



eCommerce Sales Attrition: A Business Intelligence Visualization

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Abstract. As technology advances, electronic commercialization makes a more significant impact on business as it offers versatility and convenience. In fact, organizations have made a leap to adopt related knowledge frameworks in e-commerce computing with the combination of business intelligence to remain in front of patterns and future demands. This is manifested by a significant number of organizations of all sizes, in all enterprises, all around the globe by actualizing and using Strategic Business Intelligence. This paper deals with the development of an Online Product/Service Catalogs with Business Intelligence application for a shipping and aircraft business that leads to the increase of efficiency and profits through timely and informed decision making. Using descriptive and developmental instrument, system development model and data visualization tools, the researcher evaluate the website's sales attrition after having developed its mobile application version and deploying the system online. The results indicate the usefulness of the system in managing materials, delivering quality services to the customers and at the same time helps businesses to increase competitiveness and business profitability.

Keywords: Sales patronage · Business · Data mining · Mining visualization
Online shopping

1 Introduction

In the world business, profit indispensable part to its existence. This gives importance to keep track of the company's sales attrition rate to measure its impact on the business profit in particular and to the whole business existence as a whole. As a matter of fact, business establishments progressively need to carry on like multichannel retail traders by concentrating on approaches to venture into new markets, pick up clients, keep them and boost the productivity of every transaction. This paves the way to the existence of electronic commercialization (e-commerce).

E-commerce alludes to the way toward purchasing or offering items or administrations over the Internet. Web-based shopping is ending up plainly progressively well known in light of speed and convenience for clients [1]. This technology enables marketers to widen their horizon and keep their competitiveness with other business entities in the similar market field.

For those that venture into e-commercialization, it gives an advantage for business companies such as shipping and aircraft services to venture into the world of online retailing. Aside from embracing the technology where customers can avail its services online, the system is equipped with business analytics that measures customer's interaction with the website. These consumers activities are then stored in the system's database and later be processed to visualize important information that could help the company generate the greater picture of the website's current and future trends.

This study deals with the e-commerce sales attrition visualization using business intelligence tools through consumers' interaction in the said shipping aircraft services website.

2 Related Works

Organizations around the globe have grasped web based business in their organizations and have procured benefits thereof. Presently, in web based business, numbers of clients from different social gathering increments through overall promoting of the items. They give distinct advantages to customers as they offer articles and administrations where consumers can browse [2].

Web-based shopping is a necessary plan of action in e-commerce. It is the procedure whereby buyers specifically purchase products or administrations from a merchant continuously, without a mediator benefit, over the Internet. Additionally, it is used as a medium for correspondence to increment or enhance in esteem, quality and appeal of conveying client advantages and better fulfilment, that is the reason web-based shopping is more accommodation and step by step expanding its popularity [3].

Moreover, a huge number of organizations are actualizing and using business insight (BI). It will likely upgrade the importance and estimation of reactions to the choice procedure. Without bi, an organization runs a danger of settling on basic choices in view of deficient and off base data. BI, when effectively thought out and appropriately executed, enables all clients to settle on educated decisions and choices extremely time, in each circumstance [4]. Also, data gathered from a capable bi makes representatives more gainful, providers more productive, and clients more loyal.

With the business intelligence at hand, companies can gather relevant data from the system and out of its visualization, information is generated, and this includes attrition rate.

In the work of Sessoms (2017), he defines the word "attrition" which is commonly used in the human resources may also be employed in sales. As a matter of fact, sales attrition may refer to the consumer loss and retention. This is directly influenced by different entities such as profit and growth. The importance of keeping track of customers helps the business to improve customer's communication, update marketing strategies, and augment sales and wider market sales. He further explains that silent attrition refers to the loss of clients who leave without communicating their discontent with a business practice or client benefit issue. These clients may react with direct disappointment on client studies. For example, a medical coverage client may feel disappointed with endeavors to achieve the client benefit office and imperfection to another insurance agency. This quiet wearing down happens because the organization

is ignorant or inert to the client's misery and does not have a chance to keep the client from clearing out. The client is run with no clarification [5].

In the visualization, study utilizes *Cohort Analysis* to breakdown data structures through the use of algorithm. Cohort analysis is a subset of behavioral investigation that takes the information from a given eCommerce stage, web application, or web based diversion and as opposed to taking a gander at all clients as one unit, it breaks them into related gatherings for examination. These related gatherings, or accomplices, more often than not share basic qualities or encounters inside a characterized time-traverse. Further, it is an apparatus to quantify client engagement after some time. It knows whether client engagement is really showing signs of improvement after some time or just seems to enhance in view of development [6].

With such analysis, the sales attrition rate of a shipping and aircraft company through visualization was realized.

3 Methodology

The research utilizes the experimental method in the processing of data for an aircraft and shipping online shop. In this case, the researchers used a visualization tool incorporated as business intelligence in the said website to identify the sales attrition rate using the data within a year. The data are then presented using the following parameters (Table 1).

Table 1. For mining the data, the study uses the sales attrition, user's statistics, and sales patronage as the basis for the sales visualization.

Parameters used for the sales attrition visualization
Sales Attrition
User's Statistics
Sales Patronage

Furthermore, the study uses the Statistical Analysis System (SAS) for Visual Analytics framework as a basis for projecting actual data of the website and predicting future sales. This framework enables the company to gain insight from all of the data accumulated in the database (Fig. 1).

4 Results and Discussion

This part of the study shows the visualization results based on the different parameters from the business intelligence tool (Fig. 2).

This implies that a great number of customers are inclined to transact in online shopping. This is supported by Katawetawaraks (2011), [8] the study illustrates the enthusiasm of online consumers on what keeps them motivated to online shopping. It is found out that there are a number of reasons why people shop online such as convenience

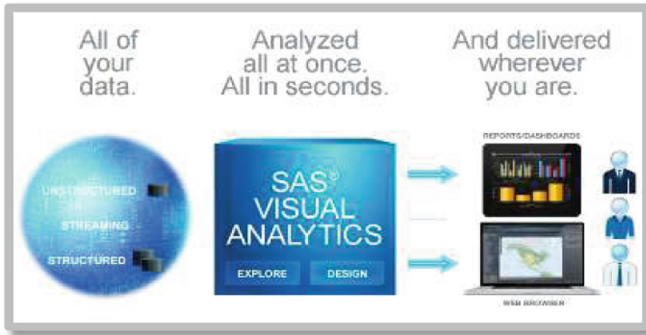


Fig. 1. SAS Visual Analytics Framework is used in the study [SAS® Visual Analytics]. The system clarifies that clients can comprehend purchasing designs and distinguishes patterns, which prompts better administration and consumer loyalty. With SAS Visual Analytics, what was made can be distributed and gotten to utilizing tools so managers can see and connect with basic data and basic leadership information effectively [7].

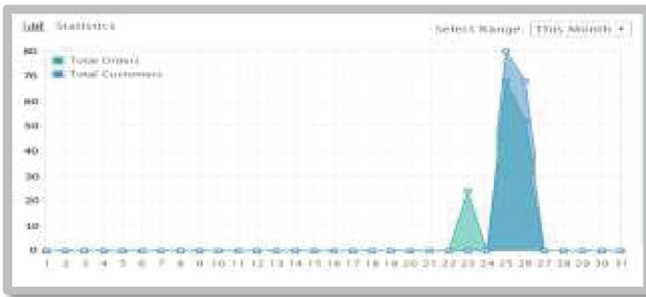


Fig. 2. In this figure, the result shows the graphical representation of the user statistics of the customers who made the website views, reservations and orders within a period of one month. The finding reveals that for the total of 80 customers who views the website, 70 of them avails the online shop's services through reservation of product. It further demonstrates that a 27% of the customers who view the websites completed the close-out transaction since they have completed the order process.

since consumers can buy the same product at a lower price by comparing different websites at the same time; avoid pressure when having a face-to-face interaction with salespeople and even avoid the traffic jam in going to shopping centers (Fig. 3).

In the study of Sultan (2001), it shows that there are some factors which influence online shoppers to transact business on the web and this includes their consideration to prices, discounts, and feedbacks from previous customers and quality of product and services offered [9]. This results then support the findings in the above figure since it is noted that many users are into window shopping and this indicates that they are into viewing and comparing products from another website such that they tend not to buy at once (Fig. 4).

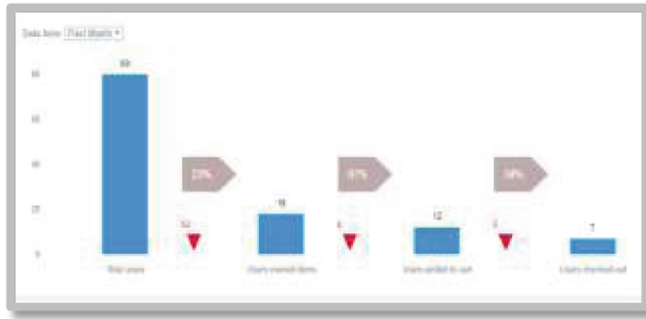


Fig. 3. In this figure, it shows the breakdown of user's statistics that uses the website to shop online. The data reveals that out of 80 users in a month, 18 of them viewed the items, 12 added the items to the cart and 7 of them checked out the items.

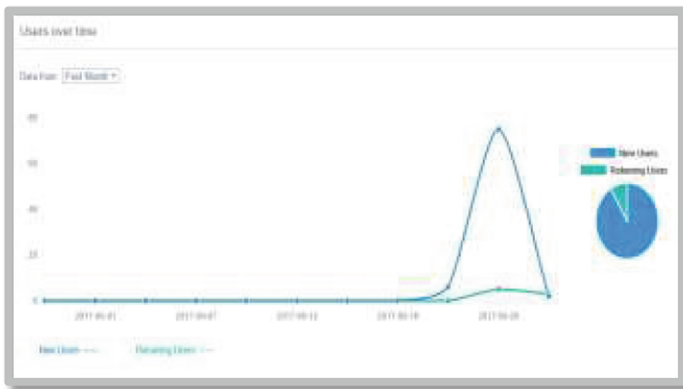


Fig. 4. The figure illustrates the sale patronage of the consumers of the shipping and aircraft online shop based on a one-month data. The finding reveals that out of 80 shoppers 15% are considered to be returnees while 85% of them are new.

Despite the fact that the advance of innovation utilizing e-commercialization develops throughout the years regardless it pauses for a minute for customers to acknowledge it and receive in their everyday life. The absence of buyers' acknowledgment towards new innovation remains a test for the online advertisers. This is clarified in the investigation of Cheema (2013) [10] that the web shop ought to require more endeavors to speak and instruct their objective market about the advantages of the web based shopping on the off chance that they mean to expand the activity on their online shop with the end goal that of a delivery and air ship site.

5 Conclusions

E-commercialization has opened a promising avenue for online marketers to capture wider and bigger market online. And with the introduction of business intelligence tools for data mining, the marketers are updated as consumers activities in their websites are recorded and this data are analyzed to become useful business information. The study is conducted to a shipping and aircraft shopping website that originates in the United States of America. Using the sites business analytics, the study reveals based on the user's statistics the consumers tend to visit the site however only a few completes the transaction to order. It further illustrates that the sales patronage is not very high since only 15% of the consumers returns to the website to make new transactions.

Thus, the study implies that online shopping as a supplement marketing tool has a positive advantage due to its contribution to the sales as it draws a wider range of market by capturing online shoppers.

References

1. Ontario: Advanced e-business topics and an introductory handbook how you can profit from e-business (2013). ontario.ca/ebusiness
2. Panian, Z.: How to make business intelligence actionable through service-oriented architectures. *Wseas Trans. Bus. Econ.* **5**(5), 210–221 (2008)
3. Gefen, D., Karahanna, E., Straub, D.W.: Trust and TAM in online shopping: an integrated model. *MIS Q.* **27**(1), 51–90 (2003)
4. Williams, S., Williams, N.: *The Profit Impact of Business Intelligence*. Morgan Kaufmann, San Francisco (2010)
5. Sessoms, G.: What does attrition mean? (2017). http://www.ehow.com/info_12106271_attrition-mean-sales-terms.html. Accessed 28 May 2017
6. Makhija, P.: How to use cohort analysis to improve customer retention, (2016). <http://www.kdnuggets.com/2016/05/clevertap-use-cohort-analysis-improve-customer-retention.html>. Accessed 30 May 2017
7. Zhan, L., et al.: Visual analytics for the big data era—a comparative review of state-of-the-art commercial systems. In: 2012 IEEE Conference on Visual Analytics Science and Technology (vast), pp. 173–182. IEEE, October 2012
8. Katawetawaraks, C., et al.: Online shopper behavior: influences of online shopping decision. *Asian J. Bus. Res.* (2011)
9. Sultan, et al.: Consumers' Attitude towards Online Shopping Factors influencing Gotland consumers to shop online (2011)
10. Cheema, U., et al.: The trend of online shopping in 21st century: impact of enjoyment in tam model. *Asian J. Empir. Res.* **3**(2), 131–141 (2013)