The Business Model as a Tool of Improving Value Creation in Complex Private Service System - Case: Value Network of Electric Mobility

Otto Mäkelä¹ and Veikka Pirhonen¹

¹Aalto University School of Science and Technology, BIT Research Centre

This paper shows how the concept of business model can be used as an analysis tool when attempting to understand and describe the complexity of the value creation of a developing industry, namely electric mobility. The business model concept is applied as a theoretical framework in action research based and facilitated workshops with nine case companies operating in the field of electric mobility. The concept turned out to be a promising tool in creating a better understanding of the value creation in electric mobility, and thus being a potential framework for the development work for the actors in that field. The concept can help companies to improve cooperation with other players by being a common terminology.

1. Introduction

Value creation in complex private service systems has become more and more important issue in service development (see e.g. Vargo; Maglio; Akaka, 2008). Often, the value creation in these complex systems calls for a powerful technology development. However, the management of such a technology driven development often underrates the specification of the value provided to different interest groups involved. This paper presents an action research in the field of electric mobility (later e-mobility), including e.g. electric vehicles, charging infrastructure and ICT, and attempts to unravel the complexity of value creation in that industry.

The debate on global warming and sustainability is a centrality in the Western Countries, and global agreements for decreasing CO₂ emissions are pressurising transportation sector. Traditional internal combustion engine vehicles are considered polluting and problematic for local air quality, whereas electric vehicles are characterised as being highly energy efficient, lowly polluting and noiseless (van Wee, 2007; Lauber, 2009). Transition towards e-mobility is argumented to improve the energy security and trade balance of individual countries by decreasing oil import as well as enabling the use of renewable energy by using the batteries of electric vehicles as energy storages. Thus, electrification of transportation has been prioritised in several countries (Jean, 2011; EPoSS; Ertrac; Smartgrids, 2009). However, the business logic and a holistic understanding of the dynamics of the e-mobility is considered to be rather ambiguous. Hence, the actors in the field are struggling with their businesses.
This paper illustrates how the concept of business model can be used as an analysis tool when describing the value creation logic of a developing industry, namely e-mobility. By analysing the value creation and business logic of companies by using the business model framework, it is possible to develop a solid understanding about the principles and dynamics of a specific industry. The business model also highlights the critical service related issues like relationships with customers needing special attention in the industry’s development, and it can be utilised in designing new services, too. Also, understanding of value creation logic with a business model has potentially an effect on the productivity of the companies in a developing industry. As a consequence of higher productivity, a favourable profit impact should be achieved for the service provider and useful value created for the customers (Grönroos; Ojasalo, 2004).

The empirical data of our study consists of several meetings with nine case companies which operate in e-mobility. Action research based and researcher facilitated workshop exercises of describing case companies’ business models are used as a method of data collection. Business model canvas by Osterwalder & Pigneur (2010) is used as a framework and map in the workshops, and as a tool for creating understanding of the value creation in e-mobility.

We first provide a brief review on the literature on business models and the development of electric mobility. Then, we present the empirical setting of the research. As results we present the benefits that the use of business model framework can produce when attempting to understand the dynamics of a developing service industry.

2. The Business Model Concept

The use of the concept of business model increased dramatically during the rise of the so-called ‘digital economy’ period in the 1990s when companies were actively seeking new ways of doing business. Simultaneously, the debates over the ‘correct’ conception of a business model dramatically increased (Ghaziani; Ventresca, 2005). Hence, studies of business models is a relatively new research field (Zott; Amit, 2008; Osterwalder; Pigneur; Tucci, 2005), and the concept is still fragmented. It is often used in illustrating even simply the product or service offerings to customers. In fact, the concept has been used to describe almost anything related to business operations, from daily activities to longer term strategies (Magretta, 2002; Chesbrough; Rosenbloom, 2002; Porter, 2001; Seddon et al., 2004).

The empirical use of the business model concept has been criticised for being superficial, ambiguous and not theoretically grounded (Porter, 2001). The concept is often used independently from theory, which means that the components of the model and their interrelations are relatively obscure (Hedman; Kalling, 2003). Thus, empirical evidence on business models is thin, based mostly on quantitative and hypothetico-deductive settings (Zott; Amit, 2007; Malone et al., 2006; Markides; Charitou, 2004).

Despite the above mentioned challenges, the business model concept offers managers a coherent way to consider their options in uncertain and fast-moving environments (McGrath, 2010). A business model of a company can be seen as an essential locus of innovation, and has the potential to disrupt existing industry structures (Amit;
Zott, 2001; see also Markides; Charitou, 2004). Business models can also be used as an analytical tool for the description of business activities of a company. The essence of a business model is in defining the manner by which the firm delivers value to customers, attracts customers to pay for the value and turns those payments into a profit (Teece, 2010). Business models help in getting everyone in the organisation aligned in producing the kind of value the company wants to create. Therefore, the concept has an enormous practical value (Magretta, 2002).

A business model is a holistic concept which embraces elements such as pricing mechanisms, customer relationships, partnering and revenue sharing (Osterwalder, 2004). Certainly, every company operates according to some logic, even if the logic is not described as a business model. However, a systematic approach essentially facilitates the communication of the business goals to the employees and keeps the pieces of business together. Business models can be seen as focusing on the activity-system side of how a firm creates economic value, as Seddon et al. (2004, 429) describe: ‘A business model outlines the essential details of a firm’s value proposition for its various stakeholders and the activity system the firm uses to create and deliver value to its customers.’

In this research, we apply the view of Osterwalder et al. (2005, 5) who define business model as ‘a conceptual tool containing a set of objects, concepts and their relationships with the objective to express the business logic of a specific firm’. The authors thus specify that ‘we must consider which concepts and relationships allow a simplified description and representation of what value is provided to customers, how this is done and with which financial consequences’. This definition addresses the value the concept embraces in the creation of an understanding of what a firm is, how it works, and what it offers and to whom.

### 2.1. The Business Model Canvas as a Tool in Value Creation

Next, we explain our theoretical framework – the business model canvas by Osterwalder & Pigneur (2010) – in more detail. The canvas is derived from the business model ontology by Osterwalder (2004; see also Osterwalder et al., 2005). It includes four areas that constitute the essentials of a company: customer interface, value proposition, infrastructure management, and financial aspects. These areas are further divided into a set of nine interlinked building blocks that allow the outlining of a business model. Osterwalder (2004) proposes that while the four areas provide a rough structure for the business model, the nine building blocks are the core of the business model. These building blocks are customer segments, value proposition, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure. The blocks and their foundations are presented in the Fig. 1.
The building blocks delineate interdependent aspects of a company’s business. Depending on who the customers are, the company has to find the right customer channels and develop its value proposition, too. Depending on the value proposition and the customers, the company has to design its activities and resources. The systemic whole described by the seven views of the company’s business operations are connected in the model by the financial aspects – the cost structure and the revenue streams – presenting the economic model of the physical activities in the company. This combination of the financial aspects and the physical aspects into a single whole in Osterwalder’s & Pigneur’s (2010) business model differentiates it from those focusing mostly on revenue models of business logic.

Osterwalder’s & Pigneur’s (2010) model has been used in practice in various companies and industries (see e.g. Mäkelä; Lehtonen, 2011). It is holistic but still relatively simple. It is generic and as such applicable to different kinds of businesses. It can be understood as a canvas which resembles a painter’s canvas – preformatted with the nine building blocks. Canvas allows one to paint pictures and describe new or existing business models (Osterwalder; Pigneur, 2010). In the empirical part of this paper we explain how the canvas was used as a tool in workshops with the case companies of this study.
3. Development of services in electric mobility

In general, the role of services in automotive industry is growing. The transition towards service-based business strategies from technology oriented and product-based strategies is analogue to other industries and companies, e.g. IBM, Xerox and Kone. In addition, the electrification of cars is seen as disruptive technology from traditional automotive perspective, and this creates a lot of opportunities for new service innovations (Godlevskaja; van Iwaarden; van der Wiele, 2011).

The shift from traditional oil-based internal combustion engine value chain towards the e-mobility value chain changes the dynamics of the automotive and the surrounding industry substantially. Mobility powered by electricity differs from conventional oil-based mobility by placing the storage of energy, in other words a large battery, to the center of the value chain. This requires totally new co-operation between different actors compared to the internal combustion-engine which needs fuelling. On the contrary, charging the battery of an electric vehicle can take place at home, workplace or at the shopping center. However, this causes a need for co-operation between energy utility, charging service enabler, IT service provider and the car and battery manufacturer at a minimum. A generic description of this kind of value chain is provided in the Fig. 2.

Fig. 2: Generic industrial e-mobility value chain (adapted from Pirhonen; Giesecke; Malinen, 2011).

The totally new e-mobility value chain brings demands and opportunities for a whole new service family. Particularly, the emerging co-operation between energy utilities, ITC and car manufacturers provides an example of the complex and rich service innovation space. One example of this is the need for innovative services to enable the deployment of electric cars to perform ancillary services for the electric grid. This is all but unambiguous, and actors entering this industry need good tools and methods for succeeding in creating new service models and viable business models (Quinn;
Zimmerle; Bradley, 2009). Our empirical study attempts to cover this by applying the business model approach to e-mobility.

4. **Action research on value creation of electric mobility**

In this chapter we present the empirical study implemented for this paper. We approach the empirical study with the following research question:

- *How can the concept of business model be used as a framework in action research when attempting to understand the value creation logic of a specific emerging service industry, namely electric mobility?*

In order to answer to the research question, we have applied action research (Eden; Huxham, 1996) and case study methodology (Yin 2003). Next, we describe the research strategy, cases included and data collection of the study.

4.1. **Action research as a research strategy**

Our empirical study was based on action research approach. Action research is usually aimed at developing and elaborating theory from practice (Eden; Huxman, 1996). Action research quite literally combines action and research, or rephrased, combines practice and theory. Basically, there are two thrusts in action research. One is concerned with a practical problem solving in real-world situations. The other is concerned with research or the development of new knowledge (McKay; Marshall, 2001). Action research should be carried out with a declared-in-advance methodology (encompassing a particular framework of ideas) in such a way that the process is recoverable by anyone interested in subjecting the research to critical scrutiny (Checkland; Holwell, 2007).

4.2. **Case companies of the study**

There are nine case companies in this study. They are national and international players which operate in or are entering to the field of electric mobility services. The above presented Fig. 2 describes these actors in the emerging e-mobility value network and shows which type of case companies we had within this research. Nine of the companies in this research represent seven different elements of the value network of electric mobility as illustrated in the Fig. 2. For example, some of the companies provide batteries for electric vehicles, while others provide charging infrastructure.

We treat the nine business models of the case companies of the study as representative cases of the phenomenon studied, namely the business model as a tool of improving value creation. The underlying idea is that the understanding of the business models of the case companies enables to construct a description about how the value network and value creation of electric mobility has evolved.
4.3. Workshops as a method of data collection in the action research

In our setting the practise of action research is the workshops and discussions with the case companies’ representatives about their value creation activities in electric mobility. We applied the earlier presented business model canvas as a tool in these discussions. One of the authors of this paper organised and led these workshops and discussions. The number of these is listed in the Table 1. In the workshops, the business model canvas, which included the nine business model building blocks, was portrayed to a large paper so that the representatives of the case companies could jointly sketch and discuss about their business models. The canvas is a hands-on tool which fosters understanding, discussion, creativity and analysis (Osterwalder; Pigneur, 2010). In other words, one of the authors of this paper used a scientific framework, namely the business model concept, to study the resolution of an important organisational issue together with those (company representatives) who experience this issue directly (Coughlan; Coghlan, 2002).

<table>
<thead>
<tr>
<th>Case company</th>
<th>Workshops with the business model canvas</th>
<th>Discussions or e-mails to refine the canvas</th>
<th>Other discussions relating these issues</th>
</tr>
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<tbody>
<tr>
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<td>3</td>
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<td>B</td>
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Table 1: Estimates of the data gathering sessions.

The progress of the workshops was as follows. Firstly, one of the authors of this paper presented the basic idea behind the business model canvas to the participants of the workshop. Then, the participants discussed with the help of the canvas their current relation to e-mobility. Firstly, they concentrated on value proposition and then key partners and proceeded with different building blocks of the canvas ending with financial issues (i.e. revenue streams and cost structure). The participants were encouraged to comment and change freely everything concerning the canvas during the workshop. After the workshop, one of the authors wrote up the ideas presented and sent them to the company representatives for commenting. The communication
between the action researcher and the representatives about the value creation activities of e-mobility was also strengthened with several phone conversations and emails. These iterations specified the understanding of the business models studied in the workshops. Hence, the action researcher and the company representatives could achieve a common understanding about the value logic of e-mobility. This understanding is reflected in the value chain presented in the above pictured Fig. 2.

5. **Results: Business model as a framework in understanding the value creation logic of electric mobility**

The results of this study can be categorised to two segments:

1. Data collection of business models with the help of the business model canvas in action research setting.
2. Achieving a common terminology of the electric mobility, and hence creating a better understanding of the value creation in electric mobility.

Next, we will illuminate these results in more detail.

The first result is the positive experience of using the business model framework, namely the business model canvas, as a data collection framework in workshops and discussions with the case companies. The canvas is light enough to be introduced shortly in the beginning of the workshop and does not need a long time to get familiarised with the company representatives. All case companies received the canvas well and workshopping with employing the canvas was fluent and natural.

The second result is the achievement of a common terminology of the electric mobility. Since e-mobility is a rather recent field, it is important to the field’s players to share a common concepts of it. This is a prerequisite for the understanding of the dynamics of value creation in the field. The terminology is the foundation for a fruitful follow-up discussions of the value creation, and the business model canvas functioned as a tool in these discussions. Utilising the canvas created a common terminology for the case companies and it was comfortable to continue the analysis in the following meetings, and hence create a deeper understanding of e-mobility.

The results led to a mature understanding of the dynamics of value creation logic of electric mobility. Overall, the action research process was a productive experience for the companies and action researcher involved, and the business model canvas provided an excellent framework to clarify the value creation in the e-mobility market.
6. **Concluding discussion**

This study has aimed at illustrating how the concept of business model can be used as an analysis tool when describing the value creation logic of a developing industry. This task has been carried out as action research in which the researcher has an active role in the community which action is in the focus of the research.

The action research in this study followed four cyclical steps as described by Coughlan & Coghlan (2002): planning, taking action and evaluating the action, leading to further planning and so on. Also, the action research carried out in this study was participative. This means that the members of the system which was studied (business models and value network of electric mobility) participated actively in the above mentioned cyclical process. The research was concurrent with action, too. The goal was to make the action more effective while simultaneously creating scientific knowledge (Coughlan; Coghlan, 2002).

The research data was gathered in iterative cycles by feeding it back to those concerned, analysing it again, planning action, taking action and evaluating, and leading to further data gathering. In other words, one of the authors of this study was in active relationship with the informants during the research process.

The main goals for the case companies of this study were to understand better electric mobility and its value creation, develop case companies' current business models, and improve co-operation with other players in the field by creating a common concepts. The role of the action researcher as a facilitator was to offer a coherent and simple framework, and the business model canvas proved to be a good tool for this.

One limitation of the study is the high confidentiality of the case companies and their justified wish to keep strategic information hidden. This imposes challenges on the discussion and presentation of case companies' business models. The utilisation of the business model canvas would perhaps be even more productive if the case companies could have been able to be more open.

To get a deeper understanding and more empirical evidence about how well the business model framework supports companies to understand their own business and the industry that they are dealing with or entering to, it could be interesting and beneficial to interview the case company representatives afterwards about their view on the use of the business model framework. This would perhaps give an insight whether they will use the framework as a tool in service development in the future.
References


Author addresses

Otto Mäkelä, Project manager, M.Sc.
Aalto University School of Science and Technology,
BIT Research Centre
P.O Box 15500 FI-00076 Aalto, Finland
Otto.makela@aalto.fi

Veikka Pirhonen, Researcher, M.Sc.
Aalto University School of Science and Technology,
BIT Research Centre
P.O Box 15500 FI-00076 Aalto, Finland
Veikka.pirhonen@aalto.fi