Research on E-commerce Demand Forecast Based on Big data Algorithm and AI

Zike Deng

Wenzhou-Kean University, Wenzhou 325060, China

2532087249@qq.com

Abstract. With the growth of the Internet, the field of e-commerce has gradually developed into an important field in people's lives. Nowadays, e-commerce brands bring consumers a huge convenience and efficient consumption mode, while operating costs are lower compared to the real economy. People's daily consumption and shopping have gradually transformed from traditional trading models to online trading activities conducted through electronic trading. A large number of merchants have established their own e-commerce platforms to provide high-quality services and make people's daily lives more convenient. With the growth of AI, the use of massive user consumption data, combined with advanced algorithms such as data mining (DM) and deep learning, accurately analyzes user purchase, return, and other behaviors, thereby upgrading the experience of e-commerce platforms to attract more customers and purchases. Currently, e-commerce Big data can be used in precision marketing, supply chain, logistics warehousing, payment security, e-commerce finance and other fields; In the future, e-commerce Big data will be closely combined with AI and VR/AR to promote the digitalization of traditional industries and pay more attention to data security and personal privacy. Based on Big data algorithm and AI, this paper analyzes e-commerce demand forecasting.

Keywords: Big data algorithm, AI, e-commerce demand forecasting.

1. Introduction

With the support of "Internet plus" and Big data technology, China's e-commerce is booming and has become a new industry [1]. Intelligent innovation technology will lead the digital upgrading of the e-commerce industry, and AI technology is providing a continuous source of power for e-commerce platforms to acquire loyal users. AI is a trendy scientific technology in today's society, which has been applied in multiple fields and is constantly growing and on the rise. It is a major direction for future growth in various fields [2]. E-commerce usually refers to a novel business operation model where consumers engage in various commercial activities based on browser/server applications on an open internet platform [3].

The application of AI in e-commerce management is a present situation and future growth direction in the field of e-commerce. With the further growth of e-commerce, people have put forward higher demands for this new business model. The combination of AI and e-commerce management can further improve the functions of e-commerce and have a profound impact. The purchase behavior prediction of e-commerce customers refers to the behavior of real-time prediction of online customers' purchase propensity according to the behavior rules contained in consumers' historical access click operations, Server log, browsing records and commodity feedback information. E-commerce related enterprises can use AI technology to achieve better growth, and establish a comprehensive information exchange platform using AI, which can bring better experiences to users [4]. The characteristics of massive data volume, fast processing speed, multiple types, high timeliness demands, high value, and high accuracy have brought new challenges and opportunities to the marketing of the e-commerce market. In addition, with the acceleration of modern planning and construction, consumers' demand for standardized, large-scale, and market-oriented supply of products is becoming increasingly strong. The data assortment of products on the e-commerce platform, the assortment of consumer strength of user groups, and the DM of consumer browsing behavior, attention behavior, and Consumer behaviour are conducive to the e-commerce platform to gain accurate user portraits, so as to enhance consumption guidance or commodity push information

[5]. More and more e-commerce enterprises are paying more attention to providing high-quality services to users through the use of the Internet. With the increasing popularity of e-commerce, more people choose to conduct transactions on it. Therefore, there is a huge amount of customer purchasing behavior data information, and more importantly, consumer evaluations and feedback [6].

However, in the process of e-commerce Big data assortment and mining, the low accuracy of the algorithm has become an important factor impeding the growth of e-commerce. Accurately grasping customer purchasing behavior, being able to accurately identify and locate potential customer groups, and turning viewers into buyers, has extremely strong practical significance and economic value [7]. In the new era, people put higher demands in the degree of AI of e-commerce DM and assortment, which demands deepening the application of technology in precise operations to achieve intelligent growth of e-commerce DM and assortment.

2. The Application Path of AI and E-commerce Management

2.1 Reduce Labor Costs

The AI customer service robot based on the Internet Big data system has a super Natural language processing system, which can understand and analyze various questions raised by customers, and answer customer questions instead of real customer service, thus liberating manpower and greatly reducing labor costs. Every time virtual assistants are mentioned, people often think of "Siri", and in the e-commerce model, AI technology has been fully applied, and virtual assistants based on AI technology are representative of them. In the traditional e-commerce field, in order to ensure thoughtful service, e-commerce enterprises must invest a large amount of labor costs and set up many customer service to solve problems for customers [8].

Virtual assistants can screen Big data and quickly screen products that meet customer needs on the basis of store products, which is a significant advantage of AI technology [9]. The logistics management of e-commerce is also a labor-intensive and material task. Traditional e-commerce must rely on manpower to complete the tedious logistics management work, and the application of AI in logistics management has greatly liberated manpower. By entrusting a large amount of complex logistics management work to AI, not only can enterprises save labor costs, but also bring customers a better shopping experience. The virtual assistant of AI technology can also replace human customer service to answer customer questions, enabling consumers to have a better consumption experience; And this virtual assistant itself meets the demands of 24-hour full-time work, without being limited by time and space, making it convenient for buyers to purchase and handle after-sales service.

2.2 Meeting the Personalized Needs of Users

Nowadays, with the continuous growth of Chinese society and economy, the products presented are diverse. However, diversification also requires considering the specific needs of specific customers, so how to better focus products on customer needs is the key for e-commerce to seize the opportunity in industry competition. From the perspective of e-commerce marketing, with the support of AI technology, this technology has been widely applied in various production processes, ultimately providing consumers with various intelligent and personalized consumption experiences. Another important advantage of AI in e-commerce management is that it can establish a complete recommendation engine, use AI algorithms, build Big data, analyze the Consumer behaviour of users, predict their preferences, and then recommend relevant products to them [10].

Intelligent technology can also provide customized production modes. In the production process, manufacturers can predict consumers' purchase demand according to the sales data provided by the e-commerce platform, and achieve small batch production according to the evolution of data data conducted by Big data. AI can accelerate the realization of batch production, module setting and other functions, and ultimately further improve the level of user intelligence. Through AI technology, it is possible to obtain consumers' browsing history, browsing information, and purchasing tendencies, ultimately obtaining "holographic information" of their consumption process, and ultimately

providing consumers with more detailed product recommendations. Take Taobao as an example. When we browse a certain type of goods, as time passes, the Taobao interface we use will recommend us the same or related types of goods. This is precisely because Taobao uses AI algorithms to analyze our Consumer behaviour, predict our likes, and then recommend us the goods that meet our preferences, as shown in Figure 1.

Figure 1. Taobao intelligent recommendation

3. The growth of AI in E-commerce

3.1 Building a User Behavior Mining Tree

For e-commerce enterprises, accurately obtaining userinfo has a humongous influence on their decision-making and business staffwork. In this regard, it is imperative to build the necessary userinfo model tree in the management of e-commerce Big data, so as to realize the effective mining of user behavior. In the process of e-commerce applications, the accuracy of userinfo obtained has a significant impact on the final DM results. To ensure the correctness and comprehensiveness of e-commerce data, the priority is to wholly scan all data of the entire network, so that specific nodes can be known and more complete data sets can be obtained. Selecting the node with the largest amount of data from the dataset, DM work starts from that node and processes the leftover data nodes through sorting processing.

Finish the basic data model tree. For precision marketing purposes, e-commerce enterprises should also think about consumer behavior, and then analyze the relevance between precise consumer behavior and precise nodes to construct a user behavior mining tree. According to the sorting results of user behavior, the nodes with a high degree of association with user behavior will be sorted in the parallel data total stage as the basis for subsequent DM. Finally, the Binary tree method is used to arrange the data, and a more integral user behavior mining tree can be acquired. The Tree model of e-commerce Big data user behavior mining is shown in Figure 2.

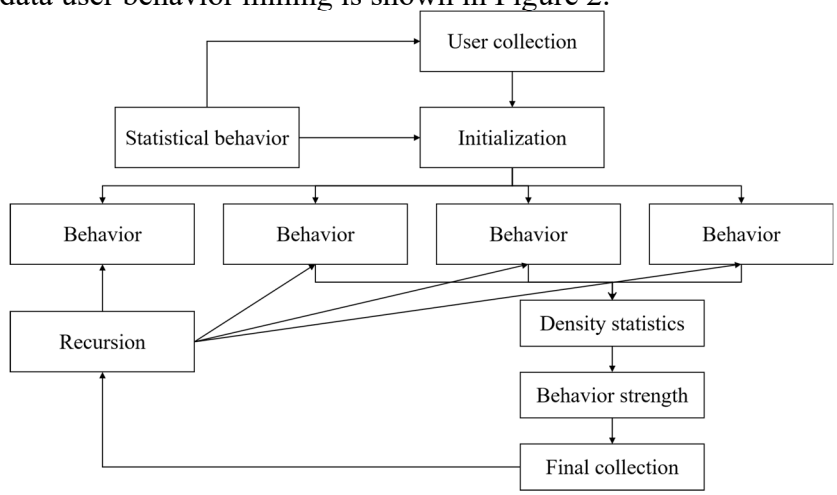

Figure 2. Tree model of user behavior mining

3.2 Traditional Industry Dataization

The application of Big data is not only in the computer and Internet fields. Data is essentially generated and exists in all aspects of production and life. Therefore, the penetration of Big data into traditional offline industries will also be an important trend in the growth of Big data. Taking agricultural products as an example, on the basis of accurately targeting target customers, we plan and design personalized advertisements that reflect the characteristics of agricultural products in all aspects, judge online shopping malls that consumers trust more through Big data and AI technology, and recommend agricultural products that meet their interests and needs, are reasonable in price, and have good quality at the right time. Crop growth data, variety data, and growth environment data can all be collected and mined by sensors to guide agricultural production, such as monitoring soil acidity and alkalinity for soil improvement to promote crop growth.

In the era of Big data and AI, through the collection, collation and analysis of data, we can dig deeply into the characteristics of consumers, build consumer portraits, make full use of data to guide the production and marketing of agricultural products, and provide consumers with personalized agricultural products. At the same time, major e-commerce platforms store a large amount of merchant data, product data, and enterprise information, which directly affects the interests of enterprise merchants. Once lost, it not only causes huge economic losses, but also damages the platform image and affects user interests. In addition to enterprise data, personal privacy involves deeper related interests, and strengthening personal privacy protection is extremely important.

4. Conclusions

In the era of AI, we rely on algorithms to obtain accurate user profiles. It is suggested that e-commerce platforms subdivide commodity data types, user data types, user behavior data types, user order data types, and user comment data types, and obtain more accurate original data information by building a complete database assortment. At present, Big data can be used for precision marketing, supply chain management, improvement of logistics and warehousing, payment security and e-commerce finance. Consumer behavior prediction is currently a highly forward-looking research field in e-commerce. With the in-depth research of AI deep learning models, the accuracy of consumer behavior prediction has been greatly improved. Applying AI related technologies in e-commerce management can reduce labor costs for enterprises, bring better economic benefits to enterprises, and provide users with a high-quality shopping experience; It can also make the diversified products of e-commerce targeted to meet the needs of different users; Utilize AI algorithms to establish a comprehensive search engine and form a comprehensive push mechanism. The combination of AI technology and e-commerce has broad growth prospects, so in future work, we should actively explore new paths for the growth of AI technology and leverage its advantages. The application of AI in e-commerce management is the current situation and future growth direction of e-commerce. With the continuous penetration of Big data, it will also continue to have a positive and far-reaching impact on production and social life.

References

[1] Long Rui. E-commerce big data assortment and mining algorithm based on AI [J]. Modern Electronic Technology, 2020, 43(14):4.

[2] Li Jiahua. Personalized information recommendation algorithm of AI cross-border e-commerce shopping guide platform based on big data [J]. Science, Technology and Engineering, 2019, 19(14):6.

[3] Zhu Min. Internet of Things big data mining algorithm based on AI technology [J]. Journal of Jixi University, 2021, 021(012):54-59.

[4] Qin Yu. E-commerce big data assortment and mining algorithm based on AI [J]. Electronic Technology and Software Engineering, 2021(14):2.

[5] Li Xu. growth, application and research prospect of AI in e-commerce field [J]. New Economy, 2021, 548(012):71-74.

[6] Mo Xiaoting. Analysis of AI and e-commerce management [J]. Fortune Times, 2019(7):1.

[7] Yang Yifan. The growth, present situation and future prospect of e-commerce big data [J]. Communication World, 2018(8):3.

[8] Huang Lei. AI and e-commerce management [J]. Marketing, 2019(43):233-234.

[9] Yang Yanli, Fan Yaguo, Liu Liang, et al. Thinking and practice of the integration of e-commerce and AI technology [J]. Digital Design (I), 2022(003):000.

[10] Ju Xiaoling, Fan Chongjun, Wang Mengyuan, et al. Discussion on the application of AI in e-commerce [J]. E-commerce, 2020(10):2.