From process to promise: business model choices of complex service providers

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Abstract

While value creation and the capture of strategic choices regarding firm boundaries, such as ‘make’ versus ‘buy’ or different forms of collaboration, have been carefully studied on the individual level from one value-creating lens at a time, their interconnections and the overall ‘gestalt’ of firm transactions and activities are just starting to enter academic discourse through research on business models. Our research on the business model evolution of 12 complex service providers points to strong interconnectedness between boundary choices; all of the firms we studied engaged in the simultaneous extension of transactions on the demand/customer side and the supply/supplier-partner side. For example, a firm moved from providing one service on an ad-hoc basis to guaranteeing the outcome associated with a number of services; to deliver this outcome, it deepened relationships with suppliers and entered into new partnerships for complementary resources. Firms configured the transaction and activity nexus – the business model – to reap value on the demand side (e.g. customer’s economies of scope) as well as the supply side (e.g. resource complementarities and transaction efficiency). This value-creating spiral comes at a price though; by extending transactions on both sides, the firm extends its accountability for a (growing) solution, while loses control over its provision to the ecosystem. We argue that firms need to set their business models so as to balance this ‘accountability spread’ while maximizing enduring sources of value on the demand and supply sides.
INTRODUCTION

For decades, the strategic management field has diligently investigated how different strategic choices impact value creation and capture and, thus, the sustainable competitive advantage of firms. Scholarship has focused in particular on boundary choices (Santos 2005): the vertical and horizontal scope of activities and collaborations (transactions) with suppliers and partners along vertical and horizontal axes (Gulati et al. 2012, Jacobides and Billinger 2006). In doing so, authors have tended to make a thorough examination of one or two strategic choices at a time¹ (Parmigiani and Rivera-Santos 2011). This has led them to somewhat neglect the interrelationships between all the choices that a firm makes over a given period² (Teece 2010, Cassadesus-Masnel and Ricart 2010).

This lack of understanding of strategic ‘gestalt’ became very evident in the digital economy, where the number of simultaneous strategic choices made by companies, particularly entrepreneurial ones, increased dramatically (Teece 2010; Amit and Zott 2001). Academia responded by coining the ‘business model’ construct (Teece 2010) to fill this gap. While the precise definition is the subject of debate (Zott et al. 2011), the business model can be considered a template of strategic choices related to the firm activities and transactions, which describes the overarching logic of value creation and capture (for an overview, see Zott and Amit 2011). Hence, the business model can be seen as the template for firm boundary and collaboration choices.

The nascent business model field has been diligently defining typologies and exploring the relationships between specific strategies (Zott and Amit 2007, 2008). At the same time, focus on the actual design elements of the business model, their nature and change patterns (e.g. why a firm chooses to reconfigure choices and activities) was less profound. The business model literature has also suffered from the lack of theoretical underpinnings. The academic tendency to subscribe to one theoretical lens at a time may have contributed to this (Santos 2005); since a business model implies interrelationships between different strategic choices that can be underpinned by different theoretical rationales, the choice of a single theory becomes problematic. For instance, our understanding of the business model (and, broadly, value creation and capture) remains largely based on supply-side perspectives on value creation, such as

¹ For example, alliances have been one of the most well-researched collaboration types, examined by numerous contributions.
² Apart from a few notable exceptions (Teece 1986)
the resource-based view or transaction-cost economics, while neglecting perspectives from the demand side (customer) (Ye et al. 2012, Priem 2007).

This research inquiry is guided by the research question: **how do business-model design elements evolve, interrelate and create value in so doing.** We used a combination of theoretical perspectives on value creation, and we focused on the under-researched context of complex service providers such as utilities, transportation, engineering systems and defense (see Dougherty and Dunne (2011) for the definition) to answer this question. Not only have the firms in these sectors been widely neglected in the business model literature, but they provide a particularly appropriate research context since the complexity of their offering forces them to juggle a number of strategic choices at the same time (Davies et al. 2009, Dougherty and Dunne 2011).

The case study research we carried out on twelve organizations from six complex service sectors yielded surprisingly consistent patterns with respect to the use of business model elements and the logic of business model design. Results show that all twelve service providers, motivated by an increase in customer utility and economies of scope on the demand side, have been engaged in the “simultaneous extension of transactions on the demand and supply sides”.

Simultaneous extension begins with extending their transactions with customers, which then triggers the extension of the firm’s internal activity system and/or the transactions with suppliers and partners. For example, a train manufacturer turned train-solution provider extended its transactions from selling trains to providing seven-year train availability agreements, where customers simply enjoy train utility (the capacity to transport passengers) whilst the provider is responsible for the provision of that outcome (the availability and reliability of refurbished, maintained and clean trains at the designated location). To deliver this outcome, a train manufacturer expanded its activity system by providing maintenance activities in-house and extended transactions by fostering longer relationships with existing suppliers, and by forging new partnerships with depot constructors to construct appropriate depots and with banks to finance retained train ownership.

The value-creation logic that underpins the simultaneous extension of transactions stems from a direct increase in customer utility and demand-side economies of scope (Ye et al. 2012), and continues with competency and transaction-efficiency arguments.
(Santos 2005) that shape the choices concerning activity and transaction expansion on the supply side. In the aforementioned example, offering accountability for train availability over seven years increased economies of scope in purchasing (the one-stop-shop solution) and decreased risk exposure (guaranteed availability) for the customer. In doing so, the train provider realized internal economies of scope (between train manufacturing and train maintenance activities provided in-house), and it accessed complementary capabilities through partners (depot developers and banks).

Probably the most important finding of our research centers on the unintended consequences of business model innovation. Through the simultaneous extension of transactions, service providers embraced greater accountability concerning customer output, while relinquishing some control on the supply side by increasingly sourcing activities outside firm boundaries. These two shifts implied that the provider’s core role shifted from service activity delivery to accountability for customer’s utility, underpinned by orchestration of the activities within and across firm boundaries. For example, the train manufacturer began to guarantee more inclusive service outcomes and, at the same time, provide associated services increasingly outside firm boundaries and beyond its direct control. In sum, simultaneous extension of transactions created a virtuous cycle of value creation underpinned by multiple sources, but it also increased the uncertainty for the service provider, making the ability to balance the ‘accountability spread’ the core competence of the firm.

Our study directly contributes to the business model literature by showing how companies balance the value of expanding the transaction and activity system with the disadvantage of accompanying uncertainties. Thus, our study is the first to introduce the accountability spread as a central business model design element. In line with Amit and Zott (2001), our study also adds value by demonstrating the pivotal role of the business model construct in helping to connect distinct strategic choices.

Furthermore, we contribute to the literature on firm boundaries by exploring the less-understood interrelationship between various boundary choices (Parmigiani and Rivera-Santos 2011, Gulati et al. 2012). We build on Santos and Eisenhardt (2005) by jointly considering different sources of value and their synergistic power. In line with Ye et al. (2012), we demonstrate that demand-side and supply-side theories on value creation need to be considered jointly. We contrast the source of value in these choices with the uncertainties that they create, and we bring a new perspective to the logic of
boundary choices, which we refer to as ‘accountability spread balancing’. More specifically, we argue that organizational boundaries may be formed through consideration of the accountability that a firm wishes to adopt. This also suggests that a crucial role for management (Augier and Teece 2009) is to balance the demand-side/supply-side value potential with the accompanying accountability.

CONCEPTUAL DEVELOPMENT

Boundary choices as business model design elements

The underpinnings of sustainable competitive advantage (SCA) have been the focus of the strategic management field for decades (Barney 1991). SCA is a result of the value creation and capture that firms achieve through a number of strategic choices regarding the scope of their activities and transactions. Strategic choices related to the scope of activities and transactions – firm boundary choices – can be divided into choices concerning the horizontal scope (products/markets covered) and the vertical scope (industry value chain activities undertaken by the focal firm) (Santos 2005). Horizontal scope choices include different diversification options such as related/unrelated across-industry, intra-industry and inter-industry diversifications (Zahavi and Lavie Forthcoming, Ye et al. 2012). Collaborations, in the form of alliances or joint ventures, can be seen as the option that provides added nuance to the choice on the horizontal scope through expanding transactions with partners rather than extending internal activity (Parmigiani and Rivera-Santos 2011). Vertical scope has been traditionally seen as a ‘make-or-buy’ dichotomy (extending the internal activity scope or transactions through supplier outsourcing). Nevertheless, similar to the horizontal scope, a collaboration option ‘ally’ has been linked to this option space (Jacobides and Billinger 2006).

The literature has increasingly recognized that firms make multiple boundary and collaboration choices simultaneously. Authors have recently looked into the relationships between different types of diversification. For example, Tanriverdi and Lee (2008) have investigated how platform relatedness and product-market relatedness complement each other in the software industry. Piscitello (2004) has looked at the interrelationships between technological diversification choices and product-market diversification choices. The simultaneous occurrence of collaboration
and other transactional choices prompted academics to study the capabilities that underpin selection of the appropriate internal and external capability developments (Capron and Mitchell 2009).

While the academic literature has begun to realize that different boundaries and collaboration choices tend to be interconnected and occur in parallel, research on this interconnectedness remains limited. Studies are usually limited to two strategic choices and confined to one scope ‘family’ (Santos 2005); for example, the interrelationships between strategic choices related to the horizontal scope have been considered together but in isolation from the choices on the vertical scope and vice versa. Moreover, boundary choice literature related to the extension or the retraction of the firm’s internal activity system has evolved separately, for the most part, from the collaboration literature (Jacobides and Billinger 2006). Even within the collaboration literature, those contributions that explain how firms enter into transactions related to (horizontal) collaboration (in Gulati et al. 2012: e.g., Reuer 2004; Gulati 1995a, 1998, 2007) as well as (vertical) outsourcing (in Gulati et al. 2012: Gulati and Kletter 2005, Srikanth and Puranam 2010) have remained somewhat disconnected (Parmigiani and Rivera-Santos 2011).

The business model has emerged as a construct whose primary role is to capture this interconnectedness. Diverse definitions have produced inconsistencies but this has stimulated a rich discussion that has been favorable to the early stages of literature development (Zott et al. 2011). Nevertheless, the core characteristics of the business model seem to be consistent across the literature and can be viewed as a template describing a system of activities, transactions and choices that are instrumental for a firm’s value creation and value capture. Thus, the business model is concerned with the system of elements rather than any of the elements per se. Finally, these elements may or may not be within firm boundaries; the business model encompasses the focal firm as well as its ecosystem, with the purpose of making inferences about the value creation and capture of the firm.

In relation to the nature of the elements, the business model literature is still in flux. The business model entered the organizational theory dialog as a construct that characterizes external organizational design as a system of transactions with the external environment (Zott and Amit, 2007, 2008). In a more recent contribution, Zott and Amit (2010) extend the conceptualization of the business model as the activity
system that exceeds the boundaries of a single firm. Given that the collaborations (transactions with the environment) are increasingly seen as an alternative to extending the scope of the firm’s internal activity system, one could argue that the transaction and activity perspectives are not at odds but are highly complementary. Transactions could be seen as particular types of activity, which represent the ‘connective tissue’ between the firm and its environment. Finally, Cassedesus-Masnel and Ricart (2010) point out that the business model can be seen as a set of choices and consequences that a firm faces, emphasizing the importance of understanding the logic of these choices.

Some other studies offer an alternative view on the design elements of the business model. A number of studies, with some degree of variation, see business models as a combination of the value proposition, value capture (or the revenue model) and value delivery (Teece 2010). The value proposition can be interpreted as the value that customers derive from the offering that a firm presents to its client(s) (Chesbrough 2010). Value capture or the ‘revenue model’ represents a mechanism that a firm uses to appropriate value from this offering (e.g. a price, annuity) while value delivery represents the 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, pp. 533-534). Again, these contributions are not necessarily in conflict but merely represent a particular grouping of activities and transactions with respect to whether they are facing the client/demand side or the delivery/supply side.

All definitions of the business model seem to emphasize the fact that the business model represents a firm’s ‘architecture’, ‘template’ or ‘logic’ for value creation and capture that occurs beyond the boundaries of a single firm. While a group of authors presents the design elements or ‘building blocks’ of the business model in terms of transactions, activities and choices, others emphasize that a business model has a customer demand or output side (value proposition and revenue model) as well as a supply or input side (value delivery).

Combining these perspectives, one may consider the business model as the template of choices concerning the activities and transactions on the demand/customer and supply/partner sides of the ecosystem that jointly shape the value creation and
capture logic of the focal firm. Indeed, when juxtaposed with the firm boundary literature, the business model can be seen as a template of choices regarding the horizontal and vertical scope of activities and transactions with the ecosystem on both the horizontal and vertical axes.

**Sources of value creation as underpinnings of business model design**

Strategic choices related to firm boundaries and collaborations have been explained by a number of theories. Vertical boundary choices, when examined by transaction-cost economics, were seen as a consequence of transaction efficiency (Williamson 1975, 1981). Conversely, studies relying on competency perspectives, such as the resource-based view, the knowledge-based view or the dynamic capabilities perspective, would argue that firms extend the vertical boundary scope and enter into collaborations when the resources are related to their competencies. Horizontal scope choices, such as differentiation, have relied strongly on the competency argument. Collaboration choices have been a subject of interest to transaction-cost economics (TCE) and other exchange-based perspectives (Poppo and Zenger 1998, Nickerson and Silverman 2003) as well as to the resource-based view (RBV) and associated perspectives (Parmigiani and Rivera-Santos 2011).

Each theory advanced a particular source or logic of value creation that it argued would prompt the choice in question (Santos 2005). Governance cost efficiency has been the central source of value motivating decisions on the vertical scope (Coase 1960). Market transaction costs versus firm coordination costs have been seen as two governance-related costs that need to be balanced by means of the boundary scope (Williamson 1981). Information asymmetry costs such as the difficulty in assessing the quality of loans (Jacobides and Hitt 2005) have been seen as another variable in efficiency-motivated boundary choices. Economies of scope and scale, derived from the competency view, entered the literature on the vertical scope more recently and focused on the choice of boundaries in order to maximize the firm’s resource portfolio (Santos 2005). For example, Argyres (1996) showed how resource relatedness determines the vertical scope of industry component manufacturers.

Economies of scope and scale have been the central sources of value explaining the strategic choices related to the horizontal scope, such as related cross-industry diversification and intra-industry diversification. For example, Helfat (1997) showed
how the relatedness of R&D resources explains diversification activities in the petroleum industry. Collaboration choices have benefited from all the aforementioned sources of value. In line with the efficiency perspective, collaborations— as opposed to internalization or market transactions – have been used when they offered the most efficient governance form to ensure complementary assets or align incentives (Geyskens et al. 2006, Williamson 1991). From the competency perspective, firms will enter collaborations in order to ensure new resources, along with internal development, external procurement, and full acquisition (Rivera-Santos & Inkpen 2009).

Recently, it has been noted that most of these perspectives and sources of value are supply-sided; they see value creation exclusively from the perspective of the firm and its suppliers and partners whereas the perspective of the customer is neglected (Ye et al. 2012). More recent literature on diversification – and inter-industry diversification, in particular – highlights the demand-side sources of value, such as demand-based economies of scope and direct and indirect network effects. For example, Ye et al. (2012) find that combinations of ordinary assets – such as gas stations and grocery stores – can create superior customer utility when bundled. This superior value has been attributed to the increase in economies of scope on the customer side that is materialized through the reduced time that a customer invests in acquiring these assets; instead of investing time in each acquisition separately, she can halve that cost by purchasing groceries at the gas station as well as gas.

The literature on boundary choices has been focusing on the single value logic and one theoretical perspective at a time. Recently, some authors have begun to recognize the incompleteness of this approach. For example, Jacobides and Billinger (2006) have noted that firms tend to engage in extension of the vertical scope – ‘make’ – and outsourcing – ‘buy’ – simultaneously. They see this approach as a form of collaboration – ‘ally’ – aimed at stimulating competition between the internal and external sources. Considering boundary choices in general, Santos and Eisenheardt (2005) have shown several examples of how multiple theoretical perspectives can be synergetic in explaining a single strategic choice. For example, they show how firms follow the resource-based rationale to extend the vertical scope, and then the efficiency rationale to outsource parts of these activities (Santos 2003, Jacobides 2005). While these studies represent examples where multiple theoretical logics were considered for one strategic choice, we still lack examples of studies where multiple theoretical logics are jointly considered for multiple strategic choices.
Amit and Zott’s early work represents an important step in this direction. Amit and Zott (2001) outlined five major theoretical perspectives, all of them necessary to explain the sources of value that underpin the business model choices of E-businesses. Cassadesus-Masneix and Ricart (2010) see diverse sources of value as a major driver of business model choices, but little further work in this area has appeared to date.

As the business model design, and its underpinning choices concerning transactions and activities, can be viewed as a template for the boundary choices of the firm, this lack of understanding of how a firm juggles multiple sources of value to make multiple boundary choices would appear to be the knowledge gap that unites both lines of literature. Thus, understanding the sources of value that firms consider in designing their business models is central to understanding the gestalt of value creation and capture and, thus, the sustainable competitive advantage of firms.

**Research questions**

In sum, our understanding of the firm’s boundary and collaboration choices has evolved considerably on the standalone basis of one choice at a time. The business model (BM) construct – a template of choices regarding activities and transactions on the demand and supply sides – has evolved to tackle the interdependencies between these choices, bringing all to the same common denominator. Furthermore, scholarship has concluded that the strategic choices concerning these activities and transactions may well be motivated by multiple sources of value. We know very little about how the choices and the sources of value that underpin them are inter-connected, which puts into question our understanding of the overarching logic of value creation. Thus, we formulate the following research questions to guide our research:

1) How do BM design elements (activities and transactions) on the demand side evolve?
2) How do BM design elements (activities and transactions) on the supply side evolve?
3) How are these developments interconnected and what sources of value underpin them?
RESEARCH METHODOLOGY

Research design

The objective of this study is to extend our understanding of the evolution of business model elements and accompanying value creation. Since we are seeking to contribute to different literature streams of intermediate maturity, our research can be seen as an attempt at theory building leading to new theoretical relations, constructs and measures (Edmondson and McManus 2007). Thus, we have used case study design (Eisenhardt 1989, Yin 1989). Following the positivist tradition of theory induction (Eisenhardt 1989), we opted for theoretical sampling (Glaser and Strauss 1967). We have selected firms that reported changes in their business models (Amit and Zott 2001, Zott and Amit 2007, 2008).

Sample. We focused on complex service providers, as these companies have been known to make several strategic choices simultaneously, due to the complexity of their offerings (Davies and Brady 2000, Davies et al. 2009, Dougherty and Dunne 2011). All firms were mid-sized, not too large to allow us to obtain access to people who occupy senior management roles and, hence, are involved in making strategic choices and designing the business model but, at the same time, have a good understanding of business model implantation.

We made a balanced selection of providers of complex services, from those that are more project-oriented to those that are non-project oriented or, as we labeled them, providers of repetitive services. This decision has been motivated by the fact that extant research on integrated solutions (Davies and Brady 2000) and project-based organizations (Blindenbach-Driessen and van den Ende 2010) shows that, due to the complexity and the customized nature of the services provided, providers of project-based services are more likely to engage in intense collaboration with the ecosystem on the demand and supply sides than providers of repetitive services. To control for this potential bias, we chose from sectors with different degrees of concentration of the client base, which we could then use as an indicator to identify those providers inclined to the more customized and project-oriented approach. For example, firms with 1 or 2 clients such as defense or transportation solution providers tended to be more project-oriented, while consulting and IT service providers had hundreds of clients and more standardized and repetitive services.
To increase the construct validity of our research and develop measures for a diverse array of sectors, we decided to choose two service providers from each sector. Thus, we were able to strengthen replication logic (Yin 1989) since pair-wise comparison could be made within a sector resulting in the sector-specific measures, and then followed by across-sector comparison, producing the generalized measures. This has helped us to connect sector-specific insights to the generic constructs and formulate strong measures that can be generalized across sectors. Our sample of 12 was larger than recommended for reaching theoretical saturation (Glaser Glaser and Strauss 1967, Eisenhardt 1989), but this large sample enabled the detection of consistent patterns (Edmondson et al. 2001). This was particularly important since the data on the subject of interest was relatively easy to obtain even with secondary data (e.g. data on the scope of services and products is widely available) but it requires substantial cross-case analysis in order to detect the patterns that persist across sectors. Table 1 provides the case overview.

Data collection

To familiarize ourselves with the research subject and the context of complex service sectors, we organized a workshop with five middle/senior managers from two providers coming from opposite poles of the repetitive versus project-oriented services spectrum (Yin 1994) and five academics with expertise in various relevant areas and based in two top business schools in the USA and Europe. We hosted discussions regarding the research project with five additional academic experts in the area, as well as with five additional practitioners followed the workshop. A review of the relevant literature was performed in parallel. Based on notes from this stage, we designed the data collection instruments. We made sure that the research questions phrased in academic jargon were translated correctly into practitioner jargon.

We used the interview as a primary source of data, and secondary data as the secondary source, in order to assure a well-grounded dataset. We began with the collection of secondary source data on the firm’s product and service portfolio,
customers, suppliers and partners as well as on performance. A research assistant was given the task of collecting secondary data by performing a website search, an annual report search and a press search. Retrieved data was then structured to explain the company’s business model, the ecosystem that the company operates in and the relationships between the ecosystem and the company.

Data collection proceeded with interviews with company representatives using a semi-structured interview guide with prompts. Due to the strategic nature of the research questions, we expended a considerable amount of effort obtaining interviews with at least one representative of senior management. Interviews with other senior and middle managers who were recommended as appropriate contacts followed. On average, we performed more than two interviews per company, but we undertook additional interviews with large and complex service providers where it was more difficult to understand the company’s business model. Interviews typically lasted 90 minutes but ranged between 60 and 120 minutes. Interviews were based on the semi-structured questionnaire. We explained the concept of the business model – as defined in previous sections – to the interviewees in advance. We asked ‘what’ questions to elicit the nature of the firms’ transactions with both the demand and the supply sides and how these transactions had changed. We encouraged the interviewee to talk about the transactions with participants he had named earlier rather than to talk in general. After understanding each of the transactions, we asked the ‘why’ and ‘how’ questions to comprehend the motivation concerning the changes in transactions, to see how these transactions were interrelated, and to extrapolate the capabilities that underpinned those changes.

Data analysis

At this stage, researchers began the process of interpreting the data and making connections with the pre-chosen constructs stipulated in the research questions. Principal investigators began by analyzing the unstructured narratives with two approaches. The first step was to structure the narrative according to the three predefined main categories: transactions on the demand side and their evolution, transactions on the supply side and their evolution (including changes to the internal activity system), and the interrelationships between the two, along with the value creation (or destruction) sources. The second element was to design an ecosystem
activity map and to mark the transactions between the focal firm and the ecosystem participants, and their changes over time. An example of the ecosystem map is presented in the Figure 1.

Furthermore, the process of tabulation was used to gradually translate narratives and activity maps into the data table (Huberman and Miles 1983). Firstly, the table contained unstructured data for the three core categories: demand-side transactions, supply-side transactions and their interrelationships. The sources of value creation were contained in the categories they referred to. After the first run of the analysis, we allowed for the emergence of secondary categories (modes of transaction expansions).

After the ‘within-case’ analysis was performed by the principal investigator, the second author was provided with the secondary-source data documents, transcriptions, narratives, activity maps and data tables coded with the first-level and second-level categories in order to validate the coding approach. After minor differences in data interpretation between the two researchers were resolved and within-case analysis was completed, we began to look for salient patterns across the twelve cases. First, the researchers individually analyzed the data in each of the categories. In a subsequent meeting, individual versions were dealt with and the cross-case analysis was completed (Eisenhardt 1989).

Once a common perspective on all questions was achieved, four workshops were carried out to validate the ‘within-case’ and the ‘across-case’ analysis results. More than fifty practitioners participated in our workshops, including the representatives of nine researched firms. The additional three companies were contacted by email. All comments and feedback were incorporated into the results. Table 2 below outlines the main steps of data collection and analysis.

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FINDINGS

In the following sections, we illustrate our research findings. Table 1a in the appendix provides a summary of the demand-side and supply-side transaction evolution and the sources of value; Table 1b summarizes the interrelationships and implications of the transaction evolution. The representative quotes for each of the constructs are available in the appendix: Tables 2a and 2b.

Demand-side transactions evolution and sources of value creation

The data presented in Table 1a suggests a high level of congruence among the twelve service providers with respect to the direction of change of transactions on the customer side of the ecosystem: all service providers in the sample, regardless of the type of service sector, have consciously attempted to extend the scope of transactions with their customers.

The extension of scope was uniformly motivated by growth opportunities that stemmed from the ability to reconfigure transactions towards creating superior value for the customer. Service providers often explained that the increase in customer value came from the one-stop-shop feature of their service extensions.

The senior management spotted the opportunity to change it from a projects-based business into a more long-term relationship with clients. The clients got one large contractor, so there are the benefits we don’t get to see, but they do. Having one provider supplying that range of services means just one management team gives them office economies of scale.

In most cases, an increase in customer value was superimposed on the internal consistency of the service provider’s own activity system. For example, in order to maximize coverage of the customer’s functional need, or provision of a comprehensive system covering every functionally related element from the perspective of the customer’s activity system, a warehousing service provider coded CAR gradually evolved towards providing a suite of 24 supply-chain services, including warehousing, transportation, procurement and purchasing. These services were all related from the perspective of customer use (e.g. transportation and warehousing contributed to the
same supply chain goal) but not from the perspective of the activities associated with the provision of these services (e.g. warehousing required entirely different resources and skills from transportation). Giving priority to customers’ needs over the consistency of the providers’ business model was seen as a paradigm shift internally. One of the respondents labeled this “a shift from thinking about ‘what service activities we provide’ to thinking about ‘outcomes that make sense from the perspective of the customer’”.

Finding 1a: Service providers extend their transactions on the customer side of the ecosystem even when this distorts the consistency of their business model internally.
Finding 1b: All extensions of transactions on the customer side of the ecosystem were motivated by an increase in customer utility.

While the direction and motivation of the change in transactions was clearly uniform, we identified three modes (approaches) for extending transactions: transaction scope, transaction timescale, and nature of transaction. Transaction scope amounts to the scope of services offered. The earlier example of a service provider, CAR, that developed from in-warehousing services to a suite of 24 supply chain services is a excellent illustration of this mode of expansion. Often, some of these ‘new activities’ by the provider represented activities that used to be performed internally by the customer. For example, an aircraft engine provider that became a provider of through-life services for aircraft maintenance took over those activities from the customer who previously had provided them in-house. Interviewees explained the tendency to expand the transaction scope with reference to the value that customers obtained by being able to source all related services from the one provider and ‘obliviate’ them.

“We start with the simple services. Let’s say warehouse management, plus transportation, and people. And after having seen what we do, how we work, the level of quality we deliver, the client makes some more enquiries for new, more complex services, like customer support, inventory management, packaging services.” Project manager, CAR

Some providers extended the timescale of transactions by moving from transactional services to multi-year service contracts. Taking one example that we studied, the train manufacturer turned through-life support service provider changed from train maintenance on an ad-hoc basis (‘when the customer calls’) to maintenance contracts spanning more than 20 years. The extension of the transaction timescale
allowed companies to invest in resources such as IT systems or automation and provide a better quality service to the customer. The construction company turned facility-maintenance provider followed a similar approach; it evolved from merely constructing buildings to client specification into a provider of facility maintenance services specified in agreements spanning between 25 and 40 years.

Our data also demonstrated a notable shift in the nature of transactions: service providers were developing from providing services as processes or activities into providing services as outcomes where the service provider guarantees the outcome of the service or the performance associated with the activities provided. A water services provider would offer a guarantee for the provision of water and management of the water infrastructure; the quality of this service being subject to 20 Key Performance Indicators, each of which had a particular penalty associated with it. The providers of aerospace and defense solutions were very active in this respect. For example, instead of providing engine maintenance, ROR began to guarantee the availability and reliability of power by the hour according to defined levels of availability and engine reliability. Guaranteeing the outcome would reduce risk for customers and increase incentives for investment in innovation and quality. The train solution providers sold performance-based contracts that included availability, reliability and cleanliness, and they even contemplated guaranteeing the energy efficiency of trains. These contracts were stipulated in the ‘price per km’ or ‘price per day’ format.

**Finding 2a:** To extend their transactions on the customer side of the ecosystem, service providers used one of, or a combination of, three modes: extension of scope, the timescale, and the nature of their transactions with the customer.

**Finding 2b:** The extension of transactions on the customer side is motivated by increases in customer utility such as the one-stop-shop solution and interoperability, increases in the quality of service thanks to long-term investment in the service delivery system, reductions in customer risk and information asymmetry as well as the optimization of providers' incentives to invest in innovation and quality.

Analysis of the different examples of transaction extension showed a certain hierarchy among the three modes. The most sophisticated mode of transaction extension, a change in the *nature* of the transaction, was underpinned by the extension of *scope* as well as *timescale*. In a similar manner, the extension of timescale frequently entailed the extension of scope. For example, in order to guarantee engine
availability and reliability, ROR unquestionably needed to provide this service for an
assured period of time. Furthermore, the guarantee of availability and reliability meant
that, in addition to a good engine, ROR needed to perform service activities such as
engine maintenance and monitoring throughout its use.

**Finding 3:** The three modes of extension are subject to a certain hierarchy. Extension
of scope can occur on a standalone basis. To extend the length of transactions, service
providers need to extend the scope of services. To change its nature from service
activity to service outcome, the service provider has to extend the length and scope of
the services provided.

**Supply-side transactions and activities evolution and sources of value creation**

The direction of change concerning transactions and activities on the supply side
demonstrated a similar tendency as transactions with the demand base. Given the sale
of more services, service providers had to undertake additional activities. For example,
NIS nurtured an ecosystem of over 2 million researchers that they leveraged to help
their clients resolve innovation challenges. The extension of activities and transactions
on the supply side was stimulated by the extension of transactions on the supply side.
Thus, as illustrated in the Table 3, the twelve service providers we researched all
extended the scope of their activities and transactions on the supply side.

Nevertheless, the tendency to adopt services that are related from the demand side
but not from the supply perspective has led to the extension of transactions on the
supply side extending beyond internal activities. For example, CAR, who decided to
extend the scope of transactions on the demand side from warehousing to 24 supply
chain services including transportation realized that transportation has very little to do
with their competencies and decided to subcontract these services to specialized
transportation suppliers.

**Finding 4a:** Stimulated by the extension of transactions on the demand side, service
providers extend the scope of activities and transactions on the supply side.
Transactions on the supply side of the ecosystems tend to increase, due to the
tendency of service providers to preserve the internal activity fit while providing related
services on the customer side but unrelated from the supply (competency) perspective.
Finding 4b: Service providers combine the value creation logic of the resource-based perspective and transaction efficiency to achieve an optimal system of activities and transactions on the supply side.

The direction of the change of transactions and activities on the supply side was similar to the transactions on the demand side. We identified three modes to extend the transactions/activities on the supply side: extension of the internal activities system, extension of transactions with suppliers, and extension of transactions with partners. Extension of the internal activity system consisted of extension of the scope of activities through organic growth or growth by acquisition. For example, MAG embarked on a series of acquisitions allowing them to extend their blue collar service offering based mainly on road repair services to include support services to local councils that encompassed other blue collar services such as refuse collection but also white collar services associated with managing the efficient and effective provision and monitoring of these support services. The motivation for the extension was primarily relatedness to the competency base and/or the strategic importance of the activities.

The interviews corroborated two main modes of extending transactions on the supply side of the ecosystem, already well covered by the extant literature: partnering and outsourcing (Gulati et al. 2012). The extension of supplier transactions was quite common since service providers were looking to outsource activities that they were not best placed to offer, not having appropriate resources and capabilities. Service providers were likely to extend the scope of transactions with suppliers in order to offer complex activities far removed from the provider’s core activities and competencies. For example, a water utility outsourced the design and delivery of complex water containers to construction firms. 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, a facility maintenance provider outsourced cleaning services, a logistics service provider outsourced transportation, and a logistic provider outsourced transportation. Hence, both transaction efficiency and resource-based rationales supported outsourcing choices.

The extension of transactions with partners was primarily motivated by the innovation opportunities that the extension of transactions opened up on the customer side. For example, when a supply chain consultancy that we investigated assumed responsibility for the state of the inventory over an extended period of time (as opposed
to just performing the activities related to inventory management), they entered into partnership with a software developer to develop a bespoke tool for optimizing the inventory levels of their clients. On a number of other occasions, simpler supplier relationships were ‘upgraded’ to partnerships. For example, train manufacturers organized a consortium with a depot developer to provide first-of-a-kind train availability contracts with retained ownership spanning 27 years. A partnership between MAG – a service support provider – and IBA – an ICT provider – opened up innovation throughout the entire service suite: MAG began to use refuse collection trucks to monitor the state of the roads and pre-empt large holes.

Finding 5a. Service providers extend their activity systems, as well as transactions on the supply side of the ecosystem, by engaging in partnering or outsourcing relationships.

Finding 5b. An increase in outsourcing is motivated by an increase in transaction efficiency and resource allocation effectiveness in the supply relationships, while partnering is primarily motivated by value generated through innovation.

The analysis of different examples showed that different modes of expansion on the demand side 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, a road maintenance service provider who had turned provider of council support services including waste management installed cameras on its waste management trucks to monitor the state of the roads and pre-empt the creation of road bumps, thereby generating economies of scope among seemingly unrelated services. Secondly, extension of the timescale was associated with specialized investment in assets and a system to improve service provision that would not be possible in the context of ad-hoc services. This is well illustrated by the earlier example of the system of inventory management. Thirdly, the extension of the guaranteed performance attributes offered an opportunity to fundamentally redesign transactions and the activity system. For example, taking responsibility for the availability and reliability of trains made train service providers extend the timescale of their transactions with their key suppliers as well as create new agreements with financial services to finance the leasing of trains.
Finding 6: Different extensions of transactions on the demand side led to different innovations in the activity system and extensions of transactions on the supply side. Changes in the nature of transactions and the timescale were likely to result in innovation and partnering, while the extension of scope was likely to result in the extension of internal activities and supplier transactions.

Interrelationships and implications of the transaction extensions

The 12 providers of complex services were one in their tendency to extend the scope of transactions to both sides of the ecosystem, demand and supply. Moreover, simultaneous transaction extensions were motivated by value creation that was cumulative in effect. An increase in customer utility through various sources was matched by transaction efficiency, competency base arguments, and innovation. However, analysis of the data demonstrates that, besides these intentional effects, the simultaneous extension of transactions has unintended and less anticipated consequences: every transaction extension carries with it an associated source of uncertainty. As with the sources of value, the sources of uncertainty are also ongoing.

To start with, the extension of transactions on the demand side implies that the service provider becomes increasingly accountable for the customer utility that is provided by the growing number of service activities (and outcomes) over longer periods of time. For example, a train solution provider who becomes responsible for the availability of a certain number of trains on a daily basis over 27 years is accountable for the provision of trains and train maintenance but also train ownership, cleaning or painting. In order to provide those activities, the service provider needs to improve the activity system, which carries uncertainty associated with innovating the activity system. He could also transfer some of those activities to suppliers or find a partner that has relevant capabilities. This would imply uncertainty as well, since the dependency of the service provider rises as a result of the extension of transactions on the supply side. Thus, a closer look at the services suggests that, besides the aforementioned value creation opportunities that promote an extension of transactions and activities, each may lead to an associated increase in uncertainty on the service provider’s side.
Finding 7a: An increase in the transactions and activities on the demand and supply sides is accompanied by an increase in multiple sources of value. Contrary to the theoretical expectation, a company does not choose among the sources of value that different theories of the firm stipulate but it combines them and makes them amplify each other.

Finding 7b: An increase in the transactions and activities on the demand and supply sides is also accompanied by a rise in the uncertainty associated with the transaction. Thus, simultaneous extension of transactions leads to an extension in the uncertainty base.

Thus, a closer look at the data suggests that each mode of transaction expansion gives rise to changes in uncertainty facing a provider. Uncertainty associated with the ability to deliver agreed-upon service activities is labeled operational uncertainty. For example, even simple equipment maintenance, obliged a service provider to secure access to specialized resources (e.g. skilled mechanics and spare parts). The consequence of not being able to deliver this service at all may have contractual or indeed reputational consequences.

The delivery of agreed service activities and outcomes that span longer time periods were subject to changing economic conditions and general uncertainty: we label this dynamic uncertainty. For example, for the services that span longer periods of time such as the 27-year train solution, the uncertainty associated with fluctuations in the financial markets may impact the service provider’s profitability. Similarly, the supply chain may become unavailable (e.g. due to bankruptcy) or the prices of supplied elements such as spare parts may change over time. The dynamic uncertainty is even higher in the case of retention of ownership of the asset. For example, the train manufacturers that began to offer trains as a service charged on a ‘per day’ basis instead of selling the trains faced the uncertainty of miscalculating residual value (e.g. in the car markets in the USA, a trend to lease resulted in systematic under-pricing of leasing agreements, leaving the manufacturers and car owners with worthless assets).

Finally, we also encountered the most widely referenced form of uncertainty – uncertainty associated with guaranteeing a certain level of performance. Performance uncertainty may be associated with availability, reliability, energy efficiency, and quality of the service delivery outcome. For example, when a supply change consultancy switched from providing warehousing activities – which constitutes service
as a process – to guaranteeing inventory levels with guaranteed level of goods availability – which constitutes service as an outcome – it inevitably embraced performance risk(s). The inability to meet agreed performance targets implies penalties that can easily make a once-profitable service unprofitable. For example, at the onset of service provision, one of the train service providers faced thousands of pounds in penalties on a daily basis due to its failure to make available the agreed number of trains each day. Similarly, the IT service provider – the SWO – that embarked on a joint venture with its clients faced losses of £18 million in a single year, due to its inability to deliver the services to the expected level of efficiency.

_We had to fix the price of the contract before we actually started the deal, so it meant we had to sort of take a punt on the labor rates based on our experience._

Head of Maintenance Delivery, HIC

**Finding 8:** An extension of transactions on the demand side through scope, length and nature of services leads to an increase in operational, dynamic and performance uncertainty, respectively. Operational uncertainty already emerges with expansion of the scope of service activities (e.g. the uncertainty in delivering non-traditional services). Dynamic uncertainty appears as the transaction timescale expands beyond ad-hoc service delivery. Performance uncertainty appears with the change in transaction nature from service activities to service outcomes.

Given the interaction between transactions on the customer side and the supply side, the delivery of these service activities extends beyond firm boundaries into the supply side of the ecosystem. Besides the three types of uncertainties associated with the change of transactions on the customer side, the extension of transactions on the supply side may make the service provider more vulnerable to the operational, dynamic and performance uncertainty brought on by the internal delivery of new services, the extension of transactions with existing and new suppliers, and the extension of transactions with partners.

The _internal uncertainty_ comes from a wide range of operational as well as organizational sources. For example, redrawing firm boundaries and extending internal activities may lead to incentive distortion. For example, a client – a train operator (the customer) – may be less interested in the wear and tear of the train if the train manufacturer is responsible for through-life provision of a functional train. Furthermore,
a lack of incentives may also come from the ecosystem participants to whom the provider may not directly relate. In another rail example, the train manufacturer committed to train delivery within a certain time frame may become constrained by the infrastructure operator who assigns times for testing new trains.

The **supplier uncertainty** amounts to the uncertainty generated when, due to the extension of transactions on the demand side, the service provider increases dependence on suppliers. For example, having become accountable for the spares inventory of their clients, BAB had to redraw agreements with sub-suppliers of some spare parts to include clauses on technical support and the time frames for spare parts delivery. Any delay or failure on the part of suppliers to deliver their components on time would directly translate into the failure of BAB to deliver its spares on time, making it subject to penalties.

The causes of **partner uncertainty** would appear to be similar to supplier uncertainty; they are normally associated with the partner's inability to provide its segment of the service on time. Drawing on an earlier example of the train solution provider, guaranteeing the availability of trains can become even more risky when its level of train availability becomes conditional upon the ability of its partner, the train depot developer, to complete a new depot on time. Partner uncertainty seems also harder to assess and broader than supplier uncertainty since the partnering agreements tend to be associated with more complex and novel aspects of service delivery. For example, CAR faced the uncertainty that its software services provider would not design the software in line with the requirements of the service.

*When you try and put together collaboration between two parties, it’s like a square relationship where each has their own set of objectives and criterion priorities and reconciling them is like a square, two sides of a square. If you’ve got three parties, it’s a cube. And if you’ve got four, it’s a Latin hypercube. Head of Business Analysis, RAR*

| Finding 9: | The extension of internal activities and transactions to suppliers and partners creates an increase in internal, supplier and partner-related uncertainty, respectively. Internal uncertainty is subject to changes to the activity system that may be uncertain or raise the uncertainty of the system as a whole. Supplier uncertainty is generated by increased reliance on suppliers for delivery times, quality and even price |

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From process to promise: business model choices of complex service providers
levels. Partner uncertainty is created by the reliance on partners to deliver an integral part of the service.

Finally, these uncertainties are subject to the same interdependencies as transaction extensions. Just as transactions on the demand side are subject to a certain hierarchy, so are the uncertainties. For example, a performance-based contract of an engine manufacturer contains performance, dynamic, and operational uncertainty. Just as extension of transactions on the demand side leads to extension of transactions on the supply side, so demand-side uncertainty triggers uncertainty on the supply-side. The aforementioned performance-based contract is likely to increase internal, supplier, and partner-related uncertainty.

**Finding 10:** Similar to transaction extensions, uncertainties are subject to hierarchy and interrelationships. Simultaneous extension of transactions leads to a rise in the service provider's accountability for the service outcome. This accountability is further extended by the fact that the services are increasingly delivered outside the boundaries of the firm by suppliers and partners. This increases the level of dependence of the service provider on the ecosystem.

**DISCUSSION**

Our conceptual development suggests that a weak appreciation of the ‘gestalt of value creation’ stems from a poor understanding of the interrelationships between different strategic choices concerning the firm’s boundaries and of the multiple sources of value that may underpin these choices.

Our findings shed light on the co-evolution of firm boundaries through the simultaneous extension of transactions on the demand and supply sides, and the intended as well as un-intended consequences that accompany these changes. First, our findings suggest a tendency across each of the 12 service providers to extend the scope, length and nature of transactions on the customer side. This tendency is underpinned by the sources of value that stem from the increase in customer utility through economies of scope on the customer side, reduction of risk and an increase in quality of the overall solution due to inter-operationality. Thus, the business model
extension seems indeed to be motivated by the demand-side sources of value (Ye et al. 2012, Priem 2007, Cottrell and Nault 2004).

Once the service provider opts for the extension of transactions on the customer side, he is forced either to extend the internal activity system or transactions with suppliers and partners. The strategic choices here are thoroughly described in the literature on boundary choices. Indeed, we have found that service providers are led primarily by the sources of value detailed by the firm’s transaction-efficiency perspective (Williamson 1979) as well as the competency arguments (Barney 1991, Prahalad and Hamel 1990).

When we consider the logic of simultaneous transaction extension, it becomes clear that service providers not only consider different sources of value jointly, but they also make sure that they are mutually reinforced. Demand-side sources of value that trigger customer transaction extension are the source of transaction-cost economies of scale, competence extension and formation, and innovation. Given the hierarchy of transaction extension on the demand side, the higher the order of extension, the greater the sources of value the service provider is likely to embrace through business model evolution.

Moreover, this logic of value creation is reminiscent of Nickerson and Zenger’s (2004) problem-solving perspective on the theory of the firm. Service providers embrace more complex problems and reap multiple sources of value by resolving these problems and coordinating the delivery of the solution by multiple stakeholders.

**Proposition 1.** Service providers extend their business models through the simultaneous extension of transactions on the demand and supply sides. These transaction developments are underpinned by multiple sources of value: demand-side economies of scope, transaction efficiency competence-based arguments and innovation opportunities. Similar to transaction and activity system changes, the sources of value are interrelated and tend to be mutually reinforcing rather than mutually exclusive.

The proposition above suggests that customers are benefiting from an ever-increasing value-creation function by extending their business model. Nevertheless, analysis of the data demonstrates that, besides these intentional effects of the
simultaneous extension of transactions on the demand and supply sides, the service providers also face exposure to increased uncertainty that may lead to diminishing returns.

The increasing uncertainty comes from the tendency to become accountable for customer utility through the provision of a growing number of service activities and, indeed, their outcomes over longer periods of time. Given the interaction between transactions on the customer side and on the supply side, the uncertainty is not entirely contained and managed within one company and extends beyond firm boundaries into the supply side of the ecosystem. Given that the uncertainty seem to be initiated by rising accountability resulting from the expansion of transactions on the customer side and continues to spread as transactions on the supply side expand, we label this phenomenon accountability spread.

Accountability spread may be seen as the ‘cost’ that a service provider pays for the sources of value. Nevertheless, the issue with this ‘cost element’ is that it is very elusive and poorly understood. Unlike regular costs, uncertainty can easily escape companies, particularly when it comes to the delivery of a new service. None of the management theories that are used to examine the effects of boundary choices helped us understand how companies handle this increase in uncertainty. Uncertainty is only beginning to be recognized as a topic of discussion by the practitioner branch of the business model literature (Girotra and Netessine 2011). Moreover, the uncertainty may not be entirely negative from the service provider’s perspective. In line with Girotra and Netessine (2011), our findings suggest that, in becoming accountable for the client’s value proposition, service providers are able to price this uncertainty and manage it effectively, consequently creating even greater value.

**Proposition 2.** Business model extension results in rising accountability for customer utility, which is, at the same time, increasingly underpinned by services provided outside service providers’ boundaries. We label this accumulation of different yet inter-related types of uncertainty accountability spread. We argue that accountability spread should represent a core design element of the business model, as companies need to make their choices concerning transactions and activities with due regard to their implications for accountability spread.
These findings also raise questions regarding the role of management in firms innovating their business models and the nature of the dynamic capabilities that they need to posses (Augier and Teece 2009). Our results would suggest that a crucial role for senior management is to balance the sources of value on one side with the accompanying accountability.

Interestingly, while the trend to extend the business model and, therefore, increase the accountability spread has persisted across all the firms that we have studied, respondents reported varying degree of capability in balancing the accountability spread. For example, one of the informants reported that his firm uses a structured engineering process to calibrate solutions they offer and guarantees they intend to offer. Uncertainty is not internalized unless it is commercially viable. On the other hand, one of the informants reported that his firm suffered substantial profit loss from guaranteeing performance levels that proved to be unattainable, largely because of the unreliable supply chain.

These and a number of other examples led us to tentatively propose a set of routines that may constitute dynamic capability in balancing the accountability spread. Firstly, it would appear that the provider needs to fully understand the implications of the extension of transactions with the customer and the uncertainty associated with promising different service activities and attributes; in similar fashion, the provider needs to identify the sources of uncertainty associated with transferring certain service activities to the suppliers and partners on the supply side of the ecosystem. For example, in some cases, respondents were able to talk very explicitly about the characteristics of their transactions and their implications while, in other cases, the intention to please customers and forge relationships with them at any expense prevailed over any concern to understand the associated uncertainties. Second, the ability to assess the extent of the uncertainty and potentially quantify the risk seemed important. Companies that were able to quantify risk suffered less from the penalties associated with performance-based contracts, for example. Some firms invested in information technology and instruments such as sensors and RFID tags to enhance their ability to assess and anticipate, while others relied on ‘gut feeling’. Thirdly, the ability to price the uncertainty for the customer as well as manage it in delivering the service was very important in seeking to ‘profit’ from the accountability spread. Some respondents endeavored to explain to us their efforts to understand the uncertainty
associated with customer involvement in the activity system and to assign penalties to clients who failed to deliver their segment of activities.

**Proposition 3.** As a firm expands the business model, thereby expanding its accountability spread and shifting the locus of value creation from the firm to the ecosystem, *balancing the accountability spread with value creation* increasingly represents one of the main roles of management. The capability of balancing the accountability spread represents the capacity to understand the associated uncertainty sources, assess and quantify the extent of uncertainty, price the ‘balancing of the accountability’ for the customer, and mitigate it or manage/share it with suppliers or partners.

**CONCLUSION**

Our findings underscore the importance of focusing on the interrelationships between different strategic choices, particularly boundary choices and collaborations. We find that providers of complex services tend to routinely extend transactions on the demand side, which, in turn, leads to the extension of transactions on the supply side. Colloquially speaking, firms tend to assume greater responsibility on the customer side, while simultaneously opening up their business model to customers and suppliers. The simultaneous extension of transactions that underpins the business model innovation of complex service providers leads to a transfer of the locus of service delivery outside firm boundaries. Counter-intuitively though, the company simultaneously becomes the locus of accountability for the provision of customer utility.

Given these findings, we believe our research makes several contributions to the literature. We connect the stream of business model literature that recognizes activities, transactions or choices as business model design elements with the literature that distinguishes between the demand side (value proposition) and the supply side (value delivery). Besides showing how these design elements develop through simultaneous extension and explication of the underlying value creation logic, we also shed light on uncertainty and accountability as the under-represented design elements that need to be considered in business model design.
Furthermore, we contribute to the literature on firm boundaries by exploring the less-understood interrelationship between various boundary choices (Parmigiani and Rivera-Santos 2011, Gulati et al. 2012). We build on Santos and Eisenhardt (2005) by jointly considering different sources of value and their synergistic power. We provide a new perspective on the core competencies argument (Prahalad and Hamel 1990) by positing that it remains a valid perspective on the decisions firms make concerning their supply-side configuration (the decisions relating to what they make in-house versus what they outsource) but not necessarily on the demand side (customer ‘jobs’ they decide to take on). We build on Ye et al. (2012) by using demand-side sources of value alongside supply-side ones. We then contrast the sources of value with the uncertainties in accurately deriving the logic of boundary choices that we refer to as ‘balancing the accountability spread’. Thus, we argue that organizational boundaries are formed by the choices that firms make concerning their preferred accountability for the problems they want to solve. This also sheds light on the role of the management (Augier and Teece 2009); our results suggest that a crucial role for senior management is to balance demand-side optimization (sources of value and uncertainty) and resource-side optimization (sources of value and uncertainty), or to value potential with accompanying accountability.
REFERENCES


### FIGURES

#### TABLE 1. Company information table (latest available)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Clients (no)</th>
<th>Employees</th>
<th>Revenues ($)</th>
<th>Profit (%)</th>
</tr>
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<tbody>
<tr>
<td>BAB Aerospace/Defence</td>
<td>&lt;10</td>
<td>81,000</td>
<td>26,809 m</td>
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<td>BOB Train Manufacturer and Solution provider</td>
<td>&lt;10</td>
<td>2874</td>
<td>1,757 m</td>
<td>11.4</td>
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<tr>
<td>CAR Supply Chain Consulting</td>
<td>10-100</td>
<td>1447</td>
<td>£224 m</td>
<td>15.24</td>
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<td>HIC Train Manufacturer and Solution provider</td>
<td>&lt;10</td>
<td>104</td>
<td>24.95 m</td>
<td>-71.30</td>
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<tr>
<td>IBA IT Services, Hardware and Software Provider</td>
<td>&gt;1000</td>
<td>16,075</td>
<td>6,176 m</td>
<td>8.20</td>
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<tr>
<td>MAG Road Maintenance and Support Services for Cities</td>
<td>10-100</td>
<td>5,923</td>
<td>1,113 m</td>
<td>1.98</td>
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<td>NIS Innovation Consulting</td>
<td>10-100</td>
<td>200</td>
<td>1.10 m</td>
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<td>ROR Aerospace / Defense</td>
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<td>22,000</td>
<td>19,616 m</td>
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<td>STR Water Utility</td>
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<td>8,051</td>
<td>2,835 m</td>
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<td>SMS Energy Sector</td>
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<tr>
<td>SWO Management Consulting / IT Management Consulting</td>
<td>&lt;10</td>
<td>141</td>
<td>33 m</td>
<td>-43.90</td>
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<td>VIN Construction, Building Services / Facility Maintenance</td>
<td>100-1000</td>
<td>4,061</td>
<td>1,729 m</td>
<td>1.40</td>
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### TABLE 2. Data collection, analysis and validation

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<thead>
<tr>
<th>Collection</th>
<th>Interviewees</th>
<th>Observations</th>
<th>Analysis</th>
<th>Validation</th>
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</thead>
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<tr>
<td>Archival data</td>
<td>Interviewees</td>
<td>Observations</td>
<td>Analysis</td>
<td>Validation</td>
</tr>
<tr>
<td>BAB*</td>
<td>Business Lead, Service Design Engineer Capability Manager, Head of Capability Development, Head of Systems Engineering, Head of Strategy and Planning, Head of Programme Governance, Head of Service Unit</td>
<td>Several company visits, workshops, speeches</td>
<td>Maps</td>
<td>No. of interview quotes*</td>
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<tr>
<td>BOB</td>
<td>Director, Predictive Asset Management, Business Development Responsible, Service Contract Manager, Monitoring Specialist</td>
<td>A company visit</td>
<td>YES</td>
<td>146</td>
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<tr>
<td>CAR</td>
<td>Manager Supply Chain Solutions, Vice President Business Development</td>
<td>A company visit, speeches, workshops</td>
<td>YES</td>
<td>86</td>
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<tr>
<td>HIC</td>
<td>Maintenance Delivery Manager, Head of Maintenance Delivery, Chairman and CEO</td>
<td>Two company visits</td>
<td>YES</td>
<td>200</td>
</tr>
<tr>
<td>IBA*</td>
<td>Managing Partner and General Manager, Consulting Services Leader, Executive Partner (2), Client and Programme Executive, Banking and Financial Markets Executive Architect, Senior Managing Consultant</td>
<td>Several company visits, workshops, speeches</td>
<td>YES</td>
<td>117</td>
</tr>
<tr>
<td>MAG</td>
<td>Director of Information Systems - Chief Information officer (CIO)</td>
<td>A company visit</td>
<td>YES</td>
<td>93</td>
</tr>
<tr>
<td>NIS</td>
<td>CEO Europe, Vice President UK</td>
<td>A company visit</td>
<td>YES</td>
<td>88</td>
</tr>
<tr>
<td>ROR</td>
<td>Head of Business Analysis, President of Services Business, Head of Services Research and Development</td>
<td>Speeches</td>
<td>YES</td>
<td>104</td>
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<td>STR</td>
<td>Director, Strategy and Regulation (CEO), Chief Information officer (CIO)</td>
<td>A company visit</td>
<td>YES</td>
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<td>SMS</td>
<td>Director and the CEO</td>
<td>A company visit</td>
<td>YES</td>
<td>51</td>
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<td>SWO</td>
<td>Director, CEO, Executive Partner</td>
<td>A company visit, speech</td>
<td>YES</td>
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<tr>
<td>VIN</td>
<td>Commercial Director</td>
<td>-</td>
<td>YES</td>
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* Paragraphs of interview transcriptions that we used to answer the research questions
FIGURE 1 Ecosystem map
## APPENDIX

### TABLE 1a. Company information table

<table>
<thead>
<tr>
<th>PARTNERS</th>
<th>SUPPLY-SIDED TRANSACTIONS AND ACTIVITIES</th>
<th>INTERNAL SUPPLIERS</th>
<th>PERFORMANCE</th>
<th>OPERATIONAL</th>
<th>LENGTH OF SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAB: From spare parts delivery to spares inventory management</td>
<td>New guarantees on spare parts availability for target cost (price/km of vehicle use)</td>
<td>New activities to manage the inventory, investments in inventory IT systems</td>
<td>Increase in complexity of the supply chain - number of suppliers</td>
<td>Started partnering for delivery of spares for partner's vehicles</td>
<td>From ad-hoc supply of spares to a multi-year contract (up to 5 years)</td>
</tr>
<tr>
<td>BOB: From train sales to through-life train asset management.</td>
<td>New penalty clauses and revenue share incentives (e.g. energy efficiency)</td>
<td>New data diagnostics experts and systems service business model adoption</td>
<td>New technical support and spares supply contracts w/ suppliers</td>
<td>Started partnering for provision of technical support and spare supplies.</td>
<td>From ad-hoc maintenance service provision to multi-year contracts</td>
</tr>
<tr>
<td>CAR: From warehousing to 24 supply chain (SC) related services</td>
<td>Contracts w/ guaranteed cutoffs, availability and inventory returns</td>
<td>Developed internal knowledge on inventory management</td>
<td>Subcontracting the transportation services</td>
<td>Partnering w/ consulting and software firm to develop SC software</td>
<td>From commodity services of 1-2 years, to customized 5-year contracts</td>
</tr>
<tr>
<td>HIC: From trains to train solutions (refurbishment, full rebuild and cleaning)</td>
<td>Charging for usage guaranteeing availability, reliability and cleanliness</td>
<td>Hired with well-trained and experienced service staff that do a range of jobs</td>
<td>Extended contracts with their suppliers into spares supply</td>
<td>Partnering with depot developers to finance train ownership</td>
<td>From ad hoc to 7-9 years and finally 27 (7+20) years</td>
</tr>
<tr>
<td>IBA: From hardware to services and integrated solutions</td>
<td>A structured process to assess the possibility and the level of guarantee</td>
<td>Came up with structured engineering process to assess guarantee offerings</td>
<td>Collaborate to fill their skills gaps (e.g. for specialized software)</td>
<td>Global research network (3500 pure researchers)</td>
<td>E.g. post merger integration IT projects last between 36 and 60 months.</td>
</tr>
<tr>
<td>MAG: From blue-collar services (road repair) to all city support services</td>
<td>Revenue-sharing agreements based on cost targets</td>
<td>Substantial expansion through acquisition of support-service providers</td>
<td>MAG relies on the supply network of small local service providers</td>
<td>Partnering with IT provider to generate data for all city support services</td>
<td>From one-off projects to 5-year contracts and above.</td>
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<tr>
<td>NIS: From connecting clients to research community to helping in problem definition</td>
<td>Vouching with reputation that found solution does not exist elsewhere</td>
<td>NIS hired PhDs in diverse fields to translate and generalize problems</td>
<td>N/A</td>
<td>NIS nurtures network of 2 million researchers</td>
<td>Developing into long-term relationships where NIS works closely with clients</td>
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<tr>
<td>ROR: From selling engines to selling engine capacity</td>
<td>Guaranteeing engine performance</td>
<td>Monitoring room to track engines in real-time on civil aircraft</td>
<td>Extensive product and technology supply chain</td>
<td>Integrated solution delivery in partnership w/ other service firms</td>
<td>From ad-hoc supply of spares to long-term contracting for capability</td>
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<td>STR: From clean water to all-water and 'door-to-door' solutions</td>
<td>Delivery of service is measured by 20 KPIs. (e.g. leakages, quality)</td>
<td>Investing in data analytics using social media for customer support</td>
<td>Outsourcing to third parties (e.g. private drains and sewage leakage).</td>
<td>Partners with engineering firms for designing and building water wells.</td>
<td>Working under 20-year rolling contracts</td>
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<td>SMS: From energy data reading to smart meter installations and data analytics</td>
<td>Paid for quality data only; not all data collected</td>
<td>Invested in data analytics competencies</td>
<td>Relies on workforce solution providers for management of field workers.</td>
<td>Partnering with offshore wind farms solution providers</td>
<td>Starts with pilots (install one or two smart meters), to get long-term renewal contracts (3 years and more)</td>
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<td>SWO: A set of 8 interrelated IT support services to citizens</td>
<td>Core partner makes 100% of the profits and covers 100% of the losses.</td>
<td>Created entirely new organization with novel organization- a JV with clients</td>
<td>Each of the partners brought its own suppliers</td>
<td>Services partly provided by the three JV partners- city councils</td>
<td>The partnership, which is set to run for an initial period of 10 years, began in 2007.</td>
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<td>VIN: From ad-hoc construction services to facility management solutions</td>
<td>Contract for 95% of building availability, response time penalties</td>
<td>Consolidated scattered service outlets in a consolidated service chain</td>
<td>New service data IT system for a nationwide network.</td>
<td>Partnering with an IT company to ensure full integration with the client’s system</td>
<td>From ad-hoc services to 3-5 years contracts to 25-40 years contracts</td>
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</tbody>
</table>
From process to promise: business model choices of complex service providers

<table>
<thead>
<tr>
<th>TABLE 1b. Company information table</th>
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<tbody>
<tr>
<td>OPERATIONAL</td>
</tr>
<tr>
<td>BAB: Novel decisions have to be made on inventory efficiency</td>
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<tr>
<td>BOB: Ability to upgrade train effectively</td>
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<td>CAR: Ability to coordinate provision of 24 interconnected services</td>
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<tr>
<td>HIC: Entirely new train maintenance depot is needed</td>
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<tr>
<td>IBA: Coordination across business units adds uncertainty</td>
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<td>MAG: Reputation loss from delivery failure or delay is substantial</td>
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<td>NIS: Ability to understand client’s problem</td>
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<td>ROR: responsibility for the overhaul cycle with limited customer input</td>
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<td>STR: Catching leakages on time</td>
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<td>SMS: Cannibalization of the energy data reading services by the smart metering services (installation and analytics)</td>
</tr>
<tr>
<td>SWO: operational inefficiency in providing 8 services</td>
</tr>
<tr>
<td>VIN: Work has to be planned ex-ante. Risk that a client backs down on planned amount of work</td>
</tr>
</tbody>
</table>
**TABLE 1a. Quotes**

<table>
<thead>
<tr>
<th>OPERATIONAL</th>
<th>VALUE PROPOSITION</th>
<th>LENGTH OF SERVICE</th>
<th>PERFORMANCE</th>
<th>INTERNAL</th>
<th>VALUE DELIVERY</th>
<th>SUPPLIERS</th>
<th>PARTNERS</th>
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</thead>
<tbody>
<tr>
<td><strong>MAG:</strong> So, two years ago, we really didn’t have any environmental business, now it’s one of our growth engines, partly through acquisition and partly through growth. And we are now one of the key players in recycling services. About two years ago we didn’t do it at all. What we’ve been up to in some of the counties is combining that with highways and actually sort of bundled services to our clients. So actually we could take all of that from you. Much better value for money, we can start coordinating the services and get economies of scale out of it. So as a business, we’re looking for how we keep adding on more services to do that. But secondly we tend to be very much blue collar in a sense that all the decision-making and budget management is still done by the local authority. So one of our potential growth areas is, well we can actually take some of that [decision making] off you and do more of the budget management.</td>
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<td><strong>HIC:</strong> …we renewed the [7-year long] contract for twenty [years]. Then we have got a whole life [of the train], and that helps us because we can invest.</td>
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<td><strong>SMS:</strong> We prefer long-term contracts. Three-year [contracts] then become renewal contracts after [three years]. That’s what we prefer. With some of the new technology, it starts off with pilots. So, for some of this [energy] metering [services] that we talked about we are sort of installing one or two to get them to see the benefit before we can then go along with another proposition to roll it out to hundred [of customer’s] nine hundred stores.</td>
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<td><strong>IBA:</strong> We do upside risk reward based deals where we know we are very good at something because we’ve done it many times before and it’s big, it’s multi-year, and it’s in the clients’ interest to make sure that it’s done to world class standards. So where we over-deliver, because it’s early, and do all things we said we’d do, than they pay us a bonus, and if we’re late than we pay them, in credits, service credits.</td>
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<td><strong>ROR:</strong> [explaining the activities developed to deliver engine availability service] from our operations room, we can monitor all our engines all over the world – in the air, in real time. So that we can call up the pilot and say: “Just dial back a bit.” Indeed, we can arrange to have spares, or maintenance crews on the ground, waiting for the aircraft to land if we’re a bit worried about it and use that real-time data to look at reliability and plan maintenance. And we’ve got experts there to give advice to people all over the World.</td>
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<td><strong>STR:</strong> [talking about the KPIs that they are evaluated against] We publish in the public domain 20 KPIs that we are looking to achieve. For example, how much are we reducing leakage by, and how many houses are at threat of low pressure; we measure customer complaints, so if they rang us up and we’ve not replied and they then send us a letter. We measure whether we polluted any rivers, we measure extraction, we measure these KPIs. And we then monitor our performance against those KPIs, which lead to our strategic intentions.</td>
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<td><strong>NIS:</strong> Our core knowledge is in understanding how to translate [innovation problems]. Companies normally talk in solutions … a company may come to us and say ‘our customers want a new drill which is faster, less noisy, less dusty’ and then we analyze it and say ‘the problem that you have is that you want to create a hole’ and we can help you in finding better ways to make that hole.</td>
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<td><strong>CAT:</strong> The reason our dealers exist is that they provide a value add that we don’t think we can provide. They bring agility, knowledge of the local market, the local practices, a relationship and understanding of the local aspects and behaviors, access to the right resources, the right location in the territory that they cover.</td>
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From process to promise: business model choices of complex service providers

TABLE 1b. Quotes

<table>
<thead>
<tr>
<th>OPERATIONAL</th>
<th>DYNAMIC</th>
<th>PERFORMANCE</th>
<th>INTERNAL</th>
<th>SUPPLIERS</th>
<th>PARTNERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IBA:</strong> [talking about a new IT solution] So, we’ve got a 25 million pound opportunity. We’ve got 24 months for it. It will be across business units. So you will have front office transformation, which is to do with channels, people and revenue. And a back office one which is to do with customer service quality, operational stability and cost reduction. This is dangerous as you’re changing everything at once. <strong>SMS:</strong> [talking about a shift from the energy reading to smart meter installation and managing services] One of the key things is to manage the commercial risks. As that market declines, we have to have the right business model to manage the labor cost down in parallel with the volume reduction as smart meters get put on walls. No one can firmly predict how many smart meters will go on the wall in 2013, 2014, but we’re signing up to 5-year contracts so we have to have some sort of revenue protection clauses to protect us.</td>
<td><strong>HIC:</strong> Spare parts business is a very long-term business, so you have to think seven, even twenty years in advance. And if you think about a train, it’s got about a hundred what we call tier-1 suppliers. So a hundred pieces of kit with a suppliers name on it around a vehicle. Beneath all that is a whole sub-tier, so it’s into the thousands of suppliers, and we’ve got to manage all of that, and it’s very difficult, because companies go bust. And if it’s a small organization they’ll go bust and they’ll just disappear, because it might only be ten people. Key suppliers should be big enough not to fail. You can just lose access to everything. <strong>IBA:</strong> Lots of the programs might run very well, and to high standard and still be cancelled, because something external hits the environment, which makes it irrelevant or the wrong thing to do. There will be environmental reasons for a lot of them, direct and indirect, economic crisis, changing the law, public opinion, all kind of things. <strong>SMS:</strong> We’re testing the water to see how far to go on performance management contracts. The danger with performance management contracts is they become quite inefficient because of the conditions that one enters from a contractual point of view. This is because things change very quickly and you end up with a lot of clauses, which then lead to wrong behavior. So it becomes, in a way it becomes anti-productive. <strong>SWO</strong> [explaining the consequences of entering a joint venture with the client; where the budget for the service is set and all the profits and losses from inefficient service delivery are borne by the client]. So I think we lost something like 18 million last year, something like that. I think it might have been more the year before, and of course it’s all us. <strong>BOB:</strong> Usually when something good is discovered, the company’s top management wants it done everywhere throughout the company, and that can put in danger the whole incubation process.</td>
<td><strong>MAG:</strong> [talking about challenges when overtaking support service delivery from a city] most of our employees are actually given to us, a lot of our contracts were public sector, utilities, so we actually don’t choose our workforce, largely. So a large percent of our cost base is given to us. So how do we make that more efficient? How do we deliver against the commitments we made to our clients with the workforce, which is exactly the same workforce. So that is a challenge for us and clearly our ability to make margin is pretty much driven on how we can do that more efficiently. <strong>IBA:</strong> It’s very easy to write a back-to-back contract between you and somebody in the ecosystem, that’s easy. But that in itself doesn’t guarantee that you can deliver on you commitments. So you have to take a business judgment which says ‘if I’m going to have to deliver this project, do I just have one supplier or do I need to go to multiple suppliers?’, ‘how do I manage, how do I mitigate risks that any of these suppliers could fail’. And that’s where you get some interesting challenges. We will have a contingency plan against a mitigation plan. So if this fails, this is what we would do and this is how we would recover from it.</td>
<td><strong>HIC:</strong> [talking about taking over the maintenance of the trains designed by competitors] Whenever you interface with somebody else’s kit, it is always a risk. Because they won’t tell you everything about it. And it’s in their interest in the after-sales to keep some of the risk. <strong>IBA:</strong> It’s a very easy to write a back-to-back contract between you and somebody in the ecosystem, that’s easy. But that in itself doesn’t guarantee that you can deliver on you commitments. So you have to take a business judgment which says ‘if I’m going to have to deliver this project, do I just have one supplier or do I need to go to multiple suppliers?’ ‘how do I manage, how do I mitigate risks that any of these suppliers could fail’. And that’s where you get some interesting challenges. We will have a contingency plan against a mitigation plan. So if this fails, this is what we would do and this is how we would recover from it. <strong>SWO:</strong> [talking about partnering with clients in a joint venture] A flaw in the model is ‘I make my money out of the venture, they make their money out of the reduction in the charges’. So I’ll do a little role-play: “Dear board, we’d like to put up our prices in line with the contract. Do we all vote for that?” 30% would go absolutely no way. Now, the second thing is we say “ok, can we all agree that the answer is 63”, so 70% of us will say yes, 30% will say actually we need now to take this to our members to check, and we go “oh”, and then it delays processes, and if we had some major decision to take it would be a disaster. So they treat it as a governance meeting, turning up being briefed, they’re not equipped to make a decision.</td>
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