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RESEARCH ARTICLE

The Relevance of Analytical CRM and Knowledge Management in an Organisation: A Data Mining Structure

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ABSTRACT - Knowledge Management and Analytical CRM are useful tools and technology in decision making process and understanding in an organization. This paper aims to provide a complete analysis of the concepts of Data Mining, knowledge management and analytical CRM to set up a framework for integrating all three together. The objective is to show how Knowledge Management and analytical CRM can be integrated into a structure that supports decision making using efficient Data Mining Techniques and to research how working on an analytical CRM system can enable organizations deliver complete solutions.

Keywords: Data Mining, Knowledge Management, Customer Relationship management, Analytical CRM, Decision Support

I. INTRODUCTION

Data is been collected and compiled in every organization. There is urgent requirement for a new generation of computational theories and tools to assist in extracting useful information from the growing volume of digital data. Manual extraction of schemes in large data sets has grown in size and involvement, direct data analysis has been reinforced with indirect, automated data processing regarding computer science. Data mining bridges the gap from applied statistics and artificial Intelligence to database management by utilizing the process that data is stored and indexed in database, allowing DM methods to be utilized in larger data sets.

With changes and improvements every day, organizations must be prepared and informed with the possible directions and applications in order to achieve competitive advantage [1]. DM helps organization by providing profitable information to the decision makers of an organization, handling decision making techniques [2], helping decision makers to better group customers [3], and solving business problems to achieve competitive advantage [4]. Organizations are regularly expanding into a more complex system; and with global competition, decision making in organizations has become heterogeneous.

Knowledge is considered as the most significant resource in an organization. KM, strategic orientation and organizational innovation have a strong impact on performance. KM is an important factor for organizational success.

This paper contributes to the theoretical and practical insights of KM, Analytical CRM and DM; and the chances for a consideration on these meaningful issues to increase the understanding of utilizing DM in KM environments. This paper begins with the concept of KM, CRM, analytical CRM and DM; the relationship among KM, analytical CRM and DM; and the emerging trends toward practical results in KM, analytical CRM and DM, respectively.

II. THE CONCEPT OF KNOWLEDGE MANAGEMENT

Knowledge management is the process of capturing, developing, sharing and effectively using organization knowledge [5].

It refers to a multi-disciplined approach to achieving organizational Objectives by making the best use of knowledge. Knowledge Management efforts typically focus on organizational objectives such as improved performance, competitive advantage, innovation, the sharing of lessons learned, integration and continuous improvement of the organization [6]. The general goal of KM IS to improve the systematic handling of knowledge within the organization. Knowledge must be refreshed by the organization and therefore, knowledge networks are needed to ensure employees have opportunities to share knowledge [7]. In addition, [8] stated that KM processes can be used to correct dysfunctional organizational behavior.

KM processes involves the identification of needed skills, sharing knowledge, creating new knowledge and cataloguing current organizational knowledge [9]. The role of KM is to allow an organization to Leverage its information resources and knowledge assets by remembering and applying experience [10]. Knowledge is widely recognized as an asset in improving organization performance [11], and also provides the processes and structures to create, capture, analyze and act on information which helps organizations to manage continuous change in a highly dynamic environment.

III. THE CONCEPT OF CUSTOMER RELATIONSHIP MANAGEMENT

This involves the principles, practices, and guidelines that an organization follows when interacting with its customers. Customer relationship management is a system for managing a company's interactions with current and future customers. It often involves using technology to organize, automate and synchronize sales, marketing, customer service and technical support [12].

From the organization's point of view, this entire relationship not only encompasses the direct interaction aspect, such as sales and/or service related processes, but also in the forecasting and analysis of customer trends and behaviors, which ultimately serve to enhance the customer's overall experience.

CRM will enable an organization to control, maintain and manage customer relations in an organized and strategic manner. Practically, it means leveraging on organization's methodologies, internal procedures, and mode of operation, software and Internet capabilities to be able to address customers' needs and, as a result, make customer's relationship more profitable.

Using a CRM system, an organization can keep track of vital information about their customers; such information may include customer's contact number and address, communications, accounts, purchases and preferences - allowing the organization to match customers' needs with available products and rendered services. By analyzing the data, organizations can:

1. Identify loyal customers
2. Enrich and customize communication between the organization and their customers
3. Manage marketing campaigns
4. Reduce customer response times
5. Serve wider geographical regions

IV. THE CONCEPT OF ANALYTICAL CRM

Analytical CRM may be defined as a decision support system that is targeted to helping senior executives, marketing, sales and customer support personnel to better understand and capitalize upon their customer needs, the company's interactions with the customer, and the customer buying cycle. Analytical CRM is the process of gathering, analyzing and exploiting information of a company's customer base. Information is typically obtained about customer existing and future needs, customer decision making processes, customer behavior and trends as well as using data about the competition. Analytical CRM supports organizational back-office operations and analysis. It deals with all the operations and processes that do not directly deal with customers. Hence, there is a key difference between operational CRM and Analytical CRM. Unlike with operational CRM where automation of marketing, sales-force and services are done by direct interaction with customers and determining customer's needs; analytical CRM is designed to analyze deeply the customer's information and data and unwrap or disclose the essential convention and intension of behavior of customers on which capitalization can be done by the organization.

Primary goal of analytical CRM is to develop, support and enhance the work and decision making capability of an organization by determining strong patterns and predictions in customer data and information which are gathered from different operational CRM systems.

CRM Equation: Customer Relationship Management = Customer Understanding + Relationship Management

Customer Understanding means analysis of customer data to gain deep understanding down to the level of individual customer.

Relationship Management entails interaction with the customer through various channels for various purposes.

Analytical CRM involves using customer understanding to perform effective relationship management.

The following are the key features of analytical CRM:

1. Seizing all the relevant and essential information of customers from various channels and sources and collaboratively integrating and inheriting all this data into a central repository knowledge base with an overall organization view.
2. Determining, developing and analyzing inclusive set of rules and analytical methods to scale and optimize relationship with customers by analyzing and resolving all the questions which are suitable for business.
3. Implementing or deploying the results to enhance the efficiency of CRM system and processes, improve relationship and interaction with customers and the actual business planning with customers.
4. Combine and integrate the values of customers with strategic business management of organization and value of stakeholders.

Analytical CRM is a solid and consistent platform which provides analytical applications to help predict, scale and optimize customer relations. Advantages of implementing and using an analytical CRM are described below.

1. Helps in making more profitable customer base by providing high value services.
2. Helps in retaining profitable customers through sophisticated analysis and making new customers that are clones of best of the customers.
3. Helps in addressing individual customer's needs and efficiently improving the relationships with new and existing customers.
4. Improves customer satisfaction and loyalty.

The power of CRM provides a lot of managerial opportunities to the organization. It implements the customer information in an intelligent way and creates views on customer values, spending, affinity and segmentation. Analysis is done in every aspect of business as described below:

1. Customer Analytics: This is the base analytic used to analyze customer knowledge base. It provides a better view of customer behavior and by modeling, assessing customer values and assessing customer's portfolio or profiles and creates an exact understanding of all the customers.
2. Marketing Analytics: This helps discovering new market opportunities and seeks their potential values. It also helps in managing marketing strategies and scale and plan marketing performance at district, regional

and national levels. Marketing analytics also focus on campaign management and planning, product analysis and branding.

3. Sales Analytics: Sales analytic provides essential environment to plan, simulate and predict sales volumes and profits by constantly analyzing organizational sales behavior. It helps in pipelining all the selling opportunities in an efficient way by indulging and improving the sales cycle.
4. Service Analytics: Analytical CRM has major role in enhancing the services which answering all the questions regarding customer satisfaction, quality and cost of products, complaint management etc. It even helps in improving and optimizing the services by sophisticatedly analyzing the service revenue and cost.
5. Channel Analytics: This type of analysis helps to determine the customer behavior on channel preferences, like web channel, personal interaction, telephone channel etc. This information is efficiently integrated in customers' knowledge base so that they can be contacted accordingly.

V. THE CONCEPT OF DATA MINING

Data mining is a process that uses statistical, mathematical, artificial intelligence, and machine learning techniques to extract and identify useful information and subsequent knowledge from large databases [13]. It also refers to the process of analyzing data from different perspectives and summarizing it into useful information that can be used to increase revenue, cut costs or both. The overall goal of data mining is to extract information from a data set and transform it into an understandable structure for further use [14].

The various mechanism of Data Mining includes abstractions, aggregations, summarizations, and characterizations of data [15]. DM uses well-established statistical and machine learning techniques to build models that predict customer behavior. Today, technology automates the mining process, integrates it with commercial data warehouses, and presents it in a relevant way for business users. Data mining includes tasks such as knowledge extraction, data archaeology, data exploration, data pattern processing, data dredging, and information harvesting. The following are the major characteristics and objectives of data mining:

1. Data are often buried deep within very large databases, which sometimes contain data from several years. In many cases, the data are cleansed and consolidated in a data warehouse.
2. The data mining environment is usually client/server architecture or a web-based architecture.
3. Data mining tools are readily combined with spreadsheets and other software development tools. Thus, the mined data can be analyzed and processed quickly and easily.
4. Because of the large amounts of data and massive search efforts, it is sometimes necessary to used parallel processing for data mining.

A. DATA MINED IN AN ORGANIZATION

Whether it is a simple quantitative data such as employee's salary and age, or complex qualitative elements such as multimedia and hypertext documents, different organization mine various kind of data for its productivity and growth. According to [16] the kind of data that can be mined from an organization includes but not limited to the following;

1. **Business Proceedings:** Transactions can either be between one or more organizations, or within an organization. The type of business transactions can be for marketing, sale, purchases; banking e.t.c. channelling an organization towards carrying out the right business proceeding at any point in time can help boost productivity, hence increasing organizational growth
2. **Memos and reports:** Organizations collects and exchanges memos and reports in textual form either between or within organizations. These memos and reports are usually exchanged through E-mails. These messages are stored for future use to build a strong digital library and mined whenever needed.
3. **World Wide Web Repository:** World Wide Web is a large repository of multimedia and hypertext document, covering a broad variety of topics covered and the infinite contributions of resources and publishers. Even though WWW can be redundant and inconsistent sometimes, information mined from the WWW can be of great importance to improve organization productivity.
4. **Digital Media:** The ease, economy of scale and scalable nature of digital information have increased its wide spread use in organization. Most organizations are beginning to convert their data repositories into digital format.
5. **CAD and Software engineering data:** There are a number of Computer Aided Software Engineering (CASE) tools which organizations can use to design their databases and data warehouse. These tools generates large amount of objects, codes and function libraries which needs to be properly managed and maintained.

VI. DECISION SUPPORT PROGRESS TO DATA MINING

KM, Analytical CRM and Data Mining are useful tools that permit both active and passive delivery of information from large scale Data Warehouse, providing organizations and managers with timely answers to mission-critical questions. The aim of these applications is to turn the huge amounts of accessible data into knowledge that can be used by organizations. The growth of this class of apps has been driven by the demand for more competitive business intelligence and increases in electronic data capture and storage. Furthermore, the advent of the Internet and other communications technologies has made possible economical approach to and delivery of information to remote users throughout the world. Data mining is a process in which all the data you collect is sorted to determine patterns. For instance, it can tell you which products are most popular and whether one type of customer is likely to buy a particular item. Effective Knowledge Management reduces costs. Most individuals, teams and organizations are today continually 'reinventing the wheel'. This is often because they simply do not know that what they are

trying to do have already been done by someone elsewhere. They do not know what is already known, or they do not know where to access the knowledge. Continually reinventing the wheel is such a costly and inefficient activity, whereas a more systematic reuse of knowledge will show substantial cost benefits immediately.

In addition to cost reduction, effective knowledge management should also dramatically increase speed of response as a direct result of better knowledge access and application.

Effective knowledge management, using more collective and systematic processes, will also reduce the tendency to 'repeat the same mistakes'. This is, again, extremely costly and inefficient. Effective knowledge management, therefore, can dramatically improve quality of products and/or services.

Better knowing stakeholder needs, customer needs, employee needs, industry needs, for example, has an obvious immediate effect on relationship management.

In summary, Effective Knowledge Management will greatly contribute to improved excellence in the following ways:

1. Dramatically reduce costs.
2. Provide potential to expand and grow.
3. Increase our value and/or profitability.
4. Improve products and services.
5. Faster response

The ability to better collaborate in physical and virtual teams, as knowledge workers, is driving the process of new knowledge creation. Ideas can now be turned into innovative products and services much faster.

VII. CONCLUSION

Decision makers cannot afford not to mainstream, embed and embody these three principles, strategies, policies, processes, methods, tools and technologies into the successful organizational paradigm. Organizations that can best sense, become quickly alerted to, find, organize, and apply knowledge, with a much faster response time, will simply leave the competition far behind. This can only be achieved through application of leadership that understands the unchanging timeless principles for KM and Analytical CRM using a data mining structure that transforms organizations to become far more responsive and effective players in a growing economy.

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