

Chapter 8

Churn Management of E-Banking Customers by Fuzzy AHP

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ABSTRACT

As the world goes through a paper-less environment, electronic banking solutions are more welcome by most of the corporations. It is important that companies control their cash management electronically. Banking services provide such solutions to satisfy customers' needs. This study focuses on E-Banking usage data to identify the customers' behavior. When a corporation wants to keep or promote its position in the market, churn management can be considered as an efficient solution. Basically, Churn Management will shape the customers into segments in order for the corporation to focus on the customers that are closer to be out of the portfolio.

INTRODUCTION

Electronic Banking (EB) offers customers to gain access to bank accounts twenty four hours in a day and seven days in a week. By this way, customers can use banking services for payment inquiry or transaction initiation purposes. As well as simple banking tasks can be served for bank customers with different solutions to provide much more

secure environments. In this manner, some corporations use mobile integrated software solutions while the customers can access the online banking services. There are also mobile platforms where banking services can be accessed and processed (Bilgen, 2009).

Different types of banking operations and activities may also be supported from different technological platforms, such as virtual retail

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banking over the Internet that was introduced in Singapore on 1997–1998 by the Development Bank of Singapore, the Post Office Savings Bank, the Overseas Chinese Banking Corporation, and the United Overseas Bank. In 2000, consumer attitudes toward the usefulness of and willingness to use Internet e-retail banking were identified and measured (Liao and Cheung, 2002).

In general, each banking and insurance company provides different types of Mobil and internet based platforms for customers to satisfies them by this broad technologies and functionalities.

To understand intends, requirements, satisfaction level of the e-banking customers, different customer segmentation analysis will carried by CRM (customer relationship management) tools. Data analysis techniques cover different approaches and methods that can be used for profiling customers by taking into account of his habits and activities. Business Analysts' get use of data mining methods to figure out the best match shape which will directly be referred as the strategy in the future of a corporation base on the CRM. Sort of the different soft computing techniques are used to handle banking and finance related indicators for CRM especially in churn management. When customer attrition analysis is performed for financial services; demographic characteristics, environmental changes and stimulating "interactive and continuous" relationships with customers are major concern points when considering retention. Customer behavior predictors only have a limited impact on attrition in terms of total products owned as well as the inter purchase time (Poel and Larivière, 2004). In another study discusses commercial bank customer churn prediction based on SVM (support vector machines) model, and uses random sampling method to improve SVM model, considering the imbalance characteristics of customer data sets. The results show that this method can effectively enhance the prediction accuracy of the selected model (He, Shi, Wan and Zhao, 2014). Analytic Hierarchy Process (AHP) was also used

in measuring Critical Success Factors of E-Bank Portals. In this case, measurement has a multi levels and multi-criteria that Fuzzy Analytic Hierarchy Process method was conducted (Ellatif, 2008). Another work aims to present e-banking customers' intentions in a time period as per their previous experiences. Churn Prediction Model in Retail Banking by using Fuzzy C-Means firstly proposed by Popović (2008). Clusters predicted based on fuzzy methods for churn prediction in retail banking. The study was performed on the real data set that covers 5000 customers of a retail bank. Real data is great strength of the study, as a lot of studies often use old, irrelevant or artificial data. This study focused on the prediction engine that uses these sums performed best in churn prediction, applied to both balanced and non-balanced test sets (Popović, 2008). Working with both of the balanced and non-balanced fashion data will let the result to be compared. Churn is the gross rate of customer loss during a given period. Churn can be stated as follows:

$$\text{Monthly Churn} = (C_0 + A_1 - C_1) / C_0$$

Where:

C_0 : Number of customers at the beginning of the month

C_1 : Number of customers at the end of the month

A_1 : Gross new customers during the month

A persistent challenge on both the cost and revenue side is customer churn. In churn activities, customers move from one bank to another bank in order to search better and reliable banking products and services. As markets become saturated and competitive, customers have more choices to select different services, products and operations. Churn rates have escalated with increased competition and deregulation. For banking corporations, increased customer churn has resulted in rising

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