Servitized business model innovation for sustainable transportation: Case study of failure to bridge the design-implementation gap

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Abstract

The goal of this study is to assess whether servitized business models may potentially be emulated to overcome similar technological challenges between industries. To address this gap in the literature, the case study empirically investigates a company that attempted to apply a pay-per-use model to sustainable transportation, based on its success in the telecommunications industry. Information collected from the interviews and from secondary external data is used to juxtapose between the industries. The Cambridge business model innovation process provides a framework to analyze the company’s development stages. Results indicate that the company didn’t succeed to bridge the design-implementation gap because it failed to acknowledge key marketing differences between industries. While cross-industry innovation offers entrepreneurial opportunities, organizations should consider the constraints imposed by the scale of investment required to build supportive infrastructure before emulating servitized business models. The study concludes with implications which may provide useful lessons to other sustainable transportation projects in-progress, such as Tesla and Riversimple, in terms of business model, technology, and prospects for commercialization. Finally, fruitful avenue for future research that can build on and extend this discussion is the investigation of servitized business models for the self-driving cars industry.

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1. Introduction

The heightened popularity of sustainability issues, sustainable transportation in particular, has led to new attempts to mass produce e-cars competitively (Hoyer, 2008). However, like other environmentally-friendly innovations, the initial enthusiasm displayed by potential consumers does not necessarily translate into actual purchases (Lane and Potter, 2007). To rectify this situation, a possible strategy is to creatively emulate existing business models from other industries, a phenomenon termed cross-industry innovation (Enkel and Gassmann, 2010). As such, the goal of this study is to investigate whether cross-industry innovation pertaining to a particular category of solution, servitized business models (Bocken et al., 2014; Bohnsack et al., 2014; Plepys et al., 2015), can potentially be used to overcome similar technological challenges between industries. More specifically, a servitized business model, adapted from the telecommunications industry, may allow a company to overcome traditional cost barriers to e-car acquisition (Agrawal et al., 2012; Rothenberg, 2007).

Cross-industry innovation occurs when organizations transfer technological or business developments from one industry to another or apply cross-industry analogies (Enkel and Gassmann, 2010; Gassmann et al., 2011). It materializes through analogical thinking, where customers and designers find familiarity, comfort, and inspiration in comparing a new solution to an existing one (Gassmann and Zeschky, 2008). Consequently, it occurs to establish legitimacy in the eyes of stakeholders or conform to their expectations (Barreto and Baden-Fuller, 2006; O’Neill et al., 1998). The theoretical tenets of cross-industry innovation are rooted in institutional theory, which posits that organizations survive by conforming to external rules and norms, and consequently converge by an emulation process due to strong isomorphic forces for legitimacy (DiMaggio and Powell, 1983; Galaskiewicz and Wasserman, 1989). Jennings and Zandbergen (1995) postulate that institutional theory is well-suited for investigating the adoption of sustainable practices designed to address environmental issues driven by external pressures.
To address this gap in the literature, the current case study examines a company, Better Place, which applied a servitized business model of pay-per-mile to electric vehicles, based on the pay-per-minute model utilized in the cellular telecommunications industry. Servitized business models have become increasingly popular, as they offer manufacturers additional revenue streams and a way to differentiate their offerings from other firms (Benedettini et al., 2015). Much of the research on servitized business models examines the transition of existing manufacturing business models to ones in which the service component is prominent (Vargo and Lusch, 2008). In contrast, this descriptive study provides the opportunity to explore the adoption of a servitized business model in an entrepreneurial venture. Cherubini et al. (2015) note that the product-service system (Beuren et al., 2013), and in particular the service component, is a significant factor in the decision to buy an e-car.

The rest of this study is organized in the following format: it starts with literature review about servitized business models. The methodology section describes the case of a company, Better Place, which sought to develop a servitized business model for sustainable transportation via an e-car infrastructure, but failed to bridge the design-implementation gap (Geissdoerfer et al., 2017). Traditionally, the key barriers to e-car adoption have been battery range and price (Naor et al., 2015). Based on primary and secondary information gathered during the study, the case discusses how emulation of the servitized business model of pay-per-use (Bast et al., 2012) informed the business model of the company described and explores how it could possibly be a viable strategy for overcoming the difficulties in promulgating environmentally-friendly innovations. The Cambridge business model innovation process provides a framework to analyze the company's development stages. Similar challenges between cellular communication and electric transportation industries are analyzed and the dissimilarities which impede emulation are elaborated. The study concludes with implications which shed light on the transition of existing manufacturing business models to ones in which the service component is prominent.

Bocken et al. (2015) observe that the extant literature seems to generally frame business model innovation in terms of changing the value proposition to the customer, and they submit that the scope of the concept should be broader. They propose that business model innovation must go beyond process and products, because it encompasses changing the way the organization conducts business. Business model innovation in this study refers to the creation of new business models in start-ups (Chesbrough, 2007; Geissdoerfer et al., 2016; Johnson, 2010). In similar vein, Better Place changed how the electricity and batteries would be paid for in e-cars. Sustainable business innovation also focuses on integrating sustainable value and proactive management of a wide scope of stakeholders into the business model (Boons and Lüdeke-Frey, 2013; Geissdoerfer et al., 2016). Among the key stakeholders in Better Place's business model were the target customer, municipal governments, and auto manufacturers.

Adopting Bocken et al. (2014)'s sustainable business archetypes, Better Place can be identified in the category of “deliver functionality rather than ownership”, as it attempted to shift the business model from offering a manufactured product to offering a combination of products and services, focusing on delivering functionality rather than ownership. Bocken et al. (2014) remark that this archetype has the potential to change consumption patterns by reducing the need for product ownership. This is particularly salient point, because changing consumption patterns highlights the criticality of carefully selecting the appropriate target consumer. Better Place targeted price-sensitive customers that used their cars for long commutes (Berman, 2011). This might have been an erroneous choice given that the value proposition was heavily dependent on high volumes of subscriptions in local markets. There was a substantial upfront financial cost to build the required and costly immediate infrastructure, whose pay-off would only come in the long run as prospective subscriptions slowly started to grow over time. The value proposition for municipal governments of large metropolitan regions was also arguably weak, considering their focus on reducing car dependence rather than reducing oil dependence.

A sustainable business model describes how a company creates value and how it captures a portion of that value in the form of profits (Al-Saleh and Mahroum, 2015). The core of a sustainable business model is a value proposition that allows a company to simultaneously create value for multiple stakeholders as well as for the environment and society (Baldassarre et al., 2017; Bocken et al., 2015; Tyl et al., 2015). However, Yang et al. (2017) note that there is a debate in the literature on how to achieve sustainable business model innovation. A servitized business model, or servicing, as described in this study, attempts to fill this gap in the literature. It is recognized as a type of cross-industry innovation (Desmet et al., 2013) that offers great potential for efforts to gain a competitive advantage in the area of sustainable practices (Rothenberg, 2007; van der Veen et al., 2017). The concept of servicing focuses on the notion of making an innovative sustainable solution economically affordable to the customer through a leasing process (Agrawal and Bellos, 2017). Nevertheless, despite its touted potential, Reim et al. (2015) note that knowledge about how servitized systems can be implemented remains limited. Servicing may also improve sustainability through a reduction in consumption, because users pay per mile driven. In addition, the servitized business model could have offered further opportunities to improve the sustainability of e-cars through Better Place’s control of the end-of-life process for batteries. Note that cell phones have suffered from end-of-life issues because customers did not lease the device itself. Take-back legislation is an attempt to address this problem (Atasu et al., 2009). In the case of e-cars, the batteries are one of the most environmentally hazardous components. Given that Better Place planned to lease the batteries, it may have been able to better...
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