**Predictive Analytics in Online Marketing and Retail**

Laurence T. Burden

Purdue Global University

IN402: Modeling and Predictive Analysis

Steward Huang

December 12, 2023

Predictive analytics has been shown to be useful in a wide range of industries. Online marketing and retail spaces are no different. Target marketing is a relatively new process that allows retailers to tailor their advertisements and products shown to the individual consumer. There is a common set of other concerns that online retailers share and are working to overcome. Every aspect of the analytics process can be enhanced by being aware of multiculturalism and diversity within the customer base. Predictive analytics can help with these concerns and many other areas.

Target marketing is the practice of placing an ad in front of a user based on their past purchases or other attributes. Tracking the customer’s past purchases is an easy practice when the retailer controls their platform. Tracking other attributes must use data from a large set of other customers to build a predictive model that will be useful to use on new customers as they onboard the system. “Such targeting not only increases the efficiency of advertising, it gives customers a more personal relationship with the retailer, thereby encouraging repeat business” (Anderson & Semmerlroth, 2015).

Customer experience is an umbrella term to describe how easy to use a website is for the customer. Certain concerns fall under this term that can be broken out for further research. Some common areas of concern in the online retail world include bad user experiences with the website, complex checkout processes, and missing or unclear product information (Tyrrel, 2023). Each of these concerns can use predictive analytics to help overcome many of the challenges. First, we will look at the issue of bad user experiences with the website.

Websites must be built to allow for fast and efficient use by the end user. A bad user experience will quickly turn into a lost customer. A user of an online retail website will have certain expectations. One such expectation is the ability to quickly find products that they are interested in.

Customers also expect the pages to load quickly and without errors. The web team can track a multitude of useful metrics to accurately gauge customer satisfaction with the site’s usability. These metrics include tracking how long a customer stays on a page, how many repeat visits the site gets, and any bug reports submitted. The site can also enhance the user experience by showing relevant information by predicting the customer’s needs. One way to help this issue is to implement personalization within the website code base.

Personalization is the process of tailoring a website’s appearance to the individual customer. Amazon personalizes the front page of every customer to reflect their recent purchases and items that the customer may be interested in based on their past browsing and purchasing habits. The ability to display relevant recommendations relies on complete data being captured correctly.

Missing data will complicate any endeavor. Online shopping is no different. A strong data governance program needs to be in place to ensure that all relevant information is recorded and displayed on product pages. A review process should be put in place to check that no products exist that do not display all of the required data. This practice will reduce complexities on the consumer’s end.

People do want a complex process when completing financial transactions. The user experience at a brick-and-mortar store is well-known and easy to understand. The checkout process for an online store should be even easier. The concept of a shopping cart was brought over to the online world for this reason. This concept is so well accepted that even new online retailers immediately implement it.

Online retailers of all sizes can benefit from predictive analytics. Large companies such as Amazon and Microsoft use analytics to retain current customers and to obtain new ones. Small businesses can use predictive analytics for the same reasons. There is also an advantage to knowing what to advertise to the customer while they are shopping.

New online retailers can implement recommendation systems similar to Amazon’s. There are a couple of options in building the system. One method is to use collaborative filtering. This method of filtering relies on the actions of the community as a whole (Bari, et. al., 2017). The website must place a person within a community first for this method. That community could be any set of attributes to group like individuals together. The recommendation system then displays items from the community’s interests to others that are found to exist within the community. Another method is item-based filtering.

Item-based filtering is performed by using a set of product attributes as predictor variables to find the target variable of similarity-of-use (Bari, et. al., 2017). This allows the customer to quickly compare similar products while browsing the online store. A table of attributes can be displayed to give the customer a quick lesson on the similarities and differences of multiple products. This leads to a more informed decision by the customer, which should then lead to a more satisfying purchase.

Online retailers can use target marketing outside of the website, too. One area that can be greatly enhanced with analytics, is the direct mailing marketing process. Mass mailing advertisements without any personalization may turn customers off and it does not have a high return on investment. In the book *Predictive Analytics for Dummies*, Bari, et. al., suggest that introducing analytics into the mass mailing process can increase the response rate from 2% to 10% (2017). For this reason, online retailers should not abandon the direct mailing catalog process.

All of the ways that predictive analytics can help relies on the data analyst selecting the most relevant variables of interest. A model is only as strong as the data used. Relevant variables must be selected that show strong correlation and output useful models that can accurately predict the needed events. Finding these relevant variables can be a difficult task. It takes a strong and diverse team to help build the best models.

Multiculturalism is a term that represents the diversity of cultures throughout our society. Diversity in a broad sense refers to having a diverse representation within a group. This could represent a group made up of diverse genders, cultures, and races. Our products must be built to accommodate as diverse a field as possible.

Businesses are always looking for ways to expand their target audiences. Models can be built to include multiculturalism and diversity in their analysis. These concepts can be used to link current customers' habits with those in other groups that may have some common traits. Finding these traits will allow the business to expand the product range to be viewed and purchased by a more diverse group of consumers.

The variable of Buyer within the paper “Data mining for the online retail industry: A case study of RFM model-based customer segmentation using data mining” refers to the postcode of a buyer from an online retailer (Chen, et. al., 2012). The paper’s analysis relies on data that is supplied internally by the online retailer. The analysis could be enriched by obtaining external data on the buyers. This would allow the models built to include the buyer’s culture and any attributes that place them in diverse groups. Information about the groups that a buyer fits into can then be used to make better predictions.

The retailer used in Chen, et. al.’s paper could be helped by introducing multiculturalism. The authors point out that “...conducting association analysis to establish customer buying patterns with regard to which products have been purchased together frequently by which customers and which customer groups; enhancing the merchant ’ s web site to enable a consumer’s shopping activities to be captured and tracked instantaneously and accurately; and predicting each customer’s lifecycle value to quantify the level of diversity of each customer” (Chen, et. al., 2012). In summation, better analysis would be achieved by introducing more information about the customer’s culture.

Many industries have found predictive analytics to help further their goals. The online retail industry is no different. Analysts can assist in building more usable websites by tracking customer use rates and happiness scores. Mailing lists and mail content can be targeted to customers to help increase the return on investment of the endeavor. Finally, analysts can help build more robust data models by considering the diversity of the customer base and including it in their analysis.

**References**

Anderson, A., & Semmelroth, D. (2015). *Statistics for big data for dummies*. John Wiley and Sons.

Tyrrell, P. (2023, June 5). *15 common online shopping problems causing revenue loss for your business (+ how to fix or avoid them)*. Prefixbox Blog. https://www.prefixbox.com/blog/online-shopping-problems/

Bari, A., Chaouchi, M., & Jung, T. (2017). *Predictive analytics for dummies*. John Wiley & Sons.

Chen, D., Sain, S. L., & Guo, K. (2012). Data mining for the online retail industry: A case study of RFM model-based customer segmentation using data mining. Journal of Database Marketing & Customer Strategy Management, 19(3), 197–208. https://doi.org/10.1057/dbm.2012.17