RESEARCH ARTICLE   OPEN ACCESS

Data Mining Concepts with Customer Relationship Management

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ABSTRACT
Data mining is important in creating a great experience at e-business. Data mining is the systematic way of extracting information from data. Many of the companies are developing an online internet presence to sell or promote their products and services. Most of the internet users are aware of on-line shopping concepts and techniques to own a product. The e-commerce landscape is the relation between customer relationship management (sales, marketing & support), internet and suppliers.
Keywords - e-business, on-line shopping, e-commerce, sales, marketing & support

I.   INTRODUCTION

In this paper we are discussing about how the data mining influencing on CRM (Customer Relationship Management). 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.

II. WHAT IS DATA MINING

With the development of computers and network technology, the capacities of information production and data collection have been drastically improved. A lot of databases have been extensively applied in the fields of industrial production, huge organizations, business management, scientific research as well as administration of general government areas. In this case, data explosion caused by data overburden may bring many new problems. Therefore, people are in great need of related methods and technologies to automatically and intelligently acquire useful knowledge and information out of mass data. The formation and development of Data Mining are mainly based on the needs for the analysis and realization of data.

III. CUSTOMER   RELATIONSHIP MANAGEMENT

Customer Relationship Management is defined by four elements of a simple framework: Know, Target, Sell, Service.CRM need to know about the customers and their requirements. For this juncture the market need the information about the customers, this involves the company type, usage of product, area of customer interest.   Knowing about the customer involves in many ways, such as collecting the feedback of related products. The Target include the type of the customers such as which product is useful to which type of customers. Identify the customers and campaign the product details in such areas. The sale of the product depends on the quality of the product and level of need of the product. If the firm focusing on the better service, the customers will acquire the product easily.

IV. CONCEPTS OF CUSTOMER RELATIONSHIP MANAGEMENT

Customer relationship management is a combination of several components. Before the process can begin, initially the firm must possess customer information. Companies can learn about their customers through internal customer data or they can purchase data from outside sources. Some of the following sources help to understand the customers such as
  ➢ Records of customers (Bill books)
  ➢ Mode of payment (e-cards, cash, etc)
  ➢ Feedback forms
  ➢ Multiple usage of product

V. V.DATA MINING WITH CUSTOMER RELATIONSHIP MANAGEMENT DATA MINING TECHNIQUES IN CRM

Many techniques include in data mining CRM, such models are as follows:
- Cluster models: In these models the groups are not known in advance. Instead we need the algorithms to analyze the input data patterns and identify the natural Clustering of records or cases. When new cases are scored by the generated cluster model they are assigned to one of the revealed clusters.

- Association and sequence models: These models also belong to the class of unsupervised modelling. They do not involve direct prediction of a single field. In fact, all the fields involved have a double role, since they act as inputs and outputs at the same time. Association models detect associations between discrete events, products, or attributes. Sequence models detect associations over time.

The data mining CRM framework includes the following concepts:
- Customer Segmentation
- Direct Marketing Campaigns
- Market Basket and Sequence Analysis

VI. CUSTOMER SEGMENTATION

Customer analytics is a process by which data from customer behaviour is used to help make key business decisions through market segmentation and predictive analytics. This information is used by businesses for direct marketing, location selection, and customer relationship management. Marketing provides services in order to satisfy customers. Whereas, the productive system is considered from its beginning at the production level, to the end of the cycle at the consumer. Customer analytics plays a very important role in the prediction of customer behaviour. Customer behaviour study is based on consumer buying behaviour, with the customer playing the three distinct roles of user, payer and buyer. Research has shown that consumer behaviour is difficult to predict whereas **Market segmentation** is a marketing strategy that involves dividing a large target business into subsets of customers who have common needs and priorities, and then designing and implementing strategies to focus on them. Market segmentation strategies may be used to identify the focused customers, and provide supporting data for positioning to achieve a marketing plans and objective. Businesses may develop products differentiation strategies, or an undifferentiated method, involving specific products or product depending on the specific demand and attributes of the target product segment.

## VII. DIRECT MARKETING CAMPAIGNS

The Direct Marketing Campaigns involves how the company interfaces with its customers for examples
- Direct mail
- Email
- Banner ads
- Telemarketing
- Billing inserts
- Customer service centers
- Messages on receipts

These Channels are the source of data, which interface to customers and company. This enables a company to get a particular message to a particular customer. Channel management is a challenge in organizations. CRM is about serving customers through above particulars. In such a way Berry and Linoff used data mining to help a major cellular company figure out who is at risk for attrition and why are they at risk. They built predictive models to generate call lists for telemarketing as a result it was a better focused, more effective retention campaign.

VIII. VIII.MARKET BASKET AND SEQUENCE ANALYSIS

Market basket analysis (also known as *association rule discovery* or *affinity analysis*) is a popular data mining method. In the simplest situation, the data consists of two variables: a *transaction* and an *item*.

Market Basket Analysis

Rule	Support	Confidence
A ⇒ D	2/5	2/3
C ⇒ A	2/5	2/4
A ⇒ C	2/5	2/3
B & C ⇒ D	1/5	1/3
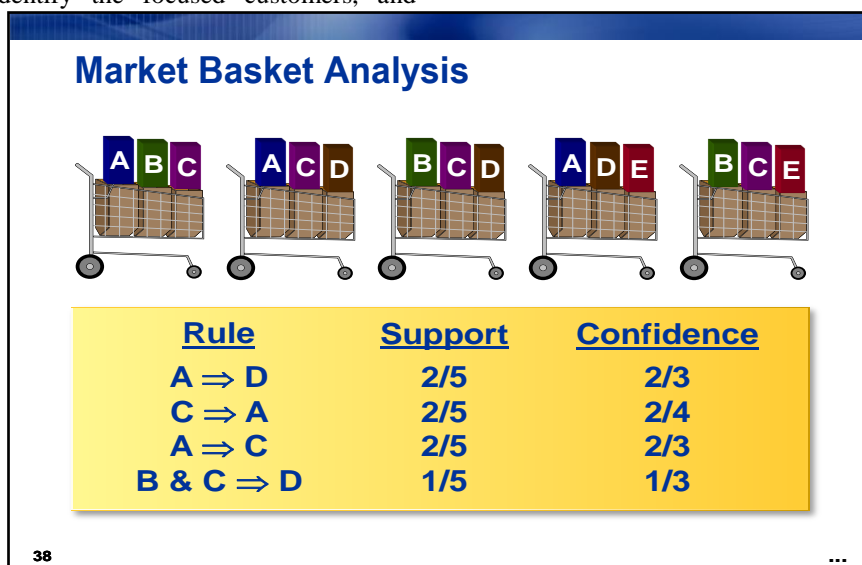
For each transaction, there is a list of items. Typically, a transaction is a single customer purchase, and the items are the things that were bought. An *association rule* is a statement of the form (item set *A*) $\Rightarrow$ (item set *B*).

The aim of the analysis is to determine the strength of all the association rules among a set of items.

The strength of the association is measured by the *support* and *confidence* of the rule. The support for the rule $A \Rightarrow B$ is the probability that the two item sets occur together. The support of the rule $A \Rightarrow B$ is estimated by the following:

$$\frac{transactions\ that\ contain\ every\ item\ in\ A\ and\ B}{all\ transactions}$$

Notice that support is symmetric. That is, the support of the rule $A \Rightarrow B$ is the same as the support of the rule $B \Rightarrow A$.

The confidence of an association rule $A \Rightarrow B$ is the conditional probability of a transaction containing item set *B* given that it contains item set *A*. The confidence is estimated by the following:

$$\frac{transactions\ that\ contain\ every\ item\ in\ A\ and\ B}{transactions\ that\ contain\ the\ items\ in\ A}$$

IX. CONCLUSION

Customer relationship management, through which, banks, organizations hope to identify the preference of different customer groups, products and services prepare to their liking to enhance the relation between types of customers and the organization, has become a topic of great interest. Shaw et al. mainly describes how to incorporate data mining into the framework of marketing knowledge management. The application of data mining techniques reinforces the knowledge management process and allows marketing personnel to know their customers well to provide better services. Song depicts a method to detect changes of customer behavior at different time snapshots from customer profiles and sales data. The common approach is to discover changes from two datasets and generate rules from each data set to carry out rule matching. Kalakota & Robinson defines CRM as the strategy integrating sales, marketing and service, which defines operating procedures and technology to better understand customers from different perspectives. Kandell views CRM as a customer centric initiative that regards customer lifecycle as an important business asset and aims to retain customers and enrich the customer satisfaction.

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