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IMPROVEMENT OF CUSTOMER RELATIONSHIP MANAGEMENT (CRM) USING DATA MINING TOOLS

Improvement of Customer Relationship Management (CRM) using Data Mining Tools

Syeda Shaheda Siddiqui

Lecturer, MIS Department, College of Business Administration, King Saud University, Riyadh, Saudi Arabia

Abstract – This research article conducts a study on the subject of improvement of CRM using data mining tools. Taking a critical point of view, the study is a discussion of the role of data mining tools in making advancement in CRM implementation. However, the study as well broadly discusses the concepts and various points of views related to CRM functions. The study is conducted relying solely on secondary research. The article begins with defining and conceptualizing of the CRM, and further looking into the use of data mining tools in CRM through defining and conceptualizing of data mining. The main body of the article discusses the useful models of CRM and useful data mining methods as well as tools applicable in CRM.

The article concludes through the discussion that the method or technique of data mining might help out business organizations to extract or spot the presence of lifetime customers in the market, and further generate value for the analysis of performance data and customer Behavior. CRM functions led by data mining models revolve around four aspects of customer relationship in the forms of customer identification, customer attraction, customer retention, and customer development. Data mining techniques applied in CRM helps out a business organization to have deeper understanding of acquiring data in a non-intrusive, low cost, highly accurate manner, though managing these bulky sets of data is extremely challenging.

Keywords: CRM, Data Mining Tools

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1. INTRODUCTION

1.1 About CRM

CRM is a recent phenomenon in the field of customer relationship and marketing, and is still in its evolving phase, yet much has been researched and established about its methods, processes and value deliverance. Whilst conceptualizing CRM in this paper, it is worth to begin with some useful definitions. Swift(2000) defines CRM as "*A system of recognizing the behavior of customers all the way through concentrated communication with them aiming to get better the performance which is signified in appealing the customers, keeping hold of them and increasing their loyalty and effectiveness*" (p.p. 12-13). From this definition CRM appears as just communication extended from the part of the organization in a bid to recognize the behavior of customers. Furthermore, Stone and Findlay (2001) define CRM as "*The organization undertaking various information regarding the customer from different resources and holding it for breaking up the territories, analyzing and reutilizing*" (p. 167). This definition of CRM elucidates CRM as just gathering and recording information regarding the customers. Moreover, Fross and Stone (2001) define

CRM as "*The organization utilizing of its capabilities in the area of research method, technology and e-commerce for managing customer relationships*" (p.1). In this definition, the concept of CRM is defined as the capability to make use of technology in the area of managing customers. One of the most talked definition is the one given by Parvatiyar and Sheth (2002) who define CRM as "*A broad strategy that consists of the procedure of getting hold of certain customers, holding them and working together with them to generate a great value for both the business organization and the customers*" (p.5). This definition signifies that CRM is a strategic endeavor from the part of business organization that integrates marketing and customer service with the needs and wants of the customers in order to accomplish the utmost capability and competence for delivering value to the customers. CRM in fact is an all-inclusive process working to acquire, retain and collaborate with specific customers to generate superior value for both the business organization and its customers, where there is carried an incorporation of marketing, sales, customer service, and supply chain operations of the organization to accomplish

superior effectiveness and efficacy through delivery excellent value.

1.2 Use of data mining tools in CRM

Use of data mining tools in CRM is a rising drift in the world of marketing and business, where the fundamental idea is analyzing and recognizing behavior and traits of customers for extending a competitive CRM strategy in a bid to get hold of and keep profitable customers through maximizing their value deliverance. In the obtainable research literature there are number useful definitions. Turban, Aronson, Liang, and Sharda (2007) define data mining as "The procedure that makes use of statistical, mathematical, simulated astuteness and machine-learning methods to take out and recognize functional information and afterward get knowledge from bulky databases" (p.305). Berson, Smith and Thearling (2000), and Berry and Linoff (2004) as well define data mining in a similar manner as being the procedure of extracting or detecting secreted models or information from bulky databases. In this framework, Berson, Smith and Thearling (2000) argue that suitable data mining methods and tools, which are fine at extracting and recognizing functional information and knowledge from huge customer databases, are one of the excellent supporting tools for creating CRM decisions in a different way. This implies that data mining is a database and information-led technological application in CRM application, which functions differently and effectively in the direction of delivering maximized value for the potential and profitable customers.

2. LITERATURE REVIEW

2.1 Customer Relationship Model

CRM can be perceived from a range of perspectives such as customer relation process, customer relationship strategy and technological application in managing customers (Zablah, Bellenger and Johnson, 2004). In this framework, Zablah, Bellenger and Johnson (2004, p.p. 475-489) put that there might be five points of views for defining and conceptualizing CRM in the forms of process, strategy, philosophy, ability and technology. These points of views are described in the table given below in relation to their description, success requirement and concept. The table gives a clear idea as how process, strategy, ability, philosophy and technology work as contributing in managing customer relationship effectively, and what would be the success requirement.

Point of view	Description	Success requirement	Concept
As a process	Improving the relationships between the seller and the buyer; this relationships must be strong and endurable.	The institution should have the ability to discover the customer's desires and to respond to them.	CRM is creating and enhancing the engagement and relationships with the external parties, specially the agents and end-consumers.
As a strategy	The value of the life period of the customer with the institution determines the amount and kind or resources that the organization can invest in a relationship.	The institution should assess its relationship with the customer continuously. It should assign priorities in dealing with him/her on basis of the quantitative profitability during the life period of the customer.	CRM is the investment of the companies in the customers who are expected to be valuable for the institution, and the reduction of investment in the valueless customers of the company.
As a philosophy	Customer retention can be better achieved through focusing on establishing relationships and maintaining them.	The customer should be the focus of the attention of the institution, which should be oriented towards understanding the changeable needs of the customer.	CRM is not a temporary project, but a work philosophy, which aims at putting the customer in the focus of the attention of the organization.
As an ability	Profitable and long-term relationships only arise when the companies are able to customize its behavior continuously towards every customer.	The company should possess a group of tangible and intangible resources, which the company uses to flexibly remodel its behavior towards the customer continuously.	CRM means the desire and ability of the institution to custom its behavior towards every customer, on the basis of the information the customer tells and what the institution knows about that customer.
As a technology	Knowledge management and reaction represent the main resources that the institution needs to establish profitable and long-term relationships with the customer.	The institution should be directed with the functional method, and also the user's acceptance of the technology applied by the institution in order to establish the customer's knowledge and reaction management.	CRM is the technology used to integrate sales systems, marketing systems and information systems to establish relationships with customers.

Table 1: Defining the concept of CRM

Source: Soliman (2011, p.168)

CRM as a process improves relationship between the organization and its customers, through the capability to identify the customers' desires and to respond to them, where the engagement and relationship might be created and enhanced with the external parties. CRM as a strategy is focused on the value of life period of customers with the organization, where the organization is expected to assess its relationship with the customers continually on the basis of quantitative profitability, and making investments in valuable customers. CRM as a philosophy is focused towards customer retention which can be better accomplished in the course of establishing relationships and keeping up them, where the success requirement all concerns to understanding the changeable needs of the customers, and putting the customers at the centre. CRM as an ability is making profitable and long-term relationships by the business organization proficient to customize its behavior continuously towards every customer, where the business organization needs to possess a grouping of tangible and intangible resources in relation to the information the customers share and what the organization knows about the customers. CRM as a technology concerns to knowledge management of the business organization for establishing profitable and long-term relationships with the customers, where the operation is to utilize technological tools integrating sales systems, marketing systems and information systems to establish relationships with customers. Hence, any application of CRM in a business organization may well be evaluated from the point of

view of a process, a strategy, a philosophy, ability and a technology.

Formerly various scholars examining the relationship between buyer and seller have extended models of relationship development procedure (Evans and Laskin, 1994; Wilson, 1995). In this framework of CRM as a process, Parvatiyar and Sheth (2002) have extended a four-stage CRM process model. The model is shown in the Figure.
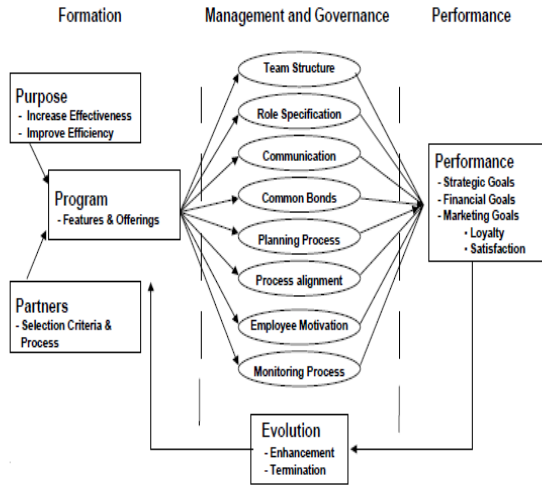

Figure 1: CRM Process Model

Source: Parvatiyar and Sheth (2002, p.9)

The model consisting of the four sub-processes in the forms of a process of customer relationship formation, a process of relationship management and governance, a process of relational performance evaluation, and a process of CRM evolution or enhancement. This is a proven model of applying CRM as a process to maximize value from the point of view of both the organization and its customers, and therefore widely practiced and acclaimed by the researchers and practitioners in that order (Parvatiyar and Sheth, 2002). However, CRM as a process is not the only process as far as the world of business and market is concerned. CRM as a strategic model is widely held up by the scholars in the research literature.

CRM as a strategy is a model of CRM application, where the organization practices customer orientation all the way through recognizing the market and placing the resources in the direction of accomplishing the needs and wants of the customers and quantifying the capability to give a value for the customers, where the customer relationships are directly related to marketing performance. Soliman (2011) extends an effective model of CRM strategy directed to marketing performance. The model is shown in the Figure 2.
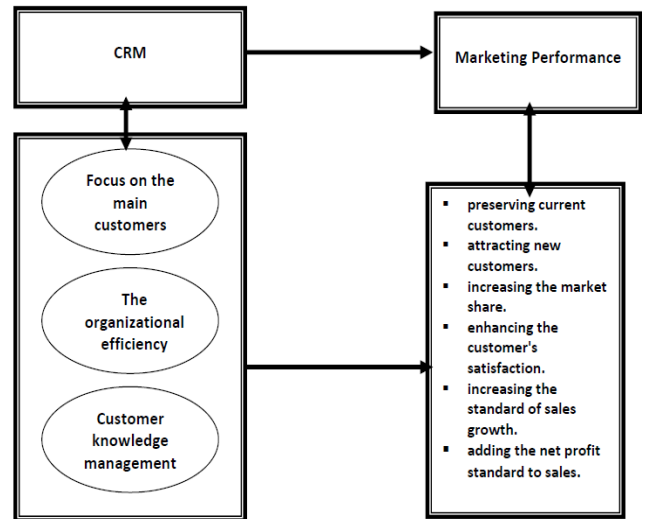

Figure 2: CRM Strategy

Source: Soliman (2011)

This model of CRM strategy is made of three strategic aspects in the forms of focus on the main customers, the organizational efficiency, and customer knowledge management. As per the model, these three strategic actions of CRM can be evaluated in relation to marketing performance comprising preserving current customers, attracting new customers, increasing the market share, enhancing the customers' satisfaction, increasing standard of sales growth and adding the net profit standard to sales. This strategic model of CRM is empirically proven, and therefore can be extended as an effective model of CRM strategy model.

Further the model of CRM technology can be best recognized in terms of e-CRM. Chaffey (2007) defines e-CRM as electronic CRM that is more web-based, where apart from customer contact through telephone and fax; it can also be achieved through the technological tools in the forms of internet, email, wireless and latest technologies. Farooqi and Dhusia (2011) have extended an effective model of e-CRM technology distinguishing from CRM technology, which is shown in the Figure.
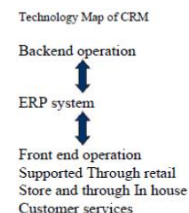

Figure 3: e-CRM Technology Model

Source: Farooqi and Dhusia (2011)

2.2 Data Mining Tools in CRM

Data mining concerns to the procedure of noticing attention-grabbing customer information and knowledge from bulky databases, where, such information and knowledge is available in diverse varieties, such as, a set of rules which might demonstrate in the midst of other things, or the links of products commonly being purchased by customers. Adopting a classification model there might be replicated the classification format secreted in a classified dataset. The data might be demonstrated as a cluster of data representing noteworthy distinction from the rest of the data (Gupta and Aggarwal, 2013).

The fundamental facet of data mining comprises the forming of a model making use of data, where every data mining method and tool might act upon one or more of the seven models of data modeling described in the obtainable literature. These seven models are association, classification, clustering, forecasting, regression, sequence discovery, and visualization (Ahmed, 2004; Carrier and Povel, 2003; Turban et al., 2007). It is notable here that there are several machine learning methods and tools accessible for every sort of data mining model, where options of data mining tools ought to be based on the data distinctiveness and business necessities. The CRM function led by these seven data mining models revolve around four aspects of customer relationship in the forms of customer identification, customer attraction, customer retention, and customer development, as per Ngai, Xiu and Chau (2009). This is shown in the Figure 4.
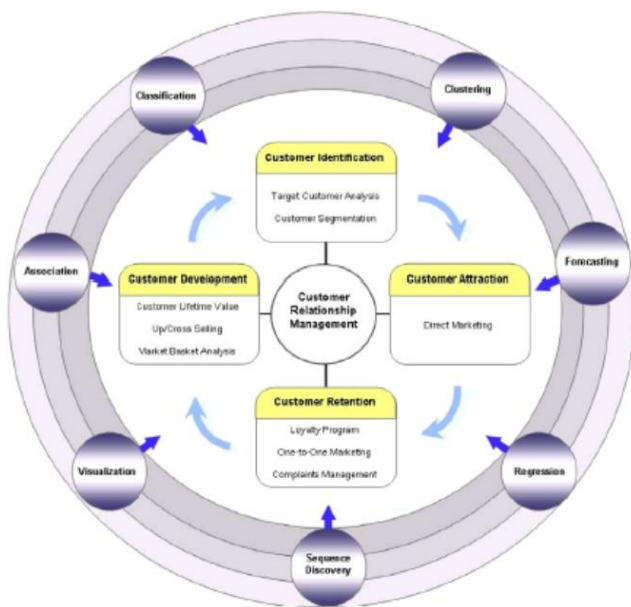

Figure 4: CRM function

Source: Ngai, Xiu and Chau (2009)

The method or technique of data mining might help out business organizations to extract or spot the presence of lifetime customers in the market, and further generate value for the analysis of performance data and behavior customer. As per a model extended by Ngai (2009), use and application of data mining in CRM may well be recognized from four points of views namely: clustering, classification, regression and association. The model is shown in the Figure 5.
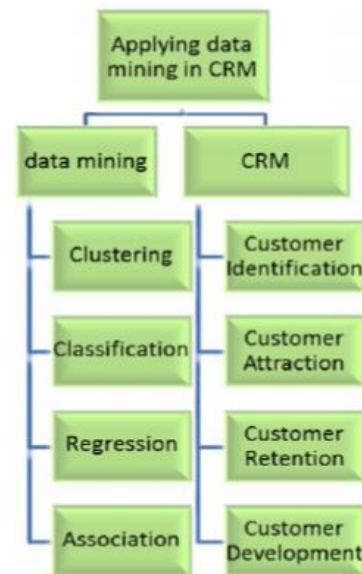

Figure 5: Applying CRM in Data Mining

Source: Ngai (2009) Cited From Rodpysh, Aghai and Majdi (2012)

In this model the clustering function of data mining can help the business organization to identify the customers as CRM strategy. Further the function of data mining in the form of classification conducts the CRM role of customer identification. Moreover, regression function of data mining conducts the role of customer retention in CRM. Finally association function of data mining works for customer development in CRM. This model of data mining use in CRM appears more lucid and effective than the one discussed previously.

2.3 Challenges and Advantages

The advantages of data mining in CRM are identified as many, where the main advantages are described as: data filtering to get rid of duplicate data; taking out, data management, analysis and access to value customers, keep hold of customers models; fast and accurate access to incorporated data; the utilization of accurate tools and superior data analysis and reporting; boost satisfaction of customers; and exert a pull on potential customers, keep hold of existing customers and add to market share (Rodpysh, Aghai and Majdi, 2012).

These above stated advantages of data mining in CRM leave no doubt reflect the scope of opportunities but at the same time involve several challenges as well, where foremost are: non-trivial results nearly constantly necessitate a grouping of data mining methods and tools; strapping necessity for data integration prior to data mining; varied data

sorts are generally run into, which necessitates the incorporated mining of varied and assorted data; dealing with highly and manifestly intense data; real-world validation of results is indispensable for approval; extending deeper models of customer behavior; for deeper recognition acquisition of data in a non-intrusive, low cost, high accuracy approach; and managing bootstrap predicament (Farooqi and Raza, 2011).

3. CONCLUSION

CRM in fact is an all-inclusive process working to acquire, retain and collaborate with specific customers to generate superior value for both the business organization and its customers. The data mining is a database and information led technological application in CRM application, which functions differently and effectively in the direction of delivering maximized value for the potential and profitable customers. CRM function led by data mining models revolves around four aspects of customer relationship in the forms of customer identification, customer attraction, customer retention, and customer development. Data mining techniques applied in CRM helps out a business organization to have deeper understanding of acquiring customer data in a non-intrusive, low cost, highly accurate manner, though managing bulky data set is challenging. This article is entirely based on secondary research, and therefore no empirical evidence is presented. Hence, the validity and reliability of the findings in this study can be improved through empirical research, examining the data mining and CRM models.

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Syeda Shaheda Siddiqui