A Conceptual Study of Knowledge Mining for Business Solutions of Super Bazaars

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Abstract: **India is going through a retail revolution. All the big business houses are entering this sector and it is growing at a very past pace. One of the booming business formats of retail is super bazaar. In order to excel in the marketplace, retailers aim at developing strategic advantage, they need to effectively manage their critical resources, real estate and locations. So, it has become necessary for super bazaar owners to understand their consumers so that they can provide better services and enhance quality of business. To achieve better service and quality they depend upon buying behaviour of consumers. Knowledge mining is one of the most popular topics in information technology. It concerns the process of automatically extracting useful information and has the promise of discovering hidden relationships that exist in large datasets. The data collected could be mined to extract interesting patterns so that users buying behaviour could be understood. This paper presents how knowledge mining can systematically study buying behaviour of consumers related to various form of super bazaar data.**

Keywords: **Super Bazaar, Knowledge Mining, Consumer, Buying Behaviour, Retail Sector.**

1. INTRODUCTION

Retail sector in Indian is growing very fast. Retail is final stage of any economic activity. Any organization selling to final consumer's weather it is manufacturer, wholesaler or retailer is doing by retailing. By virtue of this fact, retail occupies an important place in the world economy. A super bazaar is self service shop offering a wide variety of food and household products organized in aisles. It is larger in size and has wider selection than traditional grocery store. It is usually situated near a residential area in order to be convenient to consumers. Consumer behaviour study is based on consumer buying behaviour, with the consumer playing the three distinct roles of user, payer and buyer. Consumer behaviour is difficult to predict. The consumer landscape is changing very fast. Consumer behaviour is difficult to predict. The consumer landscape is changing very fast.

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A greater importance is also placed on consumer retention, customer relationship management, personalization and customization. Occupational changes, expansion and penetration of media have caused a significant change in the way the consumer lives and spends his money [12]. Consumers today see an exciting explosion of choices, new categories and new shopping options and have increasing disposable income to fulfil their aspirations. They are seeking more information to make these choices. Consumers are increasingly seeking convenience in shopping and want the shopping experience to be enjoyable. Different methods and structures used for recording buying behaviour of consumers in super bazaars. The amount of data in super bazaars increasing every year and capacity to analyse that data is simply not keeping up. The challenge for these super bazaars is the difficulty of analysing large volumes of data. Customer identification is critical to successful super bazaar functioning. Knowledge mining helps model and identify the traits of profitable customers and reveal the "hidden" relationship that have not already found. Accurate prediction and an understanding of customer behaviour can help managers keep customers, improve sales, and extend the relationship with their customers. Knowledge mining can identify valuable customers who are likely to defect to a competitor, allowing the customer relationship management team to target them for retention. It also points out potential long-term, high-value customers who can be accelerated to that value through marketing programs. Knowledge mining can encourage the right purchase behaviour. Managers of super bazaars can make marketing new products and services more profitable by using knowledge mining to find customers most likely to respond to an offer for such products or services. Knowledge mining used for several super bazaar owners to analyse shopping patterns within stores based on point of sale (POS) information. To stay competitive, super bazaar managers must understand not only current consumer behaviour, but must also be able to predict future consumer behaviour. Knowledge mining is the technology helping organizations like grocery stores present product in ways that encourage cross-item sales. Knowledge mining approach can be used design pricing strategy that will help to strengthen company's competitiveness. Knowledge mining is used to identifying

valid, potentially useful and unknown patterns from a large amount of data [11]. Knowledge mining is one in which numerous technique are available. The usage of knowledge mining concept helps to explore the enormous data and making it possible in reaching the ultimate goal of complex data analysis. The data may or may not be in directly usable form and may need some interpretation based on previous knowledge, experience and most importantly for the purpose of data analysis. So, many computational tools are used and are broadly termed as 'Knowledge Mining Tools'. The tools are comprised of basic Statistics and Regression methods, Decision Trees, Rule Based Techniques, and, also advanced algorithms that use Artificial Intelligence or in a combined form. The result of such data processing is that many important non-obvious relationships can be identified. The main aim of this paper is to study how knowledge mining can systematically study buying behaviour of consumers that can systematically address the complex problems related to various form of super bazaar data.

2. REVIEW OF LITERATURE

Consumption universes based supermarket layout through association rule mining and multidimensional scaling by Ibrahim Cil [8] proposes the success depends on its ability in understanding consumers' behaviours. Analysis of transaction data is the key for taking advantage of these new opportunities, which enables supermarkets to understand and predict customer behaviour, has become a crucial technique for effective decision-making and strategy formation**.** Product development with data mining techniques: A case on design of digital camera by Jae Kwon Bae, Jinhwa Kim [9] insist that many enterprises have been devoting a significant portion of their budget to product development in order to distinguish their products from those of their competitors. To investigate these research issues, the Apriori and C5.0 algorithms are methodologies of association rules and decision trees for data mining, which is implemented to mine customer's needs. Dynamic rough clustering and its applications by Georg Peters, Richard Weber, René Nowatzke [6] proposed algorithm consists of a dynamic clustering cycle when the data set will be refreshed from time to time. Within this cycle criteria check if the newly arrived data have structurally changed in comparison to the data already analyzed. If yes, appropriate actions are triggered, in particular an update of the initial settings of the cluster algorithm. A product network analysis for extending the market basket analysis by Hyea Kyeong Kim, Jae Kyeong Kim, Qiu Yi Chen [7] suggest two kinds of product networks, market basket networks and co-purchased product networks. Two networks are comparatively evaluated to analyse the topological characteristics and the structure of those networks it is used in personalized services, such as cross selling, up selling, and personalized product display utilizes the deep relation between products. Predict on-shelf product availability in grocery retailing with classification methods by Dimitris Papakkiriak [4] compares various classification algorithms that can identify 'out-of-shelf' products. Due to the class imbalance of product availability, an ensemble learning method is used to increase performance of the base classifiers used. The validation results indicate that it is possible to deliver accurate predictions regarding which products are 'out-of-shelf' for a selected retail store on a daily base. Predicting food demand in food courts by decision tree approaches by Ahmet Selman Bozkir, Ebru Akcapinar Sezer [1] found that to overcome problem of fluctuations and unpredictability in food demand, three decision tree methods (CART, CHAID and Microsoft Decision Trees) are utilized. This study shown that decision tree methodology is suitable for food consumption prediction. Cluster analysis using data mining approach to develop CRM methodology to assess the customer loyalty by Seyed Mohammad Seyed Hosseini, Anahita Maleki, Mohammad Reza Gholamian [12] has proposed a new procedure, based on expanded RFM model by including one additional parameter, joining WRFM-based method to *K*-means algorithm applied in DM with *K*-optimum according to Davies–Bouldin Index, and then classifying customer product loyalty in under B2B concept. A data mining approach for retail knowledge discovery with consideration of the effect of shelf-space adjacency on sales by Yen-Liang Chen, Jen-Ming Chen, Ching-Wen Tung [13] proposes a novel representation scheme and develops a robust algorithm based on association analysis. To show its efficiency and effectiveness, an intensive experimental study using self-defined simulation data was conducted. Why promotion strategies based on market basket analysis do not work by Bernd Vindevogel, Dirk Van den Poel, Geert Wets [2] highlights that market basket analysis cannot be used to build a promotion expert system for retailers. Instead, there is advice to base the promotion strategy on cross-price elasticity's. Customer relationship management in retailing by Joan L. Anderson, Laura D. Jolly, Ann E. Fairhurst [10] proposes of this research was to increase knowledge and understanding of how retailers use business intelligence and data mining tools to implement customer relationship management (CRM) in retailing. Findings provide insight into the challenges retailers face as they implement a more customer-centric business strategy.

It is found that research has been carried out on selected topic on CRM in retailing, problem of fluctuations and unpredictability in food demand, identify out-of-shelf products. But there is need to study the knowledge mining for effective decision making in super bazaars in order to retain customers, optimize the resources and reduce the

operational expenses. At the same time it provides a better platform for the customers taking services from the super bazaars.

3. STATEMENT OF PROBLEM

For a super bazaar owner, it is very difficult to retain the potential buyer because the buyers are scattered according to their convenience of purchasing. In order to keep possession of their sales volume, the owner has to face a stiff competition in the bazaar business. So research is carried out on super bazaar to study buying behaviour of consumers using different knowledge mining methods. This conceptual study is useful for effective decision making by studying customer purchase patterns and trends over time.

4. OBJECTIVES OF RESEARCH

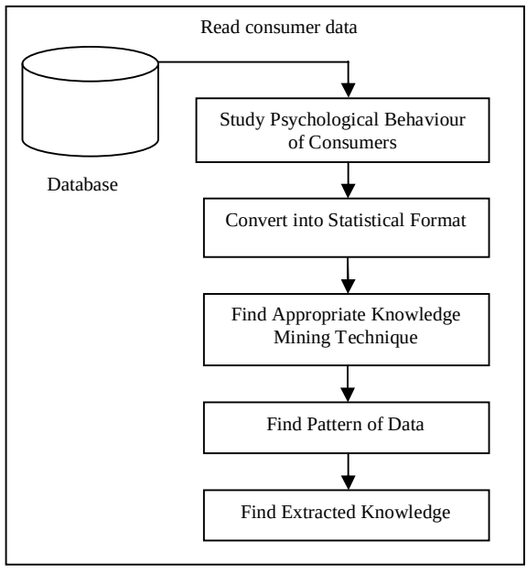
1. To study the factors influencing buying decisions of the consumer visiting super bazaars using knowledge mining.
2. To find out the association of consumers with different products using association rule mining.
3. To extract the information using knowledge mining to measure the level of satisfaction for buying behavior of consumers from super bazaars.
4. To generate the pattern of data to know the consumer buying behavior.

5. METHODS OF DATA COLLECTION

Both primary and secondary data is collected. Primary data is collected by researcher through survey and opinion with the help of different sets of structured questionnaires, interviews, observations for consumers, managers and owners of the super bazaars and secondary data will be collected from publications, directories, and statistics from websites, various libraries, internet, journals, periodicals and research references in specialized areas.

6. ARCHITECTURE OF KNOWLEDGE MINING FOR BUSINESS SOLUTIONS

Knowledge mining is a process of extracting interesting knowledge from large amounts of data stored in multiple data sources such as file systems, databases and data warehouses. Knowledge mining techniques are expected to be a more effective tool for analysing consumer behaviours. It is important to select appropriate technique to mine database. Knowledge mining is the method of analysing data from different angle or perspective and collecting it to get useful information that can be used to increase revenue in super bazaar business. For getting the result by implementing knowledge mining methodologies researcher collects data from super bazaar database. Architecture of knowledge mining provides study of psychological behaviour of consumers, converting this into statistical format and study is there any technical format by which we can analyse consumer buying behaviour. It is represented in following steps:



7. CONCLUSIONS

The proposed study will help super bazaar owners to have a deeper understanding of customer purchase sequence, patterns and trends over time. This study will be beneficial for customer identification, customer attraction, customer retention, customer development and to study buying characteristics of customers in super bazaars. Further, this study can provide baseline information on the recent status of business practices in super bazaar business. Also, this study will help to bring about demographic study of urban and rural consumers. Different methods of knowledge mining are studied for effective decision making in super bazaars. It will help increase the profit of super bazaars. Adopting a knowledge mining based business will create foundation for improved business efficiency. Therefore proposed knowledge mining strategies will enable super bazaar business for achieving greater heights both horizontally and vertically. Further, this proposed study will prove beneficial and helpful for prospective researchers.

8. REFERENCES

[1] Ahmet Selman Bozkir, Ebru Akcapinar Sezer, "Predicting food demand in food courts by decision tree approaches," *Procedia Computer Science*, Volume 3, PP. 759-763, 2011.

[2] Bernd Vindevogel, Dirk Van den Poel, Geert Wets, "Why promotion strategies based on market basket analysis do not work," *Expert Systems with Applications*, Volume 28, Issue 3, PP.583-590, April 2005.

[3] Briony J Oates , *Researching Information Systems and Computing*, South Asian Edition, 2006.

[4] Dimitris Papakkiriakopoulos, "Predict on-shelf product availability in grocery retailing with classification methods," *Expert Systems with Applications*, Volume 39, Issue 4, PP. 4473-4482, March 2012.

[5] G. Maragatham and Dr. M. Lakshmi, "A Road Map for Mining Statistically Significant Non-Redundant Association Rules: SSNRARM Approach,"*Journal of Computer Science and Applications*, Volume 4, Number 2, PP.147-151, Dec2012.

[6] Georg Peters, Richard Weber, René Nowatzke, "Dynamic rough clustering and its applications," *Applied Soft Computing*, Volume 12, Issue 10, PP.3193-3207, October 2012.

[7] Hyea Kyeong Kim, Jae Kyeong Kim, Qiu Yi Chen, "A product network analysis for extending the market basket analysis," *Expert Systems with Applications*, Volume 39, Issue 8, PP.7403-7410, June 2012.

[8] Ibrahim Cil, "Consumption universes based supermarket layout through association rule mining and multidimensional scaling," *Expert Systems with Applications*, Volume 39, Issue 10, PP.8611-8625, August 2012.

[9] Jae Kwon Bae, Jinhwa Kim, "Product development with data mining techniques: A case on design of digital camera," *Expert Systems with Applications*, Volume 38, Issue 8, PP. 9274-9280, August 2011.

[10] Joan L. Anderson, Laura D. Jolly, Ann E. Fairhurst, "Customer relationship management in retailing," *A content analysis of retail trade journals of Retailing and Consumer Services*, Volume 14, Issue 6, PP. 394-399, November 2007.

[11] Margaret H. Dunham, S. Sridhar, "*Data Mining: Introductory and Advanced Topics*" Pearson Education, Inc., 2006.

[12] Seyed Mohammad Seyed Hosseini, Anahita Maleki, Mohammad Reza Gholamian, "Cluster analysis using data mining approach to develop CRM methodology to assess the customer loyalty," *Expert Systems with Applications*, Volume 37, Issue 7, PP.5259-5264, July 2010.

[13] Yen Liang Chen, Jen-Ming Chen, Ching-Wen Tung, "A data mining approach for retail knowledge discovery with consideration of the effect of shelf-space adjacency on sales", *Decision Support Systems*, Volume 42, Issue 3, PP.1503-1520, December 2006.