IMPLEMENTATION OF FRIEDMAN'S ANALYSIS IN BANKING SECTOR MEDICLAIM INSURANCE

Pratik Biswas[1], ParthaSarathi Bishnu[2] Mridanish Jha[3]

[1]Sr. Lecturer, FST, ICFAI University, ICFAI,University Jharkhand. Ranchi
[2]Department of computer science, Birla Institute of Technology,Ranchi
3Assistant professor FMS, ICFAI University

Abstract: Banking sector medical insurance have proven itself an important topic of discussion for last couple of years. Customer segmentation and customer satisfaction are two pivotal factors of this topic. Valued customers are the most essential factor of marketing for any business organization (private or public). Same concept is applicable for banking sector too. Banks provide medical policies to their personal customers in reasonable rate and flexible conditions. Policies are of different types with unlike features (attributes).Some of them are more adaptable than the other. As we know the interplay between theoretical ideas and data analysis could lead to major policy implications, in this paper we use Friedman's test for ranking preference and CRM for segmentation part in order to prefer policies in customer point of view.

I. INTRODUCTION

IT becomes a part of daily life for most of the people. Today, intellectual business is one of the modern mechanisms to increase competitive advantage and overcome competitors. This is an era of customers or customer relationship management. Customers are the most important asset of an organization. There cannot be any business prospect without satisfied customer who remain loyal and develop their relationship with the organization [15].The dramatic increase in competition within the banking sector (both public and private) has led to give more importance to customer. The new generation banks are technology based. The ways in which banks interact with their customers have changed dramatically over the past few years [2][3]. Cashless Bima policy[1] is a unique health insurance policy designed especially for the account holders for both nationalized and private banks. The policy covers the account holder, spouse and two dependent children. This policy covers hospitalization expenses for account holder and family. In case of hospitalization expenses, the entire family is covered for the Floater sum insured as opted for, i.e. either one or all members of the family can utilize the sum insured during the policy period. Major exclusions of the policy are: Pre-existing diseases will not be covered. There are a couple of diseases which will not be covered unless one year is completed company.24hrshospitalization or more is compulsory for a claim to be settled [4][5].The banking industry in all over India has experienced remarkable change and an increased growth in earnings from selling insurance products. Therefore selling various policies in bank have proved, that this field has a bright future as well as increase popularity among the prospective customers.

The main objectives of our paper are as follows:
i) To analyse factors influencing attribute in medical policy.
ii) To study bank customer perception towards factors influencing attribute in medical policy.
iii) To assess the role of bank officers towards customer selection and then customer satisfaction.

The outline of this paper is as follows: in section two we present methodology and Friedman's, analysis of variance in section three we discuss about role of CRM in bank. Section four explains experimental design and analysis of raw data section, five deals with hypothesis testing, section six gives conclusion.

II. METHODOLOGY

The purpose of this paper aims to present how Friedman's rank test can be implemented through customer relationship management (CRM) is useful in banking sector medical insurance. The two statistical techniques used in this study are Friedman's Two-way Analysis of Variance by Ranks and Customer relationship management. When the first part of the study focused on customer segmentation in bank for identifying the potential customer in terms of Mediclaim policy matter [4], the second part relates to the use of

Friedman's Two-way Analysis of Variance by Ranks to determine the relative importance of policy attributes which influence the choice/purchase of a Mediclaim insurance policy by a customer. Both of these statistical techniques and their applications are explained next.

A. Friedman's two-way analysis of variance by ranks

Friedman's test [9][10] is a non-parametric test for testing hypothesis, that a given number of samples have been drawn from the same population. This test is similar to ANOVA. The Friedman test is non- parametric test developed by the U.S. economist Milton Friedman[9][10].Similar to the parametric repeated measure ANOVA when sample groups are not normally distributed. It is used to detect differences in treatments across multiple test attempts. The procedure involves ranking in each row (or block) together, then considering the values of ranks by columns The Friedman Test is also an alternative for single-factor, repeated-measures ANOVA when the dependent variable is ordinal instead of continuous as required by ANOVA[16][17]. An ordinal variable is a categorical variable whose value indicates a rank or order among other data points. The Likert scale is an example of an ordinal data scale[7]. The Likert scale is often associated with survey in which a respondent rates something with ratings. Friedman Test is a nonparametric alternative for single-factor, repeated-measures ANOVA. Such as "good," "very good," and "excellent" [6][7].

B. why Friedman's ranks test

The cash less Mediclaim Policy provided by different nationalized or private banks is a unique cashless healthcare policy available to any Account Holder / Employee of that particular bank. If we go through the policy details [11][12] we will see more than 80% features are common and range of the policy-premium is likely to be same. Therefore it is difficult to compare these policies only on the basis of their premium amount. On the other hand Friedman's Two Way Analysis of Variance is a useful test when it is desirable to know if differences exist between three or more sample and data are ordinal (i.e., ranked). It is generally desirable to structure a design so that a parametric analysis is used. But, in case of demographic data, it is only possible to use ordinal data [6][7]. When that is the case, the Friedman test may be an appropriate alternate statistical aid when looking at multiple analysis and possible interaction [16][17].

III. WHY HEALTH INSURANCE IS IMPORTANT

As healthcare is becoming very costly now days, having health insurance is important because medical coverage helps people get timely medical care and improve their lives and health [14]. It is also found that uninsured people receive inadequate medical care and also not in time, risking their health. Rising medical costs can wipe-out a lifetime of savings with just one major medical event[13].on the other hand the premium for health care insurance provided by different banks for their own customer are quite affordable. By paying a certain amount of premium, one can get himself and his family secured [12][13].

A. Bank and CRM

In India, the banking sector has been operating in a very stable environment from last three to four decades. In current scenario of banking sector, the falling of interest rates and tough competition between these players have made Indian bankers to realize that the purpose of their business is to create and retain a customer and to see that the entire business process is consistent with an integrated effort to discover, retain and satisfy customer needs. But the success of CRM strategy depends upon its ability to understand the needs of the customer and to integrate them with the organization's strategy, people, and technology and business process [21].In the banking field a unique 'Relationship' exists between the customers and the bank. It is a business strategy used to learn more about customers' needs and behaviours in order to develop stronger relationships with them. Customer relationship management is really much more a human function than a technology implementation. This would typically provide the bank with a birds-eye-view of the customer, his saving, spending and buying patterns. The next logical step is to use this 360 degree view of the customer. The ultimate goal of an organization is to identify potential customers who in the long run can prove to be useful and loyal towards the organization. Therefore the first step is to identify such customers [4][22]. Actually this is the task of CRM, (customer, relationship, and management) that is first: identify customer, second: develop relationship with the customers (in terms, of knowledge), third: manage (motivate) the customers. Here this entire process is defined with the help of figure -1. Which includes three steps, first: From customer data base (which is already with the bank) segment the customers on the basis of demographic data like age, sex, economic status. Second: identify potential customers and third: define target customer. After applying such technique we update the contents of the customer data base[23][24][25].
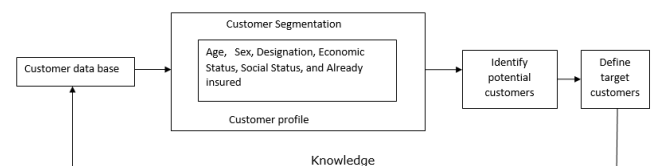

Fig.1CRM component define potential and target customer

B. *Customer Segmentation in bank*

Segmentation is the process of dividing the customer's base into distinct and internally homogeneous groups, in order to develop and differentiate marketing strategies according to their characteristics. There are different segmentation types based on the specific criteria or attributes used for segmentation [4][18]. In case of banking sector health insurance, Customer Relationship Management (CRM) is gaining popularity among organizations operating in competitive business environments. One of the success factors of a CRM launch depends on how appropriately the market has segmented. In case of banking sectors this segmentation job is rather easier. Bank customers are more homogeneous in comparison to other sectors on the basis of customer's life cycle. If we see the life cycle of most of the customers, they are likely to be same. From opening a savings account (mandatory for all customers) to switch over to other types of accounts or switch over to asking for a loan: is a common pattern of life cycle for all most all the customers. Therefore identification of target customer who are willing to purchase Mediclaim policy or not can be identified from segmentation using CRM technique explained in fig.2[18][19][20].
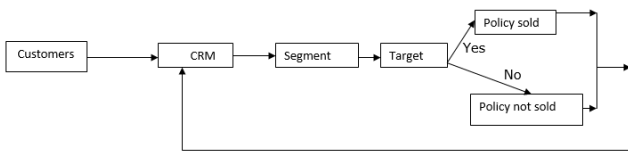

Fig. 2. Customer's choice through segmentation

IV. EXPERIMENTAL DESIGN

This study is based on the fundamental research design which includes both primary and secondary information (data). Secondary data is collected from the web site of nationalized & private banks[11][12]. Whereas primary information is gathered from customers of different banks, agents of insurance companies, and authorized officers of the banks.
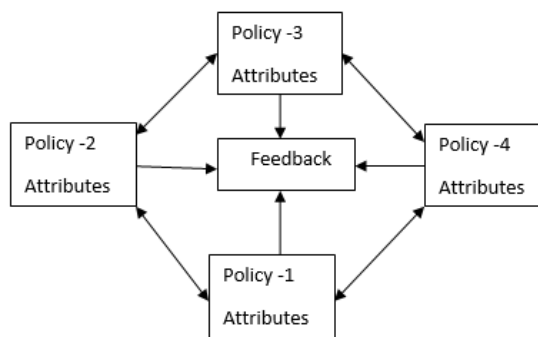

Fig.3. Attributes Feedback by customers

The initial questionnaire comprised of selected 15 coverage's in the policy[9][10][11] , and the interviewees were asked to reply according to five-point Likert scales ranging from ''strongly agree'' to ''strongly disagree.'' [6]The questionnaire is based on the attributes mentioned in the Mediclaim insurance promotional material. Answers were assessed on the basis of the degree to which they matched with the requirement of the customers. This is arranged in terms of feedback shown in figure 3, whereas the total arrangement is shown in figure 4.
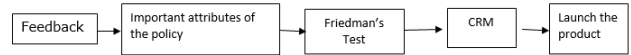

Fig- 4.Launching of product using Friedman's

B *Analysis of raw data*

A valid questionnaire must be able to measure the research purpose. The measured items of this research were established according to the relevant literature. Moreover, the questionnaire was pre-tested by experts in the field and then revised in light of the experts' suggestions before being sent out to the respondents. Therefore, the measures of this research have face validity. Once the answers are received from the customers' side, following steps are followed to form Friedman's test.

We have divided the facilities mentioned in the medical insurance policy, offered by the banks on the basis of four category of attributes: Premium amount, Coverage options, Coverage facilities and the Floater Sum Insured (INR), from the information provided in the policy database. We have defined amount of Premium for the policy on display as Premium Types, types of coverage option on display Coverage Type, types of facilities on display as Facility Type and sum insured as INR Type. The data is so arranged that scores from each subject are in the appropriate columns, one for each condition. These scores are shown in Table-1.

Table-I: Score given to each policy on the basis of attributes.

scores--->	Policy$_1$	Policy$_2$	Policy$_3$	Policy$_4$
C$_1$	15	12	14	10
C$_2$	12	13	14	15
C$_3$	13	10	12	15
C$_4$	15	12	13	10
C$_5$	15	12	13	14
C$_6$	14	10	12	15
C$_7$	15	14	12	13
C$_8$	12	15	14	10
C$_9$	13	15	12	11
C$_{10}$	11	14	10	13
C$_{11}$	15	10	14	10
C$_{12}$	15	11	13	10
C$_{13}$	15	16	14	12
C$_{14}$	10	12	13	15
C$_{15}$	13	15	12	14
SUM	203	191	192	180
	Mean = 13.5	Mean =12.7	Mean = 12.8	Mean = 12.5
	SD =1.6275	SD= 2.0603	SD= 1.1075	SD= 1.9821

Here we have ranked data separately for each subject with the smallest score getting a value of 1. If there are ties (within the scores for a subject) each receives the average

rank they would have received.R1, R2, R3, and R4represent the sum of the rank respectively. (Table-2).

Table. II   Rank based on score given to each policy.

RANK --->	Policy₁	Policy₂	Policy₃	Policy₄
C_1	4	2	3	1
C_2	1	2	3	4
C_3	3	1	2	4
C_4	4	2	3	1
C_5	4	1	2	3
C_6	3	1	2	4
C_7	4	3	1	2
C_8	2	4	3	1
C_9	3	4	2	1
C_{10}	2	4	1	3
C_{11}	4	2	3	1
C_{12}	4	2	3	1
C_{13}	3	4	2	1
C_{14}	1	2	3	4
C_{15}	2	4	1	3
Sum	$\Sigma R_1 = 44$	$\Sigma R_2 = 38$	$\Sigma R_3 = 34$	$\Sigma R_4 = 34$

IV. DESCRIPTIVE STATISTICS OF POLICIES

Since the coefficient of variation CV measure the absolute variation of a distribution, the greater the amount of variation, the greater the CV. A small CV means a high degree of uniformity of the observation as well as homogeneity of a series; a larger CV means just the opposite. If we compare the values of CV in case of policy1 (CV-12.05%) to policy4 (CV-15.85%), there is a high degree of variation in all four cases. Especiallypolicy2 (CV- 16.22%) and policy3 (CV- 8.65%), it is just double, here S.D plays an important role since mean are like to be same.

Table III Descriptive statistics of politics

Particulars	Mean	S.D	C.V
Policy1	13.5	1.6275	12.05%
Policy2	12.7	2.0603	16.22%
Policy3	12.8	1.1075	8.65%
Policy4	12.5	1.9821	15.85%

Which seems that customers have entirely different view about these two policies. May be there are some attributes which make these differences.

V. HYPOTHESIS DEVELOPMENT

The validity of empirical study is always very important phenomena and the most important part is collection of data, since statistics is defined as collection, organization, presentation, analysis and interpretation of data [16]. Therefore analysis of data is basically dependent on the method of collection and from whom we had collected the data [17].Here we are considering the data from bank's customer. Our object is choice of customer and objective is analysis of the outcome of the customer's choice. While choice of customer is made using customer segmentation, analysis portion is done using Friedman's test. On the basis

of the information (attributes of different policies) we have made our research hypothesis as follows:

Research Hypothesis statements:
Null hypothesis   H0: All   the policies are same.
Alternative hypothesisH1: All   the policies are not same.

Considering the number of subjects N = 15, and number condition k =3, we have Compute Friedman's F, using the following formula (carry at least 3 decimals in these calculations) as follows:

$$F_c = \frac{12}{Nk(k+1)} \sum_{j=1}^{k} R_j - (3N(k+1))$$

$$F_c = \frac{12}{15 \times 4(4+1)}(44^2 + 38^2 + 34^2 + 34^2) - (3*15*(4+1))$$

$$= 2.68$$

Here we consider the case of large samples (k > 5 OR N > 13): The critical value of F by looking at the table of critical values for the chi-Square test [7] [15] (degree of freedom = k– 1 = 4 – 1 = 3, level of significance p=0.05) = 7.81

Since the calculated value is less than that of table value therefore we will accept the null hypothesis that is all the policies are same. May be it is due to the fact that most of the policies are offering same facilities in same premium amount that is nothing new about it in customer point of view.

VI. CONCLUSITION:

It may be noticed that there are anomalies in the selection of policies from customer point of view. Where according to Friedman's rank test all the policies are same, Coefficient of variance shows different result. May be this is due to the fact that some banks have very high rate of premium and at the same time they offer coverage without hospitalization for some cases (diseases) also.

VII. REFFERENCE

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