Big Data Analysis of E-commerce Based on the Internet of Things

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***Abstract*-In the era of big data, while providing massive information, it also challenges the development of related activities in the overall environment. In the context of the rapid development of e-commerce, the opportunities of the development of the Internet of things technology are analyzed from the aspects of logistics distribution, quality control and facilities promotion. Electronic commerce is a new form of trade under the development of modern information technology, while cloud computing and the Internet of Things provide related services. Under the exertion of their related functions, the revolutionary improvement of e-commerce mode has been realized, and to a certain extent, it has promoted the development and operation of modern market economy. This article analyzes the development strategy of e-commerce based on Internet of things and cloud computing under the overall environment of big data era.**

***Keywords*-Big Data; Internet of things; electronic commerce**

I. INTRODUCTIONS

With the development of the times and the continuous progress of science and technology, the cloud computing and the technology of the Internet of things have made great progress and progress[1]. Under the common effect, the big explosion of data has been realized, and it has entered the era of big data. At present, the Internet of things has been the third wave of information reform in the world, giving e-business services based on information technology[2]. It brings new opportunities and challenges for optimizing industrial structure, promoting industrial upgrading and creating new economic growth points[3]. In the process of the development of the Internet of Things, because the Internet of Things has not only the basic characteristics of computers, but also the basic characteristics of the Internet. It also has the characteristics of real-time data exchange such as the Internet of things itself, which provides a wider market for the Internet of things[4].However, in the practical application process of the Internet of things, because of the large amount of data, high information content and low density of information distribution, it brings inconvenience to the work of data processing and access.

II. ANALYSIS OF INTERNET OF THINGS, CLOUD COMPUTING AND E-COMMERCE APPLICATION IN BIG DATA ERA

In the era of Big Data, the acquisition of diversified information can be achieved during the development of e-commerce, which provides an opportunity for its development and carries out related business activities in electronic form. And as a new form of transaction, all the organizations involved in the transaction will be brought into the era of network economy in the process of application, and then the automation and electronic information of the whole transaction will be fully realized. Logistics is an important part of electronic commerce. Electronic commerce is realized by using the Internet platform. If there is no security, fast and smooth guarantee of logistics transportation. There are some problems or mistakes in the main link of E-commerce goods exchange, and the lag of goods exchange will directly affect the development of E-commerce. The hardware configuration information is shown in Table 1, and the software name is shown in Table 2.

Table. 1 Hardware information

Name	Value
CPU kernel number	2
Memory	2G
Hard disk	55H
Network	50M

Table. 2 Software name

Name	Edition
Operating system	CentOS8
Java version	1.8.0_91
Spark	2.5
Hadoop	2.9
Scala	2.12.10

The analysis of program running by using monitoring tools and program logs is compared and analyzed in terms of processing time and memory occupancy space, as shown in Figure 1 and Figure 2.

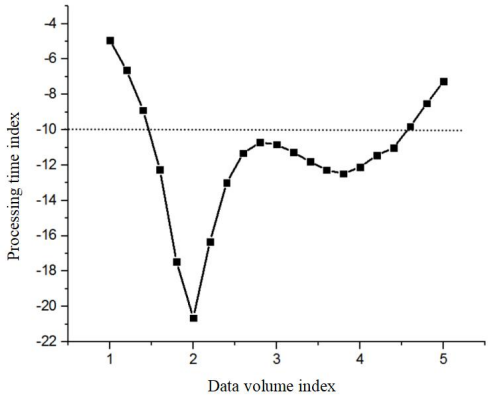

Fig. 1 Processing single data time

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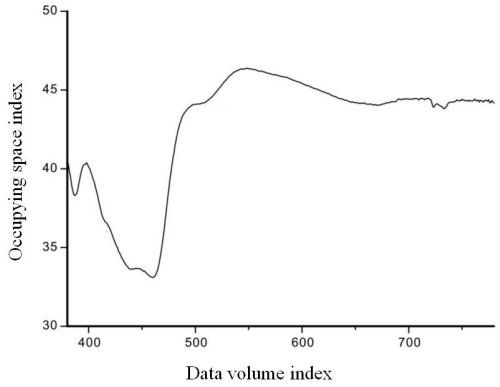

Fig. 2 Memory occupancy space

The Internet of things (IOT) is a combination of objects and objects based on Internet technology. It is based on infrared sensors, laser scanners, radio frequency identification (RFID), global positioning system and other information sensing devices. According to the agreed protocol, the connection between the Internet and any item is realized, and the intelligent management and monitoring are carried out to complete a network of communication and information exchange. Detailed records of people's consumption data, through the analysis and collation of massive data, we can fully understand and grasp the needs and hobbies of consumers. Furthermore, when consumers are using e-commerce websites, they can make recommendations based on consumers' needs and hobbies. In order to win the trust and affirmation of consumers, it plays a significant role in promoting the control of market share for e-commerce enterprises. As far as practical application is concerned, with the rapid development of Internet of Things technology and related industries, it has brought tremendous opportunities for the modernization of e-commerce. And its application has effectively promoted the rapid monitoring and development of e-commerce. The run time comparison is shown in Table 3 and figure 3.

Table. 3 Running time comparison

Join	1	2
Spark default	33min	40min
Filter sampling in the partition	12min	15min

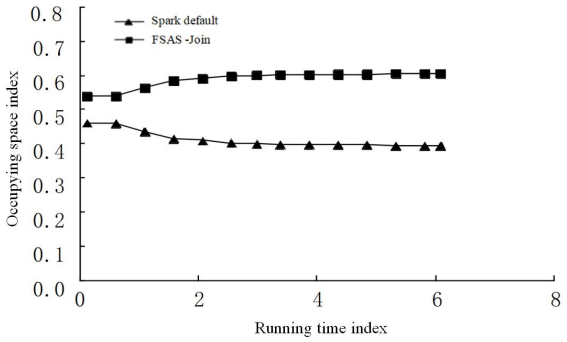

Fig. 3 Running time comparison index

III. E-COMMERCE DEVELOPMENT STRATEGY BASED ON INTERNET OF THINGS AND CLOUD COMPUTING IN BIG DATA ERA

Logistics is a common problem in the development of e-commerce. With the deepening and strengthening of people's online shopping habits, the pressure of logistics transportation is increasing. But in the process of transportation, if the delivery is not timely or error, it is very easy to cause consumer dissatisfaction, and then affect the quality of service, which is not conducive to the healthy and sustainable development of e-commerce in the era of Big Data. In addition, the analysis of consumer shopping behavior and consumer psychology can make electronic business enterprises make a correct judgment on the demand of consumers, and make the industrial structure of e-commerce enterprises be further improved. Therefore, it is necessary to realize the construction of the intelligent logistics system based on the Internet of things, manage and monitor the dynamic commodity logistics in real time, optimize the logistics transport activities, and improve the service quality and level. The experimental data sets are shown as shown in Table 4 and Figure 4.

Table. 4 Experimental data set

Data set	1	2
RDD_a	4.2G	3.0G
RDD_b	4.5G	6.9G

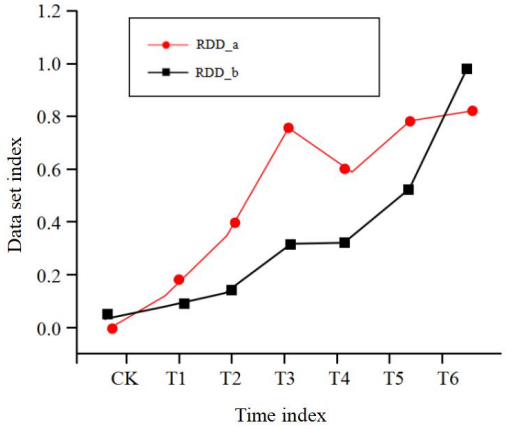

Fig. 4 Experimental data set

In the development of e-commerce, consumers will worry that online shopping will lead to their own privacy information disclosure, to a certain extent, affect the shopping community. Therefore, the construction of security management system based on the application of the Internet of things can increase the protection of consumer privacy, eliminate the concerns and worries of consumers in the process of online shopping, so as to carry on the network shopping. In addition, the query function of data information is not strong enough to make search response in time and quickly. In addition, in the application process, e-commerce enterprises need to implement the strict authority management of the cloud

computing platform, and the data are encrypted, stored, transmitted, and timely backup, and distributed. The data center also needs some disaster tolerance and fault tolerance. It can be seen that choosing a safe and reliable cloud computing system is the basic premise for e-commerce enterprises to implement cloud computing applications. Different files are written and hut as shown in Figure 5.

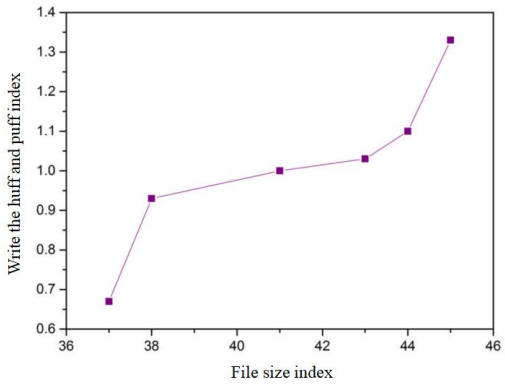

Fig. 5 Writing and throughput index of different file sizes

IV. Conclusions

In summary, based on the massive information technology in the era of Big Data, in the development of e-commerce, to achieve the application of Internet of Things and cloud computing. In the process of optimizing the actual operation of enterprises, it can provide more convenient development and services for enterprises, and then realize the overall sustainable development. It has caused a certain threat to people's information privacy security, and constantly improve the quality of real-time information exchange of large amount of data, and can push forward the further development of the animal network industry. Realize the healthy development of e-commerce based on Internet of Things and cloud computing in the era of big data, and promote the steady operation of China's market economy.

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References

[1] Fang Y, Qureshi I, Sun H, et al. Trust, satisfaction, and online repurchase intention: the moderating role of perceived effectiveness of E-commerce institutional mechanisms[J]. Mis Quarterly, 2014, 38(2):407-427.

[2] Suciu G, Suciu V, Martian A, et al. Big Data, Internet of Things and Cloud Convergence--An Architecture for Secure E-Health Applications[J]. Journal of Medical Systems, 2015, 39(11):1-8.

[3] Shukla S K. Editorial: Big Data, Internet of Things, Cybersecurity—A New Trinity of Embedded Systems Research[J]. Acm Transactions on Embedded Computing Systems, 2015, 14(4):1-2.

[4] O'Leary D E. 'BIG DATA', THE 'INTERNET OF THINGS' AND THE 'INTERNET OF SIGNS'[J]. Intelligent Systems in Accounting Finance & Management, 2013, 20(1):53-65.