



Paper to be presented at the DRUID 2012

on

June 19 to June 21

at

CBS, Copenhagen, Denmark,

Business model Innovation of Complex Service Providers- A Quest for Fit

Ivanka Visnjic

ESADE Business School
Operations and Innovation management
ivanka.visnjic@esade.edu

Andy Neely

Cambridge University
Department of Engineering
andy.neely@eng.cam.ac.uk

Abstract

The objective of our study was to extend the milestones of dynamic capabilities framework towards the ability of a firm to manage the value creation on the level of the ecosystem. Using the business model that represents a design of firm-wide transactions on both sides of the ecosystem as the research construct, we have collected and examined data on 12 service providers to understand how these firms change their transactions with their ecosystems, how the changes of the transactions interact and what implication this has on the focal firm and its role and required capabilities. We found that all service providers we studied exhibited simultaneous extensions of their transactions where growth and customer satisfaction-inspired activity extension on the demand/customer side triggers internal activity-system consistency and innovation-inspired extension of transactions on the supply side of the ecosystem. Simultaneous extension of the transactions led to the increase in the accountability on the customer-side of the ecosystem, while at the same time shifting the locus of the value creation from the service provider to the ecosystem on the supply side. This process, in turn, led to the increase of different risk types that we have jointly labeled accountability spread. Given the change of the firm's key role from performing of the activities to managing the risk associated with the activities, we argue that the capability to manage accountability spread, characterized by the ability to identify, measure and manage

different types of risk, represents a core dynamic capability in this context.

Business Model Innovation: A Quest for Fit

ABSTRACT

The objective of our study was to extend the milestones of dynamic capabilities framework towards the ability of a firm to manage the value creation on the level of the ecosystem. Using the business model that represents a design of firm-wide transactions on both sides of the ecosystem as the research construct, we have collected and examined data on 12 service providers to understand how these firms change their transactions with their ecosystems, how the changes of the transactions interact and what implication this has on the focal firm and its role and required capabilities. We found that all service providers we studied exhibited simultaneous extensions of their transactions where growth and customer satisfaction-inspired activity extension on the demand/customer side triggers internal activity-system consistency and innovation-inspired extension of transactions on the supply side of the ecosystem. Simultaneous extension of the transactions led to the increase in the accountability on the customer-side of the ecosystem, while at the same time shifting the locus of the value creation from the service provider to the ecosystem on the supply side. This process, in turn, led to the increase of different risk types that we have jointly labeled accountability spread. Given the change of the firm's key role from 'doing' the activities to managing the risk associated with the activities, we argue that the capability to manage accountability spread, characterized by the ability to identify, measure and manage different types of risk, represents a core dynamic capability in this context.

INTRODUCTION

Ongoing inter-organizational collaboration, evolved to the point of formation of networks or supra-firm organizational forms, is becoming increasingly important determinant of value

creation on the level of firms as well as economies in general (Gulati et al. 2012; Parmigiani and Rivera-Santos 2011). Labels as such as business ecosystems (Santos and Eisenhardt 2005), ecology (Dougherty and Dunne 2011), meta-organizational forms (Gulati et al. 2012), platforms/platform markets (Eisenmann et al. 2011), networks (Rank et al. 2010) have been used to depict these ecosystems of organizations that may vary in their overall structure, underpinning forms, nature and strength of linkages.

While different labels and definitions may make different assumptions concerning the role of the ecosystems and a single firm within the ecosystem (e.g. the extent to which the ecosystem is orchestrated (Gulati et al. 2012) or emergent (Dougherty and Dunne 2011)), we opt for the use of popular label ‘ecosystem’, which we use to refer to the constellations of firms linked to each other (at least) by virtue of their interconnected value creation functions. Consider, as an example, a train manufacturer turned service provider of a 7-year train availability agreement, where customer merely uses the train, while train provider together with a number of different service providers now collaborates on daily basis to provide refurbished, maintained, clean at a designated location.

In parallel, academic interest in the tendency for value creation to exceed the boundaries of one firm (Santos and Eisenhardt 2005) in which value creation resides on the level of the ecosystem (Dougherty and Dunne 2011) has been on a steady rise. For example, Dougherty and Dunne (2011) note that innovation-based value creation in a number of sectors, such as biotech, energy, finance or healthcare, relies on suppliers, partners, customers, non-profit organizations, consortia and other organizations participating in these “ecologies”. Furthermore, the ability to shape the ecosystem through the deployment of effective business models (Teece 2007) has been flagged to represent the heart of one of the most prominent strategic management theories nowadays, the dynamic capability framework.

While dynamic capabilities framework expects that the role of a firm (Teece 2007) and its top management (Augier and Teece 2009) evolves to become an ecosystem orchestrator, the understanding of the dynamic capabilities required to make this leap is yet to come. Indeed,

dynamic capabilities framework has been deployed extensively by the literature on the inter-firm relationships, and a number of dynamic capabilities that explain how firms effectively form (individual) dyadic relationships, such as alliances, joint ventures and cross-sector collaborations, and source capabilities from these relationships, have been identified. Moreover, the literature has evolved towards generalizing across these different dyadic forms of collaboration (Parmigiani and Rivera-Santos 2011) and effort has been invested to understand dynamic capabilities that a firm needs to possess to conceive right forms of collaborations (Capron and Mitchell 2009) and manage the portfolios (Wassmer 2010).

At the same time, all the discussion has focused primarily on the supply side relationships, either partnering or outsourcing practices by the focal firm (Gulati et al. 2012), while the demand side and the role that the customer may play has been largely neglected in inter-organizational collaboration, even though it has been actively researched by other research areas, particularly in innovation (Baldwin and von Hippel 2011; Chesbrough 2010) and marketing (Vargo and Lusch 2004). Indeed, joint consideration of the customer/demand as well as the sourcing/supply relationships seems as a promising next step towards understanding how more complex, multiparty ecosystems, where that the locus of value creation shifted from individual firms to the ecosystem, emerge. In particular, we argue that the next step in closing this literature gap is in understanding the inception of these multiparty ecosystems and what roles and capabilities enables individual firms to shift the locus of the value creation to the ecosystem. Thus, the research question that we answer is: *How firms change their business model from firm-level conceptualization of the value creation to the ecosystem level and what (new) capabilities play a key role in managing at the ecosystem level?*

To help answer this question, we collected data on 12 providers of complex services that have recently changed the way they create value for themselves and their ecosystem stakeholders. We used the construct of business model, defined as the template of firm's transactions (Zott and Amit 2008), to conceptualize how a organization's relations with its ecosystem change,

and we found a consistent pattern among the 12 organizations, which we refer to as the “simultaneous extension of transactions on the demand and supply side”. First, on the demand side a profitable growth objective and customer satisfaction incites the 12 service providers to extend the scope of their transactions with customers by extending breadth of service portfolio (transaction scope), length of service commitments (transaction timescale) and/or by evolving from provision of service activities towards provision of service outcomes (transaction nature). In a previous example, an extension from a train selling to a 7-year contract with a customer, the train operator, whereby train availability is guaranteed and charged by price per km, represents an example of this transaction extension where a complex service is underpinned by a constellation of (sub-) services. Second, on the supply side, these extended transactions with the customer triggered an extension of transactions with existing and new ecosystem suppliers and partners. For example, the train manufacturer needed to foster longer relationships with the existing suppliers and find a financial services partner that will handle the financing of asset (train), which now becomes leased rather than sold.

Simultaneous extension of transactions on the demand and supply side has two-fold implications: on one side, more innovation is triggered by knowledge re-combinations beyond firm boundaries thereby leading to more value creation in what we refer to as the ecosystem, but on the other side, the threat of accumulation of risk of the focal firm is considerably raised. For example, not only that train manufacturer starts to provide more extensive outcome guarantees for longer and less predictable time periods, but she also does that for the increasing portfolio of services now provided increasingly outside of firm boundaries and outside of her direct control. As firm accountability for an increasingly complex service raises risk, we refer to this process as opening of the accountability spread. We argue that managing accountability spread becomes a key dynamic capability (Teece et al. 1997; Teece 2007) that firms need in order to create value by extending their transactions beyond their boundaries.

By connecting disparate streams of literature concerned by the ecosystem-based value creation and external organizational design (business model) with the theory of dynamic

capabilities, we make several contributions. First, we contribute to the literature on inter-firm collaboration by identifying a specific pattern in which shift from firm-based to ecosystem-based value creation occurs. Thus, we contribute to the growing literature on the business models by connecting different interpretations of the business model construct (Amit and Zott 2001; Teece 2010; Zott and Amit 2007) and further relating it to the dynamic capabilities framework (Teece 2007). Furthermore, while business model literature draws largely from the examples of start-ups and highly agile, predominantly technologically driven product companies, we provide a contrasting, yet complementary perspective of incumbents in the service segments. Second, we contribute to the literature on dynamic capabilities by extending the notion of the core property of dynamic capabilities from inside the firm to being to adopt the right business model and manage the balance between the accountability spread and value creation across firms within the ecosystem (Augier and Teece 2009; Teece 2007).

CONCEPTUAL DEVELOPMENT

Dynamic capabilities view (DCV) of firm competitiveness has foreseen the role of the firm as the ecosystem orchestrator as a part of its core construct (Teece et al. 1997; Teece 2007). In parallel, literature on inter-organizational relationships has been evolving from understanding of dynamic capabilities from individual forms of collaborative relations towards a firm-wide approach to conceive and manage these relationships (Capron and Mitchell 2009). While very valuable, these contributions still largely consider collaborative efforts on the supply side of the ecosystem of the focal firm, while we argue that the consideration of the demand, customer side of the ecosystem is necessary to understand the evolution from the firm level to the ecosystem-level value creation. We propose deploying business model construct, defined as a template of a firm's boundary-spanning transactions (Zott and Amit 2007), to bridge this gap.

Dynamic capabilities: towards the capacity to proactively change the firm ecosystem

DCV of firm competitiveness, concerned with the capacity of a firm to make strategic choices in relation to changing environmental conditions, has attracted substantial interest in the academic literature (Barreto 2010). DCV represents a dynamic extension of the Resource Based View of the firm that recognizes a capability as a firm's capacity to deploy resources with the objective of accomplishing sustainable competitive advantage (Amit and Schoemaker, 1993: 35). While a number of scholars have contributed to the definition of dynamic capability (see Barreto (2010) for the overview), perhaps the most encompassing and consistently used is the definition where dynamic capability is seen as *a capacity to sense and shape environmental opportunities and threats, seize opportunities and maintain competitiveness through combining, protecting and reconfiguring the tangible and intangible assets* (Teece 2007).

Changing environment and the capacity of a firm and their management to interact with it – respond to the environmental changes (Teece et al. 1997) as well as proactively shape the environment (Eisenhardt and Martin 2000)- is central to the concept of dynamic capabilities. Besides competitive dynamics aspect of environmental considerations, authors also point to the necessity to the more collaborative aspects. Teece (2007) notes that boundary choices are one of the key micro foundations of the dynamic capability constructs. Starting from the decisions surrounding the vertical and horizontal scope, strategic managers also need to have the ability to procure technology externally, through inter-firm collaboration, as well as develop it internally (Chesbrough and Teece 1996). Furthermore, Teece (2007) recognizes that developing (or encouraging) complementary investments of other firms and capturing co-specialization benefits represents a core capability of the 21st century. Finally, Teece (2007:1320) argues that dynamic capabilities "embrace the enterprise's capacity to shape the ecosystem it occupies, develop new products and processes, and design and implement viable business models."

Inter-organizational literature and dynamic capabilities

Dynamic capabilities and dyadic relationships

At the same time, the research on inter-organizational collaboration has extensively relied on the dynamic capabilities view to explicate the requirements and effect of the inter-firm collaboration. Large body of literature on different forms of dyadic relationships has defined dynamic capabilities necessary to achieve in conceiving that specific type of relationship. For example, authors emphasize the integration capabilities for acquisitions and its effect on the process of learning in the post-acquisition management as well as the impact of the structural integration on the acquisition success (Puranam et al. 2009; Zollo and Singh 2004). Dynamic capability for alliance arrangements, are seen as a key capacity for a firm to actively learn and upgrade relevant skills (Branzei and Vertinsky 2006). Firms that have structured their alliance capability in a dedicated alliance function have been shown to realize greater success (Kale et al. 2002). Authors also relate the corporate venture capital investments mediated with a firm's internal knowledge base with the firm performance (Benson and Ziedonis 2009).

Two common traits seem to be characterizing the main part of the extant literature on the capabilities for inter-firm collaboration. Firstly, the dynamic capabilities are concerned with a firm's capability to conceive a dyadic relationship. Second, the purpose of these capabilities is to use external sourcing to reconfigure firm's (internal) capability and resource base (Capron and Mitchell 2009).

Dynamic capability and inter-organizational relationships: looking beyond dyads

Indeed, recent literature on inter-organizational relationships in general pointed to the need to compare and contrast different dyadic forms (Parmigiani and Rivera-Santos 2011) and provide systemic view on the firm's engagement in these relationships (Wassmer 2010). In particular, researchers interested in the inter-firm collaboration started to point out the increasing relevance of firms' ongoing interactions with the multiple stakeholders in the

process of value creation (Dougherty and Dunne 2011; Gulati et al. 2012) that move beyond dyadic relationships, such as collaborative relationships in form of the alliances or joint ventures (Gulati 1995, 1998; Reuer et al. 2004) or outsourcing relationships (Gulati and Kletter 2005; Srikanth and Puranam 2011).

Various terms, such as ‘virtual organizations,’ ‘ego networks,’ ‘constellations,’ ‘ecologies,’ ‘industrial clusters,’ ‘ecosystems,’ and ‘hybrid organizations’ (see Gulati et al. 2012 for the overview), have been adopted by a body of disconnected literature coming from, both practitioner and academic sources, to refer to the inter-firm networks/systems/constellations that jointly participate in the delivery of a product, a service, a product or service portfolio and/or jointly create value over prolonged periods of time. Two recently introduced terms were offered with more structured definitions. Gulati et al. (2012) introduced the concept of a meta-organization, defined as a "networks of firms or individuals not bounded by authority based on employment relationships, but characterized by a system-level goal" (Gulati et al. 2012: 573). Dougherty and Dunne (2011) see ecologies as the groups of organizations, institutions and various other agents that create, combine and recombine knowledge with the goal of creating new products and services.

Both meta-organizations and ecologies have been used to define the groups of informally connected organizations that collaborate to produce common outcome, yet both of the definitions brought their own assumptions with respect to the functioning of the group (orchestrated vs. self-organizing). While the assumption of the orchestration of the meta-organization fits better Teece’s (2007) definition on the role of the dynamic capabilities to “orchestrate” the inter-firm value creation, given the early stage of the literature development and the absence of the substantial evidence in this respect, we decided to refrain from making this assumption. Instead, we opted to retain the generic/umbrella label ‘ecosystem’ that has been used extensively yet loosely in diverse contributions (Augier and Teece 2009; Santos and Eisenhardt 2005; Teece 2007) to simply describe a group/network of entities interconnected by (at least) their value creation function. As such, the definition is both

consistent with Gulati et al.'s (2012) view on the meta-organizations as well as Dougherty and Dunne's (2010) view on the ecologies, without making any speculations regarding the nature of the relationships between the companies or the rules of functioning.

Dynamic capabilities literature made its first steps towards the understanding of dynamic capabilities for managing ecosystem-level value creation by examining firm's capacity to manage the portfolio of inter-firm relationships. On an example of the personal computer industry, Mayer and Argyres (2004) suggest how and when contracts might serve as repositories for knowledge about how to govern collaborations, and suggest some boundary conditions for this phenomenon. Capron et al. (2009) also further build on the research on capabilities for inter-firm collaboration by underscoring the importance of the firm's (dynamic) capability to select among different external and internal modes of capability sourcing. While these two articles represent examples of the literature that can be readily extended to the multi-firm collaboration setting, these still focus mostly on the sourcing perspective of the collaboration capabilities.

In addition to the fact that that simultaneous relationship with the diverse group of stakeholders increasingly represents the reality of the firms (Dougherty and Dunne 2011), some streams of literature also noted the growing importance of the demand side of the ecosystem. For example, innovation literature has been focused on the role of customers, users and other stakeholders in the process of the so-called open and collaborative innovation, isolating the organizational principles that would enable value creation through enhanced knowledge exchange (Baldwin and von Hippel 2011; Chesbrough 2010). Marketing literature has been also focusing closely on the understanding of the co-production and co-creation with the customer, known under the label of service-dominant logic (Vargo and Lusch 2004). While highly complementary, phenomena concerning the collaboration with the customer have been largely treated separately from the phenomena concerning supply side collaborations and sourcing of capabilities.

While different streams of literature on inter-organizational relationship and related literature are evolving towards better understanding of a firm's systematic engagement in relationships, with either demand or supply side of the ecosystem, the gap in literature remains concerning a firm's ability to systematically 'orchestrate' (Teece 2007) creation, development and deployment of capabilities that are dispersed over multiple ecosystem stakeholders. Filling this gap seems to require systemic view over different types of relationships with all ecosystem partners, including the ones situated on the demand side.

Business model: construct for framing firm's systematic interaction with ecosystem

Organizational literature that has over the years mostly focused on the internal organizational design (Zott and Amit 2007) has been also gradually moving towards conceptualizing complex, simultaneous and ongoing web of relationships between multiple partners. Business model entered within the dialog of organizational theory as the construct that qualifies external organizational design or the design of its boundaries and relationships with the external environments, complementing mature literature on the internal organizational design (Zott and Amit 2007).

Business model has been defined by several authors resulting in some inconsistencies, but also a rich discussion that is favorable for early stages of the literature development (Zott et al. 2011). Zott and Amit (2007, 2008) following Amit and Zott (2001) defined business model as a design of *transaction content, structure, and governance so as to create value through the exploitation of business opportunities*. The transaction structure refers to the way different parties involved in an exchange are linked to each other, including the order in which exchanges take place and the type of exchange mechanism adopted. The transaction governance relates to how the transaction content and the transaction structure are controlled by the concerned parties through the legal form of organization and the incentive schemes. While closely related, business model of a firm has been empirically demonstrated as qualitatively different than strategy (Zott and Amit 2007).

In a more recent contribution, Zott and Amit (2010) draw on their earlier work to present the business model as an activity system, which represents a collection of activities designed to address perceived market needs. The content, structure and governance that depict the architecture of the system that goes beyond the boundaries of a single firm define an activity system. Indeed, Zott and Amit (2010) argue that a business model, as a system and a locus of value creating potential, exceeds the boundaries of one firm, representing a system of interdependent activities that transcends the focal firm boundaries and spans across the ecosystem of firms interconnected by the virtue of their value creation functions. The nature of the business model, therefore, enables the firm, in concert with its partners, to create value and also defines how a single firm appropriates a share of that value.

Other studies offer an alternative view on the dimensions and design elements of the business model. With some variation, *a number of studies see business models as a combination of value proposition, value capture or a revenue model and value delivery* (Teece 2010). Value proposition can be interpreted as the offering, a product, service or a solution that a firm offers to its client(s). Value capture or a ‘revenue model’ represents a mechanism that a firm uses to appropriate value from this offering (e.g. a price, annuity), while value delivery represents a configuration of a system of processes, resources and actors that bring the offering to the customer. The function of a business model is to ‘articulate’ the value proposition, select the appropriate technologies and features, identify targeted market segments, define the structure of the value chain, and estimate the cost structure and profit potential (Chesbrough and Rosenbloom, 2002: 533–534).

All definitions of the business model seem to emphasize the fact that the business model represents a firm’s ‘architecture’ or ‘template’ for value creation that happens beyond the boundaries of their firm and the transactions that govern that value creation. While first group of authors offers the ‘building blocks’ of the business model in terms of transactions and activities, the second group of authors recognizes that a business model has the output side (value proposition and the revenue model) as well as the input side (value delivery).

Combining the two perspectives, one gets closer to understanding the role that the business model may play in helping firm shape the ecosystem. For example, one may consider how a firm shapes activities and transactions on the customer-side of the ecosystem versus how does firm shape activities and transactions on the partner and supply-side of the ecosystem.

Indeed, validating the compatibility of the two types of definitions would be an important next step for the development of the literature on the business model, as well the better understanding of a firm's role in the ecosystem and the necessary capabilities. More specifically, the choice of the architecture of transactions and activities is likely to depend on motivation and role that a firm plays in the ecosystem (see previous sub-section), while the firm's ability to select and implement the architecture, that dynamically corresponds to the (changing) ecosystem on the customer as well as partner side has been already defined as a be a result of a dynamic capability (Teece 2007).

Dynamic capabilities for shaping the ecosystem through the business model design

To summarize, a research gap seems to be developing at the touch point of several research areas. The dynamic capabilities literature is looking to improve our understanding on the nature of the capabilities a firm needs to actively manage the ecosystem through the deployment of the effective business models. The inter-organizational relationship literature is evolving from the understanding of how collaboration drives value creation of dyads and what dynamic capabilities enable this, towards the understanding of the collaborations on systemic level and dynamic capabilities for sourcing and collaboration portfolio management. Finally, collaboration literature streams coming from innovation and marketing literature point to the overseen role of the customer in the collaboration.

Next step towards closing the gap of firms ability to effectively move from the firm-centered to the ecosystem-centered conceptualization of the value creation, characterized by the multi-party and ongoing collaboration seems to be at putting together these complementary yet

disparate streams of literature and in particular bringing the demand side perspective in the dialogue on the topic of capabilities for inter-organizational collaboration. Business models construct seems helpful in this respect as it offers us a frame of reference to structure our thinking around how a firm relates to the other ecosystem stakeholders and connects to them through transactions and activities as well as how these transactions interrelate. We formally pose the following research questions to help us to close this gap:

- How are firms changing their business model?
 - How are firms changing their transaction with the demand side of the ecosystem, i.e. customers and users and/or with the supply side of the ecosystem, i.e. suppliers and partners?
- How do the two sets of transactions interrelate and how does that affect the level of firm's value creation?
- What key capabilities a firm needs to develop should the locus of the value creation change from the firm level to the ecosystem level?

METHODOLOGY SECTION

Study design and case study selection

The objective of this study was to extend the theoretical base of dynamic capabilities literature on inter-organizational collaboration from firm-focused collaboration towards ecosystem-focused value creation that considers all (both supply-side and demand-side) collaborations. To perform this research, we on the research on business model construct as the template that consists of transactions of a firm with all its ecosystem partners.

Our research could be seen as a theory building effort that combines different literature streams of intermediate maturity, resulting in new theoretical relations, constructs and measures (Edmondson and Mcmanus 2007). This objective led our study design; following positivist tradition of the theory induction (Eisenhardt 1989), we opted for theoretical

sampling (Glaser and Strauss 1967), choosing from the pool of service providers from the complex service sectors, such as transportation, aerospace and defense, IT and utilities. These complex service sectors have been already recognized as fertile ground for the occurrence of ecosystem-based service provision, innovation and value creation (Dougherty and Dunne 2011).

The extent research on providers of complex services and of complex product systems (Davies and Brady 2000) led to a realization that the services provided in these sectors can be divided between project-oriented and non project-oriented, or what we refer to as ‘repetitive’ services (Blindenbach-Driessen and van den Ende 2010). This distinction was important given that due to the complexity and be-spoke nature of the services provided, the former group was more likely to engage in collaboration with their customer and ecosystem than the later. Mindful about the external validity, we opted for 6 sectors with different degree of concentration of the client base and level of regulation. For example, sectors with 1 or 2 clients such as defense or highly regulated, such as transportation tended to be more client and project-oriented, while consulting and IT service had more clients and more repetitive and standardized services. The overview of the firms and their sector can be found in the Table 1.

INSERT TABLE 1 ABOUT HERE

To increase the construct validity of our research and develop measures for diverse array of sectors, we decided to choose two service providers from each sector. Hereby we strengthened replication logic (Yin, 1994) through pair-wise, cross case and within-sector comparison that followed within case analysis that distills relevant firm-specific data and preceded cross-case, cross-sector analysis to match the data and measures to the constructs.

Beside study of 12 firms we engaged in continuous dialogue with two companies from the opposite poles of the project orientation spectrum (Yin 1994). This step was used to assure the necessary read across from the research questions stipulated in the academic jargon to the practitioner jargon and, hence, in our view the crucial step to improve internal validity. Quarterly workshops and availability of the top and middle managers on weekly basis throughout the 18 months study helped us to increase reliability and manage the pressure that the choice of 12 companies on the resources. As will be discussed at length in the following section, strong theoretical milestones and continuous dialogue with the two firms helped us achieved theoretical saturation after three cycles of data collection and analysis (Glaser and Strauss 1967).

Research process: data collection and analysis.

At the onset of the analysis, we designed our data collection instruments through triangulation of the theory and inputs from academics and industry. After the review of the relevant literature streams, we organized a workshop with five middle and top managers from the two aforementioned firms and five academics with expertise in different relevant areas and based in different schools. This event proved useful in understanding practitioner jargon and it helped with the design of the study protocol and the data collection tools, including questionnaire that was then subjected to scrutiny of wider audience of practitioners and academics as well.

We used multiple sources of data to obtain well-grounded dataset. We started from the collection of the archival data. A research assistant was given a task of collecting the basic data on the company based on the secondary data after which the research assistant and the principal investigator made an attempt to construct the narrative on the ecosystem and company from the secondary sources. This first analytical attempt was formalized in a power point document that was structured around data on company and data on the ecosystem. Second round of data collection proceeded with interviews with one top manager followed by

an interview with one middle manager. Interviews were based on the semi-structured questionnaire that consisted from two parts: first we asked open-ended question on the firm's business, ecosystem, and the role that the firm has in its ecosystem and how the business, ecosystem and the firm's role evolved. In the second round we asked "what" questions to understand the nature of the firms' transactions with both sides of the ecosystems and how these transactions have changed. For more project-oriented firms, we focused on the business as a whole, while for firms with repetitive services we focused on a handful of representative cases. Finally, we asked the "why" and "how" to understand the motivation between the changes in the transactions, how these transactions were interrelated and to infer about the capabilities that underpinned the changes.

As the data collection involved certain level of retrospection, we encouraged our interviewees to focus on the events and dates (Faems et al. 2008) and we relied on the archival data collected from the external sources to increase factuality and reliability of the data. Triangulation between the data collection and analysis unfolded by researchers individually listening to the recordings individually, taking notes based on their observations. In a subsequent meeting, individual versions were confronted and the within case analysis was completed (Eisenhardt 1989). Activity maps of the ecosystem with changing business, ecosystem and their relationship over time reported by the respondents and corroborated by the data were the result of this step to help us visualize the transition (Huberman and Miles 1983). At the same time, we created rich, descriptive narratives for each case to capture more 'soft data'. In the process of within case analysis, we organized workshops that congregated respondents from the researched firms, with the intention to verify the interpretation of the changes that occurred in the ecosystem with respect to their firms role, as well as the underlying dynamics and relationships.

Patterns that started to emerge during the discussions at the last "within-case" workshops represented a valuable input in the cross-case analysis (Eisenhardt 1989). First group of patterns consisted of distinctions between single service and service portfolio, ad hoc

services, service relationships and service with different levels of performance guarantees. Respondents predominantly described these patterns as the dimensions of a service provider's "value propositions". Second group of patterns consisted of distinctions between 'core competence', valuable peripheral services and commoditized peripheral service activities; service activities provided internally, in partnership and outsourced. These data patterns were associated with the so-called "service delivery-" or "value delivery system". While the changes in these patterns or dimensions were relatively straightforward to interpret and connect to extent literature, the consequences and skills associated with these changes were less obvious.

At this stage, researchers felt ready to interpret the data and connect them to the pre-chosen constructs making their way towards answering the research questions. Using the process of tabulation and translating rich stories and activity maps to the data table (Huberman and Miles 1983), led the first two propositions. Through the process of the development of a single construct from multiple indicators (Eisenhardt 1989) we have concluded that the different patterns of "value proposition" all correspond to the modes of transaction changes with the stakeholders on the demand or customer-side of the ecosystem. Similarly, different patterns of "value delivery system change" were perceived as the modes of the transaction changes with the supply side of the ecosystem.

While fitting well with the data held in the activity system maps, the changes of scope of the two sets of transactions were insufficient to tell the complete "stories" of service providers that we have constructed based on what the respondents told us. Data underscored the need for system-wide perspective on the transactions that cover the supply-side and the customer-side and confirmed that these systemic changes in the transactions had more profound, salient, implications on the role of the firm and the capability requirements. This led to one additional reiteration between the (regrouped) data and refined perspective on new (dynamic) capabilities that are required as the role of the firm changes due to systemic changes of the transactions on both sides of the ecosystem.

RESEARCH FINDINGS

Transactions on both sides of the ecosystem

When asked to describe their ecosystem and the changing role of their firm, most respondents would naturally distinguish between the demand / customer-side of the ecosystem and the supply-side of the ecosystem. In relations to the customer-side of the ecosystem, respondents would talk about the main customers and her business models, intermediaries, regulators, and any other stakeholder that influence firm's changes to "value proposition" that we interpreted as transactions with the customer. In relation to the input side or the supply side of the ecosystem, respondents emphasized the changing nature of the "value delivery system" that we interpreted as transactions with the suppliers and partners regarding the activities necessary to deliver the services to the customer. After describing their ecosystem, respondents would give a series of statements that describe the characteristics of the transactions and how they have changed. After the analysis of the data, we have distilled the *direction* and the *mode* of the changes of transactions for each of the ecosystem sides. Finally, after the questions have been raised, interdependencies between the changes of the two sets of transactions, as well as the implication that the service provider's role in the value creation and capabilities would emerge. The data, hence, lent itself well to be structured in the following areas:

- Direction and modes of changes of transactions with ecosystem. In particular of the:
 - Transactions with the customer-side of ecosystem
 - Transactions with the supply-side of the ecosystem
- Nature of changes to the focal firm's role as the result of the changes in transactions on both sides of the ecosystem and the emerging capability requirement.

The Table 2 lists the most representative examples and quotes associated with each of the three areas of findings.

INSERT TABLE 2 ABOUT HERE

Extending the transaction with the ecosystem

Direction and mode of transaction changes with the customer-side of ecosystem

The data suggested a high level of congruence among the twelve service providers with respect to the direction of the change of the transactions with the customer side of the ecosystem: all service providers, regardless of the type of the service sector, have been consciously attempting to extend the scope of the transactions with their customers.

The extension of the scope has been motivated by growth opportunities for the service providers, but also by the ability to reconfigure the transactions towards the better fit with the customer's activity system. This imperative was by all service providers superimposed to the imperative of the fit with the service provider's own activity system. For example, in order to maximize the coverage of customer's functional need, or provision of a comprehensive system of all functionally related elements from the perspective of customer's activity system, a warehousing service provider we studied has gradually evolved towards the provision of a suite of 24 supply chain services, including warehousing, transportation, procurement, purchasing. These services were all related from the customer's use perspective, but not from the perspective of the activities associated with the provision of these services. The extension of the scope was clearly optimized towards the outcome achieved, maximizing the complementarities on the customer side, at the expense of costs associated with, what could be seen as, an unrelated diversification of the service offering.

This change in the priority of the optimization can be seen as a paradigm shift from configuring the transactions on the customer side according to the firm's (existing) activity system towards configuring the transactions with the customer towards the customer's

activity system. One of the respondents labeled this as a shift from thinking about ‘what service activities we provide’ to thinking about ‘outcomes that make sense from the perspective of customer’.

While the direction of the change of transactions was clearly uniform, there were a variety of modes associated with the extension of the transactions. After the examination of the sector-specific examples, three core modes of transaction changes started to emerge:

- Transaction scope (i.e. the scope of the services offered)
- Transaction timescale (i.e. length of the service agreements)
- Transaction nature (i.e. type of the promised performance attributes)

Some providers focused merely on the extension of the scope of the activities they offered or adding layer over layer of services. Earlier example of the service provider specializing in warehousing service that evolved into supply chain consultancy, which now offers a portfolio of 24 supply chain services lends itself well to illustrate this mode of expansion. Oftentimes, some of these ‘new activities’ for the provider represented the activities that have been offered internally by the customer before and, hence, represent a form of outsourcing relationship. For example, an aircraft provider that turned into a provider of through-life services for the aircraft maintenance would be taking over those activities from the customer who used to provide them in house.

Some providers went for the extension of the timescale of the transactions vouching to provide the activities that are needed over an extended period of time. For example, both train manufacturer and through-life support service providers we studied changed from maintenance of a train on ad-hoc basis (‘when customer calls’) to maintenance contract that spans more than 20 years.

Finally, data demonstrated that notable efforts by the providers to shift from providing services as activities or processes to guaranteeing the outcome of that service or the performance associated with the activities provided. In this case, the nature of the transactions

has notably shifted from merely providing service activities on ad-hoc basis without any performance attributes associated to guaranteeing the ability to provide that service and further on guaranteeing the provision of the service with certain quality attributes, on the way to guaranteeing the outcome of the provision. The providers of the aerospace and defense solutions were very active in this respect. For example, instead of providing engine maintenance, one provider started to guarantee the availability and reliability of the power by the hour with defined levels of availability and reliability of the engine.

The analysis of different examples of transaction extension showed also a certain level of the hierarchy among the three modes. The most sophisticated mode of transaction extension, the change in the nature of transaction, was driving the extension of the scope as well as timescale. In a similar manner, extension of timescale frequently would impose the extension of the scope.

Proposition 1. Motivated by growth but also by optimization of the transaction configuration towards the customer's activity system, service providers are extending their transactions with the customer side of the ecosystem by changing the scope, timescale or nature of their transactions or their combination.

Direction and mode of transaction changes with the supply-side of ecosystem

The direction of change in the transactions with the supply base demonstrated the same tendency as the transactions with the demand base: the twelve service providers we researched were experimenting with different modes of extending the scope of their transactions with the supply-base. While provoked by the changes of the customer-side transactions, changes of the supply-side transactions did not demonstrate the same purpose; instead of looking for a fit with the client's activity system, the purpose was to achieve the fit with the internal, service provider's activity system that tended to be distorted by changes in the configuration and extension of transactions on the customer-side. The extension of the

transaction scope towards service activities that the provider has no competencies for put pressure on the capability base, forcing the customer to source those capabilities externally. Referring back to the example of the supply chain provider, becoming accountable for the transportation services that he cannot competitively deliver created a competence gap and led to the alliances with transportation specialists.

While the extension of the transactions with the supply-side may have been initially triggered by the need to source “non-core” service activities, it also stimulated the extensions motivated by the innovation opportunities that the extension of transactions on customer side opened. For example, as a supply chain consultancy we investigated became responsible for the state of the inventory over the extended period of time (as opposed to just performing the activities related to inventory management), they entered in partnership with a software developer to develop a be-spoke tool for optimizing the inventory levels of their clients.

The analysis of different examples showed that different modes of expansions offered different types of innovation potential. Firstly, extension of the scope of transactions was associated with economies of scale or scope in the activity system. For example road maintenance service provider turned provider of council support services, including waste management, installed cameras on their waste management trucks to monitor the state of the road and preempt creation of road bumps. Secondly, extension of the timescale was associated with the specialized investments in assets and system to improve the service provision, that wouldn't be possible in the context of ad-hoc services. The earlier example on the system for inventory management is the illustration for this. Thirdly, the extension in the guaranteed performance attributes offered an opportunity to fundamentally redesign the activity system and transactions. For example, becoming responsible for the availability and reliability of the trains made train service providers to extend the timescale of their transactions with their key suppliers as well as create new agreements with the financial services to finance the leasing of the trains.

The interviews corroborated two main modes of the extension of transactions with the supply-side of the ecosystem, already well covered by the extant literature: partnering and outsourcing (Gulati et al. 2012). On one side, service providers were likely to liaise with the ecosystem partners to offer complex activities that are far away/ disconnected from provider's core activities and competences. For example, water utility partnered with construction expert firms on design and delivery of complex water containers, while supply chain consultancy partnered with a software designer to develop state of the art software for supply chain and logistics. On the other side, service providers were likely to outsource simple service activities to more competitive markets in order to leverage competitive forces in other parts of the value chain. For example, facility maintenance provider outsources cleaning services, logistics service provider outsources transportation, and train manufacturer outsources painting, logistic providers outsource transportation.

Proposition 2. Motivated by the activity system misfit triggered by the expansion of the customer-side transactions but also by innovation opportunities that the broader customer transactions offer, service providers are increasingly extending their transactions with the supply side of the ecosystem by engaging in partnering or outsourcing relationships.

4.3 Implications of the transaction extensions

To summarize, the findings suggest that the extension of the transactions on the customer size triggers the extension of the transactions on the supply side. As we will argue in this section, this process on one side leads to acquisition of higher levels of accountability from the customer to the service provider that then triggers a value creation to be coordinated by the service provider, but provided by the supply side the ecosystem, where even customer himself may play a role.

Changing role of the firm in the ecosystem driven business model

Providers of complex services seem to be unanimous in their tendency to extend the scope of the transaction of both sides of the ecosystem, customer as well as supply. Moreover, these two processes do not happen in isolation: somewhat counterintuitive, the trend seems to be for the “simultaneous extension of transactions demand and supply side of the ecosystem”, as the extension of the transaction on the customer side triggers transaction expansion on the supply side. Furthermore the interactions happen on the level of individual modes of the transactions. To start with, different modes of the transaction expansion on the customer side interact amongst themselves, then each triggers the transactions with the partners and/or suppliers.

The question to be posited then is: what is the implication of the simultaneous transaction expansions on both sides of the ecosystem? To start with, the data corroborates that the complex service providers are indeed increasingly playing the role of the orchestrator of the value creation process (Teece 2007) as the transactions simultaneously extend. Indeed, respondents have confirmed the need for capabilities that have been already identified by the extant literature on the inter-organizational relationships, such as the need to manage relationships by means of contract and trust (Faems et al. 2008) on both sides of the ecosystem or coordinate in real time (Brady and Davies 2004; Hobday et al. 2005).

Nevertheless, closer analysis of the reported data suggested that these capabilities are needed, but not sufficient and that the role of the complex service providers is increasingly connected to assessing and manage the risk exposure. The increasing need to manage risk starts from the tendency to become *accountable* for the provision growing number of service activities and then even their outcomes over longer periods of time. Given the interaction between the transactions on the customer side and the supply side, the risk is not entirely contained and managed within one company and extends beyond firm boundaries into the supply-side of the ecosystem. For example, a train solution provider becoming responsible for the availability of a certain number of trains on the daily basis faces the risks associated not only with the

provision of trains, provision of maintenance of the train, but also the quality of the cleaning services provided by a specialized cleaning service provider. Given that the risk seem to initiate by rising accountability that results from the expansion of the transactions on the customer side and continues to spread as the transactions on the supply side continues to expand, we label this phenomenon *accountability spread*.

Nature and forms of the risk within the accountability spread

Our respondents have identified different forms of risks associated either with their ability to provide the service (value creation) or their ability to retain value from the provision of the service (value capture). Risk associated with the ability to deliver agreed upon service activities has been labeled ***operational risk***. For example, even a simple equipment maintenance, obliged service provider to have access to specialized resources (e.g. skilled mechanics or spare parts).

Furthermore, the delivery of the agreed upon service activities and outcomes that span longer time period were subject to the changing economic conditions and general uncertainty, which we label as ***dynamic risk***. For example, for the services that span longer period of time, the factors such as risks associated with the fluctuations of the financial markets may change the conditions for the service provider.

Retention of ownership of the asset in a form of the leasing agreements has resulted in the appearance of the ***financial risk***. For example, the train manufacturers that started to offer trains as a service charged on ‘per day’ basis instead of selling the train faced the risk of miscalculation of residual value (e.g. in the car markets in US, a trend to lease resulted in systematic under-pricing of leasing agreements, leaving manufacturers-car owners with worthless assets).

Financial risk can be in fact seen as a special type of the group of risks that we label as ***performance risks***. As their name implies, performance risks are associated with the

guarantee of the certain level of performance, such as availability, reliability, energy efficiency, and quality of the output associated with the delivery of the service. When supply change consultancy changed from provision of warehousing activities, which constitutes service as a process, to guarantee inventory levels with guaranteed level of goods availability, which constitutes service as an outcome, they inevitably embraced performance risk(s). The inability to meet the agreed upon performance targets implies penalties that can easily change service from profitable to unprofitable. For example, at the onset of the service provision, one of the train service providers faced thousands of pounds of penalties on daily basis due to the failure to make available the right number of trains each day.

Closer look at the services suggests that each group of risks appears with the mode of transaction: operational risk appears already with the expansion of the scope of service activities (e.g. risks of delivery of non-traditional services may be quite high as well as the risk of effective coordination among different services). Dynamic risk appears as the transaction timescale expands beyond ad-hoc service delivery. Performance and financial risks appear with the change in the transaction nature from service activities to service outcomes. Finally the risks are likely to compound and are subject to the similar hierarchy as transactions on the customer side; for example, a performance-based contract that triggers the appearance of the performance risk is likely to imply dynamic risk as well as the operational risk.

Besides the four types of risks associated with the change of transactions on the customer side, the extension of the transactions on the supply-side may make the service provider more vulnerable to the operational, dynamic, financial and performance risks brought by partners and suppliers that we will jointly label as *partner risk*. For example, guaranteeing the availability of the trains from earlier example became even more risky for the train solution provider, when his level of train availability became conditional upon the ability of his partner, the train depot developers to finalize a new depot on time.

Finally, redrawing the firm boundaries through the change of transactions on both sides can also triggers more salient, organizational types of risk, such as the *risk of the incentive distortion*. For example, client, a train operator for example, might be less interested in the wear and tear of the train, if the train designer is responsible for through-life provision of a functional train. Furthermore, a lack of incentives may also come from the ecosystem participants that provider does not directly relate to. In another rail example, the train manufacturer that commits to a train delivery within a certain timeframe may find him held back by the infrastructure operator that assigns the times for testing of new trains.

Proposition 3. Simultaneous extension of the transactions on the customer side and the supply side, results in rising accountability towards customer combined with a shift of the locus of the value creation from the service provider to the ecosystem, giving rise to the accumulation of the multitude of different yet interrelated types of risks on the side of service provider that we jointly label *accountability spread*.

Capabilities underpinning the new role of a firm: focus on accountability spread

A number of capabilities, such as the capability to forge the transactions, to manage the relationships through formal and informal mechanisms as well as to coordinate the transactions had a clear impact on the firm performance, but didn't seem to be unique to the simultaneous transaction extension and have been already well established by the literature. A more salient capability, pertinent to the simultaneous capability extension that has started to emerge was closely related to the management of the accountability spread.

While the trend to simultaneously extend transactions on both sides of the ecosystem, increasing accountability spread and shifting the locus of value creation towards the ecosystem has persisted across all firms we have studied, respondents reported varying degree of capabilities and accountability spread in particular. For example, one of the informants reported that his firm uses structured engineering process to calibrate solutions that they offer

and guarantees they are about to offer. Risk is not taken unless it is commercially viable to take the risk. On the other hand, one of the informants reported that his firm has suffered substantial profit loss by guaranteeing performance levels that turn out to be unattainable, mainly because of the unreliable supply chain.

These and a number of other examples led us to derive routines that may constitute capability to manage the accountability spread. Firstly, it seems that provider needs to understand well the implications of the extension of transactions with the customer and the risks associated with promising different service activities and attributes; in similar fashion he needs to identify risks associated with handing over certain service activities to the suppliers and partners on the supply side of the ecosystem. For example, in some cases respondents that we have interviewed would be able to talk very explicitly about the characteristics of their transactions and their implications, while in the other cases the intention to please the customer and forge the relationship with them at any expense would prevail over even the interest to understand the risks associated. Second, the ability to measure the risk exposure was different across organizations. Some firms were investing in information technology and instruments, such as sensors or RFID tags, to have a better ability to assess and anticipate risk, while others would be relying on their 'gut feeling'. Thirdly, some but not all respondents would talk about their efforts to stipulate the risks in the contracts and price them. Some would go as far as to understand the risks associated with customer's involvement in the activity system and would start to counter the cultural resistance and assigned penalties for the clients when their part of the activities wouldn't be delivered.

Proposition 4. Capability to manage the accountability spread represents the capacity to understand the associated risk factors and properly protect against them through pricing mechanism or mechanisms for risk transfer or sharing. As a firm simultaneously expands the transactions with both sides of the ecosystem, thereby expanding the level of its accountability and changing the locus of value creation from the firm to the ecosystem, this ability starts to represent one of the crucial dynamic capabilities of a firm.

CONCLUSION

The objective of our study was to extend the milestones of dynamic capabilities framework towards the ability of a firm to manage the value creation on the level of the ecosystem. This aspiration was consistent with the definition of dynamic capability itself (Teece 2007) as well as the recent trend in the economy for the value creation to exceed the boundaries of one firm and exist on the level of ecosystem of organizations (Gulati et al. 2012).

We found the underpinnings for our research in the inter-organizational relationship literature and the dynamic capabilities that underpin inter-organizational relationships in particular. This literature has been evolving from the extensive focus on the different forms of individual dyadic relationships on the supply side (e.g. alliances, joint ventures) and the underpinning capabilities (e.g.), towards the interest in the firm-wide perspective on different types of relationships (Parmigiani and Rivera-Santos 2011; Wassmer 2010) and the underlying capabilities (Capron and Mitchell 2009). What remained the gap in the literature, it seems was the relevance of the changing relationships with the customers that became the focus of inter-firm relationships in specific functional areas, such as innovation and marketing.

Using the business model that represents a design of firm-wide transactions on both sides of the ecosystem as the research construct, we have collected and examined data on 12 service providers to understand how these firms change their transactions with their ecosystem, how the changes of the transactions interact and what implication this has on the focal firm and its role and required capabilities. We found that all service providers we studied exhibited simultaneous extensions of their transactions with both sides of the ecosystem. Motivated by attaining profitable growth and customer satisfaction, the firms started by extending their transactions with the customer-side of the ecosystem through three typical modes: extension of scope, timescale and change of nature of transactions from activities to outcomes. As the desired objectives required for service provider to make conscious choice to prioritize the fit of transactions with the customer's activity system over his own, the new service activities

were oftentimes related from the use perspective, but not from the supply perspective. This process has triggered a need to extend the transactions with the suppliers and partners on the supply side of the ecosystem, as the firms either lacked the capabilities to provide sets of unrelated service activities within their own boundaries or the broadening of the scope of transactions on the customer side opened up the opportunity to innovate.

Simultaneous extension of the transactions led to the increase in the accountability on the customer-side of the ecosystem, while at the same time shifting the locus of the value creation from the service provider to the ecosystem. This process, in turn, led to the increase of different risk types that we have jointly labeled accountability spread. Given the change of the firm's key role from 'doing' the activities to managing the risk associated with the activities, we argue that the capability to manage accountability spread, characterized by the ability to identify, measure and manage different types of risk, represents a core dynamic capability in this context.

We anticipate that our findings contribute to the literature in several ways. Firstly, we hope to contribute to the inter-organizational relationship literature, by identifying the need to consider jointly transactions on the supply-side and the customer-side and by explaining the process by which firm moves from the firm-level value creation towards the ecosystem-level value creation. In doing so, we find support for the Gulati's (2012) argument that the ecosystem, or in this case meta-organizational form is coined in and orchestrated by one focal firm. This is very much in line with Teece (2007) argument that the role of a firm, through its dynamic capabilities, is to orchestrate the ecosystem. Thus, secondly, we also hope to provide contribution to the dynamic capabilities view by substantiating this claim and by identifying how firms change from relying more on the internal capabilities towards the dynamic capability that manage the capabilities necessary for the value creation on the level of the ecosystem. Furthermore, we propose core dynamic capability, the capability to manage accountability spread, which becomes key enabler to successfully accomplish this shift.

We also believe to contribute to the emerging literature on business models in several ways. First, our findings confirm the relevance of transactions as the building block of the business model construct (Zott and Amit 2007, 2008), but also the relevance of the distinction between the customer side and the supply side that can be seen as, respectively, value proposition and value delivery system, which represent the core building blocks of the second most prevalent definition (Teece 2010). Second, our findings that suggests how a business model switches from closed to open in the case of (established) service providers complement existing literature on business models that has been largely based on the smaller entrepreneurial firms and emphasized novelty and efficiency design themes. Finally, we connect the business model construct with the dynamic capabilities theory; the connection to theoretical underpinning has been identified as one of the key needs for the development of the business models field.

We also see several avenues for future research:

- While we have aspired to put the milestones for the capabilities required for the ecosystem level value creation, the process and capabilities required to make the switch can be better documented.
- Capability for managing accountability spread can be better documented and its impact on the firm performance should also formally tested in a quantitative manner.
- Capabilities associated with different modes of the transactions, their nature, interrelations and hierarchies should be document more in depth. For example, the extension of the timescale of the transaction, the nature of the interaction can be seen as changing from the transactional to the relational, leading to the higher proximity of both organizations. It would be interesting to study the implication for innovation in this context.
- Service providers differed in their strategies on how to approach the hierarchy of the transactions on the customer side. Some started from the extension of scope moving gradually towards changing in timescale and nature of the transactions, while others directly targeted

the change in the nature of the transactions and immediately incorporated the changes in the scope and timescale. Is one preferred over the other?

- It would be instructive to elaborate on the difference between partnering and outsourcing, as two alternative governance mechanisms or more specifically styles of transacting. According to the respondents, outsourcing relationships presume a more client-provider relationship with transactional governance mechanism and strong notion of price negotiation. Partnering, on the other hand, assumes more relational posture of the provider, whereby provider looks to develop a relationship with the other ecosystem partner.

- The lack of capabilities to manage different transactions with the ecosystem may limit provider's ability to grow and become more profitable, but they do not represent a particular hazard to its existence. The capability to manage accountability spread and ecosystem exposure is particularly important because the effects of negligence may appear with significant time lags- the situation that lends itself well to the organizational inability to bind risk-taking behavior with its consequences and penalize reckless risk-takers. Hence, how does an organization manage accountability spread over extended periods of time?

- Our research focuses on the service organizations, it would be interesting to have comparable findings on the accountability spread from the pure product providers.

Finally, these findings may offer somewhat counterintuitive insights for the theoretical development: dynamic capabilities view has been predominantly considered to be a (dynamic) extension of the resource based view of the firm. However, our findings may suggest that as firm changes the locus of the value creation more to the ecosystem level, by practicing dynamic capabilities, the importance of the firm (non-dynamic) capabilities on the firm performance lessens, given that the ecosystem becomes an alternative for the provision of different capabilities. This would suggest that the dynamic capabilities perspective represents a quantum leap and not merely a linear extension of the resource based view. We hope that this inspires colleagues to future research on this topic.

REFERENCE LIST

- Amit, R., P.J.H. Schoemaker. 1993. Strategic Assets and Organizational Rent. *Strategic Management Journal* **14**(1) 33-46.
- Amit, R., C. Zott. 2001. Value Creation in E-business. *Strategic Management Journal* **22**(6-7) 493-520.
- Augier, M., D.J. Teece. 2009. Dynamic Capabilities and the Role of Managers in Business Strategy and Economic Performance. *Organization Science* **20**(2) 410-421.
- Baldwin, C., E. von Hippel. 2011. Modeling a Paradigm Shift: From Producer Innovation to User and Open Collaborative Innovation. *Organization Science* **22**(6) 1399-1417.
- Barreto, I. 2010. Dynamic Capabilities: A Review of Past Research and an Agenda for the Future. *Journal of Management* **36**(1) 256-280.
- Benson, D., R.H. Ziedonis. 2009. Corporate Venture Capital as a Window on New Technologies: Implications for the Performance of Corporate Investors When Acquiring Startups. *Organization Science* **20**(2) 329-351.
- Blindenbach-Driessen, F., J. van den Ende. 2010. Innovation Management Practices Compared: The Example of Project-Based Firms. *Journal of Product Innovation Management* **27**(5) 705-724.
- Brady, T., A. Davies. 2004. Building project capabilities: From exploratory to exploitative learning. *Organization Studies* **25**(9) 1601-1621.
- Branzei, O., I. Vertinsky. 2006. Strategic pathways to product innovation capabilities in SMEs. *J Bus Venturing* **21**(1) 75-105.
- Capron, L., W. Mitchell. 2009. Selection Capability: How Capability Gaps and Internal Social Frictions Affect Internal and External Strategic Renewal. *Organization Science* **20**(2) 294-312.
- Chesbrough, H. 2010. Business Model Innovation: Opportunities and Barriers. *Long Range Planning* **43**(2-3) 354-363.
- Chesbrough, H., R.S. Rosenbloom. 2002. The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change* **11**(3) 529-555.
- Chesbrough, H.W., D.J. Teece. 1996. When is virtual virtuous? Organizing for innovation. *Harvard Business Review* **74**(1) 65-&.
- Davies, A., T. Brady. 2000. Organisational capabilities and learning in complex product systems: towards repeatable solutions. *Research Policy* **29**(7-8) 931-953.
- Dougherty, D., D.D. Dunne. 2011. Organizing Ecologies of Complex Innovation. *Organization Science* **22**(5) 1214-1223.
- Edmondson, A.C., S.E. Mcmanus. 2007. Methodological fit in management field research. *Academy of Management Review* **32**(4) 1155-1179.
- Eisenhardt, K.M. 1989. Building Theories from Case-Study Research. *Academy of Management Review* **14**(4) 532-550.
- Eisenhardt, K.M., J.A. Martin. 2000. Dynamic capabilities: What are they? *Strategic Management Journal* **21**(10-11) 1105-1121.
- Eisenmann, T., G. Parker, M. Van Alstyne. 2011. Platform envelopment. *Strategic Management Journal* **32**(12) 1270-1285.
- Faems, D., M. Janssens, A. Madhok, B. Van Looy. 2008. Toward an Integrative Perspective on Alliance Governance: Connecting Contract Design, Trust Dynamics, and Contract Application. *Academy of Management Journal* **51**(6) 1053-1078.
- Gulati, R. 1995. Social structure and alliance formation patterns: A longitudinal analysis. *Admin Sci Quart* **40**(4) 619-652.
- Gulati, R. 1998. Alliances and networks. *Strategic Management Journal* **19**(4) 293-317.
- Gulati, R., D. Kletter. 2005. Shrinking core, expanding periphery: The relational architecture of high-performing organizations. *California Management Review* **47**(3) 77-+.
- Gulati, R., P. Puranam, M. Tushman. 2012. Meta-organization design: Rethinking design in interorganizational and community contexts. *Strategic Management Journal* **33**(6) 571-586.

- Hobday, M., A. Davies, A. Prencipe. 2005. Systems integration: a core capability of the modern corporation. *Industrial and Corporate Change* **14**(6) 1109-1143.
- Huberman, A.M., M.B. Miles. 1983. Drawing Valid Meaning from Qualitative Data - Some Techniques of Data Reduction and Display. *Qual Quant* **17**(4) 281-339.
- Kale, P., J.H. Dyer, H. Singh. 2002. Alliance capability, stock market response, and long-term alliance success: The role of the alliance function. *Strategic Management Journal* **23**(8) 747-767.
- Mayer, K.J., N.S. Argyres. 2004. Learning to contract: Evidence from the personal computer industry. *Organization Science* **15**(4) 394-410.
- Parmigiani, A., M. Rivera-Santos. 2011. Clearing a Path Through the Forest: A Meta-Review of Interorganizational Relationships. *Journal of Management* **37**(4) 1108-1136.
- Puranam, P., H. Singh, S. Chaudhuri. 2009. Integrating Acquired Capabilities: When Structural Integration Is (Un)necessary. *Organization Science* **20**(2) 313-328.
- Rank, O.N., G.L. Robins, P.E. Pattison. 2010. Structural Logic of Intraorganizational Networks. *Organization Science* **21**(3) 745-764.
- Reuer, J.J., O. Shenkar, R. Ragozzino. 2004. Mitigating risk in international mergers and acquisitions: the role of contingent payouts. *J Int Bus Stud* **35**(1) 19-32.
- Santos, F.A., K.A. Eisenhardt. 2005. Organizational boundaries and theories of organization. *Organization Science* **16**(5) 491-508.
- Srikanth, K., P. Puranam. 2011. Integrating Distributed Work: Comparing Task Design, Communication, and Tacit Coordination Mechanisms. *Strategic Management Journal* **32**(8) 849-875.
- Teece, D., G. Pisano, A. Shuen. 1997. Dynamic Capabilities and Strategic Management. *Strategic Management Journal* **18**(7) 509-533.
- Teece, D.J. 2007. Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal* **28**(13) 1319-1350.
- Teece, D.J. 2010. Business Models, Business Strategy and Innovation. *Long Range Planning* **43**(2-3) 172-194.
- Vargo, S.L., R.F. Lusch. 2004. Evolving to a new dominant logic for marketing. *Journal of Marketing* **68**(1) 1-17.
- Wassmer, U. 2010. Alliance Portfolios: A Review and Research Agenda. *Journal of Management* **36**(1) 141-171.
- Zollo, M., H. Singh. 2004. Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in US bank mergers. *Strategic Management Journal* **25**(13) 1233-1256.
- Zott, C., R. Amit. 2007. Business model design and the performance of entrepreneurial firms. *Organization Science* **18**(2) 181-199.
- Zott, C., R. Amit. 2008. The fit between product market strategy and business model: Implications for firm performance. *Strategic Management Journal* **29**(1) 1-26.
- Zott, C., R. Amit. 2010. Business Model Design: An Activity System Perspective. *Long Range Planning* **43**(2-3) 216-226.
- Zott, C., R. Amit, L. Massa. 2011. The Business Model: Recent Developments and Future Research. *Journal of Management* **37**(4) 1019-1042.

TABLES

TABLE 1- Researched firms and their characteristics

Code	Ecosystem /client characteristics	Service provider characteristics
BTR	Rail ecosystem/ rail regulator & public	Train solution provider
HTR	Rail ecosystem/ rail regulator & public	Train solution provider
TST	Water utility/ water regulator & public	Water utility provider
STS	Energy & water utility/ regulators & public	Energy and water metering
MTG	Regional ecosystems (e.g. city councils)	Support services and outsourcing
VTF	Multiple ecosystems	Support services and outsourcing
BTT	Defense, UK Ministry of Defense	Defense solution provider
RTR	Defense, UK Ministry of Defense	Defense solution provider
ITB	Multiple ecosystems	Consulting, IT
SWT	Regional ecosystems (e.g. city councils)	Consulting, IT
NTS	Multiple ecosystems	Consulting, innovation
CTL	Multiple ecosystems	Consulting, supply chain

TABLE 2a- Research findings (1/2)

Code	Transactions on the demand side	Transactions on the supply side	Accountability spread
BTR	BTR evolves from one-time selling of trains to providing train product-service systems over 7 year period with defined standards of availability and reliability.	BTR partners with the sub-suppliers to be able to guarantee spare parts provision over 7 years period.	BTR takes operational risk of being able to design adequate trains and provide service, performance risk of making trains reliable and available to agreed standards and dynamic risks of estimating the uncertainty over 7 years period.
HTR	HTR evolves from selling of trains to providing train capabilities on the train-per-day base over 20 years, with defined standards of availability, reliability and energy efficiency.	HTR partners with the suppliers to be able to guarantee spare parts provision over 20 years period. HTR partners with the depot owners to obtain financial agreement for the train and depot (necessary for servicing) investments.	In addition to BTR's risk levels, HTR faces financial risk of retained train ownership (risk of money market conditions and residual train value under-estimate), performance risk of meeting the energy efficiency standard and dynamic risks of facing uncertainty over 20 years period.
TST	TST evolves from clean water provision 'till the doorstep' to the overall water network optimization to point of use (including sewages).	TST partners with construction engineering firms for development of complex water wells and with local sewage cleaners for efficient servicing of local sewages.	TST takes operational risk for the leakages of water infrastructure. TST takes ecosystem partner risk for quality of the sewage cleaning.
STS	STS evolves from offering a service of energy measurement, where the payment is based on the fee per energy 'reading' to real time energy data analytics with fee for the amount of high-quality data provided within a given timeframe.	STS partners with local hiring agencies to procure part-time blue-collar workforce for energy readings. SMS partners with IT service provider to develop IT platforms for energy data analytics.	In moving from 'pay per energy reading' to fixed pay for the amount of high-quality data within a timeframe, STS will take an operational risk of being able to provide data of high quality.
MTG	MTG evolved from highway construction services to the full-suit of support services for local authorities (e.g. infrastructure maintenance, recycling) together with the back office support activities over 4/5 years.	MTG partners with IT solutions provider to develop an IT platform to automate back office activities and develop data analytics services.	MTG faces operational risks of high span service provision against an agreed fix-priced deal. Performance risk against the agreed standards of service quality. Financial risk for investments in equipment for service provision and dynamic risk.
VTF	VTF evolves from providing ad-hoc maintenance and construction services to 30-year life care of buildings.	VTF partners with cleaning service providers to provide cost-competitive service and is looking to partner with construction services and property management services for developing broader solutions of building design-care-ownership.	VTF faces exposure to operational risk of providing complete suit of services for the building care, performance risk of service quality and energy efficiency, financial risk for mid-sized investments (e.g. heating) and dynamic risk over 30 year period.

TABLE 2b- Research findings (2/2)

Code	Transactions on the demand side	Transactions on the supply side	Accountability spread
BTT	BTT evolved for providing defense equipment to defense product-service systems with through-life support.	In order to provide through-life support BTT had to change the nature of the relationship with their key suppliers from supplier-customer to partnering relationship.	BTT faces exposure to the performance risk (availability and reliability) as well as performance risk of attaining a certain cost target and dynamic risk.
RTR	RTR evolved from providing defense equipment to providing defense capabilities.	RTR had to conceive alliance with 2 other partners to ensure provision of the novel defense platform through life.	RTR faces exposure to operational risk of delivering the capability as well as the exposure to partner's operational risk.
ITB	ITB evolves from manufacturing of IT equipment to providing IT infrastructure solutions (e.g. computing capacity) and data analytics solutions and service.	ITB partners with software developers to provide infrastructure and with academia to develop data analytic capabilities.	ITB takes the operational risk of functioning and availability of the IT infrastructure, the performance risk quality of the data provided, financial risk for the retaining of the infrastructure and dynamic risk of overtime provision.
SWT	SWT is set to provide service suit of IT support and administrative services to the regional councils against defined performance levels over 10 years	SWT seconds (sub-employs) clients' employees to work on the implementation of the IT & admin support solutions.	SWT faces operational risk to deliver the support solution within a fixed fee agreement, incentive risk of working with hires from client and ecosystem exposure to operational risks of partners (who is client in this case)
NTS	NTS evolves from screening innovation landscape to working with their clients to forge the alliances with the identified innovation partners.	NTS relies on their clients 'fair partnering' to create value in two-sided markets.	NTS relies on the success of the partnering to realize full gains (performance risk, as well as the operational risk).
CTL	CTL evolved from providing warehousing to providing suit of over 20 supply chain management services against performance targets.	CTL partners with the software developer and auditing consultancy to develop specialized software for supply chain management. CL partners with transportation providers to provide cost-competitive transportation service activities on their behalf.	CTL faces partnering risk, operational risk for provision of each of services, performance risk against agreed standards of performance (e.g. inventory level and availability).

