

Analysis of various Customer Relationship Management

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Abstract— Within the CRM concept, most widely spread applications that are associated with the management of contents of the messages of clients. And the objective is to re-route the particular request implicitly for accurate service or may provide the immediate answers to frequently asked questions. The most famous banks are also using the Data-Mining applications for the customer-segmentation and for many other advantages, for the credit-scoring and for approval, also for anticipating the lapse of payment, marketing, etc. Now a day Banking and the Retail firm is observing that to obtain the competitive raise through implementing the data-mining is easy. And the Customer-Relationship-Management is also one domain that has been under focus for deployment of Data-mining. Many financial companies and business organizations have grown from rags to riches by tackling marketing issues by the Data-Mining. This is also made easy to enhance the efficiency of CRM, in order to have an efficient and rapid response to customer requirements, by integrating or combining CRM and DM techniques. In this study, the main concepts of CRM and DM techniques are investigated and employed in CRM. This paper gives the concept regarding the CRM by the use of Data-Mining approach.

Keywords—Customer Relationship Management, Clustering, Data Mining

I. INTRODUCTION

In modern days, mass production and new advertising techniques has changed the concept of conventional contest in the marketplace. Today, customer's ability to access the products is being increased. In this competitive condition of the market, one of the most significant principles for organizations is to maintain in good relationship with their customers or consumers, in order to guard their long term association. Currently, only the companies which alter their perspective about marketing can achieve more importance and high level of success and reputation [1].

CRM methodologies and tools help the business in order to maintain the customer relationships within a proper manner. CRM is managed through software in which companies provide the following customer's information: last name, first name, telephone number, address, places where the client prefers to purchase. It helps the company to better focus on the client and to send those offers, to provide products and services that meet their needs by reducing costs. The company has a tool that sets all the contacts. Different techniques are used to make the contact with the customers.

Data-mining is also termed as the analytical-intelligence approach or the business intelligence approach. As this is apparently one of the latest domains, it is also has been described in several manners within the history. [2] Few mostly applied approaches of data-mining are genetic algorithms, artificial neural networks, K-nearest neighbor, decision-trees, or data-reduction approach etc. This is one of the approaches that are equivalent to the other type of data-analysis approaches like on-line analytical-processing, spreadsheets or basic type of data-access. The approaches of Data-mining provide support in the business analysts in order to produce the hypotheses, but this never limits the concept.

So in this way the companies get communicated along with their customers may have extremely modified in the last few years. And the customer is running the business which is not guaranteed to be succeeded. Therefore, the companies may have observed that there is a requirement to find out their best customers also can provide the respond quickly according to their requirements and wants. Additionally, also the time requirement for these types of responses required has been reduced.

On integrating data mining with CRM, manager can get better results of predicting profitability, guiding decision making, decision forecasting and make the process proactive. As size of Industry's complex data sets are growing day by day, Integrated CRM along with the data-mining approaches has deployed within the Cloud-Computing area, so that both user and supervisor will be beneficial by accessing the service through Internet [3].

Traditional marketing focuses on mass(huge) marketing to expand the business but it also has been changed into one to one marketing due to tremendous growth of the information technology. All the above factors have favored the organization to concentrate on the CRM. An organization must rely on customers to achieve profitable goal. CRM is a set of process which provides the business plans in order to design a long term also a beneficial relationship among the customers.

II. APPLICATION

2.1 Application of CRM within Hotel Industries:

In this domain the CRM provides so much beneficial functionality and concepts in order to manage all the working of the hotel industries in an efficient way. Such that the CRM may provide seriousness amongst the hotel managers in order to made them more responsive towards the CRM rules and assist them in enhancing the hotel presentation and to be more ambitious.

2.2 Application of CRM within Banking and Insurance field:

The CRM may provide the solutions for the Banking also by enabling the multi-channel interaction or communication along with the customers in an effective way. This approach also differentiate the banks from their competitors by providing them most effective data gathering approaches, that are unified in respect of every client, it also improve the decision-making, and the product designing along with their sales. In short the CRM will enable the banks to understand their clients also to provide the way to use the communication with customers more efficiently.

2.3 Application of CRM within the Healthcare domain:

Additionally, the CRM model offer huge support within the management work of the hospitals and their patients that are creating complaints. Also CRM may contribute for providing education to the patients regarding their health and also how to deal with their diseases. Further, the CRM tools have been observed as an efficient tool for anticipating the future requirements of the patients.

2.4 Application of CRM in Higher Education

Within the higher education also, the CRM may offer a proper status report of each and every student or children along with all the working of the user within the school or college. Also the CRM may enable the students to perform the interactions along with their university being an individual entity through offering a proper learning of their presentation within an organization. For the students this concept consists of information like registration, enrollment, student-accounts and accommodation etc.

2.5 Application of CRM within Agriculture

As the CRM is mostly referred as the strategy, so it may be termed as CRM concept which has to include a sequence of functions which may provide the agricultural organizations an opportunity in order to achieve or manage the benefits against their competitors. In the Agricultural organizations this have to prepare a knowledge-base regarding the customers such that products or services that may meet the recent requirement and also the wishes of customers.

III. CUSTOMER RELATIONSHIP MANAGER (CRM)

The Customer-relationship-management is a crucial concept in every up growing company to explore their products. The growth of the company is depends on understanding the customer needs and services. CRM is especially for the change of business process to make remarkable growth in an organization [4].

CRM consists of a set of methods and systems that supports business tactic to support long-term and profitable relationships with customers. Customer's data and information technology (IT) tools are the crucial factors for any successful CRM. In addition, rapid internet is increasing and its related technologies have changed relationship and communication ways among companies and their consumers. So the opportunities for marketing/advertising have been increasing today [5].

In the special response to Telecommunication domain, CRM plays an important role as *Customer aspects; i.e. customer management, service management, tariff Plan management and customer Interaction a process of communicating with our marketing; that it is a process of communicating with our customer and listening to their responses.*

According to the Paul Greenberg, CRM is defines as: "CRM is study of fundamental nature of knowledge, reality and the business planning, which is supported by system and the technology and which is designed to enhance the human interactions with the business firms. It is a continuing business process which demands a dynamic, ongoing plan of action for customer agreement".

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The CRM concept is also divided into two major types such as Strategic and the operational [8]. And the information regarding the customer is provided in detail through the strategic type of CRM which is gathered and prepared the information regarding the customer. This may also provide support to the company in order to detect the customer's point of view over the company also

with their products. And the operational type of CRM may provide support in gathering the data associated with the customer also to analyze them recognizing the optimal customers. This is also providing the company the way to manage them. The CRM can be considered also as the software that may be expressed as the tool which is implemented within the organization or firm.

IV. VARIOUS PART OF CRM

4.1 Creating a Customer Database

Initial step of CRM is to provide a whole CRM solution which is the creation of the database of customer information in a file [4]. This step is performed as the base for any type of CRM. Like for the Web-based organization, it must be a direct work like the customer's transactions or the contact details that are observed as the obvious element of the communication with the customers.

4.2 Analyzing the Data

Basically, the customer's databases may get investigated [8] along with the purpose of defining the customer-segments. And various multivariate-statistical approaches that are range from cluster and the discriminate type of analysis that have been applied to the group along with the customers and by same behavioral way and the descriptive information that are applied then in order to evolved various types of products that are providing a direct marketing [5].

4.3 Customer Selection

After creating the database and then analyzed it, for the next step this is taken the customers in order to target. And the results that are generated from the analysis can be of several types. If the segmentation-type that is observed got performed over purchasing or may be have related behavior, then the customers within is at the desired segments that will normally be get selected.

4.4 Targeting the Customers

In this the mass marketing technique like TV, radio, or the print-advertising are the most necessary components for providing the awareness and also obtaining other types of communications goal, also they are badly paced for the CRM because of their impersonal behavior.

4.5 Relationship Programs

While the customer contact by the e-mail providing the most necessary element of the CRM. This is above than a technology for applying the CRM as compare to a program implementation. And the relationships are not generated and maintained with the e-mails only whereas it is made possible by the other types of programs which are provided for the e-mail that may have a delivery tool. And the entire objective of the relationship-programs [7] is to provide a high-level of the user's satisfaction.

V. CRM OPTIMIZED BY DATA-MINING

This concept of customer-relationship-management is one of the applications of various types of information technology sectors and this is the process having the goal to recognize the major expectations along with the preferences of clients also to utilize the collected information efficiently for enhancing the relationships in between business or the customers. In this the data-mining performs a vital part within the CRM through recognizing the behavior patterns of the customer from the usage data of customer and also anticipating that which customers are more prone to provide the respond to the cross-sell campaigns and to the up-sell campaigns, that is a significant part for each business [4]. Associated with the earlier customers, the data-mining may be utilized in order to observe the causes for the churns also to anticipate the churn [5].

Major concept behind the data-mining application for CRM approach is that the data obtained from past may also includes the information which may be essential for future works. This concept works since the behaviors of customer may be gathered within the corporate data that are not random; also it may represent the differing requirements, propensities, or the customer's treatments. And the Data-mining may enables the customer details that are significant in order to build an efficient CRM technique. It may also provide support to the personalized communication along with the customers and therefore it is raised the satisfaction and the beneficial customer-relationships by this type of data analysis. This may also provide support as an optimized-customer-management at overall the steps of the lifecycle of customer, starting from acquisition and development of the strong relationship till the prevention of the attrition along with the getting back the lost customers again [7].

The techniques of Data-mining may be applied successfully within CRM, particularly since the CRM may implement as a multi-dimensional technique. In order to build good model of CRM system, there are a number of steps that need to be followed. Following are the major phases of the data-mining approach for implementing the CRM: -

5.2 Define the Business Problem

Every application of CRM may have more than one business goals due to which they are required to design an efficient model. And based on these objectives this will design a very separate model.

5.2 Build a Marketing Database

Next process is to design a database for marketing as for the operational databases along with the corporate data-warehouse. This may also mostly not includes the data within the form in which it is required.

5.3 Explore the Data

This is necessary to understand the data before designing a good predictive model.

5.4 Prepare Data for Modeling

Before designing the models this is a final step of data preparation

5.5 Data-mining Model Building

And this is very significant step within this step an iterative process is made. Also is requirement is there in order to represent the alternative models for finding the one approach which is useful for solving the business issues. And various types of applications of CRM are dependent on a protocol called supervised learning.

5.6 Evaluate Your Results

Whereas the most high rate metric for determining the results is the accuracy. So the other measure which is regularly applied is the lift.

5.7 Deploy Model and Results

For creating a CRM application, the data-mining approach is mostly used as a small but a very complicated component of its final product. And the way in which the data-mining is designed within the application is to be examined by the behavior of the customer communication.

VI. LITERATURE REVIEW

Within this paper [9] represented that for the retailers, the data-mining approach may be applied in order to offer the information over the product sales, their customer purchasing pattern and their needs etc. This paper also offers a statistic of the ideas of the Data-mining and the Customer-relationship-management within the Banking and the Retail industries. In his paper also described the standard work which consists of a data-mining approach that determined the several data-mining implementations within various domains. And those types of banks and the retailers which may have analyzed the use of data-mining included it within the procedure of designing the data-mining area for the decision-making may provide extreme profits and also obtain relatively high competitive benefit to the competition in the future work.

Within this paper [10] describes how the Data-mining may be implemented for the various CRM issues. It is believed that steps outlined in this paper and the algorithm formulated is to a great extent successful in optimizing the existing CRM process. Though the algorithm may have some limitations, soft issues like CRM could bear with them as a high level of accuracy is generally not required. Successful implementation of the algorithm would benefit small business organizations as some of them cannot afford to buy Clementine or any other Data-mining software for that case which would make them void of Data-mining. Data-mining could provide drastic performance improvements for such business oriented organizations also.

In this paper [11] described as the need for data-mining tool is growing every day, the ability of integrating various data-mining technique on analyzing past data in cloud environment becomes more and more stringent. And the implementation of the Data-mining approaches within the CRM is an growing concept within the industry. Research on application of data-mining in CRM will increase significantly in the future based on past publication rate & increasing interest in the area. These articles could provide insight to Telecommunication Industry Policy creator over the data-mining applications which are used in all dimensions. From huge database, proposed model will take the inputs from customer profiles and options and decision will be taken accordingly for satisfaction through CRM.

This paper [12] provides an overview on how the data-mining may be proved helpful for an organization in order to provide better CRM objectives also to obtain the personalized and to be more efficient to the customer-management on the basis of customer details. It is concluded that the group of the business sectors along with the strength of the data-mining approaches may provide support to the organizations to achieve the competitive benefit in their functionality in order to enhance the customer-management. Also the Clustering approach is a collection of data-mining approaches which is a very commonly applied pattern to segment the data-set based on their same properties. This paper also targeted over the customer-segmentation by the use of data-mining

approaches. In short, in this paper theoretically described regarding the customer-relationship-management along with their utilization of the set of data-mining approaches particularly defined as clustering approaches for the customer-segmentation.

Within this paper [13] represented the customer satisfaction is dependent on the best products and their best services which is provided by the company. This is also true for all domains. In order to customize a product or a service, an organization may require obtaining more learning of the customer's behavior. So within the banking domains the medical insurance is completely a latest concept, and the bank managers, therefore may have to find out the difficulty in order to correlate the customer information along with the reached customer. By following this concept, within this paper initially perform the segmentation of the huge data-base by the use of clustering approach then introduced the data-mining approach in order to identify them and in end by the use of clustering attempt to detect a pattern for finding the right customer.

Within this paper [14] presented the target of this research work that was to develop an application that can provide SMEs and users, a centralized place from where they can select CRM, BPM or CRM-BPM-DM on Cloud. During the research study, there was an effort to fulfill above objective by developing "Cloud Based Integration of CRM systems with BPM and DM techniques for SMEs". Integration of CRM systems with Apriori Algorithm and BPM Systems has increased the sale of products which give higher benefit to SMEs and users. This integrated application has thus resulted into improved efficiency, performance, productivity, customer retention, customer satisfaction rate and profit of SMEs. Some of the limitations are also required to be resolved in the future. This proposed system "cloud based integration of CRM system with BPM and DM Technique" can be applied for fuzzy logic and neural networks. Customizations can be applied at BPM and CRM level. BPM has many features like Rules Engine, Knowledge Management, Collaborative Tools, Document Management, so all these features can be used in the CRM systems at the time of BPM integration.

Here presented in this paper [15] that this is a world in which the e-commerce is treated to be the most required aspect for the successful data-mining since it provides the appropriate components based on situation. And the existing concept is that the e-commerce may provide the customer-relationship-management implementation. And the businesses are focusing the customers that have the direct connection with the financial status of the country since the recent e-commerce-system is utilized by the people. In this paper targeted at the analysis over the e-commerce along with the data-mining approach suggesting an architectural model which is incorporating an enhanced CRM concept for managing the business issues and also provide help in building the strategies in order to improve the best CRM.

This paper [16] presented that the CRM concept is heavily used within the market for the old and the new customers. Within this research work represented the influence of the CRM technique over the factors like satisfaction of customer and their loyalty. As the CRM is referred as the significant component within the business in order to manage and raise their customer database. And in this analysis also describe the several factors which are required for an efficient CRM approach.

Here also focused on the issues which are taking the importance at the high-level officials within an organization that there is a proper relationship in between the CRM along with the satisfaction of customer and their loyalty. And if this is finding successful then it is analyzed how this may associate the CRM along with the customer-satisfaction and also with their loyalty. Along with the globalization of industries the competition has also raised. Additionally along with the proper analysis a basic hypotheses is created within this analysis which is validated that the results have represented that the high-positive-correlation is found within the variables that are taken for this analysis.

In this paper, [17] represented that since more users are working on the social media, so the marketers may use these concepts which are also rising. And 21 percent of the marketers declared that the social-media has now become the more significant factor to the companies since the last few years [35]. And the marketers have also analyzed that the customers through Facebook are 52 percent, LinkedIn are 43percent, from Twitter are 36 percent [35]. And social-media techniques as the major component of the CRM may have the capacity to provide the company and the customers nearer by the two-way communication. This was also represented that the s-CRM approach may efficiently help the customer-relations and the use of their facilities. This is also significant to use the s-CRM system by the point of supporting the information-management also enhancing the communication with the customers through the use of latest channels of the communication.

In paper [18], has described the analysis over the data-mining approaches for the optimal CRM. This is focused over the significance of one of the optimization approaches within the data-mining approaches. This is also describes the some of the predictive-models along with the functioning rules. This is also described that the data-mining approach is the most suitable approach for the CRM implementation as this decreases the cost also the time. And also in this paper, described the various kinds of analysis and the researches which have been performed within this field.

This research work provides the analysis which is dependent on the investigation over the cloud computing for the SME that has been described in paper [19]. Within this analysis have described the motivations and the concerns with the needs that are associated with the cloud computing. Also they may have also represented that the infrastructure and the services of the cloud-computing concepts. Here also have performed this analysis on the 300 SME within the UK. In this also concluded that in order to attract the SME's in the cloud environment, with the security problems which must be used for designing.

Within this research [20] has represented one of the web based Android-CRM platform for the builders in the cloud-based sales environment and some CRM implementation in different domains. In this paper also suggested a mobile based application along with the web supported PC implementation for sales-persons also includes the builders. Here also utilized the simple-object-access-protocol approach. By the use of this concept the manager may schedule their meetings, manage their clients, and obtain the review over the meetings also they may send the emails via this Android based application.

VII. CONCLUSION

In this paper it is concluded that the information is obtained from customers is essential for the organization in order to satisfy their requirements and needs of their users. And the organization may also earn the profit and also maintain a long-term relation along with their customers, but also they must confirm the privacy of customers, which must not be affected while the use of data. And the Data-mining approaches that may be implemented through the cloud-computing environment is an absolutely necessary characteristic for today's business in order to make the knowledge based decisions for the goal marketing such as it helps them have future trends and customer behaviors predicted under CRM. In this paper analyzed the business profits that have been obtained via the combination of the data-mining approach along with the recent information-systems and with the latest products that may provide these types of integration to the huge range of users.

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