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A feasibility test model for new telecom service development using MCDM method: A case study of video telephone service in Korea

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ABSTRACT

The telecommunications industry is undergoing dramatic changes fueled by rapid technical development and regulatory changes. Especially, in Korea, the penetration rate of mobile service is almost 90%; therefore, there is not enough room for a new customer. Furthermore, today's new services have been influenced by more factors in decision making before launching. It has been the main issue for decision makers whether a new service will be successful or not. However, a few methods have been introduced to evaluate the feasibility of a new service. And very few papers have introduced to the evaluatation of comparative advantages among competitive services, but such methods mainly depend on subjective opinion of experts. The proposed model considers the multidimensional factors influencing telecom service evaluation based on the ANP's advantages, which helps service providers in a telecom field to select a new service with the view of their strategies. Also, the BSC perspectives are adapted in the model to generate evaluation measures. Additionally, a new video phone service in Korea is evaluated based on a proposed model.

1. Introduction

The telecommunications industry is undergoing dramatic changes fueled by rapid technical development and regulatory changes (Ahn, Kim, & Lee, 2005). Especially, in Korea, the penetration rate of mobile service is almost 90%; there is not enough room for new customers (NIA, 2007). Furthermore, in the telecom service market, the uncertainty of customer needs makes it very difficult to develop a new service, since customers' preferences for services are ever changing. In addition, there is the effect of the third party's uncertainty such as regulatory change, competitive landscapes, cost estimations, and technology changes (Ahn & Skudlark, 2002). These uncertainties usually create risks to service providers, but they can be opportunities as long as they are able to manage the uncertainties. To reduce the uncertainties in the new service development process, the feasibility test enables a company to make a decision on whether to continue or to discard a telecom service development (Ahn & Skudlark, 2002).

Less than 15% of new product development projects are commercially successful (Cooper, 2001). For that reason, the major issue in the new product development is how to evaluate the future success of the new products (Balachandra, 1984; Benson, Sage, & Cook, 1993). But it is more difficult to predict the success of service than products because it is hard to evaluate before being used by the customers (Easingwood, 1986). Although today's new services have much more factors that influence in decision making before their launch, most of the evaluation methods for a new product development process only focus on the effect of financial benefit, service quality, the possible volume of potential customers, requirement of customers and so on. As a result, the decision makers need to have a comprehensive evaluation model for the feasibility of new services. A very few papers have introduced the evaluation of comparative advantages among competitive services by using the CUP (Cost Utility Preference) model, scenario planning and case-based methodology, but such methods mainly depend on the subjective opinion of experts (Ahn et al., 2005; Ahn & Skudlark, 2002; Bowers, 1989; Ozer, 2005, 2008).

Therefore, this paper aims to propose a feasibility test model for new telecom service development using MCDM (Multiple Criteria Decision Making) method. Furthermore, proposed feasibility test model is verified by a case study of video telephone service in Korea. Due to the multidimensional factors that influence telecom service evaluation, the comprehensive and practical model in this paper is proposed based on the ANP's advantages, which helps the service providers in a telecom field to select new services with the view of their strategies. Using pairwise comparisons of

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elements on a criterion, both the AHP (Analytic Hierarchy Process) and ANP (Analytic Network Process) can derive priorities, but the ANP can deal with all kinds of dependences systematically (Niemira & Saaty, 2004), thus it has been used successfully in many fields such as manufacturing, management, and evaluation, which is different from the AHP method (Agarwal & Shankar, 2002; Karsak, Sozer, & Alptekin, 2003; Lee & Kim, 2001; Meade & Presley, 2002; Partovi, 2001; Partovi & Corredoira, 2002; Shang, Tjader, & Ding, 2004; Yurdakul, 2004).

Also, the BSC perspectives are adapted in the model to generate evaluation measures. The BSC is widely used to evaluate the business performance in various fields including the consulting firm. In addition, the BSC can help decision makers to evaluate the services with an objective and balanced view based on four perspectives such as financial, learning and growth, internal business process, and customer (Kaplan and Norton, 1992).

This paper is organized as follows. In the next section, a process of new product and service development is introduced, and model for telecom service evaluation is reviewed with the related literature. The proposed model is explained in the third section, which consists of three phases; (1) the BSC phase for deriving perspectives and measures, (2) the ANP phase for generating network model to be evaluated, and (3) the evaluation procedure for deciding the feasibility of a service is presented. In Section 4, video telephone service in Korea is evaluated according to the proposed feasibility test model. The research finishes with concluding remarks in Section 5.

2. Literature review

2.1. New product development and new service development

To sustain a continuous competitive advantage of a company, the development of a new product or service is indispensable, and it is well known that an effective development process plays an important role in success of a newly developed product (de Brentani, 1989, 1995; Cooper & Brentani, 1991; Cooper, Easingwood, Edgett, Kleinschmidt, & Storey, 1994; Edgett, 1994; Storey & Easingwood, 1993).

The '5-step model' (Urban & John, 1993) and 'stage-gate model' (Cooper, 1993) are famous and well known models that describe the process of new product development. Urban recommends the five-step decision process. The purpose of the first step is for market definition and idea generation, and at the second step customer needs, product positioning, segmentation, sales forecasting, engineering and marketing mix are defined. At the third step, advertising and product, testing, pretest and pre-launch, forecasting and test marketing are performed, while at the fourth step, the product is introduced to the market as the launch plan. After market monitoring and response analysis at the fifth step, NPD is finally estimated as a successful product. On the contrary, Cooper's model insists that the check point called 'Gate' is needed to guarantee the satisfaction of a required condition at the end of every step in the entire process.

However, the rapid development of technology and complicated needs of customers increase the uncertainty of market and technology. In that sense, another new marketing method called 'high-tech marketing' has emerged to satisfy ever changing customers' needs (Moriarty & Kosnik, 1989). At the age of high-tech marketing, the traditional product development process needs to change because the possibility of success is lower than ever. Thus, 'new' new product development process has been proposed (Kim, 2006). The first stage is the development of a dramatic technology, the second stage is the timely 'productization' and the third stage is directly launching the 'new' new product in the market without test marketing as 'Time-to-market' strategy.

In the new service development process unlike the new product development process, ideas for new service innovations can be originated from many sources such as customers' suggestion, frontline employees' concern, and possible service extensions by data mining, new advances in technology and so on. During the new service development cycle, these ideas are used as an input for 'development' stage. Besides, team, tool and organizational context play an important role as enablers. This cycle consists of two parts such as 'planning phase' and 'execution phase'. At the development state, new services are formulated such as objective/strategy, idea generation and screening, concept development and testing at the analysis stage business analysis, Project authorization is preformed; third stage performs service design and testing, Process and system design and testing, Marketing program design and testing, personnel training, service testing, pilot run, and test marketing; finally at full launch stage, full scale launch and post-launch review are performed (Fitzsimmons & Fitzsimmons, 2004).

Unlike the traditional product or general service, in case of service especially in a telecom area, customers do not know the real value of service before using it and cannot evaluate the quality and benefit even after using it. Besides, the high-tech market has a high level of uncertainty as the level of technology becomes more advanced than ever (John, Weiss, & Dutta, 1999; Mohr, 2000; Moriarty & Kosnik, 1989; Nelson, 1970; Shanklin & Ryans, 1984). For such reasons, a new service development process for telecommunications is needed.

Ahn and Skudlark (2002) have introduced a new modified process for a new telecom service, because traditional development processes have not considered the uncertain factors outside of process such as technological innovations, political influences and changes of management environment. Also, it is stressed on the feasibility stage that the first major decision is made on whether to pursue and support the designed service concept.

2.2. Evaluation of telecommunications services

Despite the importance of the assessment in a new product development process, there has been no small sum of researches on the development and deployment strategy of the advanced telecommunication services for telecom service providers (Ahn, 1999; Akimaru & Finley, 1997; Ims & Olsen, 1997; Ims, 1998; Kwok, 1997). Furthermore, they merely focused on the techno economic feasibility. Similar to the techno economic analysis, most of the evaluations for new service have been performed in specific areas such as financial benefit of a service, technology valuation and service quality, and customer behavior (Apostolopoulos & Pramataris, 1997; Kuo, Wu, & Pei, 2007; Kwon, 2002; Mokdad & Ben-Othman, 2003). Also, most of the assessment methods depend on experts' opinion such as the assessment of likelihood by Experts (Bowers, 1989), Brainstorming, the Delphi method, conjoint analysis and quality function deployment, survey (Duran & Flores, 1998; Nijssen & Frambach, 2000), and case-based study (Ozer, 2005). Naturally, the research method based on experts' opinion is a crucial fact for forecasting telecom service success in future (Ozer, 2008). But, that kind of subjective method is not enough to consider various kinds of interactions among all components (Cho, Lee, & Park, 2007).

Moreover, a few papers show the comparative advantages among the services. Even though MOA (Market Opportunity Analysis) is a common method for the feasibility test in a productization process of a new technology, it mainly focuses on 'customer function' (Reddy, 1990). Kuo and Chen (2006) showed another evaluation model for selection mobile service with fuzzy synthetic evaluation model. But this method was used for consumer's service selection. Lee suggested telecommunications ser-