

## Identifying and Segmenting Customers of Pasargad Insurance Company Through RFM Model (RFM)

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**Abstract:** Customers' segmentation helps organizations in targeting their services customization and prioritizing products on the basis of its profitability. Organizations' success depends on attracting and keeping loyal customers. Since, most vehicle insurance policies are issued in one year period and it would be expired after the period, end of insurance period may lead to end of customer's loyalty. Therefore, recognition and identification of customers whom are more likely to repurchase or renew their insurance policies is important for insurance companies and it helps them in targeted marketing and advertising, keeping existing customers and identifying future customers. In this study, we aimed to provide a framework for customers' (vehicle insurance clients) segmentation in Pasargad Insurance Company based on the factors affecting customer lifetime value. For this purpose, a series of transactions related to the 384 customers of Pasargad Insurance Company in the spring of 2015 were considered. Transaction data included customers' purchase recency (R), frequency of insurance policies renewals in the 6 years period (F) and the monetary amounts paid by each customer for vehicle insurance policy in the last purchase (M). According to the results of clustering, customers were divided into 4 segments; the first segment; golden customers, the second segment: valued and loyal customers, the third segment; steady customers, the fourth segment; invaluable customers and with the probability to disaffirm.

**Key words:** Customer classification, customer segmentation, vehicle insurance, clustering, probability

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### INTRODUCTION

In the past, retailers, banks, insurance companies and car dealers had close ties with their customers and knew what customers want; so they tried to grant their needs and wishes by offering special services to them. Later, with the arrival of mass production and marketing and increased number of consumer customers, the importance of building relationships with customers was reduced and the variety of products and their prices also declined. There are a lot of evidences indicating that the customer relationships were taken into consideration since the late 19th century. Today, through the effective use of information technology and communication, organizations can provide their customers with diverse products with lower prices and special services simultaneously (Taghavifard and Nadali, 2012).

As, it is mentioned by Saeedpoor *et al.* (2015), insurance companies are one of dynamic and important institutions in many countries. These companies are very important to the community with respect to the features and benefits they provide. Insurance companies transfer risk from community to themselves and lead to social

peace and welfare. Insurance companies invest their income in investment companies or stock exchange, and lead to the economic growth of the country. In order to provide good service to policyholders, insurance should have close relationship with buyers, esp. non-compulsory insurance buyers to be aware of their needs and offer appropriate insurance to satisfy them. In today's business world, in which competition is not only intense between companies of an industry but also between different industries is also intense. Understanding customers and being aware of their buying behavior, provides a competitive advantage for the company. Companies are trying to modify their attitude towards the profitability and introduce a new organizing for their company. They try to alter their company's organizing from product-based structure to customer-based structure. So, the effort is to put customers at the center of their attention. Navigation key of these changes is in the emergence of customer relationship management that are moving by integrated information systems and supporting solutions to satisfy customer needs.

Today, the rapid growth of information technology in various business sectors has brought many advantages

for business owners; Insurance sector is also not an exception. Information technology has led to changes in organizations' marketing methods and the creation of large volumes of customer data. Given the intense competition in the market and diverse options in products and services for customers, analysis of customers' behavior are deemed to be very important element for the survival of the business.

According to the mentioned items, one of the most effective tools to study customers' behavior is using clustering techniques. In this chapter, the use of segmentation to segment customers and its importance are described; then questions and related objectives are developed and finally the main research variables are defined.

**MATERIALS AND METHODS**

The present study is an applied research in terms of objectives; and in terms of data collection, it is a survey using secondary data; in terms data analysis, this study is a descriptive-analytic research.

The population consists of all customers of Pasargad Insurance in Tehran. For this purpose, by using two-stage cluster sampling method, first among the branches and then from customers of selected branches, customers were selected randomly. Due to the large number of customers, a total of 384 (through Morgan Table) vehicle insurance customers in the spring of 2015 were randomly selected.

**RESULTS AND DISCUSSION**

By using RFM analysis node (recency, frequency, monetary) one can quantitatively determine better customers. This analysis shows the diversity of customers' purchases (Recency), frequency of purchase (Frequency), and the money they spend for their transactions (Monetary). Thus, the research variables include:

- The number of vehicle insurance policies purchased from third party insurance and passenger insurance and the body in the last purchase of customers in Pasargad Insurance Company or purchasing other insurance policies from this company (recency)

- The number of vehicle insurance renewal in Pasargad insurance company (Frequency). The number according to the time that the insurance company established, is between 1 and 6 years
- The amounts paid for vehicle insurance in the last purchase of customers in Pasargad Insurance Company (Monetary)

**Statistical description of data:** In this stage to cut down costs, those data are chosen from the database that are being investigated and the objective is to find results about them. Therefore, data relating to the research variables are being selected from data.

For initial evaluation of data, after entering the data into the application, the table of summary statistics is used.

According to Table 1, the average amount of insurance premiums paid by sample subjects in Pasargad Insurance Company is equal to 1,92,61,919 Rials. The maximum amount of insurance premiums paid by sample subjects in Pasargad Insurance Company is equal to 9,31,16,031 Rials. The minimum amount of insurance premiums paid by sample subjects in Pasargad Insurance Company is equal to 50,34,455 Rials. The average in number of purchased insurance policies types by sample subjects in Pasargad Insurance Company is equal to 1/61. The average in number of renewals by sample subjects in Pasargad Insurance Company is equal to 3/48.

The highest number of renewals by sample subjects in Pasargad Insurance Company is equal to 6 periods. About 8/6% of the sample subjects, purchased vehicle insurance policy from this company for the first. About 50% of the sample had renewed their vehicle insurance policies in this company for >3 times (Table 2). About 46/9% of the subjects only purchased third party and passenger insurance, and 45/6% of the subjects purchased body insurance in addition to a third party and passenger insurance, 7/6% of the subjects have also purchased other services in addition to vehicle insurance (Table 3).

Table 2: Frequency of vehicle insurance policy renewals

Renewals frequency	Frequency	Frequency (%)	Cumulative frequency (%)
1	33	8.6	8.6
2	81	21.1	29.7
3	84	21.9	51.6
4	77	20.1	71.6
5	72	18.8	90.4
6	37	9.6	100.0
Total	384	100.0	

Table 1: Summary statistics of research variables

Variable	Average	SD	Skewness	Elongation	Minimum	Maximum
Renewals frequency	3.48	1.465	0.125	-0.995	1	6
Types of purchased insurance policies	1.61	0.625	0.125	-0.628	1	3
The average amount of insurance premiums	19261918.67	17751834.755	0.125	3.475	5034455	93116031

Table 3: Frequency of vehicle insurance policy types

Types of vehicle insurance policies	Frequency	Frequency (%)	Cumulative frequency (%)
Third party and passenger	180	46.9	46.9
Body, passenger, third party	175	45.6	92.4
Other pasargad insurance services	29	7.6	100.0
Total	384	100.0	

Table 4: Segmentation by RFM for the monetary volume (output of Clementine software by SPSS)

Binned filed: Moetary; Bins will be created using the values shown in table

Bin	Lower	Upper
1	≥ 5034455	< 7165014
2	≥ 7165014	< 8275979
3	≥ 8275979	< 1842787
4	≥ 18424787	< 28593249
5	≥ 28593249	≤ 93116031

Table 5: Segmentation by RFM for the frequency (output of clementine software by SPSS)

Binned filed: Frequency; Bins will be created using the values shown in table

Bin	Lower	Upper
1	≥ 1	< 2
2	≥ 2	< 3
3	≥ 3	< 4
4	≥ 4	< 5
5	≥ 5	≤ 6

Table 6: Segmentation by RFM for the recency (output of clementine software by SPSS)

Binned filed: Recency; Bins will be created using the values shown in table

Bin	Lower	Upper
1	> 2	≤ 3
2	> 1	≤ 2
3	≥ 1	≤ 1

**Exploring the data:** At this stage, the segmentation is performed. At this stage, by using segmentation techniques, data are explored, their knowledge will be extracted and modeling will be done.

**Segmentation via RFM:** By using RFM analysis, one can determine better customers in quantitative form. This analysis shows the diversity of customers' purchases (Recency), frequency of purchase (Frequency) and the money they spend for their transactions (Monetary). For each of the above three types of output, 5 categories are considered by software default.

RFM score is calculated as follows: (Monetary weight × Monetary weight) + (Frequency score × Frequency weight) + (Recency score × Recency score). In the present study, weights of these factors are considered equal. During the RFM analysis, the initial value of purchase diversity, renewal and the volume of money are determined by binary variables and new fields are added to the data set (Table 4-6). Recency score creates a binary ranking for purchase diversity. Frequency score creates a binary ranking for renewals. Monetary score creates a binary ranking for volume of money. RFM Score: Total

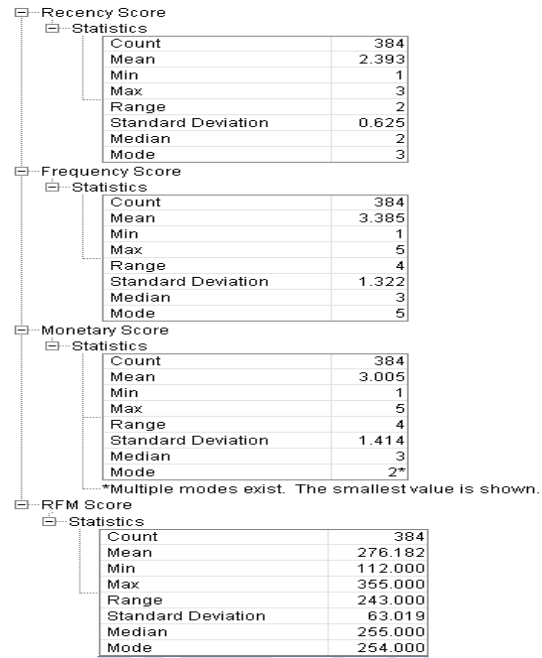


Fig. 1: Descriptive statistics scoring fields added to the data set

weighted score of purchase type, frequency and money volume. The current segmentation is done by RFM Node in SPSS software as follows (Sohrabi and Khanlari, 2007). Most of insurance policies renewals was 6 years in regard to establishment of the company. Thus, the number of renewals is done in the ranges of 1-6 times as mentioned in section 5.

In the above classification, those whom purchased other insurance policies in addition to vehicle insurance are in Group 1 those who purchased body insurance in addition to third party and passenger insurance are in group 2 and others who only purchased third party insurance in Pasargad Insurance companies are in the third group.

Software output in the figure below, shows descriptive statistics of scores of each new fields added to the data set: Based on the above graph, frequency has the highest score and recency has the lowest score. The value of each index in RFM model is determined by index score multiplied by weight. In this the weight for all three indices are considered equal to 1. The average value of each index is determined by dividing the total value of the index in all customers to the total number of customers. To cluster customers in order to differentiate them in homogenous groups based on the value of the model parameters, k-mean clustering method was used. Software output is as follows.

Numerical form of Figure is given. Figure 1 shows the first cluster includes 169 records. The score in terms

of re-purchase is 3 (people who have renewal for three times), the score in terms of monetary volume is 2 (people whose paid premium is 7,165,014-8,275,979 Rials), the score in terms of recency is 3 (people who just purchased third party and passenger insurance). The second cluster includes 103 records. The score in terms of re-purchase is 5 (people who have renewal for 5 or 6 times), the score in terms of monetary volume is 4 (people whose paid premium is 1,842,787-2,859,249 Rials), the score in terms of recency is 2 (people who purchased body insurance in addition to third party and passenger insurance).

The third cluster includes 27 records. The score in terms of re-purchase is 5 (people who have renewal for 5 or 6 times), the score in terms of monetary volume is 1 (people whose paid premium is 5,034,455-7,165,014 Rials), the score in terms of recency is 3 (people who just purchased third party and passenger insurance). It should be noted that subjects whom had recency of 1 (those who purchased other services as well as vehicle insurance) are put into the third group too.

The fourth cluster includes 29 records. The score in terms of re-purchase is 4 (people who have renewal for 5 or 6 times), the score in terms of monetary volume is 2 (people whose paid premium is 28,593,249 to 93,116,031 Rials), the score in terms of recency is 3 (people who purchased body insurance in addition to third party and passenger insurance).

The fifth cluster includes 56 records. The score in terms of re-purchase is 5, the score in terms of monetary volume is 5 (people whose paid premium is 28,593,249 to

93,116,031 Rials), the score in terms of recency is 2 (people who purchased body insurance in addition to third party and passenger insurance).

The average value of each index in each cluster is determined by dividing the total value of the index in the cluster to number of customers in the cluster and Customer Lifetime Value (CLV) of each cluster is calculated by the total average value of RFM indices in that cluster. For segmenting customers based on their lifetime value, customers are segmented in the form of clusters based on customer lifetime value pyramid which in fact represents customer rating in the form of clusters based on the lifetime value in each cluster. According to Fig. 2-4 it can be concluded:

- Cluster 1 includes 44% of customers; frequency score 3, monetary score 2 and recency score is 3. The rating CLV index for this cluster is 8
- Cluster 2 includes 26% of customers; frequency score 5, monetary score 4 and recency score is 2. The rating CLV index for this cluster is 11

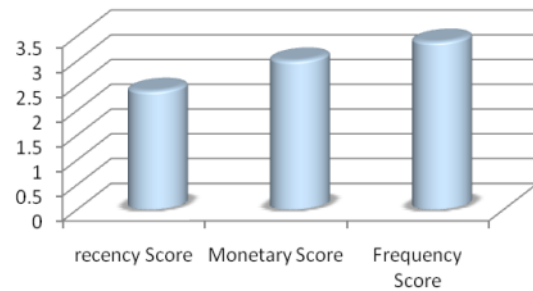


Fig. 2: Comparison of recency, frequency and monetary

	cluster-1 Count: 169 (44%)	cluster-2 Count: 103 (26%)	cluster-5 Count: 56 (14%)	cluster-4 Count: 29 (7%)	cluster-3 Count: 27 (7%)																																																																											
K-Means KMeans																																																																																
Frequency Score	<table border="1"> <tr><td>1</td><td>19</td><td>11.24%</td></tr> <tr><td>2</td><td>37</td><td>21.89%</td></tr> <tr><td>3</td><td>48</td><td>28.40%</td></tr> <tr><td>4</td><td>37</td><td>21.89%</td></tr> <tr><td>5</td><td>28</td><td>16.57%</td></tr> </table>	1	19	11.24%	2	37	21.89%	3	48	28.40%	4	37	21.89%	5	28	16.57%	<table border="1"> <tr><td>1</td><td>9</td><td>8.74%</td></tr> <tr><td>2</td><td>24</td><td>23.30%</td></tr> <tr><td>3</td><td>26</td><td>25.24%</td></tr> <tr><td>4</td><td>11</td><td>10.68%</td></tr> <tr><td>5</td><td>33</td><td>32.04%</td></tr> </table>	1	9	8.74%	2	24	23.30%	3	26	25.24%	4	11	10.68%	5	33	32.04%	<table border="1"> <tr><td>1</td><td>5</td><td>8.93%</td></tr> <tr><td>2</td><td>19</td><td>33.93%</td></tr> <tr><td>3</td><td>10</td><td>17.86%</td></tr> <tr><td>4</td><td>0</td><td>0.00%</td></tr> <tr><td>5</td><td>22</td><td>39.29%</td></tr> </table>	1	5	8.93%	2	19	33.93%	3	10	17.86%	4	0	0.00%	5	22	39.29%	<table border="1"> <tr><td>1</td><td>0</td><td>0.00%</td></tr> <tr><td>2</td><td>0</td><td>0.00%</td></tr> <tr><td>3</td><td>0</td><td>0.00%</td></tr> <tr><td>4</td><td>29</td><td>100.00%</td></tr> <tr><td>5</td><td>0</td><td>0.00%</td></tr> </table>	1	0	0.00%	2	0	0.00%	3	0	0.00%	4	29	100.00%	5	0	0.00%	<table border="1"> <tr><td>1</td><td>0</td><td>0.00%</td></tr> <tr><td>2</td><td>1</td><td>3.70%</td></tr> <tr><td>3</td><td>0</td><td>0.00%</td></tr> <tr><td>4</td><td>0</td><td>0.00%</td></tr> <tr><td>5</td><td>26</td><td>96.30%</td></tr> </table>	1	0	0.00%	2	1	3.70%	3	0	0.00%	4	0	0.00%	5	26	96.30%
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Fig. 3: Comparison of clusters for each scoring fields of recency, frequency and monetary

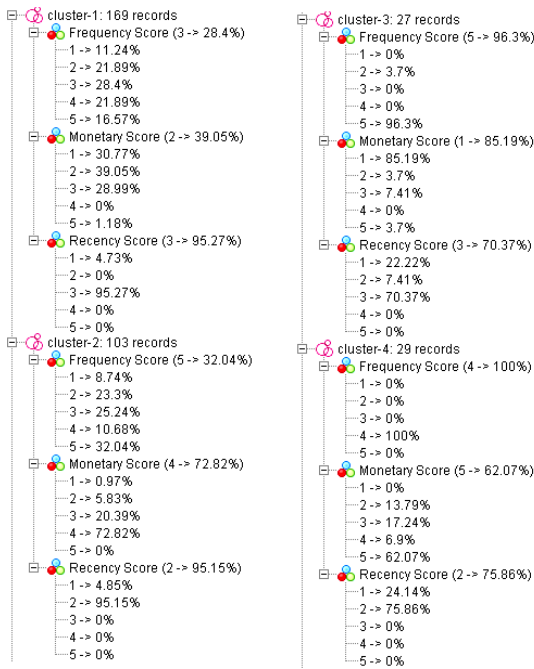


Fig. 4: Comparison of clusters for each scoring fields of recency, frequency and monetary

- Cluster 3 includes 7% of customers; frequency score 5, monetary score 1 and recency score is 3. The rating CLV index for this cluster is 9
- Cluster 4 includes 7% of customers: Frequency score 4, monetary score 5 and recency score is 2. The rating CLV index for this cluster is 11
- Cluster 5 includes 7% of customers: Frequency score 5, monetary score 5 and recency score is 2. The rating CLV index for this cluster is 12

**CONCLUSION**

Today by emergence of competitive markets, the customer's role in the success and survival of organizations is more than ever and companies' interaction with customers is significantly modified. The role of customers in form of following the producers changed to roles in form of leading the manufacturers. Therefore, Customers' segmentation helps organizations in targeting their services customization and prioritizing products on the basis of its profitability. Organizations' success is in attracting and keeping customers (Balaji and Srivatsa, 2002).

One of the major and affecting issues in the management of dynamic companies like insurance companies is the respect and attention to the customer relationship management issues (Khatami *et al.*, 2011).

The use of information technology and communication tools in order to achieve the optimal customer relationship management not only causes continual interaction with customers and ultimately lead to their satisfaction and loyalty, but it also creates profits for insurance companies and helps them to gain competitive advantage over other competitors. Since most vehicle insurance policies are issued in one year period and it would be expired after the period, end of insurance period may lead to end of customer's loyalty. Therefore, recognition and identification of customers whom are more likely to repurchase or renew their insurance policies is important for insurance companies and it helps them in targeted marketing and advertising, keeping existing customers and identifying future customers.

Due to the rapid development of information technology, the volume of information stored in databases of insurance companies is rapidly increasing and these large databases contain large amounts of data and potential opportunities in valuable business information (Cheng and Chen, 2009). Today, the role of customers in form of following the producers changed to roles in form of leading the manufacturers, thus, customers' segmentation helps organizations in targeting their services customization and prioritizing products on the basis of its profitability. Like other economic sectors, recognizing and attracting low-risk and profitable customers for the insurance industry is also important. Understanding different groups of customers and creating an effective communication with them as to guarantee the future economic benefits is very important in the insurance companies. In our country, vehicle insurance is one of the most important fields of insurance that has a major contribution in the portfolio of insurance industry. If insurance companies segment customers according to their observable characteristics, they can increase the coverage rate and their profits. In addition, the burden on low risk individuals to compensate the losses incurred by high risk individuals can be reduced (Wu *et al.*, 2009).

In this study, we aimed to provide a framework for customers' (vehicle insurance clients) segmentation in Pasargad Insurance Company, based on the factors affecting customer lifetime value. For this purpose, a series of transactions related to the 384 customers of Pasargad Insurance Company in the spring of 2015 were considered. Transaction data included customers' purchase Recency (R), Frequency of insurance policies renewals in the six years period (F) and the Monetary amounts paid by each customer for vehicle insurance policy in the last purchase (M).

Modern marketing is based on customer segmentation but one of the key challenges for planners and managers in the field of banking services, credit institutions and insurance companies is to achieve the standards or criteria for the classification (segmentation) of customers in such services. Certainly the use of appropriate model for customer segmentation to provide the organization with an opportunity to design its valuable suggestions tailored to the needs and demands of the targeted sectors. As a result, company performance will be improved in various perspectives (Jahangiri *et al.*, 2014).

Using tools such as scoring customer makes the organization to focus with a maximum effort to identify, attract and retain customers with greater profitability. Customer lifetime value as criterion for valuing customers, can be a framework for this task. The main objective of this study was to develop an adapted model for customer segmentation through RFM Reference Model in Pasargad Insurance Company.

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