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Business Model Implementation within Networked Enterprises: A Case Study on a Finnish Pharmaceutical Project

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In many entrepreneurial projects, the concept of the business model (BM) is used to describe a business idea at a high-level and in a holistic way. However, existing literature pays less attention to implementation (or execution) of BM. Implementation becomes more complex when a BM is proposed by or requires a network of collaborating enterprises. The aim of this paper is to provide an approach based on empirical research that supports BM transition from design to implementation. The empirical data used in this paper is based on a case study involving an innovative project in the pharmaceutical sector in Finland. The case analysis demonstrates how a high-level BM needs careful consideration of its operational components from a network perspective to secure both value creation and capture. Drawing on the analysis, six concluding propositions on BM implementation in networked settings are put forward.

Keywords: business model; business processes; networked enterprises; case study

Introduction

Magretta (2002) states that a business model (BM) is essential to every successful organization, whether it is a new venture or an established player. A growing community of scholars shares that view (see Pateli and Giaglis, 2004; Osterwalder *et al.,* 2005; Zott *et al.,* 2011). Strictly speaking, the design or innovation of a BM should be distinguished from its implementation as the former represents the business logic and the latter is the form BM takes in reality (Osterwalder *et al.* 2005). Despite increasing attention in academia and practice, literature on BM has mainly been focusing on frameworks that are highly useful in BM conceptualization, while largely neglecting the question of how a BM should be implemented in order to create and capture value (Bouwman *et al.,* 2008, 2012; Al-Debei and Avison, 2010; Teece, 2010). In response, scholars call for more attention to BM implementation and the inherent complexities (Veit *et al*., 2014; Wirtz *et al.,* 2016), and emphasizing the urgency of guidelines and insights in how BM can be implemented and which operational factors may impede or contribute to implementation (Bask *et al.,* 2010; El-Sawy and Pereira, 2013; Osterwalder *et al.,* 2005).

Part of the complexity can be attributed to the dynamic network-driven context of contemporary businesses (Haaker *et al.,* 2006; Solaimani *et al.,* 2015). Most BM frameworks take a single firm perspective and in that way ignore the fact that more often than not firms operate as multi-actor cross-industry networked enterprises. Networked enterprises are marked by heterogeneous inter-organizational processes and interdependencies (El-Sawy and Pereira, 2013; Palo and Tähtinen, 2013), where value creation and capture is not a mere result of a dyadic relationship between provider and consumer, but value is created and captured by a collective effort of the involved network (Sharma *et al.*, 2010). Hence, the twofold aim of this paper is to advance our understanding of BM implementation and the role of operational network processes in value creation and capture.

The empirical data used in this paper is based on a case study involving an innovative Finnish pharmaceutical project in which multiple actors have to work together.

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First, the BM canvas model (Osterwalder, 2004) is used to arrive at a comprehensive description of BM from the focal firm viewpoint, after which the implementation of the BM is analysed making use of a framework that focuses on network aspects (Solaimani and Bouwman, 2012). In doing so, a gestalt view of the multi-level operational interactions and network interdependencies are developed, which, in turn, helped to identify factors diluting (or strengthening) BM implementation.

The remainder of the paper is organized as follows. The subsequent section provides a brief review of literature on BM. Then, the gap between design and implementation is explicated. Next, the research method is discussed and the results are presented. The paper discusses the empirical findings, after which the final conclusions are presented, along with the limitations and suggestions for future research.

Business model analysis: a shift from conceptualization to implementation

The concept of BM has been investigated and used by many scholars and practitioners from various disciplines and contexts, which has resulted in a wide variety of definitions (e.g., an overview is provided by Pateli and Giaglis, 2004; Osterwalder *et al.,* 2005; Zott *et al.,* 2011). Generally speaking, the concept of BM refers to a description or model that represents a firm's logic to create and capture value from and for its stakeholders (e.g., Timmers, 1998; Linder and Cantrell, 2000; Gordijn *et al.,* 2000; Petrovic *et al.,* 2001; Weill and Vitale, 2001; Chesbrough and Rosenbloom, 2002; Magretta, 2002; Bouwman *et al.,* 2008). Without making any pretense of being comprehensive (for a thorough literature review see Pateli and Giaglis, 2004; Morris *et al.,* 2005; Shafer *et al.,* 2005; Al-Debei and Avison, 2010; Baden–Fuller and Morgan, 2010; Zott *et al.,* 2011), the extant body of knowledge can be divided into typologies (Timmers, 1998; Tapscott *et al.,* 2000; Weill and Vitale, 2001; Rappa, 2001; Malone *et al.,* 2006), classifications (Pateli and Giaglis, 2004; Shafer *et al.,* 2005), and ontologies, for example, business model components (Cherbakov *et al.,* 2005), the Service, Technology, Organization, Finance (STOF) model (Bouwman *et al.,* 2008), Customer, Service, Organization, Finance, Technology (CSOFT) (Heikkilä *et al.,* 2010), BM canvas (Osterwalder, 2004), and BM qube (Lindgren and Rasmussen, 2013).

Recently, scholars and practitioners underscore the need to shift the focus from conceptualization toward implementation, aiming at developing approaches to analyse BM viability and feasibility (Bouwman *et al.*, 2008; Al-Debei and Avison, 2010; Teece, 2010; El-Sawy and Pereira, 2013). According to Teece (2010) promising technological ideas are commonly doomed to commercial fail due to lack of proper attention to implementability.

Although strategic considerations are essential in designing a BM (c.f., Teece, 2010), BM is not in itself a strategy (Shafer *et al.,* 2005); instead, it can be deemed as a coherent system of activities that help firms to implement their strategy (cf, Casadesus-Masanell and Ricart 2010). Thus, BM can be positioned at the intermediate layer between business strategy and business processes (Osterwalder, 2004; Morris *et al.*, 2005; Al-Debei and Avison, 2010; Bask *et al.*, 2010; Cavalcante *et al.*, 2011). Business process are defined as 'a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action' (Davenport, 1993: 5).

Clearly, a firm is not operating in isolation (Håkansson and Snehota, 1989), both strategy and business processes need also to be considered from a network perspective. Chesbrough and Rosenbloom (2002) emphasize the influence of the firms surrounding network on the value captured from commercialization, for instance through the supply of complementary goods on the supply side and increasing the network effect among consumers on the demand side. Such network-oriented perspective is in line with 'relational view', which refers to value creation and capture as a function of network resources generated in an exchange relationship among networked stakeholders (Dyer and Singh, 1998). However, with a network perspective, it becomes clear that value creation and capture are two distinct processes, as also argued by Bowman and Ambrosini (2000). Value creation is often related to value offered to and perceived by consumer or receiver (e.g., customers), while value capturing is about how value provider reciprocally benefits from the value consumer. It is important to notice that in a network setting, the entity that creates value is not necessarily the same entity that captures or retains the value in the long run per se; rather, the value created at one level of analysis can be captured at another, a process that is called 'value slippage' (Lepak *et al.*, 2007). In order to understand value slippage a careful analysis of the operational side of networked enterprises by looking into the multi-level inter-organizational business processes is required.

In understanding the relationship BM and multi-level analysis of BM networked business processes, at least, two streams of literature seem promising, namely, BM tooling models and conversion models. BM tooling helps to analyse a BM by focusing on one or more operational aspects of its implementation. As such, Bouwman *et al.* (2012) put forward stress testing to analyse BM uncertainties, Heikkilä *et al.* (2014) provide metrics to measure BM performance, De Reuver *et al.* (2012) introduce BM scenario testing, and Tian *et al.* (2008) BM financial impact analysis Daas *et al.* (2013). The conversion methods, on the other hand, aim to translate

or map a BM representation into a business process model. Examples are the chaining methodology that enables the conversion of e^{3}value into Unified Modeling Language (UML) (Andersson *et al.,* 2006), or Iacob *et al.*'s (2012) model to convert BM canvas to ArchiMate. However, at a closer look, by comparing these models (see Appendices I and II for an overview of both models), we can see that a network-oriented focus on inter-organizational business processes is still largely lacking. For instance, Allee's (2008) value network analysis does not address the operational processes and process dependencies between stakeholders, while Pijpers *et al.*'s (2009) e^{3}alignment approach fails to extricate intangible operational assets, capabilities and dependencies, such as knowledge and expert systems, from high-order monetary values. In fact, many of the models seem not to be focused on any analysis at all, and primarily aim is to (graphically) represent the BM with a higher level of granularity.

The value-information-process (VIP) framework proposed by Solaimani and Bouwman (2012) appears to be one of the few BM analytical frameworks that explicitly rely on networked operational processes and interdependencies (Figure 1). The framework aims at (i) providing a comprehensive account of the BMs' underlying inter-organizational interactions and interdependencies, (ii) facilitating a systematic analysis of pertinent elements of intra-organizational interactions and interdependencies, and (iii) addressing multiple levels of analysis. With that, the 'V' stands for the value creation and exchange between stakeholders, ranging from tangible (e.g., monetary flows) to intangible value flows (e.g., cooperative alliance). The 'I' stands for the creation and sharing of information and knowledge between stakeholders, ranging from unprocessed data to information and knowledge. The 'P' focuses on the primary underlying business processes of the networked enterprise. On the horizontal axe of the framework addresses four generic components of networked enterprise collaborations, (i) delineation of the business network, (ii) network resources and capabilities, (iii) interactions between networked actors, and (iv) relationships and interdependencies between collaborating stakeholders. Given the focus of this study, being on the BM implementation within networked enterprises context, the VIP framework is deemed to be sufficiently promising to be used as an analytical 'lens' to further probe the implementability aspect of BM. The next section details how the framework is applied.

Research method

To arrive at a solid understanding of BM implementation and the inherent complexities regarding value creation and capture within networked stakeholders, an explorative case study is perceived as an appropriate research methodology. Explorative case study aims at gaining an in-depth understanding of a phenomenon and its context (Roethlisberger, 1977; Benbasat, 1984; Cavaye, 1996). Particularly, case study helps us to understand the nature and complexity of the processes taking place (Benbasat *et al.*, 1987). Grounded in the actors' experiences and the context of their action (Bonoma, 1983), such inductive approach is helpful in revealing what factors are perceived as critical by the networked stakeholders throughout the BM implementation process.

The empirical data is based on an innovative pharmaceutical case, in which a number of firms work together in developing services that are designed to increase and improve the physical activity of their patients. With that, the unit of analysis is not an individual firm, but a networked enterprise, consisting of several interdependent, yet autonomous, partners with a common goal. In total, 11 semi-structured interviews were conducted with key stakeholders at both a strategic and operational level (Table 1). On average, each interview took about one and half hours and all interviews were recorded (the interview questions are available upon request). Multiple data sources were triangulated, including firms' websites, stakeholders' meeting minutes, business and market analysis reports. The search for new interviews and other data sources only stopped after 'data saturation' has been reached (Glaser and Strauss, 2009), that is, the last interviewees could not provide any new information or new documents that might lead to new insights. Prior to the interviews, a case study protocol

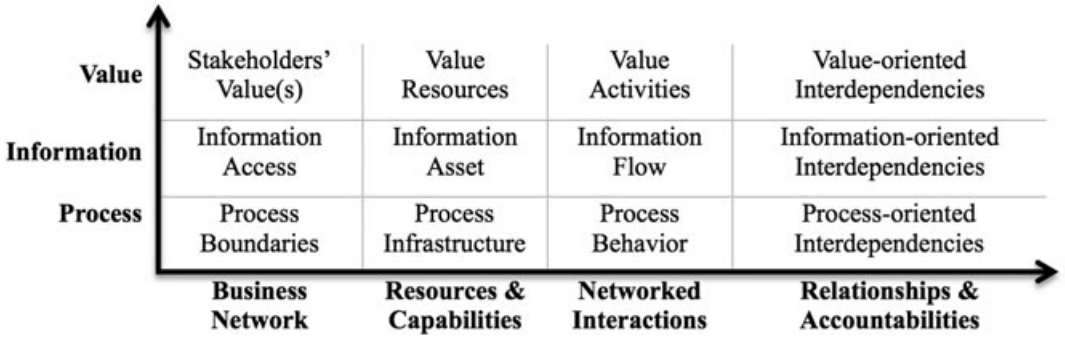

Figure 1 The VIP framework (adapted from Solaimani & Bouwman, 2012)

Table 1 The interviewees at both strategic and operational levels

	Roles	*Companies*	*# interviews*
Strategic	Project Initiator	Pharmacy Training	1
	Service Development directors	Healthcare provider	2
	Project Management	University-based	4*
	ICT Developer Management	Healthcare provider	1
Operational	Pharmacist	Pharmacy	1
	Operational Management	University-based	1
	Sales & Marketing Manager of the pharmacy	Pharmacy	1

* *The project manager was involved in both strategic and operational level activities and decision-making. Therefore, multiple interviews were conducted with this person.*

and an interview protocol were developed to guarantee research reliability (Yin, 2009).

Business model description

Before this study was initiated, a preliminary outline of the project's BM had already been drafted. The partners had used the BM canvas (Osterwalder, 2004), in an attempt to structure and represent the overall logic of the case. As the network actors were already familiar with the BM canvas, it was natural to use the same model to further structure and represent the overall logic of the project. The commonly accepted components of BM, including the projects value propositions, underlying technologies, stakeholders and their relationships, key resources, cost and revenue structure were addressed in the first part the interview. The final version of the BM canvas of the project has been reviewed by all the interviewees.

Business processes analysis

After the BM canvas was finalised and shared between partners, the interviews were geared toward the issues related to implementation of the BM. The questions drawn on the VIP framework with a focus (i) the underlying structure of value and information resources and how they are created and captured with and by the network, (ii) the structure of the primary business processes and how these are flowing through the stakeholders, and (iii) and how network-driven operational issues may contribute or undermine the BM. Drawing on the extracted data, several VIP diagrams were developed, and iteratively reviewed and revised throughout the interviews.

The analysis of the BM/BP alignment

The interview transcriptions, as well as, other collected documents were subjected to systematic data analysis proposed by Miles and Huberman (1994). The analysis started with 'open coding', which is concerned with identifying, naming, categorizing and describing phenomena found in the transcriptions (Strauss and Corbin, 1998). The authors reviewed each other's codes and discussed the concepts to be coded, the labels of the codes, and the levels of detail, which ultimately resulted in 32 reoccurring codes (the list of codes are available upon request). A final check indicated that, with three exceptions, the authors were highly consistent in their perception of the codes involved. Finally, by means of 'pattern coding' (Miles and Huberman, 1994), the lengthy list of codes was clustered into a smaller set of factors. After several interactive and iterative sessions, the authors came to a unanimous conclusion that six critical factors explain the issues identified in this case study.

Results

Business model description

The physical activity prescription (PAP) project is represented in a BM Canvas. For the sake of confidentiality, fictitious names are used.

Value propositions. The goal of the PAP is to further enhance patients' physical health and fitness by enabling medical doctors (MDs) to prescribe medically reliable physical exercises, in the form of a 'personalized activity program', in addition to the medical treatment that the patient would receive. The service focuses on preventing health issues such as obesity, type II diabetes, hypertension, hypercholesterolemia, and cardiovascular issues.

Customer segments. The PAP service will first be available as an occupational health service, and can be scaled up in the later stages. Therefore, initially, the end-users (or patients) are employees from companies that, in turn, are customers of one of the largest occupational healthcare service providers in Finland.

Customer relationships. The service providers (including MDs and pharmacists) and the patients are the two key customers in the PAP case. As a part of the PAP initiative, special trainings and workshops are provided to MDs and pharmacists to re-educate them with regard to well-being and physical activities and the cutting edge assistive technologies. Furthermore, the PAP initiative is expected

to intensify the relationship between patients and service providers.

Channels. The medical doctors and pharmacists are the primary channels through which medical knowledge and supporting products are delivered to patients. In the later stages, a virtual service platform is envisioned as a complementary medium (in addition to a face-to-face interaction) between patients and healthcare service providers. Some merits of such a platform are instant and seamless communication and service provisioning, intensified integration and collaboration of service providers, service bundling and (visual) knowledge management.

Key activities. The process starts as soon as a patient visits the MDs or pharmacies involved in the PAP project. Key activities are prescribing physical activities to patients, measuring patient well-being (e.g. body age index, body mass index, body fat percentage), storing patient data in a central database (Figure 2), and periodic control to motivate the patients, while providing them with guidance and planning throughout the process.

Key resources. The project benefits from an established network of cooperative MDs affiliated to one of the leading Finnish occupational healthcare providers (which is one of the largest pharmacy chains in Finland), and a company that provides training courses and workshops to doctors and pharmacies. Furthermore, an international pharmaceutical company is involved. The project is co-funded by one of the largest Finnish government innovation and research funds.

Key partners. The stakeholders are presented in Table 2. The project aims to create value for all the stakeholders involved.

Cost structure. The core costs are staff salary (including trainers, marketers, coordinators), the development of the service platform, the maintenance of user data and data regarding predefined prescriptions, and the integration of the platform with the partners information systems.

Revenue model. The generated revenues differ for various providers, see Table 2.

Business model operational analysis

From the collected data the VIP component were inferred and visualized (Appendix III). The diagram captures the stakeholders shared resources, value objectives, interactions and interdependencies at a value, information and processes level. On the diagram, the stakeholders and their information systems are interconnected at various levels, likewise the value creation and capture, and the shared information, processes and infrastructure. The boundaries of three core process units are approximated by dotted ovals, representing the platform provision, data generation and management, and platform management. The value propositions are depicted at the bottom, each related to one or more stakeholders. In the process of modeling, reviewing and revising the diagram by and with the stakeholders, several operational conflicts at various levels of analysis have been identified. Next, for the sake of brevity, a select few quotes are presented and discussed.

Value creation and value capturing. Except for the pharmacy training company, the initiator of the PAP project, some stakeholders are skeptical and uncertain about the financial viability of the concept.

v1. 'It is uncertain if patients usage and the money they bring in the network will exceed the system development costs. (Project Manager)
v2. 'The question is whether enough patients will accept to visit a pharmacy to do the test and pay for it, which would cover the costs made by us [pharmacist] to purchase the measurement devices'. (Pharmacist)
v3. 'We have all the Lego blocks, we can actually build the process, but are we all going to have our shares?' (Service Development Director)

There seems to be is some skepticism and uncertainty among the stakeholders reciprocal objectives and intentions. The dynamism and diversity in the network

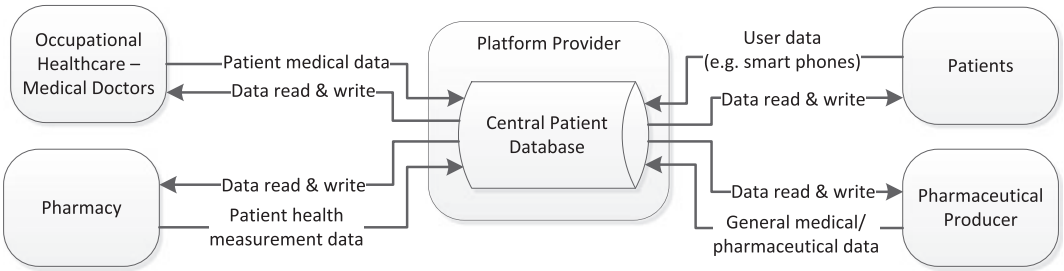

Figure 2 Data flow and the central database

Table 2 The value add to stakeholders

Stakeholders	*Value creating/capturing potentials*
The Patient/Clients	Medical Doctors (MDs) prescribe physical exercises that are aligned with patients' needs and constraints. The changes in physical well-being are measured regularly at a pharmacy and the patient is also encouraged to increase his/her physical activities. The underlying presumption is that patients are more likely to be committed to increase their physical activities (which effectively helps the patients to improve their physical and mental wellness) when a MD prescribes it.
The Patients' Employers	The patients' employer is another (indirect) beneficiary of the project. Any amelioration in the patient's lifestyle will have a positive impact on the patient's work performance in terms of mental and physical wellness, engagement, less absenteeism, happiness and satisfaction.
Occupational Healthcare Provider and MDs	The targeted MDs in this case are affiliated with the Occupational Healthcare Provider (OHP) company. The MDs charge the patients, the OHP reimburses the patients' healthcare costs, and the patients' employer pays the OHP.
Pharmacies	For the purpose of periodic check more customers will more frequently visit the pharmacies, which provides an opportunity for the involved pharmacies to not only improve their customer-products exposure rate, but also offer a new range of relevant products to the customers (e.g., basic measurement equipments, home exercise tools, supplementary nutrition).
IT Developer	Charges a pre-agreed hourly wage for the development the platform and its integration in the MDs' patient information systems, as well as, the technical maintenance and aftersales services. Moreover, the IT developer company is currently responsible for the MDs' information system. The platform project extends their dominance in the network.
Equipment Provider	The MDs and pharmacies need measurement devices and maintenance services, which will be provided by the Equipment Provider (EP).
Training Company (the project initiator)	A large set of tailored-made exercise programs (depending on the patients weight, height, illness, mental state, and more) will be developed by the Training Company (TC), which will be at the MDs en pharmacies disposal via the platform, and who can fill in a form and download a contextualized prescription (i.e. Pay-per-Click payment). In this position, the TC can collect real-time anonymized data regarding the downloaded prescriptions. Furthermore, it is the TC's responsibility to train the MDs and pharmacies about the cutting-edge technologies, trends and researches in the field of physical activities.
Pharmaceutical Producer	Comparable with the EP, the Pharmaceutical Producer (PhP) delivers new products relevant to the prescribed physical exercises, including supplementary and energizers, customized multi-vitamins and suchlike. In addition, the PhP expects to benefit from a positive market image by positioning itself as pro-preventive healthcare company.
Sport Centers	The patients/customers (referred by MDs en pharmacies) will be received and coached by a dedicated team of well-informed instructors at the local sport centers.
Government	One of the most prominent Finnish governmental healthcare institutes co-fund the initiative, and benefits in terms of 'policy effectuation' regarding of health and vitality of the citizen.
University	A Finnish university is co-funding the project to gain access to empirical data that can be used in studying various topics (e.g., entrepreneurship, business modeling, preventive healthcare).

appears to complicate the process of reaching a common vision and clarifying the roles and responsibility in the network actors (see also quote i9).

v4. 'We have several stakeholders in this complicated network, we have the pharmacy side, MDs, service providers who evaluate whether prescriptions are used, and us … it is not clear which value propositions all these actors, individually and collectively, are focusing on now, and particularly, if these values will be different in future'. (Service Development Director)

v5. 'Well, if we had a more concrete view, a shared vision on each other's roles, so that we could say hey, you bring that piece; we bring these pieces, in order to achieve a functioning end result. Then the pieces are clear and we know whom to contact in order to carry on. That is something that maybe could be improved, I mean the understanding of each other's roles'. (Sales and Marketing Manager)

The patient, another nodal point in the network, seem to be largely left out of consideration. As a result, broad market diffusion and user acceptance remain a serious question mark for some stakeholders.

v6. 'We need to investigate the users more seriously. We don't know how they will react to this concept. We have collaborations with health clubs, where the physiotherapists refer their patients. They [the physiotherapists] also accompany the patient during the first visit(s) to the gym. Perhaps it might be easier for the patients to visit our physiotherapists and to get the measurement in the same building as the medical doctors'. (Service Development Director)

Another source of conflict is the lack of agreement on how value will be captured by the stakeholders. One pertinent example is the stakeholders' skepticism about the shared service platform and how various services will be provided on the platform.

v7. 'In my opinion, having the physical exercises on prescriptions is the trigger of the preventive treatment chain. But we need more. We need to

motivate the patient to keep up exercising, by using an app [mobile application], for example, or anything else. Also, the control of what a patient is doing is an important task that we need to take into account … All these services, either in-house or outsourced, can be stored on our platform or on third-party platforms … but this is something that we yet need to understand and decide'. (Service Development Director)

As part of value capturing process, the questions of 'who should hold the ownership of the service platform?' seems to be non-trivial, if not controversial, in a network with 'equal' participating actors. Should it be the pharmaceutical company, the occupational healthcare provider, the initiator, or all together. A consensus view seems to be needed on how resources (including data, knowledge, revenues, market exposure) need to be shared and who is accountable for what.

v8. 'To implement the PAP concept, various resources and knowledge are needed … they [healthcare providers] will bring a lot of credibility and agility to this project, which makes it possible to roll out the project nationally … But to me, it is a dilemma if a person like John [the initiator of the project and the director of the pharmacy training company] will not be accepted as the owner of the platform, will they [the healthcare providers] look forward to share the system, or they may both aim to develop a totally open system'. (Operations Management)

A focus on value creation and capture reveals other conflicting sentiments among stakeholders. In this case, the project initiator refers to a counter-innovative attitude of the occupational care provider.

v9. 'I'm doing my best, first, to find the right person with the needed authority and expertise in this enormous enterprise [occupational care provider], and second, to get this concept on their agenda, which is even more challenging, typically in the health sector, and especially in this organization, which is dominated by bureaucracy, hierarchy, rules, and a conservative and unresponsive attitude toward innovation'. (Project Initiator)

The occupational healthcare provider, in turn, raises doubts about the monetary value streams that underlie the concept.

v10. 'As such [following quote v7], it is not clear who makes money and how? And this is one of the most relevant questions that we still cannot clearly define. This is basically the money flow, who will pay, and who will get what?' (Service Development Director)

Information resources. A focus on information resources reveals that the foregoing value-related issues are cascaded into information flow and interdependencies among the stakeholders. For instance, the confusion about the platforms ownership (see quote v8) gives rise to another intricate issue, namely, data ownership. Should the data be under patient control, but exclusively superintended by the MDs, which would imply a semi-open platform, or rather, should it be made accessible with the patients consent by means of an open service platform based on which providers can offer personalized services.

i1. 'The pharmacy, platform provider, and others, are interested in patient data, but we are interested in the database as well'. (Service Development Director)

i2. 'Ownership of the database in not clear! But it is one of the most important sources of revenue'. (Project Initiator)

i3. 'The PAP is highly dependent on occupational healthcare providers for gaining access to the systems of medical doctors. Without that access, the database provides an incomplete picture of the patient'. (Project Initiator)

i4. 'The prescriptions and medical information should be stored in our medical patient information system; however, we don't need to store the results of the physical exercises in our systems. That should be stored in a different database, owned by a third trusted party or the patients themselves. In a same way, for example, information regarding antibiotics will be stored in the medical system, but whether you have consumed the antibiotics and how many of them and what time are not stored in our system … there are other possible variations, which we need to evaluate and agree upon'. (Service Development Director)

The extent of platform's openness appears to have a significant impact on how data can be exchanged between stakeholders. There are several ways how the service platform can be set up, each with significant impact on data exchange and ownership, as well as, the type of collaboration among the stakeholders. As such, the platform can be exclusively owned by a set of providers whose services are collectively co-created and provided to customers (i.e., closed platform). Alternatively, the platform can serve as an extension of existing healthcare services, exclusively managed by a handful of first-tier providers whom buy services from an exclusive network of second-tier providers (i.e., semi-closed platform). And

third option is a hybrid form of co-ownership of the platform with semi-open 'gate policy', where consent of all (or a majority of the) platform members is needed to allow for new entrants to provide their services on the platform (Figure 3).

i5. 'The medical doctors will issue a prescription, which will be stored on our system; but this information will be sent to another system (physiotherapist, pharmacy, gym, etc.) and patients should be able to access this second system throughout their lives … In a similar way, the measurement comes from the doctors, but also from the health clubs or the patients themselves. This means that it is not a prescription system, but rather a motivational platform, that not only helps the patient to start the physical exercises, but to keep doing them in the future as well, comparable to Endomondo [which is a sports community based on free real-time GPS tracking of running, cycling, etc.]'. (Service Development Director)

Not unrelated to the types of the platform, yet a concern in its own right is data privacy and security. The sensitive information, including non-public patient data, confidential sales and purchasing data of the providers and suchlike needs a careful consideration. According to the operational manager, the risks and threats need to be identified and assessed in advance; the data security can be treated on the basis of an ad hoc 'trial and error' fashion.

i6. 'A lot can be done with data but that is a risk at the same time. We need to find out what threats there are and how these threats might affect our business'. (Operational Management)

The unique value proposition involved in this project is highly dependent on the (tacit) knowledge based of some actors in the network (e.g., the pharmacies' knowledge of physical exercises or the skills of health center coaches in dealing with patients). According to one of the interviewees, the concern of having the 'right' partner in the network is a genuine one; in fact, a lack of expertise, for instance in physical exercises, associated technologies and trends, may severely deteriorates the service quality and endanger patients health.

i7. 'The patient should go to a pharmacy to get advice regarding physical exercises, but in my opinion, they [pharmacists] are no experts in this area. I trust them telling me about antibiotics, but not how I should move … sometimes the medical doctors need to send their patient to an expert on physical activities, like a physiotherapist or personal trainer (at a gym), but not to a pharmacist'. (Service Development Director)

Similarly, lack of access to knowledge impairs service quality and service delivery. For instance, one of the pharmacists adds that, in addition to knowledge on physical exercises and rehabilitation (especially for disabled patients), information regarding local health clubs (e.g., contact information, process and procedures) is not at pharmacies disposal. As a consequence, the pharmacy neither can inform the customers about the health clubs, nor providing auxiliary services, including follow-up personalized exercise programs based on the patient's progress.

i8. 'We need the training in order to approach our customer properly and provide them with adequate information about how to move, exercise and so on … we advise patients and if they want to follow up, they will need information regarding sport centers, which we do not have!' (Pharmacist)

i9. 'Accepting patients with mental disabilities or instabilities or with drug addiction may present us with problems. Note that it is exactly these patients who may need more physical exercise. We need to discuss with the partners how to deal with this'. (Pharmacist)

Primary business processes. The complications and conflicts at the value and information level continue to

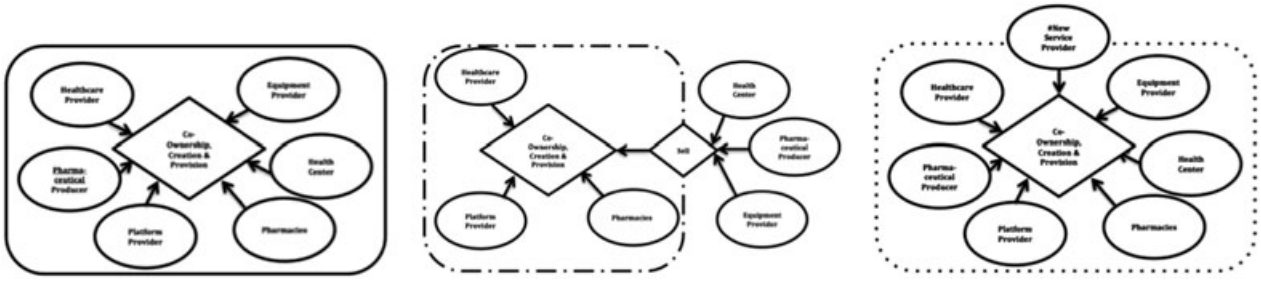

Figure 3 Open integrated platform versus semi-closed dedicated platform

manifest themselves at the process level as well. An example is the ambiguity around stakeholders' intentions in this project (see quote v4), as a consequence of which the system and process integration is considered to be contingent upon stakeholders' consensus on value creation and capture.

p1. 'Of course, the connection or integration of the healthcare provider's IS [information system] and CRM [customer relationship management] with the PAP platform, which includes the prescriptions and patient data, is complex or challenging, but only with good planning, together with them [the healthcare provider], we can deal with it'. (ICT Developer Management)

Similarly, the ambiguity around stakeholders' accountability (see quotes v5, v8 and i5) leads to indeterminate jurisdictions over inter-organizational process and blurred process boundaries. According to one of the interviewees, attention for process accountability, as well as, governance and compatibility of the processes that transcend the boundaries of the networked actors are among the top priorities. A clear instance is the patient measurement protocol that should capture the needs of various stakeholders.

p2. 'The roles within the value chain should be specified. So for example, if you give patients the prescriptions and send them to pharmacy, then they will do some measurements, but we also want to do the measurements! Who decides what these measurements should be? And at what point are these measurements no longer medical data, but more related to the well-being services? And why shouldn't we be able to do that? In short, it should become clear where our jurisdiction ends and where the others' start in order to plan the required future activities … on the other hand, it is not clear what the prescription is exactly. Is it piece of paper that you can put it in your pocket and forget about? Or is it something that can be traced, monitored, etc.? It [the prescription] also should contain enough information, not only 'go to gym'. It has to be specific'. (Service Development Director)

The delineation of process boundaries within the network can also be brought into relation with the dilemma regarding data management, that is, extending the existing MDs information systems versus development of a stand-alone exclusive PAP-owned information platform (see quote v8, i1 to i5).

p3. 'There is a system integration dilemma, we don't want to put more things in our system but at the same time, we don't want to do things outside the system, for instance a platform in the cloud!' (Service Development Director)

Inter-organizational process coordination (or orchestration) is another necessary condition for preserving a consistent services level, such as patient identification and traceability.

p4. 'If a medical doctor sends a patient to physiotherapy, health center, gym or wherever, the same medical doctor should remain responsible for the whole trajectory. In case we send a patient to the gym, and the patient gets a heart attack, we need to be able to trace where in system we have failed or how we should help the patient better'. (Service Development Director)

p5. 'Changing employer or pharmacy may lead to conflicting information or untraceable patient data'. (Project Manager)

According to the healthcare provider, although a poor coordination may not hinder firms excelling in their own processes in the short run, it severely hinders the progress and leads to process uncertainty in the integration phase, typically when considerable portions of resources are already exhausted.

p6. 'One of my fears is that we start to optimize partially! Pharmacists will start to optimize their things, Jyvaskyla people will optimize their systems, Turku people the same, and we, as the biggest player, we will optimize only our part'. (Service Development Director)

p7. 'It is not clear … what the others have done since the last meeting! Has something come up that would hinder the project? Or something that would speed it up? This is not mistrust but uncertainty'. (Sales and Marketing Manager)

Discussion

The comparison and classification of issues identified in the case study yielded six patterns of reoccurring network-driven operational hindrances to the implementation of the studied BM, namely, contingencies and uncertainties, resource scarcity, unknown and latent requirements, conflicting and incoherent business processes, and unilateral decision-making process. Next, the six factors and how these factors influence the process of value creation and capturing is detailed.

Contingency (and uncertainty) are conditions, difficulties or limitations that are hard to predict due to complex and dynamic interaction of situational and

environmental factors (López-Gamero *et al.,* 2011; Olsen *et al.,* 2014). Lepak *et al.* (2007: 183) posit that answering the question how value is created requires one to define the source and target of value creation and the level of analysis, that is, individual, organization or societal level. A clear example from the case is, how efficient the medical doctors will be able to use the new third-party prescription system in combination with the existing systems. Poor system usability will cause annoyance and reluctance on the side of the medical staff, leading to counterproductive overheads for the staff, and ultimately is expected to cause resistance to change. System requirements and the future users' usage behavior seemed to be another source of uncertainty for the stakeholders we interviewed. Hence, for value to be created, the operational uncertainties need to be identified, from both individual and networked perspective, in an early stage of BM design:

Proposition 1. Uncertainties caused by or inherent in operational processes of networked enterprises deteriorate the implementability of BM.

Resource scarcity denotes the unavailable and inaccessible assets, capabilities and resources that are required by one or more stakeholders to create value. Pfeffer and Salancik (1978: 2) argue, 'no organization is self-contained, and the key to organizational survival is the ability to acquire and maintain resources'. In particular, from a network view, various interdependencies are in place (Cook and Emerson, 1978). Through their relationships, the stakeholders involved in the network can gain access to each other's resources, and therefore, mobilize and use resources controlled by other stakeholders in the network (Håkansson and Snehota, 1989). Typically, the network and the inherent resource dependencies are constituted by actors with various strategic power (Iansiti and Levien, 2004; Wehn de Montalvo *et al.*, 2005) with varying (gatekeeping) control over relevant resources and capabilities (Ballon, 2007). Accordingly, operational access to and control over resources need to be aligned with the overarching BM.

An example from the case is the pharmacists whom are supposed to provide patients with all kinds of personalized information regarding physical activities. However, in the current setting, there is no information exchange or communication channel between pharmacies and health clubs. Hence, the data regarding patients' physical activities and progress are not readily available to pharmacies. Not to mention that customers' data is a strategic asset to that is not likely to be shared, next to more generic issues related to data protection and confidentiality of data that needs to be taken into account as well. Lack of preparedness to share customer data or of sharing customer contacts is one of the typical causes of BM failures in networked environments (Solaimani *et al.,* 2015). In conclusion, throughout an early design stage, the indispensable operational and supportive resources, specifically with regard to critical information, need to be identified and resource availability and accessibility needs to be collectively assessed:

Proposition 2. Lack of availability and accessibility of operational and supportive network enterprise' resources deteriorates the implementability of BM.

Unknown and latent requirements concern stakeholders unknown and latent needs, constraints, goals, and often, strategic intentions. Stakeholders may deliberately hide or be reluctant to share information with other network partners to enhance their bargaining power and safeguard their strategic position within the network; a phenomenon coined as 'isolating mechanism' by Lepak *et al.* (2007). Frequently, stakeholder analysis is suggested as an approach to identify stakeholders and their strategic goals (Freeman, 1984; Mitchell *et al.,* 1997). Clearly, candid, transparent and frequent dialogues among stakeholders are a prerequisite to arrive at shared vision, mutual understanding and trust, without which the value creation process is virtually impossible (Solaimani *et al.*, 2013). An example from the case is that the project initiator did not know whether the equipment provider is able (or willing) to customize its systems and devices to adhere to the platform's requirements. Although, on the surface it may seem harmless, a lack of compliance with requirements is expected to introduce all kinds of unnecessary complications into operations, but also on data collection, retrieval and analysis. Throughout an early design stage, the stakeholders' core operational requirements need to be identified and compared, so that the sources of mismatch can be expounded:

Proposition 3. Lack of clarity of stakeholders' strategic intent and operational requirements deteriorates the implementability of BM.

Conflicting processes refer to business processes, within and between stakeholders, which are redundant, inconsistent with, oppose or weaken other processes, causing value discrepancies within the network. Also, conflicting trade-offs are a part of this factor. It is argued that conflicting value activities (Gordijn *et al.*, 2000; Bouwman *et al.*, 2008) and inconsistent and redundant processes (e.g., Sommerville *et al.*, 1999; Sadiq *et al.*, 2007; Recker *et al.*, 2009) lead to misaligned BMs and suboptimal business moves (Osterwalder, 2004; Chesbrough and Schwartz, 2007). Such conflicts are typically immanent in matters like 'the division of the captured value', for instance, in terms of revenue sharing

(Kindström, 2010). An example from the case is a conflicting trade-off, as to expand the existing patient information system toward an integrated system with a higher usability for the MDs offset by higher development costs and system fragility (since the complexity of MDs' existing information systems render any system integration virtually impossible), or to develop a stand-alone external platform owned by one actor (e.g., the project initiator), which allows the platform owner to have the exclusive rights of the system in exchange for accepting the development cost, risk of malfunction or imperfect compatibility, poor user acceptance, etc. To sum, throughout an early stage of design, the potentially conflicting value creating and capturing processes and trade-offs need to be mitigated:

Proposition 4. Conflicting inter-organizational business processes deteriorate the implementability of BM.

Incoherent processes refer to business processes, within or between stakeholders, which are in a state of chaos, disordered sequence, poorly coordinated or siloed from the integrated (networked) system. Drawing on the same literature as in the conflicting processes, incoherent processes between network partners are detrimental to both value creation and capturing process. An example from the case is the patient measurement data. In the current state, patients undergo various measurements by MDs, pharmacies, health clubs, and by themselves (e.g., using smart phones to register physical activities, nutrition, medicine consumption). There is a clear lack of orchestrated approach or architecture to connect, relate and combine these measurements in an integrated dashboard without which the intended value cannot be optimally created. Hence, throughout an early stage of design, the potentially incoherent processes need to be identified and addressed by involved network actors:

Proposition 5. Incoherent inter-organizational business processes deteriorate the implementability of BM.

Unilateral decision-making refers to a lack of consensus between networked actors on collective matters, including but not limited to contracts, scope, service level agreements and key performance indicators. Identifying conflicting or incoherent operational aspects is one thing, but collectively agreeing on a solution is something entirely different. According to Lepak *et al.* (2007: 185) 'various stakeholders have different views as to what is valuable because of unique knowledge, goals, and context conditions that affect how the novelty and appropriateness of the new value will be evaluated. Moreover, they may have competing interests and viewpoints on what is valuable'. Hence, for collaboration to emerge and sustain, a broader and longer term view on targets of value creation and capture is needed (Lepak *et al.*, 2007). A concrete example from the case is the stakeholders' decision on the extent of platform's openness, which determines several operational choices regarding value division, data exchange, or system integration. Hence, throughout an early stage of design, the collaboration should be geared toward achieving multilateral consensus on critical operational aspects:

Proposition 6. Lack of multilateral consensus on critical operational aspects among stakeholders deteriorates the implementability of BM.

Conclusion

BMs can be considered as holistic narratives that describe how the pieces of business fit together. By their very nature, BMs, whether based on Canvas (Osterwalder, 2004) STOF, VISOR or any other model, are skewed toward a high level representation of BM, often with a single-firm focus on value creation, leaving out the operational conflicts and constrains that hinder implementation. Specifically in networked environments value can only be optimally and sustainably created and captured by shared vision, harmonized intents, and aligned action of the involved stakeholders. In achieving such alignment, this paper posits that some extent of granularity on operational interactions and interdependencies between network stakeholders are necessary. The devil is in the detail, and the details become clear when BM operational level aspects of value creation and capture and the inherent trade-offs are deliberated.

In this paper, a case study approach is applied to gain an in-depth understanding of the transition of BM design to implementation in general, and the factors that impede or contribute to implementation in particular. Although the BM Canvas is used to describe the overarching BM of the focal firm, a more detailed understanding of operational feasibility of the BM was needed. With that, the VIP framework, which has a focus on networked processes and interdependencies, is applied to systematically break down the high-level BM into detailed operational pieces at a network level. By doing so, the authors were able to pinpoint several operational issues that hinder the implementability of the BM. By comparing and classifying the hindrances six generic factors stood out as being most critical; that is, uncertainty and contingencies, resource scarcity, hidden and unknown requirements, conflicting and incoherent processes, and unilateral decision-making.

Although the identified factors have shown a broader external validity as some research (Solaimani *et al.*,

2014), the idiosyncrasies of the studied case may undermine the generalizability of the findings. Hence, it remains important to research whether the foregoing factors hold up under various circumstances, industries, countries or business cultures. It may be assumed that some factors are related to institutional arrangements, as well as, to regulatory regimes, industry-specific practices or market structures. Other limitations may have to do with the BM ontology being used. Using different BM ontologies may lead to different outcomes. However, it is argued in this paper that BMs in general are not meant to provide a detailed view of business operational underpinnings of the focal firm and its surrounding network. At face value, a multi-level understanding of BM implementation may seem to increase complexity. Yet, based on this study, it can be postulated that a multilevel understanding of networked actors' operations is a non-trivial requirement to arrive at an operationally feasible BM, without which value creation and capturing are doomed to fail.

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Appendix I. Business model tooling

Tooling approaches	*Tool description*	*Method*	*Foci of analysis*	*Unit of analysis*	*Unit of observation*	*Generic vs. Specific*
CSOFT (Heikkilä *et al.,* 2010)	The CSOFT framework is a technique for Business Model estimation. It provides a process to transform a business model into an operational model that describes for each service and its components what (IT) Key Performance Indicators (KPIs) are required. The framework is suggested to be useful in evaluation of robustness of business models by means of KPIs and analyzing the 'As-is' and 'To-be' –states of resources.	Qualitative and/or quantitative analysis based on KPIs (Business processes, Applications, Information, Hardware, Organization)	Performance	Business Model(s)	Service components	Generic
BEAM (Tian *et al.,* 2008)	The BEAM framework is for the modeling and analysis of business model designs involving a network of interconnected business entities. The framework aims to provide insight into value distribution among the entities and evaluation of performance under different conditions/scenarios.	Quantitative analysis based on financial performance indicators (e.g., customer price, marketing cost, revenue, sale volume), resources (tangible and intangible), and business roles, goals, decisions and entities, and resource consuming activities	High-level roles and activities Resource consumption and requirements Revenue model Decisions and interactions	(Networked) Business Model	Value distribution among stakeholders	Generic
Operating Model (Ross et al., 2006)	Operating model encompasses business process integration and standardization for delivering goods and services to customers and describes how a company wants to thrive and grow.	Integrated with company enterprise architecture, one of the four operation models can be chosen (i.e., Diversification, Coordination, Replication, Unification), which is an actionable view, useful for strategy execution.	Core business processes Shared data driving core process Key linking & automation technologies Key customers	The firm strategy execution	Enterprise Architecture	Generic
The e^3alignment method (Pijpers *et al.,* 2009)	The e^3alignment aims at exploring the inter-organizational alignment by focusing on the networked value-driven interactions with focus on value creation and appropriation processes.	Qualitative problem identification (from various perspectives) by using descriptive value diagrams and assessing possible solutions by employing impact analysis	Strategic influences Creation and exchange of value Value supporting activities Technology to exchange information	A service (or product)	Value interactions	Specific (following e^3value model – Gordijn & Akkermans, 2001)
			Tangible value	Value network	Value network actors	Generic

Tooling approaches	*Tool description*	*Method*	*Foci of analysis*	*Unit of analysis*	*Unit of observation*	*Generic vs. Specific*
Value Network Analysis (Allee, 2008)	Value network analysis (VNA) links specific interactions within the value creating network directly to financial and non-financial scorecards.	Descriptive representation of value creating network (value diagrams) based on qualitative analysis, in order to understand tangible and intangible values (and knowledge) exchange between stakeholders in order to identify inconsistency between tangible and intangible values.	Intangible value			
Four elements Framework (Johnson *et al.,* 2008)	Four elements framework aims to describe the building blocks of a business and integrates rules, metrics and norms for the purpose of analysis.	Descriptive representation of Business Model based on value proposition, profit formula, key resources and processes, and quantitative analysis is recommended by using metrics.	Value creation Financial viability Resources Processes	Single firm Business Model	Business Model	Generic
The Value, Information, and Process framework (Solaimani & Bouwman, 2012)	The VIP framework aims to develop a detailed understanding of business model implementation and possible problems, by analyzing various views of the stakeholders' intentions and objectives, as well as the multilevel operational interactions and processes within and between the stakeholders involved.	1. Descriptive representation of Business Model underlying multi-level business processes, 2. Analytical (critical) review of the actors' operational inter-dependencies at value, information and process levels.	Actors and their: Value objectives, activities, dependencies Information access, objects, flow and dependencies, Primary Business Processes, process boundaries, behavior and dependencies	Networked-enterprise and single-firm Business Models	Business Model	Generic

Appendix II. Business model conversion methods

Authors	*Aim*	*Method (steps)*
Jayaweera (2004)	Business Model based on Resource-Event-Agent (REA) to BPMN	*BP^3 method (Business Process Pattern Perspective) based on the Unified Framework (Bergholtz et al.* 2003*):* 1. Design the business model 2. Order the economic values defined in the previous step 3. Gathering information about existing negotiation dependencies 4. Establishing inter-phase and inter-pool dependencies 5. Applying a set of production rules on the results of the previous steps in order to generate a process model
Bergholtz *et al.* (2005)	Canvas to e^3value to BPMN	1. Construction of Canvas 2. Partial derivation of a value web model (i.e., e^3value) from the Canvas 3. Detailing the value web model into process model (i.e., BPMN)
Janssen *et al.* (2005)	e^3value to ArchiMate	1. Link the revenue defined in the business part and analysed in e^3value, to the cost defined in the application and technology layers of ArchiMate 2. Use the business processes and supporting applications and technical infrastructure to determine the cost of the service offering
Andersson *et al.* (2005)	Business Model to BPMN	1. Five steps to derive an Activity Dependency Model (AMD)* from Business Model (Agent, Value transfer offering, Duality) 2. Nine steps to derive process model form the AMD 3. Adding procedural details for the sub-processes of the process model (e.g., by process patterns provided in UMM [2013])
Andersson et al. (2006)	e^3value to UML (activity diagram): Chaining methodology	1. Consider an e^3value model 2. For each value exchange, determine whether the custody component of the value exchange exists and shall be modelled explicitly 3. For each value exchange, determine whether the evidence document component of the value exchange exist and shall be modelled explicitly 4. Identify a set of processes based on the extended e^3value model from step 3 and the Open-EDI transaction phases (ISO 2010) 5. For each process, select a pattern (e.g., UMM [2013]) based on the resource managed by the process and the goals of the actors. Apply the selected pattern to the set of identified processes.
Pijpers & Gordijn (2007)	e^3value to UML (activity diagram): E^3transition approach	1. Adapt the actors, value activities and customer needs from the e^3value model 2. Derive and determine the transfers of the actual object, ownership/possession right between providing/receiving actor from e^3value model (and other additional information sources) 3. Each actor in the e3transition model becomes a *swim lane* in the process model 4. Every value transfer in the e^3transition model is an exchange of an object between the same actors in the process model 5. Answers the question "Who initiates a value transfer and its corresponding reciprocal value transfer(s)?" 6. After it has been identified which exchanges and processes should occur in the process model the exchanges and processes have to be placed in the right order. The main question here is "What is the order of the processes?". Processes can either occur sequential or parallel.
Weigand *et al.* (2007)	e^3value to BPMN	1. Three conceptual steps and one implementation step to construct Resource Management model from Value model 2. Three conceptual steps and one implementation step to construct Communication model from Value model 3. Determining the sequence flow based on logistics and risk analysis
Edirisuriya & Johannesson (2009)	e^3value to BPMN	1. Six steps to derive an AMD from e^3value 2. Nine steps to derive process model from the AMD
Fritscher & Pigneur (2011)	Canvas to ArchiMate	Using a correspondence scheme that links the seven elements of ArchiMate to the nine elements of the Canvas and IT services
Iacob *et al.* (2012)	Canvas to ArchiMate	1. Specifying the current company's primary operations and representing it by using ArchiMate (the baseline architecture) 2. Extracting the current BM from the baseline architecture and representing it by using Canvas 3. Specifying the target situation, adapting/extending the baseline architecture 4. Adapting/extending the earlier created Canvas based on the target architecture

*An AMD can be seen as a graph with four kinds of nodes, representing activities (i.e., value transfer, assignment, production, and coordination activities), and four kinds of directed edges, representing relationships between activities (i.e., duality, flow, trust, and trigger dependencies) (Andersson *et al.* 2005)

Appendix III. The VIP diagram