BUSINESS MODELS DESIGN IN BUSINESS NETWORKS

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BUSINESS MODELS DESIGN IN BUSINESS NETWORKS

Research in Progress

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Abstract

Previous research in the area of business models has focused on their use in the context of an individual organization and has failed to incorporate considerations associated with a network of business partners in a candidate business model. Building on existing literature, this paper reports on an ongoing work which investigates the challenges associated with designing business models for wider business operation scenarios, commonly known as business networks, where there is a need to foresee and manage critical decision-making points. The research methodology combines literature review and interactive research including insights derived from participant discussions in a research workshop. The documented data captured during the workshop was used as an input for further refinement of the initial networked business model design constructs. The result is a conceptual framework that provides a set of interrelated design elements for business models in network environments. The design elements are the decision points for an organization where its networked operation has to be configured, operated, optimized and dynamically reconfigured. The framework was validated through a case study in the oil and gas industry with the aim of improving operational planning among business partners. This work is supported in part by ARC Linkage Grant LP140101062 (Transforming Banking Service Delivery Through Connected Communities) and ARC Discovery Grant DP140103788.

Keywords: Business network, design, business model, Oil&Gas.
1 Introduction

Globalization, financial deregulation, economic turmoil, and technological breakthroughs are profoundly exposing organizations to business networks (Kose et al., 2012), in order to diversify supply and demand capacity through wider markets, partners and resources. In this setting, the concept of the business model of the network often remains unspecified and implicit. In the digital economy, definitions and concepts shift from being production-focussed to being more communication- and customer-centric therefore organizations and their business partners are facing new challenges in order to create value. This exposes the need for new designs for business models operating in networks of business partners. It is important to point out that the architectural structure of business networks is out of the scope of this paper and we only focus on identifying the components relevant to networked business models.

Additional affordances, such as everything as a service, have been introduced through the Internet and have changed the dynamics of the business world. In the unconventional business model of a network environment, the value creation process is now shifted to cross the boundaries of a focal organization (Lee et al., 2012). The focus no longer resides inside an individual organization, instead it is formed across channels, business interfaces and business capabilities rather than at the level of individual business partners. A model of a potential networked business needs to incorporate the underlying components shared within each of the participating business partners. These completely revolutionary processes in value creation emphasise the need for corresponding changes in the design elements for business models in the network context. A business model for operation in a business network must encompass a broader representation of participants in the network (commonly known as actors), their interactions and relationships with other business partners, and the value created through the network endeavour. Our intended contributions in this ongoing research are two-fold: first, to provide a set of design elements for business models in business networks environments, anchored on theoretical and empirical research in literature; and second, to demonstrate the use of the framework with a case study in the oil and gas industry. This should facilitate and give guidance for future research on the topic.

The remainder of this review is structured as follows: we begin by briefly reviewing the emergence of the business model concept and their design elements in business networks, and then proceed to a methods section where we briefly discuss the way this research is being carried out. We then discuss the design elements framework and illustrate its use through a case study in oil and gas industry. A discussion section concludes the paper.

2 Designing business models for a networked operation

The potential of the business model has been subject to research across a variety of scientific contexts including innovation (Chesbrough, 2007; Fielt, 2014; Martins, Rindova, & Greenbaum, 2015), knowledge management (Week, 2000), and strategic management (Zott and Amit, 2008). This diversity of application contexts readily illustrates the ability of the business model to encompass the range of architectural considerations inherent within a business operation. The business model is defined as the preeminent means by which an organization can deliver value to its customers (Teece, 2010) in a way that articulates the business logic of the organization. This necessitates the delineation and capture of a range of elements from the business within a business model. Previous research has identified the impact of these elements and their interrelation (Zott and Amit, 2007, Gordijn and Akkermans, 2001, DaSilva and Trkman, 2014) with business model innovation (Lièdeke-Freund, 2009). With the emergence of technologies such as the Internet, new ideas involving the concept of business models have resonated within both the scientific community and business practitioners as a means of realising more collaborative and agile operational environments. New ideas require new designs. Consequently, there is a requirement for new formalisms and frameworks able to capture the architectural concepts emerging in contemporary business models such that the conventional elements of a business model
can be related to new settings at the level of the network environment. A network environment can be identified as a group of interdependent organizations (Heck and Vervest, 2007), each one providing a particular role (Ritter et al., 2004) in order for the network to achieve a particular outcome (Forsgren and Johanson, 2014). In this setting, one must consider the whole network and capture the interplay between the various components of the network where each component can potentially be facilitated by a distinct business partner. Previous research has shown the cross-boundary nature of business model operation (Zott et al., 2011) where certain activities of a focal organization are performed by other business partners, suppliers or associates. This allows for the use of resources and capabilities available in the network through different operation arrangements such as outsourcing or co-sourcing. Given their complexity of underlying design and coexisting business models in business networks, operational models often overlap and lead to a level of uncertainty. Therefore, as an organization matures and begins to leverage its business networks, the establishment of a networked operation model needs to be facilitated through the identification and capture of specific, contributing elements that underpin the operation of the network (Decker, Barros, Kraft, & Lohmann, 2008). In this paper, the proposed conceptual framework captures these required design elements for a business network and equips high-level managers of such networks with the means to foresee and deal with critical decision points.

3 Research methodology

It has been established that the development of a framework requires a broad survey and synthesis of the literature, common sense and experience (Eisenhardt, 1989). This has been adopted in our research design which combines a comprehensive literature review with learnings from field-based research based on analysis of case study operational practices and documentation, and discussions with domain experts (Bowen, 2009, Small, 2009). The research design includes three main phases:

(1) Conceptualization phase which includes conducting a literature review in the area of business models with a focus on collaborative networks of organizations, and the conceptual development of the primary draft of business network design elements. Our initial list of academic journals included the Academy of Management Journal (AMJ), Academy of Management Review (AMR), Journal of Management (JOM), Journal of Management Studies (JMS), Management Science (MS), MIS Quarterly, Organization Science (OS), and Strategic Management Journal (SMJ). We also reviewed three of the leading practitioner-oriented journals and websites, namely, PWC Global, Gartner group, and MIT Sloan Management Review (MSM). The focus was on articles that contained the term “business model” in the title or keywords.

(2) Refinement phase, which stabilises the constructs of the primary draft through further literature review and participant discussions. The focus here being on research and learning through document analysis and observation (Miller, 2014) from the research workshop. We conducted two full-day research workshop with 12 participants from industry. The research workshop was conducted to identify additional viewpoints to the initial model through exploration with participants how each model construct relates to their business operation. During the workshop, the researchers documented participant discussions, providing crucial input for further refinement of the model and its design elements.
(3) **Implication** phase, which includes analysis of the case study and concluding the development of the framework and its associated constructs. The case study selection was based on pragmatic considerations, including availability and partner commitment. We also find the oil and gas industry provides a very interesting application context: the industry is highly fragmented with several actors involved in the network including government agencies, service providers, and the operating company (Mother Company).

There is a need for novel, collaborative business models. In the case study, the focus is on collaboration between business partners and how they can best utilise the design elements within their networked operation. It also extends the literature through targeted dissemination of research findings, and discusses further theoretical and managerial implications of the model. This phase of the research project is still underway. The research process is illustrated in further detail in Figure 1.

This is a research work in progress and for this reason; we only focus on the first two phases in the current paper. In the conceptualization phase, the initial draft of the framework was developed through a systematic literature review (Guillemin et al., 1993, Greenland, 1987, Aveyard, 2014) in both the areas of business networks and business models, and through discussion sessions with domain experts. This review provided insights into relevant business model concepts and analysed them with respect to the current literature relating to business model design. The conceptualization phase provided the research team with a deep understanding of the broad range of business models utilised in industry and the literature. The iterative processes of the discussion sessions and literature analysis served to stabilize the framework constructs. In the refinement phase, the research team secured access to the candidate organization for the purposes of the case study. Analysis of the business context of the case study partner (including source documents, business architecture, operational environment and other relevant artefacts) and the subsequent capture of fundamental elements of the relevant business model concepts and their role in its business networks provided further insights from which a new version of the framework was developed.

## 4 Conceptualization of the networked business model design elements

On the basis of the themes and concepts relating to business models surfaced through theoretical and empirical research, and based on insights from discussions conducted during research workshops, we propose the networked business model design elements framework. It consists of three orthogonal design layers: Strategic Partner, Network Sourcing, and Economic Model. The framework considers four orthogonal dimensions for each design principle: Market, Offering, Operation, and Management. The act of design can be effectively described as the delineation of appropriate instructions in an application context based on knowledge with the purpose of creating value (Baldwin and Clark, 2005). In the context of business networks, the design principles provide guidance to organizations, or...
ultimately the actors within a network, regarding the choices they need to make about the definition and operation of their business network. The detailed definitions of each design element are provided in Table 1. The implication column captures the underpinning relationships between organizational artefacts advocated by each design principle. Such relationships can relate to obligations, dependencies or affordances that may exist between the two partners. As a means of capturing these correspondences, we have previously proposed the use of novation requirements (Bakhtiyari et al., 2015). The general form of a novation requirement is illustrated in Figure 2.

The strategic partner layer captures the characteristics of a potential strategic partner. These characteristics are subject to the specific context of the industry in which they are applied and can be defined in relation to any of the network actors. This design layer offers a strategic viewpoint across all of the dimensions of the business network. This notion has received significant attention in the literature (Horowitz, 1983, Morris et al., 2005, Gordijn and Akkermans, 2001) and encompasses a broad range of considerations. In the market dimension, it characterises specific partners and their associated channels. The offering dimension identifies strategies for integration across business partners in a network environment. The operation dimension captures strategic decision-making information and artefacts relevant to business network operation. The management dimension provides a focus on information and artefacts relevant to the governance of the business network.

The network sourcing (Hines, 1996) layer captures information and artefacts related to the configuration of the design principles in a business network at the network level rather at the operational level of an individual partner organisation. The market dimension provides a view of the overall network structure. The offering dimension captures details of the configuration of exposed artefacts at the business network level. The operation dimension identifies the future state requirements for the business network operation and the various roles and resources involved. The management dimension focuses on identification of capabilities supported across the business network. The economic model layer focuses on design principles that delineate value creation opportunities with the business network (Betz, 2002). The market dimension captures details of the target market and potential customers. The offering dimension focuses on financial models applicable in the business network. The operation dimension identifies specific value propositions associated with resources, services and capabilities in the business network. The management dimension describes the actual pricing model of services and capabilities provided in a business network context.

4.1 Case study: Oil & Gas operation network

This research analyses the operation of business partners forming a collaborative business in the oil and gas industry. These parties include government agencies, service provider companies (SMEs), and the operating company (i.e., the coordinating company that is the host organization for the case study). Business partners aim to collaborate in upstream oil and gas industry activities, commonly termed exploration and production. Energy has become an influential factor in the global economy. Petroleum oil and natural gas continue to be major energy sources, accelerating the development of modern civilization. They are also increasingly dominant resources in the production of synthetic materials. This high level of demand necessitates the ongoing search for new oil and gas fields, and the
development of facilities for the extraction of petroleum and natural gas from the earth. Extraction of petroleum is an expensive operation involving a range of different organizations including government agencies, operating organizations (operation orchestrators), drilling contractors, and service companies. A range of major activities are required to support the operating activities of the oil and gas industry ranging from legal and economic analysis, exploration, and development, through to business administration support. These involve the integration of capabilities provided by government agencies, drilling contractors, and the main operating company in order to achieve the required strategic and operational goals. Table 2 provides list of situations that exemplify the use of each of the design elements in a complex networked operation, foreseeing the major decision points and configuration alternatives to ensure the overall transparency of the business network, which in turn results in improved network and operation planning. Further, it offers a guide for deployment of the major artefacts and configuration options as applied to the oil and gas industry case study. These can serve as a ‘check list’ for each actor to identify significant decision points and alternatives for each design layer. In an oil and gas context, network dynamics change frequently and evolve markedly over the medium term horizon, consequently participants need to actively analyse the network environment and seek opportunities for creating additional value. **Strategic partner/supplier definition:** identifies strategic characteristics of potential business partners. In the case of the oil and gas industry, indicators such as prior history of successful operations, the current network of the partner, safety measures, and standard tool packages will be considered useful in identifying a strategic partner. The focus is on providing strategic alignment between a focal organization and the network environment. The layer continues to offer a strategic view across the entire dimension as shown in Table 2. **Network sourcing:** contains a determination of the required resources and services that are actually available at the local and/or global level. The focus is mainly on the interactions between network actors and their associated configuration. **Economic model:** involves exploration of the financial nature of the associated market and value propositions.

## 5 Discussion

Any business explicitly or implicitly requires the adoption of a business model that serves to crystalize the operational requirements for the business, the way it delivers value to its customers, and how it performs in a sustainable and profitable manner. The emergence of new technologies and the Internet has digitally transformed businesses such that the whole network operation now presents the business model and the value creation process is shifted to operate across the boundaries of a focal business partner. Managing the transformations required to take full advantage of this new operating model is challenging for organizations. We use this opportunity to propose a framework for designing a networked business model. This provides a set of design elements for network actors to foresee and appropriately configure the various aspects (both internal and external) of networked business operations. Further, one can conclude that configuring internal operations of a focal organization can still be related to external operation at the business network level. The present paper aims to enrich to current understanding of networked business models. Thus, it should be acknowledged that the current paper is exploratory in nature and does not offer normative comprehensive guidance for designing a networked based business model. The present study opens research avenues with regard to a globally sourced business operation and its building blocks. It contributes to the understanding of the network related aspects of business models. The current research extends the literature on business model constructs and design elements and enhances the literature in business network management and configuration. A more in-depth understanding of design elements of business model allows for better governance of the network operation. Naturally, a single case study cannot lead to definitive conclusions as to whether other organizations can use the framework in the same way. The framework consists of three orthogonal design layers: strategic partner definition, network sourcing and economic model. Each layer focuses on certain aspect of network operation, encompassing network actors, network links and the associated financial model, in way that prepares a business operation to improve their engagement.
in network activities. The design elements are considered to comprise four orthogonal dimensions. The design dimensions aim to fine-tune the constructs of the business network model so that they can be incorporated into the business network planning for an organization. The market dimension analyses the current market that network is operating within in order to best respond to the prevailing economic opportunities. The offering dimension defines innovative service and product designs and the associated pricing logic, consequently, this dimension captures both internal and external configuration details associated with the design elements in such a way that a network partner can proceed to participate in network operations with in-depth understanding of what is being offered, how it can be accessed and what the associated financial obligations are. The operation dimension answers questions regarding the overall strategy of the network operation (i.e., the prescriptive aspect). The management dimension focuses on the task of managing the network operation from a governance standpoint (i.e., the prescriptive aspect).

<table>
<thead>
<tr>
<th>Design dimension</th>
<th>Market</th>
<th>Offering</th>
<th>Operation</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Partner/Supplier</td>
<td>Partner position: refers to how an org manages its partners/associations within the market.</td>
<td>Offering configuration: refers to the innovative way capabilities/services/products are used in a network</td>
<td>Operational strategy: justifies the decisions related to operating model selection.</td>
<td>Interactions management: identifies the underlying principles &amp; regulations related to interactions within a business network.</td>
</tr>
<tr>
<td>Network Sourcing</td>
<td>Network formation: identifies the list of potential participating partners in a business network.</td>
<td>Service/Product design &amp; development: refers to the innovative and re-useable services/products in a business network to be offered to customers (Internal config).</td>
<td>Network strategy: establishes common mission, goal and objectives across all network partners.</td>
<td>Processes/connected activities/business support: identifies within processes/activities/services to support a business network operation.</td>
</tr>
<tr>
<td>Economic model</td>
<td>Target customer/market: identifies the characteristics of the target market/customers for consuming a service/product. It recognizes that each market segment has different needs.</td>
<td>Offering components: identifies a list of selected capabilities/services/products/resources required in a network operation.</td>
<td>Target operating model: identifies the desired state of the architecture for a networked operation.</td>
<td>Business network capability map: characterises the range of capabilities supported across a business network.</td>
</tr>
<tr>
<td></td>
<td>Pricing model of services &amp; product bundles: captures how an org makes a profit from its operation. It is affected by pricing logic &amp; cost structure.</td>
<td>Pricing model of services &amp; product bundles: captures how an org makes a profit from its operation. It is affected by pricing logic &amp; cost structure.</td>
<td>Value proposition: refers to service/capability integration and the diversified value created by them.</td>
<td>Financial aspects &amp; revenue: identifies the pricing logic for service/product/resource deployment based on business rules or changes in the business network.</td>
</tr>
</tbody>
</table>

Table 1: Networked business model design elements
<table>
<thead>
<tr>
<th>Design layers</th>
<th>Market</th>
<th>Offering</th>
<th>Operation</th>
<th>Management</th>
<th>Implication (Novations)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic Partner/Supplier definition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partner position: Only an operating company with certain operating history and ranking will be called for bids.</td>
<td>Offering configuration: It is service provider company responsibility to ensure all equipment are and securely packed in a basket before they shipped on a rig and required manpower are ready.</td>
<td>Operating strategy: Based on a strategic decision a service company might outsource a service like mudding and focus on only drilling.</td>
<td>Interaction management: An operating company uses shipping company to deliver the service provider equipment to a rig after equipment's descriptions checked with the operation requirements. -Interactions of a two service providers to deliver joint operating agreement -Processes/connected activities: A respond to a RFP remains in an active mode till the regulatory compliance approved by the government agency.</td>
<td>Novations capture the correspondences between artefacts within each partner.</td>
</tr>
<tr>
<td></td>
<td>Channel strategy: A service provider company should actively contact the operating company head office, either alone or with partners.</td>
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<tr>
<td></td>
<td>IP rights: Intellectual property ownership resides with an operating company/service providers that created the work product or tools.</td>
<td>Network strategy: An operating company that is responsible for excavation operation of number of oilfields in a region sets certain timeline for service providers.</td>
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<tr>
<td></td>
<td>Channel model: A drilling service provider company uses a specialist subsidiary of another OIl&amp;Gas group to provide drilling manpower services.</td>
<td>Network value stream: An operating company is using number of service providers a cross a reign, It needs to ensure that there is no conflicts in the sequence of operations.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Network Sourcing</strong></td>
<td>Network formation: Issuing an operation permit holds till a list of service providers and their service/ resources submitted to the government agency.</td>
<td>Service/product design &amp; development: For a high quality service, service provider company needs to actively upgrades the tools, descriptions and training workshops for employees.</td>
<td>Targeted operating model: Government agency may change the reporting flow due to changes in machinery of government.</td>
<td>Business network capability map: Based on the specification of a job, an operating company may use number of service provider companies or franchise from other mother companies</td>
<td>Novations capture the dependency constraints in various sourcing alternatives within a context of interacting with a business partner.</td>
</tr>
<tr>
<td></td>
<td>Market model: An operating company needs to actively research the market for service provider companies/business opportunities.</td>
<td>Business interfaces: Service provider company human resources only start their job in the attendance of a company man from operating company.</td>
<td>Role/resource: A service provider company may have number of employees acting a driller due to time constraints.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economic model</td>
<td>Offering components: A service company may not possess a whole range of tools for a specific operation, this activates alternatives such as white branding, leasing tools.</td>
<td>Value proposition: A drilling service company offers a better value by drilling the initial hole and performing a coring operation.</td>
<td>Financial aspects &amp; revenue: A service provider company needs to ensure that the current pricing model covers their cost in extreme conditions such as government policy changes, number of active competitors.</td>
<td>Novations capture identifies the dependencies exist in service compositions/product bundles.</td>
</tr>
<tr>
<td></td>
<td>Target customer/market: A driling company services varies depending their customer/partner requirements.</td>
<td>Pricing model of service &amp; product bundle: Based on a job’s difficulty level and number of resources required service company may provide different quotation.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
References


