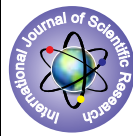


Data Mining: an Effective Technique to Study Consumer Buying Behavior



Computer Science

KEYWORDS : Data Mining- DM, Unstructured-US, Semi-structured-SS, Structured-S, Decision Process-DP

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ABSTRACT

In the industrial scenario the degree of success of the any Organization and the Manager's job is measured by the ratio of Outputs to Inputs. Thus, this ratio becomes the indication of Organization's Productivity. Hence, all managerial/administrative activities revolve around decision making. The manager is first and foremost a decision maker. As Managers have considered 'Decision Making' a pure art, a talent required for long period of the time through experience. A variety of individual styles could be used in analyzing a problem and finally solving successfully managerial problems. These managerial styles are often based on Creativity, Judgment, Intuition and experience rather than on systematic quantitative methods based on a scientific way. But in today's situation business and its dynamics are rapidly changing and have become more complex than ever before. These changes in business world has wider impact on the managerial decision making process. Due to this situation, today decision making is more complicated than it was in the past. It is more difficult to make decisions for several reasons. Harbridge House (a Boston Firm) has conducted a survey, and ranked Clear-cut decisions needed as the most important of 10 management practices. As the trends are changing, it is very difficult to rely upon trial and error approach to management, in case of decision is unstructured and semi-structured decision making situations. Managers must learn sophisticated, new tools and techniques. Using these technological tools such as Data Mining, its mostly hot- cake in today's managerial decision process.

2 Data Mining : A Key aspect

Discovering hidden values in the form of Databases : Data mining(DM), the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their databases. Data mining tools enables to predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by DM move beyond the analyses of past events provided by retrospective tools typical of decision support systems. Data mining tools can answer business questions that traditionally were too time consuming to resolve. They scan databases for hidden patterns, finding predictive information that experts may miss because it lies outside their expectations.

3 The Scope

Data mining derives its name from the similarities between searching for valuable business information in a large database — for example, finding linked products in gigabytes of store and mining a mountain of database for a valuable ore (ie: knowledge). Both processes require either sifting through an immense amount of material, or intelligently probing it to find exactly where the value resides. Given databases of sufficient size and quality, data mining technology can generate **new business opportunities**.

Data mining techniques can yield the benefits of automation on existing software and hardware platforms, and can be implemented on new systems as existing platforms are upgraded and new products developed. When data mining tools are implemented on high performance parallel processing systems, they can analyze massive databases in minutes. Faster processing means that users can automatically experiment with more models to understand complex data. High speed makes it practical for users to analyze huge quantities of data. Larger databases, in turn, yield improved predictions.

4 Stages of the Consumer Buying Process:

Six Stages to the Consumer Buying Decision Process. Actual purchasing is only one stage of the process. Not all decision processes lead to a purchase. All consumer decisions do not always include all 6 stages, determined by the degree of complexity. The 6 stages are:

1. Problem Recognition--difference between the desired state and the actual condition. Deficit in assortment of products.
2. Information search-- A successful information search leaves a buyer with possible alternatives, the evoked set.
 - a. Internal search, memory.
 - b. External search if you need more information.

Friends and relatives (word of mouth). Marketer dominated sources; comparison shopping; public sources etc.

3. Evaluation of Alternatives--need to establish criteria for evaluation, features the buyer wants or does not want. Rank/weight alternatives or resume search.
4. Purchase decision--Choose buying alternative, includes product, package, store, method of purchase etc.
5. Purchase--May differ from decision, time lapse between 4 & 5, product availability.
6. Post-Purchase Evaluation--outcome: Satisfaction or Dissatisfaction. Cognitive Dissonance, have you made the right decision. This can be reduced by warranties, after sales communication etc.

3 Types of Consumer Buying Behavior

Types of consumer buying behavior are determined by:

- Level of Involvement in purchase decision. Importance and intensity of interest in a product in a particular situation.
- Buyer's level of involvement determines why he/she is motivated to seek information about a certain products and brands but virtually ignores others.

High involvement purchases--Honda Motorbike, high priced goods, products visible to others, and the higher the risk the higher the involvement. Types of risk:

- Personal risk
- Social risk
- Economic risk

The four type of consumer buying behavior are:

- Routine Response/Programmed Behavior--Buying low involvement frequently purchased low cost items; need very little search and decision effort; purchased almost automatically. Examples include soft drinks, snack foods, milk etc.
- Limited Decision Making--Buying product occasionally. When you need to obtain information about unfamiliar brand in a familiar product category, perhaps. Requires a moderate amount of time for information gathering. Examples include Clothes--know product class but not the brand.
- Extensive Decision Making/Complex high involvement, unfamiliar, expensive and/or infrequently bought products. High degree of economic/performance/psychological risk. Examples include cars, homes, computers, education. Spend a lot of time seeking information and deciding. Information from the companies MM; friends and relatives, store personnel etc. Go through all six stages of the buying process.
- Impulse buying, no conscious planning.

The purchase of the same product does not always elicit the same Buying Behavior. Product can shift from one category to the next. For example: Going out for dinner for one person may be extensive decision making (for someone that does not go out often at all), but limited decision making for someone else. The reason for the dinner, whether it is an anniversary celebration, or a meal with a couple of friends will also determine the extent of the decision making.

Research Design

The first and prime objective of our study is comparative analysis of consumers buying behavior in South-Western Maharashtra State in the selected supermarkets. The study of consumer behavior is the most important factor for marketing of any goods and services. The consumer behavior suggests how individual, groups and organization select, buy, use and dispose of goods, services, ideas or experience to satisfy their needs and wants. It also clues for improving or introducing products or services, setting price, devising channels, promoting products, venturing joint products, etc. which ultimately leads to the conversion of visitor to a customer.

4 Methodology Adopted

The descriptive research design methodology was followed in the present research design. Research problem: A study of buying behavior in South-Western Maharashtra State in the selected supermarkets.

Data source: Primary data and secondary data

Research approach: Survey approach

Research methodology: Exploratory method

Research Instruments: Questionnaire

5 Sampling Plan - Selected Super Markets as below:

Sample: Super Market : Big Bazaar, Lucky Bazaar and D-Mart

Sample Methods Random Simple Sampling

Sample size 180 (From each Bazaar 60 respondents)

Primary data Questionnaire and Interview

6 Sample Design

While deciding about the sample of research, it is required from the researcher's point to pay attention to these under mentioned points:

- Sample Units: A decision has to be taken concerning a sampling unit before selecting a sample, sampling unit may be a geographical one such as state, district, village Etc. so in this research sampling unit is South-Western Maharashtra State
- Source list: It is also called sampling frame from which sample is to be drawn, it caters name of all the items of a universe (in case of finite universe only). Researcher has to prepare it

Data Analysis And Interpretation

Table : Bazar & Income

Rule #	Conf. %	Antecedent (a)	Consequent (c)	Support (a)	Support (c)	Support (a U c)	Lift Ratio
11	34.62	< 1.5 Lakh=>	Lucky	78	60	27	1.038462
12	34.62	< 1.5 Lakh=>	Big Bazar	78	60	27	1.038462
16	30.77	< 1.5 Lakh=>	D Mart	78	60	24	0.923077
4	39.13	< 3 Lakh=>	D Mart	69	60	27	1.173913
14	31.88	< 3 Lakh=>	Big Bazar	69	60	22	0.956522
22	28.99	< 3 Lakh=>	Lucky	69	60	20	0.869565
5	34.78	< 4.5 Lakh=>	Big Bazar	23	60	8	1.043478
6	34.78	< 4.5 Lakh=>	Lucky	23	60	8	1.043478
17	30.43	< 4.5 Lakh=>	D Mart	23	60	7	0.913043
1	50	> 4.5=>	Lucky	10	60	5	1.5
19	30	> 4.5=>	Big Bazar	10	60	3	0.9
23	20	> 4.5=>	D Mart	10	60	2	0.6

- Sampling size: This refers to the no. of items to be selected from the universe to constitute a sample. This is a major problem before the researcher. The size of sample should neither be excessively large nor too small, it should be optimum. This size of population must be kept in view for this also limits the sample size. Sample size in this research is 75 customers.
- Sampling procedure: Finally the researcher must decide the type of sample he must be. That is he must decide about the technique to be used in selecting items for the sample. In fact this technique or procedure stands for the sample design itself. In this we used the random sampling on the basis of first survey results, which is from 75 respondents.

7 Instruments Used

We have collected primary data through sample survey or census surveys from the selected elements in super markets. So for this purpose we have used the most popular tool of primary data collection through direct communication with respondents. The tools we used are questionnaires.

Source of data: Data required for the study was collected through primary sources i.e. Market Survey.

8 Method Of Data Collection

Actually data is of two kinds so researchers should keep in mind both types of data.

- Primary Data: Primary data are those, which are collected afresh and for the first time and this happen to be original in character.
- Secondary Data: Secondary data are those data which have already been collected by someone else and which have already been used as per required.

There are basically two sources to collect secondary data

- Internally: Provided by the company/organization
- Externally: Various publication of central, state and local Government.

· Books, magazines, newspapers, Internet

We have collected data from selected super Markets using questionnaire schedules and noted down their opinions of their experiences about services provided by the super markets under study. After soliciting the data through survey conducted and then data is entered into the Excel sheets. Then **XL-Miner tool** was used to process the data and to get the computed outputs. Following are some sample tables shown which indicates various parameters studied and the association exist between the parameters.

7	13.33	Big Bazaar=>	< 4.5 Lac	60	23	8	1.043478
10	45	Big Bazaar=>	< 1.5 Lac	60	78	27	1.038462
13	36.67	Big Bazaar=>	< 3 Lac	60	69	22	0.956522
20	5	Big Bazaar=>	> 4.5	60	10	3	0.9
3	45	D Mart=>	< 3 Lac	60	69	27	1.173913
15	40	D Mart=>	< 1.5 Lac	60	78	24	0.923077
18	11.67	D Mart=>	< 4.5 Lac	60	23	7	0.913043
24	3.33	D Mart=>	> 4.5	60	10	2	0.6
2	8.33	Lucky=>	> 4.5	60	10	5	1.5
8	13.33	Lucky=>	< 4.5 Lac	60	23	8	1.043478
9	45	Lucky=>	< 1.5 Lac	60	78	27	1.038462
21	33.33	Lucky=>	< 3 Lac	60	69	20	0.869565

The above table represents the various group of customer falling under different groups i.e. 1. income having up to 1.5 lakh p.a., 2. income having less than 3 lakhs p.a. and 3. income having less than 4.5 lakh p.a. and last group income having more than 4.5 lakh p.a. The observations indicates that the confidence level 34.62%, 34.62% and 30.77% for Lucky Bazaar, Big Bazaar and D Mart bazaar respectively for income group possessing less than 4.5 lakh p.a. Which shows the people having income less than 1.5 lakh p.a. prefer buying products from nearest bazaar irrespective of all other factors.

The customers belong into next group of income slot (i.e. income less than 3 lakh) the majority of them (39.13%) prefer buying from D mart, where as 31.88% and 28.99% prefer buy-

ing from Big bazaar and Lucky Bazaar respectively.

The customer population having income less than 4.5 lakh p.a. have shown preference (34.78%) to Lucky Bazaar and Big Bazaar each and 30.43% customers go for purchasing to D Mart.

Income group calling under more than 4.5 lakh income p.a. have shown (50%) buying confidence in Lucky Bazaar and 30% confidence buying through Big Bazaar and remaining 20% from D Mart.

Conclusion:

It was inferred from above observations that from average income group people prefer buying from the nearest bazaar irrespective of other factors.

Table No.2 Bazaar & Education

Rule #	Conf. %	Antecedent (a)	Consequent (c)	Support (a)	Support (c)	Support (a U c)	Lift Ratio
1	50	SSC=>	Big Bazaar	6	60	3	1.5
11	33.33	SSC=>	D Mart	6	60	2	1
23	16.67	SSC=>	Lucky	6	60	1	0.5
4	43.08	pg=>	D Mart	65	60	28	1.292308
18	29.23	pg=>	Big Bazar	65	60	19	0.876923
20	27.69	pg=>	Lucky	65	60	18	0.830769
5	60	Lucky=>	graduate	60	94	36	1.148936
14	8.33	Lucky=>	HSC	60	15	5	1
19	30	Lucky=>	pg	60	65	18	0.830769
24	1.67	Lucky=>	SSC	60	6	1	0.5
9	33.33	HSC=>	Big Bazaar	15	60	5	1
10	33.33	HSC=>	D Mart	15	60	5	1
12	33.33	HSC=>	Lucky	15	60	5	1
6	38.3	graduate=>	Lucky	94	60	36	1.148936
8	35.11	graduate=>	Big Bazaar	94	60	33	1.053191
22	26.6	graduate=>	D Mart	94	60	25	0.797872
3	46.67	D Mart=>	pg	60	65	28	1.292308
15	8.33	D Mart=>	HSC	60	15	5	1
16	3.33	D Mart=>	SSC	60	6	2	1
21	41.67	D Mart=>	graduate	60	94	25	0.797872
2	5	Big Bazaar=>	SSC	60	6	3	1.5
7	55	Big Bazaar=>	graduate	60	94	33	1.053191
13	8.33	Big Bazaar=>	HSC	60	15	5	1
17	31.67	Big Bazaar=>	pg	60	65	19	0.876923

The above table represents the data of customers having different educational criteria, who do visit to different bazaars as below:

The customers having SSC (50%) visit Big Bazaar, 33.33% visit D Mart and 16.67% visit Lucky Bazaar this may be due to aggressive promotional activities like (Buy one, Get one Free) and

discounts coupons. The customers having HSC background have shown equal interest in visiting Big Bazar, D Mart and Lucky Bazaar respectively. The Graduate customer population have shown 38.3% preference to Lucky Bazar, 33.11% preference to Bazaar and 26.6% to D Mart.

The Post graduate people go to purchasing for (43.08%) to D

Mart, 29.23% Big Bazar and 27.67% to Lucky Bazaar respectively.

Conclusion

Most of highly educated people prefer purchasing from **D Mart** super market only.

Conclusions And Suggestions

As the consumer buying behavior is the important factor to forecast the sales of any product in a particular area. So company should keep close eye on the market situation. yet, customer were price sensitive, but the changing market trend and customer view and preference shown that customer are now quality sensitive. They want quality product, good services, easy availability of product and better performance by the product. These days no of customer buying from malls has been increased. Also the frequency to visit the malls has been increased

substantially. People are more brands conscious and they are satisfied with the range of products available there. We can conclude from our study that

Suggestions

1. Customer like best quality product on any price, so super market should add latest technology to their products.
2. After sales, services are the area where super market can highly satisfy the existing customer, because they can make more customers through their word of mouth.
3. Customer's behavior always looks for some extra benefit with purchasing. They demand for affordable price for product and gifts with purchasing.
4. Super market should make strategy to cater every income group customers in city. Upper income group are affordable to purchase but lower income group is not. So
5. They should keep a close eye on competitor strategy.

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