*Journal of International Trade, Logistics and Law, Vol. 10, Num. 1, 2024, 77-91*

# ROLE AND IMPORTANCE OF BIG DATA USAGE IN GAINING COMPETITIVE ADVANTAGE

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Received: January 08, 2024 Accepted: February 26, 2024 Published: June 01, 2024

## Abstract:
*In today's rapidly digitalizing commercial world, the e-commerce sector is becoming more and more valuable. Big data lies at the heart of this change and development. E-commerce businesses use big data to understand and evaluate consumer behavior and market variables. Our study focuses on the effects of using big data in e-commerce on the business in gaining competitive power. Studies show that e-commerce businesses can increase customer satisfaction and plan their products and services in accordance with market expectations by predicting consumer wants and needs more effectively and quickly with big data analysis. The value-added information obtained with big data helps the business to quickly adapt to competitiveness and market conditions. In this context, it is important to explain the effects of the use of big data in e-commerce on the competitiveness of businesses, to the business environment. The importance of processing the data, causing the data to gain an economic value, and then analyzing the results in the best way possible is evident. Within the framework of the issues addressed in this study, a comprehensive literature review is presented on the potential application and impact areas of big data in e-commerce businesses and the advantages it provides in achieving competitiveness.*

## Keywords:
E-commerce, big data, competitive advantage
## JEL Classification Codes
L81, C55, D41

## 1. Introduction
With the rapid development of the digital age in today's business world, e-commerce businesses have access to more data and can turn this into a strategic advantage. These developments create both opportunities and a huge competitive environment for e-commerce businesses. E-commerce is a rapidly growing and evolving sector. The requirements of being successful in this sector cannot be limited only to product quality or price competition. A data-driven approach also needs to be developed. At this point, the role of big data in e-commerce is noteworthy. Thus, businesses can deliver their products and services to a wider consumer base without limitation in terms of time and location. It has important advantages that affect competitiveness, such as shortening decision-making processes by optimizing business processes.

For the e-commerce sector, which is at the center of this change, effective use of huge data sets becomes possible with big data. In addition to contributing to the transaction speed for e-commerce businesses, big data also contributes to the competitiveness of the business by rendering the decision-making processes more effective (Constantiou et al., 2015:18). Businesses have engaged in the attempt of using all kinds of data created by consumers in the internet environment by turning it into an economic asset. At this point, big data, which is the expression of data sets produced with high velocity, volume and variety, comes into play. Big data covers all kinds of digital data that consumers create on online platforms. It stands before us as a revolutionary matter that concern all aspects of our lives, from businesses to consumers and from science to public services (Jagadish et al., 2014:91).

It was seen that businesses doing e-commerce with big data can get to know consumers more specifically with all this digital media data. Thus, it becomes easier to reach the right consumer at the right time with the right information.

When it is revealed by the analysis how long it takes for a product to be repurchased and at which periods of the year the purchase is repeated or increased (Yılmaz, 2021:45); the impact of big data usage on the competitiveness of the business is seen more clearly. With big data, e-commerce businesses gain competitive advantage by increasing business performance while rendering the decision-making processes more effective (Constantiou et al., 2015:18). From the aspect of businesses, consumer preferences and demands can be determined faster and more accurately, and the product and service innovation process can be adapted to the consumption speed. LaValle et al. (2011:23) state that it is of great importance for businesses to respond to rapidly-changing consumer demands by using data in an effective and timely manner and to remain strong in the competitive environment. Studies also emphasize the necessity and importance of businesses' integrating big data into their strategies.

This study aims to explain how a critical element big data is in gaining competitive advantage in e-commerce. This study will also discuss how much of a big difference big data makes for businesses, the impact of the revolution it has created while shaping the future of e-commerce, and how businesses can use this advantage.

## 2. Literature Review

### 2.1. The E-commerce Concept

E-commerce refers to the purchase & sale and payment transactions of products and services performed by buyers and sellers on digital platforms. Also referred to as electronic commerce, e-commerce has become the digital face of commerce with the use of the internet. As an important step, the definition of e-commerce was made in 1988 by the World Trade Organization (WTO) which recommended the creation of a "Comprehensive E-commerce Network" at the second Balkans Conference held in Geneva (İsmail, 2020:30). According to this definition, electronic commerce is a trading model in which people communicate through digital platforms and purchase and sell products and services in online environment (WTO, 1998). According to the e-commerce definition of OECD (Organization for Economic Co-operation and Development) member countries, dated 2001, identification of a transaction as e-commerce is made based on placement and receipt of orders online. In the definitions OECD made in 2011, it expressed the performance of commercial transactions online in a narrow sense, and the performance of commercial transactions using computer networks in a broader sense (Gedik, 2021:185). In 2013, WTO defined e-commerce as the purchase and sale of products and services by placing or receiving orders using computer networks. Becoming increasingly more important, e-commerce stands out as an online commercial platform that allows various economic transactions to be performed and directed via the internet (Satar et al., 2019:454). The entire process, from purchasing the product or service to choosing payment and delivery methods, starts and ends online. This provides e-commerce businesses with unlimited mobility across the global geographical locations (Kalakota et al., 1997:11). With the influence of the internet and technology, businesses have achieved a wider market potential by reaching consumers on a global scale. Shaped according to the economic dynamics created by the digital world, e-commerce is accepted as a driving force that encourages innovation by increasing the competitiveness of businesses (Soava et al., 2022:4).

**Table 1. E-commerce definitions**

| Author | Definition |
|---|---|
| Wigand, 1997:7 | E-commerce is an expression to describe businesses' sale of products and services via the internet in accordance with their purpose, and their use of this electronic platform effectively. |
| Canpolat, 2001:14 | E-commerce is a method of commerce that involves the use of the internet and computer networks to purchase and sell products and services, and to manage, regulate and effectively supervise payment processes. |
| Carter, 2002:171 | E-commerce refers to all commercial transactions performed via internet-based computer networks. |
| Sarısakal, 2001:1075 | E-commerce is the purchase and sale of products or services in digital environment via computer networks. |
| Karagozoglu et al., 2004:292 | E-commerce is businesses' supervision of products and services via online platforms. |

| | |
|---|---|
| Özmen, 2009:245 | E-commerce is a trading model in which products and services are purchased and sold in the internet environment, in addition to performance of all other transactions through computer networks. |

**Table 1. E-commerce definitions (Table Continued)**

| | |
|---|---|
| Akar, 2010:119 | E-commerce refers to creating high added value on electronic platforms via computer networks, by enabling commercial activities to be carried out more effectively and efficiently. |
| Jusoh et al., 2012:224 | E-commerce is a process including stages such as the consumer's online product search, product selection, review of product features, comparison of products, and ultimately making a purchase decision. |
| Özmen, 2013:460 | E-commerce refers to a trading model in which the purchase and sale of products and services are carried out in the internet environment via computers. |
| Gupta, 2014:1050 | E-commerce is the execution of a multitude of commercial transactions in an internet-based environment. |
| Kasemsap, 2015:303 | E-commerce is a technological application with the widest use around the world. |
| Civelek, 2017:13 | E-commerce is the realization of payment stages in products and services trade, via the internet. |
| Barkatullah et al., 2018:95 | E-commerce is an innovative commercial business model where transactions are performed in the electronic environment. |
| Dahbi et al., 2019:814 | E-commerce is a commercial concept that allows businesses and individuals to shop online on digital platforms using computer networks. |
| Bjerkan et al., 2020:294 | E-commerce is an important commercial tool provided by internet platforms to enable the understanding and determination of the purchasing habits and preferences of individuals and businesses. |
| Tran, 2021:2 | E-commerce is a trading model in which not only payment transactions but also purchase and sale transactions are carried out in electronic medium. |

Source: Created by the author.

In recent years, a large portion of businesses engaged in traditional commerce have turned to e-commerce in order to adapt to the business environment that has been changing with the effect of digital transformation, to gain competitive advantage, and to maintain the competition effectively. This trend has led the businesses carrying out traditional commerce to increase the use of e-commerce by moving their products and services to the online environment, in addition to physical merchandising activities (Fouskas et al., 2020:689).

**Table 2. Traditional commerce vs. e-commerce**

| Traditional Commerce | E-Commerce |
|---|---|
| Only Business to Business | - Business to Consumer<br>- Businesses to Business<br>- Business to Government<br>- Consumer to Consumer |
| Generally sector-specific closed groups | Globally open marketplace |
| Limited number of corporate partners | Unlimited partners |
| Limited access - closed networks | Unlimited access - open networks |
| Known and reliable partners | Known and unknown partners |
| Confidence in sources | Confidence in sources, and authentication |
| Market refers to a community | Networks are an expression of the market |

Source: CORDIS, A European Initiative in Electronic Commerce, Communication to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions, Community Research & Development Information Service (CORDIS) Publications Office, 1997, p.9.

Developing a new understanding of commerce and reshaping commercial rules (Marangoz, 2011:184), e-commerce brings ease of transaction, great advantages, and superiority in competition, compared to the types of business-to-business, business-to-consumer, and finally consumer-to-consumer, the use of which has increased (Karagözoğlu et al., 2004:295). This classification evaluates e-commerce from a general perspective and provides a comprehensive view of the subject (Laudon et al., 2012:19).

**Table 3. Types of e-commerce**

| | |
|---|---|
| B2B | Business to Business e-commerce |
| B2C | Business to Consumer e-commerce |
| B2G | Business to Government e-commerce |
| C2G | Consumer to Government e-commerce |
| C2C | Consumer to Consumer e-commerce |
| G2G | Government to Government e-commerce |

Source: Akpunar, E. N. 2017). Development of electronic international commerce in Türkiye and the employment relationship. Harran Maarif Journal, 2(2), 18-32.

In their study, Maity et al. (2014:37) defined e-commerce enterprises as organizations that constantly renew themselves on online platforms, aim to do business by offering innovative products and services, are able to cope with uncertainties, and are focused on consumer needs (Hashem et al., 2015:102).

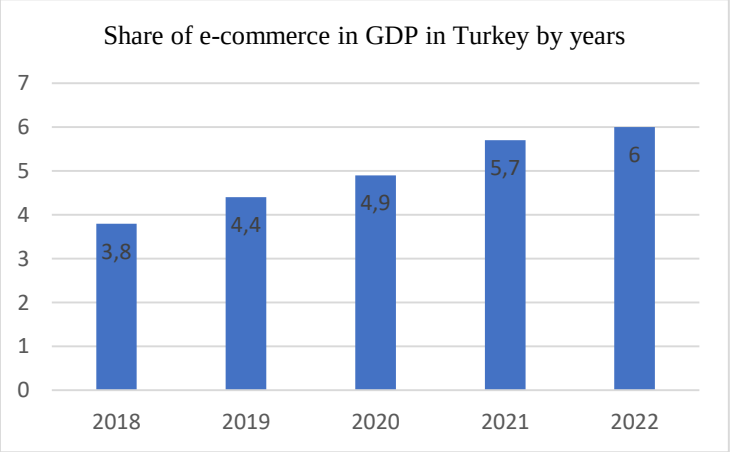


**Figure 1: Share of e-commerce in GDP in Türkiye by year**
Source: Report on E-commerce Ecosystem in Türkiye (2022)

Looking at Figure 1, its share in Türkiye's GDP was 3.8% in 2018, whereas this rate was 4.4% in 2019 and increased in the following years due to the effect of the pandemic, reaching 5.7% in 2022. In 2022, the rate continued to increase and reached 6%.
According to the Report on E-commerce Ecosystem in Türkiye, prepared by İyzico in cooperation with the Electronic Commerce Operators Association (ETİD) and Dogma Alares; in 2022, the e-commerce sector constituted approximately 6% of Türkiye's economic size, reaching a volume of 801 billion TL. This result shows that e-commerce has an increasing importance for Türkiye's economy, gradually contributing to the country's economy more and more. The report states the number of e-commerce transactions occurred in 2020 as 4.8 billion, and there was an increase of

13 TL in basket amounts between 2020 and 2021 and 79 TL between 2021 and 2022. Easy access to global markets, automation of business processes, and increased efficiency are achieved through e-commerce. A decrease in operating costs, effective stock and logistics management, more efficient processes through innovation, and increased competitiveness are also achieved (Astuti et al., 2014:70). Traditional business-doing methods do not suffice to meet commercial expectations, and it is seen that businesses have to renew themselves regularly in order to gain competitive advantage in the market where technology provides instant changes (MacGregor et al., 2005:15).

**Table 4. E-commerce business data by year**

| | 2019 | 2020 | 2021 | 2022 |
|---|---|---|---|---|
| Number of businesses registered in ETBİS *(Electronic Commerce Information System)* | 16,202 | 20,682 | 26,442 | 31,320 |
| Number of businesses operating in marketplaces | 57,394 | 247,654 | 472,604 | 533,019 |
| Number of businesses having their own website and marketplace | 5,139 | 11,475 | 14,699 | 15,651 |
| Total number of businesses in e-commerce activity | 68,457 | 256,861 | 484,347 | 548,688 |

Source: Created by the author with data taken from e-ticaret.gov.tr.

According to the 2019 data, the number of businesses registered in ETBİS (Electronic Commerce Information System) was 16,202, whereas the number of businesses in the world of commerce experiencing the ongoing-year impacts along with the effects of the Corona-19 felt worldwide was 20,682, and the number of businesses operating in the market achieved a great bounce with an increase by 331%, from 57,394 to 247,654. Again, between 2019 and 2020, the total number of businesses engaged in e-commerce activities in our country rose by 275%, from 68,457 to 256,861. As for the 2022 data, the number of businesses registered in ETBİS increased to 31,320 and the total number of businesses engaged in e-commerce stood at 548,688. It is seen that the e-commerce activities of businesses are constantly increasing in line with the efficiency and profitability they achieve (e-ticaret.gov.tr).

### 2.2. The Big Data Concept

Definitions of big data have been developed to emphasize the importance and features of big data. It basically refers to the effective management of data (Mikalef et al., 2018:554). Big data is data produced with large volume, high velocity and greater variety, which exceeds the limits of traditional database systems. Traditional databases cannot meet the expectation in processing large amounts of data. Big data analysis comes into play at this point, ensuring the fast collection, storage and processing of data (Dumbill, 2013:251). This represents a major transformation of data (Schönberger et al., 2013:20). The main reason for the rapid spread of big data is the intensive production and sharing of and the widespread use of data today (De Mauro et al., 2016:124). Big data is also expressed as a technological approach consisting of the combination of techniques and technology which a business may use to analyze large and complex data stacks (Manyika et al., 2011:25).

**Table 5. Big data definitions**

| | |
|---|---|
| Davenport, 2006:1165 | Big data is an approach that enables the evaluation of data coming from a wide range of sources, based on numerical values. |
| Bose, 2009:156 | Big data refers to the method used to achieve profitability and efficiency in businesses. |
| Manyika et al., 2011:25 | Big data is data stacks that require the acquisition, analysis, interpretation and storage of data produced with high velocity and variety. |
| Agarwal et al., 2012:446 | Big data is the analysis method used to make the most effective use of data produced from a wide variety of complex sources. |

| | |
|---|---|
| Schönberger et al., 2013:148 | Big data is adding value to products and services produced based on data. |
| Davenport, 2014:24 | Big data is data that is of high volume, is unstructured, and requires high storage space. |
| Anuradha, 2015:320 | Big data is the expression of data sets that require collecting high-intensity data and adding value thereto dynamically. |
| Laux et al., 2017:664 | Big data is the expression of all operations carried out to process and add value to data. |

Although big data was first mentioned in the 1990s, it was introduced by Francis X. Diebold in the 8th World Econometrics Congress held in Seattle in 2000. It was not until 2011 that the world got familiar with it and started to use it widely. It represents large data stacks which are so large and produced at such high velocity that it would not be possible for traditional data processing methods to process them, and which strain the capacities of information systems (Narin et al., 2017:220). The use of big data affects every domain of our lives in a wide range, from trade to economy and politics, natural and social sciences, and daily life. With big data analysis, data turns into meaningful information, and businesses can minimize the risk by making decisions with more effective results (Özcan, 2021:17).

**Table 6. Fields of use of big data in business**

| Marketing | Products and Services | Finance and Banking |
|---|---|---|
| - Offering products and services specific to individual customer needs<br>- Customer satisfaction<br>- Customer loyalty<br>- Mobile and Social media marketing | - E-commerce applications<br>- Instant recommendations<br>- Stock control and handling<br>- Improvement in business processes<br>- Innovation<br>- Products and services planning<br>- Reducing costs<br>- Ensuing efficiency increase | - Using capital effectively<br>- Analysis of investment instruments<br>- Identifying the risks and uncertainties<br>- Taking security measures<br>- Customer risk analyses<br>- Analyzing and predicting investment returns |

Source: Yıldız, A. (2022). The V's of Big Data and Data Analytics.
Journal of Pamukkale University Institute of Social Sciences, (51), 361-378.

Big data is examined under three main categories: structured, semi-structured, and unstructured (Aktan, 2018:3). Structured data refers to data that is structured in an orderly manner as tables, columns and rows in traditional databases (Yıldız, 2022:363). Semi-structured data refers to data that generally consists of texts and that, although are not orderly, have a certain order in itself (Yıldız, 2022:363). Unstructured data, which makes up 80% of big data stacks, is difficult to analyze because it is produced with high velocity and volume. These originate from media such as text-based e-mails, audio and video content files (Yıldız, 2022:363). Big data is an analysis method that allows accessing hidden information by focusing on large and diverse data sources. Information obtained from this very large and complex

data, which has gained value and the accuracy of which is confirmed, is used in almost every sector. Its most common use is in the B2B, B2C, and C2C areas of e-commerce (Johari, 2020:106).
3Vs were introduced to the literature on the basis of the basic features of volume, velocity and variety that define big data (Doğan et al., 2016:23). Over time, value has been added to these constantly-developing and changing definitions (Cackett, 2013:6). Lastly, variability and veracity were added and the tern took its place in the literature as 6Vs (Bozkurt, 2016:59).

**Table 7. Big data features and definitions**

| | |
|---|---|
| Volume | - It refers to the size of the data (Hoy, 2014:322).<br>- It describes the size of data coming from different sources and requiring large storage space (Davenport, 2012:23).<br>- It refers to the size of big data (Kaisler et al., 2013:996). |
| Velocity | - It refers to the possibility of using data in real time (Cackett, 2013:6).<br>- It is the production and storage of data at high velocity and its constant renewal (Gandomi et al., 2015:139).<br>- It indicates the flow rate of data over time (Akter et al., 2016:176). |
| Variety | - It shows the complex and varied structure of the data (Akay et al., 2018:15).<br>- It indicates the structured, semi-structured and unstructured status of the data (Doğan, 2016:23).<br>- It emphasizes that data is not homogeneous or in a single form, and that there are different types of data (Hoy, 2014:322). |
| Value | - It shows how important data is (Schroeck et al., 2012:12).<br>- It measures the importance and usefulness of the data for the business (Akay, 2022:46).<br>- It is the calculation of the financial return to be derived from use of the data (Storey et al., 2017:55). |
| Veracity | - It shows how reliable the data is (Schroeck et al., 2012:12).<br>- It expresses the reliability of the data source (Kılıç, 2019:291).<br>- It refers to the versatility of the data and the quality of the data (Alkoç et al., 2013:84). |
| Variability | - It is the characteristics of the data and the inconsistencies in the data itself (Akay, 2018:15).<br>- It is used to sort out low quality data and render the data more usable (Johari, 2020:106).<br>- It shows to what extent valuable data can be separated from within the data coming from different sources (Panimalar et al., 2017:4). |

Source: Created by the author.

## 3. Place and Importance of Big Data in E-commerce

In today's rapidly digitalizing market environment, big data has become an important element for e-commerce businesses. Big data, an analysis method that includes important techniques and methods, comes into play to ensure effective use of rapidly increasing data (Behl et al., 2019:290).For businesses operating in the e-commerce sector, the amount and variety of data produced, its instant processing, integration of data with each other, and ensuring its storage and security have become important necessities (Khajouei et al., 2017:9). By using big data analysis method, e-commerce businesses have the opportunity to group consumers, reach them with personalized messages, and capture potential consumers and turn them into opportunities (Anderson 2018:25). To collect big data and render it usable, technology-based companies such as Google, Amazon, Facebook and Apple have used big data for understanding consumer behaviors, shaping their products and services accordingly, and creating successful marketing strategies (Miguel et al., 2016:130). Amazon has managed to increase its sales by 35% by gaining an understanding of consumer behaviors and creating a recommendation system through the use of big data (Arya et al., 2016:82).
The biggest problem of e-commerce businesses is the processing and analysis of the data obtained. At this point, such a problem is overcome with big data. Big data and various data obtained through messages and social media constitute the driving force of growth and competition by optimizing decision-making processes in e-commerce businesses (Alrumiah et al., 2021:37282). The research conducted demonstrates how important big data is for e-commerce businesses as a long-term tool to be able to control and analyze important information (Sazu, 2022:58). With such rapid production of data, big data makes e-commerce businesses higher-performers and more competitive compared to when they were first established (Kayser et al., 2018:17).
Big data enables setting of a market strategy and gaining of competitive advantage, which are critical elements for e-commerce businesses (Alrumiah et al., 2021:37283). The actual value of big data is manifested in classifying and analyzing data and providing better and faster responses to consumer demands and needs (Labrinidis et al., 2012:2032). The common view of the research conducted is that big data analysis offers a solution to the problems faced by businesses in data management and analysis (Bahrami et al., 2022:1622). Businesses' handling big data and reaching factual, applicable information to gain sustainable advantages in a competitive market environment lies at the heart of big data (Wamba et al., 2017:360).

**Table 8. Yields of big data**

| | |
|---|---|
| 1 | Ability to conduct real-time analysis to detect the source of errors. |
| 2 | Building on consumers' shopping preferences for new sales opportunities. |
| 3 | Reviewing and re-evaluating risks related to sales. |
| 4 | Ability to detect problems without disrupting usual workflow. |
| 5 | Marketing consumer-specific products. |
| 6 | Increasing consumers' trust levels. |
| 7 | Increasing the efficiency of business processes. |
| 8 | Improvement in consumer support services. |
| 9 | Gaining new customers as well as maintaining the existing customer loyalty. |

Source: Aydın, N. 2019). Industrial Use of Big Data. Cataloging-In-Publication Data, 602.

E-commerce businesses attach importance to big data analysis in order to respond to changing market conditions and rapidly-evolving consumer preferences in the most appropriate manner and at the most appropriate time. According to businesses, the goal is to achieve sustainable competitive advantage. With the investments they make in this field, it becomes possible for them to achieve some of their important goals such as increasing customer satisfaction, reducing the costs, and increasing the revenue (Bresciani et al., 2021:10). Big data is an important tool for e-commerce businesses to better identify market expectations and consumer behaviors. In the e-commerce sector, in particular, customers' online shopping habits and preferences are changing rapidly. Big data offers e-commerce businesses the ability to provide the fastest and instant responses to these changes (He, 2021).

**Table 9. Literature review on big data use in e-commerce**

| Author | Conclusion |
|---|---|
| Akter, S. et al. (2016:174) | By conducting a literature review on big data analysis in e-commerce, solutions were offered to possible problems within the framework of the features and varieties of big data, its contributions to the literature, and the business values it brings into existence. |
| Suguna et al., (2016:240) | The outcomes of processing and storing big data produced at high velocity in e-commerce and providing the prediction, recommendation and minimum response times needed by e-commerce were examined and strategies were offered. |
| Le, T. M. et al., (2017:798) | The research focusing on the positive and negative effects of big data use in e-commerce reached the conclusion that, based on the findings obtained from 273 participants living in Vietnam, big data has positive effects on consumers' behaviors through information search, recommendation system, dynamic pricing, and quick response system. |
| Wu, P. J. et al., (2018:239) | By drawing upon big data analysis, the effects to be created by big data on e-commerce business models, in the use of technology suitable for e-commerce logistics, were examined and an analytical model was developed. |
| Raguseo, (2018:190) | The variations in the use of big data technology in medium and large-scale e-commerce companies between different sectors and different companies were focused on. |
| Behl et al., (2019:290) | A structural model was suggested to optimize multifaceted decision-making processes in the use of big data in e-commerce. |
| Hurtado et al., (2019:840) | A conceptual model based on the use of big data, grounding on consumer purchasing behaviors, was put forward to increase efficiency and profitability in the field of logistics and marketing in e-commerce. |
| Zheng et al., (2020:630) | The gains to be achieved by using the advantages to be provided by big data applications on distribution applications in the e-commerce logistics were focused on. |

**Table 9. Literature review on big data use in e-commerce (Table Continued)**

| | |
|---|---|
| Liu et al., (2020:843) | The effects of big data usage by an e-commerce platform in telephone sales in China through 2013-2016, on the value perceived by customers and the establishment of customer loyalty, were studied. |
| Apampa, 2020:1 | The sustainable purchasing behavior which the use of big data in e-commerce platforms will bring about in consumer purchasing behaviors, and the conveniences it will bring to sustainable development, were studied. |
| Ayvaz et al., (2020:730) | Interviews were conducted by survey method with 101 company managers using big data in Türkiye, and it was aimed to reveal the sector awareness about the gains of big data by measuring the companies' big data uses and degrees. |

| | |
|---|---|
| Yuelin et al., (2021:2) | By examining the Amazon online site, they concluded that, by giving its users the opportunity to comment and "star-rate" the products and services they purchase, Amazon provides other users and manufacturers with the opportunity to use these evaluations, which is equally beneficial for both parties. |
| Alrumiah et al., (2021:37283) | 15 articles selected for analysis of the effects of using big data in e-commerce for consumers and sellers were reviewed and the advantages it brings were examined. |
| Yılmaz, (2021:46) | It was aimed to obtain insights into the added value that e-commerce businesses will create by rendering the decision process more efficient by making use of big data analysis for the effective use of data. |
| Yu et al., (2021:127) | The e-commerce system with the use of big data technology applications in e-commerce was analyzed and its advantages and disadvantages were examined. |
| Zhuang et al., 2021 | They focused on positive effects of the use of big data analytics in e-commerce on the global economy. They touched upon the relative impact of big data use in e-commerce in the case of America and China, two important actors in global trade. |
| Jahan et al., (2022:62) | It states that it is possible for e-commerce businesses to gain competitive advantage by benefiting from big data analytics and the innovations brought by big data, and thus getting to know their users and offering more advantageous products according to user preferences. |

**Table 9. Literature review on big data use in e-commerce (Table Continued)**

| | |
|---|---|
| Mesbaul Haque Sazu (2022:58) | It states that it is possible for e-commerce businesses to gain competitive advantage by benefiting from big data analytics and the innovations brought by big data, and thus getting to know their users and offering more advantageous products according to user preferences. |
| Zhang et al., (2023:5) | Recommendations were made to the effect that it is possible to use price optimization, which can be achieved through the use of smart technologies such as big data analysis in e-commerce, in sector services ranging from tourism to logistics and entrepreneurship. |

Source: Created by the author

The studies conducted emphasize that businesses need to develop long-term capabilities. It is stated that big data, in particular, is a sustainable capability that helps businesses gain competitive advantage, identify market trends, and understand consumer preferences (Alrumiah et al., 2021:37281).

### 3.1. Effect of Using Big Data in E-commerce on the Competitiveness of Businesses

The strategic importance of big data use for e-commerce businesses has increased in recent years. Many e-commerce businesses make use of the opportunity of gaining competitive advantage and producing effective solutions to critical problems with their investments in the field of big data (Constantiou et al., 2015:6). Big data stands out as a tool that helps companies gain superiority over others, especially in a dynamic and competitive market environment (Behl et al., 2019:290). It is an important resource that can help businesses make more accurate, effective, instant strategic decisions and manage the risks. It is predicted that this will increase the competitive advantage of businesses, supporting their efficiency in the long term (Erkul, 2021:193).

From the aspect of e-commerce businesses, big data provides competitive power with the possibility of easy access to data and the ability to easily acquire and incorporate the talents and systems of other businesses (Johari, 2020:106). At this stage, while big data analysis improves business performances and customer experiences, it makes significant contributions to all processes of a business with the instant pricing and personalized service elements (Ghandour, 2015:942). Big data analysis is a valuable organization-based analysis method that provides great competitive advantage in today's business world (Barton et al., 2012:81). It provides e-commerce businesses with the ability to make better decisions, create more effective strategies, and offer better services to customers (McAfee et al., 2012:63).

Brands (2014) and Ghasemaghaei et al. (2017:101) emphasized in their studies the importance of big data analysis in increasing the efficiency of businesses. They expressed that businesses can make the utmost use of big data in regard to improving their performance, reducing their costs, and using their resources more effectively, by creating strategies based on the data collected as a result of big data analysis (Maroufkhani et al., 2019:2). E-commerce businesses acquire special and inimitable business skills (Barney, 1991:627). By processing the data obtained from different data stacks with big data analysis, they reach more comprehensive results and make quick and effective decisions by gaining competitive power (Charles et al., 2013:1070). Many high-performance e-commerce businesses are actively implementing the big data strategy and supporting their growth by achieving efficiency. These strategies are used to contribute to the future increase in businesses' competitiveness. Thus, it becomes possible for businesses to respond more quickly and accurately to the demands and needs of consumers (Charles et al., 2013:1071). Studies conducted on big data with "Fortune 1000" companies show that big data investments have a significant impact in the business world. It was expressed that 48.4% of businesses have achieved actual results from their investments in big data. 80.7% of the executives evaluated the investments made in the field of big data as successful and recognized them as a strategic tool (Bean, 2017:38). Big data analysis provides businesses with a distinct and advantageous position against others. It makes possible to seize the opportunities in a more advantageous position and to be more competitive in the market (Barney et al., 2007:105). Being able to transform data into meaningful information offers e-commerce businesses speed, innovation and competitive advantage for the future (Charles, et al., 2013:1071). Businesses that find the opportunity to manage their business processes effectively can reshape their strategies according to opportunities and risks (Pavlou et al., 2006). Many of the businesses exhibiting superior performance actively use big data to develop effective business strategies and secure their future place in the market.

By effectively analyzing the collected data, e-commerce businesses have the chance to transform it into strategic decisions aimed at predicting market demands, gaining competitive advantage, and increasing market shares (Chen et al., 2012:1170). The potential of big data analysis to increase the efficiency of e-commerce businesses is considered an important criterion for businesses (Ghasemaghaei et al., 2017:101). LaValle et al. (2011) considered big data analytics as a rapidly growing, remarkable phenomenon that has great transformation and development potential for businesses. Chen et al. (2015) stated that the use of big data analysis has a direct impact on growth. In their studies, Ji-fan Ren et al. (2016), Wamba et al. (2017:360), Gunasekaran et al. (2017), El-Kassar and Singh (2018), Raguseo and Vitari (2018), Akter et al. (2018) reported that utilizing big data analysis contributes to the competitiveness of businesses, through its direct impact on their operational and financial performance.

Examples from literature reviews show that data analysis plays an important role in many different fields. Businesses focusing on big data analysis can gain competitive advantage by understanding consumer behaviors, developing marketing strategies, optimizing business processes, and increasing reliability and service quality (Sağıroğlu et al., 2013). Big data greatly contributes to businesses in regularly updating the data sources they possess and organizing and improving their business processes (Gupta et al., 2016:1050). It becomes possible to use all resources effectively as a result of decrease in costs, increase in customer satisfaction, and improvement in service quality (Gupta et al.,

2016:1050). With the influence of big data, businesses obtain a more objective, data-based and concrete approach, enabling business processes to be managed based on effective results (Mandal, 2019:305).

## 4. Conclusion

This study focuses on examining the effects of big data use in the e-commerce sector on gaining competitive power. It was concluded that the information obtained in the literature review created significant foresight and value for e-commerce businesses.

Big data analysis enables e-commerce businesses to have a deeper understanding of consumer behaviors and to develop market strategies accordingly. Big data makes it possible for businesses to derive value from data sources and make effective decisions (Barton et al., 2012:81). Moreover, the insights obtained increase the competitiveness of businesses, and become a good indicator for monitoring the activities of rival businesses more closely. Big data offers new and exciting opportunities for businesses.

Understanding and managing the flow of big data, the importance of which is being rapidly recognized, is transforming into a critical requirement for businesses. And this transformation and change are based on the businesses' goal of gaining competitive advantage. Businesses wishing to be ahead of their competitors and engaging in an effective market activity have begun to understand the potential of big data. The impact of the change created by big data that is radically changing and reshaping the way of doing business is getting bigger day by day. Businesses that can keep up with this change and manage big data effectively will be able to achieve success in the future with a competitive advantage.

As a result, this study emphasizes the potential of big data use in e-commerce to increase the competitiveness of businesses. E-commerce businesses need to fully make use of this potential and develop data-based strategies when necessary. Since big data will play an even more central role in the e-commerce sector, it is crucial for businesses to constantly improve their capabilities in this field and make the necessary investments.

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Yılmaz,Şebnem,K.,Uluslararası Yönetim Bilişim Sistemleri ve Bilgisayar Bilimleri Dergisi, 2021, 5(1):44-62