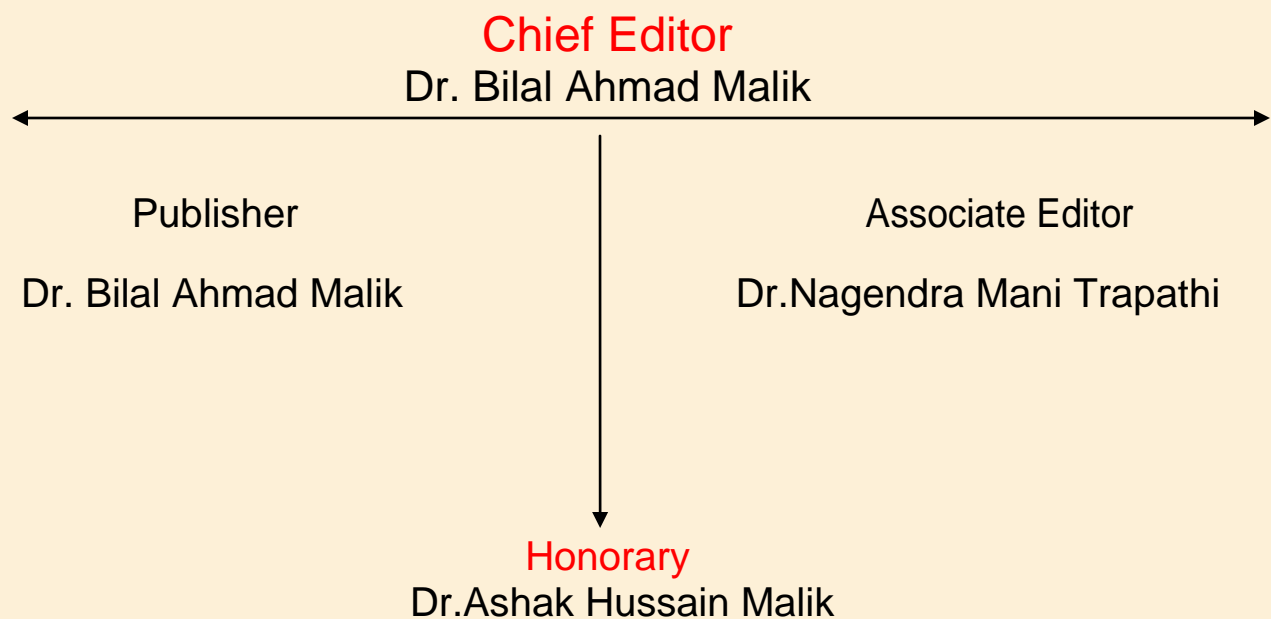


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CUSTOMER RELATIONSHIP MANAGEMENT USING FUZZY CLUSTERING

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Abstract: - Data mining is primarily used today by companies with a strong consumer focus - retail, financial, communication, and marketing organizations. Finally, it enables them to "drill down" into summary information to view detail transactional data. Clustering is a data mining technique used to place data elements into related groups without advance knowledge of the group definitions. Popular clustering techniques include k-means clustering and expectation maximization clustering. This project aims to implement soft clustering to enhance CRM (Customer Relationship Management). Data mining is an efficiently used tool in CRM. This project primarily focuses on applying apt clustering algorithm to identify the soft partitions of the customers namely the fuzzy c means (FCM) clustering algorithm to determine the churn ratio accurately.

Keywords: - Telecom, Data mining, Customer Relationship Management, Clustering, Fuzzy C Means.

INTRODUCTION:

A new business culture is developing today. Within it, the economics of customer relationships are

changing in fundamental ways, and companies are facing the need to implement new solutions and strategies that address these changes. The concepts of mass production and mass marketing, first created during the Industrial Revolution, are being supplanted by new ideas in which customer relationships are the central business issue. Firms today are concerned with increasing customer value through analysis of the customer lifecycle. The tools and technologies of data warehousing, data mining, and other customer relationship management (CRM) techniques afford new opportunities for businesses to act on the concepts of relationship marketing. In the traditional process, the marketing goal is to reach more customers and expand the customer base. But given the high cost of acquiring new customers, it makes better sense to conduct business with current customers. Businesses do not just deal with customers in order to make transactions; they turn the opportunity to sell products into a service experience and endeavor to establish a long-term relationship with each customer.

The advent of the Internet has undoubtedly contributed to the shift of marketing focus. As on-

line information becomes more accessible and abundant, consumers become more informed and sophisticated. They are aware of all that is being offered, and they demand the best. To cope with this condition, businesses have to distinguish their products or services in a way that avoids the undesired result of becoming mere commodities. One effective way to distinguish themselves is with systems that can interact precisely and consistently with customers. Collecting customer demographics and behavior data makes precision targeting possible. This kind of targeting also helps when devising an effective promotion plan to meet tough competition or identifying prospective customers when new products appear. The importance of establishing close customer relationships is recognized, and CRM is called for. CRM helps smooth the process when various representatives of seller and buyer companies communicate and collaborate.

Data mining discovers patterns and relationships hidden in data, which describes the steps that must be taken to ensure meaningful results. Data mining software eliminate the need to know the business, understand the data, or be aware of general statistical methods.

MODEL: -

We have used waterfall model. It has five stages in it: Requirement, Design, Coding, Testing, Maintenance

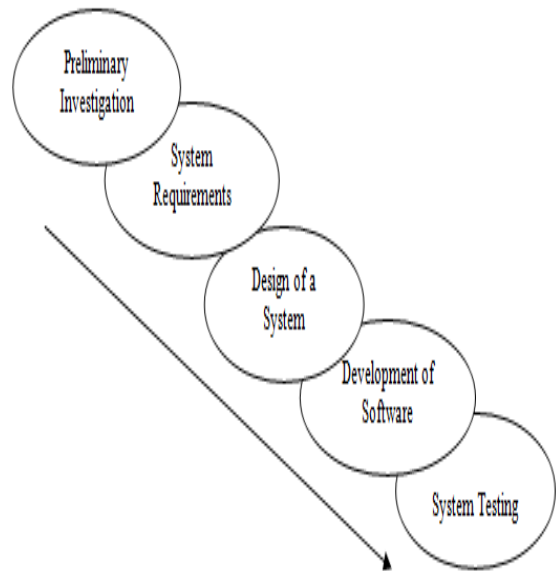


Fig. (1) Different phases of the Model

1. Requirement Phase: Basic requirements are gathered during the planning stage.
2. Design Phase: Front end and Back end is decided.
3. Engineering Phase: In this phase software is developed and testing is also done.
4. Evaluation Phase: This phase allows customer to evaluate the output of the project.

ARCHITECTURE

- A system architecture or systems architecture is the conceptual model that defines the structure, behaviour, and more views of a system.[1] An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviours of the system.

- A system architecture can comprise system components, the externally visible properties of those components, the relationships (e.g. the behaviour) between them. It can provide a plan from which products can be procured, and systems developed, that will work together to implement the overall system.
- In our system the main system components are the addition of the customer details to the database. After addition of data to database system will perform analysis on this data. FCM algorithm will be applied on data which will form the clusters of services. And with the formed clusters company (admin) using our application find the solutions. Hence our application will help the company to analyse the customer behaviour with the help of clusters formed

FLOWCHART:

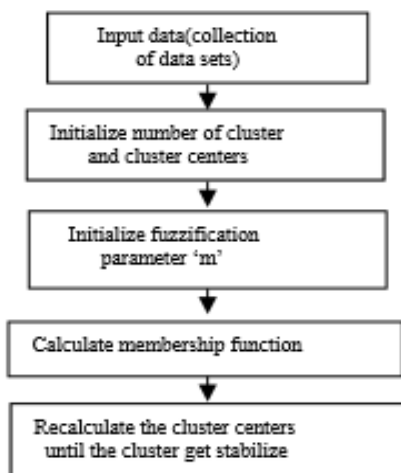


Fig. (2) Flowchart

HARDWARE REQUIREMENTS:

- MEMORY SPACE - MINIMUM 512MB
- HD - To install the software at least 2 GB and the data storage is depending upon the organizational setup.
- PROCESSOR - Any , 1.8 GHZ or above
- RAM - 512 MB or above
- VIDEO - 1024x768, 24-bit colors
- KEYBOARD - Standard 104 Keys(QWERTY)

SOFTWARE REQUIREMENTS

- windows 7
- JAVA (jdk-6)
- NetBeans IDE
- MySQL

SCREENSHOTS:



Fig.1

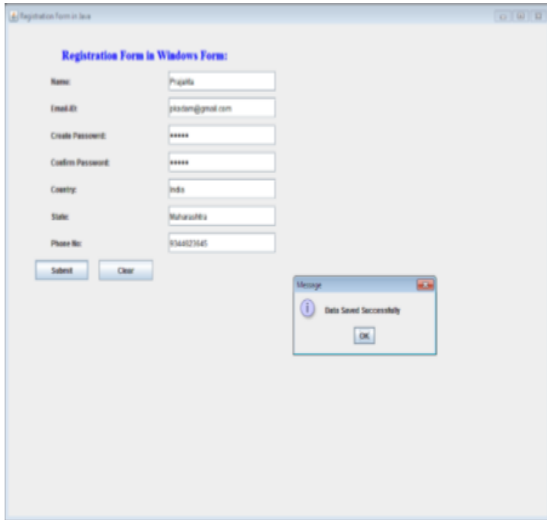


Fig.2



Fig.5

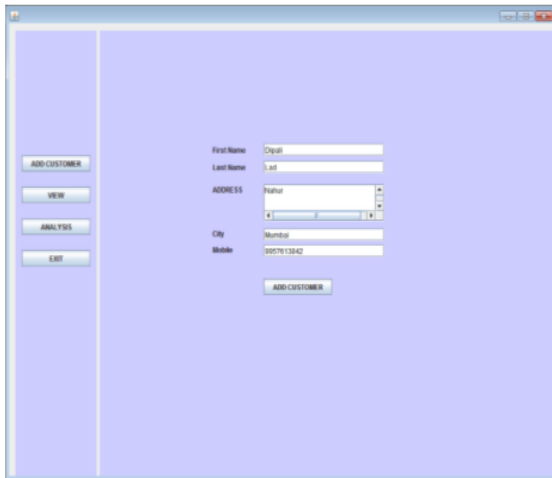


Fig.3



Fig.4

FUTURE WORK:

As we have already mentioned our application is useful for the telecom companies. If telecom companies will be using this system it will help them to analysis of customer behavior. As a result company can maintain their market status. User interface is the medium through which the user interacts with the system. Therefore the user interface should be simple and indicative of what action or even will occur when we interact with that particular part of UI. Although we have tried to make the UI simple and indicative, there's always room for improvement in UI. In the future we can add up new things to application which will make application more effective.

Advantages

- 1) Gives best result for overlapped data set and comparatively better than k-means algorithm.
- 2) Unlike k-means where data point must exclusively belong to one cluster center here data point is assigned membership to each cluster center as a result of which data point may belong to more than one cluster center.

Disadvantages

- 1) Apriority specification of the number of clusters.
- 2) With lower value of β we get the better result but at the expense of more number of iteration.
- 3) Euclidean distance measures can unequally weight underlying factors.

CONCLUSION:

Our system is analysis system where we help the Telecom Company to manage CRM. Because of using our application admin or user accessing our application will able to analyze the customer behavior. This is a very helpful application for the telecom companies. Telecom companies are very much emerging now a day. Hence in such a case our application can help telecom industries to manage

the CRM thereby retaining the customers. Application's first module enables the user to add customer's data. The very next module he reaches is the addition of service details. View is a button which allows user to add services to customer. And the last module analysis quickly gives the graphical representation of clusters.

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