Machine Learning in Predicting Customer Behavior

David D Berberena

Bellevue University

DSC 500 Introduction to Data Science

Nasheb Ismaily

November 5, 2023

Machine Learning in Predicting Customer Behavior

As businesses attempt to sell as many products as they can to their loyal customers, they also wish to establish a long-term relationship so these same customers can continue to come back to their business for future sales. This sounds all well and good, however, there is a problem with this ideology that until the modern age we live in now was not able to be addressed. How do businesses know what products customers will buy? How will businesses be able to forecast what products return customers want to buy in the future? In other words, how do businesses today manage the definition and prediction of customer behavior?

**The Solution to Customer Behavior: Machine Learning**

Machine learning is the answer that most data-driven companies will give to an inquiring executive or investor. Machine learning algorithms can take the data generated from the sale of products and apply it to customers to see what behavior they exhibit. Examples of what data is generated include the products themselves, what form of payment was used and whether that payment method is most frequently used, how frequently a customer buys the same product, how much the customer spent when purchasing from the business, and more. Machine learning can compile all of these metrics at once to see what a customer prefers at what time and how they prefer it. A blog post titled “Your Complete Guide to Predicting Consumer Behavior” goes as far as stating that machine learning “can help you detect patterns not visible to the naked eye and estimate how existing and new customers are likely to engage.” (Lahunou, 2022) With this direction, we can understand how current customers will behave based on their past purchase habits, and we can begin to incorporate the addition of new customers into the machine learning algorithm. For example, if a woman named Lily has seasonal allergies and goes to a pharmacy to buy over-the-counter allergy pills at a certain time every year when her allergies flare up, the pharmacy could employ a machine learning algorithm to capture the time of year Lily buys the allergy medicine, what brand of pills she buys the most, and how much money she spends on the medication during the time of seasonal allergies. Once enough data has been gathered on her, the machine learning algorithm could suggest that Lily be sent a coupon for the medication she buys the most a couple of months before the start of the allergy season, effectively predicting that in a couple of months, Lily will be coming to the pharmacy to buy that exact allergy medication.

**Societal Concerns**

As effective as the above example sounds for the pharmacy and Lily, some issues need to be addressed. A drawback of machine learning would be the particular data being gathered being irrelevant to curating an actual intelligent prediction. Using the above example, if the pharmacy gathers data on the number of accompanying guests that Lily brings with her when she goes to purchase the allergy medication, that may lead to the algorithm thinking that each person Lily brings with her also would need a coupon, erroneously suggesting the total number of potential customers, not the actual customer herself. Ethically, if Lily were to receive a coupon (whether it be direct mail or an online advertisement or whatever channel the pharmacy chooses to reach Lily) for her allergy medicine, she may feel that her medical tendencies being used for commercial purposes is an invasion of her privacy, as she may not want others to know that she has seasonal allergies. Machine learning being used to predict customer behavior is a slippery slope, as some customers can exhibit purchasing habits “that can be erratic, and not always defined by logic.” (Lahunou, 2022) The algorithm may not be able to find a pattern in a customer’s habits and may suggest erroneous predictions that are harder to deal with than still being left in the dark as to how a customer may make a future purchase. I firmly believe that with increased vigilance and accurate, relevant data collection techniques, machine learning can easily lead to increased revenue for large data-driven companies, better brand reputation, and more customer satisfaction ratings, among other benefits.

**Conclusion**: Provided unlimited funding, all companies intending to forge better relationships with their customers in the interest of a bigger bottom line would be remiss not to incorporate machine learning into their business model. Using machine learning algorithms can leverage a company’s success to a whole new level, with increasingly accurate knowledge of how their customers will react concerning future purchases.

References

*Lahunou, I. (2022, June 28).*Your Complete Guide To Predicting Customer Behavior*. Verfacto. Retrieved November 2, 2023, from https://www.verfacto.com/blog/behavioral-data/predicting-customer-behavior/*