertheless, research to find solutions has been scarce.

Running networked operations differs from managing a firm that internally performs the majority of value creating activities. As partners tend to behave opportunistically (Deeds & Hill 1999), for instance by promising more than they can actually deliver, forming successful partnerships is not easy. A large proportion of partnerships face severe problems during the first years of operation or even collapse (Segil 2008). Therefore, finding suitable partners and being able to manage the relationships are very important factors in international SMEs' operations. However, management of a partnership does not imply that SMEs will be able to dictate or have control over the actions of their partners. Rather, it refers to the actions SMEs take to influence their partners' operations so that the partners operate in ways that benefit them (cf. Svahn 2004). Management of inter-organisational relationships is very different from managing within a firm, and hence managing this kind of organisational structure calls for new kinds of capabilities (Buckley 2009b), both organisational and managerial.

In addition to the net of resources and capabilities, the dynamic capabilities⁴ of an SME can also be decisive to its competitiveness today (cf. Jantunen et al.

³ This study makes a distinction between networks that are broad with constantly changing structures that emerge unintentionally (see for example Ford 1997) and nets that comprise a more limited set of actors and are intentionally created (Gulati et al. 2000; Parolini 1999; Svahn & Westerlund 2007).

⁴ Dynamic capability is a higher order capability that deals with the sensing and seizing of opportunities and transforming the organisation (Teece 2007).

2005). In the globalising environment, firms often face situations in which external changes can either offer opportunities for new ways of creating value or force the firm to make changes (Möller & Svahn 2006). Hence, dynamic capability concerns the ability to identify the need or opportunity for change, and to formulate and implement the response (Helfat et al. 2007). Therefore, some types of dynamic capability can be argued to facilitate overcoming the abovementioned liabilities.

1.2 Positioning of the study

This study crosses the boundaries of various fields of research. The theoretical positioning of this study actually sits at the intersection of two established research traditions that overlap in many respects: international business and strategic management. To be more specific, the focus is on SME internationalisation within the domain of international business, and the study primarily addresses the discussion concerning dynamic capabilities within the field of strategic management. Additionally, emergent streams of the literature on strategic (value) nets, global factory structure and business models are important in this study (Gulati et al. 2000; Jarillo 1988; Moller & Svahn 2003; Zott & Amit 2007; 2010). These emerging streams are at the interface of international business and strategic management, and therefore discussed here under the umbrella of international management (cf. Werner 2002). The positioning is illustrated in Figure 1 below.

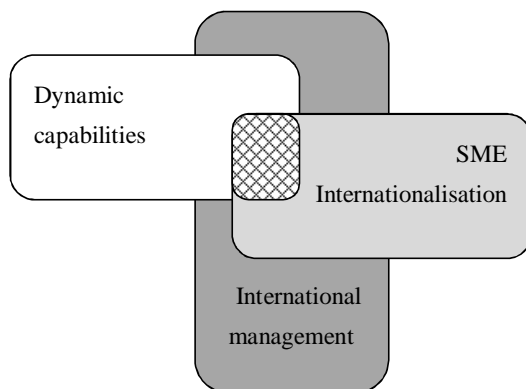


Figure 1 Theoretical positioning of the study

As the literature on the three last mentioned domains is still in a relatively nascent state, the use of these concepts in the academic literature remains

ambiguous. All in all, the concepts address issues that are closely linked, and thus overlap somewhat. Consequently, the concepts are occasionally employed to refer to the same issues. Nevertheless, as clear differences can be found between the concepts, this study makes a distinction between them. This is important, as each of the three concepts provides a different perspective on the phenomenon.

Crossing the boundaries of different fields of research has become more common in the field of organisational studies as the phenomena examined have become increasingly complex. Theoretical pluralism can enhance understanding of the complexity, although it can also encourage excessive theoretical compartmentalisation as it is easy to lose sight of how various schools of thought relate to one another. It is the interplay between different theoretical perspectives that is beneficial for theory advancement. (Astley & Van de Ven 1983, 245) In the following, the three streams of literature most relevant for this study are discussed with regard to their purpose and context, and the intended contribution of this study is specified.

1.2.1 Dynamic capabilities

The dynamic capabilities approach, which is the principal lens in the theoretical frame of this thesis, has recently attracted a lot of interest in academia. The approach aims to explain competitive advantage of firms over time (Teece & Pisano 1994; Teece et al. 1997) and in today's dynamic world it has become widely utilised. The development of the discussion can be perceived in the fact that, in addition to the reviews that form part of this thesis, there are four recently published review-type articles on the concept (Ambrosini & Bowman 2009; Barreto 2010; Di Stefano et al. 2010; Wang & Ahmed 2007). The approach has proven widely applicable and, indeed, it can be found in quite a versatile set of studies. The field, however, still lacks a widely accepted definition of the core concept (Di Stefano et al. 2010; cf. Thomas & Pollock 1999). Hence the discussion has remained largely scattered and theoretical advancements somewhat isolated. This hinders theory development, which is why the problem needs to be tackled.

The dynamic capabilities approach focuses on the internal organisation of the firm and how it operates to develop and renew its resources and capabilities (Collis 1994; Teece & Pisano 1994; Teece et al. 1997). Considering the seminal writings, this is natural. However, more recent research has shown that factors at various other levels in addition to the organisational level also exert an influence on dynamic capabilities. For instance, skills and capacities of individuals can affect organisational dynamic capabilities (Jones & Kraft

2004; Narayanan et al. 2009; Schlemmer & Webb 2008). Moreover, the framework does not pay much attention to the importance of partners. However, partners are a key factor in many firms' operations today, and therefore they cannot be neglected (Colarelli O'Connor et al. 2008; Macpherson et al. 2004). Thus, it is important that research takes into consideration other levels in addition to the organisational level. For instance, Kivelä (2007) acknowledges the importance of dynamic capabilities in inter-organisational relationships.

Existing research on dynamic capabilities can be divided into three foci: the elements, the antecedents and the outcomes of dynamic capabilities (cf. Zahra et al. 2006). Based on the systematic literature review conducted as part of this study, it can be argued that all three areas are covered rather evenly in the extant literature. This study focuses on the antecedents of dynamic capabilities, but also touches on the elements. In these two areas, the literature is somewhat more scattered than in the area of the outcomes.

With regard to the types of organisations examined, SMEs are mainly neglected in the dynamic capabilities literature (see Kuuluvainen 2011 as an example of a study in the SME context). The research very much focuses on large firms (McKelvie & Davidsson 2009; Rosenbloom 2000). One reason for this might be that data on larger firms are often more easily available. Many processes are more codified in large firms than in small firms, and therefore large firms might have offered easier context for empirical examination on dynamic capabilities. Additionally, there are more secondary data available on large firms that have been widely employed in dynamic capabilities research. However, the majority of firms in Europe are SMEs, and therefore understanding their dynamic capabilities is very important, especially as the ability to change is typically linked to SMEs rather than larger firms. This study examines international technology-based SMEs as very little is known concerning the antecedents of dynamic capabilities in these kinds of highly networked smaller organisation.

The scant literature that exists on the antecedents of dynamic capabilities in SMEs focuses mainly on organisational-level issues. By taking multiple levels of analysis into account, this research makes a much needed contribution to a more holistic understanding of the antecedents of dynamic capabilities. Although a largely neglected factor, the level of analysis is important as the role of managers is vital (Kuuluvainen 2011; Penrose 1959; Zahra et al. 2006, 918). Additionally, linking the managerial level to the organisational level is scarce in earlier research. Therefore, it can be argued that this study addresses an area that has been left without attention in previous research.

In addition, the dynamic capabilities discussion is largely dominated by conceptual examination on various aspects relating to competitive advantage

of the firm. Managerial implications of the studies are too often quite scant. This study addresses the research questions through a review of the extant empirical literature and empirical case studies on four technology-based SMEs. The analysis of the various factors that contribute to the dynamic capability of value net management in a technology-based SME offers a good opportunity for a managerially relevant contribution as well as indicating interesting avenues for future research.

The dynamic capabilities approach alone is insufficient to form the theoretical frame for this study. To understand the management of the international value net as a dynamic capability in the SME context, other literatures are also needed. This study, therefore supplements the dynamic capability framework with insights from SME internationalisation theory as well as the strategic value net perspective and discussions concerning global factories and business models to acquire a more comprehensive picture of the highly international technology-based SME.

1.2.2 SME internationalisation

As the international SME⁵ is the focus, SME internationalisation is a ubiquitous factor in this study. By combining the literature on internationalising SMEs with the literature on dynamic capabilities, this study contributes to a better understanding of the competitive advantage of international SMEs. This is an area that has received relatively little attention in the discussion on the internationalisation of SMEs.

Internationalisation of firms, in general, has been examined for decades employing different approaches: the perspective of foreign direct investment, the process perspective and the network perspective to name the most prominent examples. Although the research on internationalisation is rather well established, the domain of SME internationalisation has received less attention (Coviello & McAuley 1999, 224). As argued by Welsh and White (1981) and Shuman and Seeger (1986), SMEs are not just smaller versions of large corporations; they have their own distinctive characteristics that result largely, but not solely, from the differences in resource endowments. Therefore, the international operations of SMEs warrant a research area of their own.

⁵ SME is defined here according to European Commission (2005) as a firm that:

- employs fewer than 250 persons and
- has an annual turnover not exceeding €50 million and/or
- an annual balance sheet total not exceeding €43 million.

The literature on SME internationalisation contains basically three different kinds of approach or discipline-based theory: the process theory of internationalisation (or the stages model), the network theory of internationalisation and the resource-based view (RBV) to internationalisation (Ruzzier et al. 2006). Conceptualising internationalisation as a process of increasing involvement has the longest tradition of the three. This approach stems from the seminal ideas of Johanson and Vahlne (1977) and Luostarinen (1979). The focus is on understanding how the process of SME internationalisation proceeds in time, and what kinds of factor influence the process (Buckley 1989, 91; Jones 1999, 16). The internationalisation process has actually been explained with different kinds of process theory. Two of the most influential are the Uppsala Model (Johanson & Vahlne 1977; Johanson & Vahlne 2009) and the innovation stages model (e.g. Andersen 1993; Welch & Paavilainen-Mäntymäki 2010). Initially the internationalisation process discussion only addressed outward operations. However, more recently, the inward side of the process has also received some attention (Jones 1999, 15).

More recently, the network approach has become increasingly popular in SME internationalisation research. The studies taking a network perspective to internationalisation mostly focus on how the actors, resources and activities in the network affect different dimensions of internationalisation (Ruzzier et al. 2006, 485). The network approach to international business implies that business takes place in a network comprising actors that are linked to each other through business relationships (Havila & Salmi 2002, 459). According to this perspective, internationalisation entails establishing and developing positions in foreign markets (Johanson & Mattsson 1988). Therefore, internationalisation is not controlled solely by the internationalising company; the network also has an influence (Havila & Salmi 2002, 459).

Finally, there is emergent literature that takes a resource-based perspective on SME internationalisation. This approach examines resources and their characteristics (Ahokangas et al. 2010, 126). Similar to the network approach, the RBV to internationalisation discusses where essential resources are located: internal versus external (Ruzzier et al. 2006, 486). The resource-based perspective on internationalisation postulates that internationalisation is enabled by an organisation's ability to combine resources from different national markets (McDougall et al. 1994).

The study at hand relies mostly on the RBV to internationalisation. The dynamic capabilities approach has its roots in the RBV discussion, and therefore these two approaches are compatible. Additionally, resources and resource constraints in particular are highly relevant in the internationalisation of SMEs (Bell et al. 2003). Moreover, the RBV also considers the capabilities of the firm (Barney 1991; McDougall et al. 1994), and therefore taking the

RBV to internationalisation of SMEs is in line with the objectives of this study. The RBV to internationalisation considers the importance of knowledge-based resources and capabilities (Ahokangas 1998, 47). Nevertheless, the focus of the study is on the capability of managing internationalised operations and not on the resource-based internationalisation per se.

Additionally, there is the stream of international entrepreneurship that develops at the intersection of international business and the entrepreneurship literatures (Jones et al. 2011; Keupp & Gassmann 2009; McDougall & Oviatt 2000; Nummela & Saarenketo 2011). Three different bodies of research can be identified in the international entrepreneurship literature: entrepreneurial internationalisation (where entrepreneurship across borders is examined), international comparisons of entrepreneurship (where entrepreneurship is compared across national settings) and comparative entrepreneurial internationalisation (where entrepreneurial internationalisation is compared across national settings) (Jones et al. 2011). All in all, research has focused on three issues: the propensity of small young firms to internationalise, what the firms have done to penetrate and survive in international markets and how their performance differs, and, finally, the characteristics of the entrepreneurs (Keupp & Gassmann 2009, 601; cf. Zahra 2005, 22). The characteristics of the entrepreneur, or the characteristics of entrepreneurial managers, are of interest to the current study. Therefore, some insights from the international entrepreneurship also supplement the theoretical understanding.

Although the definition of international entrepreneurship has evolved since the seminal writings, it can be argued that international entrepreneurship is, by definition, concerned with behaviour and value-creating processes (McDougall & Oviatt 2000; see also Oviatt & McDougall 2005). Hence, it complements very well the SME internationalisation literature for understanding the management of internationalised operations. However, the period of post-entry internationalisation has not been examined much in international entrepreneurship research (Morgan-Thomas & Jones 2009; Prashantham & Young 2011), and therefore this study has potential to contribute also to international entrepreneurship.

The literature on SME internationalisation stems from seminal writings in Europe, and especially the Nordic countries, whereas the international entrepreneurship literature has its roots in North American research. Moreover, the SME internationalisation discussion strongly relies on international business tradition, whereas that on international entrepreneurship very much utilises the entrepreneurship tradition and blends in with the international business perspective. Therefore, the two discussions have a lot of common ground, although they also differ. This study develops insights on issues that can be categorised as the elements of international entrepreneurship (Keupp &

Gassmann 2009, 605), namely resources and capabilities; that is, sources of competitive advantage.

There is indeed a large body of research on the patterns of internationalisation in terms of pace, market selection and modes of foreign market entry. Nevertheless, international SMEs are only partly understood in the light of the extant literature (Nummela & Saarenketo 2011, 3). For instance, the inter-organisational management practices have received very little if any attention in the academic discussion (Tolstoy 2010, 3, 86). Mainly due to a lack of hierarchical authority, management in the inter-organisational setting differs from management within an organisation. Therefore, it also calls for a different approach from managers. Hence, this study directs attention particularly to managerial level capabilities and the combinative capabilities of the organisation (see Kogut & Zander 1992).

There has been a call for theoretical diversity in research on SME internationalisation as it is feared that reliance on only one theoretical basis leads to a myopic perspective (Coviello & McAuley 1999, 241). This study contributes to the understanding of international SMEs by integrating the dynamic capability approach and the management of strategic nets into the knowledge on the challenges of SME internationalisation.

1.2.3 International management

In addition to the dynamic capabilities approach from strategic management, three other emerging streams of the literature on the interface of strategic management and international business are key to the positioning of this study. These are the literatures concerning strategic nets, global factories and business models.

The emerging literature on **strategic nets and their management** is an important source for this study. The literature contains discussion on value nets and therefore informs this study on possible means of value net management. Additionally, a value net is an essential part of the business model of the firm, and hence the literatures on value nets and business models supplement each other.

Two issues are focal in all kinds of network: the structure of the network and the processes within the network. Despite the fact that these two are closely linked, very few studies take both into consideration. In general, studies that focus on the structure are much more common, partly because process studies require more resources, especially time. However, in the emerging stream of value net research, there are mainly studies that consider management-related processes within the value net (Möller et al. 2005; Möller

& Rajala 2007; Svahn 2004). All in all, net/network management has received very little attention, and the discussion is only beginning to emerge. One factor that has hindered advancement is the fact that the few studies that exist tend to have very different underlying assumptions on the ontological characteristics of networks (Järvensivu & Möller 2009, 654). The emerging literature is therefore rather fragmented. This study follows the previous contributions in the stream of value net management and focuses on management-related processes in the value net. Additionally, this study analyses the structure of the value net and discusses the interrelatedness of the two aspects.

The literature on value nets conceptualises the net through the underlying value systems of the involved organisations. A firm can strive to influence its partners, which is considered value net management (Svahn 2004). The management of value nets has been examined from the capability perspective, although the focus has been on the managerial capabilities required to manage different types of value net (Moller & Svahn 2003). This study continues with the capability focus, but incorporates multiple levels of analysis as it examines the dynamic capability of managing the value net in a small global factory, and the managerial and organisational factors that contribute to it. Indeed, it has been noted that there is lack of research on the means of managing the value net under the prevailing lack of hierarchical authority (Dhanarag & Parkhe 2006, 666). Moreover, many of the existing articles regarding the topic are conceptual (Möller et al. 2005; Svahn & Westerlund 2007). Hence, this empirical study makes an important contribution to the literature on value net management.

All in all, research on inter-organisational relationships has progressed at two levels: the network and the dyadic levels (Dhanarag & Parkhe 2006, 665). These two streams have progressed along their own lines, which has created some imbalances. The research on the dyadic level (also known as research on alliances) has largely neglected the embeddedness of the firm and the alliance in the wider context, whereas the network level research has tended to neglect firm-level strategies, processes and behaviour (Dhanarag & Parkhe 2006, 665). Metaphorically, researchers have focused on either the trees or the forest, but have often failed to see the importance of both. This study strives to draw something from both of the abovementioned streams to inform the examination on value net management.

This study pays attention to the organisation of the international SME and its value net. Therefore, the study also draws on the emerging literature concerning the global factory. This study examines the novel phenomenon of SMEs operating a global factory structure. As this is a rather recent development, particularly in the domain of SMEs, it is not yet well understood. However, it is an intriguing development.

The extant **global factory** literature examines the novel highly international organisational structure that has emerged as multinationals have begun to seek optimal locations and ownership structures for each of their activities (Buckley 2009a; Buckley 2009b). The global factory discussion on multinational corporations is relatively recent. Its aim is to understand and better explain the changing location and ownership strategies of multinational firms (Yamin 2011). To be able to examine how the internationally spread value net of an SME can be managed, it is important to understand how its operations are organised. Therefore, the global factory literature is needed for the theoretical framework of this study.

Earlier research has only dealt with large firms. Nevertheless, similar developments can also be seen in SMEs. This development has not been acknowledged in the global factory discussion. Therefore, this study is an important addition to the global factory literature. Taking the smaller global factories into consideration is important as SMEs differ from large corporations in many ways. Therefore, the challenges they face also differ.

The contribution of this study to the global factory discussion is two-fold: this is one of the very first attempts to take the concept into the SME context and it takes an inside-out perspective on the global factory. Earlier discussion on the global factory has taken an outside-in perspective on the organisation. The literature on the global factory in international business and management domain is an extension of the economic theory-based examination on the large multinational corporation. Traditionally, the economics literature on multinationals abstracts from practical issues and develops policy implications. Following this heritage, the global factory discussion has focused on examining the rise of the global factory as a phenomenon and the general implications of globalisation on the structure of the multinational corporation. The outside-in perspective of the discussion implies that the literature does not pay much attention to the organisational requirements for enhancing innovation or flexibility, for example (cf. Yamin 2011, 289). Moreover, the discussion has been at a general level instead of examining the issue based on primary data.

Although this type of examination has its merits, it tends to neglect issues that are vital for the operations of an organisation. One of the fundamental issues concerning economic theories is that they strive to simplify issues into models and rely on explicit assumptions of optimisation and equilibrium (Buckley & Casson 1993, 1037). Therefore, it does not capture the complexity in which organisations operate in real life. However, it must be noted that there is one recent contribution by Buckley and Casson (2011) that attempts to bring marketing theory into the global factory discussion. Their study is conceptual in nature and focuses on discussing how the two approaches can inform one another. Therefore, there is a need for a detailed examination on

the issues within the global factory organisational structure, and especially studies that utilise primary data from within the firm. To address this issue, the study at hand takes an inside-out perspective on the global factory.

The global factory structure is here approached as an element in the business model of the SME. The academic literature on business models is in a nascent state, as the concept originated in practitioner and consultant language. During the past ten years also academic researchers have begun addressing the issue of the business model and particularly business model design. Nonetheless, the use of the concept and its definitions remain somewhat loose.

The **business model** concept thrives in information systems research, and researchers examine how information systems can contribute to novel business models. For instance, there is a large body of literature on e-business models (Amit & Zott 2001; Hedman & Kalling 2003). The concept has gained some space also in the strategy literature (see e.g. Richardson 2008; Zott & Amit 2007; Zott & Amit 2010), which is the domain of interest for this study.

There are different perspectives on which elements constitute the business model. This study does not take part in this debate, but follows the views of Zott and Amit (2007; 2010). The choice is explained in section 3.2.4. The business model discussion is utilised in this study to better conceptualise the value net of the focal firm. The business model literature puts forward tools for conceptualising the exchanges (i.e. partnerships) needed for value creation. Instead of focusing only on the value to the customer and the focal firm, the business model literature emphasises the importance of value to the value net partners. This is a focal consideration for value net management, and therefore very important in this study.

The relationship between the three concepts discussed above is illustrated in Figure 2.

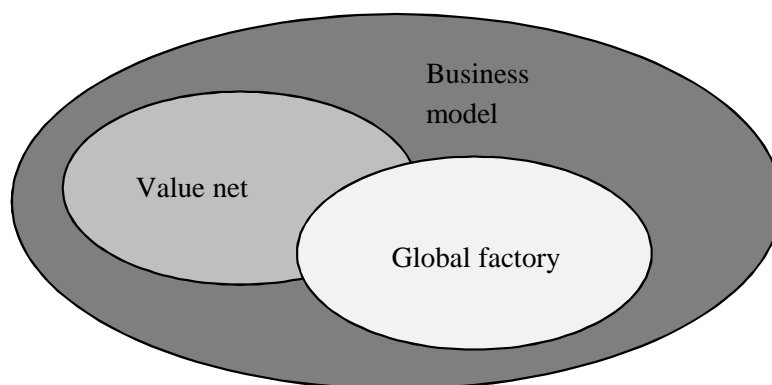


Figure 2 Relationships between focal concepts

The business model is the broadest of the three focal concepts, and actually contains the value net and global factory. As noted above, the value net is part of the business model of a firm, and the global factory structure is an element of the business model. In addition to these, a business model also contains other parts, such as the more peripheral business relationships and the revenue logic of the firm (cf. Zott & Amit 2010). However, this study examines only the value net and global factory structure in detail. The value net literature is necessary for this study as it sheds light on the management of the relations. The business model literature focuses on examining how the activities are linked and positioned in relation to one another. Moreover, the global factory concept focuses on the internationally or globally spread structure of operations, and also sheds some light on the management issues.

1.2.4 Synthesis

The array of research streams discussed above contains the key elements for the theoretical frame of this study, and represents the fields in which this study has the potential to contribute. The literatures partially overlap, which both indicates that they are rather closely linked and bring slightly different perspectives to the phenomenon examined, and demonstrates the theoretical compartmentalisation referred to at the beginning of section 1.2.

To achieve a more holistic perspective on value net management and the related capabilities in the context of a small global factory, this study combines insights from what might seem to be a diverse set of the literatures. The theoretical frame of the study utilises only parts of each literature; the parts that are relevant for tackling the research questions specified in the following section. Therefore, the coverage of different literatures is intentionally unequal. To draw the positioning of the study to a conclusion, the following discussion deals with the interfaces between the different research streams that are relevant to this study.

Research at the intersection of the dynamic capabilities approach and the SME internationalisation literature is very scarce; the dynamic capabilities perspective is only seldom included in the examination of internationalising SMEs (see Jantunen et al. 2005; Sullivan Mort & Weerawardena 2006 as two rare examples) and SMEs overall are a neglected type of organisation in dynamic capabilities research. The capabilities research, in general, tends to focus on larger corporations. One reason for this might be that many processes are more organised or better documented in large corporations. Additionally, data might be more easily available on larger firms. There is also evidence that the rare existing studies take a relatively superficial approach to the

capabilities; Graves and Thomas' (2006) study is a good example of this. They examine the capabilities for internationalisation through three elements: managerial capacity (i.e. number of managers), management expertise (e.g. training), and management processes (e.g. whether the firm has formal strategic plans). In this quantitative study, the measures, as detailed above, are very simplistic and it can be questioned whether they are able to capture capabilities. In-depth examination on dynamic capabilities in the context of an international SME therefore makes a very important contribution to the literature on organisational capabilities and the literature on international SMEs.

However, it must be noted that the study at hand does not examine the capabilities for internationalisation, but focuses on the capabilities for managing internationalised, yet continuously expanding operations. Therefore, it focuses in the stages that follow initial internationalisation, which is important as research on the capabilities needed in maintaining and managing internationalised operations is almost non-existent. The lack of research in this domain is one of the key reasons that various theoretical approaches are needed in building the theoretical frame of this study.

Related to the value net, the network aspect is considered in some dynamic capabilities studies. However, the dynamic capabilities research emphasises mainly the importance of networks for innovation (see Chang 2003; Rothaermel & Hess 2007; Smart et al. 2007), whereas other areas of operations remain largely outside the analysis. There is a small, although continuously increasing, body of studies in which dynamic capabilities have also been connected to other areas in addition to innovation (see e.g. Ramachandran & Sougata 2006). Furthermore, Macpherson et al. (2004) examine technological and organisational innovations, and also discuss the relational elements of transactions between an entrepreneurial firm and its partners, and how these offer an opportunity for the entrepreneur to expand the firm's capabilities. Therefore, it is concluded that the value net aspect offers a fruitful avenue for research in terms of dynamic capabilities.

Moreover, there is some previous research on capabilities in value net management. Svahn (2004) examines the capabilities of managing three different types of net: stable nets striving for efficiency, established nets striving for efficiency and effectiveness, and emerging nets striving for effectiveness. A focal contribution of Svahn's study is the identification of different types of value net. In terms of capabilities, Svahn focuses on the managerial capabilities that are necessary in managing the different types of strategic net. Moreover, Svahn and Westerlund (2007) present a conceptual discussion on the management of different types of value net. Nevertheless, examining organisational capability to manage the value net from the perspective of dynamic capabilities is a novel contribution. Additionally, combining

the challenges of the global operating mode contributes to a more versatile understanding of value net management. This is particularly important for the future, as companies tend increasingly to operate internationally.

Finally, the business model literature tackles issues that are focal also in the dynamic capabilities approach: “how does one build sustained competitive advantage and turn a super normal profit” (Teece 2010, 173) Therefore, the two literature streams bring insights on the same goal while focusing on different issues (cf. Helfat & Peteraf 2009; Teece 2007). Nevertheless, dynamic capabilities have not been examined in connection with the firm’s business model, although there clearly is a conceptual link between the two⁶. In the domain of strategy research, business models and dynamic capabilities can be approached from two different perspectives; while the design of a firm’s business model is an important microfoundation for its dynamic capabilities (Teece 2010), the running and management of certain business models might constitute a dynamic capability. This study is more interested in the latter perspective, which has not been addressed much in previous research.

Overall, this study examines the global factory structure in an SME context and focuses on the management of a highly international value net. The ability to manage the value net is a focal issue in running the chosen business model, and it is conceptualised here as a dynamic capability. The dynamic capability for value net management can be perceived to resemble a few other more or less established concepts. The following table summarises the most notable concepts that are close to the key concepts of this study, although beyond the scope of the study.

⁶ One rare example is Wu and Hisa (2008) study which examines dynamic capabilities for e-business. However, as Zott, Amit and Massa (2010) argue, business model literature has three streams: business models for e-business, business models and strategy and business models and innovation. Here the focus is on business models and strategy, and hence the Wu and Hisa (2008) study on e-business models does not offer much for this study.

Table 1 Concepts similar to value net management capability

Concept	Definition	Other key references
Alliance management capability	“comprising coordination, communication and bonding skills that are critical during the post-formation phase of an alliance”. (Schreiner et al. 2009, 1402)	Schilke & Goerzen 2010
Network orchestration	“Set of deliberate, purposeful actions undertaken by the hub firm as it seeks to create value (expand the pie) and extract value (gain a larger slice of the pie) from the network.” (Dhanarag & Parkhe 2006, 659)	cf. Sirmon et al. 2010; Wallin 2006
Strategic agility	“results from the combination over time of three major meta-capabilities that provide its foundations: strategic sensitivity... leadership unity... resource fluidity”. (Doz & Kosonen 2008, 96)	Doz & Kosonen 2010

Although this list is not exhaustive, it captures a few of the concepts that can be found in the academic literature, and that come close to the topic of this study. Although not directly addressed here, these concepts were selected to be presented here as they are closest to the key concepts of this study. However, this study acknowledges their existence and draws on some aspects. In other words, some aspects of each of the literatures are utilised to either supplement or contrast with the literature on the key concepts.

The main motivation for presenting these concepts and briefly discussing them in the following is to emphasise that there is a multitude of concepts that have been employed in reference to the issues focal also in this study. This further illustrates the existence of conceptual compartmentalisation in the field. The compartmentalisation is harmful for the advancement of our understanding of the phenomena examined, and hence it is important to strive for clarity. One of the contributions of this study is to bring some clarity to the academic discussion.

First, management of alliances occurs essentially at two levels: the dyadic and portfolio levels. Although these two levels are also important to the value net management discussion, it is important to note that the portfolio level slightly differs from the value net level. The alliance portfolio refers to all alliances of a firm (or all alliances of certain type of the firm), whereas value net refers to a selected sub-set of partnerships, which involves different types

of partner needed in value creation. Alliances have mainly been examined with regard to why they are formed, and somewhat also in terms of how they are formed (Ireland et al. 2002, 414). Although the management of alliances has received lesser attention, there exists some literature that focuses on alliance management capability.

Although this literature can inform the present study, there are some fundamental differences. Discussion on alliance management capability focuses on strategic alliances, whereas the value net includes strategic and non-strategic partnerships. Alliance partners are supposed to share the goal of improving both a firm's competitive position and performance through the formal alliance arrangement (Ireland et al. 2002, 413). Moreover, alliance management capability has for the most part been examined in large companies. Therefore, there is discussion on, for example, a dedicated alliance function (Dyer et al. 2001), which is out of reach for SMEs. The value net discussion takes a more comprehensive approach to the firm as it includes the focal partners in all operations (upstream and downstream), not just particular areas, such as R&D. Finally, in the alliance literature, the focus of analysis is mainly on the alliance, not the organisation that is part of the alliance (Schilke & Goerzen 2010, 1212). As this study takes the perspective of the focal SME, the alliance literature does not offer very much from the perspective of this study.

The concept of network orchestration also comes close to the focus of this study, although the concept itself is not employed. This is because the study at hand only examines a very limited part of the network of the firm, the value net. Additionally, the network orchestration discussion takes the perspective of a larger firm, whereas this study takes the perspective of an SME. The literature, however, does inform this study on the actions of network management (Dhanarag & Parkhe 2006; Sirmon et al. 2010). Moreover, the discussion highlights the facts that there is lack of research on how the focal firm operates to create and extract value from the network (Dhanarag & Parkhe 2006).

Finally, strategic agility is a relatively general level concept and can be seen to come close to dynamic capabilities. However, this discussion also takes the perspective of a larger firm, which is not entirely relevant in this study. Additionally, the focus of that discussion is on renewing the business model, whereas this study is interested in operating the business model now and into the future. Therefore, the concept of strategic agility was not chosen for the study at hand. Nonetheless, strategic agility scholars discuss the management actions that promote organisational capabilities, which offers some value added to this study.

Based on this theoretical positioning of the study, the following section highlights the research gap addressed by this study. In addition, research questions are specified.

1.3 Problem setting

Global supply chains, global product development as well as international experiences of SMEs have all been identified as important areas in future international business research (Griffith et al. 2008, 1226). This study combines various streams of literature to develop a better understanding of these three areas. However, the emphasis is on management issues in a globally operating SME. This study, as noted in the above discussion, is at the intersection of various literature streams. Although the breadth of the theoretical basis makes building a coherent theoretical frame challenging, it enables a holistic approach to the phenomenon. Taking a holistic perspective on the management of an international technology-based SME is important as existing knowledge on these kinds of firm, and especially their management, is scarce. Moreover, the dynamic phenomenon of international value net management necessitates a rather broad perspective from both researchers and managers (cf. Wang & Ahmed 2007, 44).

The management of an international SME is a topic that has not attracted much research attention. Although management challenges in an internationalised smaller firm represent an interesting avenue for academic research, scholars have focused on the internationalisation phase. It is known that internationalisation can be necessary for the competitive advantage of an SME (cf. Autio 2005), but how firms maintain their competitiveness when internationalised remains largely an open question.

SMEs often select to specialise in a niche market and, in so doing, they need to rely on value creating partners for access to specific resources and capabilities. It has been noted that specialisation strategy enhances flexibility, but also necessitates a high level of capabilities in managing the value net (cf. Mudambi & Venzin 2010, 1527). The ability to configure, motivate, influence and reconfigure the value net can be seen as a dynamic capability that might render competitive advantage to a firm through the unique resource and capability combinations it creates (cf. Teece et al. 1997). Thus, this study takes a dynamic capability perspective on the management of the global factory structure in technology-based firms. In other words, it examines the factors that contribute to an organisation's ability to manage the value net over time, and thus form a dynamic capability. Therefore, the study makes a contribution to the dynamic capability literature by analysing antecedents of the dynamic capability in the SME context. Moreover, the study conceptualises the dynamic capability of value net management as a combinative capability (Kogut & Zander 1992), and therefore also contributes to the dynamic capabilities literature.

Additionally, the study makes two important contributions to the global factory literature. First, it incorporates the inside-out perspective on the analysis of the global factory. Second, the study examines a neglected type of firm, the SME, as a global factory. The focus of the analysis is on the dynamic capability of a technology-based SME to manage the capability base that is needed to produce the desired customer value. This is an important issue for internationalising SMEs. In fact, research that leads to better understanding of SME internationalization, and especially the management of the value net, can enhance internationalisation of more SMEs (cf. Jones & Coviello 2005). Therefore, this research also makes an important contribution on the managerial side. This is an important issue also from the dynamic capabilities perspective as the dynamic capabilities literature only offers few managerial contributions.

In addition to the dynamic capabilities and global factory literatures ignoring SMEs, the significance of the value net is mainly neglected in discussion on SMEs. Although the value net is very important to the firms, research has emphasised the criticality of technological and market-related capabilities (Tolstoy 2010, 18). An SME's capability to build and manage strategic nets has received considerably less attention. Moreover, earlier studies on net(work) management have mainly excluded capability considerations from the discussion (Järvensivu & Möller 2009, 659). Hence, there is a need to develop understanding of value net management and related capabilities in the SME context. By advancing the knowledge on the capabilities for managing the value net in the SME context, this study contributes to the net(work) discussion.

All in all, there is a need for two types of information. First, we need to know what kind of business model is suitable for an SME that operates as a global factory. This means examining how internationalised highly networked SMEs create and capture value, and how the activities are organised and linked. Second, we need to know how this kind of organisation and the business model are effectively managed. Therefore, **the purpose of this study is to analyse the management of the value net as a dynamic capability in the context of an international technology-based SME which operates a small global factory.** This purpose is divided into three research questions that address three important aspects in overcoming the liabilities which SMEs need to address:

- 1) How is the small global factory structured?
- 2) How is value created and captured in a small global factory?
- 3) How is the value net in a small global factory managed?

The first research question addresses in detail the global factory structure (Buckley 2009b) in the SME context, and the second research question examines the business model design (Zott & Amit 2010). Together these two research questions aim to shed more light on the post-internationalisation operations of an SME. Understanding the business model and particularly the structure of an SME that has already somewhat established itself internationally, yet continues to expand internationally, offers new insight to the internationalisation literature. The third and final research question addresses the management aspect; to answer it, the study tackles both the means of managing the value net, and the capabilities that are needed in its management. Finding answers to this question contributes to value net management.

Technology-based SMEs are the objects of the study at hand. According to the definition employed here, a technology-based firm is reliant on technology for exploiting business opportunities (Granstrand 1998). The term technology-based is in fact employed interchangeably in the literature with various terms, such as technology-intensive or high-tech (see for instance Blomqvist et al. 2008). In this study, the term technology-based is employed to refer to firms that are involved in technology creation (i.e. development, commercialisation or manufacturing), and for which technologies are essential for competitive advantage (Forrest 1990; Yli-Renko et al. 2001).

Moreover, managing refers to actions aimed at affecting organisations (partners as well as the internal organisation). Capability is defined as the ability to utilise resources, which are the static factors of production (Grant 1996a; Penrose 1959; Winter 2000). Finally, the study also discusses nets that are purposefully created networks of partnerships (Moller & Svahn 2003; Möller & Rajala 2007).

1.4 Structure of the study

This is an article-based thesis that comprises an introductory part and four journal articles. The introductory part of the thesis is the glue that binds the four articles together and explicitly discusses the linkages between them. In addition to drawing together the contributions of the four articles, the introductory part makes an additional contribution. The synthesised research findings from the articles are subjected to the evaluation of a focus group mainly comprising experienced managers from technology-based small global factories.

The introductory part continues from here with an overview of the research methods employed in the study. Two of the articles rely on an extensive and systematic literature review while the other two rely on qualitative empirical

data. In addition to introducing the collection and analysis of the data, chapter 2 also contains an evaluation of the study.

Chapter 3 presents the theoretical foundation of the study. It discusses the relevant literatures on internationalisation of SMEs, dynamic capabilities and the management of strategic nets. Additionally, it integrates findings from the extensive literature review on the theoretical frame. Finally, chapter 4 discusses and analyses the findings from the empirical data. It merges the findings from the articles with findings from additional data collected to verify the research findings.

The introductory part is followed by four original articles. Table 2 below introduces each of the articles.

Table 2 Summary of the four publications

	Article 1	Article 2	Article 3	Article 4
Title	Processes, antecedents and outcomes of dynamic capabilities.	Critical review of methodological issues in dynamic capabilities research.	Dynamic capabilities in small global factory.	Value creation of an internationalising entrepreneurial firm – the business model perspective.
Author(s)	Eriksson	Eriksson	Eriksson, Nummela & Saarenketo	Sainio, Saarenketo, Nummela & Eriksson
Objective(s)/ Research question(s)	Examine what we know concerning dynamic capabilities based on the existing empirical research.	1) What kinds of research method (including data collection and analysis) have been employed in dynamic capability research? 2) What kinds of empirical data have been used in dynamic capabilities research?	What are the new types of dynamic capabilities that professional orchestration of a small global factory necessitates, and how can these be conceptualised?	1) Introduces the construct of the business model to the international entrepreneurship (IE) context. 2) Provides a framework for analysing value creation in IE firms, including not only the focal firm, but also its most important interfaces with value-adding partners.
Methodology	Systematic literature review	Systematic literature review	Qualitative, single-case	Qualitative, 3 cases
Main contribution	- Identifies three main areas of focus in dynamic capabilities studies: antecedents, elements and consequences of dynamic capabilities. - Identifies also three levels of analysis in the studies: intra-organisational, organisational and inter-organisational.	- Reflects the research strategies of the studies against the content of the studies and highlights some problematic issues in dynamic capabilities research. - Shows what has been studied with qualitative methods and what with quantitative methods, and emphasises the need for mixed methods studies.	- Analyses the dynamic capability that enables the operations of a small “global factory”. - Describes the hierarchical structure of the components that build up this dynamic capability.	- Shows that although the business models of firms with comparable positions can appear similar, there are fine-grained differences both in their activities and their value formation. - The data collection workshops revealed that firms tend to neglect the inspection of incentives to their partners. - Introduces the concept of business model to IE discussion,
Journal	<i>Scandinavian Journal of Management</i> (in press, 2013)	<i>Baltic Journal of Management</i> 8 (3), 306–327	<i>International Business Review</i> (in press, 2013)	<i>Journal of Small Business and Enterprise Development</i> , 18 (3), 556–570

2 RESEARCH STRATEGY

This chapter discusses the methodological issues. The details of the methods employed are presented in the four articles, and therefore are not thoroughly repeated here. Instead, the aim is to highlight the issues that are not extensively discussed in the articles, such as the selected research approach, the complete research process and discussion on the overall trustworthiness of the study.

2.1 Research approach

Selection of the research approach is one of the fundamental decisions in academic research. It reflects the researcher's position with regard to the philosophy of science and has important implications on the execution of the study. This study was conducted on the spirit of critical realism. According to critical realist thinking, an entity can exist without our identification of it (Fleetwood 2005, 198). This means that things can exist even when they are not being observed. It also applies to, for example, tacit knowledge on how to perform particular tasks. However, it is also acknowledged that there is no theory-neutral observation or interpretation. (Fleetwood & Ackroyd 2004) These basic assumptions guided this research and influenced the research questions. As for the latter, they guided the selection of the research methods.

Although international business research often addresses phenomena that are dynamic or environments that are volatile, quantitative research designs dominate the field. This is somewhat surprising as it has been strongly argued that qualitative methodologies are more suitable for examining multi-dimensional fuzzy, non-linear phenomena (Sinkovics et al. 2008, 6). Against this backdrop, the qualitative research approach was regarded to both suit this study and contribute to the international business field. Therefore, the qualitative research approach was chosen as it facilitates better possibilities of perceiving linkages between events and activities. Additionally, it is argued to enable the exploration of interpretations on factors that contribute to the aforementioned connections. (Bryman 1999, 43) In fact, the qualitative research approach enables deeper study on the examined phenomenon (Emory 1976, 80), which is very important in this study. Moreover, qualitative research is argued to be suitable when new theoretical or managerial

propositions can be expected, but where the details of the phenomenon, for instance, are not fully known (Lee 1999, 38). To further enforce these notions, it has been argued that “*quantitative research conveys a view of social reality which is static in that it tends to neglect the impact and role of change in social life*” (Bryman 1999, 42).

Qualitative research approaches are particularly suitable for studying dynamic capabilities, SMEs and international business. This is because capabilities result from complex and lengthy processes, and are thus extremely difficult to identify through quantitative research (Verona & Ravasi 2003). Additionally, the embedded nature of capabilities makes qualitative approaches more suitable (Eisenhardt & Martin 2000). In the case of SMEs, and particularly internationalising SMEs, qualitative research is important as it enables context specific description and explanation (Coviello & McAuley 1999, 249). Moreover, international business research is argued to benefit from research that addresses the meanings that underlie action; that is, the why and how questions (Ghauri 2004; Marschan-Piekkari & Welch 2004, 6). As all of the three areas – dynamic capabilities, SMEs and internationalisation merge in this study, the qualitative approach is the most suitable alternative. It facilitates the possibility of acquiring a deeper understanding of the organisations under scrutiny and enables change to be taken into account.

All in all, studying organisational capabilities empirically is very demanding as capabilities are by definition difficult to capture (Zahra et al. 2006). Identifying and evaluating capabilities is challenging for insiders within an organisation (Denrell et al. 2004), and even more demanding for outsiders. It is very easy to make over-simplistic arguments and assumptions regarding capabilities. Researchers can, for instance, assume that managers have knowledge that in reality they cannot be assumed to possess; for example, near perfect knowledge (Pandza et al. 2003b, 1028). Therefore, it is important to this study that the data were primary data, and that they were collected within the organisations. However, the lack of an established definition (Ambrosini et al. 2009) complicates the operationalisation of the concept. It is also possible that the versatility of theoretical bases behind the DC approach (Di Stefano et al. 2010; Wang & Ahmed 2007) complicates empirical research. The empirical study of DC requires consideration of various factors.

This qualitative research was carried out through case studies on four SMEs (i.e. Alpha, Beta, Gamma and Delta). The case study approach was considered suitable for this study as it is very important that dynamic capabilities studies examine the processes that occur and their interrelations (cf. Emory 1976, 80; Helfat et al. 2007, 30). Case study research, particularly longitudinal case research, is highly suited for examining the underlying dynamics of phenomena, and the role of dynamic processes (Siggelkow 2007, 22). It is an optimal

strategy for research aiming at “*understanding complex social phenomena*” (Yin 2009, 4), and hence suitable for this study that examines the dynamic capability of managing a novel organisational structure in the SME context. Moreover, compared to broader empirical research, it is argued that case data enable us to get closer to theoretical concepts (Siggelkow 2007, 22). This is very important in dynamic capabilities research due to the complexity of the focal theoretical concept. In addition, the case study approach enables the analysis of the phenomenon in its contextual setting (Ghauri 2004). Therefore, it is suitable for situations in which the focus is on a contemporary phenomenon in a real-life context. (Yin 1994, 1) The case study setting makes it possible for the researcher to offer a rich description of the scene, that is, to depict the context of the events (Dyer & Wilkins 1991, 615). This is especially important in the present study as the small global factory context is a key aspect of the study and an important contribution to the novelty value of the study. Finally, and most importantly, case strategy typically suits studies in which the aim is to find answers to how and why questions (Yin 2009, 4). This study asks three how-questions to analyse the operations and management of the small global factory. Thus case study was a natural and the most suitable choice.

Case can have two alternative roles in a study, either intrinsic or instrumental (Stake 1995, 3). In this study, the role of the cases is an instrumental one. This means that the cases serve the aim of finding a general understanding of the issues in focus: the global factory structure in an SME context and the related management issues and capabilities. However, case studies can be employed for different purposes: to provide description, to test theory or to generate theory (Eisenhardt 1989; Ghauri 2004,109; Welch et al. 2011; Yin 2009, 20). This study aims at two of these, as it describes the global factory structure in the SME context and advances the dynamic capabilities theory.

2.2 Research process

2.2.1 *Overview of data collection*

The report at hand is the result of a multifaceted process. This qualitative case study combines different types of data collected from a multitude of sources. The research process began at the end of 2006 with identification of the research topic and preliminary scanning of the literature. The initial understanding of the dynamic capabilities literature that was built during 2007–2008 created the basis for the systematic review that was initiated in 2009. Concurrent with the exploration of the literature, the empirical research

process began at the end of 2006. The main stages of the research process are depicted in the following figure.

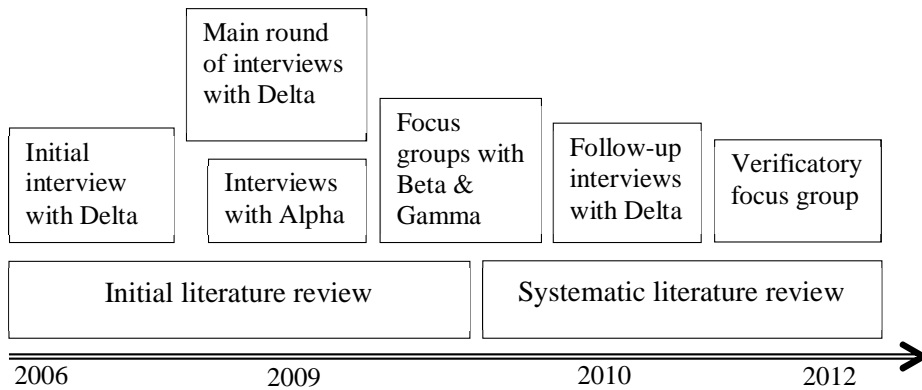


Figure 3 Data collection process

As can be seen in the figure, the empirical data collection was a process conducted over several years. This enabled the collection of longitudinal data on one of the companies, Delta. The details of data collection are discussed in the following sections.

Each type of data is utilised for various purposes. As shown in section 1.4, the dissertation comprises this introductory part and four journal articles. Two of the articles are based on an extensive and systematic review of previous research. First, the articles analyse what is known concerning dynamic capabilities based on empirical research and, second, how this knowledge has come about; that is, the methodological issues. The other two articles utilise primary empirical data, and broaden the discussion to international business, value net management and business model domains. The use of the research data is clarified in the following table.

Table 3 Use of the data

Data source	Introductory part	Article 1	Article 2	Article 3	Article 4
Systematic literature review	x	x	x		
Initial interview with Delta	x			x	
Interviews with Alpha	x				x
Main round of interviews with Delta	x			x	
Focus group with Beta	x				x
Focus group with Gamma	x				x
Follow-up interviews with Delta	x			x	
Verificatory focus group	x				

The crosses in the table indicate the parts of the study in which each data source has been utilised. As it can be seen in the table, each of the data sources (except the final focus group) is employed in at least two different parts of the study. Therefore, there is a rather balanced mix of data to inform the study. Nonetheless, the data are not collected equally on each of the companies as the cases serve different purposes. This is discussed in detail in section 2.3. Before that, however, the systematic literature review is discussed.

2.2.2 Phase I: Development of key concepts with systematic literature review

A literature review is not traditionally discussed in the methodology section of an empirical study. In this study, however, the systematic literature review plays a slightly unconventional role. The findings from the systematic review

and analysis of previous empirical studies are part of the overall findings of the study.

The systematic literature review that forms the data for the first two articles was initiated in 2009. As the dynamic capability concept is complex and the emerging literature quite scattered, it was important for the researcher to familiarise herself with the dynamic capabilities literature before conducting the review. Based on her understanding of the dynamic capabilities approach, she was able to develop the review protocol that guided the review process. The details of the review process are thoroughly discussed in articles 1 and 2. To avoid unnecessary repetition, the focus of the discussion here is on the role of the systematic review in the overall study.

The development stage of the dynamic capabilities literature can be debated. Nonetheless, it appears that the literature is still a long way from achieving maturity. There is, for instance, a lack of shared definitions (Ambrosini & Bowman 2009; Barreto 2010; Di Stefano et al. 2010; Wang & Ahmed 2007). Consequently, research has not been accumulating knowledge as efficiently as it might and the literature has become scattered. There appeared to be a need to synthesise findings from existing empirical research; that is, evidence-based or evidence-informed knowledge (Tranfield et al. 2003).

Four recently published reviews exist that concern the concept of dynamic capabilities (Ambrosini & Bowman 2009; Barreto 2010; Di Stefano et al. 2010; Wang & Ahmed 2007). This shows that consolidation of the literature is a very topical issue. Nonetheless, these reviews stress the conceptual discussion, and hence the evidence-informed knowledge on dynamic capabilities has remained unexplored. The first of the articles included in this dissertation synthesises the evidence-informed knowledge on dynamic capabilities. The second article focuses on methodological issues, which have not been addressed thus far in the dynamic capabilities discussion.

Hence, the systematic literature review first supplements the understanding of dynamic capabilities developed through conceptual discussion, and was thus important for the development of the study's theoretical frame. Second, the systematic review was needed to inform the conduct of the empirical part of the study. Findings from the analysis of the research methods employed in previous research informed the empirical part of this study. In particular, issues that were found to be problematic in the design of previous studies were highly informative for the conduct and reporting of the empirical part of this study.

2.2.3 Phase II: Empirical study among technology-based SMEs

The selection of case companies is very important to the quality of the study as it has major implications on the outcomes of the study. Above all, the research question needs to guide case selection. Additionally, the cases must correspond to the theoretical framework. (Ghauri 2004, 112) These considerations were also borne in mind in this study when selecting the cases.

Nevertheless, case selection is challenging in dynamic capabilities research. Dynamic capabilities are, by definition, difficult to spot, and thus their identification is difficult even if the researcher is familiar with the company. Hence, case selection is a crucial phase of empirical dynamic capabilities research. It is difficult and laborious to find cases that are relevant and interesting for the study in question. The researcher needs to determine many things concerning the companies before she/he is able to select a company. In this study, the initial interview with Delta also served to verify the relevance of the company for the study. In addition, the co-authors' (for the journal articles) knowledge of the three other companies enabled their selection.

It has been noted that the aim of case selection should be to maximise what can be learned (Stake 1995, 4). The cases should be selected so that they are the most likely to cast light on the issues being examined (Yin 2009, 26). Relevance to the objective of the study is thus the prime criterion (Mills et al. 2010). In this study, it was important to select somewhat similar companies to enable cross-case comparisons. Although the case companies played slightly different roles in the study, they are compared along many dimensions. In three of the cases, the examination focused on the business model and the global factory structure. In addition to these foci, specific emphasis was given in the fourth case to the management of the value net and capabilities.

Instead of random sampling, case research relies on and benefits from theoretical sampling (Eisenhardt 1989). Thus, there were strict criteria for the case selection. As this study focuses on technology-based SMEs that can be considered global factories, the companies needed to be such that technologies are focal in their offering. All four companies offer software, and three integrate hardware into the system. It can safely be argued that all of these companies are technology-based. The companies are also all SMEs. The largest of the four employs 100 people and has an annual turnover of €30 million. The companies also needed to be such that they could be considered global factories. All four companies have spread operations internationally both upstream and downstream, and they cooperate intensively with partners in many activities. Their structures are comparable to large multinationals (the organisations' structures are examined in detail in chapter 4). In addition to being global factories, the companies needed to have sufficient international

experience for the activities to be thoroughly analysed. All four companies have operated internationally for a number of years. With the least international experience, Beta began in 2006.

Various practical issues also played a role in case selection (cf. Ghauri 2004, 113). For the sake of convenience, and due to budgetary constraints (cf. Yin 2009, 26), all of the firms are headquartered in Finland, and hence their management could be interviewed in Finland. This is justified as a key issue in case selection is that the cases are accessible to the researcher (Ghauri 2004). The four Finland-based SMEs offered easy access to the researcher and, relatedly, informants who were interested in sharing information (Stake 1995). In case selection, a researcher balances advantages and disadvantages (Ghauri 2004), and the openness to the research was a major advantage in selecting these specific SMEs.

The companies are briefly introduced here. Case company Alpha Ltd. is a provider of complex ICT systems mainly for public sector organisations. It was founded in 1996, although before that it operated as a unit within a larger corporation. Currently the firm holds 85% market share in its home market with its main product. The company has almost 40 employees. Case company Beta Ltd. was established in 2002 and currently employs approximately 20 employees. The company offers solutions for bringing media content to mobile browsers. Gamma Ltd. is a provider of ICT-based systems for public sector organisations. Founded in 2001, it currently has approximately 100 employees and focuses on niche markets. The fourth company, Delta Ltd., also provides software-based systems mainly for public sector customers. The offering also includes hardware, although the design and production of hardware has been completely outsourced. The company was part of a larger corporation from the 1960s until 2001. Since 2001 it has operated as an independent SME. Table 4 shows the key facts.

Table 4 Case company facts

	Alpha	Beta	Gamma	Delta
Business	ICT systems	Software solutions	ICT systems	ICT systems
Employees	40	20	100	80
Turnover	€7m	€1m	€30m	€12m
Founded	1996*	2002	2001	2001*
Data	Three individual interviews and one group interview between 2008–2010	Group interview in spring 2010	Pair interview in spring 2010	Ten individual interviews between 2006–2010

* Previously part of a larger corporation, the company has been independent since this year.

All four firms offer systems that combine hardware, software and/or services. Some of the systems offered are sold to customers, but most are integrated into a wider package. The integration is mainly performed by a system integrator sales partner. Therefore, all four companies operate a rather similar business model; they have some key partners in software/product development and hardware manufacturing, and there are the system integrators on the sales side that are positioned between the case firms and their customers. Furthermore, two of the case companies have a longer history as they were originally part of bigger corporations. They became independent companies between 10–15 years ago. The two younger companies were established in 2001 and 2002. All four companies have had international operations for a number of years, and have therefore accumulated experience in international networks and partnerships. The collection of empirical data on the case companies is described in the following.

2.3 Empirical data collection

The data collection process was initiated at the end of 2006 and finalised in the first half of 2012. However, it must be noted that the longitudinal data collection process concerned only one of the four companies. With the three others, data were collected during a much shorter time period, although the

interviews included retrospective reflections on the past of the companies. The empirical data concern three broad themes:

- International/global value net of the firm.
- Management of the value net.
- Dynamic capability for managing the value net.

Data on the first two themes were collected in all of the companies, and the longitudinal data needed for the third theme were collected only in one of the companies.

The empirical data for this study were collected with interviews: individual, pair and group interviews. In addition, all secondary material that could be found served as further material to support the analysis. As the firms are SMEs, there were not many secondary data available. Nevertheless, some newspaper articles and press releases were found, in addition to which all four companies have very good websites. The supplementary data added to the author's understanding of the companies.

Qualitative research interviews were chosen as the primary data collection method for the study at hand. There are various reasons for this. First, interviews are a suitable data collection method for exploratory and theory-building research (Daniels & Cannice 2004). Second, the complex nature of the phenomenon under study influenced the choice. Interviews enable the researcher to develop a trusting relationship with the informant, and hence gather data that would not be accessible by any other means (Daniels & Cannice 2004, 187). Although the openness of interviewees has been identified as a potential problem in research interviews (Welch et al. 2002, 615), the informants for this study talked very openly about their views. One reason for this might be that all the informants represented SMEs in which policies might not be as strict as those in larger corporations. In addition, the Scandinavian culture of openness to academic researchers might have benefitted the data collection (cf. Macdonald & Hellgren 2004). Third, interviews suit situations in which the number of possible informants is relatively small (Daniels & Cannice 2004). This is an important aspect from the perspective of this study, as the number of SMEs that operate as global factories remains fairly low, and the number of possible informants is quite small in every SME. Together, these three aspects support the choice of interview as the data collection method (cf. Daniels & Cannice 2004, 189).

A qualitative interview is a flexible method for data collection (Puusa 2011a, 76). It enables the discovery of new relationships and the examination of novel situations (Daniels & Cannice 2004, 186). In addition, the interview situation always recreates the interview and the design can be modified during the course of the interview (Rubin & Rubin 1995, 7). Although this creates some challenges with regard to the skills of the interviewer, it is considered a

major advantage of interviews. Improvisation and adaptation are, indeed, argued to be essential parts of data collection in research that relies on interviews. However, to be able to adapt, the researcher needs to be well-prepared for the interview. (Puusa 2011a, 77; Wilkinson 2004, 207) To ensure proper preparation for the interview in this study, the interview guide was carefully planned. It was utilised in the interview situations to make sure all intended areas were properly addressed.

Qualitative interviews typically yield much more information than, for instance, surveys. Furthermore, the interview situation enables the quality and quantity of information to be influenced during data collection, as the interviewer can ask additional, specifying questions that were not planned in advance. (Emory 1976) Hence, as a data collection method, interviews enable responsiveness to the information provided by interviewees. In this study, it was particularly important to ask many specifying questions as the terms employed are complex and even ambiguous. The interviewees were asked to explain what they meant by the terms they used. Moreover, interviews were considered suitable for this study as the research question called for in-depth data on the companies and the key informants' views were considered important (cf. Rubin & Rubin 1995).

The interviews were semi-structured in nature (Kvale & Brinkmann 2009, 130). The interviewer had listed themes with some open-ended questions to guide the interview. The interview guides can be seen in appendices 1 and 2. The interview guide served as a checklist for the interviewer to ensure that all intended themes were addressed, and as a tool for time allocation (cf. Daniels & Cannice 2004, 192). A semi-structured interview enables interviewees to respond to questions in their own words and emphasise the issues they perceive as important. The open-ended nature of the interviews meant that the interviewees talked both about the facts relating to the issues in focus and their own opinions or interpretations on the issues (cf. Yin 1994).

Each interview began with a couple of very easy questions concerning the interviewee her/himself. The purpose was to make both the interviewee and the interviewer feel at ease (cf. Daniels & Cannice 2004, 198; Wilkinson 2004, 213), and to gain some background information on the interviewee that might help in interpreting their views. With the consent of the interviewees, all interviews were recorded with a digital recorder. Recording can make interviewees feel uncomfortable or even restrict what they say (Daniels & Cannice 2004, 198). Nonetheless, this was not a problem here. The interviewees hardly paid any attention to the fact that the discussion was being recorded, and they showed that they trusted the researcher to keep all information confidential. Despite recording, a key issue in a qualitative research interview is to listen to the informant (Gilchrist 1999). In effect, the

interviewer begins the process of data analysis during the interview by connecting the interviewee's comments with what the interviewer knew beforehand. In addition, listening is a prerequisite for being able to ask specifying questions. The interviewees were allowed to respond to the questions at their own pace and in their own words. The interviewer strove to give the interviewees time to think and not to rush their responses. The duration of the interviews varied from 45 minutes to approximately two hours. In total, there were 16 interviews and focus group discussions with the case firms. There were five informants from Alpha, three from Beta, two from Gamma and nine from Delta. Table 5 lists the interviews.

Table 5 Interviews

Date	Company	Interviewees (number)	Duration	Themes
December 2006	Delta	Chief technology officer (1)	47min	R&D cooperation
October 2008	Alpha	Managing director (1)	1h	Internationalisation & value net
February 2009	Delta	Executive vice president, global sales & partnerships (1)	1h 49min	Value net & capabilities
February 2009	Delta	Vice president, corporate and product marketing (1)	1h 1min	Value net & capabilities
March 2009	Alpha	Business unit manager (1)	2h	Value net
March 2009	Delta	Chief technology officer(1)	1h 45min	Value net & capabilities
March 2009	Delta	Managing director (1)	1h 45min	Value net & capabilities
March 2009	Delta	Vice president, large scale projects and strategic partnerships (1)	1h 15min	Value net & capabilities
March 2009	Delta	Senior vice president, emerging markets, Middle East, Asia (1)	1h 3min	Value net & capabilities
March 2009	Delta	Vice president, USA (1)	47min (telephone)	Value net & capabilities
April 2009	Alpha	Sales manager (1)	1h 15min	Exports & value net
August 2009	Alpha	Managing director; chief technology officer; two sales managers (4)	2h 2min	Value net
March 2010	Beta	Managing director, project manager, sales and marketing manager (3)	1h 30min	Value net
April 2010	Gamma	Manager of software business; chief financial officer (2)	2h 6min	Value net
November 2010	Delta	Managing director (1)	1h 28min	Value net & capabilities
December 2010	Delta	Vice president, business development (1)	1h 10min (telephone)	Value net & capabilities

Apart from two that were conducted by telephone, the interviews were face-to-face interviews, which were conducted in the companies' premises in rooms that were suitable for interviewing (i.e. sufficiently quiet). There were only minor interruptions during some of the interviews, and hence it can be argued that the interview settings were close to being ideal. However, one of the interviewees in the Beta group interview was working with a laptop and did not participate in the discussion unless specifically asked to comment on something. The two other interviewees in the focus group were active.

The focus groups were conducted with a Power Point presentation so that the participants could see the questions. This worked well and the interviewees themselves often returned to the topic if the discussion got side-tracked. In the individual interviews, the interviewer had the interview guide on paper. The interviewees had each received the themes of the interview by e-mail a couple of days before the interview.

The interviewees can all be considered key informants. They are all in a focal position (managerial position) in their organisations, and thus have deep understanding of the organisation (cf. Gilchrist 1999; see also Welch et al. 2002). It is also important that interviewees are motivated to give information and to share their views. The interviewer can enhance the interviewees' motivation by facilitating convenient participation for the interviewee and making the interview situation pleasant (Emory 1976, 270). Apart from the interviewee who worked on a laptop in the Beta focus group, all interviewees appeared to be well motivated and actively participated.

As shown in Table 5, the number of participants in the interviews varied from one to four. In focus groups the discussion can become very lively and result in chaotic transcripts (Kvale & Brinkmann 2009, 150). However, the focus groups in this study were small and the participants behaved very professionally. Thus the discussion was easy to follow and the transcripts are accessible. One of the main benefits of focus groups is that participants interact with each other and can engender issues that they would not have thought of themselves (Kitzinger 1999, 142). This occurred on a couple of occasions in these focus groups as the interviewees also began elaborating on each other's comments. The discussion flowed well, enabling the interviewer to remain in the background and let the company representatives converse among themselves for a while.

Further to the recorded and transcribed interviews, there were several unofficial meetings with Delta during the research process. In addition to the study at hand, the researcher also cooperated with the company in other research projects that were closely linked to the thesis project, and therefore enhanced the researcher's understanding of the company. The unrecorded meetings are listed in the Table 6.

Table 6 Unrecorded meetings with Delta

Date	Delta representatives	Topic
May 2009	Managing director	Preparation of a survey to the personnel
October 2009	Managing director	Meeting the new managing director
February 2010	Managing director; Vice president, business development; Vice president, large scale projects and strategic partnerships	Planning a customer survey
March 2010	Product manager	Introduction of Delta products
June 2010	Vice president, business development; Sales and development manager	Planning the customer survey
January 2011	Managing director	Project wrap-up
May 2011	Managing director	Joint interview of the managing director and the researcher for a magazine concerning the research project and its findings

In the last phase of data collection, after analysing all the data introduced above, a group of managerial and expert interviewees was brought together to discuss the relevance and value of the research findings. In addition to examining the managerial relevance of the findings, the discussion provided insights on the applicability and accuracy of the findings, and hence added to the trustworthiness of the study. In sum, the aim of the final focus group discussion was to improve the rigour of the thesis and show the relevance of the research findings.

In this kind of a design, there is the possibility that participants in the final focus group, without proper consideration, only agree with what the researcher presents and enforce the results. In this study, the participants in the final focus group agreed with much of what the researcher presented, but also expressed many critical comments and alternative ways of considering the issues.

This aim guided the selection of participants for the focus group (cf. Valtonen 2011, 90). Typically the number of participants varies from two to approximately ten. A smaller number of participants has been found to function well when they are experts who tend to have a lot to say concerning

the topic (Eriksson & Kovalainen 2008, 181). Moreover, theoretical sampling is recommended for focus groups (Lee 1999, 70).

For this focus group, it was important to source participants with knowledge on how highly international technology-based SMEs operate. In addition, a key feature of focus groups is the interaction between participants (Eriksson & Kovalainen 2008, 173; Kitzinger 1999). Therefore, the participants were selected so that they have something in common (i.e. knowledge of the domain), but that they also contribute potentially differing perspectives (cf. Valtonen 2011, 91). The participants are listed in Table 7.

Table 7 Participants in the verificatory focus group

Name	Position	Organisation
Jari Huovinen	Expert, SMEs & internationalisation	Confederation of Finnish Industries
Jukka Järvi-Laturi	Chairman of the board, owner	Mariachi Oy
Jyrki Kurokallio	Managing director	Stick Tech Oy

All the participants are experts in the domain of internationally operating SMEs. Both company representatives have extensive first-hand experience on international operations and the management issues in an international technology-based SME. Additionally, the representative from The Confederation of Finnish Industries has also accumulated notable know-how by operating with and studying numerous international SMEs.

The focus group was conducted at Turku School of Economics on 3rd May 2012. As the aim was to discuss the research findings, it was necessary to familiarise the participants with the findings. Each participant received a short summary of the key points to be discussed in the focus group one week before the session. Everyone had time to look at the summary before the discussion and were therefore well aware of the discussion topics. Moreover, the actual focus group session began with the researcher presenting a more detailed overview of the findings that were to be discussed.

After the researcher's briefing, each of the participants introduced themselves and stated how they relate to the topic (cf. Lee 1999, 73; Valtonen 2011, 93). As the focus group was structured, there was a pre-planned agenda for the discussion (Lee 1999, 70). The researcher induced discussion with a few broad questions, such as:

- How do the means of value net management identified in this study differ from your experience?
- What are your thoughts on the suggested capabilities for managing the value net?

- How do you think an SME manager might benefit from these findings?

Open questions by the facilitator are, indeed, suggested as a good method of inducing discussion and to guide the discussion towards desired topics (Valtonen 2011, 93). In this case the questions functioned well, as they informed the participants on what kinds of issue the researcher was expecting them to discuss.

Overall, the session lasted for an hour and a half, which was the time participants had been asked to allocate. This time was sufficient to cover the pre-planned agenda with the three participants. The actual discussion lasted for an hour. The discussion flowed easily and each of the participants had the opportunity to share their thoughts. It was important that they did not feel rushed (cf. Lee 1999, 72). All in all, the composition of the group proved to be good. All participants had many interesting comments to make concerning the topics of the discussion. Additionally, they commented on each other's arguments, and brought somewhat differing perspectives to the discussion. Each participant actively contributed to the discussion and had many highly relevant thoughts to share; as such, the researcher had an easy task in moderating the discussion. The discussion was recorded and transcribed verbatim for the analysis.

2.4 Analysis of empirical data

Data analysis is an important aspect of academic research. It reduces the mass of data to a form that the researcher can command (Puusa 2011b), and has been defined as "*the breaking down and ordering of data into meaningful groups, plus searching for patterns of relationships among these data groups*" (Emory 1976, 337). It has been noted that data analysis is one of the most challenging aspects of conducting case research as it remains one of the least developed areas of case studies (Yin 2009, 127). In addition to which, there are few instructions for qualitative data analysis (Eisenhardt 1989, 539).

Data analysis needs to begin with an analytic strategy that determines the priorities for what the researcher analyses and why (Yin 2009, 126). This was also very important in this study as the body of data was relatively large, which is typical in qualitative research. Making sense of the mass of data would not have been possible without prioritising and having a structure to the analysis. The research questions specified in chapter 1 were the structural backbone of the analysis. In addition, the fact that the cases served somewhat different purposes brought structure to the analysis process. The organisational

structure and the business model were analysed in all of the cases; however, the capability aspects were analysed in-depth in only one of the cases, (Delta).

Data analysis in this study comprised several phases due to the nature of the research process. In effect, data collection alternated with data analysis, which is typical in qualitative studies (Puusa 2011b, 114). The first stage of the process was the systematic analysis of the articles found in the literature review. As detailed in the first two articles, the analysis included both qualitative and quantitative parts; however, the primary analysis method was qualitative content analysis of 142 articles. The key theme of each article was recorded, and the focal findings on that theme were noted. Subsequently, the themes were categorised into wider upper-level themes that served as the basis for reporting the review findings. In addition to the qualitative analysis, quantitative analysis was conducted on, for example, the research methods, the data and types of firms studied. The findings from the systematic review informed the analysis of the empirical data on the case firms.

The analysis of the empirical data was initiated after the 2009 interviews. All interviews were transcribed verbatim, after which the coding scheme was prepared. The interview guide served as the backbone of the coding scheme, but the scheme was refined after careful reading of the transcripts. Most codes originate from the interview guide, but a few additional codes emerged from the reading. The coding scheme is shown in Table 8 below.

NVivo software was employed to code the transcripts of the Delta interviews. The empirical data of this study are suitable for the use of NVivo software as the transcribed interviews are the primary data. Employing software in qualitative data analysis is a controversial and widely discussed topic. While there are numerous arguments against the use of software (see Sinkovics et al. 2008 for a brief overview), there are also numerous possible benefits that can be derived by clever utilisation of software in the analysis phase. It is clear that software does not conduct the analysis for the researcher; however, it provides a set of tools that the qualitative researcher can utilise to facilitate the transparency of the analysis process, and to formalise the process for improved reliability (Sinkovics et al. 2008). In addition to the coding scheme,

Table 8 also shows how many of the Delta interviewees discussed issues coded for the code in question (column “Sources”). The column “References” shows the number of times a citation is coded for the code, and the column “Words coded” shows the number of words coded for the code in question.

Table 8 The codes for analysis of the 2009 Delta interviews

Code	Sources	References	Words coded
Description of partners	7	25	2959
Technology partners	2	15	1708
Hardware manufacturing partner	1	14	1056
Marketing communication partners	1	4	409
Strategic partners	4	20	1794
Sales partners	6	23	1497
Partners' capabilities	6	10	858
Delta technology personnel	2	9	581
Delta marketing communication personnel	2	5	154
Delta sales personnel	4	17	1290
Value proposition	2	7	910
Value net	4	15	1274
Management of value net	7	43	4883
Delta capabilities	7	90	5907
Delta personnel capabilities	3	10	839

This table illustrates how the use of the NVivo software in the analysis of the qualitative data enhances systematisation and transparency of the analysis (cf. Sinkovics et al. 2008). All of the seven managers interviewed in 2009 talked about issues that related to their field of expertise; as such, for instance, only two discussed technology partners. In the table, it can be seen that the codes with the most words are the case firm's capabilities and the management of the value net. This is in line with the purpose of this study and the role of the Delta case in the study.

Following the coding of the Delta data, the data from the interviews with Alpha in 2008–2009, and the focus groups with Beta and Gamma 2010 were analysed, but with a different coding scheme. There was also a theory-based interview guide for these interviews that served as the point of departure for the analysis. In addition, some aspects were drawn from the coding scheme for the Delta interviews to enable cross-case comparisons with regard to the management of the value net.

Finally, the data from the two interviews with Delta managers at the end of 2010 were also transcribed and coded. However, the coding scheme was slightly different because the results from the analysis of the 2009 interview

data served as the point of departure for these interviews. The coding of the 2010 interviews was therefore conducted with four codes:

- Flexibility and organisational change.
- Absorptive capacity and knowledge transfer.
- Networking.
- Global dimension.

Additionally, these interviews charted what had occurred during the one and a half years since the previous interviews.

All in all, the employed analysis method coded the data according to the coding scheme that contained the themes derived primarily from theory, although supplemented with empirical observations. The purpose of coding is to divide the data into smaller pieces that can be combined in new ways for interpretation. Coding and searching for themes in the data enable the data to be densified, thus increasing the information value (Puusa 2011b, 115, 117). In addition, it is important that the researcher is able to discover the themes' internal structures, and the relationships between the themes, as well as between the themes and the research questions (Ghauri 2004, 119; Puusa 2011b, 121). With these requirements in mind, the data coded for each theme were carefully examined over the next stage of the research process. Similarities and differences between interviewees were noted.

The organisational structure of each company was also examined, and different aspects of their structures were compared and contrasted. The analysis was thus a combination of within case and cross-case analyses. (cf. Eisenhardt 1989, 539-541) Also, figures were utilised during this phase to analyse the organisational structures and the business models of the firms. Although the amount of data collected on each of the four companies was not equal, there were sufficient overlaps in the interview themes to enable cross-case analyses.

Finally, interpretation of the findings from the analysis is an important phase of the research process (Puusa 2011b, 123). Interpretation, in fact, goes beyond the data as it links the analysis to other research and theories (Emory 1976, 337). Hence, the final stage of data analysis was interpretation of the research findings and linking them to previous knowledge. This is presented in the last sections of chapter 4, as well as in each of the four articles.

2.5 Evaluation of the empirical study

Qualitative studies can be evaluated against many different criteria. The traditional validity and reliability criteria were not considered suitable here as they are developed from the premises of quantitative research (Eriksson &

Kovalainen 2008; Tynjälä 1991). Instead, the quality of this study is evaluated against the trustworthiness criteria of Lincoln and Guba (1985), as these are specifically applicable to qualitative research. A qualitative study can be considered trustworthy when its results are independent of random or irrelevant factors (Aaltio & Puusa 2011, 153). In other words, trustworthiness signifies the plausibility of the study. It is good if the reconstructions created by the researcher correspond to the original constructions of the objects of the study (Puusa & Kuittinen 2011, 170; Tynjälä 1991, 390).

According to Lincoln and Guba (1985), trustworthiness of the study comprises four elements: credibility, transferability, dependability and confirmability. This section examines each of the four criteria and discusses the means employed in this study to ensure that the criteria are met.

Credibility is based on ideas that come close to the internal validity of quantitative research. It deals with the truth value of the findings regarding *“the subjects (respondents) with which and the context in which the inquiry was carried out”* (Lincoln & Guba 1985, 290). Therefore, establishing credibility means that the researcher ensures that the realities presented in the study match those constructed by the respondents (Sinkovics et al. 2008, 699). It is suggested that focal considerations with regard to credibility are the researcher’s familiarity with the topic and the sufficiency of the data to merit the researcher’s claims. In addition, establishing strong and logical linkages between the data and the arguments made based on the data is crucial (Eriksson & Kovalainen 2008, 294) The means of improving the credibility of this study involve prolonged engagement, data triangulation and investigator triangulation (cf. Lincoln & Guba 1985, 301).

Prolonged engagement and persistent observation of the case (cf. Lincoln & Guba 1985; Tynjälä 1991, 393) was possible with two of the four case firms. The researcher and her colleagues were involved in the research process with the case firms for several years. During that time, the researchers learned much concerning the organisations and the phenomenon. Therefore, it can be argued that the author of this study is familiar with the topic, which adds to credibility. Additionally, the researchers were able to build trust with the interviewees. This is apparent by the manner in which interviewees openly discussed their perceptions. For instance, in the last interviews, an interviewee spoke rather frankly about internal challenges in the company. His trust in the researcher was evident as he commented: *“you’re not gonna write this anywhere, but I can tell that...”* This open communication between the researcher and the interviewees is a key factor for the credibility of this study. Prolonged engagement contributed also to the accuracy and completeness of the findings, as it was easy to return to the interviewees for additional data whenever necessary (cf. Sinkovics et al. 2008, 698). This possibility was

particularly utilised with Delta, as the 2010 interviews served also to verify the findings from previous interviews. For instance, the interviewees were presented with an illustration of the value net based on the previous data, on which they were asked to comment.

Triangulation was also a significant factor for the credibility of this study. In fact, two different types of triangulation were utilised: data and investigator triangulation (Eriksson & Kovalainen 2008, 293). Data triangulation is a significant factor in reducing the possibility of misunderstanding or misinterpretation (Ghauri 2004, 115). This is because drawing data on the same issues from multiple sources enables cross-checking between the sources. However, data triangulation can also yield contradictory evidence, and hence make the work of the researcher more complicated (Tynjälä 1991, 393). This was not the case here as the different sources of data yielded consistent evidence.

Triangulation is, in fact, a defining feature of case studies, as very often data are drawn from more than one source; for example, different interviewees, documents and reports (Ghauri 2004, 115). This study had multiple interviewees from each firm, and hence the data from one informant could be contrasted with at least one other interviewee from the same firm. This was important in terms of achieving a balanced perspective on the organisation. While interviewees' opinions are naturally constrained by their position in the organisation, they can provide the most information on their field of expertise or responsibility. As this study examines, for example, the structure of the organisation and its surrounding value net, it would not have been credible to rely on only one person's depiction of the firm.

Nevertheless, in a group interview situation it is possible that a person ostensibly agrees with the others as it might be the easiest solution or because they feel that they should not express any other opinions. This influences the research findings and hampers the researcher from discovering the participants' actual experience or viewpoint. In this study, the atmosphere in the focus groups was relaxed and open. All participants seemed at ease. Moreover, they all were managerial-level employees; that is, at approximately the same level in the organisational hierarchy. Thus, it can be expected that they were able to express their own opinion regardless of the others.

However, having relatively few informants in two of the case companies (Beta and Gamma) might have an influence on the results. Had there been additional informants, it might have been possible to gather more data on the companies (cf. Ghauri 2004). Beta is a very small organisation with only 20 employees, and hence the perspectives of three focal managers can be expected to yield a comprehensive picture of the firm. However, in the case of Gamma it would have been advisable to have more informants, which unfortunately was not possible. Moreover, it is possible that the informants bring

forward their personal agendas or biases. In any event, the themes in the focus groups were not likely to invoke strong feelings in the interviewees. The ambience in the focus groups was dialogic. The small number of participants threw ideas around but did not appear to have heavy statements to make. Nevertheless, it was therefore important to utilise as much additional secondary data as possible.

The interview data were indeed supplemented with secondary sources as explained earlier in this chapter. Although there was little secondary data available on the case SMEs, the additional data offered important support to the interview data. In particular, the newspaper articles, press releases and websites of Beta and Gamma were valuable as the primary data on these were more limited than for Alpha and Delta. The secondary sources were key, for instance, in developing better understanding of the firms' operating environments.

This study also benefitted from investigator triangulation (cf. Denzin 1978) as the author of this dissertation had co-authors in writing the two empirical articles. The empirical data were to some extent analysed in cooperation with a co-author in both cases. All of the three co-authors are more experienced academics than the author of this thesis, and hence they brought much theoretical knowledge to the analysis process. The researchers were deeply involved in the data analysis process and different interpretations of the findings could be contrasted and discussed. Nonetheless, the author of this thesis had the main responsibility for the data analysis, and she conducted several additional analyses for this introductory part.

Credibility of the study also improved due to synthesis of constructs from different streams of the literature, careful application of theoretical sampling (cf. Sinkovics et al., 2008), discussing the findings with the members of the case company (cf. Lincoln & Guba, 1985) and the iteration rounds between data collection and analysis. All of these contributed to the researcher's understanding of the objects of study and the overall phenomenon under investigation. Hence, these issues were necessary to ensure that the reconstructions presented in this study are close to the constructions held by the interviewees. Most importantly, prolonged engagement and triangulation enabled building a chain of evidence (cf. Sinkovics et al. 2008; Yin 2009, 123) that enables the reader to see the linkages from data to findings and, further, to conclusions. For this chain of evidence, the report and the articles include a number of quotations from the interviews (cf. Andersen & Skaates 2004).

The second criterion, **transferability**, refers to the generalisability of the findings (Sinkovics et al. 2008). Although transferability links to issues that resemble external validity of quantitative research, the means of establishing it are very different (Lincoln & Guba 1985). This is due to generalisability

having a different meaning in qualitative research than in quantitative research. Instead of statistical generalisation, qualitative research aims at analytical generalisation (Yin 2009, 43), which implies comparing the findings to a previously developed theory (Eriksson & Kovalainen 2008, 294). Therefore, to establish transferability, researchers need to connect their research and results with earlier results (Eriksson & Kovalainen 2008, 294).

The most important means of enhancing transferability, which was also applied in this study, is to provide a thick description of the cases so that anyone interested in transferring or applying the results can decide whether the transfer is possible (Lincoln & Guba 1985, 316). Thick description means providing rich and multifaceted details of the case, and especially of the reasons underlying the details (Eriksson & Kovalainen 2008, 120). Therefore, a thick description enables the evaluation of the transferability of the findings (cf. Eisenhardt 1989).

This thesis aims to provide thick descriptions of the cases. The description is partially in this introductory part and partially in the research articles. Each of the companies is described in terms of how they operate and how their operations are organised. Also, the relevant figures as well as information on the products and markets are provided so that the reader can reflect the analysis against this background. Although a lot of detail is provided on each of the four cases, it must be noted that, due to the nature and volume of the data, the descriptions of Alpha and Delta are necessarily thicker than the descriptions of Beta and Gamma.

Although the evaluation of the transferability of the findings is always left partially to the reader, it can be stated that many of the issues discussed in this study (e.g. global structure in an SME) are likely to occur similarly in other technology-based fields in addition to ICT. However, three of the four case firms operate with public sector customers. This adds some special characteristics, for example, to sales. Public sector customers tend to be slow and bureaucratic in their decision-making. In addition, the bidding process is an art form that requires specific know-how. Nonetheless, the case SMEs only rarely deal directly with their public sector customers. Instead, they utilise intermediary partners. Therefore, it was considered that this aspect does not have major implications on the findings of this study.

Transferability has also been argued to depend on functional and conceptual equivalence (Sinkovics et al. 2008, 696). This implies that the operational definitions correspond to the conceptual definitions. To ensure that this was the case, the interviewees were asked to explain their perceptions of the focal concept of the interview (i.e. capability or business model). In addition, the interviewees were told what the interviewer meant by the particular concepts. These were very well aligned, and hence equivalence does not appear to be a

threat to the transferability of the findings. Finally, the equivalence of data analysis was ensured by having a coding scheme that guided the initial coding (cf. Sinkovics et al. 2008, 698).

Dependability of qualitative research deals with the consistency of the findings (Lincoln & Guba 1985). That is to say, the researcher evaluates the research setting and identifies factors that might influence the data. These factors can be external to the phenomenon being examined, but they might also be caused by the research setting (Tynjälä 1991, 391). Acknowledging these issues and accounting for them in the analysis enhances dependability. Therefore, the researcher is responsible for providing sufficient information to the reader on the research process to show that it has been logical, traceable and documented (Eriksson & Kovalainen 2008, 294). Dependability is also argued to address the stability of the research findings over time (Sinkovics et al. 2008).

To establish dependability, this study provides a thorough description of the research process. For instance, the data collection process is described in detail in section 2.3, and in the research articles. Thus, the reader is able to see how, when and from which sources the empirical data are collected. Also, the interview guides for both individual and focus group interviews are included as appendices (see Appendix 1 and Appendix 2). This improves the transparency of the study and thus its repeatability (Sinkovics et al., 2008).

As noted earlier, studying capabilities is a challenge. It is difficult for managers to identify capabilities in their organisation if they do not have experience of their subordinates' tasks (Denrell et al. 2004). In this study, the managers were asked about their own capabilities, and those of their subordinates. As the firms are SMEs, the managers are very close to the daily tasks of all employees, and hence can be expected to make rather reliable evaluations on their capabilities.

Moreover, Lincoln and Guba (1985, 316) also argue that there cannot be credibility without dependability and that, consequently, demonstrating the former is also sufficient to show the existence of the latter. Thus, the chain of evidence discussed above enhances dependability. This is because maintaining the chain of evidence enables the reader to follow the research process from the research questions through data collection and analysis to the conclusions (cf. Yin 2009, 122). Therefore, the chain of evidence is key to the transparency of the research process. This has been the aim in this research report, and it remains for the reader to evaluate how well the author has succeeded in its achievement. Moreover, evidence of committed study, for instance in terms of the number of interviewees, demonstrates dependability (Sinkovics et al. 2008, 697). The number of interviewees in this study is good, and the fact that there are multiple interviewees from each firm enforces the

commitment of the case organisations to the study. Furthermore, apart from one interviewee in one of the focus group sessions, all of those interviewed were very enthusiastic in talking about their company and in discussing the issues raised by the researcher.

Finally, **confirmability** concerns the neutrality of the findings (Guba & Lincoln 2006). As opposed to quantitative research, qualitative research does not aim at objectivity, as it is acknowledged that the researcher to some degree interacts with the research object(s) (Tynjälä 1991). Therefore, confirmability is a more suitable criterion for qualitative research. It actually means that the interpretations of the researcher are “*rooted in circumstances and conditions outside from researcher’s own imagination*” and that the interpretations are coherent (Sinkovics et al. 2008, 699). The researcher is, therefore, responsible for linking the interpretations to the research data in ways that the reader can understand (Eriksson & Kovalainen 2008, 294).

Many of the means discussed above also enhance the confirmability of the research findings, and are thus not all repeated here. Nonetheless, it must be noted that the most important factor in establishing the confirmability of this study is the chain of evidence (Yin 2009) that shows the reader how the data are connected to the findings and, further, to the conclusions of the study. Moreover, data triangulation and investigator triangulation also help in establishing confirmability of the study (cf. Lincoln and Guba 1985).

In addition, the strong linkage to two widely acknowledged (i.e. dynamic capabilities and international entrepreneurship) and one emergent (i.e. global factory) streams of the literature, enforces the confirmability of the findings (cf. Sinkovics et al., 2008). Finally, confirmability can also be established through an external audit of the study. As this is an article-based dissertation, all of the articles have undergone a thorough review process over which expert reviewers have evaluated the quality and plausibility of the particular part of the study relating to their expertise (cf. Sinkovics et al. 2008, 698).

3 THEORETICAL POINT OF DEPARTURE

3.1 Global factory structure in technology-based SMEs

3.1.1 Liabilities in international operations

Internationalisation can be a necessary condition for value creation and competitiveness of an SME (Autio 2005, 15). International operations, however, can differ significantly from domestic ones, especially in terms of management, and therefore pose various challenges to the firm. Earlier research has established that when internationalising, SMEs encounter various liabilities that they need to overcome. The liabilities of foreignness (Hymer 1976), newness (Stinchcombe 1965), outsidership (Johanson & Vahlne 2009), and smallness (Buckley 1989) pose many challenges for the firms. Tackling these liabilities is a key challenge for the managers in an internationalising SME.

The liability of foreignness (Hymer 1976) is a potential hindrance to the international operations of both small and large companies. The basic argument is that native firms enjoy advantages over foreign firms as they, for example, know better the local conditions, or receive support from the local government (Hymer 1976). Foreignness causes additional costs for internationalising firms and therefore acts as a barrier to internationalisation (Yamin 1991, 66). However, the nature of the liability is likely to be different between small and large companies as the entry modes they utilise tend to differ (cf. Agarwal & Ramaswami 1992, 4). The key cause of the liability of foreignness is the lack of knowledge (Forsgren 2008, 16; Lord & Ranft 2000, 573). This is critical for smaller firms as they rarely have the resources to collect the required information. However, smaller firms tend often to operate with partners, which may ease the burden of foreignness.

In addition, small and large firms can equally be confronted with the liability of outsidership that means, when entering a new market, the firm lacks a relevant network position. This causes uncertainty and impedes entry to the market. (Johanson & Vahlne 2009) When entering a new market, the firm enters new networks and has to create new relationships (Johanson & Mattsson 1988, 296). Establishing the network position poses different challenges to small and large firms due to the differences in their size and experience. Size in particular is influential here as a larger size typically entails larger volumes of business, and hence also more power and leverage. It

has been found that network relations are an important intangible resource for smaller internationalising firms, and the firms are likely to have already established these relationships prior to internationalisation (Coviello 2006). This might alleviate the liability of outsidership, although foreignness complicates becoming an insider (Johanson & Vahlne 2009). Nevertheless, earlier research has established that the capability to become part of and operate in networks is very important to firms that operate in dynamic environments (Sanchez 1996, 124). Therefore, it is very important for international SMEs to overcome these two liabilities.

SMEs are potentially subject to two additional liabilities: the liability of smallness (Buckley 1989) and the liability of newness (Stinchcombe 1965). The liability of smallness refers to limitedness of resources and capabilities, and the consequent vulnerability to environmental changes (Buckley 1989). The underlying idea of the liability of smallness is connected to the resource-based view of the firm (Lu & Beamish 2006, 464). SMEs have very limited resources at their disposal (Jarillo 1989), and therefore they are often dependent on their partners for access to additional resources. The limitedness of the resources also concerns managerial resources (Lu & Beamish 2006), which can also have important implications on internationalisation. Due to the limitedness of resources, smaller firms cannot tolerate any severe business mistakes (Gabrielsson & Kirpalani 2004). However, internationalising SMEs are typically exposed to a high rate of uncertainty regarding, for example, potential clients and their needs (Sharma & Blomstermo 2003).

Finally, the liability of newness refers to operational challenges in financing, staffing, managing relationships with customers and suppliers, and establishing the legitimacy of the company in general (Stinchcombe 1965). It is typically connected to young firms, but it can also stem from encountering situations new to the firm. Internationalisation through exports, for instance, is an innovation from the perspective of the firm (Hurmerinta-Peltomäki 2001, 49), and can therefore trigger the liability of newness. Overall, internationalisation has been found to be a process that affects the internal organisation of the firm (Nummela et al. 2006; Welch & Luostarinen 1988). Therefore, it is understandable that an organisation that has already established itself in the domestic market faces the liability of newness when internationalising. Conversely, the fact that an organisation is relatively young or faces a novel situation often also implies that it is likely to be able to learn more quickly and flexibly than more established firms (Autio et al. 2000; Oviatt & McDougall 2005, 547; Zahra 2005, 26).

All four liabilities discussed above pose challenges to international SMEs. From the perspective of a technology-based SME which has global operations, overcoming these liabilities is crucial. Continued international expansion is

possible only when the issues can be solved. The role of partners is inevitable in this, and they are an essential part of the global factory structure of an SME as discussed in the following.

3.1.2 International technology-based SME as a global factory

Many SMEs operate increasingly internationally, and their organisational structure has started to resemble that of multinationals that are considered global factories. The global factory concept is nearly thirty years old, but in the field of international business it has been discussed for less than ten years (see Buckley & Ghauri 2004; Grunwald & Flamm 1985). The need to apply the global factory concept in the international business field arose from multinational companies' novel approaches to ownership and location strategies. Instead of perceiving markets and hierarchies as alternatives to one another, multinationals had begun seeking optimal combinations of the two ownership strategies (Yamin 2011, 287). In comparison to the outsourcing and offshoring waves during the past couple of decades, a global factory differs in that various knowledge-intensive activities close to the core of the companies are also included and that, due to modularity, the activities can nowadays be sliced into much finer slivers than ever before (Buckley 2011, 274; Mudambi 2008, 708; Mudambi & Venzin 2010, 1511). All in all, the global factory literature is an intellectual attempt to identify the next big question that is capable of rejuvenating the international business research agenda (Yamin 2011, 286).

The extant literature has discussed the global factory structure merely in the context of large multinationals. The role of SMEs has been perceived to be in the "interstices" between multinationals, not as the focal firms. (cf. Buckley 2011, 273) Nevertheless, numerous examples of SMEs exist that operate as global factories in the focal position. Therefore, the global factory literature needs to be expanded to cover SMEs, which differ from large multinationals in many regards, also as global factories. The following discussion examines what has been written on large global factories and reflects on existing knowledge on SMEs, thus offering some insights on understanding small global factories.

It is clear in global factories that the focus of organisations has shifted from an internal administrative structure to coordination of inter-organisational exchanges and value creation (cf. Zott & Amit 2008). A multinational corporation that operates as a global factory seeks an optimal location for all of its activities and defines the optimal ownership structure for each activity (Buckley 2011). Therefore, the trade between corporations is increasingly in

terms of value creating activities, which can also be termed tasks, as opposed to complete goods or services (Mudambi 2008, 707). As a result, multinationals must manage globally a control matrix ranging from wholly owned units to market relationships (Buckley 2011). In the context of a large global factory, the key analytical decisions are hence related to location and control (Buckley 2011, 272). The same decisions are also focal in small global factories, although the content is somewhat different. Location is a salient factor in international business, and hence equally relevant to large and small global factories. The location decision not only concerns the selection of the country, but nowadays even more importantly concerns the selection of the city (Buckley 2011, 278). Nonetheless, for SMEs the selection of the location might be embedded in the selection of a partner. A more significant difference concerns decisions on control of operations. Large global factories determine whether it would be beneficial to perform the operations in the selected location internally or through some other arrangement. For small global factories, internalising the operations is only rarely an option, and hence their control decisions deal with the selection of suitable partners and contractual arrangements that provide them with sufficient control over operations.

Managers have a pronounced role in the global factory. They act as the coordinators of the inter-organisational system. Therefore, the management style needs to accommodate the new requirements. (Buckley 2011) This applies in both large and small global factories. As the two critical success factors in a global factory are integration and coordination (Buckley 2011), managers must be able to integrate and coordinate the widely dispersed and fragmented activities into a functioning whole. Therefore, managerial capabilities are crucial.

Furthermore, companies, large and small, can nowadays operate as so-called market-making firms that do not manufacture, assemble or warehouse their products. In these firms, the competitive advantage lies in the brand and the service they provide (Buckley 2011, 279). These kinds of firm can be found in various technology-intensive sectors. The management of the value net is crucial in these global factories; it is the core, the inimitable resource, of these companies (cf. Buckley 2011, 280). Maintaining this ability over a period of time is crucial. It requires skilled management, but also learning and training. (Buckley 2011, 281). Moreover, it has been argued that the global factory is rarely in equilibrium as it needs to constantly respond to exogenous shocks (Buckley 2011, 272). Relatedly, dynamic capabilities have been found to be essential for technology-based firms as they are needed to complement the impact of resources and social capital on performance (Wu & Wang 2007, 259).

It has been noted that the global factory literature presents a coherent and well integrated framework (Yamin 2011, 286). The discussion is based on the powerful position of the lead firm in the global factory. In the context of the large multinational corporation, the headquarters has the authority to decide on the location and control of each of the fine-sliced activities (Yamin 2011, 287). In contrast to the large multinational, the lead firm in a small global factory does not have such authority and it needs to negotiate more with its partners. However, the global factory discussion gives the SME context the idea of having control over issues beyond the boundaries of the lead firm (cf. Yamin 2011, 287). This is an important issue when considering the business model of the SME, which is discussed in the following section.

3.2 Business model and value in a small global factory

3.2.1 *Business model – value creation and capture*

Every firm employs a business model, either explicitly or implicitly (Teece 2010, 172). In fact, the business model is the backbone of a company, and therefore an essential factor in determining how successful the company is in value creation (Zott & Amit 2007). It is a concept that has transferred from practitioner and consultant language to the academic discussion over the past fifteen years. The academic literature on business models is, therefore, relatively recent, and thus far a dominant definition has not emerged that is consistent and rigorous (Rajala 2009, 17), although conceptualising the business model as the architecture for value creation has recently become widely accepted (see for example Teece 2010). However, value capture is an equally important part of the overall picture (Mudambi 2008, 718).

The business model of a firm indeed manifests itself in two key functions: value creation and value capture (Lepak et al. 2007; Teece 2010; Zott & Amit 2010). Firms generally exist to create value for their customers and owners; therefore, both value creation and value capture are highly relevant functions for all firms. Creating value is necessary to attract customers as well as partners, and capturing value is crucial for the survival of the business. It is also argued that a business model is geared towards total value creation, which means that it considers all involved parties (Zott & Amit 2010, 28). This is a very important matter in the SME context as the firms necessarily have partners in many of their operations. The small global factory is highly networked and relies on partners in many vital activities.

One of the most prominent approaches to the business model is that of Amit and Zott (2007; 2008; 2010). In their 2010 definition, which builds on their

earlier work, they state: “*we conceptualise a firm’s business model as a system of interdependent activities that transcends the focal firm and spans its boundaries*” (Zott & Amit 2010, 216). This definition is especially suitable for the study at hand as the business model of an SME is necessarily boundary spanning. Due to the limitedness of resources and capabilities, and the need to specialise or focus, SMEs create customer value in cooperation with partners. Therefore, value creation is boundary spanning and partners are an essential part of the business model of a small global factory. The aforementioned definition places sufficient emphasis on inter-organisational linkages. The primary objective of the business model is to exploit perceived opportunities through value creation and value capture (Teece 2010, 172; cf. Zott & Amit 2010, 217). Identifying and grasping opportunities is also an important aspect of the dynamic capabilities approach. This study follows these lines and conceptualises the business model as **a boundary spanning activity system that defines the ways in which value is created for all exchange partners**. Therefore, a business model includes all activities that are needed to produce value for the customer, the firm itself and its partners, no matter who performs these activities. In addition, the business model depicts how these activities relate to one another.

Despite the lack of a shared definition, academics in general agree that a business model is the conceptual and theoretical layer between strategy and business processes (Casadesus-Masanell & Ricart 2010; Rajala 2009, 21). Strategy addresses the choice of a business model (Casadesus-Masanell & Ricart 2010; Rajala 2009, 21) and binds all of its components together. Strategy, therefore gives meaning and direction to business model development. Moreover, strategy concentrates on the business model as a whole, and focuses on the totality constituted by its components (Tikkanen et al. 2005, 794). A business model links strategy to the day-to-day operations of the firm through business processes (Prahalad & Krishnan 2008, 51).

The design of a business model is argued to be purposeful (Zott & Amit 2010, 218). Decisions relating to the design of a good business model are interlinked and, ultimately, come down to the question of how to build and sustain competitive advantage and turn supernormal profits (Teece 2010, 173). The key decisions revolve around the selection of activities that need to be performed, defining how they are to be linked and who performs each of the activities (Zott & Amit 2010, 218). These choices build the backbone for value creation and value capture. The business model thus captures the logic of how the firm operates and creates value (Casadesus-Masanell & Ricart 2010, 196).

It is noteworthy that, especially for SMEs, some partners play a key role in value creation, and thus they are part of the business model (Zott & Amit 2010). Nevertheless, the business model discussion examines the operations

from a perspective internal to the focal firm. For the purposes of this study, this perspective needs to be complemented with one that is more external. Therefore, the following section introduces the value net discussion.

3.2.2 From value chain thinking to value net thinking

According to traditional Porterian thinking, value is created in the value chain that comprises both upstream and downstream operations (see Porter 1985). The model has received some criticism, and it is acknowledged also here that it is too simplistic for today's world. Nevertheless, it still has many valid points and the established terminology creates a solid ground for discussion. Porter's concepts offer tools for conceptualising value creation, and therefore they are utilised in this study. However, some modification to the original model is necessary as the world has changed.

Inter-organisational partnerships started to have an impact on competition during the 1980s and the 1990s (Welch & Luostarinen 1988), and nowadays they are an important value adding strategy. Therefore, the discussion here focuses on inter-organisational cooperation in value creation instead of considering the operations internal to one organisation. In comparison to the value chain model, a more nuanced conceptualisation of the value creating system is needed. Technology-based SMEs, in fact, typically configure value through a model that has been characterised as a value shop by Stabell and Fjeldstad (1998). This means that value is created by mobilising resources, internal and external, to solve customer problems. In so doing, organisations rely on technologies and configure their operations to suit a specific customer problem (Stabell & Fjeldstad 1998, 414, 420).

The value network concept offers a yet more complex way of understanding value creation. A network can be regarded as a form of hybrid operation between markets and hierarchies (Möller et al. 2006, 16). The Industrial Network Approach (INA) (see for example Ford 1997; Håkansson & Snehota 1995) perceives networks as large webs of an endless number of actors and activities that are dependent on each other. According to this approach, networks are self-organising with no organisation being able to manage the network. The complexity of the network makes it impossible to formulate a comprehensive picture of what is occurring in the network (Håkansson & Snehota 1995). Networks emerge as opposed to being built (Forsgren & Johanson 1992).

Alternatively, organisations that operate intensively with partners can be regarded as network organisations (Möller & Svahn 2006, 987). The latter approach is in line with the perspective on strategic networks (Gulati et al.

2000; Jarillo 1988), and more suitable for the purposes of this study. This study focuses on a limited part of the total network, the value net, which is **the purposefully created and limited set of operators that contribute to the creation of customer value**.

Companies are found to influence the other operators of the value net (Svahn 2004). The difference between a net and a network is that a net is more specifically defined and purposefully created, whereas networks usually are emergent and have evolved over time without such a specific purpose (Möller et al. 2005; Svahn & Westerlund 2007). In the network literature the perspective is thus broader, and the firms are perceived to be part of an unbounded system (cf. Blankenburg Holm et al. 1999).

Partners with which the firm cooperates before the output is produced or in the actual manufacturing phase are in the upstream part of the value net for a technology-based SME (cf. Porter 1985). The nature of operations is little different in technology-based firms to that of manufacturing firms, and hence it is necessary to specify here that upstream operations refer to technology development (i.e. the partners involved in software development and the ones that offer platforms on which the products can be developed) and to potential hardware manufacturing. Traditionally the downstream includes the operations after manufacturing: distribution, sales and marketing (Porter 1985). In this study, the downstream operations are conducted with partners in sales, marketing and after-sales support. These partners operate in the interface between the focal firm and the customers and thus play a very important role in customer value creation.

Value net is a part of the business model and depicts the key partnerships of the company (cf. Osterwalder 2004); therefore, the two are distinct concepts. In addition to the difference in perspective between the business model and value net concepts, it must also be noted that the business model examination focuses more on operations, whereas the value net discussion focuses more on the operators (i.e. firms, in this context). A value net comprises partners selected by the focal firm and which play an important role in customer value creation (Möller et al. 2005; Svahn & Westerlund 2007). The business model is a broader concept as, in addition to value creation, it encompasses value capture and, therefore, issues such as revenue logic (Rajala & Westerlund 2007, 5). It is insufficient for a firm to be able to deliver value to its customers; it must also be able to appropriate part of the total value and provide value incentives to the other organisations in the value net (Zott & Amit 2010). Therefore, the discussion now turns to the value in the value net.

3.2.3 *Value in the value net*

Companies usually seek various benefits when building business nets. Improving operational efficiency and flexibility are important objectives. Also, increased market power that can be achieved by combining resources attracts companies to build nets. Moreover, developing business operations and the offering as well as new technologies can be possible in business nets (Möller et al. 2006, 24). That is, value can be manifested in various forms in the value net.

In addition to value to the focal firm, a value net also needs to provide value to many other actors. There is a large body of the customer value literature. Although an extensive discussion on customer value is beyond the scope of this study, customer value is briefly discussed as it relates to the operations of the focal firm in the value net.

It is widely emphasised in the literature that customer is king in the customer value discussion (see for example Cheverton 2010). The analysis of what is value must always begin with the customer as it is customers who decide what is of value to them. It was found some time ago that very different aspects add value to different customers (cf. Zeithaml 1988). Therefore, the focal firm cannot assume that it would intuitively know what is wanted by customers. Rather, the firm needs to be market oriented (Narver & Slater 1990) and thus interested in the customers. This also means that the focal firm needs to have information on customer needs and wants, which calls for a good connection with the customers. To truly create value for the customer, the firm must understand what is valuable to the customers, and have the ability to deliver an offering that meets these needs (Cheverton 2010).

Moreover, it has been emphasised that in business-to-business contexts it is insufficient to know only the immediate customers. The focal firm must also understand the customer's customer (Narver & Slater 1990, 21). For many technology-based SMEs, this means that in addition to knowing the customers to which the system is sold, they must also understand the end users. Further, the increasing role of services and software in the technology-based firms' markets means that being close to the customer and particularly the end-user is a necessity (Sawhney 2006). Establishing connections to the end-users is, however, a challenge faced by small technology-based global factories. To achieve global reach, SMEs typically have sales partners in most of their foreign markets. Therefore, the role of the partners between the focal firm and the customer or the end-user is significant. Management of the value net is hence vital for technology-based SMEs as their competitiveness can heavily depend on how well the partner operates between the focal firm and its customers.

In addition to customers, the other organisations in the net also expect to receive value from the relationship. Customer value is created as the joint effort of the whole value net (Helander & Kukko, 2009), and therefore all of the net members need to have incentives to contribute to value creation. Similar to the idea of total value creation in a business model, the value net should also be geared towards total value creation (Zott & Amit 2010, 218). Being able to capture value from the cooperation is important for the motivation of the net members. It is important to note that in addition to the variations in what is valuable to the customer, there is also variation in what is valuable to the partners. The consideration of what kind of value the partners might be able to capture is an important issue, and as the value net is an integral part of the business model, it should have already been considered during the business model design.

As the value net comprises independent organisations that all have their own goals, it is not self-evident that the net members work together for a common goal. In other words, the organisations are goal disparate. For the value net to function, and thus produce opportunities for value creation and value capture, it needs to be managed by the focal firm. Also the network management literature suggests that value creation is enhanced by building mutuality through incremental commitments (Blankenburg Holm et al. 1999).

Value net management is discussed in detail in section 3.4. Before that, however, the elements of the business model of a small global factory are also examined beyond the value net, and the dynamic capabilities approach is introduced as the basis for value net management.

Finally, however, it is important to bear in mind that this study takes the perspective of a technology-based SME to value. Also, value to partners and customer value are mentioned in the discussion although the focus throughout the study is on value to the focal SME.

3.2.4 Business model and a small global factory structure

Value is a crucial factor for all firms. As explained above, firms need to be able to create it and capture part of the created value for themselves. Value has been discussed in the context of the resource-based view of the firms that, as noted in section 1, can be argued to be a key theory behind the dynamic capabilities discussion. The basic assumption is that resources need to be valuable, rare and inimitable to create at least a degree of sustained competitive advantage (Barney 1991; Barney 1995). In addition, the firm needs to be organised so that it can make use of the resources (Barney & Wright 1998). This approach has become known as the VRIO framework. Resources are

valuable when they enable improved efficiency or differentiation (Barney 1991; Barney & Wright 1998).

In this study, the value question is approached from a slightly different angle, through the business model discussion. There are actually many different ways to conceptualise and analyse business models. Demil and Lecocq (2010, 234) suggest that a business model has three basic elements: resources and competencies (RC), internal and external organisation (O), and the value propositions (V). This RCOV framework for a business model resembles the VRIO framework of the resource-based view and emphasises the need to consider all of these aspects jointly. Nevertheless, the framework is relatively rough, and it does not offer sufficient detail for analysing the business model that is necessary for the purposes of this study.

Alternatively, according to Teece (2010, 173), a business model has five elements that need to be considered. First, technologies and features embedded in the product/service are essential for business model design. Second, the benefit to the customer from using the product/service; that is, the value to the customer must be considered. Third, the firm has to decide which market segments it targets with the business model. Fourth, the revenue streams that are available must be determined. Fifth, the value capture mechanism has to be decided and developed. Teece (2010) perceives these as elements in a cycle of making decisions on the business model. In designing a business model, managers have to determine and align all of these aspects. Although this approach slightly resembles the VRIO framework, it is even too pragmatic from the perspective of this study.

Yet another approach to analysing business models is through design elements and design themes (Zott & Amit 2010). This approach also puts emphasis on considering the business model as a whole, as a system. It also offers conceptual tools for relatively detailed examination. The authors acknowledge the vital role of various partners as they stress the boundary-spanning nature of the business model. Additionally, the Zott and Amit (2010) conceptualisation is among the most established. For the purposes of this study, it was important to find a suitably detailed conceptualisation to enable analysis and comparison of and contrasting between the case firms' business models. It was also necessary to select a conceptualisation that has sound theoretical basis. For these reasons, the Zott and Amit (2010) approach is considered suitable for the study at hand.

The design elements of the business model, as defined by Zott and Amit (2010, 220) are content, structure and governance. Content refers to the selection of the activities that are included in the activity system (Zott & Amit 2010). For a small global factory this means deciding on which activities are necessary to produce value for the customer. Putting together an offering that

customers value is the point of departure in designing the business model. It entails decisions on the technologies and features in the offering, as well as determining the value to the customer (Teece 2010, 173). By definition, global factories operate in numerous markets all over the world. Customers' needs and wants are likely to differ between markets and, therefore, determining which activities to include in the business model is challenging. All in all, flexibility is a key factor in all operations of a global factory (Buckley 2009b) and needs to be built into all aspects of the business model. The selection of the activities has important implications on flexibility as it creates the backbone for the business model. SMEs often have undeveloped management and control systems. (Blomqvist 2002) While it enhances flexibility and speed of decision making it also makes the organisation more dependent on individuals as learning is not necessarily accumulated by the processes and the organisation.

Second, structure describes how the activities are linked to one another. It defines, for instance, the sequencing of activities. In addition, it defines the nature of the activities in terms of core, supporting or peripheral activity. (Zott & Amit 2010) The global factory discussion begins with the premise that the focal firm (i.e. the brand owner) has tight control over the core activities, although it acknowledges that the firm might cooperate with some key contractors in the core activities related to R&D, for example, engineering or design (Buckley & Ghauri 2004). Small global factories, however, are prone to require cooperation in various other close-to-core activities in addition to R&D. For instance, sales and marketing in foreign markets is frequently performed by a partner. Nevertheless, positioning the activities in relation to one another is very important to the functioning of the small global factory. In the case of a global factory, the structure also acquires a spatial dimension, the focal firm must decide which activities need to be performed close to one another, for which activities location is a decisive factor and in which activities the location is not so significant. All in all, the global factory structure can be seen as an element of the business model.

Third, governance defines who performs the activities (Zott & Amit 2010). This is a critical consideration for a small global factory. An international SME is necessarily dependent on numerous partners (Nummela 2011); however, a small global factory is even more so as it could not achieve and operate the global factory structure without its partners. Gaining access to numerous markets globally and maintaining a presence in those markets as well as offering, for example, support or maintenance services requires resources and know-how rarely possessed by SMEs. Furthermore, elaborate use of partnerships enables a small global factory to overcome various liabilities in its internationalisation path. Technology-based firms in general

tend to rely on partners. However, the reasons for needing partners differ between SMEs and large firms. Large firms might need partners because, for example, they lack expertise for a specific R&D project; partnering with small firms is an option for them. SMEs, in contrast, lack capital resources, physical assets and finance for many operations. Therefore, they are highly reliant on partners and customers (Blomqvist 2002). Due to resource constraints, small technology-based firms are largely dependent on finding innovative combinations between their firm-specific knowledge and the knowledge residing in their partner base (McDougall et al. 1994). The governance decisions are also linked to the geographical dimension of the global factory as the selection of a partner entails selection of the location for the activity.

The design themes define the primary value creation drivers and connect the elements of the activity system. Four major design themes have been identified: novelty, lock-in, complementarities and efficiency (Zott & Amit 2010, 221). Any one of these four themes can be the overriding design theme for the small global factory business model. Novelty in the activity system can stem from new kinds of activity, new ways of linking the activities (i.e. structure) or from new ways of governing the activities (Zott & Amit 2010). The small global factory is, in fact, a novel structure and/or governance solution for the activities. However, this does not automatically have to be the overriding business model design theme in the small global factory. Lock-in refers to the power to keep partners and customers attracted by the business model; this can happen, for example, through benefits that accrue to them or result from high switching costs (Zott & Amit 2010). In the case of the small global factory, lock-in appears intuitively very attractive as committing partners to the cooperation is crucial; however, customer lock-in can be more decisive for a business model design.

The complementarities theme refers to the value added of bundling activities together (Zott & Amit 2010). The kind of synergies implied here can result, for example, from bundling together a software-based offering with a hardware-based offering, and hence providing a complete solution to the customer. This design theme can also be very attractive for a small global factory as combining various operators into a well-functioning ensemble is at the heart of the global factory structure. Finally, the efficiency theme concerns reducing transaction costs of the operations. Efficiency can derive from any of the design elements of the business model (Zott & Amit 2010). Efficiency considerations are naturally important for small global factories, although they might not be the primary value drivers in the context of technology-based firms.

The key components of a business model are the company's network of relationships, operations embodied in the company's business processes and

resource base, and finance and accounting concepts. In particular, the management of the customer base has been identified as one of the most crucial aspects in managing a company's business model (Tikkanen et al. 2005, 795). Especially in the software industry, in which many technology-based firms operate, a firm's capabilities in managing inter-organisational relationships appear to be an important source of competitive advantage (Ethiraj et al. 2005). In addition, the revenue model and management mind-set have been identified as key components of the business model (Rajala 2009, 22).

Essentially, a business model depicts how a firm captures the value embedded in its network (cf. Zott & Amit 2010). The global factory structure can be regarded as an element in the business model. In the global factory, an optimal location is sought for all activities needed for value creation. This concerns both factor and product markets. Nonetheless, the global factory structure determines only a part of the business model and thus leaves a lot of scope for differentiated choices on content and governance, and the design themes (cf. Zott & Amit 2010). The boundary spanning value creation in technology-based small global factories necessitates excellence in operating the business model. In the global factory, the activity system comprises activities conducted by the focal firm and its partners in both the supply and market sides (cf. Zott & Amit 2010).

The elements of a business model need to work smoothly together; in other words, be co-specialised to each other (Teece 2010, 180). This hampers replication of a business model, and may thus be very important to the competitive advantage of an SME. In the case of a small global factory, the structure element of the business model is a focal factor and its special nature imposes novel requirements on the other elements. In addition to being able to create a functioning business model, it also needs to be operable by the SME. In particular, the capability to manage the value net is focal in the context of the small global factory. It is conceptualised in this study as a dynamic capability, and examined in more detail in the following sections 3.3 and 3.4.

In fact, in Finland, which is the home country of the companies examined in this study, technology-based SMEs, such as software firms, are typically very good at mastering and developing technologies. Their weaknesses lie in internationalisation, partnering and business models (von Hertzen et al. 2009, 32). All of these issues also impact value nets, as they are typically international, involve many partners and are a key aspect of any business model. This is arguably a crucial shortcoming for SMEs, and it might considerably hinder their growth. More emphasis on the value net and its management is necessary.

3.3 Dynamic capabilities approach to the small global factory

The dynamic capabilities discussion has its roots in various streams of the literature, but it is generally thought that the resource-based view of the firm (RBV) and the knowledge-based view of the firm (KBV) are the most influential theoretical approaches behind dynamic capabilities thinking (Wang & Ahmed 2007). RBV conceptualises the firm as a bundle of resources and capabilities, which are the abilities to derive services from the resources (Barney 1991; Penrose 1959; Wernerfelt 1984), whereas KBV emphasises the role of knowledge as the most influential resource and pays more attention to the external environment as well as the path dependency of organisational knowledge and capabilities (Grant 1996b; Kogut & Zander 1992; Kogut & Zander 2003).

The dynamic capabilities approach was initiated by the need to understand better the development and sustenance of competitive advantage in business firms that operate in constantly changing environments (Teece et al. 1997). By the early 1990s it had become apparent that in many industries the ability to thrive in current operations is insufficient for maintaining competitive advantage. Firms needed to be oriented to the future, also in terms of resources and capabilities.

This section first examines the concept of organisational capability, which is focal in the dynamic capabilities approach. Thereafter the discussion moves to dynamic capabilities, which are conceptualised as processes.

3.3.1 *Organisational capabilities*

Capabilities have been a popular concept for a couple of decades. Researchers are increasingly linking their research to capabilities, instead of just focusing on resources. Capability is defined as the ability to put resources into productive use. In other words, to derive services from the resources (Helfat & Winter 2011; Penrose 1959). Capabilities enable firms to utilise their resources to achieve different kinds of end result. This means that a specific resource can be utilised for different purposes according to the needs of the organisation (Penrose 1959). Organisational capabilities are argued to rest on the organising principles according to which the firm is structured. Therefore, capabilities can also be understood as higher-order organising principles that are applied to transform individual and social expertise into products and services (Kogut & Zander 1992, 384).

In the discussion on organisational resources, it is common to conceptualise resources and capabilities as hierarchical constructs. Resources are at the

bottom of the hierarchy and are often called zero-order elements (Javidan 1998; Wang & Ahmed 2007). Capabilities, as the skills required for utilising resources, are higher in the hierarchy, and are hence known as first-order elements (Cepeda & Vera 2007). Above these ordinary, operational capabilities are the second-order elements, the core capabilities of the organisation that are the most critical capabilities for current operations (Prahalad & Hamel 1990). However, there is a difference between being able to do something (i.e. having the capability) and being able to create new ways of doing similar things, which can be seen more as a dynamic capability (cf. Kogut & Zander 1992). Therefore, still higher in the hierarchy are third-order dynamic capabilities (Wang & Ahmed 2007) that influence the development of operational and core capabilities and thus govern the rate of change in ordinary capabilities (Collis 1994; Teece 2009, 88; Winter 2003). They are often combinations of simpler capabilities and the routines relating to them. Some of these simpler capabilities might be foundational to others and hence must be learned first. (Eisenhardt & Martin 2000, 1116) This conceptualisation is illustrated in Figure 4.

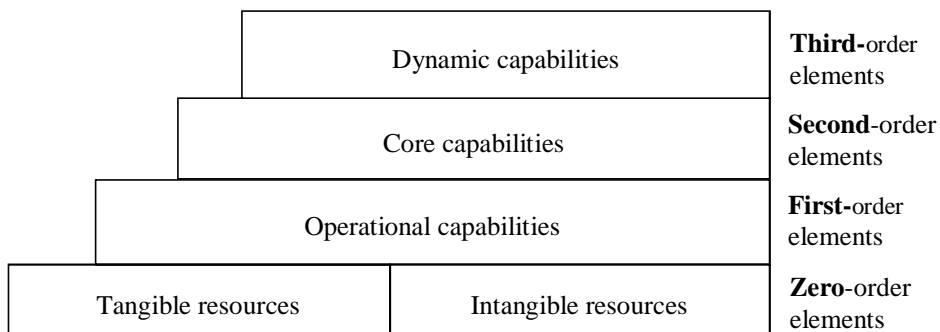


Figure 4 Conceptual hierarchy of resources and capabilities
(based on Wang & Ahmed, 2007)

From the perspective of dynamic capabilities, an organisation in a dynamic environment should be able to sense and seize opportunities, and to reconfigure its resources and capabilities accordingly (Teece, 2007). However, the need to have dynamic capabilities differs across settings; in some settings, ad hoc problem solving is sufficient whereas in other, more turbulent settings, it might be absolutely necessary for a firm to have dynamic capabilities (Winter 2003). Technology-based sectors are typically quite turbulent, and therefore a suitable context for this study.

The issues that are focal in the dynamic capabilities approach (i.e. configuration and reconfiguration of knowledge and capabilities in the organisation) had been, in fact, discussed before the publication of the seminal articles by Teece and others. Kogut and Zander (1993) suggest that firms compete based on differentials in their capabilities. Additionally, in their 1992 article, they argue that firms learn new skills by recombining their existing capabilities. This combinative capability, as it is termed, is very similar to the dynamic capabilities proposed by Teece (see Kogut & Zander 1992; Teece & Pisano 1994; Teece et al. 1997), and therefore has an essential role in this study.

Combinative capability seems to be a higher-level capability like dynamic capability, and is an academic response to trying to understand dynamic aspects of modern organisations. The dynamic capability concept was initially aimed at understanding the development of sustained competitive advantage of the (multinational) firm, whereas combinative capability was linked more to understanding the evolution of a multinational firm. Although some of the underlying assumptions are slightly different, the two literatures are highly complementary in advancing our understanding of how firms compete and thrive in dynamic settings. Therefore, this study refers to both streams of the literature.

3.3.2 Dynamic capabilities as process

According to Teece (2007), dynamic capabilities have three central dimensions: sensing capacity, seizing capacity and transformational or reconfiguring capacity. He argues that dynamic capability can be disaggregated into these three capacities for analytical purposes; in fact, Teece identifies the nature and microfoundations of each capacity. In other words, he strives to distinguish between the dynamic capability itself and its antecedents (Zahra et al. 2006). The following discussion also distinguishes between the processes that comprise dynamic capability and the antecedents that contribute to the emergence of dynamic capabilities.

Dynamic capabilities have been argued to comprise various more or less specific and identifiable processes (Ambrosini & Bowman 2009; Verona & Ravasi 2003). There are both organisational and managerial processes that are needed to identify opportunities for change and to accomplish the change (Helfat et al. 2007), although the literature tends to focus only on the organisational processes while managerial processes are often not included in the discussion. By focusing more on knowledge (i.e. information and know-how) in the organisation, Kogut and Zander (1992; 1993; 2003) bring the individual more closely into the discussion. This is an important aspect of how

their approach supplements the dynamic capabilities discussion initiated by Teece et al. (1994; 1997). Also Teece (2009), in contrast to his earlier work, discusses the role of managers to some extent.

There are, in fact, two distinct approaches to understanding and conceptualising dynamic capabilities. Some scholars perceive that there are commonalities in the dynamic capabilities between organisations (e.g. Eisenhardt & Martin 2000), whereas others perceive that dynamic capabilities are unique to the organisation and hence difficult to imitate (e.g. Zollo & Winter 2002). Proponents of the former perspective conceptualise dynamic capability through more generic processes, whereas proponents of the latter perspective favour conceptualisation through more specific processes.

To first address the more generic processes, Teece and Pisano (1994) and Teece et al. (1997) propose that the key elements of dynamic capabilities are the processes of coordinating/integrating, learning and reconfiguring. Similarly, other scholars (see for example Bruni & Verona 2009; Kuuluvainen 2011; Macher & Mowery 2009; Narasimhan et al. 2006; Pandza et al. 2003a; Prieto et al. 2009; Verona & Ravasi 2003) have proposed that dynamic capabilities comprise generic knowledge processes of:

- Accumulation and acquisition.
- Integration.
- Utilisation.
- Reconfiguration and transformation.

Alternatively, dynamic capabilities have been conceptualised as specific and identifiable processes that can integrate resources, reconfigure resources or focus on gain and release of resources (Eisenhardt & Martin 2000). As examples, technology development and transfer (Cetindamar et al. 2009; Griffith et al. 2005; Helfat 1997; Lawson & Samson 2001; Mathiassen & Vainio 2007; Petroni 1998; Tripsas 1997), inter-organisational collaboration (Capron & Mitchell 2009; Jarratt 2008; Vassolo & Anand 2007), organisational restructuring (Forrant & Flynn 1999; Karim 2006; Karim 2009; Rindova & Kotha 2001; Skilton 2009), and business model adaptation (Andren et al. 2003; Lampel & Shamsie 2003; Newbert 2005; Wilson & Daniel 2007).

Although there are rather strong conceptual arguments for either of the approaches, empirical studies rarely fall into either of these two extremes. Studies can be seen to be on a continuum of processes that ranges from generic to specific. Also in this study, the conceptualisation of dynamic capabilities falls into the mid-range, nonetheless leaning towards the generic knowledge processes end.

As opposed to ad-hoc problem solving, dynamic capabilities contain a patterned element and involve learning (Winter, 2003). Combination and

recombination of the skills in the organisation plays a focal role (Kogut & Zander 1992; Zander & Kogut 1995). Dynamic capabilities are costly to develop, require a lot of resources and might not be necessary in all operating environments (e.g. when change is gradual and reconfiguration is only occasionally necessary). Nevertheless, they have been argued to yield sustained competitive advantage in constantly changing environments (Eisenhardt & Martin, 2000).

Finally, it must be noted that the dynamic capabilities approach has also attracted criticism. The concept has been criticised for being ambiguous and tautological (Ambrosini & Bowman 2009, 38; Williamson 1999). This reflects the stage of development of the approach. The dynamic capabilities approach, although discussed quite widely, has not yet reached maturity; however, the concept remains open for various interpretations with regard to, for instance, the definition (Di Stefano et al. 2010, 1188). Also, the operationalisation of the dynamic capability concept has been found to be very challenging (Ambrosini & Bowman 2009, 37; Cavusgil et al. 2007, 165; Kraatz & Zajac 2001, 653). Additionally, the issue concerning the extent to which creation and development of capabilities (i.e. the operating of dynamic capabilities) results from deliberate actions is unknown (Cavusgil et al. 2007, 164).

Therefore, it is acknowledged that a lot of conceptual development is still needed before one can expound on dynamic capabilities theory. The findings from earlier research have remained disconnected, and research has mainly been conducted on a piecemeal basis; that is, it has not effectively built on findings from previous research (Wang & Ahmed 2007, 31). The dynamic capabilities literature, however, continues to develop and attract a lot of positive scholarly attention. The various applications of the concept and the surrounding hype attest it to be a useful and a sensible concept that is worth investigating.

Having discussed the basics of the dynamic capabilities approach, it is time to apply the principles to the management of the small global factory. The following section conceptualises the capability for value net management as a dynamic capability.

3.4 Managing the value net in a small global factory business model

3.4.1 *Dynamic capability for network management*

The dynamic capabilities approach focuses on the internal organisation of the firm and how it operates to develop and renew the firm's resources and capabilities (Ambrosini & Bowman, 2009; Barreto, 2010; Collis, 1994; Teece

et al., 1997; Teece & Pisano, 1994). However, in the context of technology-based SMEs the value net is equally important to the internal organisation (Möller et al., 2005). Hence, there is a need to broaden the dynamic capability discussion beyond the organisational boundaries of the SME. In particular, management of the global factory structure necessitates consideration on the inter-organisational context.

Earlier research has established that firms truly are able to access partners' capabilities as an alternative to developing capabilities internally or acquiring other organisations with the necessary capabilities (cf. Barney 1999, 140). Therefore, in addition to the dynamic capability of renewing in-house operational capabilities, SMEs can have the dynamic capability of supplementing their capabilities through the value net. To achieve this, the value net needs to be managed. It is suggested that even though the setting is very different in internal management compared to inter-organisational management, many of the capabilities that lead to successful inter-organisational management are the same as those that support good internal management (Doz & Hamel 1998, 251). However, taking into consideration the context of the small global factory, it is likely that new kinds of capability are needed. After all, the very same authors also state that being prepared to partner necessitates managerial understanding of what new capabilities this requires (Doz & Hamel 1998, 254). Hence it can be argued that managing the value net of a small global factory calls for a new type of dynamic capability.

Various literatures can be consulted to develop an understanding of the dynamic capability for managing the value net in the small global factory. This study turns to the synthesis of the dynamic capabilities and global factory literatures, but benefits also from the literatures on international entrepreneurship and SME internationalisation. In line with the idea of combinative capability (Kogut & Zander 1992) and Eisenhardt and Martin (2000), dynamic capability can be understood as a combination of simpler capabilities and routines. Therefore, the following discussion approaches the dynamic capability for value net management from the perspective of which kinds of lower level capability and routine could be identified, based on previous literature, as contributing to the dynamic capability.

Primarily, managers' orientations have been found to be important to firm growth in numerous studies (Kuuluvainen & Paavilainen-Mäntymäki 2011, 47). These factors can be seen as the managers' cognitive capabilities. In addition to the managers' characteristics, their capabilities are important for the organisation (Rosenbloom 2000, 1102). Some managerial capabilities have been argued to be essential for value net management (Svahn & Westerlund 2007). Managerial capabilities are necessary to enable the managers to act according to their cognition. It is reasonable to argue that organisational

capabilities are also necessary for value net management. First, in addition to individuals, the organising principles by which the individuals cooperate in the organisation are also crucial for dynamic capabilities. Second, there are organisational capabilities that have been found to be meta-capabilities for all dynamic capabilities (Kogut & Zander 1992).

Managers' cognitive capabilities that could be expected to be influential based on the extant literature were found to be cultural awareness, global mindset and entrepreneurial orientation. Cultural awareness refers to managers' openness to and understanding of different cultures, and hence emphasises the cultural aspect of cognitive capabilities (Levy et al. 2007). Global mindset is again the strategic side of cognitive capabilities as it refers to managers' ability to manage complex and spatially scattered operations (Levy et al. 2007; Nummela et al. 2004). In addition to the two rather obvious aforementioned cognitive capabilities, entrepreneurial orientation can also be regarded as important as it is an important antecedent for dynamic capabilities (Jantunen et al. 2005, 237). Entrepreneurial orientation refers to the managers' proactivity and innovativeness. Additionally, the willingness and ability to take risks are important aspects of entrepreneurial capability (Lumpkin & Dess 1996). These three cognitive capabilities can be expected to be the focal ones that build the foundation for managing the value net in the small global factory.

The managerial capabilities that were found to be interesting based on the extant literature are analytical capability and interface competence. Analytical capability draws very much on the global factory discussion, in which fine slicing of the operations as a result of managers' analytical approaches is discussed (e.g. Buckley 2009b). Here, analytical capability is employed to refer to managers' abilities to manage the dynamic global factory structure in the dynamic environment (i.e. to keep all the parts of the organisation moving) and simultaneously create the desired output. Another crucial factor is producing the desired output in cooperation with the value net members. For this, interface competence was identified as the second key managerial capability. In the spirit of network competence (Ritter et al. 2002) and collaboration capability (Blomqvist & Levy 2006), interface competence comprises both the ability to manage individual relationships and to maintain the net as a whole, although interface competence takes a broader, processual perspective. Managers need to "*coordinate external organisations into the strategy of the focal firm*" (Buckley 2009b, 233). Screening potential partners, selecting those that are suitable and forming a well-functioning relationship are vital functions (Bartels et al. 2009; Buckley 2010). However, also maintaining the partners' commitment and motivation are, if possible, even more important. Therefore, interface competence also entails good communication abilities (Svahn &

Westerlund 2007, 372). Managerial capabilities are essential as cognitive capabilities alone do not necessarily result in action.

Finally, the organisational capabilities of flexibility and absorptive capacity were identified as important for value net management. Flexibility is an all-embracing issue in a global factory (Buckley 2009b), and organisational change capability has been identified as a meta-capability for all organisational capabilities (Oxtoby et al. 2002). Conceptually, these two come very close to one another, and hence, flexibility can be expected to have important implications for the dynamic capability of value net management. In addition to flexibility in operations, global factories face the challenge of flexibility also in terms of locating their activities. By definition, the global factory constantly seeks optimal locations for its activities (Buckley 2010). Small global factories cooperate intensively with partners. To maintain their competitiveness, it is important that the firm has up-to-date know-how on all the relevant areas. Therefore, it needs to be able to absorb knowledge from various sources and utilise it for its own purposes. Thus, absorptive capacity (Cohen & Levinthal 1990) was identified as the second influential organisational capability.

Together these three levels are suggested to form the dynamic capability of managing the value net of a small global factory. Going further into the details of managing the value net, the following section discusses first the modes and then the means of value net management in the case of a small global factory. Modes refer to four somewhat abstract approaches to or objectives of the management, whereas means refer to the actual practical tools and methods utilised by managers. Each mode can be implemented through various means.

3.4.2 *Modes of value net management in the small global factory*

This study examines the value net from the perspective of a focal company, a technology-based SME. The value net thus comprises companies chosen as partners by the SME for value creation. Customer value is created as the joint effort of the whole value net (Helander & Kukko 2009). However, the networked method of operating creates challenges for SMEs. It has been noted that the management of the net calls for unique contributions from the firm (Dhanarag & Parkhe 2006, 666).

Management in general has been defined as the “*overall shaping of relationships, understanding and processes within a work organisation to bring about the completion of tasks undertaken in the organisation’s name in such a way that the organisation continues into the future*” (Watson 2006, 167). This definition focuses on management within an organisation.

However, management in the inter-organisational context is necessarily different (Blankenburg & Johanson 1992) and, therefore, has created an emerging literature on net/network management. In this context, it is emphasised that management is not unidirectional. It is rather a multidirectional process, in which negotiation and settlement are key issues (Forsgren & Johanson 1992). It is further argued in the network management literature that network management is a process in which value creation is pursued by coordinating activities between firms (Blankenburg Holm et al. 1999).

Value net management has been examined at various levels of analysis, which makes the extant literature rather scattered. A recent contribution by Järvensivu and Möller (2009), however, offers a way to structure the discussion. They argue that research on network management has occurred at four levels: management causal powers, management functions, management task characteristics and management roles (Järvensivu & Möller 2009, 655). This study mainly deals with issues at the task level; that is, the tasks that management of the net requires from managers. However, it also impacts the level of managerial roles as well as the management functions. This implies that this study examines the managerial action taken to manage the value net.

Value net management has been argued to comprise four functions: framing, activating, mobilising and synthesising (Järvensivu & Möller 2009, 658). Alternatively, four modes of management in the value net have been argued to exist: influencing, controlling and monitoring, coordinating and integrating (Svahn & Westerlund 2007, 371). Although Svahn and Westerlund do not refer to Fayol (1950), their categorisation resembles his original ideas on the elements of management. Fayol (1950) argued that management consists of planning, organising, commanding and controlling. When taken into the inter-organisational context, the elements of management must change due to the lack of hierarchical power and control. This study follows the categorisation of Svahn and Westerlund (Svahn & Westerlund 2007) and examines the modes of management in the SME context to determine what kinds of activity they include and how feasible they are in a small global factory.

The modes of value net management, as introduced above, refer to four different categories of management actions taken to manage the value net. In this section, each of the modes is discussed in detail.

Influencing the net members is the fundamental mode of management in a value net (Svahn & Westerlund 2007). The meaning of influencing is self-evident; the aim is to have an influence on what the value net members do or how they do it. Influencing as opposed to commanding (Fayol 1950) is more suitable to describe inter-organisational management.

A key issue in managing the value net is that, in addition to the partners having particular capabilities, it is necessary that they are willing to share their capabilities in the value net (Doz & Hamel 1998). Therefore, influencing value net partners refers to the focal firm's actions that are aimed at convincing their partners of the benefits of cooperation. Naturally, different firms have different degrees of influence over their value net partners, and hence the means of exerting influence on partners may differ from one situation to another.

It has been argued that from the perspective of a firm, influencing resembles conducting an orchestra (Svahn & Westerlund 2007, 371). This is an apt description as the focal organisation often does not have any direct control over the partner, although it needs to find ways of influencing from a distance. All in all, influencing aims to establish and modify the operating rule of the net (Agranoff & McGuire 2001)

Controlling and monitoring sound rather heavy modes of management. In a value net, the degree of control of the focal firm varies considerably between value nets and between individual relationships (Svahn & Westerlund 2007). Therefore, control and monitoring are relative terms in value net management. When considering an SME as the focal firm, it is likely that the firm does not have much control over the other net members. Hence, control and monitoring are very subtle.

Controlling is indeed a strong word. Here it is, however, employed with quite a neutral meaning. Controlling and monitoring refer to the need to be aware of what a partner is doing (Svahn & Westerlund 2007). Monitoring is therefore a more precise word for this mode, as it is associated more with the screening of partners' operations. Monitoring can involve means by which the focal firm aims to strengthen the commitment of the partners (Agranoff & McGuire 2001, 300). For instance, performance measures can be beneficial in monitoring the partners' situation, and discussing the performance with the partner.

Coordinating activities are those that are necessary when, for example the concurrent outputs of two or more partners need to be compatible. It involves, for example, guiding and scheduling (Svahn & Westerlund 2007). The idea of purposeful configuration is built into the concept of the value net. Therefore, coordination of activities is essential, as the net comprises independent goal-disparate organisations. The focal firm does not have the authority to issue commands to the net partners, and the autonomous net members are not obliged to obey (Dhanarag & Parkhe 2006, 659). The focal firm must find other means beyond hierarchical control to ensure value creation and extraction.

Coordination between the focal firm and its partners concerns the coordination of resources and activities. Coordination is important as at the offset the partnering firms do not have all the necessary information on each other to align the activities productively (Schilke & Goerzen 2010, 1196). Coordinating can also involve efforts to minimise or remove obstacles to cooperation (Agranoff & McGuire 2001, 300; Järvensivu & Möller 2009, 658).

Finally, **integration** refers to combining the technologies, expertise or such of multiple partners in the value net (Svahn & Westerlund, 2007). It comes close to the management of a portfolio of alliances, which has been emphasised in some studies (see e.g. Schilke & Goerzen 2010). It is noted that the need for coordination in alliance portfolio management stems from interdependencies between the individual alliances. Alliance portfolio coordination is supposed to enable the location of resources into alliance projects that yield maximal gain at acceptable risk. (Schilke & Goerzen 2010, 1196)

As can be seen in the discussion above, companies have many different possibilities in managing the value net. However, it is very interesting to examine value net management in the context of an international technology-based SME. In the study by Svahn (2004), three out of four examined cases are larger firms. Larger firms typically have more leverage in their value net, and therefore may be in a better position to really manage the value net, whereas smaller firms might struggle more with getting their message through to their partners.

Communication relates to each of the four modes discussed above. It has been emphasised in the literature that communication abilities are needed for inter-organisational management (Schreiner et al. 2009, 1403). Communication is indeed necessary, because it has been found to be crucial that partners, in addition to agreeing to cooperate, also discuss how compatible they are, how each will contribute to value creation and how they agree on value creation priorities (Doz & Hamel 1998, 94). For instance international travel is an important part of communication between partners (Axelsson et al. 1992). Face-to-face contact is of utmost importance in inter-organisational management.

Another important notion from the alliance management discussion is that firms seem to differ in terms of their capabilities to manage alliances (see for example Schreiner et al. 2009). Therefore, it is reasonable to expect the alliance management capability to be important to the competitiveness of the firm. This can be applied also in the domain of value net management and, indeed, managing the value net is a crucial factor for a small global factory; it is a focal part of managing the global factory structure.

3.5 Synthesis of managing the global factory in dynamic contexts

To conclude the theoretical discussion, this section synthesises the aspects discussed above. Overall, the theoretical frame of the study builds on four concepts: business model, dynamic capabilities, global factory and value net management. These concepts are diverse although somewhat overlapping. To paint the whole picture, this synthesising section explains three focal linkages:

- Global factory structure as an element in the business model of an SME.
- Value net management as a dynamic capability.
- Value net management as an essential factor for operating the small global factory structure.

The global factory structure is a challenge for an SME, although it can also be rewarding in terms of capturing global business opportunities. For technology-based SMEs in particular, the operating environment can be relatively volatile; opportunities unexpectedly arise and disappear. The global factory structure implies highly internationalised operations, in which each value creating activity ideally is located in an optimal location and performed by an optimal provider, whether internal or external to the focal firm (Buckley 2009b). For an SME, this is enabled by the fine-slicing of operations and reliance on numerous partners. These are actually determining factors in the business model. The global factory structure, however, does not delineate the activities needed for value creation, who performs those activities or how are all the activities linked to one another, which are the focal decisions in designing a business model (cf. Zott & Amit 2010).

The global factory structure does have some impact on the design themes, as the key idea of the structure is to effectively utilise business opportunities on the international scale through the novel organisational structure (Bartels et al. 2009; Buckley & Ghauri 2004). Therefore, the novelty theme is highly likely to be part of the business model of any small global factory (cf. Zott & Amit 2010). However, depending on the firm, other design themes might also be important. It is important that the technology-based SME continuously evaluates its business model and the structure of its operations so that they correspond to the requirements of the current market and competitive situation.

All in all, it can be argued that the global factory structure is an element in the business model design of a technology-based SME. Thus, although the concepts are developed for very different purposes, they can be complementary in understanding international technology-based SMEs.

In addition, the capability to manage the value net of an international technology-based SME is focal for operating the global factory structure. As

previously argued in this work, this can be considered a dynamic capability. All three dimensions of dynamic capability can be identified in this capability as follows. Sensing opportunities is the key to managing the value net in a changing environment. The firm needs to be alert to any signals that indicate a need or an opportunity for change. In dynamic environments, the current value net cannot respond to customer needs forever as customers change and develop different kinds of need, or new kinds of customer appear. Seizing opportunities, as it refers to addressing the sensed opportunities through development of new products, services or processes (Teece, 2007), is also tightly linked to the value net. Seizing opportunities might entail involving current partners in the development work or finding new partners. In other words, it entails preparing the organisation for transformation. Reconfiguration refers to aligning the organisation (Teece 2007), but in this context also aligning the value net with the new situation through recombining existing and acquiring new resources and capabilities. It might mean changing the roles of some partners or even more dramatic changes in the net.

The dynamic capability of value net management is based on the three different level factors described in section 3.4.1. Together these three levels – cognitive capabilities, managerial capabilities and organisational capabilities – are expected to enhance the use of different modes of value net management in the SME context.

Finally, as the value net is part of the business model (Zott & Amit 2010), it follows that value net management is an essential factor for operating the small global factory structure. To be more specific, operating the small global factory structure refers here to running the day-to-day business of the firm (both internally and inter-organisationally), but also developing the value net in terms of keeping partnerships up-to-date, and finding new partners. The latter aspect is particularly important for technology-based SMEs as they typically operate in changing environments. At least the technological environment is a dynamic one, and the competitive situation also tends to be rather fluid.

In the context of the small global factory, value is indeed created as the joint effort of the net, in the interfaces between the focal firm and its partners. Therefore, the capability for value net management in a small global factory must address both internal and inter-organisational issues. Figure 5 captures the key aspects of the conceptual discussion as it illustrates the small global factory structure that is embedded in the dynamic environment.

Small global factory structure

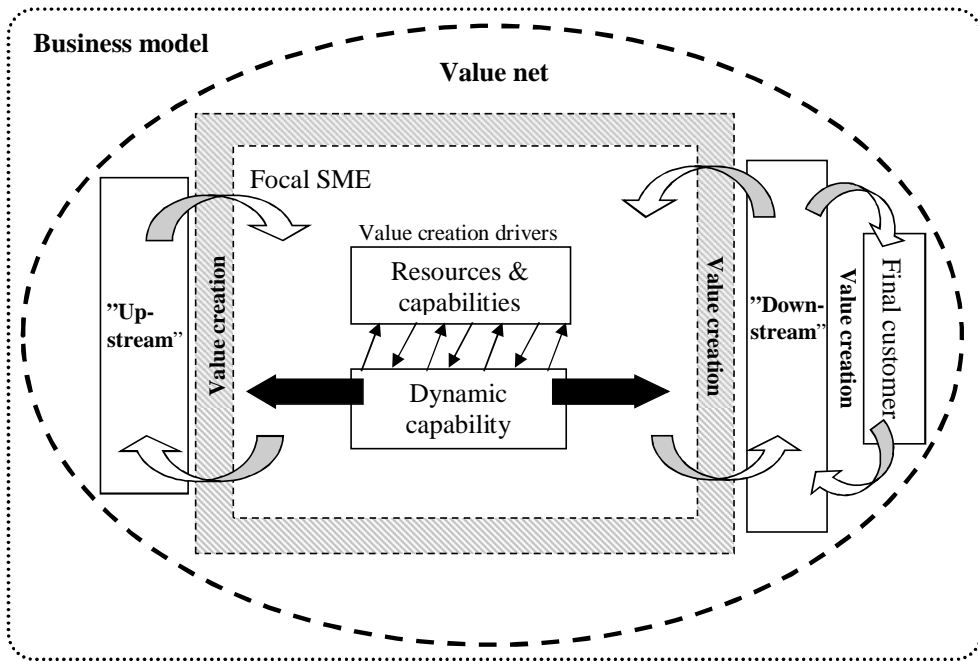


Figure 5 Conceptual framework of the study

Figure 5 shows that the internal resources and capabilities of the focal firm, as well as the dynamic capability for value net management, are the core of the global factory and create the basis for value creation. Value is created in the interaction between the focal firm and its partners. Therefore, it is important that the focal firm is capable of managing the partnerships so that all the parties involved are able to gain from the cooperation. This is necessary as the partners need to have an incentive to participate in the value creation.

All in all, the dynamic capability of managing the value creating activities can be expected to impact the competitive advantage of the focal SME through the rise of novel configurations of value creating activities (cf. Eisenhardt & Martin 2000). Based on the dynamic capability approach, these novel value creation configurations can be expected to be difficult to imitate due to, for example, path-dependencies, and hence lead to sustained competitive advantage.

4 VALUE NET MANAGEMENT AND CAPABILITIES IN THE SMALL GLOBAL FACTORIES

4.1 The global factory structure and business model in the SMEs

This section begins the examination of the topic through empirical data. The issues discussed above are analysed through qualitative data from four SMEs, as introduced in chapter 2. Before discussing the business models of the cases, it is important to consider one special characteristic of SMEs. Previous research has established that the business model is an important consideration for entrepreneurs and managers. However, in SMEs they often have very little time to examine partner portfolios and such broader questions as the daily operative-level tasks consume most of their time. This was also noted by one of the interviewed managers, and it links to what Penrose (1959) writes about managerial diseconomies. Thus, the interviews for this study also served as an opportunity for managers to consider the business model as a whole.

The business models employed by technology-based firms have been changing. Nowadays, many firms provide integrated systems, which typically necessitates intensive cooperation with various partners. Hence, capabilities in partnering are essential (von Herten et al. 2009). As can be seen in the short case introductions in section 2.2.3, the business models of the four firms appear rather similar. This is partially due to case selection, but also goes to show that the four companies examined are rather typical examples of technology-based SMEs that operate as global factories. The core of the firms is very limited and they rely extensively on partners, especially for international sales, but also for technology/software development. This is exemplified by a quote from one of the Delta interviewees: *“we are around 70 people in the organisation, but from outside we look like 70,000 people”*. The global factory structure, as an element in the business model, determines part of the business model. Despite the seemingly similar business models, many differences could be perceived between the firms when their business models were scrutinised. The detailed analysis included looking at the design elements and design themes (Zott & Amit 2010) of each company’s business model in both the upstream and downstream operations. The following table presents an overview of the cross-case analysis.

Table 9 Comparison of global factory structures in the cases

	Alpha	Beta	Gamma	Delta
Value capture	Lock-in	Efficiency	Lock-in	Lock-in
Customer value driver	Novelty, efficiency	Novelty, efficiency	Efficiency	Efficiency
Upstream				
Partners	Few	Very few	Few	Few
Content	Software & hardware	Software	Software & hardware	Software & hardware
Structure (core)	Software, system integration	Software	Software, system integration	Software
Governance	Supplier contracts and trust	Trust and supplier contracts	Supplier contracts and trust	Supplier contracts and trust
Design themes	Access to public sector bidding, growth potential	Access to international markets	Access to public sector bidding & international markets	Access to public sector bidding & international markets
Downstream				
Partners	Many	Many	Few	Many
Content	Sales partner management, marketing, support, some sales	Sales, support, sales partner management	Sales, consulting, sales partner management	Sales partner management, marketing, support, some sales
Structure (core)	Sales channel management	Sales	Consulting	Sales channel management
Governance	Trust, Contracts	Trust (Contracts)	Trust (Contracts)	Trust Contracts
Design themes	Novelty, access to new segments	Complementarity	Complementarity, efficiency	Complementarity, novelty

To begin with value capture, which is an essential part of the business model, the case firms appear to rely on either customer lock-in or efficiency. Customer lock-in as the basis for value capture means that the customer commits to the product for a longer term when making the decision to acquire it. Alpha's and Gamma's business models entail strong customer lock-in, which enhances value capture. For Delta, the customer lock-in is only moderate, and it needs to be more concerned with engaging the customers into a continuing relationship. In the case of Beta, value to the company itself is derived primarily from efficiently delivering the software to the customer.

Second, the value to the customer also appears to stem from rather similar sources between the case firms. The products of all four firms improve the customer's efficiency. This occurs, for example, through time savings in employing the system (compared to the other options). In addition, all the firms emphasise novelty; however, each of the firms build on different kinds of novelty. System novelty is the key value driver in Alpha's business model as its system is more advanced and considerably more versatile than competing systems. Beta's offering builds on novelty of the delivery channel, whereas Gamma and Delta rely on technological novelty. However, Delta seems to be striving towards less emphasis on technological novelty and more emphasis on the complementarities.

Analysing the upstream part of the value net, all the firms have only a few selected key partners in the upstream operations (i.e. in the technology development and possible manufacturing operations). Even though software is core for the case firms, they do not conduct all of the development work internally. Delta, for instance, has outsourced all hardware manufacturing, and some parts of technology development. The firm has in fact two different types of technology-related partner: technology development suppliers and partners, whose technologies the firm follows and whose platforms it utilises. There appears to be a clear difference in terms of partner size between these two groups. The former group comprises partners that are close to Delta's size, whereas the partners whose technologies Delta follows are considerably larger organisations.

Partners are employed in technologies that are beyond the focus of the case firms' own development teams. The development partners mainly conduct tasks that are not critical for the offering, but can be replaced by another partner if necessary. In other words, the firms have been able to slice the non-core tasks for the partners. The managing director of Beta explained that "*We have a few subcontractors who offer...not really pieces to our software, but separate [software]*". The firm is reliant on the partner for the overall solution to be created, but can perform its internal development operations

independently of the partner. This depicts the fine-slicing that is key to the global factory structure (cf. Buckley & Ghauri 2004).

However, replacing a partner is very challenging in most cases. Alpha categorises the upstream partners into three groups, each of which has different strategic importance ranging from very high to low, depending significantly on the replaceability of the partner. The interviewees said that some of the most strategic partners are next to impossible to replace, whereas the least strategically important partners are those which, for example, offer bulk components and are relatively easy to replace. All in all, the number of partners in the upstream operations is very limited in all of the case companies.

In terms of the business model design elements (Zott & Amit 2010), the upstream operations contain numerous similarities between the case firms. The selection of the content in the upstream operations is naturally highly dependent on the business; however, it can also be seen to somewhat define the business of the company. Of the four technology-based SMEs only one focuses purely on software, the three others also provide hardware. This is an important distinction in the content of the business model. Moreover, the companies offer different kinds of combination of products and services. Alpha and Gamma also focus on system integration, while Beta and Delta allow the partner to handle the integration. In addition, Delta is currently involved in developing an offering extension, whereby it also aims to offer content to the systems they currently provide. Thus, the firm is redefining the content of its upstream operations.

The structure deals primarily with the importance of the activities to the business model. All four firms have rather similar business models in terms of their structure, which is largely due to the companies being technology intensive. Nonetheless, system integration in Alpha and Gamma is a core operation and therefore conducted by the firm itself, whereas Beta and Delta allow their partners, specialist integrators, perform the system integration as it is not core to their business model. Hence, it can be seen that although software development is, as expected, the core of the companies, they have combined different activities with it to form the core of the business model. In terms of location (i.e. the spatial dimension of structure), it is noted that all four firms have both domestic and international partners in their upstreams. It is, in fact, important for these companies to search, for instance, for international technology partners as they operate in a specialised niche market, and the know-how available domestically is often insufficient. In addition, international partnering in manufacturing or components is rational for cost reasons.

The structure also links to the governance of the activities. As partners are necessary, the companies have carefully considered the activities that can be acquired and those that they need to perform in-house. Hybrid governance

modes could also be identified as Delta, for instance, has conducted joint work with a partner in the same premises. With regard to the importance of the operations performed by the partner, the managing director of Beta further stated that “*Something [related to product development] has been outsourced, but we see that those are not our core business.*” The firm has drawn the line between the core tasks that are performed in-house and non-core tasks that can be performed by its partners. Despite relying heavily on partners, the firm maintains a tight control on the core software development operations. Interviewees from all four companies emphasised the significance of trust to governance. While cooperation is based on official contracts, the interviewees explained that those contracts do not mean anything without trust. Moreover, some relations operate only on a trust-basis without any contracts. When asked about the issue of contracts versus trust in relations with upstream partners, a Gamma interviewee stated: “*Contract prices and contracts, we have framework agreements and project agreements..*” Another said: “*But anyway, to work in practice, it needs to be based on trust*”. Conversely, Beta interviewees stated: “*currently it is trust. Though it would be nice to create a contract to base the trust on...*” Therefore, both are very important. Nonetheless, the SMEs might face challenges in writing contracts if the partner is a larger organisation, which was stressed by Delta interviewees.

The business model design themes address the primary value drivers of the business model. Even though the companies have carefully considered the value drivers to their customers, some of them had slight difficulties in explaining the value drivers to their partners, especially to those involved in the upstream activities. Three out of four case companies stated that they offer their partners an access to international markets. In many cases, the partners would otherwise not be able to achieve this access. In addition to offering a route to international markets, three of the four companies can also provide value through offering access to public sector bidding processes that would otherwise be out of reach for their partners. Furthermore, growth potential and gaining reference customers were mentioned as value to upstream partners.

The case SMEs also rely on partners in the downstream sales and marketing part of the value net, although with varying success and intensity. Alpha and Delta rely intensively on partners in sales, and especially in international sales. Vice president (sales and marketing) of Delta said that “*In sales we have channel partners. If we start with those, they are so called channel partners or resellers or integrators, whatever you want to call them, we have some two hundred plus of these. Then we have different type of [partners] that we call strategic partners... we have some twenty of these.*” In fact, Delta considers sales channel management as one of its core operations, at which the interviewees perceive the firm is very good.

Three of the four firms emphasise sales mostly through partners. Thus, the number of partners is considerably higher than is their upstream operations. Only in Gamma is the emphasis on direct sales by the company itself, and sales through partners are seen to be an important supporting activity; however, the goal is to increase the role of the partners. In Delta, the mode of sales is defined by the market. In some markets the customers buy differently, they acquire larger entities, and the decisions are made higher in the administrative hierarchy. Hence the company wants to be more involved itself in the negotiations as well as in closing the deals. Alternatively, Beta faces a situation where different customers acquire different kinds of systems in terms of the scope of the applications. Although the firm perceives software delivery as one of its core operations, wider systems are always sold through a partner (i.e. an integration house). Smaller system can be sold directly to the customer.

Consulting is yet another sales-related activity that the firms have positioned differently in their business models. For Gamma, consulting is a core activity, for Alpha and Beta it is a supporting activity, whereas for Delta, which is new to consulting, it remains more of a peripheral activity. This illustrates the fine-grained differences between the case firms' business models. Moreover, three of the four firms maintain the supporting activity of after sales support in-house, and only Gamma has outsourced it to partners. Similar to the governance of the upstream operations, trust is also focal in the downstream relations. In fact, Beta and Gamma emphasise trust much more than contracts with their sales partners.

In terms of the design themes, the value to the downstream partners appears to resemble the value to the customer: novelty in technologies or products, specialist know-how, offering complementaries to the partners' product range, and reliability or superiority of the products. Nevertheless, the partner value drivers varied greatly between firms. In the case of Alpha, the primary value to the sales partner stems from the complementarity of the Alpha product with its own offering. This way, Alpha can, for example, enable the partner to access new market segments; as one of the interviewees stated: *"If you think of Partner firm X, in terms of turnover our portfolio is relatively small. However, we are in a way the factor by which they get a grip of the customer, and then they can offer their other products and services to the customer."* Similar to Alpha, the Gamma interviewees identified the complementarity between their offering and the partners' offerings as the main source of value. A partner that encounters a need for the solution has no other option than to acquire it as its development would often either take too long or be too expensive. Complementarity of the offerings is also a key value point for Beta and Delta.

In addition to the primary aspects above, the Beta interviewees recognised that the company has reference value to its smallest partners. However, with

larger partners, the firm has faced problems as neither the monetary nor the reference incentive is sufficient to provide additional value to the partner. Although, similar to Alpha, they see that they might be able to offer value through access to such calls for bids that the partner could not meet without the Beta product, they have not been able to truly benefit from this with their larger partners. Therefore, the firm is currently pondering on whether it should concentrate on their smaller partners, where they appear to be able to offer sufficient partner value, or should they also continue working with large players that can offer various opportunities for growth, but where the identification and especially the communication of the partner value needs further work.

Consideration of value to the partner is, indeed, a very important part of the business model design. Nevertheless, the interviews with the managers revealed that all of the case companies have focused so much on the value to the final customer and end user that they have not sufficiently considered the value to their partners. This is reinforced by the notion that, although the interviewees agreed that monetary compensation is often insufficient for their partners in the longer term, they mainly struggled to explain the value captured by their partners.

Concurrently, two of the companies are to some degree struggling with a lack of commitment from their sales partners. Beta, for instance, perceives that they are losing sales due to the lack of value or their inability to crystallise the value to their current and potential partners. The interviewees from Delta also expressed similar concerns. The partner's incentive and the compatibility between the focal firm and its partners were repeatedly highlighted by one of the interviewees in Delta. He was actually new to the organisation, and had gained his experience in larger firms with a more systematic approach to partner management. It seems that the four small global factories studied here could benefit from applying some of the more structured procedures utilised by larger corporations. Another Delta interviewee put it well, when he talked about the importance of the value to the partner: "*So the logic that should be remembered is to give first and then ask (for what is wanted)*" By this he implied that what the firm can offer to the partner should be carefully considered before any cooperation is initiated.

Good relationships with sales partners are actually crucial for all of the studied firms as they are more or less dependent on their partners for international sales. Due to the reliance on sales partners, there is actually a slight dilemma built into the small global factory structure. The companies need to understand customers and the end users' needs very well to be able to offer superior customer value. However, the majority of sales are made through partners; hence direct contact to the customers and end users might be

scarce. Knowledge of the customers and the markets is crucial for the focal firm to be able to design the business model that suits their target markets. Additionally, knowledge of the customer is necessary to support the sales partners work. Therefore, the role of managing the value net is emphasised.

4.2 Value net management practices in the case firms

The value net is an important part of small global factories' business models. It opens up various opportunities for the case firms. As they offer flexibility, partners enable scalability of the focal firms' operations. Moreover, partners have been virtually the only viable way for the four technology-based SMEs to achieve their current wide global reach. The means of and capabilities for value net management were examined in detail in only one of the case companies, Delta. However, the data collected in the three other companies offer various comparative insights on the issue. Therefore, the following examination of the means of value net management focuses on Delta; however, whenever possible it compares and contrasts the other companies.

The Delta vice president (sales and marketing) explained how value net management begins with the corporate strategy. The management team and the board of the company define the annual goals and strategic lines. Along those lines the goals are set for each function (e.g. product development, sales, finance and administration). The goals of the function are further translated into the goals of individual employees. Thus, the employees dealing with the partners know this year's goals and how these are linked to the corporate strategy. This is confirmed by his following comment: "*whatever the personal goal is, for example, for this year, it must find its place in the strategy and the corporate goals.*" Thus, internal management is the basis for value net management.

An important means of influencing the downstream value net is being actively in contact with the partners. To make this work, Delta maintains what they term an executive summary whereby they write down everything that has occurred with the partner. Delta's marketing and sales manager, however, recognises that they would need to play a more active role towards their partners, to push their products to the partners. In addition to regular meetings between regional managers and the representatives of the partners, the company actively attends partner meetings organised by some of its bigger partners. The most important issue seems to be keeping the partners aware of Delta's products and overall offering. Only in this way the partners, big and small, will turn to Delta when they need what Delta can offer. Frequent contact with partners was also emphasised by Alpha, as one of the

interviewees stated: *“We try to be a partner that is close. It is our job to be asking how are you doing, how are your kids, and have you visited [potential customers], and is everything ok?”* These two companies have found active contact with their partners a key issue in managing the sales partner net.

In addition to active contact, good personal relations were underlined by many interviewees. For example, the Gamma interviewees agreed that personal relations weigh more than contracts, which can be seen in the following citation: *“Of course contracts are made also, especially with international partners we have to go through the rigmarole of contracts, but still the relationship must be created between people.”* Similar issues were also stressed by the interviewees from Alpha and Delta. Beta, however, has been struggling somewhat with establishing the sales partner net, and especially in gaining control over the net. Beta does not have as much experience in partnering as the three other companies. All in all, active contact and interpersonal relationships were found to be the most significant means for the small global factories to influence the downstream value net members, which were more numerous than the upstream members.

Moreover, to influence the sales partners' operations, Delta offers training to the partners whenever necessary: *“We are training them to make them aware of our products and our offering, and how to sell that.”* It is crucial that the sales partners are knowledgeable on the products they are supposed to sell. Alpha interviewees also emphasised the importance of training sales partners. Training has been found very effective with smaller sales partners, whereas it is more a case of lobbying the larger sales partners through personal relations. One of the Delta interviewees said that: *“it is very much a traditional type of lobbying or we try to find common project opportunities and such.”* With larger partners the SME has to utilise more subtle means of influencing.

It was perceived as important that the partner is motivated to continue working for the benefit of the focal company. In Delta, this was enhanced by informing the partners on future benefits of the cooperation, as well as giving them incentives. One of the Delta interviewees said that they can use either a *‘carrot or the stick’*. They can use different kinds of inducement, whereby they offer particular benefits after the partner achieves the goals. Conversely, they have even threatened price increases to give the partner more incentive to advance sales. The willingness of the partners to cooperate and their commitment to the cooperation are crucial for the success of value net management. These means can be seen to be partially linked to the coordination of the net.

Before discussing coordination, however, monitoring and controlling are examined. The small global factories were indeed found also to have some means to monitoring and controlling the value net members' operations. First,

Delta has a partner programme for its sales partners in place. The programme is based on organisational goal setting and entails biannual goals for sales and marketing, as well as budgets. In addition, Delta keeps track of quality issues in the downstream through following feedback from technical support, as well as the performance of the partner in terms of delivery and installation times. In the same vein, Alpha requires monthly reports from its sales partners. The reports include information on current and near future sales, and also the activity of partners in terms of customer visits and offers made. These mechanisms give a good insight on what monitoring and controlling actually mean for small global factories. The companies do not have the leverage to dictate how their partners operate. Instead, they have the opportunity to monitor how well the partners perform against the measures they have decided are the most meaningful. It is, however, important that the partners know what these measures are and that performance is discussed with the partner, especially if results vary from expectations.

The partner programme Delta employs is also a tool for coordinating internal resources with regard to the partner. When all contacts with the partner are recorded in the system, it is easy to see what kind of information has been exchanged and with whom. Nonetheless, the Delta managing director said that the firm still has a long way to go before they utilise the partner programme to its full potential.

Compared to the downstream operations, Delta has a considerably smaller number of partners in its upstream operations. Therefore, the partnerships in the upstream part of the value net are managed differently, less systematically, than the downstream part of the value net. The situation is rather similar in the three other companies as their numbers of upstream partners are also quite small.

The R&D manager of Delta said that their partnerships are managed individually rather than as a portfolio: *“It is more like we manage each partnership separately, and we have an idea about the role of this partnership in the bigger picture.”* They have felt that there is neither a need nor possibility for systematic management, or partner programme. Delta is a relatively small player in nearly all of its R&D partners’ portfolios. Therefore, it lacks leverage and has no possibility of telling its partners how they should operate. Nonetheless, in these value net partnerships it also has some means of influencing the partners: *“We can express our wishes, and in practice we do this with key subcontractors, key software suppliers, when we discuss annually, and in some cases more often, the kinds of skill they should acquire and the kinds of operation they should develop.”* The company realises the limitations that its small volume gives to the weight of its wishes. The interviewee cited above continued: *“Those are more like for our information*

than that we could say don't do this, do that. Because then we would need to be giving significant volume of orders." Nevertheless, open communication with the partners appears to be the key also in upstream operations.

Moreover, Delta has tried to build critical mass in each of the R&D partnerships so that the work performed for them would not be threatened by, for example, one employee leaving the company. Similar problems have been recognised also by Gamma: *"it doesn't need to be more than one person to change in some big organisation, the manager for operations in Europe or the Nordic Countries, for the focus to shift completely."* Therefore, reliance on personal relations, as discussed in the case of downstream operations, also involves risks. Nevertheless, personal relations appear to be a must rather than an alternative.

In terms of monitoring, the Delta interviewees said that: *"There are two types of monitoring. One is that as we mainly buy work, which is delivered as software entities or parts of software, so we monitor that. There is on one hand the schedule that has been agreed upon and then the quality that is the functionality... Regarding the second issue we monitor the general financial performance; that is to say, whether the company will exist in a year."* Similar to the downstream monitoring, monitoring in the upstream relies on rather subtle means. Alpha interviewees said that they also carefully monitor, for instance, the quality delivered by their hardware manufacturing partners. They follow the share of defects delivered and monitor the trouble these defects cause them.

Resource coordination internally and inter-organisationally, can also be a mode of value net management. Delta has organised value net management in the upstream part so that preferably only one employee (i.e. project manager) is responsible for the partnership when the work to be performed is specified. As such, the aim is to minimise contradictory messages. Beta has also organised contacts with partners so that the roles are clear within the organisation, and everyone in the small firm knows who is responsible for which partner: *"[We are] such a small organisation that we don't have a so called partner manager, although there is role differentiation so that we knowt who is responsible for the partnerships."* On the other hand, Alpha interviewees said that, in their firm, they have a slight problem in that they have at least four people involved in the partnership. They said that the goal is to have only one person involved in the interface, but currently that is not reality. Hence, assigning the responsibility for communicating with upstream partners to one person appears to be desirable and beneficial for small global factories.

Finally, the integration of the value net members as a mode of value net management was perceived to be even strange as an idea. Delta has not

considered it necessary to try to link its R&D partners with each other or to other parts of the value net. Integration of activities takes place only between Delta and its immediate partners in cases where they undertake joint development work; the most notable example is the joint development project with a partner during which they worked in the same premises with their partner. Quite interestingly, integration between different types on value net member was considered even possibly harmful for the business: *“let’s assume that we have for instance significantly these R&D partnerships, so we do not want to go to tell the sales partners what other partners we use. We would probably like to keep that behind our back.”* Therefore, it seems that integration of activities can be a means of value net management for a small global factory. However, its use appears to be carefully considered. The means of value net management are summarised in the following table.

Table 10 Cross-case comparison of the means of value net management

	Delta	Alpha	Gamma
Influencing	Active contact, Personal relations, Training, Lobbying “Carrot or stick”	Active contact, Personal relations, Training	Personal relations
Controlling, monitoring	Partner programme, Quality monitoring	Reporting	-
Coordinating	Partner programme, Dedicated contact person	-	-
Integrating	Not utilised	-	-

Beta is omitted from the summarising table as it has not yet truly begun managing the value net properly. Instead, they say that they face problems with the sales channel, for instance: *“But truly the problem is that we have not got the channel under control”*. The data from the company did not provide comparative insight on value net management. However, the company was valuable for this study as it demonstrates a relatively nascent small global factory.

As can be seen in the table, the examined small global factories have the most means in terms of influencing their value net partners. Controlling or

monitoring and coordinating appear also relevant for the case firms, although the means of implementing these are limited. Integrating, for its part did not represent a relevant mode of value net management for the case firms. It needs to be kept in mind that the value net relationships vary in terms of intensity and importance (Blankenburg & Johanson 1992). Also, this is one factor that contributes to differences in the means of management between different relationships.

Having discussed the modes and means of value net management the case companies were found to apply, it is time to examine the dynamic capability for value net management.

4.3 The dynamic capability for managing the value net

The dynamic capability for value net management is here conceptualised as an organisational combinative capability as defined in section 3.4.1. This implies that various capabilities contribute to the dynamic capability of value net management. In examining the factors that are needed to build the dynamic capability, this study built on the initial understanding that was based on theoretical insights from the literature review. The review enforced the idea of dynamic capability as a combinative capability that draws together various factors into a higher-level capability.

Based on insights from the dynamic capabilities literature and previous discussions on the global factory, SME internationalisation and international entrepreneurship, factors on different levels were expected to contribute to the dynamic capability of value net management. Indeed, three different level factors were found to be influential: managers' cognitive capabilities, managerial capabilities and organisational capabilities. It must be noted also here that these issues were examined in detail only in Delta. The three other cases offer some comparative insights, and mainly they enforce the conception derived from Delta.

The cognitive capability concept is employed here to refer to peoples' mindset and orientations that underlie their attitudes. The examination of cognitive capabilities focuses on managers. As could be expected, based on the extant literature, three cognitive capabilities emerged in the empirical data as being the most influential: cultural awareness, global mindset and entrepreneurial orientation. However, new aspects with regard to these cognitive capabilities were discovered. As the organisational type examined is a small global factory, it is understandable that various cultural aspects were highlighted in the interviews. First, it is apparent that cultural awareness is necessary in the context of the small global factory. In Delta, it was found to

prevail in the whole organisation, not just at the managerial level. Cultural awareness had been built through international contacts both intra- and inter-organisationally. Thus, the firm had developed into a multilingual and multicultural organisation, and all employees know that their own culture is just one among many, and they more or less know what to expect from people coming from different cultural backgrounds.

Second, a global mindset was very strong among the managers in the firm. This can be seen by the managers' ability and willingness to communicate across cultures, eagerly expanding the operations to various geographical directions, and perceiving the whole globe as a potential market. Global mindset was clearly apparent also in the other companies as evidenced by the following quotation from a Gamma interviewee: "*[Our] ambition has always been strongly outside Finland.*" Additionally, other interviewees said that Gamma was initially created for operations well beyond the borders of Finland. Both cultural awareness and global mindset also appear to prevail in Beta, which is reasserted by the fact that over two thirds of its turnover comes from international operations, and that the firm has had international sales from inception. Gamma also derives nearly two thirds of its turnover from international sales.

Third, entrepreneurial orientation was found to be crucial for the dynamic capability of managing the value net. The interviewees emphasised that "*success is not just coincidence*", but for them it stems from planning and taking the initiative. Proactivity was found to be a distinguishing character of nearly all Delta interviewees, not just top management. The three other case firms also testify to the importance of a proactive approach in management. For instance, Gamma has conducted cross-border acquisitions to grasp opportunities to expand its international operations. A pattern can be seen for sensing new international market opportunities.

Altogether these three focal cognitive capabilities are connected to opportunity identification and international expansion of the firm. Cognitive capabilities are very deeply rooted in individuals and therefore change very slowly, if at all. They create the basis for dynamic capability, and hence are important antecedents.

Cognitive capabilities, however, are not sufficient for operating the small global factory; managerial capabilities are also important in enabling the exploitation of opportunities. Managerial capabilities refer to an individual's ability to exploit resources, and they build on cognitive capabilities. Nevertheless, managerial capabilities can be developed, for example by experiential learning. Two managerial capabilities were found to be necessary for the dynamic capability of managing the global value net: interface competence and analytical capability. The former refers to the ability to operate in the

inter-organisational interface. It includes the ability to manage both individual relationships and the whole net of relationships. Managing individual partnerships is a challenge for the small global factories as discussed above in section 4.2. The interviewed managers emphasised that the situation with partners is very delicate as the companies have their own business incentives, which at worst might be conflicting. Thus, the interviewees at Delta and Gamma spoke about the importance of understanding their partners' business rationales. Only by considering their partners' incentives it is possible to align the companies into a well-functioning partnership. Aligning the incentives necessitates a cycle of iteration between the partners' incentives and the focal firm's incentives. However, managing the whole value net means synchronising various activities into a coherent value net. Delta interviewees said that they have the ability to bring together different partners into a net that can deliver what the customer wants. Additionally, they noted that they can do this anywhere in the world; if they do not have the partners or the knowledge, they are able to quickly find them. They have the ability to repeatedly piece together the puzzle that is needed for delivering what the customer requires. Importantly, from the dynamic capabilities perspective, although this puzzle can look different every time, they are able to piece it together.

In all of the three other companies, managers can be seen also to have relatively high interface competence. All managers interviewed in these companies emphasised the significance of good personal relations and the need for frequent contacts. Therefore, the basis for managing individual relationships is evident in these firms. Nonetheless, the portfolio approach was not emphasised by the interviewed managers in the three other companies. This approach was clearly also weaker in Delta. The managerial diseconomies mentioned earlier might be a key contributing factor here.

Analytical capability also has two sides as it links to the ability to fine-slice operations and to see the "big picture". Fine-slicing, which is discussed in the global factory literature, implies dividing operations into slivers that can be performed (nearly) independently of one another. Today it is possible to slice operations into very fine activity slivers, much finer than ever before (cf. Buckley 2009b). In terms of analytical capability, this means the ability to consider simultaneously the details and the bigger picture, and to alternate the perspective when necessary. In addition to the Delta interviewees, the need to see the big picture was emphasised also by Alpha interviewees. When asked about the resources and capabilities that are needed to make the cooperation with partners work, an Alpha manager stated: "*what I mean is the kind of ability to piece together the ensemble.*" There is, in fact, a linkage between interface competence and analytical capability as the ability to consider partners' incentives can be seen to be linked also to managers' analytical

capabilities. One further aspect of analytical capability was raised by Gamma interviewees as they explained that it is important to them “*to understand how you can build these different kinds of functioning business models*”. In the spirit of analytical capability, this citation illustrates the importance of perceiving the business model as a whole and being able to determine which pieces yield the desired end result. Building different kinds of business model can be seen as a cycle by which the old needs to be abandoned as the new is implemented, unless the two can work in parallel.

Finally, organisational capabilities are the third factor necessary for the dynamic capability of value net management. Two organisational capabilities were found to be key factors here: flexibility and absorptive capacity. Flexibility was mentioned in numerous interviews. For instance, Beta managing director said that: “*We of course perceive ourselves as flexible and cost efficient*”. Flexibility is, in fact, a versatile capability, as it can take various forms in the organisation. In Delta, flexibility is apparent, for instance, in how the firm has successfully undergone three major technological transformations and how the firm has transformed from being part of a larger corporation into an SME. Going through the technological transformations has developed a sense of what to expect in that cycle; even during the interviews, the next transformation was anticipated.

Moreover, Delta’s boundaries are rather flexible, and the structure of its operations can be quickly changed if necessary. The interviewees also stated very clearly that they have faced many challenges in implementing change. In addition to learning new things, flexibility also necessitates unlearning the old: “*the most important thing, I would say is to know when to stop doing something... to see as quickly as possible that this is not producing anything and to quit it and move on to the next one.*” Letting go of what has proven not to work is an essential part of renewal.

Learning connects flexibility to absorptive capacity. For a small global factory, it is essential that the firm is able to learn from and with its partners. Delta has been able to learn in joint technology development projects with its partners. The partners have provided know-how complementary to that of Delta. In addition, even though the firm mainly does not sell directly to its customers, Delta has been able to develop a deep understanding of their products’ end-users and the purchasing organisations. Therefore, it has been able to learn about the users and buying organisations from its sales partners. This has been possible due to the good communication connections with its sales partners. However, as already mentioned earlier, it is challenging to draw the line between the information that is shared with partners and the information that is kept only in-house. The above discussion is summarised in the Table 11.

Table 11 Cross-case comparison of the dynamic capability

	Delta	Alpha	Beta	Gamma
Cognitive capabilities				
Cultural awareness	Identification of cultural differences	Identification of cultural differences	-	-
Global mindset	Ambition for global business	-	International ambition since inception	International ambition since inception
Entrepreneurial orientation	Proactivity	Proactivity	Proactivity	Proactivity
Managerial capabilities				
Interface competence	Individual relationship & whole net	Individual relationships	Personal relations	Personal relations
Analytical capability	Fine-slicing & “big picture”	“big picture”	-	Building business models
Organisational capabilities				
Absorptive capacity	Learning from & with partners	-	-	Consultative sales
Flexibility	Organisational boundaries, technological transformations, learning & unlearning	-	Flexible & cost efficient	Customers slow to change, but technologies change fast

As shown in the table, the case firms emphasise different aspects of the identified capabilities, which also goes to show that the firms have different levels of dynamic capability for value net management. However, the capabilities can also manifest themselves somewhat differently in different SMEs.

In sum, cognitive and managerial capabilities can be classified as antecedents to dynamic capabilities, whereas organisational capabilities come closer to the elements of dynamic capabilities.

4.4 Synthesis and verification of research findings

4.4.1 *The empirical research model*

This section synthesises the research findings discussed in the preceding sections. The aim is to highlight the most important and interesting findings and to draw conclusions. The Figure 6 below illustrates the key issues of the study. It is based on the conceptual model presented in section 3.5, but is modified based on the research findings.

The figure as a whole depicts the business model of a small global factory. The focus, as defined by the research questions, is on the value net, which is a key factor in the business model. The focal SME that is the object of this study is in the middle, and it interacts with upstream and downstream partners. The numbered aspects are subsequently discussed.

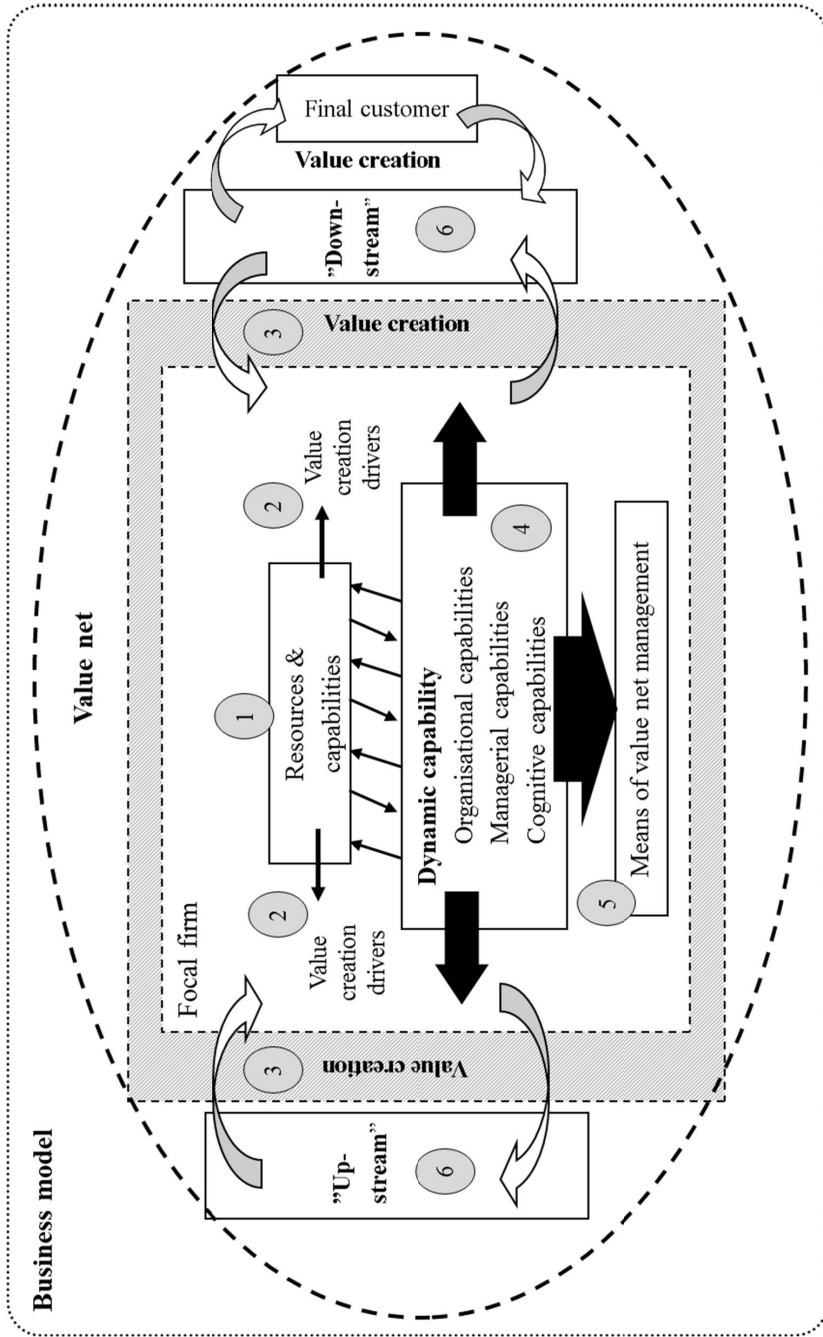


Figure 6 Empirical research model

The value net is a central factor in the business model of any firm, but especially in the small global factory. It comprises both internal and external factors to the focal organisation. Addressing internal factors first, the resources and capabilities of the focal firm are the foundation for its operations (indicated with number 1 in the figure). As suggested by Penrose (1959), capabilities enable a firm to derive services from the resources at its disposal. These services differ according to the needs and capabilities of the organisation, and hence same resources can yield various kinds of service. These services are key for value creation.

Value is always defined by the receiving end. Hence, an SME cannot decide that this is valuable to its partners or customers. Instead, it needs to communicate with the other parts of the value net to understand what is valuable to them. The value to the other members of the value net is based on value creation drivers that build on the focal firm's resources and capabilities. The value creation drivers (number 2 in the figure) were found to differ between the upstream and downstream operations. Hence, it cannot be argued that the firms only have one primary value creation driver. However, this aspect has not really been discussed in the extant business model literature.

All in all, the operating of the small global factory is highly dependent on well-functioning partnerships. Value creation that, is an essential part of the business model, is (in line with Amitt and Zott, 2010) argued to occur at the interfaces between the focal firm and its partners (number 3 in the figure). Therefore, the management of the value net partnerships is also a key issue. The dynamic capability for value net management is thus an important aspect both conceptually and managerially. Dynamic capability, as defined earlier, is an organisational, higher-level capability that pulls together many lower-level capabilities (cf. Kogut & Zander 1992). Three different level factors were found to be crucial for the dynamic capability of value net management: cognitive capabilities, managerial capabilities and organisational capabilities (number 4 in the figure).

The foundation for dynamic capability builds on the personal characteristics of the top managers in the firm, their cognitive capabilities. These typically change very slowly, if at all. The key cognitive capabilities for managing the internationally spread capability base are cultural awareness, entrepreneurial orientation and global mindset. These together form a strong basis for the organisational dynamic capability. In addition to the managerial characteristics the manager's capabilities also matter. The key managerial capabilities in this connection seem to be interface competence and analytical capability. These capabilities can be developed; however, it takes time. These two levels can be regarded as critical antecedents to the dynamic capability. They enable the dynamic capability to develop. Finally, there must also be organisational

capabilities, which can be regarded as the most important elements of the dynamic capability. The two organisational capabilities that are the most essential elements of the dynamic capability for value net management were found to be flexibility and absorptive capacity.

Dynamic capability creates the foundation for employing the means of value net management (number 5 in the figure). Similar to the primary value creation drivers, the means of value net management differ somewhat between the upstream and downstream parts of the value net. Moreover, the means of value net management were found to be very different between different types of partner. With smaller partners, the SMEs have more opportunities for straightforward influence on their partner's operations. In contrast, with larger partners, the means are less direct. However, for simplicity of illustration, the upstream and downstream are presented here as "black boxes" without differentiating between the various types of partner within each box (number 6 in the figure).

First, active and open communication was clearly the most important means of influencing both upstream and downstream partners. Relatedly, good personal relations are also very important for value net management in small global factories. These can be seen to build on managers' cognitive capabilities. In addition, training offered to smaller downstream partners and lobbying of larger downstream partners are means of influencing the partner. These means are also analytically connected to managerial capabilities (i.e. interface competence and analytical capability). Finally, motivating downstream partners by keeping them aware of the benefits of current and future cooperation was found to be also important to a small global factory. It calls for analytical capability from the managers so that they can identify the benefits from their partners' perspectives.

Second, to monitor and control their value net partners, small global factories were found to have some means, although somewhat scarce. Most importantly the companies can follow the performance both of their upstream and downstream partners. With upstream partners, monitoring focuses on quality controls, whereas with downstream partners, the company can keep track of the performance of a partner; for example, how it meets the agreed goals. Importantly, the small global factory managers discuss notably varying performance with their partners.

Third, coordination of resources with regard to partners was not very advanced in the studied small global factories. This might be mainly due to the small size of the organisations in which nearly all employees know what the others are doing. Nonetheless, coordination was raised as an issue that could be developed by the firms. In terms of capabilities, coordination clearly calls for interface competence.

Finally, integration of resources between value net partners was not deemed necessary by the small global factories. Integration of upstream partners was not utilised; after all, the number of partners in the upstream is very small. Although the small global factories had more downstream partners, integration was not regarded as beneficial. Especially in situations where the firm has only one partner per country, the managers did not perceive opportunities for integration. Even more notably, integration between upstream and downstream partners was regarded as possibly harmful for the focal business.

In sum, the interfaces between the focal firm and its partners are highlighted in this study. The interfaces are crucial in value creation and thus their management is essential. For the value net to function, managers in the focal firm need to consider the incentives of their partners to contribute to the customer value creation process. It was found that the business rationale for a partner is all too often neglected, which can lead to problems. Value net management needs also to include consideration of the partners' incentives.

4.4.2 Verification of the research findings

The final focus group conducted after analysis of the other data yielded interesting insights in support of the research findings presented above. Discussion of the results focused on the means of managing the value net and the necessary capabilities, as well as the managerial relevance of the findings.

The participants agreed with the identified means of managing the value net. However, two aspects in particular were highlighted in the discussion. One of the participants emphasised that in his opinion, which is based on his long management experience with many different firms, two issues are focal in managing the value net: personal relations and partners' motivation. The two other participants agreed and also shared their thoughts on these two aspects.

First, personal relations, as also highlighted in the findings of the study, are the foundation for longer term inter-organisational partnerships and enable good communication between the partners. This was regarded as the most important of the means for value net management. The focus group participants emphasised the importance of trust and respect for functioning relationships in the value net. Referring to the upstream situation, in which the small number of partners for the case firms meant that the firms did not seem to implement very systematic management programmes, one of the participants stated: "*But in a situation where there is no systematic management, trust can be the glue that keeps the pieces easier together*". In addition, even though value net relations are inter-organisational, it is people who operate at the

interfaces. Thus, it was perceived as highly important that the actors have a good rapport. Many issues were seen important in this, such as professional competence and the overall habitus of the person.

Related to personal relations is communication with the partner. As already emphasised in the case findings, good communication and good personal relations tend to go hand in hand. A new highly relevant aspect to the openness of communication arose in the focus group. One of the participants said that firms today often face a trade-off between the openness of communication and the speed of operations. To speed up operations, the focal firm might choose to reveal knowledge or information that it would have preferred not to disclose. This stems from the increased need to operate quickly and efficiently. The trade-off and openness of communication are also linked to the integration of value net members (see sections 3.4.2 and 4.2).

Second, motivation of a partner to operate as part of the value net was highlighted as a key factor for value net management. The partner's motivation stems from the value of the cooperation to the partner, and was discussed in relation to the global factory business model in the research findings. Nonetheless, during the focus group discussion it was emphasised as probably the most important prerequisite for value net management. This can be seen, for instance, in the following citation: *“it is very hard to see that there would be anything to manage unless the company is able to locate the motivation factors for the partner to be in this”*.

Although it was found in the focus group that monetary value to the partner can be a sufficient basis for motivation, it was emphasised that various other factors can provide additional value and motivation to the partner. In addition to the factors identified in the research findings that drive the partner's motivation, the discussion emphasised the competitive advantage that the net can offer to its members, and managers' personal motivation and goals. The competitive advantage of the net was regarded as an important issue as the more the net can offer to the individual member, the more that member is willing to contribute to the net. It was regarded as important that the focal company is able to motivate its partners to bring their own strengths to the cooperation, and that the net operates to enforce the strengths. One participant in the discussion emphasised that the value net should be able to provide the members with something that is unique, and not easily replaceable. To some extent, this could also be seen in the results discussion when the novelty value was emphasised as a focal value creation driver in the case firms.

To understand a partner's motivation, it was also regarded as very important to consider the managers' personal motivations. They may be driven by career moves and such factors. However, managers' personal motivations also link to the personal relations discussed above. It was emphasised that

inter-organisational cooperation needs to be somewhat socially rewarding for the managers on both sides.

Accentuating the value to a partner to secure the partner's motivation is particularly important in the longer term as the individuals involved in the operation might change. The participants of the focus group emphasised that the motivation can become blurred. Thus, it was regarded as important to ensure that the partner is well aware of the value they can capture. Nonetheless, one of the focus group participants highlighted that sometimes communication of the value needs to be implicit, as some people do not want to hear explicitly about the benefits of the cooperation accruing to their organisation.

In addition, as discussed in the findings, the strategy of the focal firm was emphasised as another focal starting point for managing the value net. The focus group discussion reasserted that the focal firm's strategy is essentially the point of departure for value net management. The strategy needs to be understood by its own personnel who operate with its partners; moreover, they need to be able to communicate the strategy to the partners so that the partners understand their role and what is expected of them. This is well aligned with the findings from the case studies.

In terms of the capabilities for value net management, the focus group participants appeared to consider the proposed framework relevant. Initially the dynamic capability for value net management was illustrated as a pyramid, but the participants questioned the suitability of the illustration. This yielded a good discussion, and as a result, the researcher decided to change the illustration into its current circular form (see article 3) in which the cognitive capabilities are at the core, surrounded by managerial capabilities with organisational capabilities as the outermost layer.

One of the participants contemplated the managerial capabilities suggested as prerequisites for dynamic capability. He aptly analysed that the interface competence represents the soft side of the capabilities where it is necessary to adapt, for example, to different situations and cultures, whereas the analytical capability represents the harder side of capabilities that is based more on facts, and the organisation and management of knowledge. This is a very good way to summarise the issue.

The focus group discussion largely supported the research findings from the cases, and added some interesting aspects to the results. The participants saw that the analysis of the practice of value net management describes well the operational work performed in small global factories that are somewhat advanced in their operations. In addition, they saw that the results have managerial relevance in firms that are not quite as advanced but wish to develop their value net and its management.

4.5 Theoretical contribution of the study

4.5.1 *Contribution to the dynamic capabilities approach*

This thesis contributes primarily to three literature streams; namely, dynamic capabilities, SME internationalisation and international management. The detailed examination of the concept of **dynamic capability** adds clarity to the disintegrated literature by synthesising the empirical research findings. This is a very important contribution as there are continuous calls for clarification of the scattered discussions. The synthesising analysis offers a frame for distinguishing between the processes of dynamic capabilities, their antecedents and consequences. This is a focal issue for the advancement of the dynamic capabilities literature, as conceptual rigour is much needed in the dynamic capabilities literature. Clearly distinguishing between the processes of dynamic capabilities, the antecedents and the outcomes is one way of advancing that rigour (cf. Zahra et al. 2006).

The details within each of the three areas are scrutinised. With regard to the processes of dynamic capabilities, the primary contribution of this study is the identification of the continuum ranging from very specific identifiable processes to very generic knowledge processes. Various conceptualisations can be placed on this continuum, instead of being necessarily strictly one or the other. This finding advances bridging the differing assumptions behind dynamic capabilities studies. Finding ways to bridge the focal differences is important as the prevailing differences hinder dynamic capabilities scholars from developing a coherent and robust dynamic capabilities theory.

In addition, the study provides a detailed account of factors, both internal and external, that have been found to contribute to the development of dynamic capabilities and hence function as antecedents. Although these factors have been found to exist at multiple levels (e.g. individual and organisational levels) the dynamic capabilities literature thus far has not discussed the ensemble of the antecedents. The inclusion of multiple levels is a rather rare exception in the literature. Therefore, recapitulation of the different levels in the systematic synthesising review has the potential to engender multi-level research in the future. Moreover, the empirical part of this study provides an example of how multiple internal levels of analysis can be included.

With regard to the outcomes of dynamic capabilities, the present study concludes that, despite the conceptual dominance of the perspective, that dynamic capabilities have indirect performance implications, considerable share of empirical studies hypothesise/propose and find direct relationship. This is an important link to the methodological issues. This study questions whether the fact that so many empirical studies find a direct relationship

between dynamic capabilities and performance results from an actual association or an oversimplification in the operationalisation of the concepts. In other words, this study calls for more discussion on the operationalisation of the concept.

Capturing the complexity of dynamic capabilities in empirical research poses a challenge to any researcher. Therefore, careful consideration of the research methods is a necessity. One of the most notable problematic issues that was found is combining the examination of current dynamic capabilities with past performance data. Although, by definition, dynamic capabilities change rather slowly, the current level of dynamic capability nonetheless influences future performance. This issue has not been addressed anywhere in the dynamic capabilities discussion, and hence this study strongly calls for discussion on this methodological peculiarity.

Moreover, based on the stage of development of the dynamic capabilities approach, which is somewhere between nascent and mature (cf. Edmondson & McManus 2007), this study calls for more in-depth qualitative studies that can form a more solid grounding for quantitative operationalisation. In addition, there appears to be a need for empirical studies that combine qualitative and quantitative research methods. In addition to the lack of established and widely accepted quantitative measures, there is also another problematic issue in quantitative research: the identification of interesting organisations to study. In qualitative research, researchers must familiarise themselves with the organisation in advance to confirm that it is worthy of study. In quantitative research, researchers determine the sample with the help of a sampling frame, whereby they cannot always ensure that the organisations included are relevant or interesting from the dynamic capabilities perspective. Thus, additional in-depth research is needed to develop ex-ante identification of dynamic capabilities.

In sum, the most significant methodological pitfalls were found in the utilisation of cross-sectional data, losing the essence of dynamic capability in operationalisation and relying on research settings that are not meaningful from the dynamic capabilities perspective. Therefore, this study highlights the importance of methodological fit in empirical research. Methodological fit is necessary for rigorous empirical research, and therefore the identification of the typical pitfalls in the dynamic capabilities research has the potential to enhance better achievement of methodological fit in future studies.

The empirical part of the study also contributes to the dynamic capabilities literature. Dynamic capabilities have been examined mainly in large (i.e. multinational) firms. Therefore, empirically examining the dynamic capability of value net management in the SME context is an important contribution. The examination focused on the antecedents and elements of the dynamic

capability for value net management. The value added of conducting the study in the SME context stems from being able to highlight the special characteristics of the smaller firm. In particular, the role of individuals was found to be vital for the dynamic capabilities of SMEs. However, the role of individuals has received less attention in the dynamic capabilities research. Therefore, this study is a step towards integrating the individual more tightly into the dynamic capabilities discussion. For instance, the diversity of the management team as a factor contributing to the development of dynamic capability has not been addressed in previous research; although, based on this study, it is a relevant issue, especially in SMEs. In particular, identifying the cognitive capabilities of managers as important antecedents to a dynamic capability adds value to the dynamic capabilities literature. Also, the identification of both soft and hard managerial capabilities as important for dynamic capability advances the discussion, as it represents a novel approach to conceptualising the managerial-level antecedents.

Moreover, through conceptualising the value net management dynamic capability as a higher order combinative capability (cf. Kogut & Zander 1992), this study takes a very pragmatic approach to dynamic capabilities. As such, it was possible to distinguish between the three different levels of factors relevant for the particular dynamic capability. Thus, the study advances the operationalisation of the concept.

4.5.2 Contribution to the discussion on SME internationalisation

This study contributes to the **SME internationalisation** literature by examining the management of internationalised operations, introducing the concept of the global factory to the SME context and discussing value in respect of international operations.

The SME internationalisation literature has thus far merely examined the internationalisation phase of the SME life-cycle. Maintenance and management of the internationalised operations has remained a notable gap in existing research (Morgan-Thomas & Jones 2009, 72; Prashantham & Young 2011, 275). Therefore, examining SMEs that have been operating internationally for some time and continue internationalising is a contribution to the literature. It adds to the understanding of how internationalising SMEs can succeed in their operations after initial internationalisation.

Management of the internationally spread and continuously expanding operations of small global factories was found essentially to concern the management of partnerships and the interfaces between a firm and its partners. This implies that the liability of outsidership (Johanson & Vahlne 2009) is a

significant issue for a small global factory. This study proposes a set of capabilities that is helpful in tackling the liability, and therefore adds new insight to the internationalisation discussion.

Moreover, integrating the SME internationalisation literature with the global factory discussion is an important contribution to understanding the structure of an internationally operating SME. This is important as nowadays firms, regardless of their size, might need to find new ways of organising their operations to develop and maintain competitive advantage. The global factory structure can be considered one form of business model innovation (see e.g. Chesbrough 2010); however, it induces new kinds of challenge for SMEs. This study has begun the work of charting these challenges and exploring how they are addressed by firms. Thus, the study advances our understanding of the management issues in the new kind of structure of a highly international SME.

Moreover, the literature on internationalising SMEs has largely focused on the internationalisation paths and patterns of SMEs, and capability-related issues have remained underexplored. As suggested by this study, management of highly networked organisations such as small global factories requires new kinds of personal and organisational capabilities. This study suggests that although SMEs might be disadvantaged in their partnerships due to a lack of power, capable managers are able to find ways to influence partners' operations. Previous research acknowledges that managerial characteristics can be influential in the internationalisation of firms (see for example Leonidou et al. 2002; Nummela et al. 2004). This study puts forward potentially the most important managerial characteristics in terms of cognitive capabilities: cultural awareness, entrepreneurial orientation and global mindset. Moreover, the study argues that it is not sufficient to have managerial characteristics, but there must also be managerial and organisational capabilities to exploit the opportunities and available resources. The study highlights that all three levels of factors are necessary for the dynamic capability of international value net management. Thus, this study has aptly integrated the dynamic capabilities and SME internationalisation literature streams to further our understanding of the complexity of managing internationalised and continuously expanding operations in the SME context.

The discussion on value to the customer, but even more importantly the value to the partner, is a novel contribution to the SME internationalisation literature. To date, the literature has not considered the value aspect in relation to the international networked operations. Nonetheless, this study integrates the consideration of the value to the partner into the issues to be resolved concerning internationalisation. The focal SME needs to be able to identify what the partner can gain from cooperation, and needs to be able to communicate this to the partner. In addition, this study identifies some issues

that might be sources of value to the partner. These contributions advance the SME internationalisation literature by broadening its scope to cover also the value aspect, which is highly relevant for small global factories. As argued earlier, without identification and effective communication of the value, SMEs are unlikely to succeed in partnering.

4.5.3 Contributions to international management

The literature on value chain management has been dominated by logistics' considerations and, to date, the discussion on **value net management** is scarce. Therefore, examining internationally spread value creation from the perspective of strategic management adds to the scant knowledge on the so-called soft side of value net management. In addition, SMEs have also been more or less neglected in this discussion as the focus has been on considerably larger firms due, for instance, to their large volumes. SMEs tend to be somewhat disadvantaged in various aspects compared to larger firms, therefore examining which modes of value net management identified in larger firms are applicable in the SME context is a contribution to the value net discussion. It is especially valuable to identify which means the SMEs have at their disposal for implementing these management modes. Although the means of management with which the modes can actually be implemented are important for operative management, they had not previously been examined. Therefore, this study advances the emerging value net management literature and enhances its managerial relevance.

This study also highlights the international aspects of value net management. The international or global context, in which the small global factories operate, places special requirements on value net management. This is, for instance due to the diversity of the operating environments, as well as the liabilities that the firms need to overcome: smallness (Buckley 1989), newness (Stinchcombe 1965), foreignness (Hymer 1976), outsidership (Johanson & Vahlne 2009). In addition to having organisational ability to operate in and manage a global value net, highlighting that managers need to be geared to the global operations (i.e. in terms of their cognitive capabilities) is a notable contribution to the value net management literature. Previously, the capabilities have been discussed only conceptually and on a very general level (Svahn & Westerlund 2007). This study is the first to examine the capabilities empirically and investigate the details. Thus, this study advances our understanding of the kinds of capability that contribute to the management of the global value net of an SME.

The study also makes a contribution to **the business model literature**. As illustrated by the discussion on research findings, value creation drivers can be different at the various interfaces of the company. The value offered to the software development partners can be based on very different attributes than that offered to sales partners, and to the value delivered to the end-user. The aspect of differences in drivers between various interfaces is an issue that has not really been considered in the extant literature. Moreover, it is emphasised that detailed analysis of the business model elements is necessary, as superficial examination does not reveal what might differentiate the firms' business models from one another. The conceptualisation and examination of the global factory structure as an element in the business model is a step towards clarifying the academic literature and overcoming the prevailing conceptual compartmentalisation.

The extant **global factory literature** emphasises the rational thinking of global factory managers who are expected to make decisions based on transactions costs, and thus find the optimal location and ownership strategies (cf. Buckley 2009a). This study nonetheless also suggests that managers' cognitive and managerial capabilities are influential in managing the small global factory. As opposed to being a rational entity, the small global factory appears to be a more complex phenomenon, a challenge for managers. In a small global factory, managers need to be able to build and maintain social relationships, and particularly to manage the organisational interfaces. This suggests another important notion on the global factory structure - its vulnerability. The vulnerabilities of larger global factories have been highlighted by Yamin (2011). However, the vulnerabilities of small global factories are different. A small global factory is highly dependent on its value net, and hence inter-organisational relationships are key to the functioning of a small global factory. However, as previously discussed, inter-organisational relationships are in practice interpersonal relationships. Therefore, the change of one person in a partner organisation can be fatal to the relationship. In addition, the loyalty of the partner over time is a potential source of vulnerability. Finally, in comparison to multinationals, internationally spread operations are structured differently in an SME. The challenges of the widely spread and finely sliced operations are better understood in the case of large corporations; however, the challenges faced by SMEs have remained largely unknown. Nonetheless, understanding the SME perspective is important; particularly in Scandinavia, where a large proportion of all firms are SMEs and, due to the small size of the home market, SMEs increasingly operate internationally. Thus the integration of the SME perspective into the global factory discussion advances the global factory literature in an important direction.

Further research on these topics is certainly needed. The phenomenon of small global factories is novel and, thus, there is not much research on how they develop and operate. This study is one of the first attempts to understand the global factory structure and the business models the firms employ. Future research has many possibilities to enhance our knowledge of small global factories. It would be interesting to know how the process of becoming a global factory progresses, and if and how it differs from the internationalisation processes of other kinds of SME. In addition, partnerships and their management, as well as the identification and selection of the opportunities to be exploited, present important areas for future research. Moreover, the role of the manager in the global factory structure needs to be more fully examined; in particular, cognitive and managerial capabilities should be scrutinised.

4.6 Managerial implications of the study

It seems to be well accepted that dynamic capabilities are important when operating in volatile environments. Nevertheless, as the discussion is highly theoretical, what it means in practice to be dynamically capable still remains somewhat unclear. The systematic review part of this study identified in particular the examination of the antecedents to dynamic capabilities as being important in advancing the managerial relevance of the literature. Following this notion, the empirical part of the study focuses on the antecedents to the dynamic capability of value net management in the context of a small global factory.

The pragmatic approach taken in the empirical part of this study makes a managerial contribution as it identifies key factors that are important to a particular dynamic capability. As such, the study takes the dynamic capability concept close to management practice, which is very rare in academic dynamic capabilities research.

Even more importantly, the factors are such that experienced managers are likely to be able to identify them in their own organisations. Although the factors might be very slow and difficult to change, many actions can be taken to enhance them. Cognitive capabilities can be taken into consideration when recruiting new people. Existing employees can be exposed to experiences that might gradually change their cognitive capabilities. Managerial capabilities can also be considered when recruiting; they can also be more easily influenced through training, for instance. The level of organisational capabilities of absorptive capacity and flexibility can be developed, at least in the long term. Means for development can be found, for instance, in changing the way activities are organised and linked to one another.

Also, exploring the global factory structure of SMEs offers an avenue for a managerially relevant contribution. The small global factory represents a rather poorly known organisational structure, and therefore raising public awareness of it can add a viable alternative to the selection of possible business models for SME managers. It is important that the managers understand the logic of the small global factory structure, and particularly that they form a realistic picture of management challenges posed by the structure. This study is the first step towards developing a knowledge base on these issues. The results of this study give descriptions of the global factory structure in four different technology-based SMEs. Moreover, the structures are thoroughly analysed, and hence numerous management issues are brought to the fore.

Identification of the means of value net management also has a managerial aspect. The means have not been examined earlier, and hence this is a novel contribution. The means that were identified in the study represent proven practices; in other words, they have been tested in practice by the studied SMEs and found to function. Therefore, the model of the means for value net management puts forward a kind of checklist for managers. It was actually noted in the final focus group that the means identified in this study can offer managers a benchmarking tool with which to develop their firms' value net management.

It was also suggested in the final focus group that managers could utilise the model of value net management and the capabilities presented in this study for evaluating goodness of an interesting firm through systematically analysing its value net. This interesting firm might be, for instance, a potential partner, a target for acquisition or a prospective new employer.

In addition to the operational level of value net management, this study also contributes to reminding managers of the importance of strategy for value net management. Managing the value net remains weak unless the firm has a clear strategy for its inter-organisational operations. This means that it is important for the firm to know what it wants from its partners; in other words, what are the partners' roles? It also means that the firm needs to be able to communicate to its partners what is expected of them.

Finally, and related to the strategy-issue, this study emphasises the significance of a firm identifying and acknowledging value to its partners. It was evident in the examined companies that the value the partner receives from cooperation is not always given due consideration as the focus has been solely on customer value. However, it was also evident that the compatibility of the business rationale between the focal firm and its partners is a crucial factor for the success and longevity of the partnership. Acknowledging this is a necessity for value net management and success of the partnerships. Thus, as the final

managerial contribution, this study highlights the significance of crystallising the value of cooperation both internally, and to the partner.

This study also suggests a potential tool for managers: business model analysis. This can be a useful tool with which to identify and analyse value creation drivers. The analysis enables rather flexible examination of different kinds of organisation and draws managers' attention to issues that are easily neglected.

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APPENDICES

Appendix 1 Interview guide for Delta interviews

Background

1. What is your professional background?
2. What is your current job description at Delta?
3. How about your background in Delta?

Value net

4. Which phase of value creation are you in your responsibility in this company?
 - who is responsible for the other functions?
 - where is the interface?
5. Approximately how many partners you have in this part of the chain?
6. Could you tell me about a typical partner in your area?
 - Where are the partners located?
 - What is the value added of operating with the partners?
 - What is the value you offer to the partners?
 - What know-how/skills do you receive from these partners?
 - What know-how/skills do you provide to these partners?
 - Do you exploit the value network of your partner somehow?
 - Would there be a possibility to receive more value from this partner in some way that you don't use yet?
 - Does Delta have enough resources to utilise the partners adequately?
7. What issues function well with these partners?
8. Which issues poses problems with partners?

Value net management

9. How is the value net managed in Delta?
10. In what ways do you aim to influence to the operations to your partners so that they would operate according to your best interest?
11. To what extent do you control the partners' operations?
12. To what extent do you coordinate your resources between different actors in your value chain?

13. To what extent do you aim to integrate the activities in your value chain?

Capabilities

14. How do you understand the term capability?

15. What is the most important capability in your job?

16. What kinds of capabilities do your subordinates have?

17. What do you think is the most important capability in management of the value net?

18. In your opinion what is Delta's core capability?

19. What are the most important resources and capabilities Delta provides to its customers?

20. Can you tell where these are located?

21. How are capabilities identified/recognised in your company?

22. Since the establishment of the company or since you have been working here, how the capabilities have changed?

23. Is there anyone that comes into your mind that we should also interview regarding these issues?

24. Is there something that you would like to add to any of the issues discussed?

Appendix 2 Interview guide for Alpha, Beta and Gamma focus groups

Background information

- 1) Can you please tell shortly about your job description?
- 2) How would you define business model?

Internationalisation

- 3) When did you start international operations?
- 4) Which were the most important reasons to internationalise?
- 5) How did the internationalisation proceed?
- 6) How have you organised the international operations?
- 7) What kinds of goals you have for international operations?
- 8) What kinds of challenges and opportunities you see in the future?

Customers

- 9) Who are your most important customers?
- 10) How is your product different from what competitors offer?
- 11) What kind of relationship is formed with the customer when they commit to your solution?

Suppliers (upstream)

- 12) What kinds of suppliers you have?
- 13) How many?
- 14) Where are they located?
- 15) How do you select the suppliers?
- 16) Do you anticipate any changes with regard to suppliers?
- 17) What kind of partner you think you are to your suppliers?
- 18) What motivates the partner to sell to you?
- 19) Can you describe the nature of the relationship your company has with its suppliers?
- 20) How have you organised the interface with suppliers?
- 21) What kinds of resources and capabilities are required from your company for the cooperation to work?

Sales partners (downstream)

- 22) Where do you have sales partners?
- 23) How have you selected the sales partners?
- 24) Do you anticipate any changes with regard to sales partners?
- 25) How dependent you are on the sales partners?
- 26) How easily replaceable the sales partners are?
- 27) What kind of partner your company is to the sales partners?

- 28) What is your share in the sales partner's portfolio?
- 29) What motivates the sales partner to sell your solutions?
- 30) How have you organised the interface to the sales partners?
- 31) What kinds of resources and capabilities are required in supporting the sales partners' work?
- 32) Can you describe the nature of the relationship between your company and the sales partner?

Customer value

- 33) How do you segment your customers?
- 34) Do some segments receive more value than others?
- 35) Who in your organisation work in the customer interface?
- 36) What kinds of resources and capabilities are required from a person working in the customer interface?

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RESEARCH NOTE

Processes, antecedents and outcomes of dynamic capabilities

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KEYWORDS

Dynamic capabilities;
Literature review;
Meta-synthesis

Summary This study addresses the following research question: *what do we know about dynamic capabilities based on existing empirical research?* The paper is based on a systematic synthesising review of 142 articles. The analysis focuses on three areas: the processes of dynamic capability, its antecedents, and consequences. Through its detailed analysis of factors within each of the three aforementioned domains, the study provides researchers with a stronger basis on which to explicitly position their contributions in the DC literature. With regard to the processes of dynamic capabilities, empirical studies appear to employ a continuum of conceptualisations ranging from the very specific and identifiable to a generic set of knowledge-related processes. Additionally, the antecedents were found to be either internal or external to the firm, whereas the mechanisms by which dynamic capabilities lead to performance outcomes were found to be an unresolved issue in empirical research. The study identifies numerous avenues for further research concerning each of the three focus areas.

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Introduction

Companies in changing environments need to anticipate changes and to react to them (Medina-Garrido, Ruiz-Navarro, & Bruque-Camara, 2005). The ability to do this systematically has been referred to as dynamic capability (DC) (Teece, Pisano, & Shuen, 1997). The ultimate aim of the DC approach is to explain the competitive advantage of firms over time (Teece & Pisano, 1994). The origins of the concept lie in strategic management, but it has been applied in areas as diverse as marketing, entrepreneurship (Barreto, 2010), risk management (Colarelli O'Connor, Ravichandran, et al., 2008), innovation management (Lawson & Samson, 2001) and logistics (Glenn, Genchev, & Daugherty, 2005). Although

this indicates the versatility of the approach, it also highlights the lack of established tradition in its use.

The literature on DC could be more rigorous and more explicit (see Arend & Bromiley, 2009; Schreyögg & Kliesch-Eberl, 2007). Future development in the field requires reviewing the use and content of the concept, and three recent reviews (Ambrosini & Bowman, 2009; Barreto, 2010; Wang & Ahmed, 2007) have started that work. However, they all have a narrow focus in terms of both the topic and the number of publications analysed. Wang and Ahmed (2007) examine *the commonalities between different organisations*; Ambrosini and Bowman (2009) focus on *how dynamic capabilities develop*, and discuss the performance implications; and Barreto (2010) develops his own conceptualisation of the construct based on previous literature and the identification of the various *dimensions* presented in the studies. Additionally, Di Stefano, Peteraf, and Verona (2010) examine the structure of the DC research domain through the 40 most influential articles dedicated to it. Notably, all four studies

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end up with rather different conclusions. In order to shed further light on the phenomenon, this study addresses the following question: *What do we know about dynamic capabilities based on existing empirical research?*

This paper builds on previous reviews and deepens our understanding of the empirical research on DCs. In systematically reviewing 142 empirical articles on DCs the study synthesises the evidence-informed knowledge (Tranfield, Denyer, & Smart, 2003) thus far accumulated, distinguishing between the very concept, its antecedents and outcomes (see Zahra, Sapienza, & Davidson, 2006) and offering one viable way of structuring the discussion. Through its detailed analysis of factors within each of the three aforementioned domains, the study provides researchers with a stronger basis on which to explicitly position their contributions in the DC literature. This is very important in terms of developing the approach because most existing studies are not very clear on this point and hence knowledge is not being accumulated effectively. Furthermore, reviewing empirical studies gives the opportunity to assess the similarities and differences between qualitative and quantitative research on DC, which has not been discussed previously. In focusing on empirical studies, this review also sheds some light on the operationalization of the concept, which is not discussed in earlier reviews either. Moreover, it highlights which areas have been neglected in the empirical research (cf. Needleman, 2002; Petticrew, 2001). All in all, the aim in this study is to offer a better basis on which to conduct future empirical research.

The following section gives a brief overview of the conceptual discussion on DCs, and the third section introduces the methods used in this systematic review. The fourth section discusses the findings in terms of the processes, the antecedents and the outcomes. Finally, the last section draws the conclusions, suggests avenues for future research, and discusses the limitations of the study.

The dynamic capabilities approach

The DC literature has its roots in the resource-based view of the firm (RBV), going all the way back to the works of Penrose (1959). However, other streams of literature have also influenced the discussion, specifically the evolutionary theory of economic change (Nelson & Winter, 1982), Schumpeter's views on creative destruction, the behavioural aspects of the firm (Cyert & March, 1963), and Williamson's (1975) views on markets and hierarchies (Ambrosini & Bowman, 2009; Teece, 2007). The conceptual discussion is therefore very rich.

Many authors perceive DCs as higher-order capabilities that influence the development of operational capabilities (Cepeda & Vera, 2007; Collis, 1994; Winter, 2003). They are often combinations of simpler capabilities and the routines related to them (Eisenhardt & Martin, 2000). Thus, DC is defined here as the capacity of the organisation to purposefully create, extend, or modify its resource and capability bases to address changes in its environment (Eisenhardt & Martin, 2000; Helfat et al., 2007; Teece & Pisano, 1994; Winter, 2003).

DCs are described as processes (Ambrosini & Bowman, 2009), or as comprising processes (Teece et al., 1997; Verona & Ravasi, 2003). Thus, they are dynamic by implication as they operate in time and develop over time. Although scarce,

there is some conceptual discussion related to these constituent processes: they are assumed to include both organisational and managerial processes aimed at identifying needs or opportunities for change, and at accomplishing that change (Helfat et al., 2007). Processes therefore constitute the elements of DC. It is argued on the one hand that DC is a function of three generic learning processes: experience accumulation, knowledge articulation and knowledge codification (Zollo & Winter, 2002). Other authors, on the other hand (Eisenhardt & Martin, 2000), refer to specific and identifiable processes that may integrate or reconfigure resources, or focus on their acquisition and release. Product development and alliancing are mentioned as examples. According to the former approach, DCs may be unique and hence difficult to imitate (Teece et al., 1997), whereas the latter view implies commonalities among organisations, meaning that only the resource and capability configurations DCs create can be unique (Eisenhardt & Martin, 2000). This remains an on-going conceptual debate.

In an attempt to enhance conceptual coherence and clarity, Zahra et al. (2006) suggest separating DCs from their antecedents and outcomes. Considering antecedents as inputs and outcomes as outputs is a good starting point from which to analyse the accumulated knowledge.¹

Teece (2007) offers a focal contribution with regard to the antecedents of DCs in writing about the micro-foundations that are contributory factors. For the sake of analytical clarity, he distinguishes between the micro-foundations for each of the three dimensions: sensing, seizing and reconfiguration. Sensing capability builds on individuals' capacities and organisational processes linked to discovering opportunities, whereas the antecedents of seizing capability reflect the selection of product architectures and business models, organisational boundaries, decision-making protocols, and the building of loyalty among employees. Lastly, the factors contributing to reconfiguration capability concern decentralisation, co-specialisation, governance and knowledge management. Although the antecedents of each dimension differ, Teece (2007) argues that they all include an entrepreneurial and "right brain" component. However, all of the ones mentioned above are internal to the organisation, and it is argued that external factors may also act as enablers (or inhibitors) of DCs: the pace of industry changes, for example (Ambrosini & Bowman, 2009; Winter, 2003).

Finally, in terms of outcomes there is agreement that DCs are linked to the competitive advantage of the firm, or to its performance (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003; Winter, 2003), although there is some debate about the mechanisms of this linkage (Ambrosini & Bowman, 2009). Early on it was suggested to be direct (e.g., Teece & Pisano, 1994), but more recently it has been described as indirect, meaning that DCs influence performance through the unique resource and capability configurations they develop (Helfat & Peteraf, 2003; e.g., Zollo & Winter, 2002).

DCs thus comprise various processes, arguably influenced by many different factors called antecedents. All in all, the

¹ Ambrosini and Bowman (2009) utilise a similar division in their review of the usefulness of the DC construct. See also Keupp and Gassmann's (2009) review in the field of international entrepreneurship.

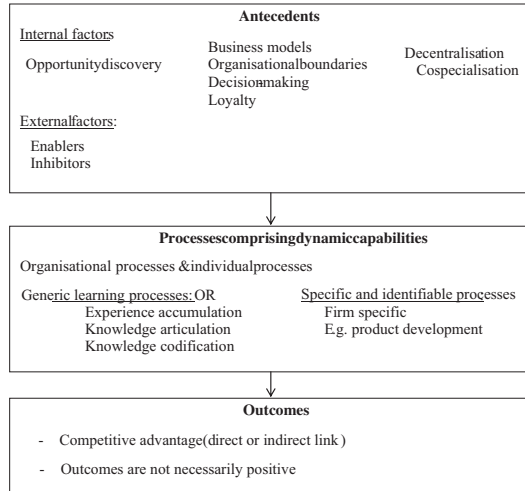


Figure 1 The dynamic capabilities frame.

need for them stems from the need for companies to maintain and enhance their competitiveness in a changing environment. Fig. 1 draws together the above discussion.

Methods

Systematic reviews have emerged in response to the need to improve rigour and reproducibility, given the accelerating output of scientific studies (Tranfield et al., 2003). The review process is made transparent through the reporting of each step in the search and analysis, as well as the criteria used. The coverage of systematic reviews is wider than that of traditional narrative reviews in that they tend to compare, contrast and link findings from a number of (sub)fields utilising a variety of research methods (Thorpe, Holt, Macpherson, & Pittaway, 2005). This, in fact, distinguishes the review at hand from earlier DC reviews. Moreover, the sheer volume of studies allowed more systematic analysis than has been achieved earlier. The present review was conducted in the spirit of critical realism. The focal features of this thinking are that an entity can exist without having any identification, but there is no theory-neutral observation or interpretation (Fleetwood, 2005; Fleetwood & Ackroyd, 2004).

The review process

The present review was conducted in three phases, as illustrated in Fig. 2.

The author discussed the preliminary outline of the study with other scholars, and having absorbed their comments went on to prepare a review protocol. The protocol, which was based on the conceptual discussion among established researchers as well as on information gleaned from the literature, contained guidelines covering the search and analysis process. Numerous articles on how to conduct systematic literature reviews were consulted, and systematic

reviews from areas other than business science served as benchmarks in the review process.

The second stage was to conduct the review. As journal articles seem to be the most respected and most efficient way of disseminating research findings, they were chosen as the source material (cf. Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005). The search criteria drawn up from the review protocol specified that the term *dynamic capability* or *dynamic capabilities* should occur in at least one of the following parts of the article: the title, the abstract or the key words. Using these strictly defined search criteria ensured a comprehensive and unbiased search, and this is considered one of the fundamental differences between a traditional narrative review and a systematic review (Tranfield et al., 2003). The search covered two databases, the ProQuest's ABI/Inform and EBSCO's Business Source Complete, both of which have a comprehensive coverage of management journals and thus suit this purpose. The search was conducted in December 2009–January 2010, and therefore included articles published up to the end of 2009. It was limited to peer-reviewed journal articles.

Following their identification as DC-related, a number of the articles were excluded from the review. First, given the focus of this study on evidence-based knowledge, conceptual articles were left out. Second, the articles were evaluated in terms of relevance and quality. The relevance criterion was that, in addition to meeting the search conditions, the articles discussed DCs in the findings and conclusions section(s). Quality was evaluated against methodological fit (Edmondson & McManus, 2007): studies that appeared to suffer from methodological discrepancies were excluded.

The review culminated in an analysis of the articles. The first step was to code them according to their focus, be it on processes, antecedents and/or outcomes. This coding is not exclusive, as one article may deal with more than one of these areas. Second, a content analysis was conducted within each of the three groups. The sampling unit in the analysis was one article, and the coding unit was a theme, a finding or

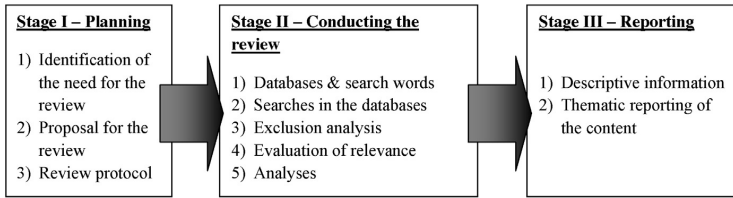


Figure 2 The search and review process.

Table 1 Coding scheme for content analysis.

Processes	Antecedents	Outcomes
Generic knowledge processes	Internal	Performance
Experience accumulation	Individual level	Direct linkage
Knowledge articulation	Project level	Indirect linkage
Knowledge codification	Organisational level	Other outcomes
Other knowledge processes	External	
Specific processes	Inter-organisational	
	Other	

an argument within the findings and conclusions sections (cf. Berg, 2004; Krippendorff, 2004). The approach to coding in this review was mainly deductive (Elo & Kyngäs, 2008), meaning that the codes were primarily concept-driven, yet a few data-driven codes emerged (Schreier, 2012). The categorisation (see Table 1) was kept simple due to the conceptual fragmentation of the field.

Because content analysis is inherently reductive, it was necessary to combine it with thematic analysis that better preserves the diversity of data. Thus, more detailed thematic analysis was conducted within each of the categories (cf. Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005), for which the quantitative data was transformed into a qualitative form in order to enable synthesis (cf. Dixon-Woods et al., 2005). The data-driven thematic analysis was carried out chronologically starting from the oldest article. The compilation of this report concluded the review process.

The data set

The searches yielded 373 journal articles altogether, the earliest one being from 1991. The majority were published after 2005, indicating that larger-scale interest in the concept is quite recent. Fig. 3 shows the number of articles published per year. The column "All" also includes the papers that were excluded from the actual analyses.

Over a third of the 373 articles were conceptual, and were therefore excluded from the content analysis. Another five were based on simulation data, which is very different from empirical data, and were thus also excluded. It is clear from the remaining 232 empirical articles that DC has become a buzzword in many fields. In fact, 42 of the articles only mention it in the abstract, and do not discuss it anywhere else. Another 12 use the concept in contexts other than business (e.g., robotics). As a result of this screening 54 studies were considered non-relevant for this review, and hence excluded from the analyses. Finally, 36 articles appeared to have some problems in terms of research design and methodology, and were therefore excluded, resulting in 142 articles. Fig. 4 depicts the selection process for the analysis, and Appendix A lists the 142 reviewed articles.

Fig. 4 also shows the extent to which different research approaches were applied in the 142 articles. Both quantitative and qualitative methods are strongly represented. The sample sizes in the studies are shown in Fig. 5.

It is noteworthy that quantitative studies with the smallest sample sizes used longitudinal panel data. Moreover, studies based on both qualitative and quantitative methods (i.e. mixed methods) were classified according to the largest sample they utilised.

Because the search was not limited to particular journals, the articles represent a wide variety. Appendix B lists the

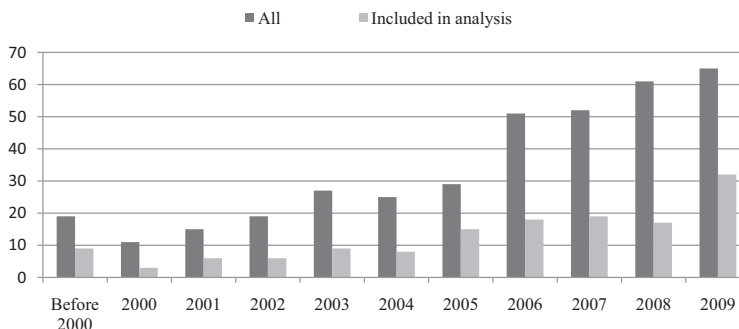


Figure 3 Articles found per year.

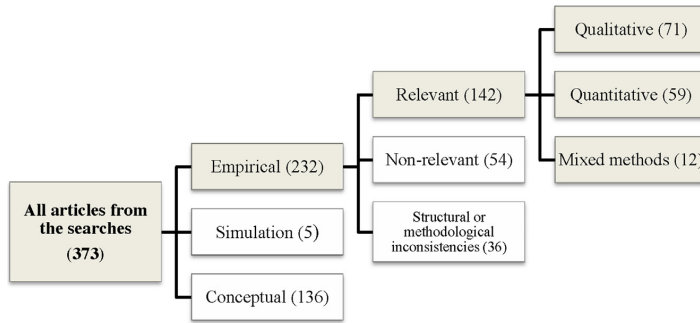


Figure 4 The selection of articles for the review.

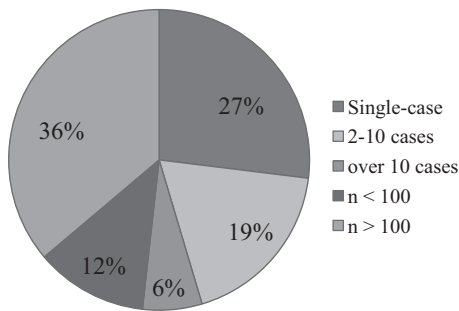


Figure 5 Sample sizes.

journals from which three or more articles were included. The *Strategic Management Journal* is clearly in first place, but there are also strongly technologically oriented journals among the top few, illustrating the importance of the concept in the area of innovation and technology development.

The results of the analyses

The following synthesis of the research findings on DCs is divided into three parts: processes, antecedents and outcomes (cf. Zahra et al., 2006). All three areas are well represented in the 142 articles: processes are discussed in 64, antecedents in 67, and outcomes in 45. It was interesting to see that processes and antecedents were discussed throughout the time period when DCs were studied empirically, but interest in outcomes is more recent.

Processes of dynamic capabilities

There is a tendency to use qualitative research methods in investigations of the processes of DCs: of the studies reviewed, almost two thirds are qualitative, slightly less than one third are quantitative and the remaining 10% employ mixed methods. A probable reason for this is the complexity of the processes, which makes them challenging to operationalise with quantitative measures.

It could be concluded from the conceptual discussion that there are two different approaches here: focusing on specific

processes, or on generic knowledge-related processes. Both are indeed strongly present in the empirical literature. Most of the studies conceptualising DCs as specific processes focus on product or technology development and transfer (Cetindamar, Phaal, & Probert, 2009; Griffith, Kiessling, & Dabic, 2005; Helfat, 1997; Lawson & Samson, 2001; Mathiassen & Vainio, 2007; Petroni, 1998; Tripsas, 1997), although some emphasise inter-organisational collaboration and capability acquisition (Capron & Mitchell, 2009; Jarratt, 2008; Vassolo & Anand, 2007), organisational restructuring (Farrant & Flynn, 1999; Karim, 2006, 2009; Rindova & Kotha, 2001; Skilton, 2009) or business-model adaptation (Andren, Magnusson, & Sjolander, 2003; Lampel & Shamsie, 2003; Newbert, 2005; Wilson & Daniel, 2007). However, a larger number of studies conceptualise DCs through generic-knowledge-related processes.

The search for themes in the articles identified the following four knowledge processes as focal elements of DCs: accumulation, integration, utilisation and reconfiguration. Given the complex nature of knowledge, these four processes are necessarily somewhat overlapping and ambiguous. However, the following discussion is an attempt to analyse the key features of each one, based on the empirical literature.

Knowledge accumulation

DCs connote renewal, and hence new or enhanced knowledge is a crucial element (Macher & Mowery, 2009). According to Pandza et al. (2003, p. 1028), "The process of how a firm acquires its capabilities cannot be separated from how it acquires its knowledge." Like DCs overall, knowledge creation in organisations is path-dependent and cumulative (Camuffo & Volpato, 1996; Farrant & Flynn, 1999): knowledge accumulates through experience (Macher & Mowery, 2009; Miyake & Nakano, 2007; Pandza, Horsburgh, Gorton, & Polajnar, 2003). Knowledge accumulation can, in fact, serve two different objectives: the replication of existing knowledge or its renewal (Lichtenthaler, 2009; Soosay & Hyland, 2008). Balancing these two is a challenge (Shamsie, Martin, & Miller, 2009), and yet a DC prerequisite.

The empirical studies confirm that both internal and external sources of knowledge are vital for DCs: experiential internal learning is identified as an important source, as is inter-organisational cooperation (Gerard, 2005; Kale &

Singh, 2007). In fact, a variety of collaborative arrangements can be adopted, although small firms tend to rely on different sources than larger firms (Bierly & Daly, 2007). One explanation for this could be that the parties involved in knowledge transactions are in different positions with regard to appropriating the returns (Skilton, 2009).

The significance of external knowledge sources has indeed been increasing recently (Ettlie & Pavlou, 2006). Nonetheless, acquiring knowledge is not easy, as there may be hurdles at both ends of the transfer (Griffith et al., 2005). For instance, in smaller firms the identification of opportunities to acquire external knowledge may be hampered by managerial diseconomies that result when managers are involved in running the day-to-day business (Macpherson, Jones, & Zhang, 2004). All in all, the empirical studies show the crucial role of managers in knowledge accumulation (Soosay & Hyland, 2008), market knowledge being one example (Bruni & Verona, 2009). However, DCs are much more than accumulated knowledge, thus the discussion now moves on to integration.

Knowledge integration

Knowledge integration entails combining various resources, typically connecting new knowledge with the existing knowledge base. It rests on systematically pulling together knowledge developed internally and that acquired from external sources, and combining the new with what is known from earlier experience. It is an important element of DC because it facilitates the maintenance of the change that knowledge accumulation initiates (Verona & Ravasi, 2003). Furthermore, knowledge only becomes relevant to the firm through integration (Ayuso, Rodriguez, & Ricart, 2006; cf. Verona & Ravasi, 2003).

Firms use various knowledge-integration strategies, many of which rely on organisational interaction and collaboration routines (Macpherson et al., 2004). It is suggested that the integration of diverse knowledge bases happens primarily through problem-solving activities (Iansiti & Clark, 1994). Problem solving is thus another key aspect of DCs, yet ad hoc problem solving is insufficient (Ambrosini & Bowman, 2009). Although integration is a complex process, there are various information systems with the capacity to enhance knowledge integration, total quality management being one (Benner, 2009; López-Mielgo, Montes-Peón, & Vázquez-Ordás, 2009).

Knowledge that is essential for a firm is not necessarily owned, nor is it useful in isolation (Macpherson et al., 2004). Integration is therefore a key activity in exploiting the knowledge in the organisation and the knowledge it has access to. It is suggested that an organisation's capacity to integrate knowledge comprises its ability to access new forms of external knowledge and its capacity to flexibly coordinate its knowledge base in various disciplinary areas (Petroni, 1998). Consequently, there are also two sides to the integration: internal and external (cf. Iansiti & Clark, 1994). Synchronising internal and external knowledge has been found to contribute to resource uniqueness (Shang, Lin, & Wu, 2009), and therefore possibly to the competitive advantage of the firm.

Knowledge utilisation

A significant although often neglected aspect of knowledge is its utilisation (see e.g., Narasimhan, Rajiv, & Dutta, 2006).

Knowledge does not erode in use, but rather develops (Pandza et al., 2003), and in this it differs from many other resources. Utilisation is, in fact, a key process through which to derive benefits from the accumulated and integrated knowledge, and therefore it is also a key element of DCs. Here again, the role of managers is emphasised in that managerial cognition is argued to be a major factor (Bruni & Verona, 2009). Moreover, political factors such as power play may affect the use of organisational knowledge, and this further highlights the importance of managers (Prieto & Easterby-Smith, 2006).

Knowledge utilisation tends to be tacit and subconscious. In analytical terms it is connected to absorptive capacity in that organisations with such capacity are better able to make use of the knowledge at their disposal (Cohen & Levinthal, 1990). Despite the tacitness however, some explicit means of utilisation have been examined. One of these is knowledge sharing, which entails disseminating individually and organisationally held knowledge. The sharing of tacit knowledge in particular is essential in interaction between individuals (Kale & Singh, 2007). Therefore, overcoming communication barriers is vital for knowledge utilisation (Bergman, Jantunen, & Saksa, 2004).

All in all, it is argued that systematic processes for knowledge sharing are prerequisites of DCs (Bergman et al., 2004). Among such processes, codification has been identified as an important factor (Bruni & Verona, 2009; cf. Swift & Hwang, 2008). It is a deliberate and proactive approach to knowledge utilisation (Kale & Singh, 2007), linking knowledge sharing with proactive knowledge reconfiguration (Bruni & Verona, 2009). This brings us to the final process.

Knowledge reconfiguration

The process of reconfiguration involves generating new combinations of existing knowledge (Grant, 1996), or leveraging existing knowledge for new purposes or in new ways (Jantunen, Puumalainen, Saarenketo, & Kyläheiko, 2005). The ability to reconfigure knowledge resources directly affects the firm's ability to sense opportunities (Macpherson et al., 2004). Reconfiguration is thus a crucial element of DCs. Moreover, given that DCs operate through the repeated recombination of existing practices rather than their disruption (Salvato, 2003), knowledge reconfiguration is naturally a key process. Resource management, in terms of both renewal and preservation, is necessary for this repeated recombination (Fleck, 2007; Moliterno & Wiersema, 2007).

Reconfiguration seems to benefit from organisational proactivity. For example, understanding the needs of potential customers and striving to find unconventional ways of serving them while utilising current resources may be a driver. Furthermore, proactivity depends very much on managers, given that managerial cognition is the key factor in organisational proactivity (Bruni & Verona, 2009). Similarly, strategic foresight, which also stems from managers, may be a powerful factor (Järvenpää & Leidner, 1998).

Research has identified certain tools that managers can utilise in order to enhance knowledge reconfiguration, including scenario analysis and competitive benchmarking (Bergman et al., 2004; cf. Bruni & Verona, 2009). Moreover, reconfiguration of the organisational structure is necessary if changing capabilities make old structures obsolete or inefficient

(Galunic & Eisenhardt, 2001). However, the destabilising of organisational routines that have been valuable but will not be in future operations requires the existence of reasonable alternatives (Macpherson et al., 2004).

In sum, firms are indeed “*conduits for processes of knowledge deployment and acquisition*” (Osegowitsch & Madhok, 2001, p. 238). The need to make the processes firm-specific is also acknowledged, because what works for one firm does not necessarily work for another (Verity, 2005). The knowledge processes discussed above come very close to what Verona and Ravasi (2003) and Prieto, Revilla, and Rodríguez-Prado (2009) propose. It is also clear from other studies that knowledge utilisation is an essential DC process. All of the processes are important, and it is argued that achieving all of them simultaneously constitutes a DC (Prieto et al., 2009). Moreover, both of the two last-mentioned studies are good examples of the operationalization of DC elements. Although, as Verona and Ravasi (2003) note, identifying the processes is very difficult with quantitative measures, Prieto et al. (2009) aptly utilise multiple subjective quantitative measures for each one.

Antecedents of dynamic capabilities

Antecedents refer to the factors that affect the emergence of DCs (cf. Ambrosini & Bowman, 2009; Teece, 2007): they are factors or conditions that enhance or inhibit their development. Of the 67 articles dealing with antecedents, 52% report qualitative studies, 37% quantitative, and 11% mixed-methods studies. The antecedents may be internal or external to the organisation, and are thus divided accordingly in the following discussion.

Internal antecedents

Internal antecedents are many and varied. It appears from the analysis that they may be of a social or more structural nature. To start with the *social* level, various orientations in an organisation are influential antecedents of DCs. They may be organisational, such as a market orientation, or individual, such as an entrepreneurial orientation (Boccardelli & Magnusson, 2006; Gowrishankar, 2008; Jantunen et al., 2005). It is considered important for organisational orientations to be supported by sufficient resources (in terms of structural antecedents) so that they can drive the development of DCs (Andren et al., 2003; Desai, Sahu, & Sinha, 2007; Menguc & Auh, 2006; Morgan, Vorhies, & Mason, 2009).

On the other hand, inherent in organisational capabilities appear to be a couple of key social antecedents of DC. Flexibility, which can also be referred to as a capability for organisational change, determines effectiveness in implementing continuous change, and is suggested to be a prerequisite of all DCs in firms of all sizes (Judge, Naoumova, & Douglas, 2009; McGuinness & Robert, 2005; Oxtoby, McGuinness, & Morgan, 2002). Second, the importance of collaboration capability (Blomqvist, Hara, Koivuniemi, & Åijö, 2004) is being acknowledged more and more as the business world becomes increasingly networked, but also simultaneously increasingly fragmented. These two organisational capabilities – flexibility and collaboration – are the bedrock on which DCs rest. On the analytical level there is an apparent

connection between them and the entrepreneurial and “right brain” components of the antecedents suggested by Teece (2007). Additionally, a project capability (Söderlund & Tell, 2009) may be a crucial factor in the current business climate. Given that organisations commonly rely on projects, the knowledge and experiences accumulated on the project level need to be disseminated more widely because only then will the learning benefit other projects (Newell & Edelman, 2008). Nonetheless, only four of the reviewed articles discuss project-related antecedents. It is necessary to establish a strong connection from the project level to the organisational level in order to facilitate the emergence of DCs.

Finally, organisational practices are connected to the social antecedents in that they enhance employee enthusiasm for work, for instance (Wooten & Crane, 2004). However, there are different views concerning the relationship between organisational routines and DCs. Some authors view DCs as routines (see e.g., Eisenhardt & Martin, 2000; Zollo & Winter, 2002), whereas in the view of others routines may inhibit the emergence of DCs because they may turn into rigidities (see e.g., Benner, 2009; Vassolo & Anand, 2007). On the conceptual level, however, routines should not turn into rigidities in a flexible organisation.

Routines, in fact, are at the interface between social and *structural antecedents*. The most obvious structural antecedent is the organisation. It is noted that flexibility, which is necessary for DCs, is easily lost when the firm grows (Jones & Kraft, 2004). Consequently, the organisational structure exerts a decisive influence on DCs, particularly in larger firms (cf. Karim, 2009). In smaller ones, heterogeneity and the continuous development of human capital are more decisive (Døving & Gooderham, 2008). Therefore, both organisational structure and flexibility appear to be vital (Colarelli O’Connor & DeMartino, 2006).

Another crucial element of DCs is the organisation’s resource mix. First of all, resource endowments influence DC development, and different types of resources carry different implications (McKelvie & Davidsson, 2009; Pan, Pan, & Hsieh, 2006). Second, the dependence of DCs on a coherent resource mix (Verona & Ravasi, 2003) highlights the need to manage and coordinate resource deployments (Kor & Mahoney, 2005; Pan et al., 2006). In fact, resources need to be aligned with the opportunities and threats that emerge, and therefore reconfiguration may be necessary (Ramachandran & Sougata, 2006; Readman & Grantham, 2006). Interestingly, it has also been found that resource scarcity significantly influences DCs in that abundant resources increase the risk of creating business models that do not generate sufficient revenue (Andren et al., 2003; Miyake & Nakano, 2007). Therefore, the impact of internal resources should not be underestimated.

Related to resources are the personnel’s capabilities. Managerial capabilities (e.g., fast response and mental model building (Zhang, 2007)) appear to affect DCs in terms of influencing resource-allocation decisions and organisational path-finding strategies. Managers also have to deal with resistance in the face of change (Narayanan, Colwell, & Douglas, 2009). Moreover, they must be sensitive to the situation, applying different strategies in different capability-development stages and contexts (Branzei & Vertinsky, 2006; Lee & Kelley, 2008), and should be able to build up a stimulating organisational environment that promotes

employee learning (Gjelsvik, 2002). All in all, managers may have a positive or negative impact on DCs. Although the potentially negative influence of managers on change has long been recognised, Penrose (1959) referring to managers as the biggest constraint regarding the growth of the firm, empirical research on such negative forces is next to non-existent.

Individuals other than managers can influence DCs through their capabilities. Product-development personnel, for instance, may contribute through their personal mastery or input into innovation (Colarelli O'Connor & McDermott, 2004; Garcia-Morales, Llorens-Montes, et al., 2007; Rothaermel & Hess, 2007). Salvato (2009) further found that the day-to-day actions of individuals within and around the organisation to improve and streamline processes were capability enhancing. However, the role of other individuals remains under-researched.

As the above discussion shows, the antecedents – both social and structural – exist on different, but intertwined levels: individuals, projects and the organisation. Academic discussion tends to focus on the organisational level, and individual- and project-level factors have attracted less attention in empirical research. Although the role of individuals in DCs is well recognised in conceptual terms, empirical research remains scarce (see Jones & Kraft, 2004; Narayanan et al., 2009; Schlemmer & Webb, 2008 as rare examples). Slightly less than 30 of the articles examine individual-level factors, and the discussion mainly revolves around how managers positively affect the change (Schlemmer & Webb, 2008).

External antecedents

The external antecedents of DCs comprise environmental factors and factors related to inter-organisational relationships. The former are very often part of the context of the study, but not explicitly addressed. If the environmental factors are explicitly addressed they usually refer to turbulence in the institutional environment (Delmas, 2002;

Järvenpää & Leidner, 1998; Yiu & Lau, 2008), the markets (Chung & Beamish, 2005; Koolen, Taminiou, & Faber, 2005) or the technological environment (Benner, 2009; MacCormack & Iansiti, 2009; Song, Droge, Hanvanich, & Calantone, 2005; Tripsas, 1997). Turbulence along any one of these dimensions increases the need for DCs (Harris, Collins, & Hevner, 2009; Macher & Mowery, 2009). An additional potential driver is an uncertain (Yiu & Lau, 2008) or very rigid (Delmas, 2002) institutional environment.

Inter-organisational relationships and networks also feature as antecedents. Although the concept of DC originated on the organisational level, the world has changed and the role of networks has increased. Indeed, networks have proven to be essential for the development of capabilities (Colarelli O'Connor, Paulson, et al., 2008; Macpherson et al., 2004). Nevertheless, the inter-organisational level has not attracted much attention in the research (Smart, Bessant, & Gupta, 2007).

The importance of complementary resources and capabilities that are accessible through networks is emphasised, and access to complementary assets through partnerships has been found to drive DCs (Chang, 2003; Liao, Kickul, & Ma, 2009). This affects smaller firms in particular, because their internal assets are very limited (Døving & Gooderham, 2008). Partners may also play a major role in terms of sensing opportunities because they can help in identifying unmet needs in the market (Ayuso et al., 2006). Large firms, in turn, appear to be able to trigger the development of DCs in their networks and not just internally (Athreye, Kale, & Ramani, 2009). On the other hand, competition between firms also appears to act as a driver (Fujimoto, 2001).

Finally, learning in inter-organisational relationships has assumed increasing significance (Kale & Singh, 2007). Although a relationship might start with a cost focus, it may develop into a learning partnership. Such a development adds value and gives rise to new capabilities and resource configurations (Vivek, Richey, & Vivek, 2009) through the exploration and exploitation of knowledge (Cegarra-Navarro, 2005). Fig. 6 draws together the discussion on antecedents.

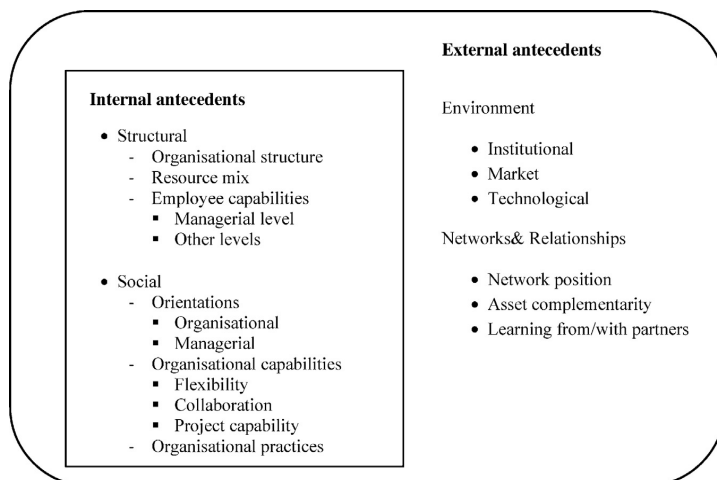


Figure 6 Antecedents of dynamic capabilities.

As the figure shows, numerous factors influence the development of DCs. There is a clear distinction between internal and external factors, and various sub-categories within both. Distinguishing between the different types of antecedents adds rigour to the literature. In the future scholars should examine the external antecedents, but should also take a more comprehensive approach instead of treating internal and external antecedents separately. Finally, the discussion turns to outcomes.

Outcomes of dynamic capabilities

Outcomes have been examined mainly in terms of either the economic performance of the firm or changes in operational capabilities.² DCs are likely to have organisational outcomes (economic and human-related) only when they are part of the top-management agenda, and hence nurtured (Narayanan et al., 2009). However, the mechanisms through which they influence performance remain unclear.

The early conceptual discussion posited a direct relationship between DCs and performance. In accordance with this view, several empirical studies report a direct relationship between what the authors conceptualise as DC and performance (García-Morales, Llorens-Montes, et al., 2007; García-Morales, Ruiz-Moreno, et al., 2007; Kor & Mahoney, 2005; Wu, 2007; Zhang, 2007; Zhu & Kraemer, 2002). Researchers have also identified factors that moderate the relationship, such as technological turbulence (Song et al., 2005) and a strategic orientation (Slater, Olson, & Hult, 2006). On the other hand, DC is also seen as a mediating variable between organisational process alignment and performance (Hung, Chung, & Lien, 2007), knowledge resources and performance (Griffith, Noble, & Chen, 2006) or network resources and performance (Yiu & Lau, 2008), thereby implying a direct link with performance. This variation shows that the measurement of DCs is in serious need of development.

All in all, the number of studies positing a direct relationship is surprisingly high, given the promotion of an indirect relationship for quite some time in the conceptual discussion. However, most of these studies are quantitative, and it may be that the quantitative measures drastically simplify the DC phenomenon, and thus a direct relationship is found.

With regard to the performance implications of DCs, it must also be noted that there is considerable variation in what constitutes performance. Many studies focus on economic performance (see Morgan, Vorhies & Mason 2009; Wang, Klein, & Jian 2007; Zhang, 2007), whereas others consider innovative or technology performance (e.g., Ellonen, Wikström, & Jantunen, 2009; Ettlie & Pavlou, 2006; Wu, 2006), environmental performance (Russo, 2009), or international performance (e.g., Chen & Jaw, 2009; Jantunen et al., 2005). Even within the studies focusing on economic performance there is considerable variation, and very few rely only on objective measures (Wu, 2007; Zhang, 2007; Zhu & Kraemer, 2002). Many of

them utilise either a combination of the objective and the subjective (Hung et al., 2007; Morgan et al., 2009; Slater et al., 2006) or only subjective measures (García-Morales, Llorens-Montes, et al., 2007; García-Morales, Ruiz-Moreno, et al., 2007; Griffith et al., 2006; Newbert, Gopalakrishnan, & Kirchoff, 2008; Song et al., 2005; Wang et al., 2007). It is noteworthy that in most of the studies relying on subjective measures the respondents evaluated their firm's performance in relation to the competitors, which apparently works well in DC research. The time span of the performance measurement in these studies varies from the current situation to the previous three years, which is not very long. Taking a longer period into consideration would be beneficial.

Indeed, the more prominent view currently is that DCs have an indirect impact on performance (e.g., Collis, 1994; Eisenhardt & Martin, 2000). Among the studies that explicitly address organisational performance or competitive advantage the results indicate an indirect connection facilitated by customer value (Readman & Grantham, 2006) or institutionalisation (Fleck, 2007), for example.³ Other studies examine changes in operational capabilities as outcomes of DCs. These studies focus only on the development of operational capability (Chen, Sun, Helms, & Jih, 2008; Espedal, 2005; Miyake & Nakano, 2007), or more broadly on the impacts of such development in terms of either competitive advantage (Athreye et al., 2009; Hagen & Lodha, 2004; Li, Qian, & Ng, 2006; Newey & Zahra, 2009; Pavlou & El Sawy, 2006) or organisational performance (Lee & Slater, 2007; Ma & Dissel, 2008). Finally, Macpherson et al. (2004) introduce a novel approach linking the outcomes of DCs to firm growth through the mediating factors of opportunity recognition and opportunity exploitation, and thus connecting DC indirectly to performance. The indirect approach appears to dominate slightly in the empirical studies.

The time frame of the studies defending an indirect relationship varies. Although some focus only on the current situation, most of them examine the phenomenon over a longer period. The time span may extend to decades through the use of secondary data (e.g., Lee & Slater, 2007; Newey & Zahra, 2009), or cover nearly ten years of real-time data collection (Chen et al., 2008). Most of the studies extending the analysis over notable time periods are qualitative, suggesting that qualitative methods are more suitable for obtaining longitudinal data that can capture DCs. The need to clearly report the time span of the study and to be explicit as to whether the data was collected in real time or retrospectively is highlighted in this review study. Time is a very important consideration in DC research, given that change is the essence of the phenomenon.

On the whole, the studies positing an indirect relationship between DCs and competitive advantage or performance appear to portray the DC phenomenon in a more fine-grained manner. Fig. 7 illustrates the various perspectives on these relationships. The first three examples depict a direct relationship, and the fourth one an indirect relationship, as discussed above.

² Although there are studies making somewhat vague connections between DCs and various outcomes such as sustained competitive advantage (Bhutto, 2005; Harreld et al., 2007), success (Koolen et al., 2005; Verity, 2005) and firm survival (Chung & Beamish, 2005), the majority of them clearly focus on the development of capabilities or of organisational performance.

³ The Fleck (2007) study is an interesting one in that it retrospectively traces the history of two companies over more than 100 years.

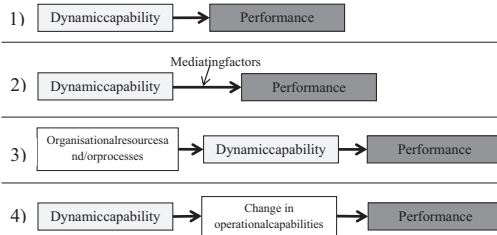


Figure 7 Conceptualisations of the relationship between dynamic capabilities and performance.

The direct relationship is discussed either in isolation (example 1) or as influenced by mediating factors (example 2). A direct relationship is also implied when DC is examined as a mediating variable between resources and performance, for instance (example 3). Finally, an indirect relationship suggests an influence on operational capabilities, which in turn yields performance implications (example 4).

As implied in the conceptual discussion, DCs are also connected to the firm’s ability to induce change in its environment (Järvenpää & Leidner, 1998; Lamar, 2009; Lee & Slater, 2007). New organisational forms that result from adaptation shape the market, and hence demonstrate the ability of dynamically capable firms to induce change (Lampel & Shamsie, 2003). Although it is also recognised that DCs do not always result in positive outcomes, empirical studies appear to neglect this aspect, possibly because most studies identify DCs based on the firm’s past success. There is thus a clear need to develop DC theory in the direction of ex ante identification. All in all, almost two thirds of the studies addressing outcomes are quantitative, and only slightly more than one third are qualitative. This implies that outcomes are easier to quantify than processes or antecedents, in addition to which there are more established measures of performance, for instance.

Conclusions and future research

This review of evidence-informed knowledge about DCs synthesises insights from a significant proportion of the

relevant empirical studies. It covers a broader range of issues than earlier reviews because it is not limited to the most prominent journals, and thus better reflects the versatility of the DC discussion. Through its synthesising analysis and distinctions between processes, antecedents and outcomes it brings coherence and structure to the scattered literature. Despite the increasing volumes of research, DC continues to be an emerging theoretical approach (cf. Edmondson & McManus, 2007). The focus on empirical articles facilitated the contrasting of the accumulated empirical research with the most prominent conceptual views. Furthermore, it is possible to make some conclusions with regard to the operationalisation of the DC concept, and thus contribute to improving the rigour of future empirical studies.

The division of the concept into three domains – DC itself, its antecedents and its outcomes – served this review well, and brought rigour into the analysis. The key findings are synthesised in Fig. 8.

It is evident from the initial conceptual framework that DCs are thought to consist of processes. Rather than making a stark division, the empirical studies appear to employ a continuum of conceptualisations ranging from the very specific and identifiable to a generic set of knowledge-related processes. In terms of operationalization, identifying a particular process within a firm as a DC is simpler than going through various (often vague) knowledge processes. However, both approaches clearly have their merits.

Operationalization through a specific organisational process enhances knowledge with regard to one type of DC. It would be useful in future research to examine these specific processes in more detail so as to produce a more holistic understanding. Comparing and contrasting the different processes could yield valuable knowledge on how DCs operate, for instance. However, it is vital that researchers link their findings to previous research, either on that specific DC or on DCs in general, so that knowledge can truly accumulate. The selection of the process to be studied is also critical because it has to qualify as a DC, the definition of which thus needs to be considered carefully. On the other end of the continuum, operationalization through generic knowledge processes can enhance understanding of the mechanisms through which DCs operate, although it is very challenging and necessitates a

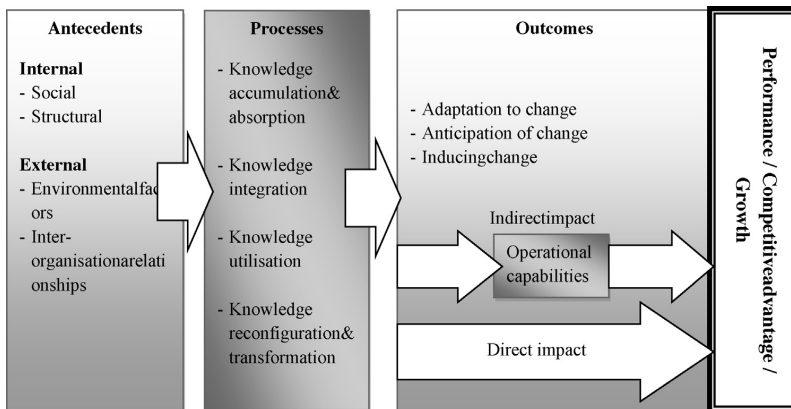


Figure 8 A synthesis of dynamic capabilities research.

deep understanding of such processes. Thus far the methods used have been mainly qualitative, and this is likely to continue until quantitative measurement develops considerably. DCs were found to comprise four knowledge processes: accumulation/acquisition, integration, utilisation and reconfiguration/transformation. In operationalising these processes, and in addition to utilising the literature on organisational learning and knowledge management, DC researchers could benefit from insights gained from the writing on entrepreneurship, for instance.

Nonetheless, the most fruitful approaches fall between these two extremes. Such studies make DCs concrete through identifiable organisational processes, and simultaneously link the discussion to knowledge processes. They therefore reduce the ambiguity and generate knowledge that is likely to be useful with regard to other DCs as well. To mention a couple of good examples, *Kale and Singh (2007)* examine alliance capability and end up discussing learning processes that constitute the specific DC, whereas *Bruni and Verona (2009)* focus on dynamic marketing capability and identify knowledge creation and release as key factors. This kind of approach to operationalization also has the benefit of offering both academic and managerial contributions, and it is highly recommended for future studies.

Various factors influence the development of DCs. *The antecedents* are basically either internal or external to the firm. The initial conceptual framework, which draws on *Teece's (2007)* ideas on their micro-foundations, focuses on *internal antecedents*, and especially on managerial actions. According to the empirical studies, such antecedents may be social or structural in nature. They also reside on different levels – of the individual, the project or the organisation. Although the individual level is well acknowledged in the conceptual discussion, empirical research remains thin. Most of the studies focus on organisational-level issues and neglect the role of managers and other individuals. There is certainly a need for more research on how managers explicitly and implicitly influence the development of DCs. In particular, the negative influences need to be examined, because understanding them would enhance the identification of firms that are likely to develop DCs. Other employees and their role constitutes another potentially important topic for future research. Furthermore, project-level factors remain underexplored, given that a significant number of organisations rely on projects nowadays (cf. *Söderlund & Tell, 2009*). A better understanding of how projects could contribute to DC development would also be very valuable from the managerial perspective. In terms of the internal antecedents, the role of routines, which remains the subject of on-going debate, deserves to be examined empirically. It would be useful to know whether the role is enabling or inhibiting, and under what conditions.

With regard to the *external antecedents*, environmental factors and inter-organisational relationships are significant. Environmental conditions are widely recognised in the conceptual discussion, whereas knowledge related to inter-organisational factors has mainly emerged from empirical research. In the latter domain, the role of complementary resources and capabilities dominates the scene here, whereas other issues lack attention. Hence, it is an area for further research. For instance, there are very few studies on the significance of the network position in the development of

DCs. The environmental conditions are often implicit in the empirical research, being built into the context but not explicitly addressed. There is also some, although very little discussion on the inhibiting external factors. Rigidities are identified as significant, but there is little further empirical evidence on other potential inhibitors. Thus, inhibiting factors are also worthy of future research in the domain of external antecedents. Moreover, the interaction between internal and external antecedents has been given insufficient empirical attention. Both types of factors are clearly very influential, but have been treated mainly in isolation. Given that firms operate in a complex reality in which internal and external factors are bound to interact and possibly have synergistic enabling or inhibiting effects, the need for further research is obvious. In other words, there is a need to examine the antecedents more holistically. All in all, antecedents are a focal area for future research. If the DC approach is to progress and become a robust theory there should be a deeper understanding of why some organisations develop DCs whereas others do not.

Finally, *the outcomes* of DCs are approached from two different, yet possibly complementary perspectives: performance indicators and changes in operational capabilities. The performance indicators utilised in empirical research are many and varied. Researchers using subjective measures tend to ask for an evaluation of the firm's performance in relation to its competitors, and this has proven suitable for DC research. The most elaborate studies employ a combination of subjective and objective measures (see *Hung et al., 2007; Morgan et al., 2009; Slater et al., 2006*). However, the mechanisms through which DCs produce performance outcomes remain somewhat unclear, and both direct and indirect relationships are strongly represented in empirical research. The large volume of studies assuming a direct relationship is surprising. Although this is supported in early conceptual contributions, prominent names have promoted an indirect relationship in the more recent discussion (*Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003*). It is, therefore, necessary for future research to examine whether a direct relationship is possible, or if the findings result from oversimplification in the research design.

It is also noteworthy that the empirical studies connect DCs only to positive organisational outcomes. However, as mentioned above, the outcomes are not automatically positive. This is a major gap in the empirical research that needs to be addressed in the future. It is actually linked to the focal issue of DC identification. Empirical studies identify DCs ex post, mainly through the firm's success, which predisposes the approach to problems of tautology. There is a serious need to find ways of identifying DCs that are developing and operating. Research on the antecedents and the elements is a key factor in this. Given a solid understanding of the factors that contribute to the emergence of DCs – in general and more specifically – it may be possible to identify organisations that are likely to develop them. Similarly, a common framework setting out the generic elements would help researchers in their efforts to collect real-time data. *Ambrosini and Bowman (2009)* argue further that there is very little empirical evidence on which to base any suggestions for deliberately developing DCs. Hence, investigation into the antecedents and the development process would also be highly beneficial from a managerial perspective.

Even though the numerous contributions are rather scattered, a systematic analysis makes it possible to identify trends and some commonalities. These very connections open new avenues for research, as noted in the above discussion. Producing a synthesising review is not a straightforward task in the DC domain. Studies are based on somewhat differing assumptions, and thus not all the findings and arguments are comparable (Leiblein, 2011). This review takes into account the existence of different schools of thought and identifies various approaches that may or may not be complementary. Although some of the differences are fundamental and cannot be reconciled, it would be useful in future DC research to build on previous findings and shared assumptions so that knowledge can accumulate, instead of merely scattering.

It is often claimed that the research on DCs is predominantly qualitative in nature. According to the results of this review, however, quantitative methods are almost as common. There is a need for both types of study in the future. Qualitative methods serve well in longitudinal studies that are critical for the development of the DC approach. Scholars should consider more carefully how to identify DCs, and thus find out how we can know in advance that an organisation is likely to develop them. Moreover, in-depth examination of the mechanisms through which DCs influence performance may resolve the direct–indirect link debate. On the other hand, given that there are fewer quantitative studies on the antecedents and especially the elements of DCs, it would be worth developing measures that could be used in quantifying the phenomenon.

The use of systematic reviews is not yet well established in the field of management, thus a major contribution of this study is to promote a more systematic approach to reviewing literature. Despite the challenges in synthesising findings from very diverse empirical articles, this study shows where the results are consistent, where there are ambiguous findings and where research is lacking.

One must be careful in drawing conclusions based on the findings of this kind of review, however. Evaluating the respective weight of the results of different studies is next to impossible, and hence some issues may be overemphasised and others underemphasised. Moreover, given that the “*absence of evidence (non-reporting) could be treated as evidence of absence (not important)*” (Tranfield et al., 2003, p. 50) in content analyses, it was necessary to combine both content and thematic analysis. This combination of methods was also helpful in addressing the challenges posed by the diversity of research approaches (Dixon-Woods et al., 2005). The analytical approach in this review was somewhat theory-driven, as the protocol as well as the initial conceptual framework guided the content analysis. The more detailed thematic analysis conducted within each of the three areas was more data-driven. This gave both structure and flexibility

to the analysis process. Regular consultation with experienced scholars who commented on both the review protocol and the findings helped in avoiding potential single-researcher bias (cf. Petticrew, 2001).

Given that the review covers a wide variety of studies, and thus also a variety of ways of conceptualising and measuring DCs, incommensurability (see e.g., Jackson & Carter, 1991) poses a potential threat in terms of its quality. Careful consideration is therefore given to the ways in which the DC concept is operationalised: only the studies that operationalise it in a way that meets the definition on which this review relies are included. Thus, the studies that are included agree on the most crucial aspects. Additionally, the quantitative evidence was converted into a qualitative form in the analysis, rather than quantifying qualitative evidence. Thus, the measurement of DCs was not the main point in the synthesising analysis. It is also noted that thematic analysis allows for the integration of quantitative and qualitative data (Dixon-Woods et al., 2005).

Although the differences between quantitative and qualitative research have fuelled criticism of attempts to synthesise findings from both streams, the author of this study considered it important to include both. Particularly in the field of management studies, the integration of qualitative and quantitative data is argued to result in a more comprehensive picture (Rousseau & Denyer, 2008). Moreover, there are proven techniques for synthesising findings from diverse groups of studies (Dixon-Woods et al., 2005; Tranfield et al., 2003), and the existence of numerous published mixed-methods studies attests that there are fruitful ways of combining quantitative and qualitative approaches (Mays, Pope, & Popay, 2005). It is also argued that a critical realist perspective promotes balance in management studies (Rousseau & Denyer, 2008). The inclusion of qualitative case studies in the analysis brings depth to the synthesis. Without them it would not have been possible to connect the findings on elements of DCs in the way it was done in the above discussion, for example. On the other hand, the good number of quantitative studies based on larger samples brings robustness to the findings.

Notwithstanding its limitations, this study is one of the first attempts to systematically map DC research. The analysis of 142 empirical articles contributes to the literature, and the structured way of analysing evidence-informed knowledge offers a solid basis on which to conceptualise DCs in future empirical studies.

Appendix A

See Table A.1.

Table A.1 The articles included in the analysis.

Abrahamsson and Brege (2004)	Griffith et al. (2005)	Newey and Zahra (2009)
Andren et al. (2003)	Griffith et al. (2006)	O'Reilly et al. (2009)
Athreye et al. (2009)	Griffy-Brown and Chun (2007)	Osegowitsch and Madhok (2001)
Ayuso et al. (2006)	Hacklin et al. (2009)	Oxtoby et al. (2002)
Azadegan et al. (2008)	Hagen and Lodha (2004)	Pan et al. (2006)
Benner (2009)	Harreld, O'Reilly, and Tushman (2007)	Pandza et al. (2003)
Bergman et al. (2004)	Harris et al. (2009)	Pandza et al. (2003)
Bessant et al. (2002)	Helfat (1997)	Pavlou and El Sawy (2006)
Bhutto (2005)	Hung et al. (2007)	Petroni (1998)
Bianchi et al. (2009)	Iansiti and Clark (1994)	Pierce (2009)
Bierly and Chakrabarti (1996)	Jantunen (2005)	Prieto and Easterby-Smith (2006)
Bierly and Daly (2007)	Jarratt (2008)	Prieto et al. (2009)
Blomqvist et al. (2004)	Jones and Kraft (2004)	Ramachandran and Sougata (2006)
Boccardelli and Magnusson (2006)	Judge et al. (2009)	Readman and Grantham (2006)
Branzei and Vertinsky (2006)	Järvenpää and Leidner (1998)	Rindova and Kotha (2001)
Bruni and Verona (2009)	Kale and Singh (2007)	Rosenbloom (2000)
Camuffo and Volpato (1996)	Karim (2006)	Russo (2009)
Camuffo (1995)	Karim (2009)	Salvato (2003)
Capron and Mitchell (2009)	Killen et al. (2008)	Salvato (2009)
Carpenter et al. (2001)	King and Tucci (2002)	Schlemmer and Webb (2008)
Cegarra-Navarro (2005)	Koolen et al. (2005)	Schlosser and Mcnaughton (2007)
Cetindamar et al. (2009)	Kor and Mahoney (2005)	Shamsie et al. (2009)
Chang (2003)	Lampel and Shamsie (2003)	Shang et al. (2009)
Chau and Witcher (2008)	Lawson and Samson (2001)	Shiri et al. (2009)
Chen and Jaw (2009)	Lee and Anderson (2006)	Skilton (2009)
Chen et al. (2008)	Lee and Kelley (2008)	Slater et al. (2006)
Chung and Beamish (2005)	Lee and Slater (2007)	Smart et al. (2007)
Colarelli O'Connor and DeMartino (2006)	Li et al. (2006)	Song et al. (2005)
Colarelli O'Connor and McDermott (2004)	Lichtenthaler (2009)	Soosay and Hyland (2008)
Colarelli O'Connor et al. (2008)	Luo (2003)	Swift and Hwang (2008)
Daniel and Wilson (2003)	Ma and Dissel (2008)	Söderlund and Tell (2009)
Danneels (2008)	MacCormack and Iansiti (2009)	Tan and Mahoney (2005)
Delmas (2002)	Macher and Mowery (2009)	Taylor and Helfat (2009)
Ellonen et al. (2009)	Macpherson et al. (2004)	Thompson (2007)
Espedal (2005)	Madhok and Osegowitsch (2000)	Tripsas (1997)
Ettlie and Pavlou (2006)	Majumdar (2000)	Vassolo and Anand (2007)
Fang and Zou (2009)	Mathiassen and Vainio (2007)	Verity (2005)
Fleck (2007)	McKelvie and Davidsson (2009)	Verona and Ravasi (2003)
Farrant and Flynn (1999)	Menguc and Barker (2005)	Wang et al. (2007)
Fujimoto (2001)	Miyake and Nakano (2007)	Wilkens et al. (2004)
Galunic and Eisenhardt (2001)	Morgan et al. (2009)	Wilson and Daniel (2007)
García-Morales et al. (2007)	Mosey (2005)	Witcher et al. (2008)
George (2005)	Narasimhan et al. (2006)	Wu (2006)
Gilbert (2006)	Narayanan et al. (2009)	Wu (2007)
Gjelsvik (2002)	Newbert (2005)	Yiu and Lau (2008)
Gopesh et al. (2009)	Newbert et al. (2008)	Zhang (2007)
Green et al. (2008)	Newell and Edelman (2008)	Zhu and Kraemer (2002)

Appendix B

See Table B.1.

Table B.1 Journals in which three or more of the identified studies are published.

Strategic Management Journal	11
Industrial and Corporate Change	7
International Journal of Operations & Production Management	6
British Journal of Management	5
International Journal of Technology Management	5
Technovation	5
Academy of Management Journal	4
Information Systems Research	4
Organisation Science	4
R & D Management	4
Journal of International Business Studies	3
European Management Journal	3
The Journal of Product Innovation Management.	3
Additionally:	
13 journals in which 2 articles	
52 journals in which 1 article	

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Dynamic capability in a small global factory

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ABSTRACT

In order to balance their local and global operations optimally, SMEs are moving toward a 'global factory' type of organizational form, meaning a differentiated network of activities held together through the control of key assets and flows of knowledge, and coordinated by a focal firm. Managing such a network requires a specific dynamic capability comprising, according to our study, cognitive, managerial, and organizational capabilities. Cognitive capabilities – cultural awareness, entrepreneurial orientation, and a global mindset – are the basis for a global factory because they are the source for opportunity recognition and exploitation, and are therefore crucial. The focal firm's organizational flexibility and absorptive capacity, as well as managerial capabilities in the areas of interface competence and analytical capability, are needed in the steering of a small global factory, the success of which depends on the nurturing of these assets.

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1. Introduction

Following developments in technologies and markets, for instance, companies have begun building new kinds of organizational structures. An intriguing trend is the emergence of 'the global factory', defined here as a globally dispersed value network of goal-disparate organizations, which jointly generate the activities traditionally governed within a single company (Buckley, 2009a; Buckley & Ghauri, 2004; cf. Mudambi, 2008). Although the global factory has thus far been discussed only in the context of large corporations (Buckley, 2011), there are also a growing number of small and medium-sized enterprises (SMEs) that have built a similar governance structure as global presence has become a necessity for them (Gupta & Westney, 2003). This study is the first attempt to explore SMEs in this context. A small global factory is not a legal entity, rather a differentiated network coordinated by an SME (cf. Buckley, 2009a, 2011) held together through the control of key assets, and flows of knowledge and intermediate products (cf. Buckley, 2007, 2009b). The global-factory structure results from the search for an optimal ownership and location solution for maximizing value-adding activities (Buckley, 2009b).

Previous research recognizes that ownership advantages have been leveraged against geographically spread structures (Dunning, 1988; Kogut & Zander, 1993), and that location-specific advantages are focal in foreign expansion, particularly when combined with firm-specific advantages (Dunning, 1988; Erramilli, Agarwal, & Kim, 1997). Nonetheless, recent studies have focused on location dynamics¹ as companies increasingly shift between locations in the search for efficiency (Mudambi & Venzin, 2010). Researchers have explained this with reference to several theories, including the eclectic paradigm

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¹ One area in particular has dominated the discussion on the location of value-adding activities in recent decades: China has transformed from one of the world's most isolated and backward economies into its fastest growing and most forceful (Fang, Zhao, & Worm, 2008). Combined with the increasing tendency for firms to separate and relocate various stages of production, this has led to a boom in locating manufacturing and service activities in China and India (Buckley, 2007).

(Dunning, 2001), linkage economies (Mudambi, 2008), and the flying-geese paradigm (Kálmán, 2004). Finding an appropriate governance structure and managing it effectively is 'a must' in today's global business environment, and thus lies at the heart of international business theory.

The emergence of global factories challenges existing theories in many respects. It requires a shift of focus from a single company toward inter-organizational, global value networks. Although the literature on multinational enterprises (MNEs) addresses geographical dispersion and conflicting goals in networked organizations (Ghoshal & Bartlett, 1990), and acknowledges the existence of 'the embedded multinational' (Forsgren, Holm, & Johanson, 2005), the governance mechanisms in the organizations concerned are largely based on ownership. This is quite surprising given Hymer's claim in his seminal works on foreign direct investment that ownership is not necessary for effective asset control (Strange & Newton, 2006).

Therefore, existing international business theories only partially explain the novel phenomenon. Business models of the global factory are based on a very different logic: partnership instead of ownership. Thus, controlling and integrating critical resources is decisive (Buckley, 2011; Mudambi & Venzin, 2010). In order to enjoy the benefits of outsourcing the firm's activities to independent partner firms, the consequential virtual organization needs to be motivated, monitored, and properly managed. Although something is known about how MNEs manage their alliances and partnerships, understanding the phenomenon from the SME perspective is in a nascent state. We believe it is of importance to make a distinction between small and larger established global factories. Most notably SMEs are different as they lack necessary resources (e.g., Buckley, 1989) and therefore, risking specific and non-redeployable investments might endanger future growth and even the survival of these firms (Sapienza, Autio, George, & Zahra, 2006). Thus, even if it might be rational to internalize activities (Erramilli & Rao, 1993) the constraints in the resource-base make it necessary for the smaller firms to look for alternative and non-ownership based governance structures. Based on the current knowledge on global factories, this kind of structure may suit the SME, which is also under pressure to be simultaneously globally efficient and locally responsive. Yet, given the limited empirical evidence, no definite conclusions can be drawn.

It is obvious that a globally dispersed value network creates considerable managerial challenges for SMEs (cf. Mudambi & Venzin, 2010). SMEs with inexperienced managers inevitably lack the legal, social, and political discernment to operate abroad (Buckley, 1989). Consequently, many SME managers find it difficult to manage and expand the firms they have created, and only few of them wish to do so (Nummela, Puumalainen, & Saarenketo, 2005). In many cases this would require the development of a new *dynamic capability* (e.g., Teece, 2007; cf. Mudambi & Venzin, 2010). However, little is known about the kind of capability required for the successful management of a small global factory, for two main reasons. First, previous research on global factories has concentrated on the location and ownership strategies of MNEs, and second, thus far researchers have shown little interest in the obligations that the changed governance structure imposes on management. Therefore, this study addresses the following question: Which factors constitute the dynamic capability needed for managing a small global factory?

The main contribution of the study is to the emerging research on the global factory. Most importantly, we propose that the novel governance structure is relevant and applicable to SMEs. Due to the differences between SMEs and MNEs, it is important to explore also the SME context to gain better understanding of the phenomenon. We also extend the use of the concept by applying an inside-out as opposed to the prevailing outside-in approach. This means that we examine the global factory from perspective internal to the firm. We collect primary empirical data within the small global factory and analyze it from the perspective of the focal SME. This is a significant deviation from earlier research, much of which is based on conceptual discussion or secondary data, and it enables the examination of the management factors that are important in the SME context, whereas previous research has maintained a distance and has not gone into the organization. The value of our approach is in gaining more holistic understanding of the global factory governance structure.

Secondly, given that the creation of a global factory governance structure can be considered an entrepreneurial discovery (cf. Shane & Venkataraman, 2000), the study advances the theory of international entrepreneurship (IE). This is still a young research field (Jones, Coviello, & Tang, 2011), and studies examining internationally entrepreneurial firms with highly networked and globally dispersed organizations are rare. The few exceptions focus on micromultinationals,² which are clearly not global factories as defined in this study. On the other hand, the period of post-entry internationalization has aroused little interest in IE research (Morgan-Thomas & Jones, 2009; Prashantham & Young, 2011), and we believe our study brings out issues of relevance for the growth of international entrepreneurial companies.

2. The small global factory and dynamic capabilities

2.1. The role of dynamic capabilities in a small global factory

Grunwald and Flamm (1985) introduced the concept of the 'global factory', and more recently Buckley and Ghauri (2004) applied it to the context of international business, where it refers to the governance structure of MNEs that have developed from single conglomerates to globally dispersed networks of goal-disparate organizations (Buckley, 2009a, 2009b, 2010;

² Micromultinationals are defined as vertically integrated small firms that share the traditional governance structure of large, multinational enterprises (Dimitratos, Johnson, Slow, & Young, 2003).

Buckley & Ghauri, 2004). In the context of international entrepreneurship, this kind of hybrid organizational structure has been connected with international new ventures (Oviatt & McDougall, 1994) and born global firms (Madsen & Servais, 1997). Nonetheless, not all these firms operate as global factories: rather than splitting their activities and operating in a virtual network, some of them have chosen a more traditional governance structure involving keeping and controlling most activities within the firm.

The research thus far provides very limited knowledge on how SMEs that adopt new kinds of organizational forms create their competitive advantage (cf. Mathews & Zander, 2007). We therefore have to rely on the literature on SME internationalization, and assume that small global factories largely face the same liabilities as internationalizing SMEs in general: newness (Stinchcombe, 1965), smallness (Buckley, 1989), foreignness (Hymer, 1976), and outsidership (Johanson & Vahlne, 2009).

The liability of newness refers to the operational challenges involved in financing, staffing, and managing relationships with customers and suppliers, and establishing the legitimacy of the young company in general (Stinchcombe, 1965), all of which are relevant to small global factories. On the other hand, the liability of smallness refers to limitedness in terms of resources and capabilities, and thus vulnerability to environmental changes (Buckley, 1989). Small global factories also face high levels of uncertainty regarding potential clients and their needs, for example (cf. Sharma & Blomstermo, 2003). Moreover, in the early phases they do not have the resources to tolerate any severe business mistakes (cf. Gabrielsson & Kirpalani, 2004). The liability of foreignness stems from a lack of local knowledge, which can lead to difficulties in competing with local firms that are more familiar with the environment (Hymer, 1976). This is a highly relevant challenge for small global factories that operate in multiple countries. Furthermore, firms may have to deal with the liability of outsidership, meaning the lack of an established position in a network. Foreignness may actually complicate becoming an insider (Johanson & Vahlne, 2009). Given that the governance structure of a small global factory is based on a well-functioning network of relationships, the liability of outsidership is a notable hurdle, and because the network needs constant re-evaluation and revision of relationships, remains decisive in later stages, too.

We argue that a dynamic capability may, in fact, have an important role in overcoming these liabilities, helping management not only to recognize them, but also to adapt to the environment in such a way that minimizes their effects (Helfat et al., 2007; Kogut & Zander, 1992). However, so far there is a lack of clarity concerning the factors that constitute the dynamic capability needed for the successful management of a small global factory.

The concept of dynamic capability has aroused lively discussion since the seminal works of Teece and Pisano (1994) and Teece, Pisano, and Shuen (1997). It is often referred to as the ability to identify the need or opportunity for change, to formulate the response and to implement it (Helfat et al., 2007). It could also be conceptualized as a combinative capability that generates new capabilities through combining and integrating various strands of knowledge (Kogut & Zander, 1992). We see it as a combinative capability, and define it as the ability to combine diverse organizational capabilities into higher-level capabilities that enable the sensing and seizing of opportunities for changing and reconfiguring the organization (Helfat et al., 2007; Kogut & Zander, 1992; Teece et al., 1997).

2.2. The building blocks of dynamic capability in a small global factory

While reviewing the literature on dynamic capabilities we identified three different levels of essential factors: cognitive, managerial, and organizational capabilities (see for example Teece, 2007, 2009, p. 66). Moreover, from the literature on international SMEs, international entrepreneurship and global factories we pinpoint key factors on each of the three levels that we consider potential focal building blocks of the dynamic capability.

2.2.1. Cognitive capabilities

The literature on international entrepreneurship often refers to a global mindset, meaning the cognitive capabilities of managers operating in a global business environment, as a prerequisite for successful international operations (see, for example, Nummela, Saarenketo, & Puumalainen, 2004). In line with earlier research (Levy, Beechler, Taylor, & Boyacigiller, 2007) we separate the cultural and strategic dimensions of the concept: cultural self-awareness is openness to and an understanding of other cultures, whereas global mindset refers to the managers' strategic ability to manage complex, geographically spread operations.

Managers of global factories need to be culturally sensitive in order to be able to identify and overcome the liability of foreignness. *Cultural awareness* refers to the ability to highlight aspects of cultures and to perceive differences. Culturally aware individuals thus understand that their culture is different, and know what to expect from other cultures. Therefore, managers with high cultural awareness are more skilled than others in exploiting 'culture-general' and 'culture-specific knowledge' (Hofstede, 1980), and possibly also in recognizing the dynamics of different cultures (Fang, 2010). Being able to identify the differences helps in selecting the appropriate tools for dealing with them (Fraser & Zarkada-Fraser, 2002).

Nonetheless, cultural awareness is no guarantee of a *global mindset*. It is also necessary to be able to see the commonalities rather than focusing on the differences between individual markets (Jeannot, 2000), and to consider the world as one marketplace that is the source of future growth (Nummela et al., 2004). A manager with a global mindset actively scans the global business environment for changes (Bouquet, 2005; Levy, 2005).

Given our focus on small global factories, an *entrepreneurial orientation* is one of the relevant cognitive capabilities. It has been identified as an important antecedent of dynamic capabilities (Jantunen, Puumalainen, Saarenketo, & Kyläheiko, 2005),

and involves the overall orchestration of the assets controlled by the firm. Here it refers to the managers' innovativeness, ability to take risks, and proactiveness (cf. Lumpkin & Dess, 1996), all of which are essential characteristics for international entrepreneurs in a small global factory (Buckley, 2010). In addition to contributing to sensing and seizing opportunities, an entrepreneurial orientation may facilitate the reconfiguring of knowledge and other resources over time (Jantunen et al., 2005; Teece, 2009). In a global business environment it should be combined with a global mindset and cultural awareness (Boccardelli & Magnusson, 2006; cf. Gowrishankar, 2008).

2.2.2. Managerial capabilities

The rise of the global factory arguably highlights the need for new management skills (Buckley, 2009b). Many of the key managerial functions, such as control, remain the same (Buckley, 2010), but the question of how to go about it needs to be revisited. Buckley (2009b) uses the term 'fine-slicing', referring to the need to break down management activities and processes into finer slivers that are more easily controlled and monitored (see also Mudambi, 2008). This is a necessity in a global factory in order to make the location- and ownership-related decisions required to construct the new governance structure and develop it further (cf. Mudambi & Venzin, 2010). It is even more important in a small global factory comprising globally spread, goal-disparate organizations with no systematic business intelligence on which to build. Furthermore, global factories are unstable by nature (Buckley, 2011), meaning that their management resembles the work of a puppeteer – keeping all the parts of the organization moving and simultaneously creating sensible output.

All of the above requires *analytical capability*. Management needs to be able to read weak signals in the business environment, control and process the collected information, and exploit it effectively for the benefit of the global factory. Analytical capability includes aspects such as integration and coordination, which have been highlighted earlier (Buckley, 2011), and comes close to the planning capability identified in multinational enterprises (cf. Yamin, 2011). It therefore covers all the dimensions of dynamic capabilities: sensing and seizing opportunities, as well as reconfiguring the organization over time.

Inter-organizational collaboration is also essential in a small global factory given that exploration, identification, and the exploitation of external resources are embedded in the concept. Therefore, the ability to utilize this social capital³ is a significant management requirement. Scholars in the field of strategic management have introduced the concept of collaboration capability, which focuses on the dyadic relationships between the SME and its partners and is suggested to be a prerequisite for leveraging partners' knowledge (Blomqvist & Levy, 2006). On the other hand, the term network capability is often used in the marketing literature, representing a more holistic approach in considering both individual relationships and the coordination and maintenance of the network as a whole (Ritter, Wilkinson, & Johnston, 2002). It covers multiple capabilities, such as network visioning and the management of nets, portfolios and relationships (Möller & Halinen, 1999), many of which are personalized in the top management of the SME (Loane, McNaughton, & Bell, 2004; Manolova, Brush, Edelman, & Greene, 2002).

In the context of the global factory, the concept best capturing the required capability is *interface competence*, meaning managers' "ability to coordinate external organizations into the strategy of the focal firm, to liaise with external bodies and governments and to cohere these activities into one strategy" (Buckley, 2009b, p. 233). The perspective is broader and more process-focused than in the case of networking and collaboration capabilities, and takes into account managers' skills in identifying appropriate external partners, screening their applicability and negotiating contracts (Bartels, Buckley, & Mariano, 2009; Buckley, 2010). Therefore, it is a question not only of forming connections, but also of keeping partners satisfied and committed over time.

Overall, managerial capabilities are foundational to organizational capabilities, given that organizations consist of individuals (Boccardelli & Magnusson, 2006; Schlemmer & Webb, 2008). The focus in the next section is on organizational capabilities in a small global factory.

2.2.3. Organizational capabilities

Dynamic capabilities are complex and build on various antecedents (Teece, 2007). It is suggested that meta-capabilities constitute the basis on which all other organizational capabilities are built, and that the ability to manage organizational change is the meta-capability behind all dynamic capabilities (Oxtoby, McGuinness, & Morgan, 2002). On the conceptual level this resembles *flexibility*, which has been defined as "the ability to reallocate resources quickly and smoothly in response to change" (Buckley & Casson, 1998, p. 23), and also described as a key attribute for a successful global factory (Buckley, 2009b). Through the continuous monitoring of their business environment these companies recognize changes earlier than their competitors and also respond to them, and thus survive crises and downturns better (Buckley, 2010). Thus, organizational-change capability comes close to strategic agility, a characteristic that is considered a necessity for companies that need to be open to new evidence, reassess their past choices, and constantly adjust their course of action (Doz & Kosonen, 2008, 2010). In sum, flexibility is essential in organizational reconfiguration. Faced with the crucial question of where to site their activities, global factories also need to show flexibility in terms of location (Buckley, 2011). It is essential for them to build up the best possible combination of location-bound resources. If the current resource bundle becomes obsolete or loses its

³ Social capital is commonly defined as "the sum of actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or a social unit" (Nahapiet & Ghoshal, 1998, p. 243).

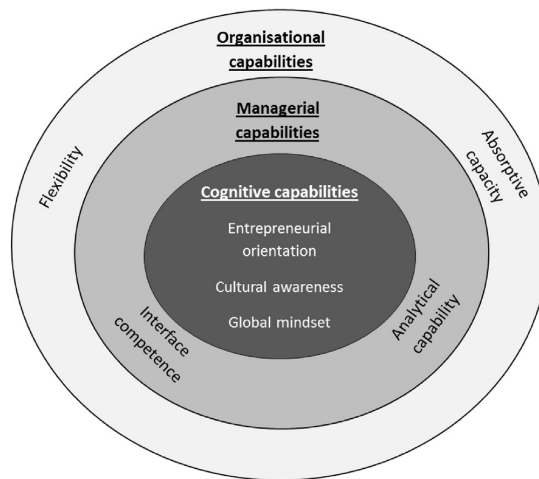


Fig. 1. Dynamic capability in a small global factory.

favorable market position, immediate or even drastic actions are needed in order to sustain competitive advantage. This may involve relocating activities, and hence reconfiguring the factory structure.

It can be argued that the 'glue' of a small global factory is the flow of knowledge and the transfer of assets between parties jointly producing valuable output for the end customer. Therefore, it is natural to assume that its success is related to the focal company's absorptive capacity, its "ability to understand the value of new information, absorb it and apply it" (Cohen & Levinthal, 1990, p. 128). Absorptive capacity relies on various learning processes that are considered imperative for the success of international new ventures (Autio, Sapienza, & Almeida, 2000), and it is also referred to as learning capability in the context of born global firms (Weerawardena, Sullivan Mort, Liesch, & Knight, 2007).

In a global factory it is not only well-functioning and constantly ongoing knowledge absorption that matters, but also how and to whom knowledge is distributed in the organization and the network. Key persons in the value network need to recognize the significance of the strategic knowledge they acquire, and forward it to the decision makers in the focal firm (Buckley, 2010). This is a major challenge in a small global factory, the value network of which is based on partnerships of independent organizations rather than ownership and strong ties as in large global factories. It is therefore necessary to create win-win situations so that partners of different sizes and backgrounds can cooperate. Furthermore, the partnership-based business model may encourage opportunistic behavior. Sharing knowledge may thus not always be in the best interest of the partner, or of the focal firm intent on protecting its valuable assets.

All in all, flexibility and absorptive capacity are both highly important capabilities along all three dimensions of dynamic capability. Flexibility is crucial in reconfiguration, whereas absorptive capacity is required for seizing opportunities. Our literature review indicates that the dynamic capability for managing a small global factory constitutes individual (cognitive and managerial) and organization-level capabilities. These factors are illustrated in the following Fig. 1.

As the figure illustrates, cognitive capabilities form the core and are difficult to observe. Managerial capabilities build on them and are more visible. Finally, organizational capabilities build on the two inner layers, and are the most visible to the outside world.

In the light of the previous literature, we suggest that these factors together form the dynamic capability of managing a small global factory. It is a question not only of maintaining and operating the current networked operations, but also of creating new connections and reconfiguring resources and capabilities (Teecce et al., 1997). The following section introduces the research methods we applied and describes empirical data collected.

3. Methods

We chose the single-case research strategy for our exploratory study. The study provides a coherent, detailed conceptualization of a phenomenon, and thus can be classified as an inductive theory-building case (cf. Welch, Piekkari, Plakoyiannaki, & Paavilainen-Mäntymäki, 2011). Being an exploratory, interview-based case study relying on positivistic assumptions, it follows the mainstream disciplinary convention within IB research (Piekkari, Welch, & Paavilainen, 2009). However, as Welch et al. (2011) point out, studies seldom fit any category perfectly. We have addressed some of the criticism aimed at case studies, and thus the study has also elements of interpretive sense making (e.g., thick description of a single case) and contextualized explanation (e.g., context-sensitivity in the explanation of the findings).

The chosen approach allows investigation of the phenomenon in its natural setting and the combination of different sources of information, thus resulting in a deeper understanding (Eisenhardt, 1989; Ghauri, 2004; Yin, 2009). Furthermore, the unit of analysis is one small global factory – i.e., the differentiated network formed around and coordinated by a focal SME – which justifies the single-case design given the potential to offer insights into a relatively rare situation (Siggelkow, 2007). Given our intention to examine what constitutes the dynamic capability needed for the successful management of this governance structure, our key informants are the managers who operate this small global factory.

In a single-case study the selection of the case is a crucial decision to which researchers need to devote considerable time. Random selection is not necessary, and theoretical, purposeful sampling is recommended (Eisenhardt & Graebner, 2007). This involves choosing cases that are likely to replicate or extend the emergent theory, or that have strong explanatory, revelatory power (Eisenhardt, 1989; Smith, 1991; Yin, 2009). It should also be kept in mind that the primary obligation of the researcher is to maximize learning from the case – therefore it is advisable to select cases that allow easy access, and informants who are interested in openly sharing their experiences (Stake, 1995).

Our main aim was to find a successfully operating small global factory. We chose the case company, which we call SolvTech in order to disguise its identity, because it is an SME with a structure comparable to the multinationals perceived as global factories. It has internationalized and outsourced various activities within both upstream and downstream operations, and its products and services are sold on over 100 markets globally. Thus, it seemed to fit the definition of a small global factory.

3.1. Data collection and analysis

We collected the empirical data in three phases between December 2006 and December 2010. First, in 2006, we conducted a pilot study in which we interviewed the company's chief technology officer, focusing mainly on upstream activities of the global factory. We were able to confirm that SolvTech was truly a small global factory. In the second phase we interviewed key persons in the company in order to find out about its global value network and the capabilities within the global factory. We interviewed all members of the management team, and a couple of other knowledgeable informants they suggested. We conducted a total of nine interviews in 2009. Finally, we interviewed two more top managers in 2010 for follow-up and validity purposes.

All twelve interviews were semi-structured and the majority of them were conducted face-to-face (two were telephone interviews due to distance and time constraints). The initial interview guide was based on insights from the above synthesis of the three literature streams: dynamic capabilities, global factories and international entrepreneurship (cf. Sinkovics, Penz, & Ghauri, 2008). It focused on the value network of the firm and the partners involved in value creation, how the firm managed the value network, and the capabilities of the firm and the interviewee, but was adapted for each interview according to the specific area of expertise of the interviewee. It was further modified for the 2010 interviews to cater for the findings accumulated in the previous round. The duration of the interviews varied from 45 min to 1 h and 45 min. They were recorded and transcribed for the analysis. We also accumulated a lot of unrecorded data in a total of ten meetings with company representatives. We were not allowed to record the meetings, but we made detailed notes. Finally, we collected some secondary data from the company website and newspapers, which developed our understanding of the firm.

During the first stage of the analysis, the research-team members closely read the transcribed data in order to construct the coding scheme. The three main themes, as derived from the interview guide, were: the value network of the firm, the management of the value network, and the capabilities in the organization. Each main theme was further classified into several sub-themes based on the theoretical framework and some issues that emerged from the data. Nvivo software was used for the coding in order to ensure systematic data analysis, ability to discuss the coding among the team members and the safe archiving of the raw data.

The data collection and analysis proceeded in parallel to some extent. The data accumulated by summer 2009 was carefully analyzed before the next interview round, and the findings guided the analysis of the 2010 interviews, although the coding scheme remained basically the same. After the coding we scrutinized the data accumulated under each code. We identified links to earlier literature, and paid attention to issues contradicting earlier views or emerging only from the data. The analysis process was iterative, theory informing the data and vice versa, and interactive as the members of the research team reflected on the findings both individually and collectively.

3.2. Trustworthiness

It has been recommended that the evaluation of qualitative research should be based on different criteria than those used in quantitative research (Sinkovics et al., 2008). We based our evaluation on Lincoln & Guba's (1985) well-received criteria: credibility, transferability, dependability and confirmability. The *credibility* of our study is enhanced in many ways, the most significant being the prolonged engagement and persistent observation (cf. Lincoln & Guba, 1985). The researchers were involved in the research process with the case firm for several years. During that time they learned a lot about the organization and were able to build up trust with the interviewees. This was evident in how the interviewees talked very openly about their perceptions. The study also benefited from investigator triangulation (cf. Denzin, 1978), as the authors were deeply involved in the data analysis, and compared and discussed different interpretations of the findings in detail. In line with many other case studies, we also used data triangulation in order to minimize informant bias: the interview data

came from multiple informants and was complemented with other data. The synthesis of constructs from different streams of literature, the careful application of theoretical sampling (cf. Sinkovics et al., 2008), discussion of the findings with members of the case company (cf. Lincoln & Guba, 1985), and the iteration rounds between the data collection and analysis also enhanced the credibility of the study.

Transferability is a complex issue in qualitative research. It requires the researcher to provide a thick description of the research endeavor and the setting in which the findings were achieved (Lincoln & Guba, 1985), which then allows theoretical generalization (cf. Eisenhardt, 1989). Although we recognize the challenges of contextualization (Michailova, 2011), with the help of the rich data we provide a detailed description of the case company and the relevant capabilities, thus allowing the reader to judge whether the findings are theoretically transferable to other contexts.

Dependability refers to the stability of the findings over time (Lincoln & Guba, 1985). Our thorough description of the research process and the data-collection protocol improves the transparency and thus the repeatability of the study (Sinkovics et al., 2008). Additionally, in order to enable the reader to follow the chain of evidence (cf. Yin, 2009), we tape-recorded and transcribed the interviews and included a number of quotations in the text (cf. Andersen & Skaates, 2004). These actions improve the *confirmability* of our findings in that the interpretations are drawn from the data, and are not the product of the researchers' imagination (Lincoln & Guba, 1985; Sinkovics et al., 2008). The strong linkage to two established (dynamic capabilities and international entrepreneurship) and one emergent (global factory) streams of literature also enhances the confirmability (cf. Sinkovics et al., 2008).

3.3. The case company

SolvTech is an ICT system provider, which – despite its small size (80 employees) – is a global leader in its narrow niche. The headquarters are in Finland, but its customers are spread over more than 100 countries throughout the world. The company serves its customers through its seven sales offices in Europe, North America, South America and Asia, and around 120 sales partners in more than 70 countries. Its annual turnover is slightly over 10 million Euros.

The company's offering is a combination of hardware-based and software-based products. The former represent older generations of technology, and continue to sell relatively well. The software-based output builds on newer generations and already constitutes the majority of sales. Growth in this area is expected to continue. Currently the company is extending its range to include consultation and content provision. With its strong technological know-how it has been able to reconfigure its R&D resources and capabilities over time as it has gone through and survived three major technological transformations. R&D is conducted both internally and in collaboration with domestic and international partners (e.g., in Hungary and the US). All hardware production is outsourced to China through an intermediary that takes care of the logistics and warehousing.

The company has evolved into its current form gradually during the past 50 years through incremental international growth and a series of cross-border mergers and acquisitions. Until a management buy-out in 2001 it was a part of a larger corporation, and is currently privately owned by a couple of investors and its management.

Although SolvTech's offering is based on rapidly developing technologies, the niche market in which it operates develops relatively slowly. The great majority of customers are public-sector organizations that tend to be slow in adopting new technologies. The company thus has to maintain a balance between rapidly developing technologies and slow market development. The ability to identify market opportunities is therefore crucial, as is the ability to reconfigure over time in order to avoid too radical or wrongly timed changes (cf. Ellonen, Wikström, & Jantunen, 2009).

Besides being an international entrepreneurial firm, SolvTech seems to be a perfect example of a global factory, as both its upstream and downstream activities are dispersed globally. It has achieved a global market reach through its extensive sales-partner network. Moreover, through effective cooperation with international partners in both production and product development it has gained access to know-how that was lacking in-house.

4. Building blocks of dynamic capability at SolvTech

Below we discuss the three building blocks of the dynamic capability needed at a small global factory on the basis of our theoretical framework (cognitive, managerial, and organizational capabilities; see Fig. 1).

4.1. Cognitive capabilities

Top management at SolvTech acknowledges the significance of cognitive capabilities. In fact, their role in the company's success was highlighted more than we expected. The managing director summarized the focal aspects of managing a small global factory: "It all depends so much on the people, in my opinion, you must get the right kind of... sufficiently diverse group." His words illustrate the importance of individual managers and their cognitive capabilities, and the diversity and dynamics in the management team.

The other informants also stressed the significance of cognitive capabilities. They pointed out that their organization was truly multicultural and multilingual on account of constant exposure to other cultures both at home and through extensive international experience. In other words, *cultural awareness* was not restricted to top management, but it was a firm-wide characteristic. A *global mindset* also appears to prevail: "We understand that our culture or legal conception and so on does not necessarily have any relevance when we go to India or China or others... Our ideas of ethics or religion or legislation – it's

just our understanding. It's one among others." The company has indeed expanded worldwide in its niche market, and its growth orientation is clearly global, with a particular focus on emerging markets. Both of these cognitive capabilities can be seen to link to the seizing ability (cf. Teece et al., 1997).

The informants also identified an *entrepreneurial orientation* as a key factor distinguishing SolvTech from its competitors and larger partners. One of the interviewees directly commented on this: "I think success is not just coincidence, but results from planning . . . but the situation is completely different when we go to the large companies. . . they lack, and now I use this concept on purpose, entrepreneurship." The key persons in our case company have apparently realized the value of an entrepreneurial orientation and utilize it purposefully in the management process. Proactiveness is not restricted to top management – it characterized all the key persons we interviewed. At the same time as developing the current offering, the company is constantly scanning opportunities and ideas for extending it in new directions in order to remain one step ahead of the technology and the competition. This comment by the business development manager illustrates the prevailing attitude: "Today we need to extend the offering . . . which links to our ability to understand the market and the technology sufficiently, and to think about what kinds of products and services we could combine to create a new offering." An entrepreneurial orientation is thus connected to sensing opportunities and reconfiguring the organization (cf. Jantunen et al., 2005). The company has, indeed, shown the ability to reconfigure by transforming the technology-base of its products and, more recently, of its sales channels.

4.2. Managerial capabilities

The key persons' managerial capabilities also appear to be geared to the small global factory. Many of the interviewees stressed issues that could be considered *interface competence*, although in terms of content the concept proved to be multi-faceted. First, it seems that the performance of a small global factory is dependent on how well the partners' objectives are aligned with the focal firm's strategy. Compatibility in business logic and objectives was emphasized as a crucial starting point. SolvTech's strategy and objectives are routinely communicated to its partners as part of the network-management process, and considerable effort is made to secure the commitment of key partners in the value network. According to the managers, the key to increasing partner commitment is to improve their understanding of SolvTech, its products and visions through training, for example. Active communication, searching for joint projects, and building good personal relationships with key persons help to overcome the liability of smallness, particularly with larger partners. Succeeding in this is decisive in that only through the network is the firm able to exploit business opportunities on all continents: this is unique for an SME in this field. Management, in fact, constantly tries to monitor the situation from the partners' viewpoint, anticipating their needs. Nonetheless, the situation is very delicate, as one of the interviewees indicated: "Like many partners, they don't just give your car a push when it stalls, they also overtake you at the next lights." Thus, interface competence also implies consciousness of the risks of partnering and potential opportunistic behavior as well as the ability to cope with and manage them.

Interface competence also includes the ability to coordinate the value network (Buckley, 2009b), and SolvTech's managers appear to be good at assembling a group of partners that together can provide what the customers need: "We know how to link all these different partners that are needed, financial institutions, subcontractors and local operators together." This ability seems to apply globally – they can deliver anywhere in the world: "We know the different phases of the process and how this kind of project is sold in some far-away country. Or we at least know how to find out how it happens". Interface competence thus appears to enhance the configuration and reconfiguration of the partner network. It also seems to play an important role in overcoming the liabilities of foreignness and outsidership (cf. Johanson & Vahlne, 2009). SolvTech seems adept at fully utilizing the temporary locational advantages of its value network, thus mastering the dynamics of the global factory quite well.

The interviewees also emphasized the need for fine-slicing competence and *analytical capability*. Fine slicing and seeing the 'big picture' had to co-exist, as one of the interviewees put it: "A broad outlook is the most important thing, if you don't have it you cannot operate, in my opinion. Of course, you need to also understand the details." Analytical capability also includes the ability to understand the partners' business logic and the extent to which it is compatible or incompatible with that of the focal firm. In this respect it is connected to interface competence. SolvTech has experienced challenges in the past because of lacking analytical capability among management. However, the long-serving managers appear to have learned through trial and error, and the more recent recruits bring new perspectives. One might thus assume that the current level of analytical capabilities is relatively high. It is nevertheless worth pointing out that managerial capabilities alone do not guarantee success: they need to be combined with organizational capabilities.

4.3. Organizational capabilities

SolvTech has experienced major organizational changes, including a series of mergers and acquisitions and three substantial technological transformations. All this has required the reconfiguration of the internal organization as well as a revision of the partner network. Some partners have been replaced, and sometimes retraining has been sufficient to meet the requirements of the novel situation. Top management has tried internally to raise awareness among the personnel of the need for continuous change. All this has required *flexibility* and the ability to stretch internal and external boundaries. As one interviewee put it: "We are flexible. If something is needed in India, we send it there from wherever we have the required skill. The borders in our firm are never impenetrable."

An example of border flexibility was the decision to outsource all production to a partner manufacturing the hardware in China. Although it was not an easy decision, it was necessary in order to stay viable. The company has been able to reconfigure and transform resources and capabilities over time on a global scale.

By no means all companies are flexible, which is very challenging, as one of the SolvTech interviewees explained: “A straw bends when the wind blows, but when the wind stops blowing the straw returns to its original position.” Although change may be necessary and the organization may be forced into it, if it is not well motivated and carefully monitored there may be a return to the original setting. Permanent change requires learning in-house. Indeed, it is common in the business literature to refer to successful companies as ‘learning organizations’. Flexibility and change require two types of learning: the fast acquisition of new knowledge and the ‘unlearning’ of practices and routines that have become obsolete (Bessant, Knowles, Briffa, & Francis, 2002). As the managing director of SolvTech put it: “The most important thing, I would say, is to know when to stop doing something. . . to see as quickly as possible that this is not producing anything and to quit it and move on to the next one.” It could be argued that such a combination of learning and unlearning is among the decisive organizational capabilities of successful global factories (Bartels et al., 2009; Buckley, 2010).

It is essential for SolvTech to learn from and with its partners. Close and rather straightforward partner relationships have evolved over time, and this ‘growing together’ has supported reciprocal learning. For example, collaboration in product development has been very concrete: projects have been undertaken in joint premises, and “knowledge has been transferred over the table from where it resides to where it is needed”. Mutual interest and regular, open interaction with the partners have increased the absorptive capacity of the focal firm to a great extent. The development of *absorptive capacity* has also been enhanced throughout the organization by means of job rotation, for instance. However, there is always room for improvement, and the successful running of a global factory requires additional investments in the learning capabilities of its personnel. The aim in the future is to equip all employees with multiple skills: currently many of them are experts only in their own niches.

Knowledge transfer has been enhanced and supported in many ways at SolvTech. Regional managers act as intermediaries, or ‘dedicated knowledge carriers’, between the company and its partners, for example. The company also facilitates knowledge transfer through the use of concrete communication tools: “We bring out the partner news monthly, through our partner portal, the partner extranet. That’s called the partner zone. That’s kind of online news, web pages with different news items maybe five to seven in a month. It’s really hands on.” However, finding the right balance between knowledge sharing and protection has been recognized as a challenge. The identity of R&D partners is such strategically sensitive information, for example, that is not revealed to all sales partners. All in all, the distribution of information within the network seems to differ in small global factories compared to their larger counterparts. Collaboration may be a double-edged sword: in the spirit of open innovation, the acquisition of knowledge from external sources and the development of complementary resources are considered dynamic capabilities promoting accelerated internationalization (cf. Weerawardena et al., 2007), but finding the right balance between knowledge sharing and protection is challenging. According to our data, this may be more relevant to a small global factory than to its larger counterparts.

5. Discussion and conclusions

5.1. Contributions to the literature

This study is to our knowledge the first to examine the emerging governance structure of global factory in the SME context. We have addressed the question of which factors constitute the dynamic capability needed for managing a small global factory governance structure, and consequently extend the literature on IB in general, and global factories in particular. Our case study indicates that reorganizing as a small global factory may help an SME to overcome some of the liabilities related to internationalization. We also found that multiple managerial and organizational factors contribute to the dynamic capability of managing such a factory. Organizational flexibility and absorptive capacity, together with managerial capabilities of interface competence and analytical capability are prerequisites for steering a successful small global factory. These capabilities build on top-management cognitive capabilities such as cultural awareness, an entrepreneurial orientation, and a global mindset.

Our empirical data support the theory-based framework, but also reveals some new aspects. Cognitive capabilities form the basis of the framework because they are the source of opportunity identification in international expansion (Zahra, Korri, & Yu, 2005), and hence are vital. Cultural awareness and a global mindset enable and motivate key decision makers to recognize entrepreneurial opportunities and to act proactively on global markets, thus promoting an entrepreneurial orientation (Levy et al., 2007). We argue that cognitive capabilities foster dynamic capability and are thus essential in *managing* a well-functioning global factory. It should be noted that they are personal and change rather slowly, if at all. Even if the top-management team has these characteristics, without relevant managerial capabilities it cannot exploit the opportunities.

Managerial capabilities build on the characteristics of the managers (Castanias & Helfat, 1991), and are essential for *running the global factory successfully over time*. As the findings from the case company demonstrate, analytical capability and interface competence seem to be deeply intertwined in that the former includes skills that also facilitate the coordination and management of the value network. Managerial capabilities are personal and expected to develop slowly, but it is possible to improve them through experiential learning (see Castanias & Helfat, 1991). Furthermore, the management of a

complicated organization such as a global factory is not a task for top management alone, and requires input from all members of the value network.

In order to preserve its competitive advantage the organization needs to reconfigure its capabilities in the turbulent environment and even build new ones (cf. Luo, 2000). *Renewal and development* are possible only if the firm possesses organizational capabilities such as flexibility and absorptive capacity. We argue that a sufficient level of absorptive capacity is a prerequisite for flexibility, which in the case of a small global factory refers to both the elasticity of organizational boundaries and adaptation to the turbulent environment (cf. Buckley, 2009b).

In sum, we argue that all the three levels have significance – none of them would be sufficient alone – and that together they form the dynamic capability needed for the successful management of a small global factory. Furthermore, the elements of cognitive, managerial and organizational capabilities are proposed to be tightly intertwined, thus linking the three levels. As Fig. 1 shows, the cognitive capabilities of the managers form the basis for the dynamic capability. They are crucial attributes and are reflected in the way managers think and operate. Managerial capabilities, build on cognitive capabilities on the one hand, and on the other hand are prerequisites for organizational capabilities. All the three levels are therefore required in developing the dynamic capability of managing a small global factory. Based on the above discussion, we propose that:

- P1. Organizing as a small global factory increases the propensity to overcome the liabilities related to internationalization in SMEs.
- P2. Organizing as a small global factory successfully requires dynamic capability that constitute of specific individual-level (cognitive and managerial), and organizational-level capabilities in SMEs.
- P3. The cognitive capabilities of small global factory entrepreneurs and managers constitute of cultural awareness, entrepreneurial orientation, and global mindset.
- P4. The managerial capabilities of small global factory entrepreneurs and managers build on the cognitive capabilities, and constitute of interface competence and analytical capability.
- P5. The organizational capabilities of small global factory build on the two levels of individual-level capabilities (cognitive and managerial), and constitute of flexibility and absorptive capacity.

This study adds to our conceptual knowledge of the global factory, and particularly of dynamic capabilities in the context of small global factories. The relevant discussion thus far does not acknowledge the possibility that an SME could adopt a global factory structure. Therefore, in arguing that an SME does have a role on the global level other than operating at the interstices between multinationals (Buckley, 2011) makes a novel contribution to the literature on global factories.

5.2. Implications for the managers

Our results also have implications for entrepreneurs and managers willing to organize their businesses as small global factories. Our empirical study highlights the complexity of the dynamic capability required for successfully managing a small global factory: it is a combination of various individual and organizational factors that foster sensing and seizing opportunities and reconfiguration (Kogut & Zander, 1992; Teece, 2007; Teece et al., 1997). This deeper understanding will be helpful to anyone conducting research on small global factories, and to managers engaged in this challenging task.

From the managerial perspective, it is essential to recognize what kinds of qualities are needed in governing the internationally expanding SME operations. Knowledge of these issues is valuable for managers when they face the need to recruit new managerial resources to support the expanding operations. On the other hand, it was found important that there is diversity in the management team, because it introduces dynamics into the operations of the management team. Additionally, the notion of unlearning is also valuable for managers. It is important that they realize that in a flexible organization learning needs to be combined with letting go of the ways that do not function. Finally, managers also benefit from the insights on interface competence. It is crucial that they bear in mind the significance of understanding and acknowledging partners' incentives. Those should be well aligned with the objectives of the focal firm in the small global factory.

Furthermore, the study takes the theory of international entrepreneurship a step further in showing how internationally entrepreneurial firms could secure subsequent growth after entering international markets. However, we do not argue that the global factory is necessarily 'the winning organizational structure' of tomorrow. On the contrary, we have rather an open mind, and like Yamin (2011) believe that the vulnerability (due to network embeddedness and internal competition for resources) and the political aspects related to large global factories in particular will force companies to think very carefully about whether this is the right strategy for them. Unraveling the complexity of the dynamic capability that managing a small global factory in a turbulent environment requires should help SME managers to decide whether or not such a structure is their best option.

5.3. Limitations and future research

Some limitations of our research need to be addressed. As with many other case studies in international business research, we cannot make any far-reaching claims about the generalizability and transferability of our results (cf. Piekkari et al., 2009). Nonetheless, theoretical generalization may be possible (cf. Eisenhardt, 1989; Yin, 2009), although one should keep in mind that the empirical data was collected in an industry characterized by highly fragmented markets and

public-sector customers, thus the findings may be context-sensitive. Moreover, given that the focus was on identifying and analyzing factors that contribute to the management of global factories in dynamic operating environments, it is not fully clear if the factors discussed are a consequence of working for a global factory or rather the premises on which to create one.

These limitations also constitute opportunities for further research. First, a single case study is always just a glimpse through an open door and the broader view of the phenomenon remains unexplored. It would therefore be interesting to expand the study by collecting a more extensive data set, perhaps based on quantitative research methods. There are, nevertheless, special challenges in using global factories as research objects in quantitative studies. For one thing, such studies would require data collection on both organizational and managerial levels, as well as in different parts of the global value network. This could prove to be rather complex, time consuming and costly. Even the first step of the process—access—could prove to be problematic. Another issue to consider, as Buckley (2011) argues, is that every global factory is unique in terms of development, control and coordination, and management. Thus, an alternative to the traditional survey-based approach, such as a mixed-methods strategy, may be more appropriate.

Secondly, it seems as if SMEs as research objects are becoming quite similar to MNEs (geographically dispersed differentiated networks (cf. Ghoshal & Bartlett, 1990)). It would be quite interesting to conduct a study comparing a small and a large global factory. Current knowledge gives no clues about whether the required dynamic capabilities differ, and it would be worthwhile exploring this. Both avenues are interesting and we hope our study will encourage other researchers to build on our framework.

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- Article 4 Value creation of an internationalizing entrepreneurial firm –
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