ABSTRACT

Marketing means finding out what people wants, why they want it. Marketing is not advertising. Marketing determines future needs and also have a strategy to meet that needs. Sales mean converting enquiry into contract. Using effective marketing strategies it is possible to increase sales revenue and sell more and more product. Today sales and marketing have struggled to work well together. Customers are constantly moving and more informed. Main objective of any business is to become competitive. This paper presents survey on several techniques used by researchers to improve the effectiveness of marketing and sales.

Keywords: Association rule mining, apriori, data mining, éclat, frequent pattern.

I. INTRODUCTION

Marketing is the activity of finding out what the market wants to buy. Main focus of marketing is to fulfill customer needs through the services and products. Sales try to fulfill sales volume objective. Marketing identify customer needs, creating products to fulfill that needs and provide promotion to advertise said products. Marketing provides a way to reach to the customer and built long lasting relationship whereas selling is the ultimate result of marketing. Main target of marketing is the construction of brand identity so that it fulfills customer needs. Sales are driven by human interaction. Sales are simply the identity to meet the needs at right time. For finding out customers needs it is necessary to track customer purchasing pattern. Customer purchasing patterns are identified by examining the pattern or items frequently purchase by the customer. For finding the items frequently purchase by the customer it is necessary to find frequent item sets from the
database. There are various methods for finding frequent items such as Apriori algorithm, frequent pattern growth algorithm, and éclat algorithm.

Apriori algorithm is the most popular algorithm of association rule mining. In many real life applications of business and industry association rule mining is used. Apriori algorithm is used for mining frequent item set. Apriori algorithm operates on database containing transactions for example apriori algorithm operates on the transactions containing set of items purchase by the customer. Each transaction contains set of items. Apriori uses bottom up approach for finding frequent items.

In association rule mining set of item sets are given for example set of retail transactions, each contain set of items purchase by the customer. The algorithm finds subsets which are common to at least a minimum number C of the item sets. Apriori algorithm uses breadth-first search approach and also uses tree structure to count candidate item sets efficiently. In Apriori algorithm candidate item sets of length n are generated from length n-1. According to the downward closure lemma candidate item set contains all frequent n-1 item sets. After that it scans the transaction database to determine frequent item sets among the candidate. Apriori algorithm suffers from some inefficiency. In candidate generation process numbers of subsets are generated.

Frequent pattern growth algorithm find frequent items based on the pattern frequently occurred. One advantage of frequent pattern growth algorithm over apriori is that it discover frequently purchase items without generation of candidate item sets. In frequent pattern growth algorithm compact data structure called FP-tree is constructed. This tree is constructed by making two passes over the data sets. Then frequent item sets are extracted from FP-tree. Frequent pattern algorithm reduces number of database scan as compare to apriori algorithm. It preserves complete information for mining frequent patterns and also reduces irrelevant information.

Eclat algorithm is use for mining frequent item sets. Item sets mining allow us to find frequent pattern like if consumer buys milk, he also buys bread. In éclat algorithm transaction-id set intersection is used to compute the support of a candidate item set avoiding the generation of subsets that doesn’t exist in the prefix tree. In this algorithm initial call uses all single items with their transaction-id sets. After that in each recursive call the function intersects transaction-id sets verifies each item sets transaction-id set pair with all other pair. If new candidate is frequent then it is added to the set.

Thus for finding the items frequently purchase by the customers apriori, frequent pattern growth and éclat algorithm are available. Main idea for improving sales is to examine the order for the product that have been purchased together. By making the use of this information organize the store and to place frequently sold products next to each other or in the same area.

II. LITERATURE SURVEY

In [1] Michael J. Shaw, Chandrasekar Subramaniam, Gek Woo Tan, Michael E. Welge have proposed a technique to manage the marketing knowledge and support marketing decisions. In this paper they have presented the model for customer retention which accounts for the dynamics of the today’s market. Their methodology helps for enhancing the customer relationship management. Their methodology introduces an efficient database encoding technique a novel tree structure called PC-Tree and PC-Miner algorithm. This paper shows how data mining can be integrated into a marketing knowledge management framework [1]. The database encoding technique utilizes Prime number characteristics and transforms each transaction into a positive integer that has all properties of its items. The PC_Tree is a simple tree structure but yet powerful to capture whole of transactions by one database scan. The PC_Miner algorithm traverses the PC_Tree and builds the gcd (greatest common divisor) set of its nodes to mine maximal frequent item sets. Experiments verify the efficiency and advantages of the proposed method [1].

Xiaohui Yu, Yang Liu, Jimmy Xiangji and Aijun An [2] performed mining on online reviews for predicting sales performance. They have conducted a case study in the movie domain. For the
sentiment factor they proposed sentiment PLSA (S-PLSA), in which they considered review as a
document, generated by number of hidden sentiment factor and capture the complex nature of
sentiment. Through S-PLSA they obtain the information embedded in the review. Based on S-PLSA
they proposed ARSA, an Autoregressive Sentiment-Aware model for sales prediction. After that
quality factor was used, with a focus on predicting a quality of review and present ARSQA, to utilize
sentiments and quality for predicting product sales performance.

In [3] Zong Kaisheng has done study on E-marketing. They investigated the dimension of
online sales promotion and proposed a theoretical model on the relationships between online sales
promotion and impulse buying online via the time and energy spended on web browsing. The finding
of this paper converts important messages to scholars by showing the value of exploratory study as
well as empirical study on online sales promotion and its impact on impulse buying online, and
converts novel messages to managers by showing the relationship between online sales promotion
and impulse buying online via web browsing [3].

In [4] Charanjeet Kaur used apriori algorithm for finding frequent item sets. They make the
survey of most recent research work done on apriori algorithm. Association rule mining is the most
important technique in the field of data mining. Association rule mining predict the occurrence of an
item on the basis of occurrence of other items in the transaction. Association rule mining finding
frequent patterns, associations, correlations, or causal structures among sets of items or objects in
transaction databases, relational databases, and other information repositories [4].

Ando T [5] developed the multivariate time series modeling method in the framework of a
general state space model to measure the effectiveness of marketing activities and baseline sales. The
Bayesian approach via Markov Chain Monte Carlo algorithm was used for estimating model
parameters. To evaluate the goodness of model, the Bayesian predictive information criteria were
used.

In [6] Mishra, Patel, Sarangdevot proposed special thought to check the impact of external
factor on the different sector. Whole sale price index is a reflection of the government policy, it
accounts for all trends in demand and supply and it's truly right when we say it is the index of all the
goods which is necessity of life [6].

In [7] Tao Ji, ChongQing introduced the way to integrate the international packaged software
with local customer software, real time sharing of customer profiles, automated meter reading and
invoicing, task distribution for abnormal activities, and other automated processes. They used
standardized coding and centralized platform for integration of onsite customers and sales and
marketing management.

Akbarian R, TavaKoli M, Fard has done study on mobile marketing. Maintaining the stock of
marketing has been most important for companies. Mobile marketing is one of the modern method of
marketing which is considered as a significant factor of competition in development marketing stock,
attraction and maintenance of customer and improvement of interactions by utilizing technology;
whereas mobile marketing is associated with different sciences, so study of mobile marketing subject
is taken into account attractive and new subjects of world trade, information technology and
economics [8].

In [9] Jian Liu, Yanqing Wang presented model about internet marketing. Based on the
theories of traditional marketing and Internet marketing, the paper builds the model of Internet
marketing relationship that describes consumer's purchase decision process and firm's Internet
marketing process, and correlation among consumer, firm, and bank and logistics firm [9]. By
making the analysis of these two processes the model reveals intrinsic characteristics and essences of
internet marketing that are all different from traditional marketing. The model provides a researchful
platform for the researchers, and a fundamental basis for further researching Internet marketing [9].

In [10] Yu and Lin A, design and implemented search engine marketing management system.
Search engine plays very important role toward the success of business objectives. Search engine
marketing is divided into two categories paid and non-paid. Paid marketing includes pay per click
and non-paid marketing includes organic search engine optimization and Link popularity. They investigated the impact of important dimension of Service-oriented architecture, reach and range, and to design a web-based Search Engine Marketing Management System (SEMMS), which can be effectively applied to technical aspects in managing paid and non-paid search engine marketing required in service-oriented architecture dimension.

III. CONCLUSION

Researchers have used different strategies for improving the effectiveness of marketing and sales. For increasing sales it is necessary to find out frequently sold items. Frequent items are generated by applying apriori, frequent pattern growth or éclat algorithm. By making the use of information obtain from frequent item sets we can take more informed decision about product placement, pricing and promotion, learn more about customer behavior and find out which products should be cross sold and also find out which products perform similarly to each other.

REFERENCES


