Service and Data Driven Multi Business Model Platform in a World of Persuasive Technologies

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Abstract

This article provides a new contribution to the concept of business models with the focus on the emerging gap between the usage of data, service and business models by suggesting a framework that function as a service and data driven business model platform. The purpose is to support manufacturing companies in establishing a service organization that delivers, creates and captures value through service and data driven business models by utilizing their network, resources and customers and/or users. Furthermore, based on literature and collaboration with the case company, the suggestion of a new framework provides the necessary construction of how the manufacturing companies can evolve their current business to provide multi service and data driven business models, using the same resources, networks and customers.

Keywords: Multi business model innovation, service and data driven business models, Persuasive business models.

1 Introduction

Recent research indicates that organizations interests regarding insights in data have increased dramatically within the last decade. More software and systems are being rapidly developed towards the purpose of understanding how to make use of data to create more value and profit (Brownlow et al., 2015, Burghin et al., 2011, Hartmann et al., 2014, McAfee and Brynjolfsson, 2012).

It seems that the use of service also has increased, at least in the manufacturing sector with over 50 percent of revenues belonging to manufacturing companies (Looy van and Visnjic, 2013). This indicates that the transformational journey from manufacturing products towards offering additional services is an increasing trend (Gebauer et al., 2005, Rodriguez and Peralta, 2014).

Regarding the terminology of big data, many of the manufacturing companies invest large amounts of their resources into investigating how to use this in their own businesses. It is here the challenge lies. Apparently, many of these companies fail to integrate large amounts of data into their business models and turn it into value and profit for their customers, and even for themselves.

These manufacturing companies face commoditization, the challenge of competing on the notion of price and products in saturated markets (Chesbrough, 2013). There are several indications that this is the reason for manufacturing companies invests and explores new opportunities evolving their businesses towards survival (Kastalli and Van Looy, 2013).

In the researchers' previous article (Andersen and Bjerrum, 2016), the introduction to Servitization (Vandermerwe, 1988, Brax, 2005, Neely, 2008, Baines and Lightfoot, 2013, Hou and Neely, 2013, Kastalli and Van Looy, 2013, Baines and Lightfoot, 2014), big data (Burghin et al., 2011, McAfee and Brynjolfsson, 2012, Anuradha and Gaurav, 2013, Hagen et al., 2013, Ward and Barker, 2013, Hartmann et al., 2014) and persuasive technologies (Fogg, 2002, Lindgren et al., 2013) was made with the purpose to state the importance of manufacturing companies to avoid commoditization by introducing new and other opportunities, such as new markets, new customers through service and data driven business models. The research indicated challenges and barriers regarding the transformational journey towards establishing a service organization that could handle service business models.

This article is seen as the extension to the first, with the perspective on a business model level (). It is the intention to propose a framework that combines the areas of business models, service and data driven business models and persuasive business models to solve the challenges faced by the manufacturing companies.

The first part of this article will focus on addressing this challenge through a literature review on multi business models, service and data driven business models and persuasive business models.

The last part will introduce the proposal of a service and data driven multi business model platform (SDBM – platform) that can support companies in the creation, delivering and capturing of value from data into persuasive business models offered to customers.

2 Methodology

This article is a natural extension to the previous research on Servitization and the technology that relates to the transformation from product dominant logic towards service dominant logic (Vargo and Lusch, 2008) incorporated in technologies that changes rapidly, and provides new opportunities (Andersen and Bjerrum, 2016). The previous article was based on a qualitative single case study, where the researchers had the opportunity to conduct empirical research in a European Electronics Manufacturing company (EEM) at manager level. The research in this article builds on top of the findings from the previous article.

The industry is a niche in the market, where the change in business models is not driven by a burning platform, but by a burning desire to gain competitive advantage. The research has provided a suggestion to the necessity for a generic model derived from the business model cube. The qualitative approach was chosen to study the subject in depth, despite the constructivism (subjectivity). This method brought a better understanding of the context through the deeper data collection, when understanding processes and cultural evolvement (Yin, 1994).

The main data consists of in-person interviews at director and manager level through both the initial introduction of service-as-a-business model, and at the end of the study. Key-selected customers and network partners also had a semi-structured interview and a survey (8 in total). The data was interpreted in the innovation center at the company as a part of contributing with data for the transformation process. This approach was done with a holistic standpoint, in order to understand a complex market situation where partners often also had the role of competition. The surveys were used as a guidance tool for low level insights and guidance for the focused interviews in a matrix. No coding tools or statistical tools was applied.

The findings were presented for the focal company, for further qualitative research.

3 Multi Business Models

There are many different terminologies and languages on the concept of business model (Zott et al., 2011, Lindgren and Rasmussen, 2013). However, many researchers' neglect the fact that there exists more than one business model in any given business (Lindgren and Jørgensen, 2012).

In order to understand this, the concept of multi business models operate with AS IS business models (How a certain business model in the business is constructed actually operates) and TO BE business models (how it is intended to be constructed), and the core business model (how a business want to construct and intends to operate its main and essential business related to the seven dimensions) (Lindgren and Jørgensen, 2012, Lindgren and Rasmussen, 2013).

When innovational processes are carried out on products and/or services, TO BE business models emerges, hence the core business model (AS IS) creates a new business model (TO BE) that might create new opportunities for the company (Lindgren and Jørgensen, 2012). As time goes by, these TO BE business models that are created will eventual become AS IS business models (Lindgren and Jørgensen, 2012). Figure 1 illustrates the different levels within any given business and the multiple business models that exists.

> *"We argue therefore that a business's different business models cannot be explained by just one business model, "the core business model" . . . with preference be better explained by different business models. . . However, any of these business models can be defined as related to a generic business model concept" (Lindgren and Rasmussen, 2013) – p. 12.*

4 Service and Data Driven Business Models

The purpose with combining service and data driven business models with each other is to understand the phenomenon of big data in terms of how data is treated concerning gathering, analysis and the customers' behavioral patterns and/or perceived value proposition to create better service business models. The researchers' see the DDBM as the extension to servitization (Andersen and Bjerrum, 2016), combining service with technology to provide far greater value to the customers.

In order to understand how data driven business model function, one needs to understand the context of data. Research conducted by (Ward and Barker,
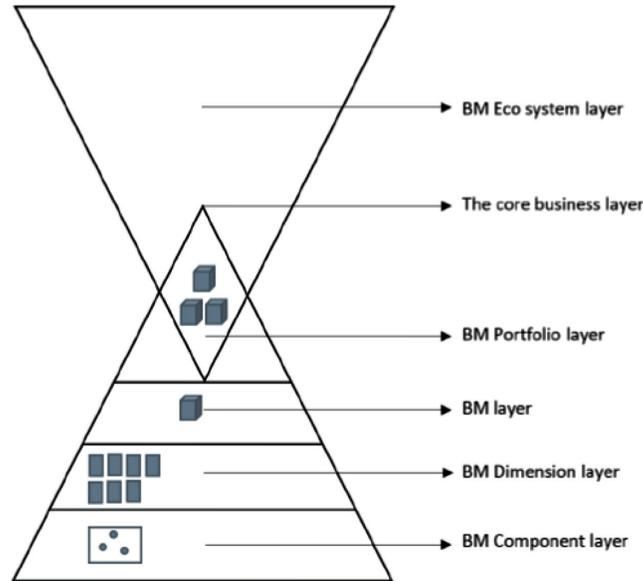
Figure 1 Inspired by: The business model layers.

2013) divides the terminology of big data into three categories; Volume (*the growth and amount of data*), Velocity (*processing data – including speed in which it is created and the need to derive value within a certain timespan*), Variety (*structured and unstructured types of data*).

The following Table 1 illustrates questions related to developing a DDBM.

Table 1 Inspired by: Common architecture for information and communication technologies

DDBM Required Development Questions	
Questions	Example of Answers
Target outcome: What are we trying to achieve?	Customer insight, Brand awareness, Competitive advantage, Product/Service improvement. Non-data product/Service, Information, Knowledge.
Offering: What is our desired offering?	Non-data product or service, Information, Knowledge, Data.
Data Source: What data do we require and where are we going to acquire it from?	Free available data, Customer-provided data, operations data, existing data. Self-generated data (crowd-sourcing). Free available, external data, internal data.

(*Continued*)

Table 1   Continued

DDBM Required Development Questions	
Questions	Example of Answers
Key Activities: How are we going to utilize this data?	Prescriptive and descriptive analytics, Data acquisition and analytics, Predictive analytics, Aggregation.
Revenue Model: How can we monetize it?	Advertising, Subscription free, Lending or renting, Usage fee, Subscription fee.
Inhibitors: What are the barriers to us accomplishing our goal?	Cultural problems, Value perception of a DDBM, Data privacy obstacles, Value perception, Personnel issues, Data availability and accessibility, Data quality and integrity, legal obstacles, Legal challenges, Data accessibility and integrity.

Source: (Brownlow et al., 2015) – P. 13.

5 Persuasive Business Modeles

Persuasive business models are about creating the opportunity and ability to persuade the user and/or customer, and network partners to adapt to ones' business model, using the persuasive technologies that exists in the business, user and/or customers or the network partners to change their behavioral patterns. This means that there might be hidden value in how the technologies are used by e.g. the user and/or customer, that can provide the business with competitive advantage. The persuasive technologies can be embedded in the businesses product and/or service technologies, production technologies or process technologies, that is defined as the competence dimension from the business model cube framework (Lindgren and Rasmussen, 2013). The idea with persuasive business models is to create agile and smart business models that enables the business to move away from commoditization, offering more than products and services, but value that is directed and customized towards each customers' behavioral patterns (Lindgren et al., 2013).

6 Suggestions for a New Service and Data Driven Multi Business Model Platform

As stated above, the researchers' previous article recommended the EEM to integrate a framework that could allow the company to combine their products with services into service business models using data as the resource to direct the value proposition (Hartmann et al., 2014). The service and data driven
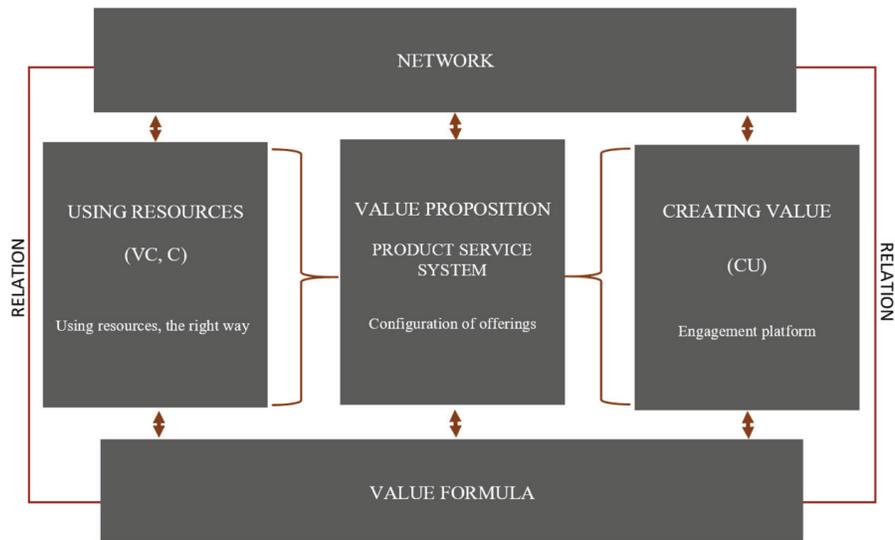
Figure 2   The service and data driven business model platform.

multi business model platform is the researchers' proposal for a framework that involves the seven dimensions from the business model cube (Lindgren and Rasmussen, 2013), the integration of service logic with the business model construct (Viljakainen et al., 2013), inspired by the business model canvas (Osterwalder et al., 2010). The overall purpose with this framework is to provide the EEM with multiple service and data driven business models through ICT technologies to gain the resources necessary. The intention is to use ICT technology to gather data in the form of e.g. customer behavioral patterns by measuring how they use the EEMs products.

In addition to this, the multi business model perspective comes into consideration when simultaneously developing business models on the combinations of products, services and data created in the processes and dimensions mentioned in the following.

6.1 Value Proposition – Configuration of Offerings

The value configuration will act as the dynamic interchangeable component of the platform. The VP dimension is dynamic by nature and is interrelated with creating value (customer and/or user dimension) and using resources (value chain and competences dimension) of the company.

In the data area this can be illustrated with input from both the production and from user data. This will provide the focal company with the information needed for updating the VP continuously to meet customer demand.

6.2 Creating Value – Engagement Platform

Creating value – engagement platform is based on the value co-creation, where multiple channels are being utilized such as customers, users, products, internet, mobile applications etch. with the goal of creating more customized value that fits with the customers perceived value proposition.

The idea is to place the customer in a position, where they are co-creators of the service, process or products, actively involved and communicating with the focal company e.g. feedback on usage of products and/or services, new ideas for optimization related to their experiences etc.

6.3 Using Resources – Using Resources the Right Way

Using resources – using resources the right way is based on the value chain and competences dimensions from the business model cube (Lindgren and Rasmussen, 2013) of the focal company. This is also a part of the input to the value proposition in the form of competences (*technology, human resources, organizational systems and culture*) channeled through the value chain's value adding processes. The ICT is part of the competences (*technology*) and also the value proposition (*a value adding relation*) (Lindgren and Rasmussen, 2013). This puts focus on the ability to mobilize and develop own resources that complement the value adding activities in the focal company through data collected by ICT.

In terms of the fast pacing technological development it is important to utilize the focal company's partners and customers and/or users. This can be done using ICT to monitor and gather data on customers, to optimize technology and products/services that ultimately create more value adding (value proposition), back into the ecosystem.

6.4 Network

One of the important parts of the framework is the network dimension (Lindgren and Rasmussen, 2013), inspired by the mind-set and terminology of open innovation (Chesbrough and Appleyard, 2007) and open business models (Chesbrough, 2007). In the SDBM – platform, the network dimension is connected to the value chain and the creating value dimensions.

When following the open innovation approach, the right resources or the most cost effective, does not necessarily lie within the focal company, but outside the company, outside of the present business model, hence the open business model approach (Chesbrough, 2007).

The innovation mind-set in relation to a service data driven business model acknowledges the idea that the possibility of best competences, lies outside the company. The services innovated and provided by the focal company can be very different from the core value, the company traditionally has provided, so that in order to reduce the risk, this dimension feeds all other dimensions thus relating to open innovation.

6.5 Value Formula

The question in the value formula dimension is to ask how does the business model generate value either monetary in terms of profit, or non-monetary in terms of other values that indirectly provides value to the focal company, and/or business model. There is a possibility that data provides more than monetary value to the business model. This could be the behavioral patterns mentioned earlier that is crucial for the service and data driven business models to understand and customize their value proposition after to fit the customers' interaction with the products and/or services.

7 Concluding Discussion

This article is based on the single case study from the previous article with the purpose of suggesting a framework that can provide support on establishing a service organization for manufacturing companies' transformational journey towards including service and data as their portfolio of business models. It is therefore only natural to discuss, the integration of such a framework in relation to the opportunities and barriers mentioned in the previous article.

The EEM's transformational process involves establishing the service organization to develop and organize services in relation to create the fit with AS IS and TO BE business models. This involves products, data and current services offered to their customers, but also how these are created and delivered internally (value chain, competences) and externally using their network of collaborations.

There are numerous opportunities to evolve the business, when considering different ways of understanding (mind-set) how a business can function. One

of which, is the open innovation approach that involves utilizing ones' network (ecosystem) on another level than a product oriented manufacturing company is used to. The main barrier in the transformation process is therefore changing the mind-set of both management and employees that are connected in the process towards understanding their business on different levels, but also to eliminate its boundaries, thinking beyond the limitation of products and services. This is where the researchers' framework and the concept of business models provides the structured understanding of how products, services and data fit into a larger picture than just separate justifications of providing profit to the business. The framework suggests to understand and involve more than just the internal parts of the company, but also to go beyond the borders of the company and involve the customers' opinions in term of services, and to analyze their usage of the company's products, services and data. It is about using the resources available (products, service and data), but in the right way.

One of the elements from the concept of open innovation is to understand what is essential for the company to produce internally, and what can be outsourced to the network. This is important to clarify in relation to how fast paced technology is developed today. The business models today need to be much more agile in order to survive disruptive and emerging technologies entering the ecosystem, otherwise they will be the subject of dying business models e.g. Kodak, Nokia and Atari etc. Their business models didn't evolve with the changes happening within their ecosystems, especially regarding to the changes on technology and customer behavior.

The idea and purpose of the SDBM – platform is to create a functioning core business model allowing a portfolio of business models to emerge that are network-based and co-created with customers and/or other stakeholders relevant to create, deliver and capture values. Equally important is the usage of technology and resources as the input of these business models that enables the agile and open innovative approach.

Appendix 1 List of Businesses Tested with the BM Cube Framework and the 7 Dimensions

- Primary cases in this paper – Vlastuin, HSJD
- Secondary cases for this paper – AH Industries, EV Metalværk A/S, Human Company, Margit, Skive El Service, X-FLEX, GP Rådgivning, Subzidizer, Censec

Appendix 2 Business Model Components and Dimensions

Appendix 3 Monetary and Non Monetary Business Values

- Please see Neffics D 3.2. www.Neffics.eu

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