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Analysis of Sales and Distribution of an IT Industry Using Data Mining Techniques

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Abstract-The goal of this work is to allow a corporation to improve its marketing, sales, and customer support operations through a better understanding of its customers. Keep in mind, however, that the data mining techniques and tools described here are equally applicable in fields ranging from law enforcement to radio astronomy, medicine, and industrial process control. Businesses in today's environment increasingly focus on gaining competitive advantages. Organizations have recognized that the effective use of data is the key element in the next generation is to predict the sales value and emerging trend of technology market. Data is becoming an important resource for the companies to analyze existing sales value with current technology trends and this will be more useful for the companies to identify future sales value. There a variety of data analysis and modeling techniques to discover patterns and relationships in data that are used to understand what your customers want and predict what they will do. The main focus of this is to help companies to select the right prospects on whom to focus, offer the right additional products to company's existing customers and identify good customers who may be about to leave. This results in improved revenue because of a greatly improved ability to respond to each individual contact in the best way and reduced costs due to properly allocated resources. Keywords: sales, customer, technology, profit.

I. INTRODUCTION

Data mining is largely concerned with building models. A model is simply an algorithm or set of rules that connects a collection of inputs (often in the form of fields in a corporate database) to a particular target or outcome. Data mining uses information from past data to analyze the outcome of a particular problem or situation that may arise.The central idea of data mining for Sales and Distribution management is that data from the past contains information that will be useful in the future. It works because customer behaviors captured in corporate data are not random, but reflect the differing needs, preferences, propensities, and treatments of customers. The goal of data mining is to find patterns in historical data that shed light on those needs, preferences, and prosperities. The task is made difficult by the fact that the patterns are not always strong, and the signals sent by customers are noisy and confusing. Separating signal from noise recognizing the fundamental patterns beneath seemingly random variations is an important role of data mining. Upward of 60 percent of IT industry believe that success will hinge on gaining new skills, notably the ability to market through a variety of channels, to integrate IT across them. Marketing practices are driven by technologies that enable closer engagement with customers and also the acquisition and analysis of more and more data on customers. Planning and Execution of Marketing activities are based on pre-defined policies on various types of sales. Every year, based on the existing market conditions all the policies are reviewed and refined to suit the existing conditions. These policies guide the planning process in marketing function.

The promise of data mining is to find the interesting patterns hidden in data. Merely finding patterns is not enough. You must respond to the patterns and act on them, ultimately turning data into information, information into action, and action into value. To achieve this promise, data mining needs to become an essential business process, incorporated into other processes including marketing, sales, customer support, product design, and inventory control. A data mining project consists out of multiple phases and actually can be seen as a cycle. The data mining process can be seen as a non linear process; steps do have a natural order but do not have to be completely finished before moving to the next step. It is a continues process in which earlier steps can be revised after finishing later steps.

The main goal is to provide insight in the process of data mining. Therewith creating a data mining process framework to support consultants with their job of advising companies on their business performance. This framework will enable consultants to determine effective analyze tasks for given business questions in order to answer those questions and be able to give companies advise.To design the data mining process framework, first the two pillars it was build up from were identified and discussed in detail. The first was the business side of the framework which includes the business processes, business drivers and business questions. The other pillar was the data mining side which includes the data mining task and algorithms.For the business side of the framework the processes of the sales department were identified, after which the importance and improvements of business performance are formulated.

Next the business questions were categorized by business process, after which the questions were grouped. When following these steps of the framework one will find a group of relevant questions.The second part of the framework starts with the mapping of the relevant questions to data mining tasks, which is done with the mapping process. Now the final part of the data mining process framework starts. The activities included here are the needed steps to come to the selection of a data mining algorithm and there with the start of the real data mining engineering process. The final result looks as shown below.

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II. METHODOLOGY

A. Identification of six primary phases of the Data Mining Process

According to IBM SPSS modeler defines CRISP-DM (Cross-Industry Standard Process for Data Mining) is a widely accepted methodology for data mining projects. CRISP-DM is a comprehensive data mining methodology and process model that provides anyone from novices to data mining experts with a complete blueprint for conducting a data mining project. CRISP-DM breaks down the life cycle of a data mining project into six phases.

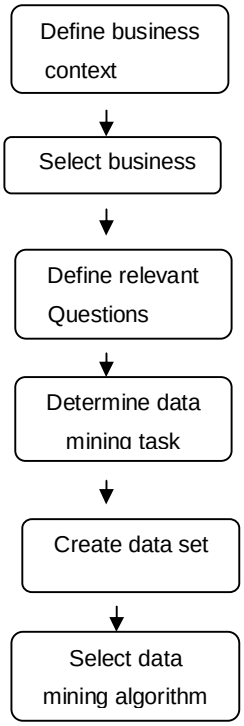

Figure 1 Work process

B. Secrets of using Data Mining to succeed at CRM

Data mining has clearly moved into the mainstream. This approach to discovering previously unknown patterns or connections in data was developed in academia and first employed by government research labs. Now it plays a central role in helping companies in virtually every industry improve daily business decision-making. More cost-effective customer acquisition and retention, better targeting of marketing campaigns, improved cross-selling and up-selling to increase customer value – these are just some of the customer issues that leading companies address through data mining.

C. Identification of Sales Management Challenges

Challenge#1: Developing and executing a compelling sales strategy.

Challenge #2*: Creating a great sales culture.*

Challenge #3: Increasing the engagement of top sales performers

Challenge#4: Managing the sales participation rate

D. Creating a Sales and Marketing Plan

Creating a successful marketing strategy, finding opportunities to sell products and services, and connecting more effectively to current and prospective customers is a demanding job.

a. Create a Marketing Plan

A good marketing plan can shape the way we connect to our existing customers and attract new ones. It can also help us determine the types of customers we should target, how to reach them and how to track the results so we learn what works to increase business. If we don't have a marketing plan, creating one is not difficult. A successful marketing plan doesn't have to be complex or lengthy, but should contain enough information to help us establish, direct and coordinate your marketing efforts.

b. Build a Sales Process

A sales process is a series of customer-focused steps that our sales team can use to substantially build our customer base, generate repeat business and increase revenue. Each step consists of several key activities and has a predictable, measurable outcome. A formal sales process also helps us understand each customer's business obstacles, match their needs to our products and services, and deliver proof that our products can meet those needs. With a strong sales process, we can more accurately assess the revenue potential for a given customer.

c. Implement our Sales Process

A well-defined, measurable sales process can make a big difference in our business. But change can sometimes be difficult for people. The following can help:

1. Demonstrate management support.

2. Make the sales process work for our customers.

3. Adopt a clearly defined approach.

d. Emerging markets

There may be a "big four" (cloud, mobile, big data/analytics, social business/ collaboration) but instead of IT using them to drive change, society and business are using them to drive IT! What a turn of affairs! Byron Miller.

E. Financial Services

Banks have not yet created a new underlying mobile business model or a clear mobile strategy. Overall IT reliability will become the focus of risk management because systems are old, networks are being stressed and security is crucial. The banking industry is very provincial; banks have no plans to expand beyond current geographies.

F. CENR – Chemical Energy Natural Resources

The Requirement for Speed and the Ubiquity of Information Creates a New Landscape for IT Support of the Supply Chain. There is awareness of business that more data is available and

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utilities are trying to figure out how to get business value out of it.

G. Healthcare

Instead of taking advantage of the cash incentives being offered for health IT, IT vendors should offer simplified solutions at more than competitive prices; incentives are running out. Life Sciences: externalization of R&D and expansion into emerging markets will have a significant effect on business models.

H. Manufacturing

Customer satisfaction is critical and depends upon developing an intelligent value chain: knowing your customers (mobility & social networking), understanding IT ROI and the cost of major processes (analytics), and aligning business units with corporate objectives (Business Consulting).Manufacturers are finding that even with technology that mother-nature can still with the supply chain... as can acquisitions, business failures, etc. This is causing a push toward vertical integration) and risk assessment.

I. TCG – Transport consumer goods

Retail -- As the global economy continues to fluctuate, and retail channels proliferate, the retail value chain must respond to a multichannel, brand-neutral and value-driven consumer, while driving down cost and improving service.Consumers, not products or channels, create the basis for growth strategies; mobile and social will be the center of retail growth strategies.Enterprises will face an increasing demand from both customers and employees for complete mobile services and sophisticated social networking.These are the some verticals to drive through big four technologies to change their trends and to increase their sales according to market trends. The CIO/IT department will become a partner to the business. In some ways the CIO is giving up control of IT; but as the economy improves the IT department will become a focus of innovation. By 2015, open development platforms and banking app stores will loosen bank dependence on vendors for customization by 25%. (Gartner).Core technology that will meet challenge: Cloud, Mobility, Big Data/Analytics, Social business/collaboration.

III. IMPLEMENTATION

Iterative, hard, flat clustering algorithm based on Euclidean distance

- Specify K, the number of clusters to be generated
- Choose K points at random as cluster center
- Assign each instance to its closest cluster center using Euclidean distance
- Calculate the centroid (mean) for each cluster; use it as a new cluster center
- Reassign all instances to the closest cluster center
- Iterate until cluster centers don't change any more

The algorithm analysis the sales data to form his preferences forming multi-attribute arguments, a step that requires special attention in negotiations and deal making. It computes the data items requested by the decision maker using a multi-dimensional range search. In the final step it produces the corresponding clusters assisting therefore the sales and distribution unit to classify his options.

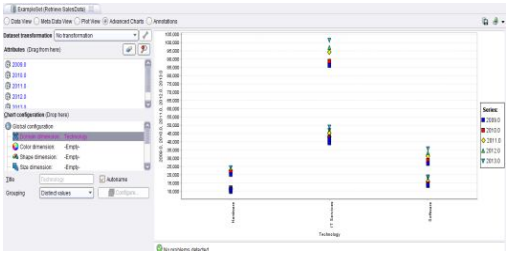

Figure 2

IV. CONCLUSION

The value of the research is to provide businesses such opportunity to faster respond to new coming customers and to increase sales trends, develop marketing campaigns, and more accurately predict customer loyalty. After a year of stagnation, its optimistically being touted as a year of innovation -- where mobile, social, analytics and cloud will drive all IT agendas. As future work it would also be interesting to construct a model to assess the new technology development and analyze the market trends in order to know situation how the technology adopts the customer needs and simultaneously adjust the target of company actions.

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