

Data mining in marketing

Thabit Zatari

Abstract: Data mining in marketing is operation of analyzing data from different perspectives in order to summarize and analyze to discover useful information. So, when firms discover the patterns or the relationships of data, they will be able to use it to increase profits or reduce costs, or both (Palace 1996). Nowadays, firms want to increase customers, and data mining is a good way to help firms to get more customers. The traditional process of marketing through advertising media costs firms a lot of money and the costs of advertising will add to the product

Introduction

Data mining can help firms to track customers' purchases, so it can help firms not only on price but it can help firms to do competition on services (Welge, 2001).

Today, it is important to become essential to apply customer-focused approach to product development in order to compete with other companies and get more customers (Raicu2010). According to Raicu (2010) "In order to avoid the initial investment of producing a product without being certain that it will be successful, a customer-focused approach will first discover what are the customers' preferences, needs, and behavioral characteristics with respect to the product's concept and only then, the concept may be developed into a real product" (2010). In other words, data mining helps companies to be more successful in particular product and it provides valuable insight into understanding the emotional and rational benefits derived from a particular product (Raicu, 2010).

Data mining tools and Application

Any organizations that desire to use data mining tools can purchase mining programs designed for existing software and hardware platforms, and it can be integrated into new products and systems (Silltow, 2006). There are many types of data mining tools in the marketplace, and each type has its own strengths and weaknesses, it recommends buying the tool that matches the organization's current detective needs (Silltow 2006). According to Silltow, "Most data mining tools can be classified into one of three categories: traditional data mining tools, dashboards, and text-mining tools" (2006).

Traditional data mining tools assist firms to monitor the data and highlight trends and others capture information residing outside a database; and these programs can help any data using online analytical processing or a similar technology (Silltow 2006). Second, dashboards are created to install in computers to monitor information in a

database, and it reflects data changes and updates onscreen such as chart or table; users able to see how the business is performing (Silltow, 2006). In fact, it is easy to use the dashboards functions because managers can have an overview of the company's performance (Silltow 2006). Third, text-mining tools have ability to mine data from different kinds of text, so these tools can provide users with an easy and convenient way of accessing data without the need to open different applications (Silltow, 2006).

Data mining techniques

Using data mining techniques will help decision makers to get knowledge about customers' preferences and needs (Raicu, 2010). Data mining also can help marketers to cover the needs and preferences of the customers and market. So, they have the capability for performing market which consists of the total market, chooses the best segments, and designs strategies for profitability serving the chosen segments better than the company's competitors do (Raicu, 2010).

There are many techniques to extract data, and the most commonly techniques are artificial neural networks, decision trees, and the nearest-neighbor method (Silltow 2006). First, artificial neural networks are non-linear, predictive models that learn through training, and they are helpful to use in reviewing records to identify fraud and fraud-like actions (Silltow 2006). Second, decision trees demonstrate decision sets, and it is very helpful to classify data that organizations can use it in appropriate cost-effective marketing strategies that are based on the assigned value of the customer, such as profit (Silltow, 2006). The last one is the nearest-neighbor method, and it is very a grateful approach because users can ask the system to search for similar items.

Moreover, business companies such as Walmart, Costco, Amazon, and Ebay have huge custom data; these companies use the information in a good way to enhance their business marketing (Kursa, 2010). In fact, most the business companies use business

software intelligence in order to get the right information, which is contributed to improve the business in decision making and enhance the business performance in the market place (Kursan, 2010).

Knowledge-based marketing

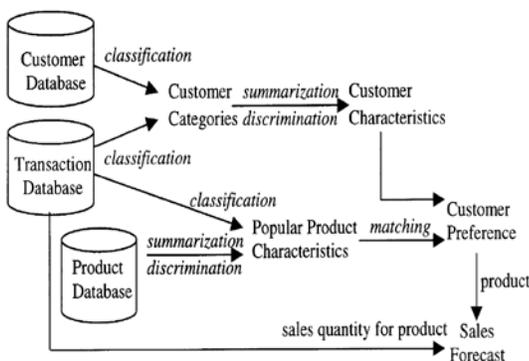
Products marketing through advertising media or distribution based on traditional way result in poor response rate and increased the cost (Welge, 2001). According to Welge, "Today's customers have such varied tastes and preferences that it is not possible to group them into large homogenous populations to develop marketing strategies." (2001). Database marketing can simplify the marketing strategies, and most firms built massive customers databases in order to track their purchase transactions. There are three major areas of application of data mining for knowledge-based marketing customers profiling, deviation analysis, and trend analysis (Welge, 2001).

1.1 Customers profiling:

Customers profiling is a useful way to collect way of information about customers, and it helps marketers in decisions making, so they can meet what customers' needs. According to Welge, he said "The data mining tasks used in customer profiling can be dependency analysis, class identification and concept description, and we present a list of transaction characteristics that can help the marketer construct useful customer profile" (2001). (See figure1)

Customers profiling systems can analyze the frequency of purchases, companies can know how many times the customers can buy this product or visit the store (Welge, 2001). Also, it helps marketers to know the size of purchases which contribute marketers information to know about how much do customers spend on a typical transactions? (Welge2001). Another important feature is identifying typical

customer groups, which allows company to obtain the characteristics of each group through class identification or concept description (Welge, 2001). For instance, if one customer bought a laptop, they will send to this customer a special offer in



accessories about the laptop.

Fig 1. Customer profiling system.

2.2 Deviation analysis

Deviation analysis can give the marketer important thing of information to analyze the customers' behavior. Data mining has very useful tool like neural networks in order to detect and classify the deviations (Welge, 2001). According to Welge, a good example of this "a change can be that a customer got a new job and moved to a new house. In this case, the marketer has to update the knowledge about the customer" (2001). Indeed, the deviation analysis gives the marketer a good capability to query changes that occurred as a result of recent price changes or promotions (Welge, 2001).

3.3 Trend analysis

The tools of trend analysis can help marketer in data mining such as marketer can have good visualization to forecast sales. Also, it will help firms to evaluate performance of products or marketing programs, so marketers can determine trends in sales, costs and profits by products or markets in order to achieve the highest amount of sales (Welge, 2001). The last feature of trend analysis in data mining is marketers can forecast the future sales through subtle relationships like a peak in sales of a product associated with a change in the profile of a particular group of customers (Welge, 2001). Last Black Friday, InfoScout found out that Apple was the big winner for selling 22% of apple products (Jones, 2013). (See figure2) .

Fig.2. Apple products were 22% of Target's saleon Black Friday.

Product	Avg Price	Sales Rank	% of Target Sales
Apple iPad Air 16GB	\$479.00	#1	8.2%
Apple iPad Mini 16GB	\$299.00	#2	7.5%
Apple iPad Air 32GB	\$599.00	#3	2.4%
Beats by Dre Headphones	\$115.00	#4	2.4%
Element 50" TV	\$229.00	#5	1.9%
Nintendo 3DS	\$149.00	#6	1.9%
Xbox 360	\$179.00	#7	1.8%
Apple iPad 2 16GB	\$399.00	#8	1.4%
Apple iTunes Gift Cards	varied	#9	1.3%
Nikon 16mp Camera	\$119.00	#10	1.1%

Advantages & Disadvantages of Data Mining

There are many benefits that business owners can leverage from data mining. Some business owners think that collecting data will waste time, but the fact is data mining gives business owners a lot of good things (Hendricks, 2013). The first way to get

a benefit from data mining is owners can make more profits (Hendricks, 2013). In fact, making more money is very important to business firms, so data mining can help business owners to see what customers like to buy; and they can work in these products in order to keep the company in competition with other companies (Hendricks, 2013). Another thing is data mining can improve branding and marketing, so it can help marketing department to see customers what services or products consumers want to use (Hendricks, 2013). The last thing is data mining can do streamline outreach between consumer and companies, so they can keep consumers stay and send a lot of advertising through emails (Hendricks, 2013).

On other hand, there are a lot of disadvantages that can effect on customer or company. The first affect is the past data mining can consume time because owners think that will extract the correct data, but the fact is too difficult to find out where to start. Second, data mining can create privacy issues, according to xiangyun, he said "Although it is against the law to sell or trade personal information between different organizations, selling personal information have occurred" (2006). In fact, data mining can access customer information, and somebody could use this information in an unethical way. Another disadvantage is security issues because companies have a lot of information about customers that is available online; and sometimes companies do not have sufficient security systems in place to protect that information (xiangyun, 2006).

Conclusion

In sum, data mining in marketing is very helpful because business owners can able to summarize and analyze to discover useful information; then, they have capability to increase the profits and reduce the cost of products. Also, any business owner can purchase mining program designed for existing software and hardware platforms, so they can contribute to improve business in decision making and enhancing the business performance in the market place. Moreover, data mining techniques can enhance business firms to get knowledge about customers' preferences and needs through customer profiling. So, they have the capability to analyze the frequency of customers purchase. Finally, collecting data gives business firms a lot of good things, such as increased profits, keeping company in competition with other companies, and streamlining outreach between consumers and companies.

References

- Palace, B. (1996, June 1). Data Mining: What is Data Mining? Retrieved, from <http://www.anderson.ucla.edu/faculty/jason.frand/teacher/technologies/palace/index.htm>
- Welge, M. (2001, January 1). Knowledge management and data mining for marketing. Retrieved, from http://student.bus.olemiss.edu/files/Conlon/Others/Others/Temp/Temp_old/MachineLearning_DataMining/Knowledge%20management%20and%20data%20mining%20for%20marketing.pdf
- Kursan, I. (2010, April 1). THE ROLE OF THE INTERNET IN MARKETING RESEARCH AND BUSINESS DECISION-MAKING. . Retrieved, from http://www.efst.hr/management/Vol15No1-2010/4-Kursan_Mihic-final.pdf
- Raicu, D. S. (2010, January 1). Data mining frame work for target marketing. Retrieved, from <http://facweb.cs.depaul.edu/research/vc/publications/C-262.pdf>
- Silltow, J. (2006, August 1). . Data Mining 101: Tools and Techniques. Retrieved , from <http://www.theiia.org/intAuditor/itaudit/archives/2006/august/data-mining-101-tools-and-techniques/>
- Jones, C. (2013, December 1). Apple's iPad A Big Winner On Black Friday. Apple's iPad A Big Winner On Black Friday. Retrieved , from <http://www.forbes.com/sites/chuckjones/2013/12/01/apples-ipad-a-big-winner-on-black-friday>
- Hendricks, D. (2013, March 21). How Businesses Can Benefit from Data Mining. . Retrieved , from <http://www.tmcnet.com/topics/articles/2013/03/21/331429-how-businesses-benefit-from-data-mining.htm>
- xiangyun, x. (2006, December 5). Advantages & Disadvantages of Data Mining?. . Retrieved , from <http://xiangyun86.wordpress.com/2006/12/05/advantages-xiangyun-disadvantages-of-data-mining/>
- Waxer, C. (2013, October 28). How data mining can boost your revenue by 300%. *How data mining can boost your revenue by 300%*. Retrieved , from <http://money.cnn.com/2013/10/28/smallbusiness/data-mining/>
- Grohol, J. (2013, December 2). Data Mining Social Media for Marketing Insights. *Data Mining Social Media for Marketing Insights*. Retrieved , from <http://psychcentral.com/news/2013/12/02/data-mining-social-media-for-marketing-insights/62743.html>

IJSER