Process of Personalizing the Ubiquitous Advertisements

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ABSTRACT

In this paper, we propose an approach combining behavioral and targeting techniques for a better reaction of the customer with a star product using a personalized ubiquitous advertisement. We use the clustering to study the customer’s behavior and the association rules to estimate the probability of star product’s purchases in the near future. In order to validate our approach, we develop a prototype to send a personalized advertisement to loyal customers and potential customers in ubiquitous environment. Each target receives the advertising according his classification and his degree of loyalty obtained by the behavioral analysis. Loyal customers are the first to receive the personalized advertising in the ubiquitous environment.

KEYWORDS

Behavioral Analysis, Customer Profile, Loyal Customer, Mobile Advertisement, Mobile Marketing, Personalized Advertisement, Potential Customer, Star Product, Ubiquitous Advertisement, Ubiquitous Marketing

INTRODUCTION

The marketing strategy suffered several variations related to the evolution of information and communication technologies. At the beginning, marketing was affecting to the mass using media based on strong audience to transfer messages and offers. In addition, the emergence of the Internet in social networks gave birth to the segmented marketing which focused on targeting certain groups of consumers. This strategy of electronic marketing sought to cluster customers in homogeneous groups and assign offers to the target. Hence, marketers narrowed their offers to smaller groups known as ‘niche’. Each ‘niche’ received the offers according to its specific needs. As a result, a new technology of the mobile was developed. It invented new channels of distribution and communication to meet the needs of the new type of marketing. This emergence of the mobile advertisements improved the individual and the interactive access to the nomadic consumer. Furthermore, the strategy of personalization ’one to one’ is used in the mobile marketing in order to send the products and services according to the industrial scale to adapt each client’s needs separately. This marketing strategy depends essentially on the type of the targeted consumer.

Today, the customer is a mobile and an interactive actor who reacts with his environment which gives birth to a new platform composed by the Customer-Business relationship. This is known as the domain of ubiquitous marketing. Our research is based on techniques existing in the marketing literature. These techniques are used to increase the rates of customer’s loyalty in their own platforms. Related to the rapid growth of sale networks and communication channels, organizations need to readapt new customers’ profiles that are always looking for new promotions based on the information

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of their profiles and their interactions history with the environment. This strategy is shown by (Leite Lucas de Azevedo and Borges, 2015). In fact, the studies of personalized targeting in the ubiquitous marketing are limited in the literature because of the new context of the interaction between the mobile customer and smart objects. Indeed, this paper focuses on solving this problem with a guarantee to personalize the ubiquitous advertisements depending on the needs of the client Business relationship. When the customer is detected in the hypermarket, he receives in his Smartphone a personalized advertisement of a star product according to his degree of loyalty stored in the database in an orderly way: The loyal customers are the first who receive the advertisement in a text message then the potential ones. This process is achieved after detecting the presence of the customer by an Indoor technique of geolocation.

In section 2, researchers post a view of the customer’s behavioral techniques existed to define and find the target. Researchers describe the evolution of advertising in marketing with an overview of Customer-Business relationship techniques. After, researchers describe the techniques used in the literature to analyze customer’s behavior and create his profile. After, researchers outline the methods used in various types of marketing (direct, electronic, mobile and ubiquitous) to look for the target. In section 3, researchers display the different stages from fixing the star product and selecting the criteria defining the targets to personalizing advertisements sent to them. Researchers validate the prototype of personalized advertisements in section 4, using the data set in question and discussing the relevant results.

LITERATURE REVIEW
Advertising has a strong connection with the development of trade. This makes its dimensions suffer a variety of changes. In our study, researchers focus on the evolution of advertising in different forms of marketing: Direct marketing, e-marketing, mobile marketing and the ubiquitous marketing. This evolution is treated after knowing the needs of customer. These needs describe the profile of each customer. In literature, there are several techniques used to analyze the customer’s behavior. The authors will discuss about these techniques in the next subsections.

Customer Behavioral Analysis
In the marketing process, the datamining techniques used to analyze the consumer’s behavior represent a basic step. These techniques exist in two criteria: Descriptive datamining and predictive datamining according to the nature of the data considered, as well as the type of the extracted knowledge (Heo et al., 2010). The descriptive datamining focuses primarily on the discover of models or explicit relationships that a decision maker can directly interpret and translate into the company (Piwowarski et al., 2014). The most used techniques are the clustering and the association rules. The predictive datamining focuses on the prediction of the model’s behavior and determines the future values of variables generated from the databases (Crémilleux et al., 2014). The most used techniques are the classification, scheduling, and the association rules. In this paper, authors are interested to discuss the datamining techniques existing in marketing literature.

Clustering
Clustering is an exploratory and critical task in the knowledge discovery process. Besides, several studies are conducted to discuss the evolution of the types of clustering algorithms from the simplest techniques such as k-means algorithm (Izquierdo-Yusta et al., 2015) to the more advanced approaches, such as kernel methods and spectral approaches (López-Catalán et al., 2015). As well, the types of constraints used in the techniques represent another topic. According to the researchers (Ho et al., 2007), customers are classified by k-means algorithm according to two criteria: The trend value of the star product’s past purchases and the static attributes of each customer. But this study is performed