

Big Data Analysis for Contemporary Consumer Behavior

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Abstract: With the popularization and application of the Internet, human beings start shopping on the Internet. Compared with offline shopping, the Internet will provide more choices and convenience. When more kinds of commodities come into the consumer's field of vision, the process of consumers' selection of commodities will generate a large amount of data. By analyzing the data of consumers' selection of goods, one can obtain the consumption habits of consumers. Massive amounts of data are analyzed, and value is generated. The emergence of new consumption patterns has led to changes in the consumption environment of consumers. This paper summarizes and demonstrates the recent state-of-art reports focusing on consumer behavior based on big data techniques. According to the analysis, big data helps the market to sell faster and easier but leads to consumer privacy concerns. In summary, this paper gives the impact of big data applications on consumer behavior and suggestions. These results shed light on guiding further exploration of consumer behavior investigation.

Keywords: Big Data, Consumer behavior, Consumer privacy.

1. Introduction

Consumer behavior plays a vital role in marketing decisions and formulating marketing strategies [1-3]. Previously, research on consumer behavior has focused on how and why people buy things, which has been lacking on people's continued consumption of products and how they use them [3-5]. With the deepening of research on consumer behavior, people are increasingly deeply aware that consumer behavior is a complete consumption process. Researching and buying is just one stage of the process. Therefore, the study of consumer behavior today has become the study of consumers from knowing the product, investigating the product, buying the product, using the product, and continuing to consume it [6, 7]. Due to the lack of detailed data on the consumer consumption process, consumer behavior has been slow to progress. In the process of consumer behavior research, there is not a large amount of data to support, and people's research on consumer behavior has never been able to use data to measure what decisions consumers will make in a specific situation [8]. Contemporarily, big data has helped the development of consumer behavior, which help people use concrete data to measure what decisions people make under what circumstances. Under the condition of modern market economy, enterprises study consumer behavior with a view to establishing and developing long-term exchange relationship with consumers. On this basis, it is necessary to understand not only how consumers acquire products and services, but also the ways that consumers consume products and how they are disposed of after use. On account of the consumer's consumption experience, how consumers dispose of old products will affect consumers' next round of purchases [9-12].

Contemporarily, the value of big data analysis is in the collection and arrangement of consumers' consumption information, and the use of big data analysis to obtain consumers' personal information and decision-making information. This information can help with marketing and future strategic planning of the business. Based on big data, people can analyze the consumer group, consumer status and business sales status. In the beginning, the concept of big data was created because of the vast number of web pages stored by search engines (e.g., Google and Yahoo). Therefore, the earliest application scenario of big data is search engines. Due to the immature development of technology at this time, it was only the storage of big data and simple big data applications, such as retrieval. After 20 years of development, big data has been integrated into many industries, including storage, computing, and applications. The application of big data has expanded from search engines to medical,

social, e-commerce, Logistics, transportation, tourism, and other industries. The development of big data has developed from the earliest big data storage to big data computing and big data processing resource management.

The research object is consumer behavior analysis in the context of big data. The research background is that technological progress leads to the emergence of big data analysis and enables people to obtain a large amount of actual consumption data. One can effectively improve and perfect the previous consumer behavior theory by using big data analysis. In addition, one can study how consumer behavior is affected by big data in modern times. The main reason for studying this topic is the rapid technological progress in today's world and the emergence of analytical technologies such as big data. Besides, one can more accurately understand the logic of consumer behavior and improve the previous theoretical model of consumer behavior research. At the same time, it is feasible to learn whether the emergence of big data will have an impact on consumer behavior. The rest parts of paper are organized as follows. The Sec. 2 will introduce the concept of big data and big data analysis. The Sec. 3 will describe the impact of big data on consumer behavior. The Sec. 4 will illustrate the limitations of this paper and prospects for the future. The Sec. 5 will summarize the full paper and explain the impact of big data on consumer behavior nowadays.

2. The basic description of big data

The concept of big data is a large scale to acquire, store, manage, analysis of the traditional database software tools beyond the scope of the data set, with massive data scale, rapid data flow, diverse data types and low value density four characteristics [13]. The strategic significance of big data technology lies not in the proficiency in massive amounts of data, but in the professional processing of meaningful data. The significance of big data is to improve the ability to analyze data and create value by analyzing data. The strategic significance of big data technology is not to master huge data information, but to professionally process these meaningful data.

Big data analysis includes six basic aspects. Analytic Visualizations are an essential requirement for data analysis. Whether for data analysis experts or ordinary users, visual data allows people to use data to prove conclusions. Data Mining Algorithms are algorithms that simplify data and create value. Predictive Analytic Capabilities allow analysts to make predictive judgments based on the results of visual analysis and data mining. Semantic Engines are tools used to parse, extract, and analyze data. Semantic engines need to be designed to intelligently extract information from data. Data Quality and Master Data Management is the processing and management of data through standardized processes and tools. Improving data quality and securing data provenance is an integral part of high-quality analytical results. Data storage is a database that facilitates the presentation of data from multiple perspectives and is stored in a specific schema.

The practical application of big data also occurs in Amazon's recommendation. By applying big data to effectively classify information and analyze the two characteristics of information, Amazon can find out the products users want more quickly. Amazon analyzes users' needs and preferences by labeling consumers with activity, consumption, age, gender, historical purchases, historical browsing, and regions. Amazon's rational usage of big data allows users to find the products they want to buy and like more quickly. Traditional marketing requires more steps to filter out what consumers like and retain customers who really have needs and preferences. By studying the AISAS model of consumer behavior, this paper finds that big data has a promoting effect in the steps of Attention, Interest, and Share of the consumer behavior model [11]. A sketch of the model is given in Fig. 1.



Fig. 1. A sketch of AISAS Model

3. Big data in consumer behavior

3.1 Application of big data in consumer behavior

With the continuous development of computer Internet technology, the user group of online shopping is increasing rapidly. Compared with traditional shopping, online shopping is more convenient and more optional, so online shopping is favored by consumers. In the process of consumption, consumers conduct browsing, searching, shopping cart and other operations, thus generating a large amount of data related to consumers. The effective use of these data requires big data-related technologies and tools. Big data technology can effectively analyze consumers by collecting data on consumers' habits and styles and develop different platform marketing and personalized services for each consumer. Based on the use of big data analysis, one can discover consumer behavior models in various situations. In this model, consumer behavior is predicted on social media including Facebook, YouTube, LinkedIn, and Twitter, etc. It is feasible to predict the behavior of consumers by doing big data analytics. A social media consumer behavior model is developed. The framework of the model is given in picture of social media consumer behavior model. In this model, data have been considered from the sources Facebook, YouTube, LinkedIn, and Twitter. The data are cleaned by removing noises, errors, duplication, and outliers to make the quality data. Moreover, one can build consumer behavior models and predict consumer behavior through big data. Through the analysis of the consumer behavior model, it is achievable to know that the length and life of online consumer comments are positively correlated with the number of readers and the degree of help [14]. Fig. 2 clearly demonstrate the behavior model.

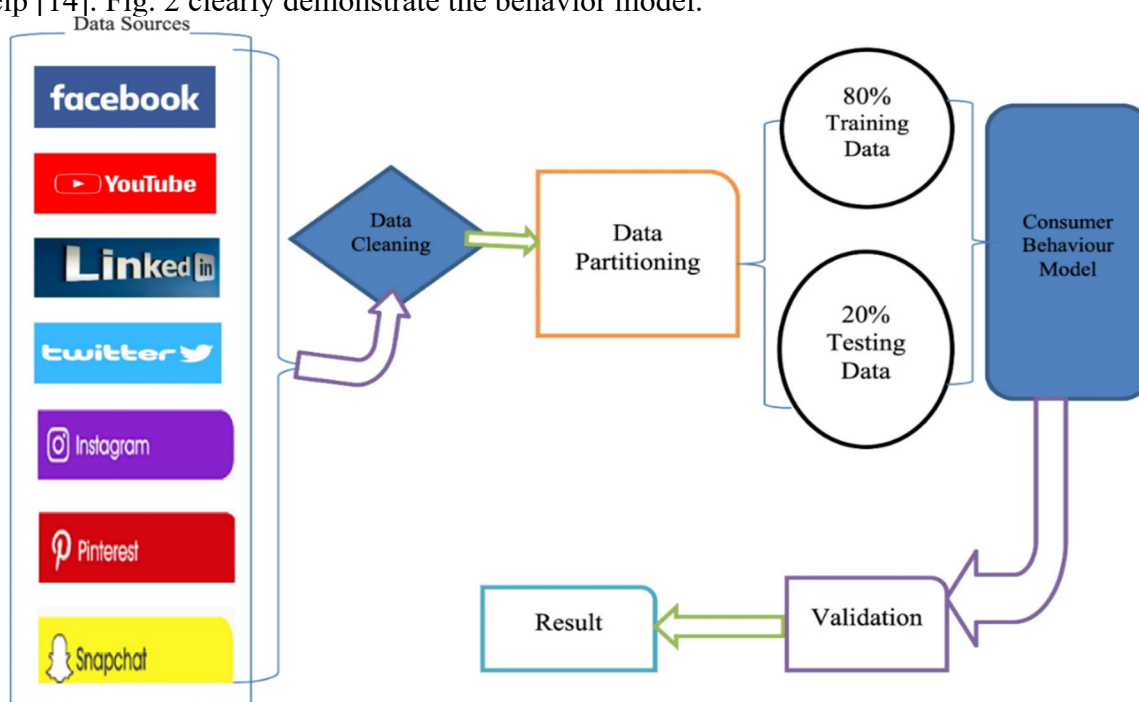


Figure. 2. Social media consumer behavior model [12].

3.2 Analysis of experimental results

The comparisons of different models are given in Fig. 3. There is no shortage of literature on the specific value that consumer data can bring. AI, as explained above, is very dynamic and functions very similarly to that of a human mind. It performs cognitive tasks that require human intelligence with precision and accuracy. It is attributed to its acceptance across various sectors. Big companies have also adopted AI to develop personalized products like smart devices, virtual assistants, etc. These products help to perform various day-to-day activities which make human life easier and faster. Thus, the innovation of AI has proved to be helpful for humans. In this case, it is tried to explain the power of aggregators like Amazon in influencing consumer behavior by making strategies through the use of AI to attract consumers and successfully retain their consumer base. Strategies like prime delivery &

personalized product recommendations have worked in their favor and have helped them to gain more control in the digital market as compared to their competitors. On the other hand, the literature describes the dangers of consumer data. Additionally, the majority of the individuals who responded, even though all of them knew about data protection and security but consumers were unaware of the laws governing it. This is the area of concern because unless consumers are themselves not aware of their rights, they will not be able to tackle the issues of data privacy and consumer exploitation. One of the major reasons for such unawareness was because there was no law protecting the digital consumers, but now the government has enacted the Consumers Protection Act 2020 and the Consumer Protection (E-commerce) Rules 2020, which provides online consumers with their necessary rights, relief, and a platform to file their grievances.

This consumer law should ensure better protection and security of digital consumers and will prevent their exploitation by the business giants. The Personal Data Protection Bill 2019 also lays down strict guidelines to protect the interest of the individuals and punish the business or e-commerce violating any of its provisions. Based on reading these literatures, this paper learned that there is a consensus in all the literature that privacy of consumers' data needs to be protected. At this point, all the literature points out that one should work harder to protect consumer data privacy because as technology continues to update, so do the threats to consumer data privacy. In addition, companies even blatantly exploit consumer data privacy for profit. For all reasons above, it is necessary to improve our laws, improve our regulatory capabilities, and update our technology to protect consumer data privacy. All of this paper's literature came from Google Scholar and all of them discussed consumer data privacy. Consumer data will lead to a better consumer experience and make it more convenient than ever before.

At the same time, this approach also brings an impact on offline chain stores and stores. The use of the Internet has accelerated the collection and analysis of consumer data. In the meantime, the protection of consumer data privacy also arises. In this case, it indicates consumers' lack of awareness of the various sales methods used by stores. Although consumers have their rights and interests, they are not able to fully understand their rights and the way merchants sell. The gaps in the subject seem to be due to the latest technology and laws and regulations that are not fully understood. It also indicates the necessity to keep learning from modern technologies and latest problems.

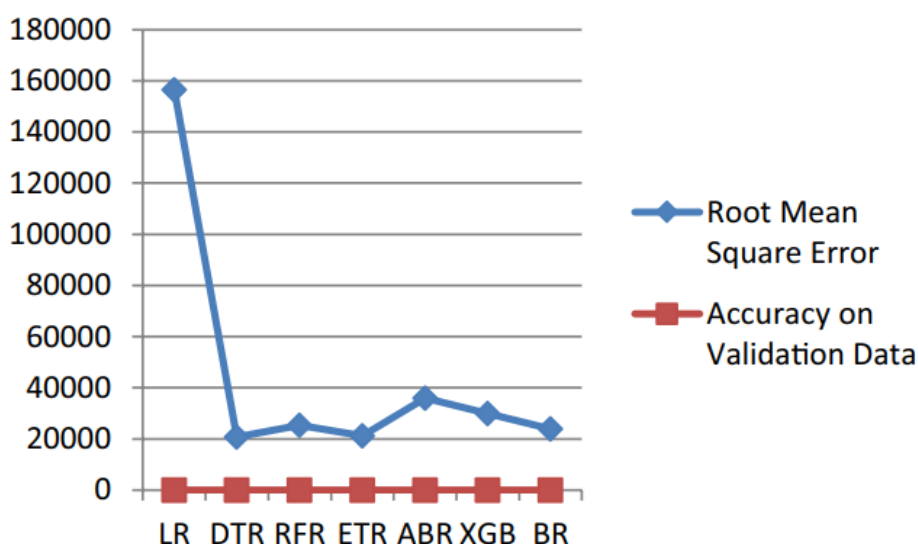


Figure. 3 Results of different models [12].

4. Limitations & Future prospect

At present, big data-related applications are still in the development stage, and a mature big data-oriented business environment has not yet been formed. Besides, it is considered that there are a lot of areas that haven't been studied using big data. The data that one can obtain is basically the data that

has been accumulated since the beginning of the Internet era. The length of time is only a few decades. A few decades are not a long time to study the development of human society and human behavior. Many of these data cannot be directly used as samples to study. The emergence of big data, a modern technology, is not widespread in the business environment. So far, it is only in the area of assisted search and preference filtering. Research on consumer behavior is even rarer. Big data has been used for a brief time and the technology is not widespread. This is the limitation of our study.

It is unknown how people will use big data to analyze and draw conclusions in the future. However, it is hoped that the application of big data can be better combined with consumer behavior in the future and further study of consumer behavior through big data. The existing content of consumer behavior can use big data analysis to get more accurate answers and help us study the unknown parts. The use of big data will lead to new applications in the future and help us deepen our understanding of consumer behavior.

5. Conclusions

In summary, this paper investigates recent papers about the impact of big data on consumer behavior. Through the integration of data to discover consumer preferences and actively arouse consumer interest, which is unprecedented. It is hard to blindly advertise and screen out relative consumers and interested people. Nevertheless, through big data analysis, one can get more accurate consumer preferences and precisely and actively stimulate consumers with corresponding preferences. This not only speeds up the process of modeling consumer behavior but also enlarges people's desire to consume, i.e., will be exposed to faster patterns of consumer behavior and help us explore the impact on consumer behavior. At the same time, one can use big data to deepen what we already know about consumer behavior. Through big data analysis, we can get more accurate details and process of consumer behavior model. This will help the whole science of consumer behavior. In addition, this paper also finds that the value generated by big data involves the personal privacy of consumers and produces a large number of privacy issues. Increased consumer privacy has been sold and this problem leading to consumer distrust of big data. The path to protect personal privacy has become the code of consumers behavior under the background of big data.

This paper makes a study by combining the concepts of consumer behavior and big data analysis. This paper found the enormous potential of consumer behavior research through big data and the influence of big data on people's consumption behavior. Big data can not only influence consumer behavior, but also study consumer behavior and quantify the data in it. In the future, consumers will be more adaptable to new consumption patterns and respond accordingly. Consumer behavior will be more stable and predictable. Moreover, the consumption environment will also change according to the needs of consumers. Overall, these results offer a guideline for two influences of consumer behavior in the context of big data. Using big data for analysis will better help people analyze consumer behavior. The value created by the unethical use of analyzed data can have a greater impact on consumer behavior.

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