Journal of Business Models

2015

Vol. 3 - No. 2

Journal of Business Models (2015), Vol. 3, No.2
Editorial staff: Christian Nielsen, Vibeke Jørgensen & Kristian Brøndum Kristiansen

Graphics: Mette Lausen

Font: Klavika

ISBN: 978-87-7112-484-2
ISSN: 2246-2465

Published by:

Aalborg University Press
Skjernvej **4**A, 2nd floor
9220 Aalborg
Denmark
Phone: (+45) 99 40 71 40
aauf@forlag.aau.dk
www.forlag.aau.dk

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Journal of Business Models (2015), Vol. 3, No. 2 pp. 1-29

JOBM
Journal of Business Models

A business model design framework for viability; a business ecosystem approach

Austin D'Souza, Hans Wortmann, George Huitema and Hugo Velthuijsen

Abstract

Purpose: To facilitate the design of viable business models by proposing a novel business model design framework for viability.

Design: A design science research method is adopted to develop a business model design framework for viability. The business model design framework for viability is demonstrated by using it to design a business model for an energy enterprise. The aforementioned framework is validated in theory by using expert opinion.

Findings: It is difficult to design viable business models because of the changing market conditions, and competing interests of stakeholders in a business ecosystem setting. Although the literature on business models provides guidance on designing viable business models, the languages (business model ontologies) used to design business models largely ignore such guidelines. Therefore, we propose a business model design framework for viability to overcome the identified shortcomings. The theoretical validation of the business model design framework for viability indicates that it is able to successfully bridge the identified shortcomings, and it is able to facilitate the design of viable business models. Moreover, the validation of the framework in practice is currently underway.

Originality/value: Several business model ontologies are used to conceptualise and evaluate business models. However, their rote application will not lead to viable business models, because they largely ignore vital design elements, such as design principles, configuration techniques, business rules, design choices, and assumptions. Therefore, we propose and validate a novel business model design framework for viability that overcomes the aforementioned shortcomings.

Keywords: Business model design, energy business model, business model design framework, viable business model

Please cite this paper as: D'Souza, A., J.C. Wortmann, G. Huitema & H. Velthuijsen (2015) A business model design framework for viability; a business ecosystem approach, Journal of Business Models, Vol. 3, No. 2 pp. 1-29

Introduction

New technologies, and dynamic market conditions are making it possible for entrepreneurs and managers to design novel business models (BMs) (Casadesus-Masanell & Ricart, 2011). A viable BM is fundamental to the success and the long-term survival of an enterprise (Magretta, 2002). However, designing a viable BM is a complex task because enterprises operate in a dynamic and fast-paced environment caused by factors such as deregulation, and changing customer preferences. Additionally, the BMs of enterprises may span several organisations, and they have to cope with competing interests of stakeholders in a business ecosystem setting (Moore, 1993). Hence, this increases the complexity of designing viable BMs.

Academics and practitioners alike still do not agree on a common definition of BMs (Jensen, 2014; Osterwalder, Pigneur, & Tucci, 2005). However, some common ground can be found among them (Zott, Amit, & Massa, 2011). A BM describes how business is carried out (Magretta, 2002). It describes the stakeholders, their roles, and the value proposition for each of them (Timmers, 1998). It also describes the value creation, exchange, and capture logic both from a focal actors perspective as well as from the business ecosystem perspective (Chesbrough, Vanhaverbeke, & West, 2006; Osterwalder & Pigneur, 2002). In addition, it defines the business architecture in terms of the building blocks (e.g. value creation activities) that enables the value creation, exchange, and capture logic (Al-Debei & Avison, 2010). Chesbrough et al. (2006) argue that a BM is viable when all the stakeholders participating in it are able to capture sufficient value such that they are motivated to be part of it. For a BM to be viable it also has to be technologically viable (Kraussl, 2011). A BM is technologically viable when an acceptable technological solution enables the provision of the envisioned service. In conclusion, a BM is viable when it is viable in terms of value and technology.

Much has been written about the definition of BMs and their basic building blocks (Fielt, 2014). However, little attention is paid to the design of viable BMs. Most of the literature on the topic originates from the business model ontology domain. Business model ontologies (BMOs) are languages used to conceptualise and communicate BMs. The focus of research here is on defining building blocks of a BM, BMOs, and evaluation criteria. However, the rote application of BMOs will not lead to viable BMs (D'Souza, Beest, Huitema, Wortmann, & Velthuijsen, 2014). Several authors have used BMOs to suggested business model patterns, for example the long tail (Osterwalder & Pigneur, 2010; Tapscott, Ticoll, & Lowy, 2000; Weill & Vitale, 2001). The idea behind identifying business model patterns is to create descriptions of viable business models that are readily implementable for exploiting products/services. However, at best these business model patterns are best practice guides or standardised business models that have to be customised to the individual needs of the organisations. The business model patterns are not directly implementable because organisations have different needs based on different factors, for example industry type, environmental condition (e.g., regulation), customer segments, etc. Additionally, the implementation of pre-identified business model patterns cannot guarantee the viability of the organisations implementing them. The BM literature proposes design elements necessary for a viable BM, such as design principles, configuration techniques, business rules, design choices, and assumptions. (Bouwman, De Vos, & Haaker, 2008; Gordijn, 2002; Timmers, 1998; Weill & Vitale, 2001). However, BMOs largely ignore these design elements because the ontology is usually built on objects (e.g. customers), and not on rules, choices or assumptions. Though some of the abovementioned elements have been used alongside some BMOs, it has been in an inconsistent and fragmented manner. Thus, it is difficult to design viable BMs without the consistent application of the aforementioned design elements. A typical example of a design element is the assumption made about the projected sales of a service. Any change to this assumption directly affects the viability of a BM. Hence, there is a need for a comprehensive business model design framework for viability (BMDFV) that integrates the design elements with BMOs to facilitate the design of viable BMs. Hence, the objective of this paper is to develop a BMDFV to facilitate the design of viable BMs. In order to design the BMDFV, we make use of the design science research methodology (DSRM) framework proposed by Peffers, Tuunanen, Rothenberger, and Chatterjee (2007).

The research design section shows how the research is structured, and how the BMDFV is developed and

validated. The related work section presents a literature review, and highlights the existing problems related to the design of viable BMs. In addition, it defines the scope for improvement, and motivates the need for a BMDFV. The methodology section elaborates on the methods used in this paper. The business model design framework for viability section presents and explains the newly developed framework. The case study that follows demonstrates and validates the framework by applying it to design a viable BM for an enterprise operating in the energy sector. Finally, the paper concludes with a reflection on the BMDFV and a conclusion section.

Research design

Figure 1 presents the research design. Firstly, we have developed the BMDFV using the design science research framework. We then demonstrate and validate the BMDFV by using it to design a BM. Finally, experts evaluate the designed BM for viability.

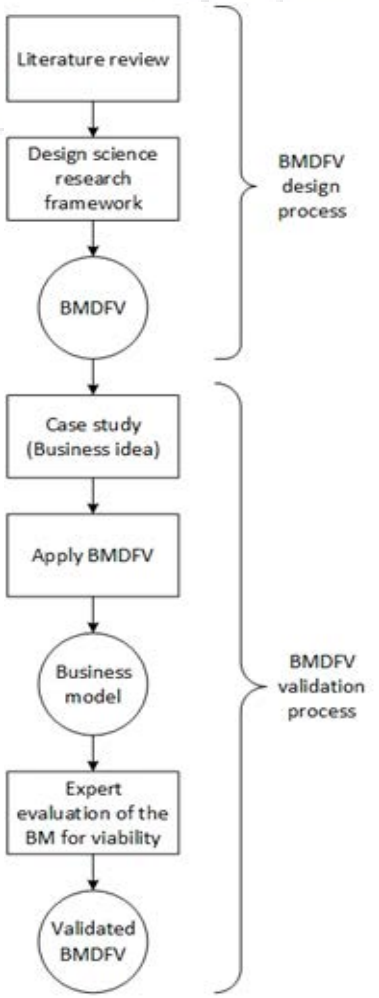

Figure 1 - Research Design

Related work

This section reviews the literature related to viable BM design, and motivates the need for a BMDFV.

Business model ontologies: There are several informal and semiformal BMOs that can be used to design BMs such as, Service, Technology, Organisation, and Finance (STOF) (Bouwman *et al.*, 2008; Bouwman & Ham, 2003), Value proposition, Interface, Service platform, Organizing model, and Revenue/cost (VISOR) (El Sawy & Pereira, 2013), Customer, Service, Organisation, Finance, and Technology (CSOFT) (M. Heikkilä, 2010), BMC (Osterwalder & Pigneur, 2010), Value Network Analysis (VNA) (Allee, 2000), and e3-value (Gordijn & Akkermans, 2003). BMC (Osterwalder & Pigneur, 2010), value network analysis (Allee, 2002), and e3-value (Gordijn & Akkermans, 2003). D'Souza *et al.* (2014) reviewed several well-established BMOs from the viability perspective, and found that none of them fully support the design of viable BMs. The BMs lack important viability criteria, such as the ability to conceptualise business models from both the single enterprise perspective as well as the business ecosystem perspective. However, for a viable BM design it is important to combine the single enterprise perspective (focal actor) and the business ecosystem perspective (D'Souza, van Beest, Huitema, Wortmann, & Velthuijsen, 2015) (D'Souza, Beest, Huitema, Wortmann, & Velthuijsen, 2014b). This means that the designer may need to use different BMOs to design BMs from the two perspectives. Therefore, the BMDFV should allow a designer to design the BM from more than one perspective.

Building blocks: BMOs are made up of building blocks such as value proposition (Fielt, 2014). Scholars still do not agree on a common set of building blocks. A trend that can be observed among researchers is that they choose the building blocks based on the aspects they want to highlight and analyse. If there are no BMOs that include the desired building blocks, they define new building blocks and corresponding BMOs that best serves their needs. Hence, the BMDFV should allow the

designers to define/choose the building blocks and the BMOs that best suit their needs.

In the context of building blocks, scholars agree that new services and products are an indispensable part of a viable BM; especially services, since they are an growing part of our economy (Bardhan, Demirkan, Kannan, Kauffman, & Sougstad, 2010). For a viable BM it is crucial that the BM designer has a clear idea of the service concept, because the consumer is ultimately paying the enterprise for the service (Bouwman et al., 2008; J. Heikkilä, Tyrväinen, & Heikkilä, 2010). In many cases, a service has to be designed before a BM is designed. Despite its importance few researchers have paid explicit attention to service design in the context of BM design (Bouwman *et al*., 2008).

Design choices: Scholars argue that it is not the rote application of BMOs that leads to a viable BM, but it is the choices a designer makes that leads to a viable BM (Bouwman *et al*., 2008). There are several frameworks that help designers make choices and evaluate the viability of the BM using a set of success factors (Ballon, 2007; Bouwman et al., 2008; Sharma & Gutiérrez, 2010). However, it is not clear how these design choices lead to a viable business model. It is important to understand how design choices affect the BM in a transparent and traceable manner for a reliable way to design viable BMs (Kraussl, 2011). Hence, the BMDFV should systematically store design choices, motivation behind the design choices, and how they affect the BM.

Design principles: Several scholars have proposed BM design principles (Al-Debei & Avison, 2010; Bouwman *et al*., 2008). These design principles are essential for a viable BM as they guide the designer in making choices that will lead to a viable BM design. However, these principles are fragmented in the literature. Hence, they need to be consolidated for a reliable way to design viable BMs.

Business rules: Demil and Lecocq (2010) have demonstrated that the external environment puts requirements on the BM that could either lead to a viable or an unviable BMs, such as laws and regulations. Similarly, there could also be internal requirements put on the BM, such as technological limitations, and safety (Eriksson & Penker, 2000). An effective way of handling these requirements is by making them explicit and internalising them in the form of business rules. A business rule is a statement that defines conditions and policies that govern a BM (D'Souza *et al*., 2014). Therefore, the BMDFV should encompass business rules.

Configuration techniques: Some researchers propose BM configuration techniques to explore the viability of BMs. These techniques are activities that a designer can perform on a BM to arrive at a viable BM. These techniques are important for designing viable BMs because designers often arrive at an unviable BM. These techniques enable the designer to explore alternate configurations of a BM. So far, surprisingly little attention has been paid to these techniques. Our literature review revealed two techniques namely, deconstruction and reconstruction, and combination of atomic BMs(Timmers, 1998; Weill & Vitale, 2001). Hence, the proposed BMDFV should incorporate these configuration techniques.

Assumptions: We interpret the term BM as a simplified model of the complex reality of how business is, or will be carried out (Baden-Fuller & Morgan, 2010; Jensen, 2014). Inherent to models are assumptions (Fowkes & Mahony, 1994) on which the viability of a BM hinges. The literature thus far has ignored assumptions in the context of BM design. Therefore, it is essential that the intended BMDFV explicitly considers assumptions.

Evaluation criteria: The evaluation of the BM depends on the goal of the evaluation. Three main goals for evaluating BMs can be identified in the BM literature namely: comparison with competitor's BMs, evaluating alternate BMs for implementation by the same firm, and evaluating innovative BMs for viability. Since our goal is to facilitate the design of viable BMs, the proposed BMDFV should focus on evaluating the designed BM for viability.

As demonstrated above the literature on design of viable BMs is fragmented, and it ignores importantelements necessary for a viable BM design. This has greatly hampered the design of viable BMs. Therefore, there is a need for an artefact that bridges the abovementioned gap.

Methodology

Our goal is to develop a BMDFV (an artefact). Therefore, we frame this research as a design science research problem. We adopt the design science research methodology (DSRM) framework proposed by Peffers et al. (2007). The criticism of DSRM framework stems from the debate on the similarities, differences, and synergies that exist between the design science research domain and the action research domain (Peffers *et al.*, 2007; Sein, Henfridsson, Purao, Rossi, & Lindgren, 2011).

DSRM has been criticised for focusing too much on the design of artefacts and its proof of usefulness in a stage gate manner and ignoring the emergent nature of the artefact (Sein *et al.*, 2011). Some argue that designing an artefact is only the beginning of finding an effective solution to a given problem in an organisational context. An effective artefact emerges over a period of time in interaction with organisational elements, such as end users, use context, users expectations etc., and the subsequent iterations of identifying problem/scope for improvement and motivation, defining objectives of the solution, design and development, demonstration, evaluation, and communication (Ferlie, Fitzgerald, Wood, & Hawkins, 2005; Sein *et al.*, 2011).

However, in context of this research where the goal is to develop an artefact that will facilitate the design of viable business models that is to develop an artefact that addresses a class of problems we find DSRM to be an appropriate method. We do acknowledge the emergent nature of the developed artefact (BMDFV), but it is beyond the scope of this paper. By emergent nature of the BMDFV, we mean exposing the framework to sustained business model design activity, and the subsequent iteration of identifying problem/scope for improvement and motivation, defining objectives of the solution, design and development, demonstration, evaluation, and communication. The DSRM framework consists of six iterative steps, namely identifying problem/scope for improvement and motivation, defining the objective of the solution, designing and developing the artefact, demonstrating the artefact, evaluating the artefact, and communicating the artefact.

The problem/scope for improvement and motivation, and the objective of the solution are defined in the introduction and the related work section. We carried out a literature review, to define the scope for improvement and to define the objective of the solution. The newly designed artefact is presented in the business model design framework for viability section. Furthermore, the BMDFV is demonstrated using a case study. A case study method is appropriate to demonstrate the BMDFV (artefact) (Hevner, March, Park, & Ram, 2004). In order to evaluate the designed artefact (i.e., the BMDFV), the results of applying the BMDFV should be compared with the objective (Peffers et al., 2007). Since our objective is to design viable BMs, the BM designed using the BMDFV is evaluated for viability. A well-established method to evaluate BMs for viability is via expert opinion (Bouwman *et al.*, 2008). Finally, the designed artefact is communicated through this paper.

For the case study, we have selected an enterprise that has plans to develop a community driven solar farm. In order to carry out the case study, we interviewed ten experts, and potential stakeholders in the BM. We used semi-structured questionnaires for the interviews. The interviews lasted approximately between 45 minutes – 1.30 hours. The interviews were transcribed and the data was used to design the viable BMs using the BMDFV. As a part of the data collection process, a workshop was organised to develop the service concept. The workshop lasted for three hours and had seven participants. Three of the participants were academics, and four participants were experts in the field of energy and ICT.

In addition, two researchers also attended a meeting that was organised by the energy enterprise for a group of community members to disseminate information about the solar farm. The researchers were also given access to four important internal documents that described the business idea, and the expected cost structure. Secondary sources of information were used for data triangulation for example, the website of the energy enterprise, and reports related to solar farm published by other research institutions.

The business model design framework for viability

Figure 2 presents the BM design framework. On the left, four elements affect the BM design domain. The BM design domain is represented by the dotted box. The box named as "Other domains" at the top of the figure indicates the influence other domains, such as marketing, and finance, have on BMs. They affect the BMs via the design decisions that a designer takes and vice versa.

Business model ontologies are languages used to conceptualise BMs. They are useful tools for designing and evaluating viable BMs. To design a viable BMs it is vital to conceptualise BMs both from the focal actors perspective and the business ecosystem perspective (D'Souza *et al.*, 2014). It is crucial that the focal actor is viable because they play a pivotal role in forming and sustaining the business ecosystem (Fielt, 2014). In the context of this paper, we use BMC to conceptualise the BM of the focal actor (See Figure 6). For the sake of simplicity, the BMs of all the stakeholders are not conceptualised in detail. However, their value capture, roles, value creation activities, and value exchange relationships are conceptualised at the ecosystem level. In order to conceptualise the BM at an ecosystem level we adopt the e3-value BMO (See Figure 7).

Building blocks are the constituent elements of a BM (Al-Debei & Avison, 2010). In addition, design choices and assumptions are made at the level of the building blocks. Further, the building blocks are systemic in nature. This implies that they affect each other, for example the value proposition affects the type of technologies employed which in turn affects the cost structure of the BM. The BMOs conceptualise BMs with the help of these building blocks. Table 1 presents a set of thirteen building blocks that we have defined based on literature (see Table 1). See Appendix A for a description of relationship among the building blocks.

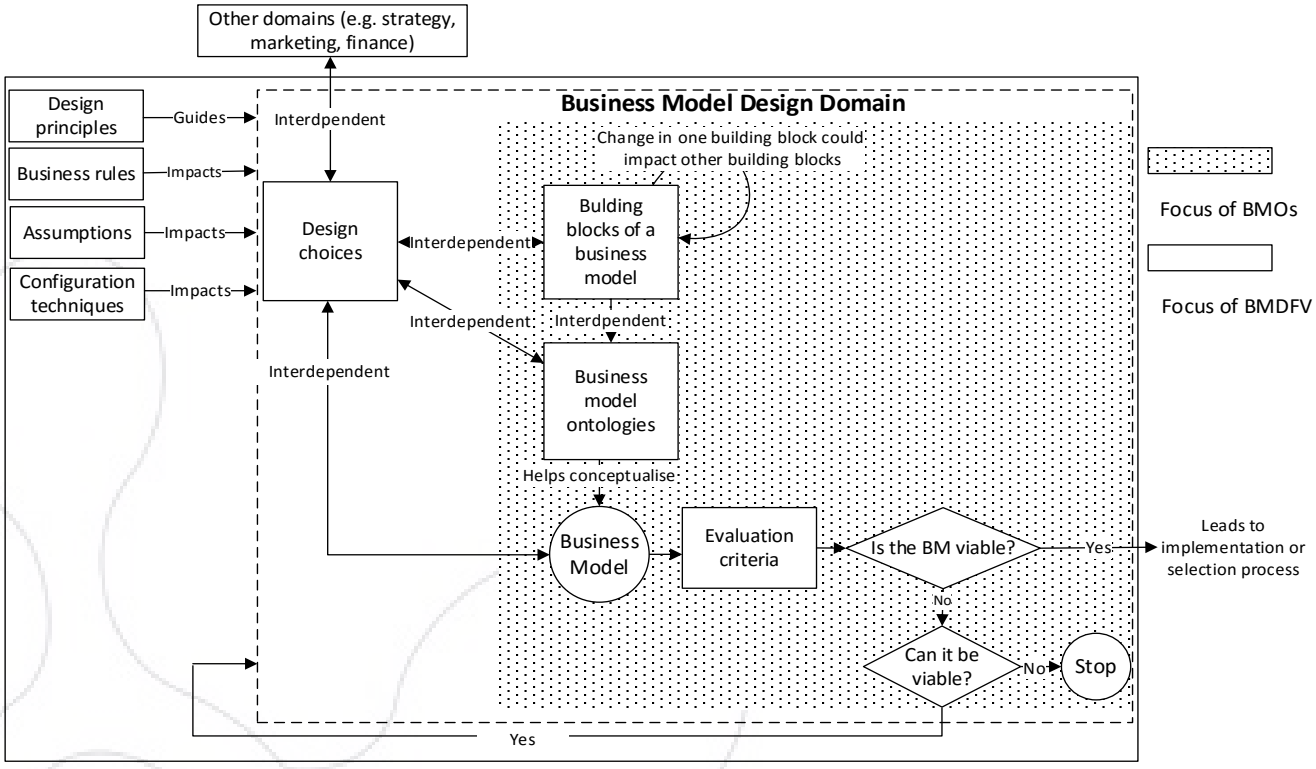

Figure 2 - Business model design framework

Table 1 - Building blocks of a BM

Building blocks	Description	Source
Stakeholders	Stakeholders are entities who participate in the BM, for example customer segment (e.g., prosumers), suppliers, and governmental institutions.	(Gordijn & Akkermans, 2003)
Roles	A role is a part that a stakeholder plays in the BM, with certain characteristics and behavioural patterns. Furthermore, these roles are not rigid structures, but they can be defined and redefined based on the value that has to be created, exchanged, and delivered.	(Al-Debei & Avison, 2010)
Value proposition	Value proposition is a set of benefits offered to the stakeholders in the BM. We adopt a multifaceted approach to value proposition. This means that there has to be a clear value proposition for all the stakeholders participating in the BM.	Timmers, 1998)
Technology architecture	The technology architecture describes how the different technological elements fit together to support the BM. The technology architecture is divided in two layers namely the information services layer, and the physical technologies layer	D'Souza et al., 2014)
Service concept	A service concept is the conceptualisation of the intended service. It should describe what is to be done for the end consumer, and how it is to be done.	Bouwman et al., 2008)
Value creation activity	A value creation activity is an activity performed in a system of value creation activities by an actor that creates value for themselves as well as for other stakeholders involved in the BM.	(Osterwalder & Pigneur, 2010)
Value exchange	Value exchange takes place between two actors participating in the BM. Objects of value are exchanged via these relationships, for example money, and services.	(Gordijn & Akkermans, 2003)
Resources	Resources are all the products and services subsumed in the value creation activities. From an ecosystem perspective, it becomes time consuming to account for all the resources subsumed by all the stakeholders in the business ecosystem. Therefore, we focus on the resources directly subsumed by the value creation activities.	Osterwalder & Pigneur, 2010)

Channels	Channels are the medium employed to communicate and deliver value proposition to customers as well as the other stakeholders involved in the BM.	(Osterwalder & Pigneur, 2010)
Revenue streams	Revenue streams describe how the BM intends to, or earns cash. Furthermore, it also describes the revenue streams of the participating actors in the context of the BM in question.	(Osterwalder & Pigneur, 2010)
Cost structure	Describes the cost structure of the BM, and how the costs are distributed among various stakeholders in the BM.	(Osterwalder & Pigneur, 2010)
Relationship type	This describes the nature of relationship among the stakeholders involved in the BM. There are different types of relationships that can be established and maintained , for example personal assistance, dedicated personal assistance, automated services, communities, co-creation, and self-service.	(Osterwalder & Pigneur, 2010)
Value captured	This is the total value retained by each player or stakeholder in the BM	(Gordijn & Akkermans, 2003)

Design choices are the choices made about the design of a BM. These choices affect all the building blocks, and include all the decisions that need to be made in the context of applying the BMOs. Furthermore, it is through this construct that other domain such as strategy, and finance exert their influence on BMs, and vice versa. For example, on the one hand the strategy adopted could influence which customer segment to serve, but on the other hand, the enterprise may have to change its strategy based on the customer segment's needs.

Design principles are rules that guide the designer through the process of designing viable BMs. A BM design should,

- enable each stakeholder to capture enough value such that they are viable (Chesbrough *et al*., 2006)
- be coherent (Al-Debei & Avison, 2010; Casadesus-Masanell & Ricart, 2011). For example, if the value proposition to the target segment is low cost, then the other building blocks, such as cost structure, customer relationships, resources should also reflect low cost.
- have a clear value proposition in terms of cost efficiency, and or superior value (Amit & Zott, 2001)
- it should incorporate relevant feedback

Business rules are statements that affect the structure and the functioning of a BM (D'Souza *et al*., 2014; Eriksson & Penker, 2000). Business rules internalise the external requirements put on the BM, for example regulation. They also help ensure that the BM complies with the internal requirements put on the BMs, for example technological limitations. Furthermore, a business rule directly affects the viability of the BM by either constraining or facilitating a BM. For example, a government policy that subsidises solar energy may facilitate new BMs that exploit solar energy. However, if the policy is retracted it could lead to unviable BMs.

Configuration techniques are actions a designer can take to make a BM viable. Following are the configuration techniques we recommend:

- *Deconstruction and reconstruction of BMs:* The value chain should be deconstructed into constituent value creation activities. The value chain should then be reconstructed in novel combinations in a way that it enables viability. This activity usually involves leveraging latest technologies for creating novel combinations (Timmers, 1998).
- *Combination of atomic BMs:* Weill and Vitale (2001) have proposed eight atomic BMs, such as shared infrastructure, and content provider. They argue that a designer should explore combinations of these atomic BMs to arrive at a viable configuration of a BM.
- *Eliminate waste:* Inspired by lean manufacturing we suggest that the designer should eliminate waste in the business model. This can be achieved by eliminating stakeholders who do not add sufficient value and redistributing their roles to other stakeholders in the business model. This may also require defining new roles or redefining existing roles in a way that creates additional value and or minimises value slippage to enable viability. While distributing roles close attention should be paid to the stakeholders capability to perform the assigned roles.

Assumptions are data or information believed to hold (De Kleer, 1986). While designing a BM, a designer makes assumptions that directly affect the viability of the BMs. Hence, this design element makes such assumptions explicit.

Evaluation criteria are a set of criteria that are used to evaluate BMs. To evaluate the viability of a BM we have distilled the following set of criteria based on literature:

- *Viability in terms of value:* A BM is viable when all the stakeholders are able to capture such that they are motivated to be part of the BM (Chesbrough *et al.*, 2006). The easiest way to do this is to assess the profitability of each stakeholder. Furthermore, for stakeholders not interested in profit we assess their value capture qualitatively in terms of benefits realised (D'Souza *et al.*, 2014; Gordijn & Akkermans, 2003). It also involves assessing the sensitivity of the value capture to the business rules and assumptions.
- *Technological viability:* For a BM to be viable it has to be technologically viable (Kraussl, 2011). Therefore, we ask experts to evaluate if the proposed technical architecture is viable.
- *Validity, coherence, and completeness of the business rules and assumptions:* Since the business rules and assumptions directly affect the viability of the BM, they are evaluated on their validity, coherence, and completeness. Evaluating them for validity involves assessing the elements on how realistic they are. Evaluating them for coherence involves checking whether the assumptions and business rules are consistently applied. Evaluating them for completeness is not about listing each and every possible business rule and assumption, but it is about making sure that none of the business rules and assumptions that have an major impact on the viability of the BM are missed.

Since BM design is an iterative process, the feedback and the assessment results are used to fine tune the BM.

Case Study

Grunneger power (GrgP) is an energy cooperative in the north of the Netherlands. Their goal is to stimulate local production of green energy, stimulate local economy, and to reduce dependence on fossil fuels. Their actions are guided by their core values of local, fair, personal, and green. Their strategy is to offer energy products and services that are not only affordable, but also to create social and environmental benefits, such as reduction of CO2, and create local jobs.

GrgP wants to provide a service that involves the setup and management of small-scale solar farms for local communities. The solar farm will be setup in close proximity to the communities. They want to make use of unused municipal real estate to setup the solar farms. The people living around these unused parcels of real estate will be approached for investments. They can participate in the solar farm by purchasing one or more solar panels.

Stakeholders: Seven stakeholders and their corresponding roles are identified. Some of these stakeholders have

been defined only as roles as multiple actors can take them on. The roles are specified within parenthesis. Following is the list of stakeholders:

- *Investor/Consumer (prosumer):* A prosumer produces goods and services entering their own consumption (Kotler, 1986). GrgP will be targeting prosumers who are innovators/early adopters and environmentally conscious.

- *Municipality of Groningen (local governing body):* The municipality of Groningen is a local governing body. They play an important role in facilitating this BM. They facilitate the BM by providing all the necessary permits, licenses, and in some cases cheap or free access to real estate. For this particular case, they are providing free real estate.

- *Enexis - Distribution system operator (DSO):* The DSO is a key partner who provides the transportation service. They transport electricity from the solar farm to the end consumer.

- *(Energy retailer):* The energy retailer supplies energy to the customer. They buy energy from producers or wholesale markets and retail it to the prosumers. In the context of this BM, they buy energy from the solar farm and retail it back to the prosumers. Furthermore, the subsidising agency uses them to deliver subsidies to the prosumers in the form of reduced energy bills.

- *(Information systems suppliers):* This is a collection of information systems suppliers, such as software accounting software, website providers, and CRM providers. Their goal is to make profit. Sourcing via local information systems suppliers will help stimulate the local economy.

- *(Hardware supplier):* Any company that supplies solar farm hardware and provides installation services can fulfil this role. Sourcing from the local suppliers will help stimulate the local economy.

- *(Accounting firm):* This role is assigned to a local accounting firm. They provide services, such as book keeping.

- *(Subsidising agency):* The subsidising agency is a governmental body that provides subsidies based on government policy.

Table 2 - BM design elements in the context of stakeholders

Design elements	Design parameter	Motivation/description
Design choices	Prosumer	*Description:* The chosen prosumers is environmentally responsible and are early adopters. *Motivation:* The chosen prosumers segment has a need to be sustainable, they are eager to adopt new services especially when it targets sustainability issues, and they are more tolerant towards service failure risks (Rogers, 2003, pp. 248-261). In addition, they provide valuable input to refine the service.
	Suppliers and service providers	*Description:* Local suppliers and service providers are chosen. *Motivation:* The choice of local suppliers and service providers aligns with the strategic goals and the value proposition of stimulating the local economy.

	Municipality and subsidising agencies	*Description:* The municipality of Groningen, and the subsidising agency (Netherlands enterprise agency) were included in the BM. *Motivation:* The municipality and the subsidising agency were included, because their goals directly align with the goals of GrgP, i.e., sustainability and stimulation of the local economy. In addition, the municipality provides free or very cheap access to real estate. Furthermore, the subsidising agency provides subsidies.
Business rules	(DSO)	*Description:* The role of the DSO is allocated to Enexis, because they own and operate the electricity grid in the area where the solar farm is being planned. Therefore, Enexis is the default DSO.
	Prosumers	*Description:* The policy stipulates that only the prosumers residing in the same postcode area as the solar farm, or residing in one of the immediate neighbouring postcode areas are eligible for subsidy.
Assumptions		No relevant assumptions

Value proposition: Table 3 presents the value proposition for all of the stakeholders participating in the BM. Table 4 presents the design choices and the assumptions made in the context of designing the value propositions for the stakeholders.

Table 3 - Value Proposition

Stakeholder	Value proposition
Prosumer	Sustainable living experience , stimulation of local economy, convenience, reliable, reasonable ROI, positive self-image
GrgP	Profit, green energy, stimulate local economy, and reduce dependence on fossil fuels
Municipality	Reduction of CO2, stimulation of local economy
DSO	Profit, sustainability

Table 3 - Value Proposition

Stakeholder	Value proposition
Energy supplier	Supply of green energy, reduction of CO2, sourcing local energy, reliable suppliers for green energy, profit
Hardware suppliers	Profit
Information systems provider	Profit
Accounting firm	Profit
Subsidising agency	Reduction of CO2, stimulation of local economy

Table 4 - BM design elements in the context of value proposition

Design elements	Design parameter	Motivation/description
Design choices	Value proposition for the prosumer	*Description:* see Table 3. *Motivation:* The above value propositions were chosen, because they directly align with the prosumers requirements, and with GrgP's goals and strategy. Furthermore, the service is positioned as a sustainable living experience rather than an investment vehicle because the ROI is not very high. The sustainable living experience is about stressing the benefits of decentralised green energy systems. However, this does not imply that the ROI is not an important part of the value proposition.
	Value proposition for other stakeholders	*Description:* see Table 3. *Motivation:* The value proposition for the other stakeholders was based on their goals.
Business rules		No relevant business rules
Assumptions		No relevant assumptions

Service concept: In order to conceptualise the service concept we have used the service blue print technique. The service blue print technique is a well-established technique that is used to outline the most important aspects of the intended service in a clear and concise manner (Stickdorn & Schneider, 2012).

Figure 3 presents the service concept. The service evidence layer shows the tangible evidence (deliverables) that the prosumer expects to see, or experience in a consistent manner, for example reduced energy bills. The prosumers action layer presents a set of actions that the prosumer will have to take to co-create or consume the service, such as participate in the cooperation. The front stage layer depicts the touch points through which the prosumer will interact with the service for example the prosumers will log on to the website of GrgP for information about the solar farm. The back stage layer depicts all the necessary value creation activities that have to be performed to support the interactions and to deliver the service evidences to the prosumers.

Table 5 - BM design elements in the context of service concept

Design elements	Design parameter	Motivation/description
Design choices	Value creation activities	*Description:* See Figure 3. *Motivation:* The value creation activities were identified by asking the question Which value creation activities are necessary to create and deliver the intended value proposition?
	Price vs quality	*Description:* See Figure 3 for a list of channels. *Motivation:* Price versus quality was one of the main decision variables that guided our choice of channels and value creation activities
Business rules	-	No relevant business rules
Assumptions	Communicating value proposition to the stakeholders (prosumers and other stakeholders)	An effective way to communicate the benefits to the prosumers and other stakeholders is by providing them relevant reports, for example CO2 emissions avoided, number of jobs created, and self sufficiency

Figure 3 - Service Blueprint

Service evidence (deliverables)	Information through social media, advertisements and word of mouth	Information through website and sales personnel	Purchase online via sales personnel, documentataion, sales confirmation/ welcome emails	Welcome package, reduced energy bills, reports, participate in management meetings, customer portal, customer support, energy	Social media, newsletters, mobile apps, investment certificates
Prosumer action	Read messages on electronic channels, interact with family and friends	Browse website, talk to sales personnel, decision to buy	Register pay, receive document	Receive welcome package, co-create (e.g., participate in the cooperation, and online community), benefits, reports, energy	Receive newsletter, check app
Line of interaction					
Frontstage	Print media, electronic channels (e.g., social media), sales personnel, word of mouth, events	Print media, electronic channels (e.g., social media), sales personnel, word of mouth, events	Electronic channels (e.g., website), sales personnel	Electronic channels (e.g., website, and apps), customer support personnel	Print media, electronic channels (e.g. customer portal and apps)
Line of visibility					
Back stage (Value creation activities)	• Marketing/ advertising • IS infrastructure (e.g., website and social media apps)	• IS infrastructure • Sales • Marketing/ advertising	• Sales • Accounting • Customer relationship management • Administration • IS infrastructure (e.g. accounting systems)	• Customer relationship management • Solarfarm setup • Solarfarm operation • Partner management • Technology infrastructures (IS and physical technology infrastructure) • Marketing • HRM • Accounting • Administration • Energy retail and transport	• Marketing/ advertisement • IS infrastructure • Customer relationship management

Technology architecture: Figure 4 shows the information services architecture necessary to support the BM. To design the information services architecture, we first designed business processes that are necessary to execute the BMs. This is a necessary logical step in designing the information services architecture (Lankhorst, 2012). However, discussing these business processes is beyond the scope of this paper. Based on these business processes eight information services were conceptualised:

- *Product/service information service* provides potential customers and partners with information about the service, and how to purchase it
- *Sales/reservation service* facilitates the transaction process that is the process of buying or reserving the product/service.
- *Customer information service* provides customers with timely and relevant information (e.g., reports), and access to the online community. Further, it is also used to store relevant customer relationship management information.
- *Operation support information service* provides GrgP with all relevant information about services of their partners, for example contract expiration date, and status on maintenance orders.
- *Billing information service* helps GrgP generate timely and correct bills that will be sent to the prosumers.
- *Accounting information service* is split in two parts, and they will be owned and operated by GrgP and the accounting firm respectively. The service on GrgPs' end allows for transmitting bookkeeping data to the accounting firm and receiving timely and relevant accounting information. The service on the accounting firms end receives the data and transforms it into relevant information.
- *Metering information service* provides relevant metering information to the DSO and GrgP. The DSO measures the amount of energy delivered to the grid by the solar farm, and the amount of energy consumed by the prosumer. This data is then made available to GrgP.
- *End user contract information service* helps GrgP maintain all the different contracts a prosumer has with GrgP. Furthermore, this service helps relay relevant information about new customers signing up for their energy retail services. This is necessary,

because the DSO meters the energy usage and relays this information to GrgP. This information is necessary to send out correct and timely bills to GrgP's customers.

Figure 5 shows a high-level physical architecture of the solar farm. Table 6 presents the BM design elements that affect the technology architecture building block.

Table 6 - BM design elements in the context of Technology architecture

Design elements	Design parameter	Motivation/description
Design choices	PV panels	*Description:* The technology chosen for decentralised production of energy are PV panels *Motivation:* The PV panels can scale as per demand provided there is enough space and connection capacity. Furthermore, they can be easily integrated into the city landscape.
	Grid connected solar farm	*Description:* Grid connected solar farm. *Motivation:* At present, it is cheaper to connect to existing grid rather than lay a private grid or implement energy storage solutions.
Business rules		The DSO is required by the regulator to facilitate production and consumption of green energy.
Assumptions		No relevant assumptions

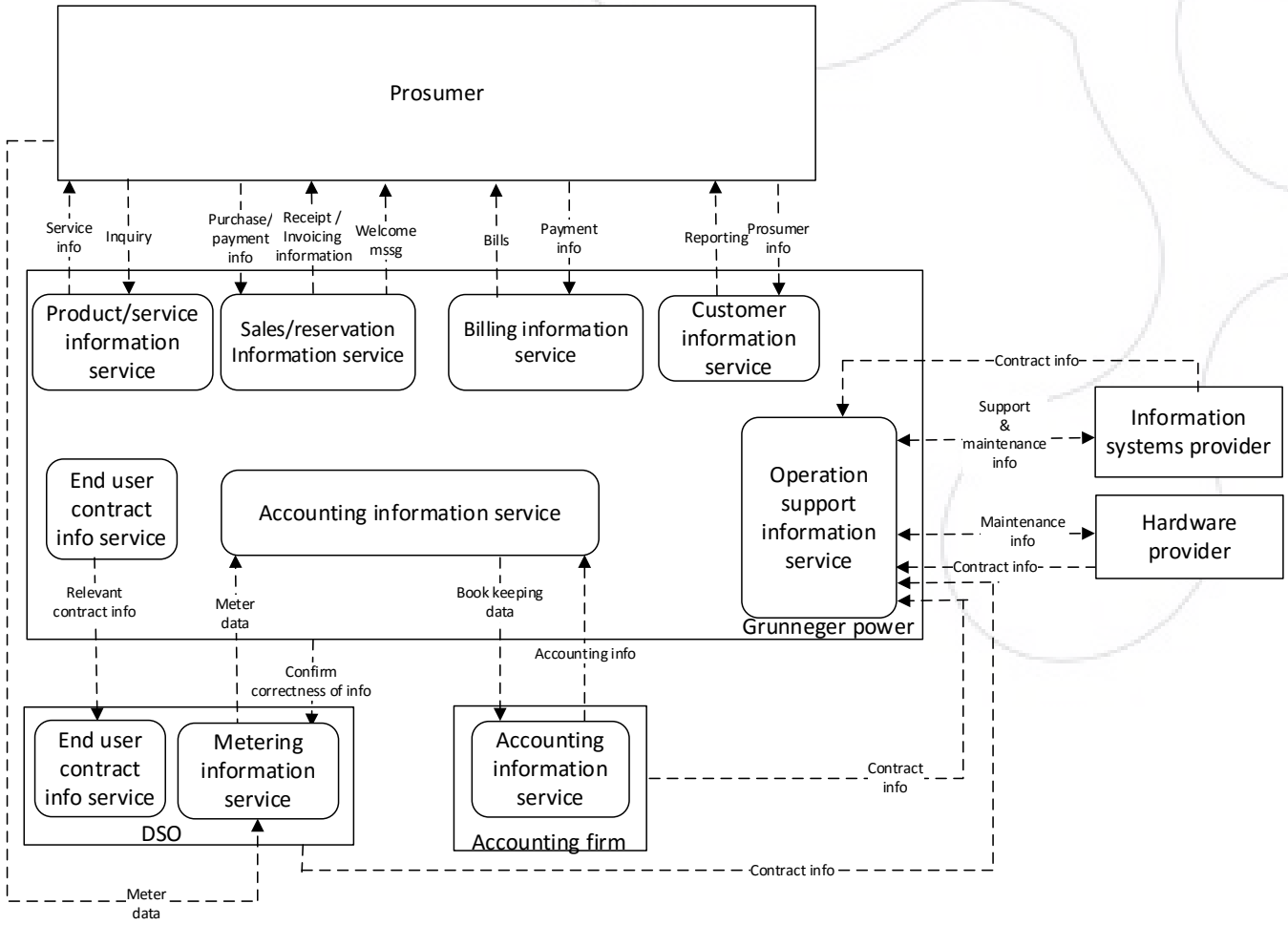

Figure 4 - Information service architecture

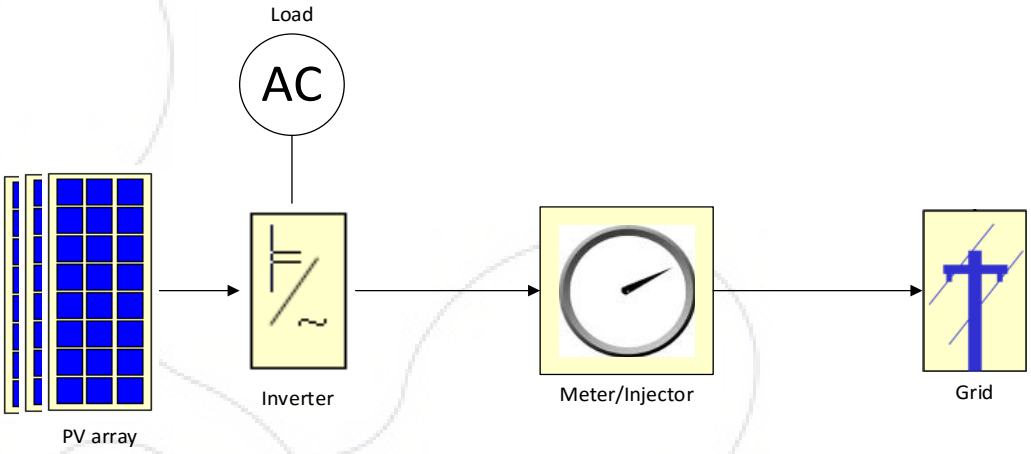

Figure 5 - Physical architecture

BM from the focal actor's perspective: Figure 6 depicts the BM from the focal actors' perspective (GrgP). Since the BMC is used to depict the BM it implies that the BM is depicted using nine BM building blocks namely key partners (stakeholder), key activities (value creation activity), value proposition, customer relationship (relationship type), customer segment (stakeholder), key resources (resource), channels, cost structure, and revenue streams. Figure 6 shows that if GrgP implements the BM as depicted it will suffer a loss of 512 euros per annum. The costs, revenue, and profitability of the business model are based on the information available at the time of the research. However, this could change when the business model is being implemented. Table 7 shows BM design elements in the context of BM from the focal actor's perspective. Since the focal actor is making a loss, the traditional BM design efforts would stop here because the business model is unviable.

However, using an ecosystem approach and the configuration techniques there is a chance that GrgP can satisfy its customers' needs profitably. Furthermore, the viability of other stakeholders can also be assessed using a business ecosystem approach.

Therefore, the following section focuses on the business ecosystem perspective of this business model.

Table 7 - BM design elements in the context of the focal actor

Design elements	Design parameter	Motivation /Description
Design choices	-	No relevant design choices.
Business rules	Subsidy	Subsidy is available for 11 years.
Assumptions	Cost structure	Capital expense: 37.773 € (solar farm with 150 PV panels). Average annual operation expense: 3.178€ Investor rents: 452 €
	Revenue stream	Average annual revenue through sale of electricity: 1.785 €
	Other figures	Lifespan of the project : 20 years; Average wholesale price of electricity 0.054€; Average annual inflation: 1,8%; average electricity produced:33.318 kWh

Figure 6 - BM from Grunneger powers (focal actor's) perspective

Key Partners (Stakeholders)

Municipality

Distribution system operator (DSO)- Enexis

Suppliers
- IS suppliers
- Hardware suppliers

Inverstors/customers (Prosumers)

Energy retailer

Key Activities (Value creation activities)

Marketing/advertising

Sales

Setup solar farm

Operate solar farm

Customer/investor relationship management (CRM)

Partner management

Key Resource

Finance

Knowledge

Human resource

Information systems

Hardware (e.g. solar panels)

Accounting capabilities

Billing capabilities

Energy transport capabilities

Real Estate

Value Proposition

Sustainable living experience

Stimulation of local economy

Reasonable ROI

Reports

Convenience

Reliable

Positive self image

Customer Relationship (Relationship type)

Communities

Personal

Automated

Co-creation

Channels

Sales personal

Website

Internet communities

Community

Resprentatives

Social Media

Customer Segment (Stakeholders)

Customers who are interested in a sustainable lifestyle, and without the possibility of installing solar panelson on their own roof. Futhermore, customers in this segment are also interested in creating social benefits.

Energy retailers who want to buy green energy and retail it.

Cost Structure

Capital expence	Amount
Investment in solar farm	37.773 €
Operating expense (Opex)	
Average annual opex	3.178 €
Average annual divident paid to prosumer	452 €
Total opex	3.630 €

Revenue Stream

Transaction revenue	Amount
Sale of shares in the solar farm	37.773 €
Recurring revenue	
Average annual revenue through sale of electricity	1.785 €
Average operational expenses charged to prosumer	1.333 €
Total recurring revenue	3.118 €
Average annual revenue before taxes (revenu stream - cost structure)	-512 €

BM from the ecosystem perspective: Figure 7 presents the BM that was found to be viable. From Figure 7, it can be observed that the traditional energy retailers are eliminated from the business ecosystem because they are not creating sufficient value. The role of energy retailer is now reallocated to GrgP. This allows GrgP to make approximately 78€ profit per household per annum through energy retailing activity (Eneco, 2014; Essent, 2013; OFGEM, 2014). Therefore, GrgP needs at least seven households to participate in the abovementioned project to cover their operational costs. Figure 7 and Table 8 shows the profitability of the different stakeholders in the business ecosystem. Furthermore, stakeholders such as the municipality, and subsidising agencies are looking to reduce CO2 emissions and stimulation local economy. They are also able to capture the intended benefits. It is estimated that a total of 151,26 tons of CO2 will be avoided, and 1297 hours of local work will be created at minimum wage. Figure 7 shows that the benefits are divided equally among three stakeholders. This was done in order to avoid double counting or over estimation of these benefits.

Table 8 - Average profit of stakeholders

Actor	EBTDA /cost saving in Euros (20 years)
GrgP	16549
Prosumer	1610
(DSO)	1428
(Hardware supplier)	4220
(Accounting firm)	9528
Information systems provider	4198

Table 9 BM design elements in the context of business ecosystems

Design elements	Design parameter	Motivation /Description
Design choices	Elimination of traditional energy retailer	*Description:* The traditional energy retailers are eliminated from the business ecosystem. *Motivation:* They are eliminated because they are not creating sufficient value in the context of this BM.

<table>
<tr><td></td><td>Activities to be outsourced by GrgP</td><td>Description: See Figure 7 for outsourced value creation activities.

Motivation: Resources, capabilities, cost, and strategy played an important role in deciding which value creation activities should be performed by GrgP, and which ones should be outsourced.</td></tr>
<tr><td>Business rules</td><td>Allocation of value creation activities</td><td>The value creation activity of electricity transport has to be allocated to a DSO because they own and operate the electricity transport grid.</td></tr>
<tr><td>Assumptions</td><td>Figures</td><td>
<table>
<tr><th>Actor</th><th>Revenue/ cost saving €</th><th>Profit margin</th><th>Source</th></tr>
<tr><td>GrgP</td><td>1.311.741</td><td>4.33%</td><td>(GrgP; Eneco 2014; ECN 2012)</td></tr>
<tr><td>DSO</td><td>31.728</td><td>4,5%</td><td>(Enexis 2013)</td></tr>
<tr><td>Accounting firm</td><td>11.910</td><td>80%</td><td>(GrgP)</td></tr>
<tr><td>Hardware supplier</td><td>43.960</td><td>9%</td><td>(GrgP)</td></tr>
<tr><td>ICT supplier</td><td>26.235</td><td>16%</td><td>(Guevara, Stegman, & Hall, 2013; Yardeni & Abbott, 2015)</td></tr>
</table>

Annual household energy bill: 1087 € (CBS 2009; ECN 2012; PBL 2013), emission 454gCO2/kWh in the netherlands (IEA, 2012, 2014), annual average electricity produced by the solar farm 33318 kWh, 1297 hours of local work will be created (includes jobs created at GrgP, local suppliers,IT suppliers, and accounting firm), prosumers required rate of return: 1%, number of prosumers households: 30
</td></tr>
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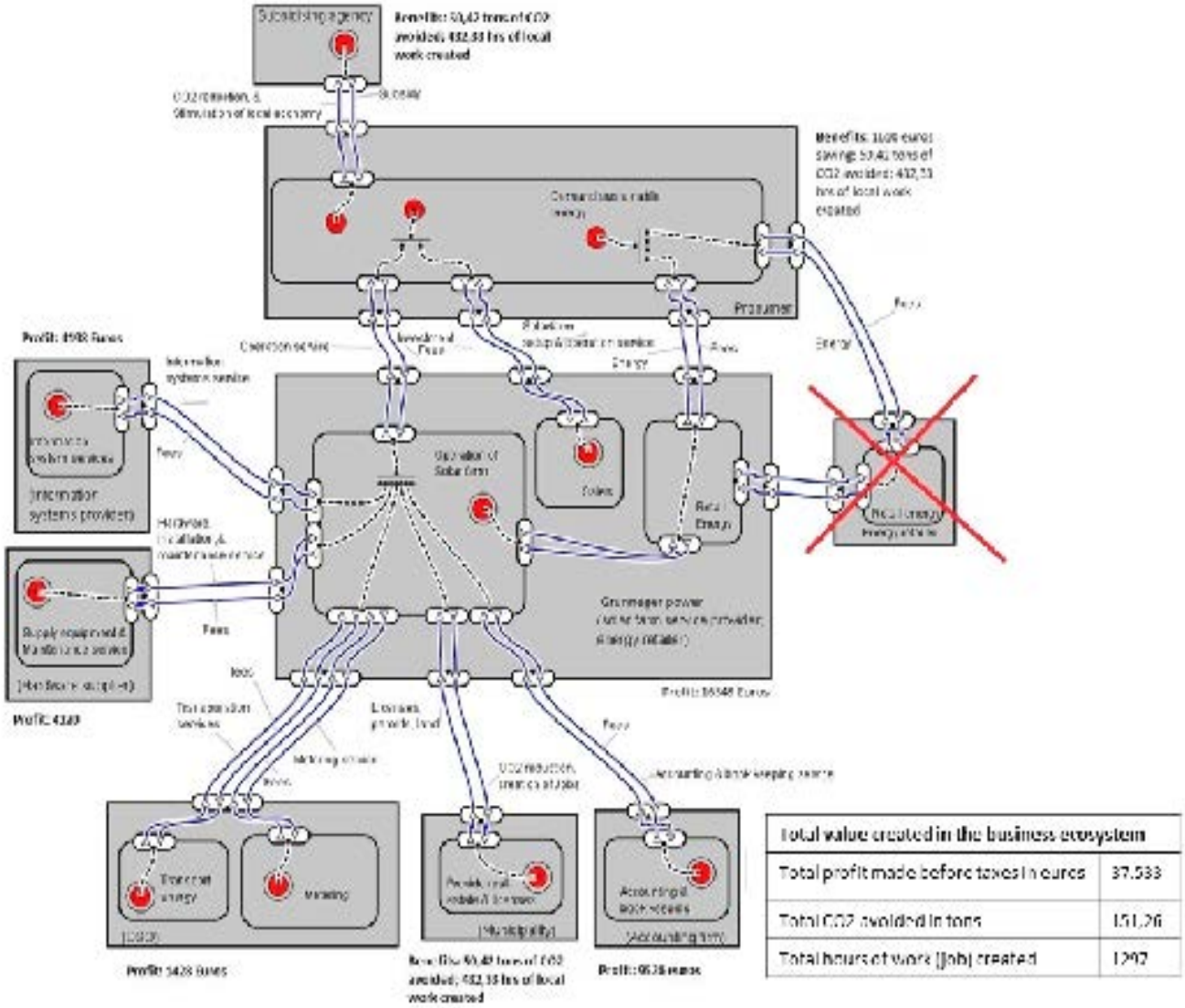

Figure 7 - The solar farm business ecosystem

The BM was presented to four experts and they were asked to evaluate the BM based on the above criteria. They were asked to score the BM on the following scale ++ (very positive), + (positive), +/- (neutral), - (negative), - - (very negative).

Table 10 - Expert evaluation of the BM

Evaluation criteria	Expert 1	Expert 2	Expert 3	Expert 4
Viability in terms of value	++	+	+	+
Technological viability	++	++	++	++

Table 11 - Expert evaluation of the applied design elements

Evaluation criteria	Expert 1	Expert 2	Expert 3	Expert 4
Validity of assumptions	++	+	+/-	+
Completeness of assumptions	+	+	++	+
Coherence of assumptions	++	++	++	++
Validity of business rules	+	++	++	++
Completeness of business rules	+	+	++	+
Coherence of business rules	++	+	++	++

From Table 10 the experts found the BM to be viable. Table 11 depicts expert evaluation of the application of the BMDFV to design the business model. Expert 3 had doubts about the assumption that GrgP would be able to retail energy at same profit margin as the traditional energy suppliers. The expert had doubts because on the one had GrgP is a lean start up without the overheads of a large traditional energy retailer; on the other hand, they do not have the economies of scale. The experts were also positive about the completeness, validity, and coherence of the BM. From Figure 7 it can be observed that the application of the configuration technique (eliminate waste) lead to the viable business model design. Furthermore, the design principles were followed closely. From Figure 7 each stakeholder is able to capture the value they are interested in. Further, the coherence of the BM was ensured by applying the design elements in a coherent manner. In addition, the applied design elements were also evaluated for their completeness. Table 3 shows that there is a clear value proposition of each of the stakeholder in terms of superior value and or cost efficiency. Furthermore, the feedback loop of the BMDFV framework facilitated the incorporation of relevant feedback into the design process. Based on the above evaluation it can be said that the BM is viable.

The viability of the BM is highly sensitive to the subsidy. If the government retracted the policy, it would lead to the prosumers becoming inviable. Their viability also depends on the sale price of electricity. Assuming all the other assumptions stay the same and if the wholesale price falls below .043 €/kWh the prosumers will not be viable in terms of value. Further, their viability also depends on the required rate of return; the lower the required rate of return the higher the profitability of the prosumers. The viability of GrgP obviously depends on their cost structure, their profit margins as energy retailer, and on the number of households participating in the solar farm. Furthermore, for simplicity we have assumed fixed profit margins for other stakeholders therefore their viability largely depends on the assumed profit margins and their revenue streams. Furthermore, the technological viability is insensitive to the business rules and assumptions, because the technologies under consideration are fairly stable and mature.

Reflection

It is very hard to design viable BMs. Part of the reason for this difficulty is because BMOs ignore vital design elements necessary for a viable BM design. To address

the abovementioned problems we proposed a BMDFV. We used DSRM do develop the BMDFV. The BMDFV is validated by using it to design a viable BM for an energy enterprise. However, the newly design BM was evaluated for viability using expert opinion, and experts are limited by bounded rationality. We have tried to counter this limitation by relying on several experts and leveraging their experience in the energy domain.

The process of designing the BM using BMDFV was an iterative process. The BM design elements make the designed BM transparent and traceable and easy to tweak with each iteration. Furthermore, considering the focal actors perspective and the business ecosystem perspective was crucial in designing the viable BM. In addition, the configuration techniques played an important role in the design of a viable BM by eliminating stakeholders who were not creating sufficient value in the business ecosystem. Furthermore, the validation process is limited by its theoretical nature.

The premises that influenced the design and application of the framework are, the BM cannot be operationalised without technology (both information services, and physical technologies), and that the BMs span several organisations.

Conclusion

Viable BMs are vital for the long-term success of enterprises. However, existing literature on the design of viable BMs is fragmented, and it ignores crucial elements necessary for a viable BM, such as business rules. To address this gap, we propose a BMDFV. We adopt a design science research approach to develop the BMDFV. The BMDFV consolidates existing literature, and adds missing elements necessary for designing a viable BM such as business rules. Furthermore, the BMDFV is demonstrated by applying it to design a BM for a community-driven solar farm. The evaluation of the framework is carried out by evaluating the designed BM for viability. The designed BM was evaluated using a number of expert opinions, and it was found to be viable in theory.

Future research should focus on rigorously testing, and evaluating BMDFV in practice. It should also focus on incorporating scenario planning into BM design with the help of BMDFV. Doing so will help enterprises to develop BMs for future scenarios. In addition, it will also help them identify capabilities necessary for implementing BMs for future scenarios.

Acknowledgements

This research has been financed by a grant of the Energy Delta Gas Research (EDGaR) program. EDGaR is co-financed by the Northern Netherlands Provinces, the European Fund for Regional Development, the Ministry of Economic Affairs and the Province of Groningen, the Netherlands.

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Appendix A

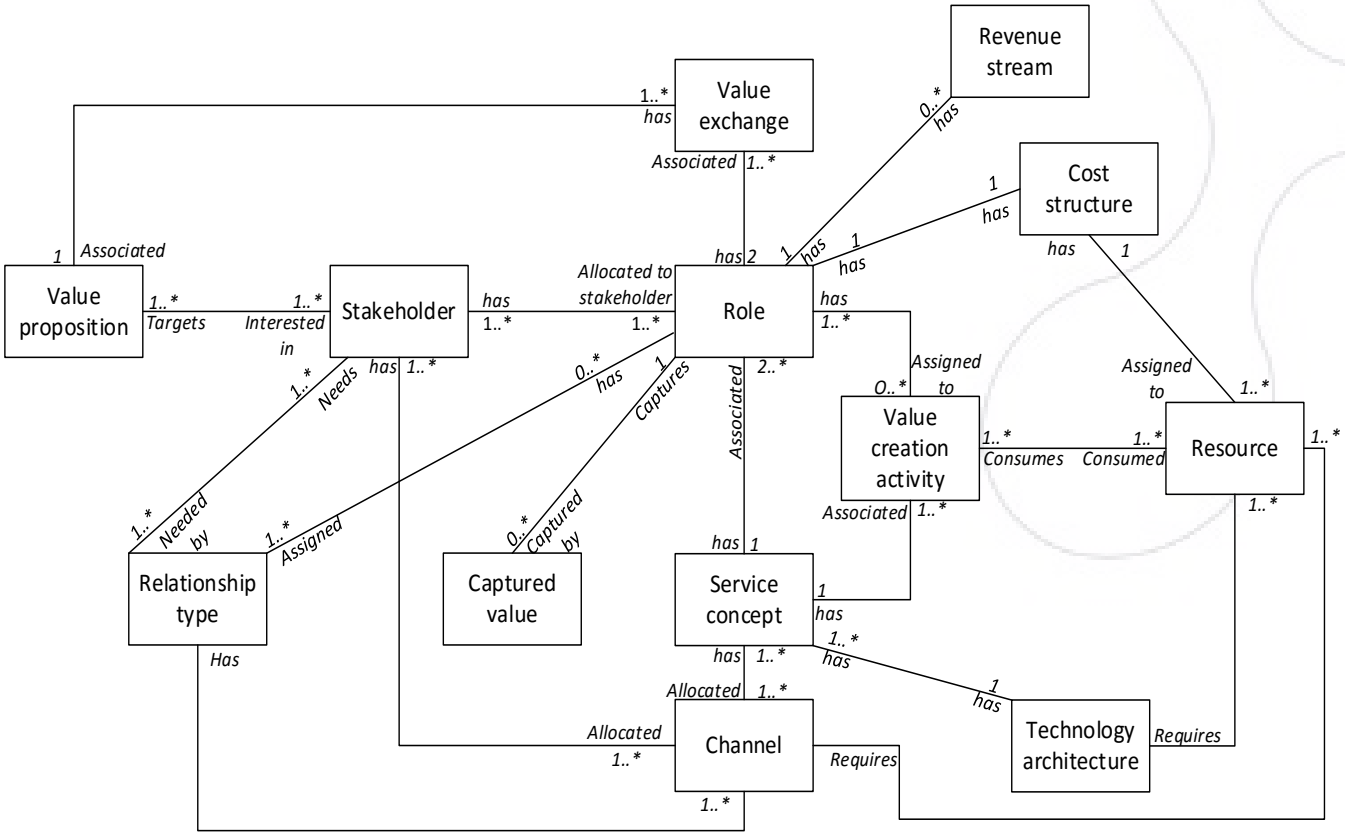

Figure 8 - Relationship among the building blocks

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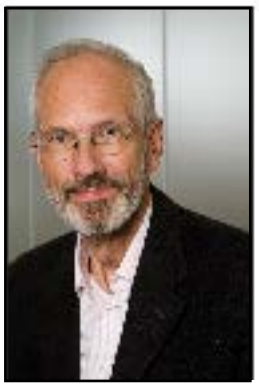

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Dynamics of Openness in SMEs: A Business Model and Innovation Strategy Perspective

Marika Miriam Iivari[1]

Abstract

Purpose: In order to explore the dynamics of openness within SMEs, this study investigates how business model transformation relates to innovation strategy transformation.

Design/Methodology/Approach: This research is conducted as a longitudinal qualitative single case study in order to fully follow transformation as a process.

Findings: This research revealed that openness in SMEs is not about continuously increasing the level of openness, but SMEs can also begin to close their innovation strategy, even though the business model stays open. The level of openness varies based on strategic openness.

Research limitations/implications: This study emphasizes that openness needs to be viewed as a continuum, where the level of openness may fluctuate during transformation. Furthermore, openness in business models and openness in innovation indeed are separate phenomena.

Practical implications: Having an understanding how strategic openness guides business model transformation enables practitioners to better utilize open innovation as an innovation strategy.

Originality/value: Through focusing on the relationship between business model transformation and innovation strategy transformation, we broaden the discussion on the dynamics of openness within SMEs.

Keywords: Classification, case study, oppenness, business model, open innovation, transformation, SME, internet-based

Please cite this paper as: Iivari, M. 2015, Dynamics of Openness in SMEs: A Business Model and Innovation Strategy Perspective, *Journal of Business Models*, Vol. 3, No. 2, pp. 30-50.

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Introduction

The advancement of technologies, shortened product life cycles, changed market forces and consumer behavior have created new kinds of challenges for companies to meet in order to survive in the global competitive landscape (Collins, 2006; Christensen et al., 2005; Bell and Loane, 2010). This new scenario has led firms to become more open to innovative sources outside their organizational boundaries (Ndou et al., 2011). When firms utilize innovation strategies that rely on cooperation with external parties to get access to components, complements and customers, it is referred to as open innovation (Chesbrough *et al.*, 2006). In this respect, open innovation (OI) has been defined as "a distributed innovation process based on purposively managed knowledge flows across organizational boundaries, using pecuniary and non-pecuniary mechanisms in line with the organization's business model" (Chesbrough *et al.*, 2014).

The purpose of business models is to utilize internal and external ideas to create value for the focal firm, while defining internal mechanisms to claim some portion of that value (Chesbrough, 2012). It is business models that define the requirements for how open innovation processes combine these internal and external ideas together into architectures, systems and platforms (Chesbrough, 2012). Hence open innovation cannot be conceived without business models (Chesbrough *et al.*, 2014, 52). However, despite of the central role of business models in open innovation, quite often these have been ignored in academic literature (West and Bogers, 2014). Moreover, despite the significance of openness and collaboration in modern networked economy, the effects and aspects of openness in relation to business models are not sufficiently understood (Frankenberger *et al.*, 2014, 175). Openness can exist in both innovation and business models: a firm may have an open innovation strategy but a closed business model, or a closed innovation strategy with an open business model Chesbrough *et al.*, 2014). Openness emerges in varying scopes and intensities (Saebi and Foss, 2015; Enkel and Bader, 2012). Therefore, rather than considering openness as a battle to choose between closed and open, we should view it as a continuum (Chesbrough, 2003). The challenge then is to find the right balance between coordination and openness (Boscherini *et al.*, 2013; Ahokangas and Myllykoski, 2014).

Indeed, the new kinds of challenges in sustaining competitive advantage have resulted in existing firms the need to redesign and transform their business models (Hienerth *et al.*, 2011; Glova *et al.*, 2014). Yet, academic literature has not adequately tackled issues related to business model transformation (Ahokangas and Myllykoski, 2014). Business models reflect the strategic choices of the firm (Saebi and Foss, 2015; Shafer et al., 2005; Chesbrough, 2007), open innovation being one of the possible strategies for creating competitive advantage (Chesbrough *et al.*, 2014). Identification of new business opportunities and business model transformation affects all levels of the organization (Casadesus-Masanell and Ricart, 2010), as transforming the business model means changing the organization. It has been stated that small and medium-sized enterprises (SMEs), in particular, engage in open innovation as a consequence of the changes in the business model for seizing new business opportunities (Vanhaverbeke *et al.*, 2012, 10). Open innovation in the SME context cannot thus be studied separately from the strategic objectives of the firm as a whole (Vanhaverbeke *et al.*, 2012). Therefore, this research investigates transformation both in business models and innovation strategy in order to explore the dynamics of openness in the context of SMEs.

Accordingly, our research question is:

"How does business model transformation relate to innovation strategy transformation?"

Our literature review first discusses the role of business models and business model transformation, after which open innovation and innovation strategy transformation are focused on. The last part of the literature review focuses on the peculiarities of transformation in the SME context. In the methodology chapter, we present the rationale for choosing a longitudinal single case study method, after which we present our case and research results. In the final chapter, we reflect these back to theory. We also discuss the academic and managerial implications as well as limitations of this study, and suggest further research directions.

Business models, open innovation and transformation

Business model transformation

The business model concept originally emerged within e-business and has most extensively been studied in that context (Ahokangas *et al.*, 2014; Onetti *et al.*, 2012; Amit and Zott, 2001). However, there are no unified definitions of the business model concept (for more thorough discussion see, for instance, Zott *et al.*, 2011; Onetti *et al.*, 2012; Ahokangas *et al.*, 2014). A business model nevertheless represents the firm's core logic and strategic choices for creating value as well as capturing a portion of that value (Shafer *et al.*, 2005; Chesbrough, 2007; Casadesus-Masanell and Ricart, 2010). As a unit of analysis, a business model may portray the firm's value creation arising from multiple sources (Amit and Zott, 2001).

Business models can be thought of as a focal firm's boundary-spanning transactions with external parties (Zott and Amit, 2007). For instance, Zott and Amit (2010, 42) define business model as a system of interconnected activities that determine the way the company does business with its customers, partners and vendors. This means that a business model is a system of specific activities conducted to satisfy the perceived needs of the market, along with the specification of who does what, whether it is the firm or its partners, and how do these activities link to each other. Hence, through the business model concept, open innovation is differentiated from earlier research on inter-organizational cooperation for innovation (West and Bogers, 2014; Chesbrough *et al.*, 2006; Clausen and Pohjola, 2009).

Indeed, collaboration of the focal firm with its ecosystem is one of the defining factors of business model openness, either as a decisive or novel element (Frankenberger *et al.*, 2014). The business model connects the focal firm with the external business environment, other firms, organizations, communities and individuals (Teece, 2010). Whereas the majority of general business model research is firm-centric (Frankenberger *et al.*, 2014), the field of open business model researches openness independent of its locus. Open business models refer to situations where the firm relies on its external partners' competencies in joint creation, delivery and capture of value according to agreements negotiated prior to their collaboration (Chesbrough *et al.*, 2014; Saebi and Foss, 2015). As the value is jointly created, partners usually team up throughout the whole product lifecycle (Chesbrough *et al.*, 2014). Hence, value is generated through external relations within the ecosystem (West and Wood, 2008; Jansson *et al.*, 2014).

As Ahokangas *et al.* (2014, 13) write, transformation of an existing business model brings special challenges to the creation stage of a business model. Business model transformation is about transforming an existing organization through repositioning the core business and adapting the current business model into the altered market place (Gilbert *et al.*, 2012; Ahokangas and Myllykoski, 2014). Transforming an organization requires a lot from the management (Giannopoulou et al., 2011) in finding the right balance between coordination and openness (Boscherini *et al.*, 2013; Ahokangas and Myllykoski, 2014). The old ways and the new ways of doing things (Giannopoulou *et al.*, 2011) may become a challenge, as the activities and logic related to the new business model may be incompatible with the status quo (Chesbrough, 2010). Consequently, the business model should always be evaluated against the business context and further calibrated in order to find an optimal fit with the environment (Teece, 2010). It is the context that influences the choices made by firms about their innovation practices (Bellantuono *et al.*, 2013). Similarly, business models become fully comprehensible for firms only through action in the business context where they emerge (Ahokangas and Myllykoski, 2014).

The search for a new business model often requires an extended period of co-existence between the current and new models (Chesbrough, 2010). Thus, a firm does not necessarily have to confine itself to a single business model but can experiment with several models simultaneously (Trimi and Berbegal-Mirabent, 2012). During the transformation of a business, it is not clear what the eventual new business model will turn out to be, but only though experimentation the company can gain the data needed to justify the transformation. However, although business model as a concept includes an underlying assumption of a process, academic literature has not tackled the issues related to

business model transformation (Ahokangas and Myllykoski, 2014). Yet, finding the right level of openness is important, as open and closed business models cannot exist in pure form. A completely closed model does not give enough space for innovation, whereas a completely open model gives insufficient opportunities for generating profit (Soloviev *et al.*, 2010).

Innovation strategy transformation

Critics argue that firms have always practiced openness in one form or another (Trott and Hartmann, 2009; Chesbrough et al., 2014; Herstad *et al.*, 2008; Huizingh, 2011). A large number of firms have experienced complications in their attempts to benefit from external knowhow (Enkel and Bader, 2012). For instance, Birkinshaw *et al.* (2011), state that the adverse effects may include considerable cost increases related to IPR issues, operations and lack of trust (see also Dahlander and Gann, 2010). A response to this is that today's business reality, naturally, cannot be based solely on open innovation (Enkel et *al.*, 2009) but on openness in varying scopes and intensities (Saebi and Foss, 2015; Enkel and Bader, 2012). Too much openness can have a negative impact, as it could lead to loss of control and loss of core competences. The focus should therefore be on whether to opt for a closed or open strategy for finding the right level of openness (Laursen and Salter, 2014; Roper *et al.*, 2013; Dabrowska *et al.*, 2013).Thus, the transformation from closed to open innovation should be seen as a continuum rather than a case of either-or (Chesbrough, 2003).

Open innovation is just one possible strategy for a firm to create a competitive advantage (Chesbrough *et al.* 2014). This means that, in an open business model, the innovation process itself needs to be organizationally decomposed (Lema, 2010). Organizational decomposition of the innovation process is connected with new firm structures, managerial priorities and the firms' boundaries (Lema, 2010, 25). This means that the firms are required to transform their boundaries from closed to semi-permeable, so as to enable innovation to move easily between internal innovation process and external environment (Chiaroni *et al.*, 2010). An important point stressed by Dabrowska et al. (2013, 3) is that internal openness to idea generation needs to be differentiated from open innovation as an actual practice of collaborating with external parties. Laursen and Salter (2006) suggest that firms embracing OI increase both the number of external sources relied upon in innovative activities, i.e., the breath, as well as the extent to which firms draw from different external sources within innovation networks, i.e., the depth. Here, the business model acts as a boundary-spanning unit of analysis (Zott *et al.,* 2011) that defines those boundaries, structures and processes for open innovation (Chesbrough, 2010), and the role of external parties within the firm's activities (Onetti et al., 2012, Zott and Amit, 2010).

Firms may choose from an array of different business models and open innovation strategies (Saebi and Foss, 2015). Different types of strategies require different levels of openness in terms of breadth and depth (Saebi and Foss, 2015). However, little is known about how to match business models and OI strategies (Saebi and Foss, 2015). One reason for this is that literature has viewed open innovation and open business models as the same concept (Chesbrough *et al.*, 2014). However, there are major differences between the two. Openness in innovation and openness in business models need to be recognized, understood, and treated as separate phenomena (Frankenberger *et al.*, 2014). According to Chesbrough *et al.* (2014), tapping into external technologies and setting up collaborative deals in OI is usually of temporary nature. Knowledge from external parties is required, but external partners do not necessarily help in creating value. Once the project has been finished, the collaboration comes to an end. The business model has a long-term and more relationship-based stance, as it extends to the commercialization phase of innovations (Chesbrough, 2010; Teece, 2010).

Open innovation and business model transformation in SMEs

It has become increasingly difficult to create innovations 'behind closed doors' in modern, globalized business environment (Herstad et al., 2008). Consequently, also SMEs in various industries have started to open their innovation processes and acquire external resources and capabilities (Wynarczyk *et al.*, 2013; Spithoven *et al.*, 2013). Especially the development of ICT technologies and the rise of the Internet have enabled even smaller and younger firms to access the global business arena (Onetti *et al.*, 2012; Bell and Loane, 2010). In this kind of environment, innovative SMEs

hold a crucial role in local-to-global economic development, dynamism and competitiveness (Lecerf, 2012; Ndou *et al.*, 2011; Hotho and Champion, 2011).

Indeed, SMEs are considered to be both a source and a driver of innovation and new product development (Chesbrough *et al.*, 2014; Wynarczyk, 2013; Wynarczyk *et al.*, 2013). New ways to conduct business, communicate ideas and exchange information have resulted in a range of new kinds of services and business models across an ecosystem of partners (Turber and Smiela, 2014; Christensen *et al.*, 2005). Especially the extension of digital technologies to previously non-digital fields, that is, digitalization, has affected both the role of SMEs in modern business as well as the nature of services built on digital platforms (Ministry of Employment and the Economy, 2015; Turber and Smiela, 2014). Business models are often necessitated by technological innovation, which creates a need to bring discoveries to market as well as the opportunity to respond to unmet customer needs (Teece, 2010; Glova *et al.*, 2014) Hence, also the business model itself may act as an example of innovation (Chesbrough, 2010).

However, in open innovation literature, SMEs have started to gain more attention only within the past few years (Chesbrough *et al.*, 2014; Lee *et al.*, 2010; Wynarczyk, 2013). It is important to acknowledge that the drivers of openness for small firms tend to be different from those for large firms (Lee *et al.*, 2010, 291; Spithoven *et al.*, 2013, Brunswicker and Vanhaverbeke, 2015). Therefore, not all OI research can be directly applied to SME context (Vanhaverbeke *et al.*, 2012). It is important to consider how (internal) organizational and (external) industry factors help or hinder SMEs' decision to open up (Brunswicker and Vanhaverbeke, 2015). For instance, it has been argued that particularly limited resources and capabilities force SMEs to search for different kinds of innovation partners outside their firm boundaries (Brunswicker and Vanhaverbeke, 2015; van de Vrande et al., 2009; Lee *et al.*, 2010). In addition, SMEs use non-internal means of innovation more than large firms do, because the former consider alliances or networks as ways to extend their (technological) competences (Lee *et al.*, 2010, 291; Brunswicker and Vanhaverbeke, 2015). Moreover, small firms often have just one articulated business model, whereas large firms with several business units usually have multiple business models (Lema, 2010). Yet, SMEs tend to experiment with multiple OI practices simultaneously when introducing new offerings to the market (Spithoven et al., 2013; Colombo *et al.*, 2014). Hence, the relationship between business models and open innovation is not clear within the SME context.

Research has tended to focus on the role of innovation and business models for start-ups and new technology-based firms (see *e.g.*, Onetti *et al.*, 2012). However, "there is an experiential and time difference between the original creation of the business model and its subsequent transformation or change—even though the basic idea of the business model as a concept remains the same" (Ahokangas and Myllykoski, 2014, 7). Thus, it is important to acknowledge that business model creation in new firms is a process that is different from business model transformation within established firms (Ahokangas and Myllykoski, 2014; Ahokangas et al., 2014). We focus on transformation within established SMEs, which we describe in Figure 1 below.

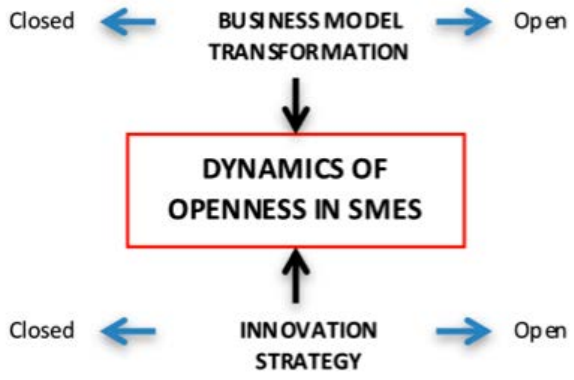

Figure 1. Dynamics of openness and transformation

Here, transformation occurs in the openness continuum both in business models and innovation strategy, our particular interest being on how the relationship between business model transformation and innovation strategy transformation affects the dynamism of openness within SMEs. To summarize, the ability to transform is crucial for the competitiveness of SMEs, especially in constantly changing modern business environment.

Research Methodology

Research design

This study was framed as a qualitative single case study (Yin, 1994; Sosna *et al.*, 2010), which is due to the explorative nature of the research question, the limited amount of research conducted in the area of transformation and the unique characteristics of open innovation and business models in the SME context. The case was chosen as the result of strategic sampling (Bergenholtz, 2011). A case study method offers the best tool to research a complex phenomenon in a holistic, process-oriented fashion (Yin, 1994; Eisenhardt, 1989; Hotho and Champion, 2011). Whilst the case study approach is not meant for mass generalization of theoretical and empirical findings, cases can still offer enriching data of intimate nature that is unlikely to be revealed through highly quantitative, hypothesis-based research settings (Denzin and Lincoln, 1994; Creswell, 1998; Yin, 1994). Furthermore, a single case study, rather than a multiple case study, enables the researcher to attain the richness and depth of the processes and dynamics of relations concerned (Bergenholtz, 2011; Dyer and Wilkins, 1991). As the specific focus of the research is to follow a firm's transformation process over time in a specific context, a longitudinal perspective to the case was applied. It can be argued that transformation per definition alone requires a similar perspective to capture its evolution.

Data collection and analysis

In order to deeper the understanding of transformation as a phenomenon, the researchers carried out a triangulation of sources and adapted several techniques during the data collection process. The types of employed primary data collection techniques included semi-structured interviews, observation, documentation, and community-based research. The data consisted of interview data, email exchanges, project documents, proposals, briefs, meeting memos, budgetary and financial data, and human resource and partner databases. Secondary data mainly included website information and general publicly available digital documents, print media, as well as social and online mediea. This kind of approach is said to maximize the robustness of the study (Denzin and Lincoln, 1994; Creswell, 1998). The researchers also actively followed the firm's participation in local business arena in formal and informal seminars and events. The recorded data were analyzed afterwards, based on thematic analysis (Coffey and Atkinson, 1996; Aronson, 1994). To increase the validity and reliability of the research, also analyst triangulation was applied. For instance, during the interviews, one researcher performed questioning, and second researcher acted as a silent observer. Afterwards, their notes were compared and combined. Information was also forwarded to the interviewees for double-checking and confirmation.

Over the period of four years, 11 semi-structured interviews were conducted among the key personnel of the firm (the Founder, the CEO and the Marketing Manager) to elicit in-depth information about open innovation and business model transformation as well as contextual information particular to digital 3D design industry. Interviews were supported by researcher participation in meetings, presentations and seminars. Altogether 22.9 hours of recorded primary data was collected. When no interviews were conducted, the researchers focused on gathering secondary data. The rationale for leaving gaps between the interview dates was to allow a sufficient time for the business model changes to emerge as a strategy put in action rather than as a mere plan, as we claim that openness always has to lead to action in order to be a strategic approach. Hence, the basic interview framework (Appendix 1) was the same in all the interviews, as it allowed us to focus to pinpoint how transformation took place. The following table presents in more detail the recorded data of the study.

Table 1 - Details of recorded data

Type of data	Interviewee/event	Time and date
Semi-structured interview	Founder	45min March 18, 2011
Semi-structured interview	CEO	45min March 18, 2011
Semi-structured interview	Marketing Manager	30min March 18, 2011
Semi-structured interview	Assistant	30min March 18, 2011
Semi-structured interview	Founder	56min Sep. 13, 2011
Seminar	International business development seminar	3h45min Sep. 14, 2011
Semi-structured interview	CEO	37min Feb. 21, 2013
Semi-structured interview	Founder	2h5min March 26, 2013
Semi-structured interview	Founder	1h45min Jan. 13, 2014
Seminar	Business model development panel discussion	6,5h Feb. 14, 2014
Semi-structured interview	Founder	46min April 4, 2014
Seminar	International Organization Design	4h April 16, 2014
Semi-structured interview	Founder	March 7, 2015 email interview
Semi-structured interview	Founder	April 22, 2015 email interview

Case analysis

Case Description

The case firm of this study, CubiCasa, comes from digital design industry. The company focuses on offering interactive, 3D-technology-based, digital floor plans for real estate agencies. A digital floor plan is a virtual image of a physical floor plan of an apartment or property that is intended for sale or for rent. CubiCasa started operating in 2005, with its main office in Finland and production facilities in Bangladesh. However, in 2008, when the global economic downturn hit, construction industry being one of the worst to suffer, the firm's business practically ceased and the business was put on hold. In 2011, the management team decided to give the business another chance, and the total transformation of the business model began. In 2013, the new model was launched successfully, and the business started to grow steadily. The firm received venture capital funding in 2014 for boosting access to international real estate markets and for developing business opportunities based on the digitalized floor plan data. In 2015, the firm held 10 percent of the real estate market in Finland, with a monthly growth rate of 15 percent, and has started to expand steadily in the US market.

Business models reflect the strategic choices of the company, and thus the choice of open innovation requires the firm to "define those ways to create, deliver and capture value in conjunction with external partners that are consistent with open innovation" (Saebi and Foss, 2015, 201). A business model should not only define what to do but also where to do it and by whom (Onetti *et al*., 2012, 361). Hence, we use the business model as a unit of analysis and apply a business model template that includes external business environmentas a unit of analysis and apply a business model template that includes external business environment model (see Ahokangas *et al*. 2014). This template covers the elements of what the firm is offering, how business is conducted and why the firm thinks the product/service can be executed profitably and, lastly, where this all is to take place – all previous elements can be located internally or externally to the firm, as each part of the business model can be executed with outside parties (Ahokangas *et al*. 2014, 15).

Case analysis

In order to illustrate the business model transformation of CubiCasa, we first present its prior business model and then describe the new business model. We then discuss, in more detail, what has changed during the transformation process and why.

What – offering, value proposition, customer segments and differentiation

Floor plans are an important but a simple part of property business. The earlier business model focused on offering a range of project-based services for real estate and construction industries. The rationale was to offer a digitalized, animated form of traditional printed floor plans. Hence the business opportunity was built around digital 3D floor plans. Main competition consisted of studios producing non-animated images of houses and apartments. However, as the firm built up their re-entry to the markets, there was very little room for differentiation and the firm struggled to build competitive advantage. The firm needed a new strategy to rely on. The new vision of the founders included launching a genuinely global and virtually functioning web service that would be physically close to customers. The management decided to focus solely on real estate industry and started to build their business model around interactive, high-quality digital floor plans. In the new business model, the business opportunity was built around interactive indoor spaces concept. This was enabled by the high-quality technology and cloud-based service platform. The basic idea of CubiCasa was that even a floor plan drawn on a napkin can be transformed into a digital form. The offering includes both single projects and on-going subscriptions. The firm states that they have a product that is simple to do, easy to control and fast to sell;
"CubiCasa is about letting things go from our grip. Let's use the power of Internet for the first time in CubiCasa's history what it is really designed for."

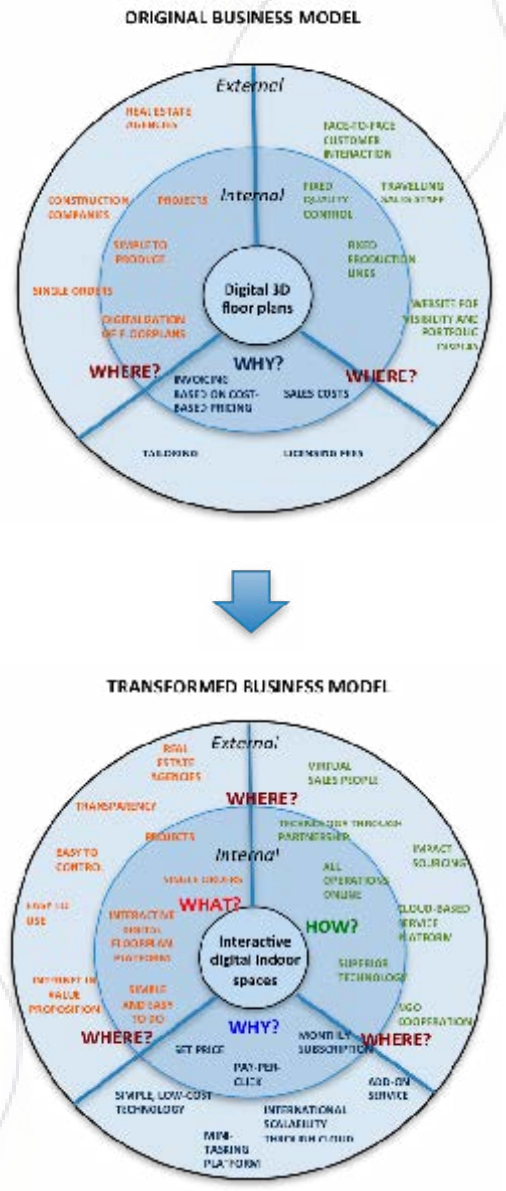

Figure 2. Business model transformation in CubiCasa

How – key operations, basis of advantage, mode of delivery, selling and marketing

The service itself was digital from the start, but, in the old model, sales and marketing was still based on traditional promotion tools, e.g., travelling salesmen, and there was no clear e-business strategy. Last minute changes were difficult to master due to a fixed production system. In the past, the company website was mainly used for portraying product portfolio and did not have an active role in customer interaction.

"We did manual labor; we were like headless chickens running around. We should have done better project management; better customer ordering system and everything else, and we didn't do that… Time for traditional sales in this business is over, and we need to be more clever and more clear about web-based businesses."

The software was originally licensed from another firm based in Denmark. However, CubiCasa innovated the business idea and its application beyond the scope and breadth of the original technology. The founder acquired the license and partnered up with a local firm in Finland. During this partnership, the digital platform was developed to its peak and is now a crucial part of the current service and its functionality. In the new model, the venture operates completely online. A floor plan can be ordered and paid for by one click, and the delivery is straight to the client's email within 24 hours. The floor plan design process works through a cloud-based platform, where floor plans are assigned to producers from Bangladesh and Vietnam. A cloud in this context refers to the practice of sharing computer resources by utilizing external servers for connectivity, management and storage of data, rather than using local servers or personal computers. Also quality control and customer support happens through the same platform. The rationale for basing operations in the developed world is in the utilization of "impact sourcing", which is a social mission for bringing internet-based jobs to disadvantaged communities (A Million Plans, accessed 8.3.2015; ImpactHub, accessed 8.3.2015).

Why – base of pricing, way of charging, cost elements and cost drivers

In the old model, a large part of the budget consisted of sales and travel costs. If amendments to the blueprints were required, these resulted in additional costs due to the fixed production system. As operational costs were high, also the base of pricing was related to cost-based invoicing. Hence, expenses were vast compared to the small margins that came out of the floor plans. Therefore, value-capture logic required a major overhaul. In the new model, pricing is based on online transactions through the digital platform. The use of cloud computing enables low costs and fast scaling up of production. The base of pricing is the same for each floor plan, the purpose of which is to make it clear for clients what they are paying for. This has been an important factor from the viewpoint of internationalization. The company also offers a subscription-based service for business clientele, with monthly invoicing. The firm provides both 2D and 3D models of the property for all, but subscribed clients also receive a link to an add-on interior design service. Floor plans are created through crowdsourcing via the concept of "minitasking", which speeds up the delivery and again offers a low-cost way of production, as any of the producers can take an order to process as soon as it appears on the platform. The utilization of impact sourcing enables high-quality floor plans with a competitive price, and the producers earn a commission for each floor plan produced.

Where – location of activities/items, internally or externally in the network or ecosystem

The where-element in the business model is the most central element that implies the role of external environment. What is done in-house, what is executed through collaboration? During the transformation process, partnerships and collaboration became a very important part of the business.

"For a small firm like us, doing everything from scratch on our own would have been costly, time consuming and quite impossible. We have a good technology and things are going well with our partner so it would have made no sense to do all that on our own! "

The core thinking is that the service should be as open as possible, with crowdsourcing (see von Hippel and von Krogh, 2006; Marjanovic, Fry and Chataway, 2012) as an important strategy in both sales and production of floor plans. As nearly everything happens on an Internet-platform between geographically distant

locations, the location of activities is external. The firm is also in active dialogue with different parties of the local business ecosystem, but in every part of the venture's activities external partners are utilized. The company has decided to opt for transparency in describing their operations, with international impact sourcing as an important part of the low-cost but ethical strategy. Not only are they utilizing external parties, the firm is also providing a service where external developers are also able to benefit from CubiCasa's technology and partnership in developing their own services and applications. However, now that the firm is internationalizing actively into North American markets, they have started to build their own intellectual property (IP) with plans to take over the technology completely later on. The rationale is that, as the service is built on digital floor plan data and external developers are able to partake as well, more security and protection is needed.

Discussion

Summary of business model transformation

CubiCasa initiated its transformation by re-focusing on a single customer group of real estate business with both residential and commercial real estate markets. They simplified and sophisticated their offering, made it easier to use and easier to produce. The core – high quality 3D floor plans – has not changed, but the offering has been positioned differently around an interactive indoor space concept. Steady turnover generated by floor plans made their business development efforts easier, as the firm is not solely dependent on external funds. They have resources of their own and are not confined by typical resource limitations faced by SMEs, as suggested by literature.

Digitalization in this transformation was one of the most important elements. The firm completely changed the way they operate and built their operations onto an online platform. This extended to all aspects of the business model in terms of the offering itself – rather than using technology and the Internet as a technical addition, the firm decided to differentiate itself through an interactive service. As all key operations were online, their streamlining was easy to handle, from customer orders to support and quality control. This improved the visibility of operations but also provided transparency to customers. The utilization of cloud computing further reduced the need to own resources. It also speeded up operation processes, which resulted in new cost structure and better profit margins. This technology also enabled CubiCasa to store floor plan data for future business development purposes. Hence, the data can be used to extend the original business idea of digital 3D floor plans to create and experiment with other concepts and business models.

By analyzing the business model transformation, the relationship to innovation strategy transformation can be exposed. Collaboration with external parties in technology and service development has always been important. The firm has active interactions with other businesses, public organizations and with general public. In the case of CubiCasa, their technology has always been open, first through licensing agreement and then through partnership. An interesting discovery is that only in the verge of internationalization and direction towards more data-reliant Internet of Things –world, the firm has started to develop their own intellectual property. In this sense, they are closing up a part of their innovation strategy. On the other hand, they have built an additional service where external developers are able to use CubiCasa's technology as part of their own services and applications. Hence, CubiCasa is not only taking advantage of the inclusion of external parties in their own innovation process but they have also opened their business model for others to benefit. Hence, in terms of dynamics of openness, we can state that the firm is heading towards a closed innovation strategy but with an open business model.

Strategic Openness

Even though the business model defines the requirements for open innovation in value creation and capture, our findings highlight that transformation in business models and innovation strategy do not necessarily travel to the same direction. To further clarify, we illustrate the transformation of CubiCasa in Figure 3 below and introduce the concept of strategic openness. We define strategic openness as "a conscious strategic move to incorporate external parties as part of the firm's innovative activities". Through strategic openness, we are able to demonstrate how the

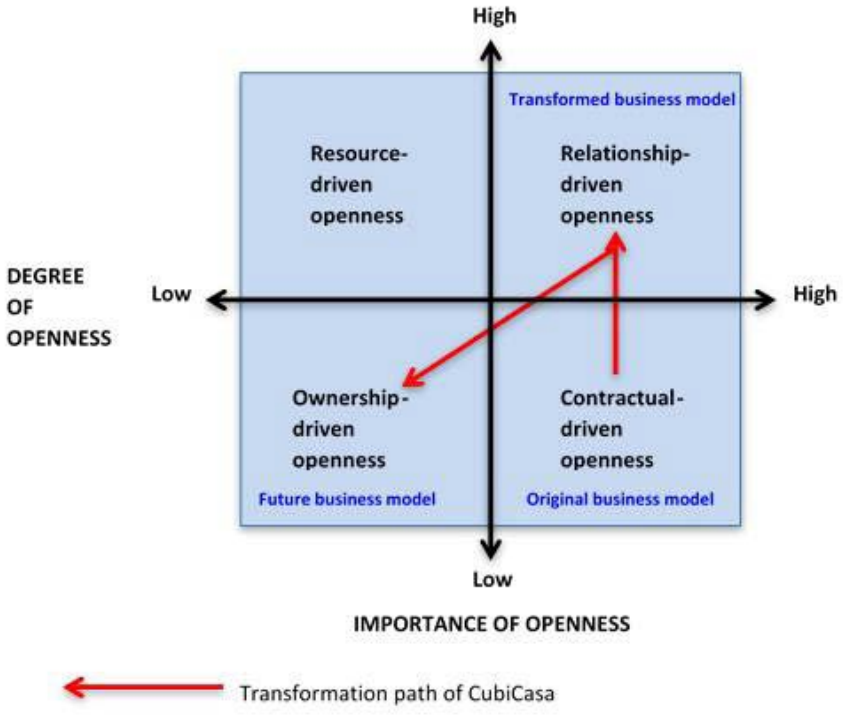

Figure 3. Strategic Openness

relationship between business model transformation and innovation strategy transformation develops. Based on findings of empirical research, we label the horizontal axis as the degree of openness and vertical axis as the importance of openness. These two dimensions determine not only how transformation takes place but also why transformation takes place as a strategic move.

The degree of openness refers to how much the firm relies on external parties for innovation in terms of scope and/or intensity, whereas the importance of openness refers to the role of these external parties within the firm's innovation activities. Ownership-driven openness refers to the traditional, closed innovation model. Here, the strategic decisions are guided by the need or will to protect the firm's own assets and competitive advantage. Therefore, openness is not considered important. As more closed approach to innovation is taken as a strategic move, hence also the degree of openness is small. When the degree of openness is low, but the importance is high, we talk of resource-driven openness. Here, firms are at the verge of openness and may not yet have a wide breadth or depth of external linkages in the innovation process. Nevertheless, these linkages are considered very important for the survival of the firm. This is typical in case SMEs are constrained by lack of resources, in which case openness is a necessity rather than an option.

When the importance of openness is low, but degree of openness high, firms can rely on contractually-driven openness. It is not so crucial to build relationships for joint innovation activities, as contracts are enough to provide assets the firm needs. When both the importance of openness and the degree of openness are high, we talk of relationship-based openness. Here, close collaboration with other parties characterizes the nature of openness. This is most typical for SMEs that practice open innovation and have managed to pass the need to collaborate to access resources and where formal, distant contracts do not provide enough flexibility for the innovative purposes of the firm. Here, openness relates more to co-creation and co-capture of value. As our purpose is to describe transformation as a process where openness is to be understood as a continuum, we are not aiming to build strict typologies.

As our case illustrates, firms can be positioned on

different points of strategic openness. Furthermore, we do not claim that, for instance, contracts cannot be a way for resource-driven SMEs to access open innovation, but we stress the main drivers behind strategic decision-making, i.e., we refer to openness as a conscious strategic move. The case shows that there is also no clear time for when a business model is "complete". The strategic choices of the firm guide the business model and determine the course of transformation. For CubiCasa, resource-driven openness has never been the main driver for transformation. The original business model was built around contractual-driven openness, as licensing was a major open innovation strategy for the firm. During the course of transformation, the company moved to relationship-driven openness, where close collaboration became highlighted for many years and co-creation of services was an important part of the collaborating firms' offering. The most interesting direction is the firm's strategic move towards ownership-driven openness. CubiCasa's current business model is still built around relationship-driven openness, but, in the future, the firm intends to start practicing internal R&D that they have not done before. Our results indicate that openness for SMEs is not only about the inclusion of external parties as part of the business model and the innovation strategy but, as a strategic move, the firm can also close up. This is an important implication for viewing open innovation as a continuum. Openness is not only going forward as a continuously increasing level of openness; the degree of openness can also revert back if the strategic direction of the firm requires so. Hence, in terms of the dynamics of openness, it fluctuates both ways.

Conclusions

This study utilized the business model as the unit of analysis in investigating how business model transformation relates to innovation strategy transformation. Within the case company, the important trigger for transformation was the economic downturn the world faced in 2008. This resulted in changes in most elements of the business model, from offering to revenue streams. All changes in how-elements, i.e., delivery of the services and why-elements, i.e., basis of pricing, were subject to the decision to take full advantage of digitalization and base all operations online 'in the cloud' as well as to utilize crowdsourcing to develop the original business idea of high-quality service into an interactive platform. The role of ICT in the case firm's transformation was therefore central. In the case firm, the dynamics of openness was twofold, as it fluctuated both ways in the openness continuum. The internal and external dynamics of openness vary depending on the degree of openness and the importance of openness for the firm. Therefore, the context SMEs operate should always be taken into account, as it influences the strategic choices firms make about their innovation practices, as pointed out by Bellantuono *et al.* (2013), and Ahokangas and Myllykoski (2014).

Academic and practical implications

Our results emphasize that openness in business models and innovation indeed needs to be studied as separate phenomena, as stressed by Chesbrough et al. (2014). Our case illustrates that, also in the SME context, a closed innovation model does not mean that the firm cannot have an open business model. Reflecting back to literature that states that SMEs utilize external parties due to lack of resources and capabilities capabilities (van de Vrande *et al.*, 2009, Lee *et al.*, 2010), it was not the case with this company. Despite being an SME, CubiCasa's activities are very much directed by strategic decision-making. Hence, we introduced strategic openness as a concept to explain the relationship between business model transformation and innovation strategy transformation. Thus, we contribute to the academic discussions in both open innovation literature and business model literature. Particularly, we aim to increase the body of knowledge in relation to SMEs (Brunswicker and Vanhaverbeke, 2015), as well as on the relationship between business models and open innovation (West and Bogers, 2014; Frankenberger *et al.*, 2014).

Having an understanding about the role of the business model enables practitioners to determine the relationship between internal and external dynamics of openness in the firm's activities, what is done in-house and what is outsourced. Indeed, it is important to understand that openness is not only about opening the organization with no going back but that firms need to be aware on the relationship between business

models and innovation strategy.

Limitations and future research directions

The main limitations relate to utilizing a single case study methodology. The case was only a representation of openness and transformation within an industry-specific SME. The role of digitalization and technology were emphasized in this firm's transformation, but how transformation occurs in non-digital SME field was not addressed. However, this study offers several interesting research possibilities, both quantitative and qualitative in nature. The concept of strategic openness could be used in various contexts to investigate how the relationship between business models and innovation strategy develops.

Literature on open innovation has tended to focus on the need of SMEs to open up due to their lack of resources. Our case revealed that also SMEs can close their innovation strategy. It would be interesting to see further studies on the dynamics of openness from this perspective. The case also shortly discussed the potential of multiple business models in SMEs. This would be a fruitful topic to tackle in future research, as it is not only large organizations with several departments that may have several business models (Lema, 2010). This research discussed transformation, implying that also organizational change is required to fully benefit from openness. More research in this field is needed, as currently there are very few contributions with an organizational change perspective on the adoption of OI (Chiaroni *et al.*, 2010; Boscherini *et al.*, 2013).

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Appendix 1. Interview questions to guide thematic interviews

Current strategy and business model

1. What is your business and industry context like?

2. Do you have a formally drafted strategy and business model?

3. What has the innovation strategy in CubiCasa been so far? How has it worked or not worked?

4. What do you think the reasons for those are?

5. How do you measure success/performance?

6. How well do you know of open innovation as a concept?

Strategy and business model transformation

1. How has your strategy changed and developed?

2. How about your business model, if you compare it to the past, how has it transformed? What were the key reasons for the change?

3. What is the new business model and strategy for CubiCasa?

4. What does openness mean to you in terms of business model, business practices and innovation management?

5. You mentioned that the "old way of doing sales" was over and Internet needed to be better utilized for sales. Can you explain further?

6. What is the role of external collaboration in relation to

    a. Key Resources (e.g., Internet platform)

    b. Key Partners (what kind, where)

    c. Customers (segments, relationships, push, pull, level of collaboration)

7. What are the main open innovation practices and how important are they?

    a. Information sources for innovation

    b. Sources for external R&D

    c. Types of collaborative innovation

    d. IP protection methods for innovation

8. How systematic is the use of open practices? Are these stated in the strategy "This is how we do it?" "This is important?"

9. What have been the most fruitful types of open innovation practices in terms of validating the new business model and value proposition?

10. Do you think you could have achieved what you have achieved so far if you only did internal development? Why is that?

Future forward

11. What are your views about open innovation as an internationalization strategy?

12. In terms of scaling and internationalizing the business, what are the main issues with external collaboration and innovation?

13. What is your position now in terms of thinking for future strategy? Open or closed innovation, or both? (How and when to be open, when not?)

14. What do you think could be the potential challenges with open innovation strategy? What would be an alternative?

15. Where do you draw the limit on openness? What is too much openness?

About the author

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