Analyzing the Business Strategies of Mobile Phone Operators Using Agent-Based Simulation

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ABSTRACT

Mobile telephone service was first introduced to Japanese market in the mid-1980s and from then on, this area of business has shown a rapid growth of the number of the subscribers. However, recently, the mobile telephone market in Japan has become saturated. Most of the adult populations have at least one mobile phone set nowadays. Moreover, there are hardly any distinct differences in the quality of voice/packet services or, in the performance of the mobile phone sets of different operators. In this situation, mobile telephone operators are taking different approaches to attract new users as well as users from their competitors. However, as the industry is well saturated, it is difficult to predict the effect of these strategies of the companies in the market. This paper will propose a model that will help the market researchers to estimate the effects of any business strategy based on user mobility. The simulation result of this research will help the strategy makers of the field of mobile telecommunication to understand the current user sentiment and to predict the reaction of the users before any new service is introduced to the market. In this research, the Conjoint Analysis Method has been used to find the user utility function and the Agent Based Simulation (ABS) method has been used to simulate the movement of the market. The result can be used in the future and it will be possible to implement this same model with few adjustments to predict the user movement in other market conditions.

Keywords: Agent Based Simulation, Conjoint Analysis, Japan, Mobile Telephone Services, Mobile Telecommunication

1. INTRODUCTION

The movement of the users in the field of mobile telecommunication is very fast nowadays (Understanding the mobile market drivers, 2003). After the introduction of MNP (Mobile Number Portability) service in Japanese market, it has become easier for the users to change their mobile operator without changing their current number. On the other hand, most of the mobile telephone operators in Japan have introduced discount services for their users with atleast 2

DOI: 10.4018/jkss.2013040106
years contract to prevent the users to shift to other operators. This research will focus on the relationship between the business strategies of the mobile telephone operators and the movement of the customers. The purpose of this research is to simulate the mobile telephone market condition of Japan and estimate the effects of any business strategies of the mobile telephone operators in the market. In the second section, the methodology and the steps of the research will be discussed. A mobile user survey has been conducted to find out the characteristics of the mobile phone user in general. These information of mobile telephone users will be used to develop a user utility function. It is important to detect the user utility function as precise as possible to get a realistic result from this model. The user utility function has been used to determine the characteristics of the agents of the Agent Based Simulation (ABS).

In the third section, the findings of the simulation have been explained and the conclusion is added in the fourth section. In recent years, many researchers have proposed comparison results and models to estimate effectiveness of the telecom services or the platform strategies of mobile phone operators using different computer simulation methods. For example, in 1996 Kawamura et. al. have proposed an effectiveness estimation method for telecom services using Agent Based Simulation method. This work shows how different telecommunication services affect the mobility of the mobile telephone users (Kawamura et al., 1996). However, this method only discusses effectiveness of only one service and does not consider the overall effect and the correlation factors between different mobile operators. In another approach, Fujikawa et. al. have discussed and evaluated different R&D strategies of different mobile operators and made a comparative analysis of the effectiveness of these strategies (Fujikawa et al., 2008). This work focused on the impact of the decisions related to the service development strategies of the mobile telephone companies in the market. The researchers have proposed a suitable model of service development process for the mobile telecommunication companies. However, this research did not focus on the other strategies, such as, marketing strategy or pricing strategy. This research will focus on both R&D strategies and marketing/pricing strategies and will show the overall effect of the strategies of different mobile telephone companies on the market share.

2. METHODOLOGY AND APPROACH

This research is implemented in three steps. First of all, a user survey has been conducted to gather information of the mobile telephone users and their priorities. In the second step, using this raw information, a conjoint analysis (Orme, 2005) has been done to detect the utility function. This utility function has shown how the mobile telephone users react to the different choices. Lastly, simulation and modeling of user mobility has been done according to the user mobility function and the influence of other agents. The simulation model is shown in Figure 1.

To develop a proper evaluation model, it is important to find out the characteristics of the mobile phone users and the response of the users to the different strategies of the mobile telephone operators. In this research, to predict users response to these strategy choices, a user mobility function has been created based on the user choices. Company strategy decision and user response to the companys new strategies are closely related to each other, and this relationship has been expressed by mathematical functions to run an effective simulation process for evaluation. From these functions, it will be possible to estimate the changes of the total number of users (market share) after the strategy implementation of the mobile telephone companies.

2.1. Mobile User Survey

To find out the present condition of the mobile phone market, and to create the user utility function, a survey has been done among the mobile phone users in Japanese market. The
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