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Determining the Customer Lifetime Value based on the Benefit Clustering in the Insurance Industry

Elham Farzanfar and Narges Delafrooz*

Department of Business Management, Rasht Branch, Islamic Azad University, Rasht, Iran; delafrooz.n@gmail.com

Abstract

Background/Objectives: This research is conducted in order to determine the customer lifetime value based on the benefit clustering in insurance industry. **Methods/Statistical analysis**: When calculating the customer lifetime value, the inputs are as follows: Learning costs, customer loss rate, discount rate, the cost of maintenance, periodic income, period of time, the difference in the profit and loss (profit margin).Customers of the insurance company have been studied over a period of 4 years. Data for this study were obtained from the database **Findings**: According to the indicators mentioned above, and customer lifetime value formula by Safari Kahreh presented in 2014, the customer lifetime value was calculated for customers of 10 types of insurance. Then, based on the customer lifetime value calculations, the value of each segment of customers was measured, and the percentage of customer lifetime value (profit) was also measured for 10 different types of insurance. Customers were sorted in descending order based on profit rates, and were classified in four gold, silver, lead and bronze categories. **Conclusion/Improvements**: Finally, some proposals were presented to the company to improve customer relationship management system.

Keywords: Benefit Segmentation, Customer Lifetime Value, Customer Relationship Management, Insurance Sector

1. Introduction

In a competitive market where traditional notions of good or bad customer loyalty has declined, customer service will tend toward complexity. Customer relationship management can effectively increase customer service, and guarantee customer maintenance. Some companies can compete effectively and with the application of the principles of customer relation in marketing are winners of the competition, since their strategies and technologies are based on the use of customer relationship management. Today, companies do not rely on selling their goods, but are trying to create more profitable customers. They not only want to create profitable customers, but want to keep them in all their life.

A concept such as Customer Lifetime Value (CLV) has made this possible for us. Customer lifetime value focuses on the customers' behaviors. The main idea of customer lifetime value is that customers should be judged on the basis of their profitability for the organization[1]. Today, the organization tend to customer-oriented, so customers are considered as an important asset that are invested for in organizations. Customer lifetime value is a measurable asset[2].

Using the concept of the customer lifetime value as a customer segmentation feature allows organizations to spend their time, capital, and energy for customers that are hoped to be profitable and increase cash flow[2]. The present study uses the confirmed formula by Safari Kahreh[5] for determining the customer lifetime value, and then customers' benefits are segmented. The study is performed on customers of one of the largest insurance companies. This research segments the customers based on the desired benefit that is their higher profitability, and

*Author for correspondence

identifies the key and golden customers to provide the context to improve performance of customer relationship management.

2. Customer Lifetime Value

The customer lifetime value is a basic principle of customer relationship management. There are various definitions of customer lifetime value. Cutler[15] has noted that customer lifetime value is a net profit that is obtained from a certain customer during its lifetime, that is the time he/she buys goods from a company. In another definition, customer lifetime value includes the calculation of his/her total financial combination, that is income minus costs of a customer (net income by a customer) during his/her connection with the organization[3]. In general, it can be said that customer lifetime value is the value that is created by customer for the organization during his/her lifetime. In addition to the current value of customers, this concept also refers to their future and potential value for the company. The main purpose of its calculation is creating a weight perception of customers for the purpose of allocating resources to them[4]. Moving towards customer oriented marketing, at the same time that increases access to customer information and transactions, enhances the interest in measuring and estimating customer lifetime value[5]. There are various methods and formulas for calculating customer lifetime value.

2.1 Calculate Customer Lifetime Value

Customer lifetime value is studied with names such as customer value, equity, and customer profitability. This concept is a sum of profits obtained from customers on the lifetime of transactions, after subtracting the total cost of attraction, sales, and customer service, with respect to t for a limited period of T time[6]. In general, the formula for calculating customer lifetime value is as follows:

$$\mathrm{CLV} = \sum_{t=0}^{T} \frac{profit}{(1+d)^t}$$

$$\mathrm{CLV} = \sum_{t=1}^{T} \frac{\mathrm{Re}venue}{(1+d)^t} - \sum_{i=1}^{T} \frac{\cos t}{(1+d)^t}$$

In this study, we try to determine customer lifetime value based on benefit segmentation. According to research, one of the key factors when decision makers use CLV measure is that the company be able to provide a correct prediction of each customer in its database[7]. It is clear that correct prediction of CLV is highly important. In addition, such predictions are used as a guide to invest in customer units[9].

When calculating the customer lifetime value, input data in this study would be as follows:

Learning costs, customer loss rate, discount rate, cost of maintenance, periodic income, period of time, the difference between profit and loss (profit margin).

- Learning cost: The amount of money that a marketing department should spend to meet a new customer.
- Customer loss rate: The percentage of customers who end their relationship with a company in a given period. The customer loss rate is specifically used for subscription services such as remote telephone service or magazines.
- Discount rate: Cost of capital used to reduce the income obtained from a customer in the future, which is frequently ignored in calculating customer lifetime value.
- Cost of maintenance: The amount of money that a company should pay in a given period of time to maintain a customer. These costs include customer support, billing, development incentives, etc.
- Period of time: The time unit intended to analyze the relationship for a customer.
- Periodic income: The amount of income collected from a customer in a period of time.
- Profit margin: Profit as a percent of profit return. Depending on the circumstances, it may be reflected as a percentage of net or gross income. Development marketing that has not suffered any overall development costs is determined with profit. Here, the difference of gross profit is acceptable[9].

2.2 Customer Relationship Management

Different definitions of customer relationship management are provided by the researchers. Thompson[10] consider customer relationship management as strategy; some consider it as technologies, some as process, and another group as information system. Bohling et al.[11] stated that of customer relationship management consists of methodologies, processes, are software that help the organized management of customers. According to Payne et al.[12], customer relationship management means creating and maintaining a clear relationship with profitable customers, through the appropriate use of information and communication technologies[13]. According to the definitions above, customer relationship management is the process of designing an organization around customers, that at the operational level examines the development of sales and marketing applications and their integration, and t the other level, considers how to create and maintain long-term relationships, and how to develop strategies and policies to achieve them. Customer relationship management is an approach in the entire organization; not just to gain knowledge about customers, but also to improve and automate business processes for customers, suppliers and employees[14].

2.3 Segmentation

Market segmentation is the process of dividing the market into distinct subsets in which customers have the same needs and behaviors. Each of these subsets can be considered as a target market and specific strategies should be used to access them. The market segmentation is also defined as a process to assess the attractiveness of each section of the market, and selecting one or more segments of the market (target market)[15] with the highest potential income as a customer or customers[16].

Literature on the segmentation is rich and relatively complete, and there are many methods for segmentation. In this study, customers are segmented based on the percentage of CLV. In a study conducted by Kumar and Vankatsan[17] it was concluded that customers who were segmented based on the percentage of CLV, were more profitable for the company.

2.4 Benefit Segmentation

Since different groups of customers require different marketing combinations, segmentation is necessary in marketing strategies. Statistical, social, and economic segmentation based on age, sex, marital status, income, occupation, education, religion, social class, etc. assumes that these variables have an impact on customer behavior, and can be used as representatives for analyzing direct needs. Lifestyle segmentation divides the market into segments based on activities, opinions, and tastes. However, compared with the demographic features that are measurable, there is no fixed definition for lifestyle[9].

Since the ultimate goal of segmentation is creating in-group homogeneity and out-group heterogeneity, segmentation based on the direct scales of expected benefits is a reasonable proposal. This method was accurately and appropriately described by Russell Halley in 1968 as benefits segmentation. It is a method for market segmentation that helps to understanding the market segments through causal factors rather than descriptive factors. The basis for this segmentation strategy is that benefits that people seek in consumption of an offered product are the main reason to create real market segments[9].

In some markets, segmentation based on the benefits, requirements, or incentives is more powerful than demographic factors or product features to understand the market dynamics. Benefit segmentation studies regularly discuss attributes or features as benefits. As a result, the benefits as causes of features preference are often overlooked, since the same features may lead to various benefits[9].

3. Literature Review

Results	Research title	Researchers
Using different RFM model, customers were clustered into 8 groups	A model for determining the customer lifetime value in the banking industry	Sohrabi, Khanlari, and Ajorlou[18]
Data provided from a finance corporation in Belgium. It shows the information between 2000-2005 consisting of 460. 566 customers. Main result this paper: The new approach of Pareto has higher performance than the older one.	A modified pareto/nbd approach for predicting customer lifetime value	Glady, Baesens and Croux[19]
With determination of CLV, 210 customers of Tous Sharaf trading company were clustered in six clusters	Using the Fuzzy Delphi Analytic Hierarchy Process (FDAHP) and Hierarchical Cluster Analysis (HCA) in RFM model to determine the customer lifetime value	Kaffashpour and Alizadeh[20]

Based on the formula provided by the customer lifetime value, customers of a commercial bank were clustered in 6 groups and Gold customers were determined	Analysis of customer lifetime value application based on the benefit segmentation in the banking sector	Mohammad Safari Kahreh Mohammad Tive Asghar Babania Mostafa Hesan[9]
In this paper, a multi-channel and multi-media framework is presented based on the concept of lifetime customer value. The framework started with data from the enterprise database, and segmented customers based on their value to the company.	Customer lifetime value approach based on multi-channel marketing in a retail environment	V. Kumar[21]
In this study, using the formula $CLV_{j} = (PPC_{j})+LI_{j}*(FPC_{J})$, it was showed that upper 28% of customers produce 80% profit for the company, and finally 3 following strategies were offered to improve business processes: 1. Develop an acceptable policy based on customer relationship 2. Develop a management strategy based on segmentation and customer lifetime value 3. Provide 100% satisfaction for upper 20% of customers (the same group that provides 80% of profits)	Application of customer lifetime value model in make-to-order manufacturing	-Oya I. Tukel and Ashutosh Dixit[22]

4. Research Methodology

4.1 Research Implementation Process

In this study, we try to determine customer lifetime value based benefit clustering. There are several formulas for calculating customer lifetime value. In this study, the following formula is used:

$$CLV = \sum_{i=1}^{n} \frac{Pt(St * Mt)}{dt} - \sum_{i=1}^{n} \frac{(Pt * Dt) + (Rt)}{dt}$$

(Safari Kahreh et al.[5])

Each parameter of the formula is described in detail in Table 1:

Table 1. Introducing the essential parameters for CLV model of the research

Description	**CLV parameters**
The possibility of continuing interaction of the customer with the bank, the amount of maintenance, the amount of customer loyalty, the rate is calculated using the following formula. $P_{t = 1-CR}$ ، و CR = churn rate	P_t
The average value of customer accounts and liquidity savings after account subtraction, in terms of insurance, this value is the total amount of premiums from customers.	S_t
the profit margin for St, in other words profit margin for insurance activities	M_t
Discount rate that is equal to the rate of inflation + 1	d^t
The first group related to costs associated with accounts	D_t
The parameter is the first cost group which is related to indirect costs. This include costs such as marketing costs, depreciation costs, advertising costs or personal expenses, etc.	R_t
Number of periods	n

Cutler[15] stated that customer lifetime value is net profit obtained from a customer during his/her lifetime, when the customer buys goods from a company. Therefore, customer lifetime value is the profit created in an economic institution in all stages of maintaining a customer relationship. As mentioned earlier, according to Cutler, customers can be classified on the basis of benefit. In this study, the expected benefit is higher profit created by the customer. The higher amount of CLV shows the higher net profit, and customers in that segment are identified as gold customers for the organization. One of the major applications of the customer lifetime value is in area of selecting in segmenting customers. By collecting and analyzing data from various sources, it is found customers who were selected based on customer lifetime value are more profitable for organizations[17]. For segmentation using CLV, customer lifetime values are sorted in descending order. In this method, the criterion for benefit segmenting is higher profits or higher lifetime value[23].

The procedure is shown in Figure1.

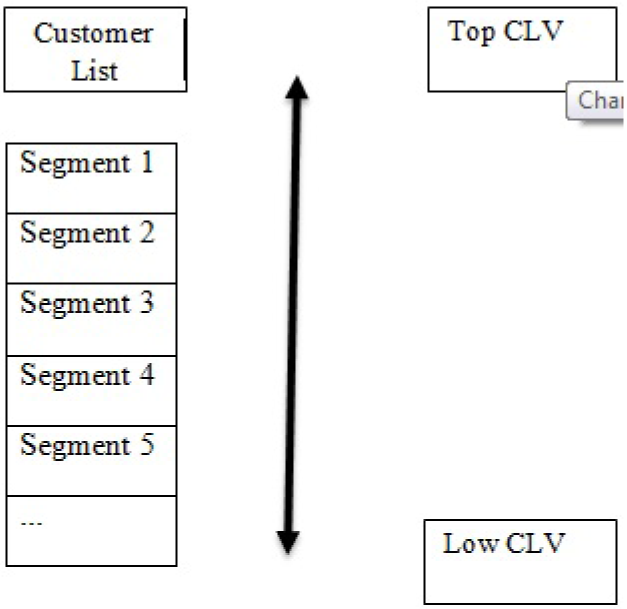

Figure 1. Clustering method.

After using the formula presented above, customer lifetime value was measured. For benefit segmentation through CLV, the total amount of lifetime customer value for each field of insurance is arranged in descending order. Then, the percentage share of each customer in total CLV is calculated. After the above steps with regard to the concept of segmentation in Figure 1 and procedures in Figure 2 [24], customers are segmented. It is shown in the figure that how some of customers are very valuable, while some customers may have a negative effect on profit of the organization. A result that is generally taken from the profitability studies is that customers who are

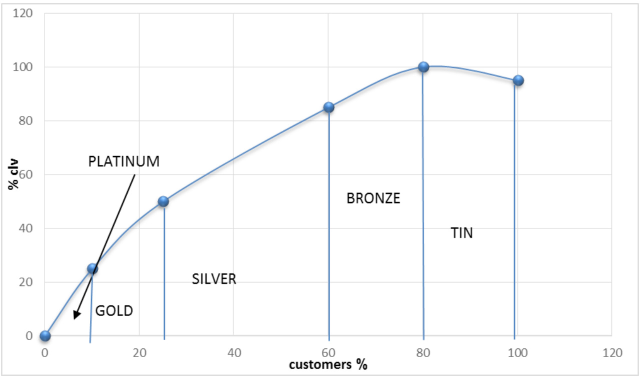

Figure 2. Different customers in terms of their profitability.

the most profitable are only ten percent of total customers, while their profitability is about 25 percent[25].

All actions taken in the framework of the proposed model is shown in Figure 3. Finally, after determining the customer lifetime value and customer segmentation strategies and suggestions for customer relationship management has been expressed.

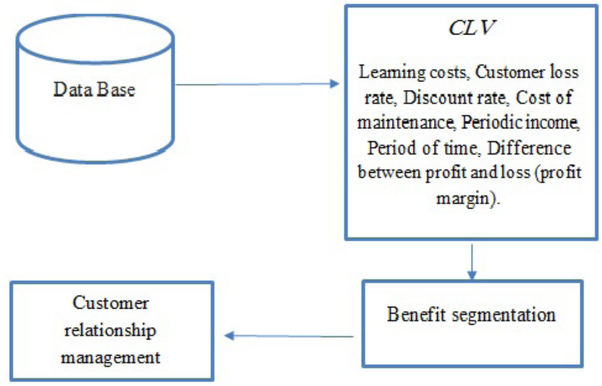

Figure 3. The proposed process model.

5. Research Results

5.1 Results Analysis and Discussion

The following table presents summary of calculations for customers of 10 types of insurance in the past 4 years. The Table 2 shows that the highest amount of customer lifetime value in the past 4 years was for third party insurance, and the lowest amount was for freight insurance.

Table 2. Summary of the calculations for the past 4 years

	1389	1390	1391	1392
Type of Insurance	**CLV**	**CLV**	**CLV**	**CLV**
Fire	$1.78634*10^{4}$	$2.12536*10^{5}$	$1.84499*10^{5}$	$1.26263*10^{6}$
Freight	$1.1911*10^{2}$	$1.52977*10^{2}$	$8.12322*10^{1}$	$7.54559*10^{3}$
Auto body	$1.48088*10^{4}$	$1.7566*10^{5}$	$1.82739*10^{5}$	$9.63694*10^{5}$
Third party	$6.1267*10^{4}$	$1.27089*10^{6}$	$1.60317*10^{6}$	$6.98733*10^{6}$
passengers	$4.60102*10^{3}$	$9.33788*10^{4}$	$1.6099*10^{5}$	$6.78952*10^{5}$
All risk	$1.0243*10^{3}$	$2.47751*10^{4}$	$9.94221*10^{3}$	$4.24523*10^{4}$
Responsibility	$1.17674*10^{4}$	$1.33343*10^{5}$	$1.6601*10^{5}$	$1.02469*10^{6}$
Life	$1.2553*10^{4}$	$1.85579*10^{5}$	$1.9164*10^{5}$	$4.6434*10^{5}$
Accidents	$2.80331*10^{3}$	$4.72785*10^{4}$	$3.43984*10^{4}$	$1.01432*10^{5}$
Medical	$5.36732*10^{4}$	$2.72062*10^{5}$	$1.34028*10^{5}$	$6.82856*10^{6}$
Total	$1.80481*10^{5}$	$2.41565*10^{6}$	$2.6675*10^{6}$	$1.83616*10^{7}$

The Table 3 summarizes CLV for each of customers. The second column of the table presents share of each customer of the total CLV (percentage). Total CLV for all customers in relationship marketing literature is called customer equity [26].

Table 3. CLV percentage

Type of insurance	%
Third party	42%
Medical	31%
Fire	7%
Auto body	6%
Responsibility	6%
Passenger	4%
Life	3%
Accidents	1%
Freight	0
All risk	0

The numbers in this table are shown in Figure 4 represents the type of insurance it is concerned the horizontal axis and the vertical axis shows the percentage of customer lifetime value

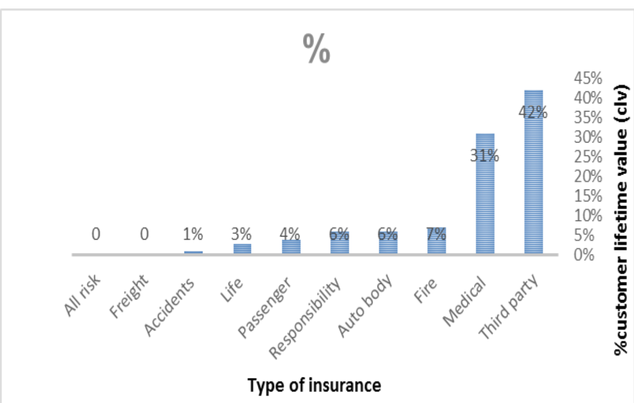

Figure 4. Diagram of CLV percentage.

The following Table 4 shows the total number of customers in percentage. The total number of customers to the insurance company is determined based on percentage, in which the highest passengers is for third party and passengers insurance with 4-year average of 35%.

However, based on the results of calculations, and considering the concept of segmentation in the Figure 5, segmentation was performed on customers. The result of segmentation is shown in the Table 5. In this table, customers are divided into four groups. As shown in the table,

Table 4. Number of customers (percentage)

Type of insurance	%
Passenger	35%
Third party	35%
Fire	17%
Auto body	7%
Accidents	3%
Responsibility	2%
Life	1%
All risk	0%
Freight	0%
Medical	0%

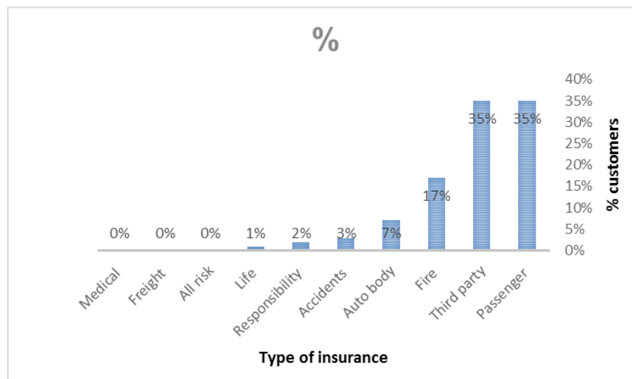

Figure 5. Diagram for percentage of customers.

only one group of customers can be considered gold. One group of customers is silver that is less valuable than the first group. 6 group of customers are low-value of organizations and 2 other customer groups are worthless for the organizations, and spending resources on them is false.

Table 5. Customer segmentation

Segment	Customer
GOLD	Third party Insurance
SILVER	Medical Insurance
BRONZE	Fire Insurance, Auto body Insurance, Responsibility Insurance, Passenger Insurance, Life Insurance, and Insurance.
TIN	Freight Insurance, all risk Insurance

It is also shown in the Figure 6 that how a group of gold customers provide high value for the organization. The situation for lead and tin customers is also well represented. A large percentage of customers are placed in low-value customer groups of organization, which can cause damage for insurance companies. The insurance companies should better identify their customers to enhance customer value.

The following diagram shows different types of customers based on their percentage of profit for the organization.

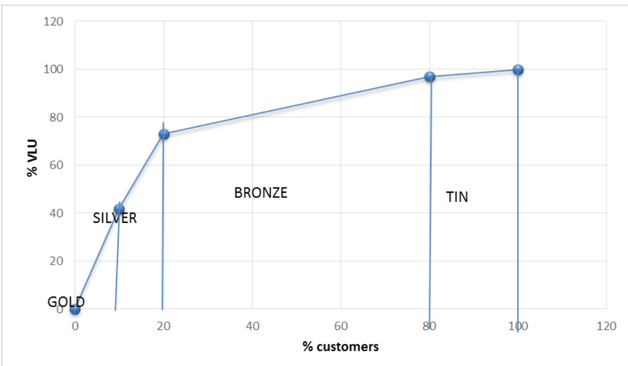

Figure 6. Types of customers in terms of value for the organization.

6. Conclusion

In this study with the purpose if determining customer lifetime value based on the benefit segmentation, CLV was calculated for each group of customers of an insurance company for the first time, and finally the gold customers who had the highest profit rate for the organization were determined. In other studies, such as Razmi and Ghanbari[4], the customer lifetime value of one of the major insurance companies for health insurance was carried out using the proposed model.

CLV approach enables us to realize the goals of market segmentation, since development of close relationships with those customers who are profitable or potentially profitable for the organization is a key goals of customer relationship management in market segmentation, that can be realized through the concept of customer lifetime value.

Based on this segmentation and identification of the customers, the company can develop appropriate programs to retain existing customers and to identify and attract new customers. Therefore, the guaranteed high performance of the organizations must be sought in a successful customer relationship management, and for achieving these objectives of the organization the task should begin with those who are associated directly with customers[27]. Finally, an appropriate marketing programs, price discounts, and rewards for profitable customer are strategies to attract and retain customers.

7. Limitations and Recommendations for Future Research

The information needed to calculate the customer lifetime value was not available in a long-term period. In addition, according to information obtained from the insurance company, there were restrictions on the use of other methods to measure customer lifetime value. In order to compare the results of the calculation of customer lifetime value, other researchers are recommended to apply the same methods for other insurance companies. Researchers can also use RFM method and other formulas such as $\mathrm{CLV} = \sum_{i=0}^{T} \frac{\mathrm{Pr}\,ofit}{(1+d)^t}$ to determine the lifetime value of their customers and compare the results.

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