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Data characterization using visualization based on Customer Buying Pattern by Association Rule Mining Algorithms

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ABSTRACT

Association rule mining is a data mining technique which consists of variety of algorithms to identify the relationships between the data set. Specifically Frequent pattern mining is a technique to find the association between the data set in any discipline. Using this technique the data miner can extract any kinds of hidden patterns in order to promote their discipline such as business intelligence, medical analysis, and scientific environment etc,. This system focused on business intelligence data where market basket analysis are performed by the Apriori algorithm already. In this system the data sets are constructed by the provision of AllElectronics data repository. The main goal of this system is for effective data summarization and characterization using visualization techniques.

Keywords: Business Intelligence ,Hidden Pattern,Market Based Analysis, Apriori Algorithm ,All Electronic Data Repository

I. INTRODUCTION

Data characterization using visualization based on Customer Buying Market Basket Analysis (Association Analysis) is a mathematical modeling technique based upon the theory that if we buy a certain group of items, we are likely to buy another group of items. It is used to analyze the customer purchasing behavior and helps in increasing the sales and maintain inventory by focusing on the point of sale transaction data .Given a dataset, the Apriori Algorithm trains and identifies product baskets and product association rules. For example, the electronic shopper's checkout items in a electronically,, a lot of data about the purchase - demographic details, address of the person goes in to the transaction database. Later, this huge data of many customers purchase data are analyzed , lot of experiments done to arrive at purchasing pattern of customers in different type of electronic. One group of customer are like to purchase in same company electronic. Another group of customer are thinking different type electronic are purchased. Also decisions like of customer which item to stock more , cross selling, up selling ,store shelf arrangement, effective data summarization and characterization using visualization techniques.

II. LITERATURE SURVEY

[Jamal Alsakran] The objective of this paper is to know consumer behaviour, his psychological condition at the time of purchase and how suitable data mining method apply to improve conventional method.Moreover, in an experiment, association rule is employed to mine rules for trusted customers using sales data in a supermarket industry. The psychology of consumers that how he thinks, feel, reasons and select between different alternatives. The mind set of how the consumer is influenced by his or her

environment. The behaviour of consumer while shopping or making other marketing decisions. How customer motivation and decision strategy differ between products that differ in their level of importance or interest that the entail for the customer; How management can adjust and improve their marketing campaigns and marketing ideas to more effectively reach customer. The data mining system is useful to Business house to find out the association of the customers with different products. And how customers are shifting from one brand to another brand of product to satisfy their need because their earlier buying habits are properly studied by the Data mining System.

[Jamal Alsakran ,Amer Al-Badarenah] This paper presents a collaborative recommender system that recommends university elective courses to students by exploiting courses that other similar students had taken. The proposed system employs an association rules mining algorithm as an underlying technique to discover patterns between courses. The main contribution of this paper is a new collaborative recommendation system that employed association rules algorithm to recommend university elective courses to a target student based on what other similar students have taken. The experiments shown that association rule is a desirable tool for making recommendation to a target student. Through our experiments, we noticed the patterns of influence of different parameters on the performance of the system. The confidence and match of a rule have a great impact on the performance, but the highest confidence or match may not be the best choice. By choosing a relatively high confidence or match, we can achieve a better performance.

[Mohamed Z. ElbashirThe University of Melbourne, Victoria 3010, Australia] Business intelligence (BI) systems provide the ability to analyse business information in order to support and improve management decision making across a broad range of business activities.Customer intelligence benefits arise from a better understanding of customers' buying habits, prediction of customers‘ future needs, and introducing new products and services accordingly.Customer benefits, prediction of customer needs analysis in BI system. New product introduce reduce cost effective of all customer need developing factor target customer benefits of sales in product. We then employ the measure in an examination of the relationship between the business process performance and organizational performance, finding significant differences in the strength of the relationship between industry sectors. This study reinforces the need to consider the specific context of use when designing performance measurement for IT-intensive systems, and highlights the need for further research examining contextual moderators to the realisation of such performance benefits .Crown Copyright © 2008 Published by Elsevier Inc. All rights reserved

[Ziming Zeng] This problem, a recommender system based on web mining is proposed in this paper. The system utilizes web mining techniques to trace the customer’s shopping behaviour and learn his/her up-to-date preferences adaptively. The experiments have been conducted to evaluate its recommender quality and the results show that the system can give sensible recommendations, and is able to help customers save enormous time for Internet shopping. In the shopping websites, the system can help customers find the most suitable products that they would like to buy by providing a list of recommended products. To overcome this problem, a recommender system based on web mining is proposed in this paper. The system utilizes web mining techniques to trace the customer’s shopping behaviour and learn his/her up-to-date preferences adaptively. The
experiments have been conducted to evaluate its recommender quality and the results show that the system can give sensible recommendations, and is able to help customers save enormous time for Internet shopping.

Apriori algorithm for Frequent Itemset Mining:

Cd_n : Candidate itemset of size n
L_n: frequent itemset of size n
L_1 = {frequent items};
For (n=1; L_n != ; n++)
Do begin
Cd_{n+1} = candidates generated from L_n;
For each transaction T in database do
Increment the count of all candidates in Cd_{n+1} that are
contained in T
L_{n+1}= candidates in Cd_{n+1} with min_support
End
Return

Apriori uses an iterative approach known as a level-wise search, in which n-item sets are used to explore (n+1)- Item sets. To improve the efficiency of the level-wise generation of frequent item sets Apriori property is used here. Apriori property insists that all non-empty subsets of frequent item set must also be frequent. This is made possible because of the anti-monotone property of support measure - the support for an item set never exceeds the support for its subsets. A two-step process consists of join and prune actions are done iteratively. The most influential algorithm for efficient association rule discovery from market databases is KApriori which uses the above mentioned Apriori property. This algorithm shows good performance with sparse datasets hence it is considered. The K-Apriori algorithm extracts a set of frequent itemsets from the data, and then pulls out the rules with the highest information content for different groups of customers by dividing the customers in different cluster.

EXISTING SYSTEM

The System design has done after the intensive study. The main study is to produce very fast and eliminate errors and give flexible to customer. To enter the data, extensions are needed. The need of new system has risen, due to inconsistency of the existing system

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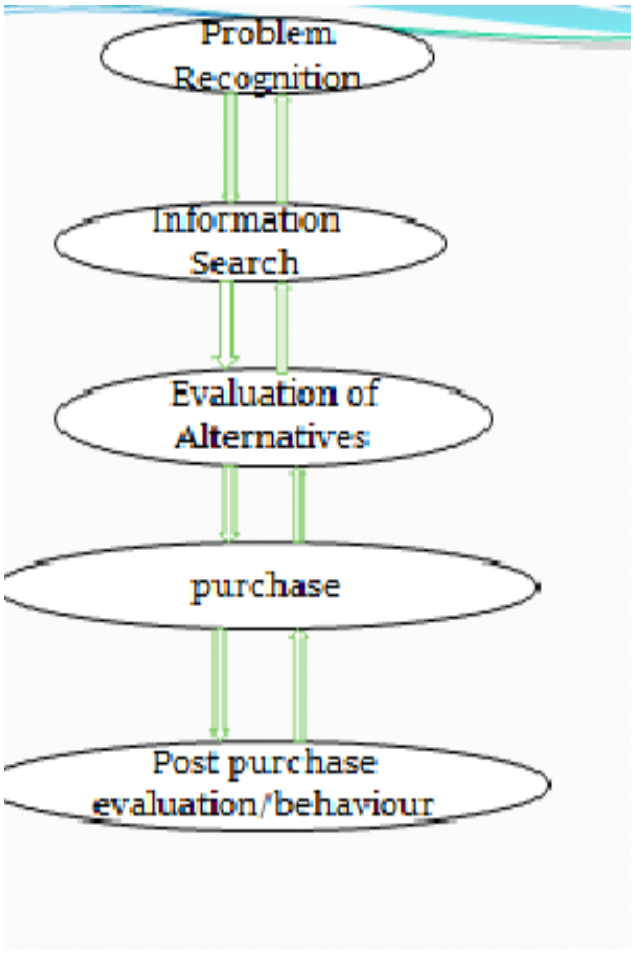


Figure 1

III. PROPOSED SYSTEM

Market basket analysis is one of the data mining Methods focusing on discovering purchasing patterns by extracting associations or co-occurrences from a store's transactional data. Market basket analysis determines the products which are bought together and to reorganize the electronic devices and also to design promotional campaigns such that products' purchase can be improved. Hence, the Market consumer behaviors need to be Analyzed, which can be done through different data mining techniques using analysis in the survey.

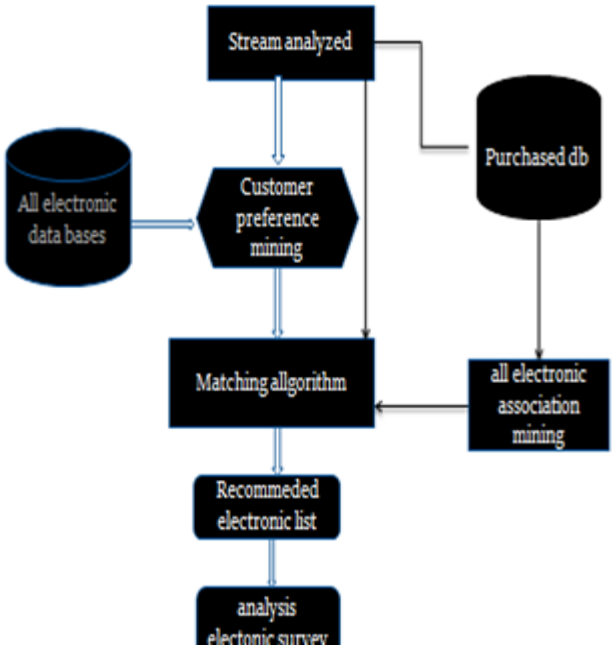


Figure 2

All electronic store description

Market basket analysis can be used to learn more about customer behaviour. The methodology of market basket analysis in all electronic stores is to discover the selling documents with the items for the transactions. Here the Copy bills are the selling documents considered here. This Logic is valid for item-related market basket analysis.

All electronic stores are a electronic company that has for years among the top supermarkets in the Tamilnadu country. All electronic stores are organized in the sections. This is the main section of this store which provides the major revenue. It provides approximately 75% of the profit for this all electronic. .Customers include small retail shops, products' agents and normal individuals.

Marketing and sales promotion campaigns

When sales campaigns are prepared, promoted items must be chosen very carefully. The main goal of a campaign is to entice customers to visit Allelectronic stores and to buy more than they usually do. Margins on promoted items are usually cut; therefore, additional non promoted items with higher margins should be sold together with promoted items. Therefore, the related items must be chosen to make effective promotions such that promoted items must generate sales of non-promoted items appliances. It makes sense that these groups are placed side by side in a retail center so that customers can access them quickly. Such related groups of goods also must be located side-by-side in order to remind customers of related items and to lead them through the center in a logical manner. When different additional brands are sold together with the basic brands, the revenue from the basic brands is not decreasing, but increasing.

CUSTOMER BUYING BEHAVIOR PATTERNS

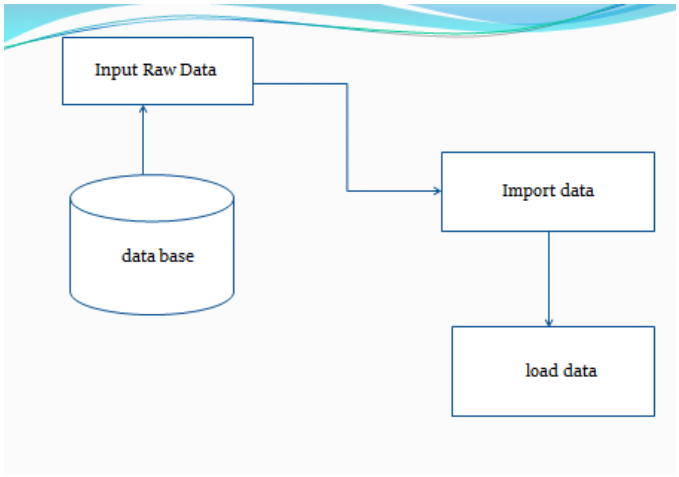
To buy is to purchase. To shop is to visit business establishments for inspection or purchase of goods. Therefore shopping is an element of customer behaviour in buying. A customer placing an order over the telephone is buying, not shopping. For this reason it may be desirable to standardize on the use of the term *buying* rather than *shopping* when the totality of customer behaviour is under co Sedation. Similarly a distinction should be made between *buying habits* and *buying behaviour patterns.* Habit is a tendency toward an action which by repetition has become spontaneous. A pattern is a design or type. Each customer has his or her own buying habits. Buying behaviour patterns represent the design of behaviour of a large number of customers. behaviour is very annoying. Customer buying habits or behaviour patterns are not permanently fixed, and certainly not sacred, even though some habits tenaciously resist change. Many factors are operating in combination to change customer food-buying behavior patterns. Among these are the all-electronic their market based and self-service ,the progress in the development and merchandising of frozen foods, prepared flour mixes, brown-and-serve baked goods and concentrated fresh milk; the increasing availability of suitable facilities in the customer's home for preserving these and other highly perishable raw and prepared foods; and the public's receptive disposition to easier and less time-

consuming ways of living. Similar and perhaps even more pronounced changes are affecting customer buying behaviour patterns of non-food commodities.

Customer buying behaviour patterns can be grouped in relation to:

1. Place of Purchase
2. Items Purchased
3. Time and Frequency of Purchase
4. Method of Purchase
5. Response to Sales Promotion Device

Data flow diagram



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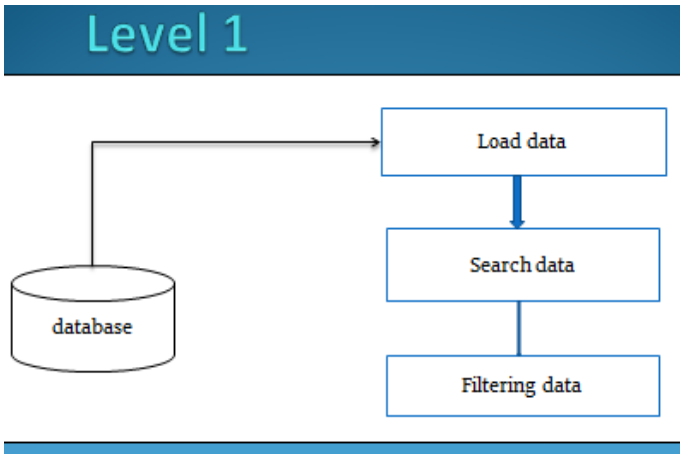

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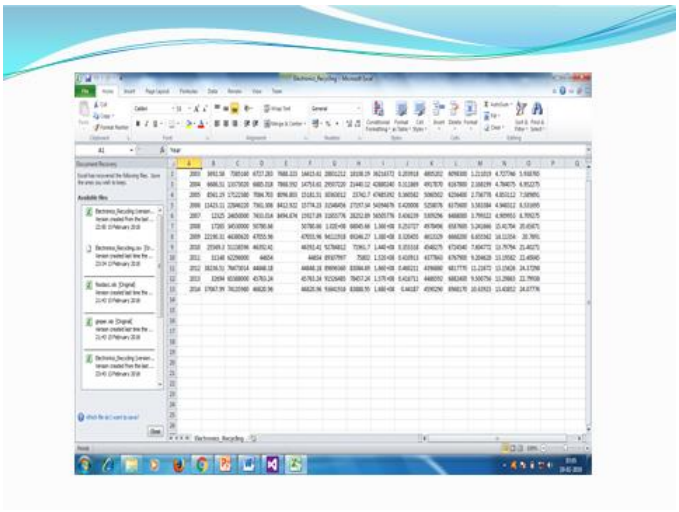

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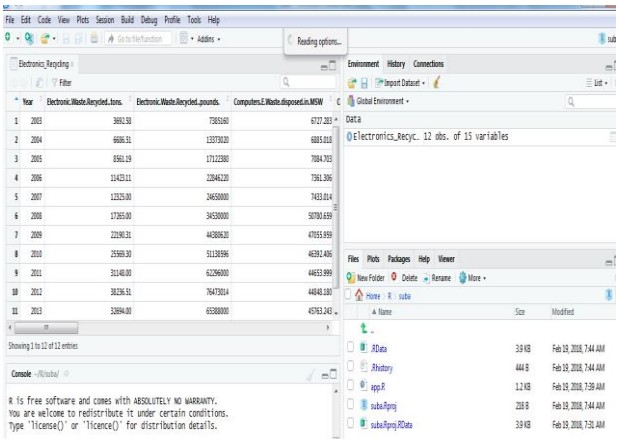

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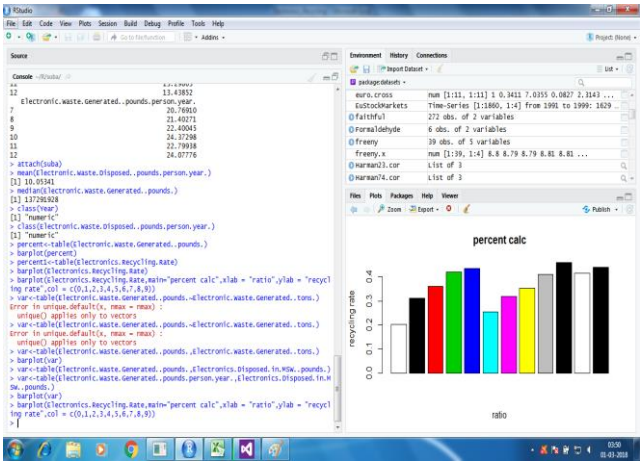

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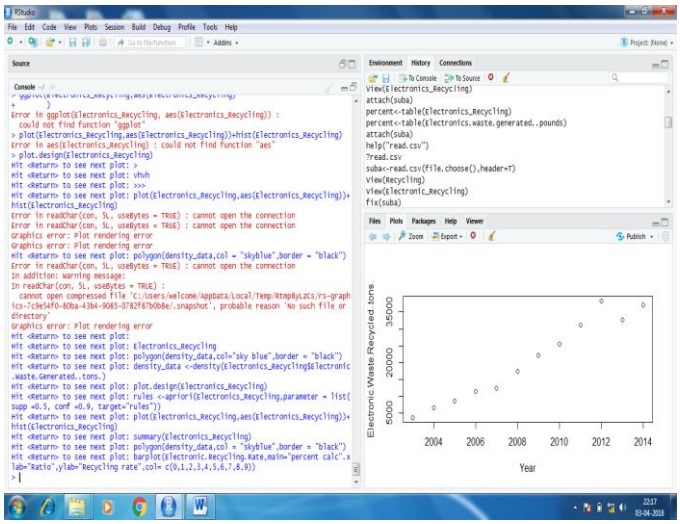

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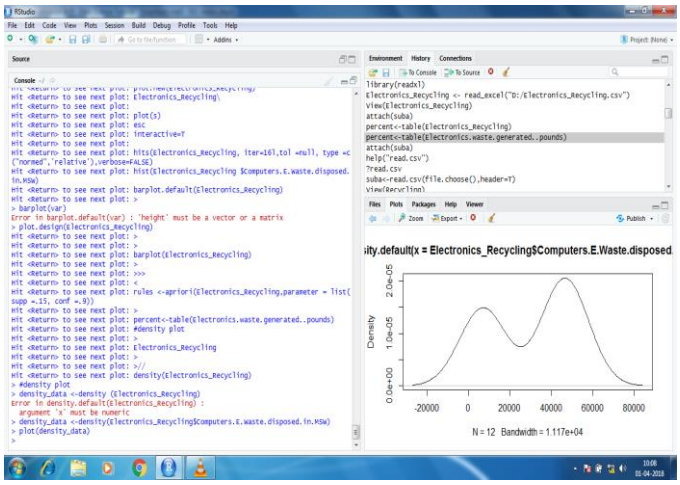

Figure 9

IV. CONCLUSION

The endeavour has been made here to show along what lines and with what techniques studies of customer behaviours can be made in allelectronic stores. Possible uses of the results for the solution of marketing problems have been suggested or indicated. To spell out fully and systematically the many practical uses to which such studies can be put by producers, manufacturers and distributors would require a series of articles—perhaps a book. This article is intended to stimulate those who can gain the most from such studies to take advantage of the opportunities for learning more about customer behaviour in the indicated. To spell out fully and systematically the many practical uses to which such studies can be put by producers, manufacturers and distributors would require a series of articles—perhaps a book. This article is intended to stimulate those who can gain the most from such studies to take advantage of the opportunities for learning more about customer behaviour in the market-place. The main goal of this system is for effective data summarization and characterization using visualization techniques.

V. FUTURE ENHANCEMENT

Considering the change of future needs has developed this project. The users need may change from day to day, so this project development in such a way to easily enhance and satisfy the future needs. The project has the scope for future enhancement and development. The project can be further enhanced by Specifically Frequent pattern mining is a technique to find the association between the data set in any discipline. Using this technique the data miner can extract any kinds of hidden patterns in order to promote their discipline such as business intelligence, medical analysis, and scientific environment etc,. This system focused on business intelligence data where market basket analysis are performed by the Apriori algorithm already Menus and screens can be designed in more attractive and more appealing manner. Each option can be provided with icons of pictorial representations. Limitations faced by this project can be easily rectified in case a standard procedure is adapted. This can be implemented by minor changes in the appropriate areas. This system is very flexible so that the maintenance and further attachments based on the changing environment and requirements can be made easily. Any change that leads to the system failures is prevented with security measures.

The mining phase consists to offset the information lost during the transaction splitting and calculates a run time estimation method to find the actual support of item set in a given database.

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