

FACTOR PARTICIPATING AND IMPACTING E-MARKETS PIONEERS BEHAVIORAL TRACKING

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Abstract

Due to the emerging of internet technology and development of mobile communications, word economic has tended to digital and soft markets. Accordingly, all the necessary steps were taken to establish a virtual market ensuring stunning shopping experience for each customer. The customer's behaviors are the most important factor in E-Commerce platforms. Marketing team (company) is desperately willing to know how dose each category of customers react to their product. Data mining technologies including the clustering techniques, classification and prediction are deployed to mining the knowledge of marketing data. The data mining technology influence on the E-Commerce has been analyzed in this study; a questionnaire base review has made to collect the data required in this study. SPSS 23 software has been used to analysis the questionnaire data. According to the results observed in this study, data mining can enhance the performance of E-Commerce by providing a smart and efficient customer behaviors prediction. Furthermore, this technology is realized with similar advantages for the end-customer also.

Keywords: E-marketing, Shopping, Clustering, Neural Network, Mean, Standard Deviation, HTML, Event Prediction.

1. INTRODUCTION

Today, the world has witnessed a wave of rapid changes and developments, which have added its effects on all levels of the economy, whether partial or total, and at various levels [1].

Specialists have agreed to call it globalization, or inclusivity, and if we reflect on this phenomenon that is in continuous development, especially starting from the half second of the twentieth century, we find that the most important component of making this privacy and excellence in it: information and communications technology [2][3].

Although this term is made up of two broad concepts: information and communication, and despite their vastness and depth, they are closely related and interconnected, and without the information and its technologies, there would be no communication, and there would be no development of the means of communication, and without communication and its technologies, the information could not reach the importance it is now [4].

Also, their cohesion has the greatest impact on the phenomenon that the universe lives today, and one of its most important features is the elimination of spatial and temporal barriers thanks to the Internet, the fruit of information technology, which enabled the whole world to communicate and exchange information everywhere and at any time with the whole world, as

it had great credit in changing the style and management of institutions. It enabled information technology, especially the Internet, to impose new rules in the field of business [5] [6].

The most important one is betting on the customer as the only way to excel [16][17][18]. The institutions have worked for creating value for him, in a manner that ensures that his needs and renewable needs are constantly met and his tendencies are known even before they are revealed, something that will not be achieved of course unless these institutions are able to make optimal use of technology Information, by establishing E-Commerce in its organization as the most cliental job in the organization, and the most closely aligned and most appropriate to adapt to information technology, in order to achieve this institution efficiently and effectively, as information technology is a link between the institution and its environment, and because the via the Internet in particular, and information technology in general requires the availability of certain physical and knowledge infrastructures [7][8].

2. PROBLEM STATEMENT

Since the todays economy tends towards E-commerce and online transactions, the term E-Commerce gained extended importance. Generally, marketing strategies can be established by understand the customer ways of thinking. Each category of customers is having different requirements and hence, marketing planers need to address out each factor associated with customer's needs. Customer needs and ways of thinking are understandable by analyzing data related to customer behaviors. Many ways are available for gathering the data such as web logging information, surveys on the web networks, personal interviews in public places, etc. Eventually, large amounts of data are witnessed for analysis prior making any marketing plans. The amount of this data is seemed not possible to be analyzed in the conventional methods and normal computer programs. Extraction of knowledge from the big data is one of the important challenges facing the marketing professionals. Data mining technology can help for addressing this issue; but other considerations alike, cost, privacy, worthiness, etc. are came to the image.

3. THEORETICAL CONCEPTS AND HYPOTHESIS

The E-Commerce had gained wide interest in the resent years due to economic changes and life development [9]. The revolution of communication has impacted the individuals as well as service provider's routines [10]. New applications alike smart mobile platforms and artificial intelligence have made great impact on business and economy [11]. Internet development as well as mobile communications popularity has made noteworthy impact on the e-commerce and marketing applications [19]. That imposed large amount of data that being exchanged hourly wised over the e-commerce and E-Commerce platforms [12]. This type of data is being gathered from various sources more likely, short time surveys, cookies, customer behaviors, etc. Using the E-Commerce platform is required to understand the factors impacting on its performance [13] [14]. Data mining technology has made outstanding impact on the performance of e-marketing [20] [21]. The factors that directly and indirectly impacting the performance of E-Commerce are enlisted in the following subsections with [15] [16].

3.1 Samples Collection

Sample a grope of people who are representing the population; so-to-say, sample of this population is to be taken to represent the population itself in this research study. A grope of thirty individuals (n=30) are invited to participate in this study by filling up a list of questionnaires. Those individuals are selected carefully to participate this study, the selection of each is made according to the following criteria:

- a) Considering the age of candidate to be from 23 years to 70 years.
- b) Every candidate might have adequate knowledge of E-Commerce as well as the data mining technology.
- c) Expecting each candidate is having diploma as minimum academic education requirements to participate the survey.
- d) Candidates participating this research study must be a combination of males and females.

The candidates participating in this research and fulfilling the above criteria are reliable enough to provide the information for drawing a conclusion and testing the hypothesizes. Because of that, the above points are kept in mind while inviting the candidates to fill-up the survey questions. Each candidate is invited to participate the survey by sharing a link that direct him/her into the questionaries' (survey) web page. a Google form are used to enlist all the questions in the survey, candidate may require to open that link and provide the answers using the radio buttons (multi-choices answer). Table below is demonstrating the demographic quintenary, the Table below provides the responses of the candidates about the biometrical questions in the survey such as gender, education, age and experience.

3.2 Survey Implementation

As soon as the validation or pilot study is over, the draft of each question involved in the questionnaire is made. The survey questionnaire was constructed of four groups of questions as illustrated in Table 1. However, the responses or the perception of taken from each candidate (participant) is made according to Likert scale such as strongly disagree to strongly agree. However, some questions are to be responded using yes or no answers. However, the questionnaire used in this survey is illustrated in Tables (2) through (4).

Table 1: Demographic and Biological Questions in the Questionnaire List

Item	Variable name	Questions
Demographic and biometrics	DB1	Provide your age.
	DB2	Provide your gender.
	DB3	Provide your experience in E-Commerce and data mining.
	DB4	Provide your educational qualification.
Data sources	DS1	Short survey in other websites (while exploring the internet) can help to build a shopping DB.
	DS2	Cookies usage in E-commerce can provide complete idea about customer

	shopping tendency
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Table 2: Customer Profiling Related Questions in the Questionnaire List

Item	Variable name	Questions
Customer profiling	CP1	Web logs information can be used for determining the behaviors of the costumer
	CP2	DM can improve the delivery of the values associated with shopping experience to the costumer end
	CP3	DM can determine whether costumer is really willing to purchase products or he/she are only exploring the products
	CP4	DM can find out whether the customers are familiar with the products they are exploring
	CP5	With the use of DM, an idea is driven about the location that customers are shopping from likely, offices, home, etc.
	CP6	DM find out whither customer is accessing the E-portal from mobile tablet, computer, smart phone
	CP7	DM is used to propose other products (add-on items) upon customer interest in particular product.
	CP8	DM is lead to generate various interactive HTML (web pages) for various types of customers

Table 3: Events Prediction Related Questions in the Questionnaire List

Item	Variable name	Questions
Events prediction	EP1	Clustering algorithms has vital role in event prediction system
	EP2	Event prediction system is benefiting for both customer as well as e-comm. Merchant
	EP3	Event prediction system can provide the E-Commerce company with the way that customers are interacting with the new offers so that, E-Commerce company can understand how to trigger customers to make more purchasing.
	EP4	Event prediction system helps customer to get maximum profit alike cost cutting by comparing the prices offered by various merchants.
	EP5	If-then-else roles can provide straight forward logic with less latency for implementation enhanced event prediction system
	EP6	Fuzzy logic can be used to implement an enhanced event management system inspire of the computational cost (e.g. latency)
	EP7	Artificial intelligence (AI) can be used to implement a smart event prediction system irrespective of revenue volume
	EP8	Artificial intelligence (AI) can be used to implement a smart event prediction system for small businesses revenue volume
	EP9	Artificial intelligence (AI) can be used to implement a smart event prediction system for big businesses revenue volume
	EP10	Customer profiling is strongly linked to the process of event prediction system implementation
	EP11	Customer profiling can be achieved using only basic demographic information provided by the customer while he/she signed up into E-Commerce portal
	EP12	Customer profiling can be implemented using several sources of data including demographic (basic information), behaviors data and event

		prediction system data
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Table 4: Technical Aspects Related Questions in the Questionnaire List

Item	Variable name	Questions
Technical aspects	TA1	DM is associated with E-Commerce portal hosting in terms of the size required to accommodate the data considering the future extension.
	TA2	The essential demand of DM (e.g. classification or clustering) is to segregate the large logging data into separated classes depending on the nature of each data source
	TA3	View transaction matrix can be used for determining the time spent by customer on each page of the E-Commerce portal
	TA4	Information taken from view transaction matrix plays essential role in mining the knowledge of E-Commerce portal graphical design
	TA5	Algorithms such as KNN and Associated role discovery algorithm can be used for processing of view transaction matrix information to gain knowledge of shopping interest similarity among the customers

3.3 Hypothesis Test

After analyzing the survey questions in the aforementioned sections, the hypothesis that were applied in this study are checked. The hypothesis correlation level with the study results are listed in Table 5.

Table 5: Hypothesis Test and Result Decision

Hypothesis	Decision
<i>Basic biometrical and personal data can have big influence in the E-Commerce strategy.</i>	Accepted
<i>Dataset of E-Commerce portal can be established using web logging information as well as physical surveys conducting on face to face bases.</i>	Accepted
<i>Customer profiling is vital step in improvement of marketing strategy by providing a unique content for each customer by using it as a backbone for dynamic HTML (web pages) generation system.</i>	Accepted
<i>Guessing or event prediction system is most required for successful pre launching and post launching marketing.</i>	Accepted
<i>Smart marketing might enhance the product sell irrespective of the quality of that product.</i>	Not accepted

4. CONCLUSION

Data mining played vital role in today's business as a result to communication and technology development. Mining of large amounts of data that being collected daily wise from the customer's activities over the shopping portals is challengeable task. The conventional models and techniques for extraction a knowledge from this large amount of data is no longer useful. Using the data mining technologies i.e. (clustering, classification and prediction) as well as tools alike neural network will required completely understand of both technical and economical consideration. In this study, methodology and impact of datamining on the E-Commerce is been discussed.

A sample of thirty people from the industry of data mining and E-Commerce specialists are

been invited to participate this study by providing their opinions about list of questionnaires that been shared with them using online form from Google. The questionnaire was consisted from four sections namely: General biometrical data, customer profiling data, event prediction data, technical aspects data and eventually some miscellaneous data. Responses of each section were collected and analyzed using the SPSS version 23 software.

Analysis of the responses were done in section wise where question from each section have been treated individually. Statistical alike, mean, median, variance, standard deviation, frequency, percentage, minimum value and maximum value are determined for each question in each section of the questionnaire. Results reveled that candidates were agreeing to the questions that used in hypothesis formulation.

In other word, data mining technologies adaptation in E-Commerce context is likely preferred by the candidates, some restrictions might be considered while so alike the cost of computing as well as economical cost should be considered carefully. Some other concern alike customer's behaviors data collection is suggested to be collected from the cookies used by the site pages. Cookies is cost efficient and highly trusted for behaviors prediction.

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