



TRANSFORMING CONSUMER BEHAVIOR TO NEW PARADIGMS THROUGH DEEP LEARNING APPLICATIONS

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Original Article

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Abstract

Direct-to-consumer (DTC) businesses are gaining popularity as a way to reach a larger number of customers and better suit their needs. Vertical brands are distinguished by their metamorphosis, in which they offer their products straight from the manufacturer to consumers without the use of distribution intermediaries, like in traditional business models. They're obliterating themselves on virtual platforms and undermining their old linear sales processes in the process. In the current scenario, the ability of connectionist models to explain consumer behavior, with a focus on the feed-forward neural network model, should be emphasized, and the possibility of expanding the implications of ANN (Artificial Neural Network) for predicting buying behavior for DTC (direct-to-consumer) brands should be explored. To forecast consumer loyalty as a critical feature of consumer behavior, a variety of neural network models of various complexity are constructed. When compared to the more standard logistic regression approach, neural networks outperform logistic regression in predicting customer loyalty. Utilitarian and Informational Reinforcement factors, both independently determined, are shown to contribute significantly to the explanation of consumer choice. The potential of connectionist models for predicting and explaining consumer behavior is discussed, and future research directions are proposed for investigating the predictive and explanatory capacity of connectionist models, such as neural network models, and their integration into consumer behavior analysis within the theoretical framework.

Keywords: DTC (Direct to Consumer Brands); ANN; Buying Intention; Purchase Decision

Introduction

Artificial intelligence (AI) has been a hot topic in a variety of sectors in recent years, and people are becoming more interested in artificial neural networks (ANN), particularly in recognition, prediction, and big data analysis. Intelligent systems are widely employed in computer science and a variety of other fields, and they offer a competitive advantage over standard statistical models. Artificial neural networks, fuzzy inference systems, expert systems, and evolutionary computing are the four fundamental ideas of artificial intelligence. Organizations have been soaring through a more dynamic, uncertain, complex, and ambiguous economic environment in recent years, where technological, environmental, and socio-economical changes have repeatedly challenged existing competitive advantages, making them transient and impermanent [1,2]. As businesses become more vulnerable, they use procedures, strategies, and operational devices to leverage customer analytics and other business analytic technologies, gaining a competitive advantage that can include consumer analytics (BDA) and data mining [3]. Artificial neural networks, for example, can learn human behavior through training, and CBP mainly analyzes consumers' purchasing behavior and changes in consumer behavior such as purchasing habits, consumption propensity, consumption preferences, and so on, to study what products and quantities consumers buy, where to buy, when to buy, and so on, to make consumers have the idea of buying, so the industry can buy more of these products, not only to increase monthly sales but also to increase monthly profit margins.

Literature Review

Current State of the Art

Artificial Neural Networks (ANNs) are distributed information-processing systems and powerful general-purpose software tools that are made up of a large number of simple computational pieces that interact via weighted connections. To put it another way, today's corporate climate is hypercompetitive and complex, with various economic elements competing, cooperating, or even cooperating to control and analyze massive amounts of data [4-6]. In this regard, in the global and digitalized economy, business data analytics, deep learning technology, and machine learning technology appear to be sources of important but temporary benefits. Market segmentation is a technique for identifying homogeneous groups of customers based on a set of common criteria in order to boost marketing efforts by better allocating resources and establishing tailorable tactics [7,8]. The problem becomes a classification task that can be learned and supervised when the target groups are known ahead of time. Financial organizations are looking into innovative methods of spotting people who have a strong desire to conserve money in order to find new sources of liquidity.

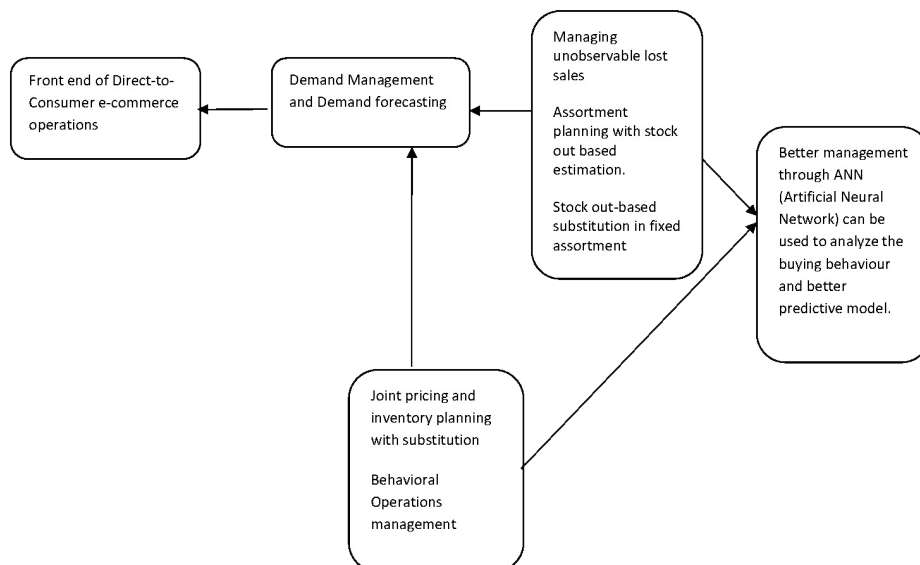
Traditional statistical methods such as discriminant analysis have been successfully used in classification jobs. The desire for even more precise results has changed researchers' attention to non-parametric categorization techniques like artificial neural networks (henceforth also referred to as ANNs).

Neural networks are Artificial Intelligence models that are inspired by the way the human brain works. They're statistical data-modelling techniques in which interconnected nodes process data in parallel while modifying and learning from prior examples. ANNs have only recently gained prominence, owing to the increasing development of computer usage and the favorable outcomes highlighted in a number of empirical studies which were first described in 1943 by McCulloch and Pitts [9-14]. The main purpose of the study is to churn out a predictive model with greater accuracy in predicting the buying behavior of consumers for DTC (direct-to-consumer) brands.

Direct to Consumer brands

DTC brands are those that have a one-of-a-kind virtual presence with the goal of selling. Customers may only acquire traditional augmentation at their brick-and-mortar locations. The disruptive virtual platforms are showcasing DTC companies, upending the current linear sales model. DTC brands market directly to the consumer, unlike traditional corporations, which promote on TV, billboards, or magazines. The digital penetration of these brands is increasing their reachability to a larger number of consumers [15]. The DTC brands are operating successfully in India. Mamaearth, WOW Skin Science, Zissto Sauces, Everpret, Super Smelly, Yaiy! Naturals, Bare Anatomy, and Noise are to be named among the wide list of DTC brands operating in the Indian Market (refer to figure 1 below).

Figure 1: Refined model to indicate the implications of ANN (Artificial Neural Network) for better management of business through analysis of consumer buying intention for DTC (direct-to -consumer brands)



Implications of ANN for Direct-to-Consumer brands

Direct-to-consumer companies must comprehend the core characteristics and basic aim of online consumers to analyse and improve their transition from a niche to a vast macro market domain in order to thrive in today's climate [16]. These companies must also have real-time consumer insights and apply machine learning and deep learning techniques to perform predictive analytics.

Discussion

The data can be assessed and predicted using an ANN (Artificial Neural Network) by employing a suitable neural network program to anticipate the consumer's buying characteristics [17]. The ANN can also be used as a connectionist system, which is made up of a collection of nodes that process non-linear relationships. In such circumstances, an R-based technique can be used to divide the data into two sets. To begin, the data is partitioned into training data sets, which are used to construct and train the model to learn. Through input, the data is fed into the network. This, in turn, activates the layers of hidden neurons, which are then retrieved and converted into output neurons. A feed-forward approach is constructed using this concept [2]. Through this predictive approach, individual weights are also extracted. After the training data has been used to predict the model, the test data is used to test the model. As a result, a feedback model is used to confirm the model's validity. This form of feedback allows the ANN to learn in the same way that the human brain does.

Applications of ANN method to know the buying attributes of Direct-to-Consumer Brands

For direct-to-consumer branding, the ANN (Artificial Neural Network) can be used to analyze many aspects of business. It can help with consumer decision-making, assortment planning, business intelligence, sales forecasting, demand forecasting, predictive and prescriptive analytics, and predictive and prescriptive analytics. Consumers' purchasing intentions can be surveyed using a pre-tested questionnaire. The purchasing intention might be labeled based on the variables used in the survey or current literature. The buying intention can be evaluated further through the survey to see if these buying characteristics can lead to purchase decisions. ANN, which is conducted using sigmoid functions, can be used to harness the relationship between buying attributes and purchasing decisions. Training and test data sets can be created from the data. The data sets for training and testing the algorithm have been separated. Because the data is harnessed using the sigmoid function, the result value is between 0 and 1. The training and test data sets can generate the respective values of misclassification error and accuracy when the data is further processed. This value, in turn, represents the extracted neural model's consistency and predictability.

Conclusion

The use of an ANN (Artificial Neural Network) for consumer behavior can provide discernment when it comes to anticipating customer preferences using a predictive model. decision trees and consumer segmentation. The predictive model can aid assortment planning and sales and demand forecasting. This refers to the uniqueness of the work as well as its methodological and theoretical implications. It can be used to surmise: (a) Using ANN to build a model that can predict the purchase intention of direct-to-consumer brands (b) Extract the variables that may influence buying decisions. c) To develop a prediction model to assist assortment planning. Customer satisfaction can be improved by achieving such goals.

Implications

The ANN (Artificial Neural Network) can be an effective tool for predicting consumer purchasing intentions. The predictive model that is commonly retrieved using the sigmoid function and algorithmic execution of an ANN (Artificial Neural Network) has various business analytics applications. It can be beneficial for brand managers, marketing analysts, and marketing strategists to forecast future customer intentions based on existing behavioral trends. The results of such an analysis, as well as their interpretations, can assist start-ups and entrepreneurs in better understanding their customers and allocating budgets based on future trends. The predictive model based on the ANN algorithm can assist businesses in thriving in today's VUCA (Volatility, Uncertainty, Complexity, and Ambiguity) world.

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