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A systematic approach for developing a new business model using morphological analysis and integrated fuzzy approach

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ABSTRACT

Despite the growing importance of developing a novel business model, most previous studies on business model remain conceptual and theoretical. A paucity of empirical studies has hindered the use of the business model concept in practical purposes. Hence, this study proposes a systematic approach to new business model development (NBMD) that helps business practitioners to develop, evaluate and select the best business model to meet the business objectives. The proposed approach comprises two stages: identification of business model alternatives and business model evaluation and selection. During the first stage, a set of business model alternatives are derived by exploring all the possible combinations of a morphological matrix, and in the second stage, we conduct an evaluation and selection of a suitable business model. Morphological analysis (MA) has been employed for the derivation and aggregation of business model alternatives, and decision-making approach that integrates fuzzy extent analytic hierarchy process (FAHP) and fuzzy technique for order of preference by similarity to ideal solution (TOPSIS) methods is used as an evaluation and selection tool. Finally, to illustrate the applicability of proposed approach, a case study on the development of a business model for a Telco has been presented.

1. Introduction

The economic value of products and services remains latent until it is commercialized using a solid business model. To capture value and maximize profit from products and services, managers should expand their perspectives to develop novel business models. Products and services will generate lesser value with a traditional business model than with a novel business model (Chesbrough, 2010). Theoretically, a business model encompasses the business logic of the firm, the manner in which it operates, and how it creates value for its stakeholders (Casadesus-Masanell & Ricart, 2010). Accordingly, new business model development (NBMD) can be considered a process for determining an innovative way for conducting business to meet the customer needs and firm's strategic objectives. Since there is an increasing consensus that a novel business model is the key to business success (Zott, Amit, & Massa, 2011), firms are endeavoring to invent novel business models to confront challenging and competitive market environments (Chesbrough, 2010).

NBMD is based on products and service concepts, which are invented through new product development (NPD) and new service development (NSD); NPD is for developing new tangible products, whereas NSD is for developing new intangible service products for the firm (Johne & Storey, 1998). However, although NPD and NSD have been studied empirically and numerous systematic supporting methodologies, models, and tools such as quality function deployment (QFD) (Einspruch, 1996), service platform (Meyera & DeToreb, 2001), and theory of inventive problem solving (TRIZ) have been developed for them, thus far, the supporting methodology for NBMD has not been adequately researched. Although many studies have been conducted on business model (Gordijn & Akkermans, 2001; Mahadevan, 2000; Osterwalder & Pigneur, 2005; Pateli & Giaglis, 2003; Shafer, Smith, & Linder, 2005; Timmers, 1998), studies related to NBMD and evaluating business model are still in its infancy (Osterwalder, 2004; Zott & Amit, 2010). Therefore, most business practitioners in the field face difficulties in developing, evaluating and selecting their business models (Linder & Cantrell, 2000).

The creation and development of a novel business model is recognized as a subjective and challenging task requiring experiential knowledge and creative thinking, which is only possible by adopting unstructured means such as intuitive thinking. Although potential sources of novel business models are ubiquitous, developing novel business models that are successful involve aggregating unusual ideas and combining them with resources to develop unique ways for creating and delivering value to the customers. For this,

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firms need to conduct an iterative process of planning, designing, testing, and re-testing alternative business model variants until it finds the one that best suits its business objectives (Sosna, Trevinyo-Rodríguez, & Velamuri, 2010). Consequently, adopting a specialized systematic approach for deriving innovative ideas from experts and aggregating them into a combined set of business model is essential. Having realized the significance of a business model, academic scholars and practitioners in the field have conducted various studies on the subject (Osterwalder & Pigneur, 2005). However, most of these studies have focused only on business model concepts. Therefore, this study aims to propose a systematic approach that supports the NBMD process. The proposed methodology will not only enable managers to seek innovative ideas from various experts but also combine them into a set of alternative business models. Moreover, the proposed methodology will include an evaluation model comprising a set of evaluation criteria to analyze and select the business model that best fits the firm's business objectives.

In order to achieve its objectives, this study proceeds with the following two stages. The first stage involves the identification of business model alternatives using morphological analysis (MA). MA is a non-quantified modeling method for structuring and analyzing technological, organizational, and social problem complexes. This method is appropriate for complex cases where expertise on several areas is required (Eriksson & Ritchey, 2002) and is currently considered one of the most extensively used methods for concept generation (Lee, Song, & Park, 2009). Therefore, MA can contribute to improving the process of NBMD by utilizing ideas from various experts. Although MA is effective for modeling a complex problem and exploring alternatives, its weakness lies in evaluating and selecting the most satisfactory alternatives (Lee et al., 2009). It is necessary to support MA with other processes such as utility theory, analytic hierarchy process (AHP), graphical tools such as matrices, QFD (Kim, Choe, Choi, & Park, 2008; Yoon, 2008; Yoon & Park, 2005) and fuzzy logic (Yan, Chen, & Shieh, 2006). In response, in the second stage, an integrated fuzzy extent analytic hierarchy process (FAHP) and fuzzy technique for order of preference by similarity to ideal solution (TOPSIS) approach is used for evaluating and selecting the business model. FAHP is applied to calculate criteria priority weights and fuzzy TOPSIS is used to select a business model alternative.

The remainder of this paper is organized as follows. Section 2 provides a literature review of the business model concept and explains the underlying methodologies used in this study. Section 3 illustrates and explains the proposed approaches for NBMD. Section 4 provides the experimental results of the case study. Finally, Section 5 presents the conclusion of the paper and suggests several directions for further research.

2. Related works

2.1. Business models

Since the early 1990s, a growing body of scholars from multidiscipline including economics, innovation, management, strategy, e-business and entrepreneurship (Amit & Zott, 2001; Hedman & Kalling, 2003; Teece, 2010) have participated in business model research. However, due to the lack of interdisciplinary theory, the business model concept is fragmented and still relatively poorly understood (Linder & Cantrell, 2000), particularly as a research area. Scholars in different disciplines use the same term to explain different phenomena, in other words, the term business model in its current use is not one concept but it is many concepts (Zott et al., 2011). Since, academia has proposed various definitions to explain the significance of its concept, business model definitions and descriptions have proliferated. For example, Timmers (1998) defines business model as a description of key components defining a business idea, including products and services, actors, roles, information, revenue, and benefits. Linder and Cantrell (2000) define a business model as the organization's core logic for creating value, whereas Magretta (2002) defines it as a story that explains how an enterprise works. Moreover, Osterwalder and Pigneur (2005) define business model as a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. Recently, Casadesus-Masanell and Ricart (2010) describes business model as an articulation of the logic, the data and other evidence that support a value proposition for the customer, and a viable structure of revenues and costs for the enterprise delivering that value. In this study, we follow the definition suggested by Chesbrough and Rosenbloom (2002), that a business model is a logic for the way a business creates and captures value from new services or products. As such, a business model illustrates how a company or stakeholders aims to make financial benefits or network value and create consumer value from a specific service offering (Bouwman, Haaker, & De Vos, 2008; Haaker, Faber, & Bouwman, 2006).

In an attempt to explore the business model literature, it was able to divide business model research stream into several categories, which are business model definition (Casadesus-Masanell & Ricart, 2010; Linder & Cantrell, 2000; Magretta, 2002; Osterwalder & Pigneur, 2005; Timmers, 1998), business model component (Afuah & Tucci, 2002; Osterwalder & Pigneur, 2005; Petrovic, Kittl, & Ryan, 2001; Rayport & Jaworski, 2001; Weill & Vitale, 2001), business model representation method (Casadesus-Masanell & Ricart, 2010; Osterwalder & Pigneur, 2005; Tapscott, Ticoll, & Lowry, 2000; Weill & Vitale, 2001), business model development method (Morris, Schindehutte, & Allen, 2005; Osterwalder, 2004; Pateli & Giaglis, 2004) and business model innovation (Linder & Cantrell, 2000; Petrovic et al., 2001; Sosna et al., 2010). Over the last few years, the topic of business model research has evolved from definition, via exploring basic concepts and classifying business model into categories to developing descriptive models (Bouwman & MacInnes, 2006). Current research trend involves more advanced and practical levels which involves higher integration of the associated concepts. Among the various research categories, this research builds a business model development methodology, which provides an enhanced way of not only capturing, understanding, communicating, designing, analyzing, and changing the logic of a business model but also gaining a better insight of the stakeholders.

The early works for the NBMD methodology were based on modeling tools such as Unified Modeling Language (UML) and eXtensible Markup Language (XML). Osterwalder (2004) introduced Business Model Modeling Language (BM^2L) and Morris et al. (2005) proposed a business model development framework that comprised the following three specific levels of decision making using six business model constituent components: foundation level, proprietary level, and rule level. However, despite a few attempts for developing an NBMD methodology, thus far, there is no commonly accepted NBMD method for practical use.

2.2. Morphological analysis (MA) for identifying alternatives

MA is a non-quantified modeling method for identifying, structuring, and analyzing technological, organizational, and social problems, and it has been widely used for identifying possible alternatives in various disciplines. It enables the representation of a problem using a number of dimensions, which are permitted to assume a number of conditions (Eriksson & Ritchey, 2002). By combining the identified conditions in each dimension, all the