

Challenges and countermeasures of international economy and trade under the background of big data

Ming Li

Simon Kuznets Kharkiv National University of Economics, kharkiv, Ukraine

ABSTRACT

In the era of big data, international economy and trade are facing unprecedented challenges and opportunities. This paper analyzes the influence of big data on international economy and trade, discusses the related challenges, and puts forward the countermeasures. In terms of challenges, big data brings privacy and security risks, data standardization issues and the widening digital divide. In order to meet these challenges, the international community needs to strengthen data security regulations, formulate international data standards, promote digital inclusion, and improve the transparency of data governance. In addition, this paper also emphasizes the great potential of big data in international trade, including improving market access, reducing trade costs and optimizing supply chain.

KEYWORDS

Big data; International economy and trade; Challenges data standardization; Digital divide; Data security.

1. INTRODUCTION

With the rapid development of information technology, big data has become an important driving force of international economy and trade. The wide application of big data has a profound impact on the global business and economic structure, but it also brings a series of new challenges. The purpose of this paper is to explore the challenges faced by international economy and trade in the era of big data, and put forward countermeasures. The challenges in the era of big data are not only reflected in the mass and complexity of data, but also include privacy and security risks, data standardization issues and the expansion of the digital divide. Privacy and security risks involve the protection of personal data and network security, which is a global problem and needs transnational cooperation to deal with. The problem of data standardization involves the inconsistency of data formats and standards between different countries and regions, which may lead to confusion and inconvenience in data exchange.

2. CHALLENGES IN THE ERA OF BIG DATA AND THE RELATIONSHIP BETWEEN INTERNATIONAL ECONOMY AND TRADE

With the rapid development of information technology and the continuous advancement of digital transformation, big data has become a key resource in today's world. The rise of big data has not only brought revolutionary changes to the operation mode of enterprises and government agencies, but also had a far-reaching impact on international economy and trade. This paper will discuss the challenges brought by the era of big data and how these challenges are closely related to international economy and trade, and then provide strategies and suggestions to deal with these challenges.

In the era of big data, data has become a valuable asset, which can be used in market analysis, consumer insight, product improvement, decision support and other fields. However, with the rapid growth of big data, it also brings a series of challenges. First of all, the management and storage costs of big data are rising, especially for small and medium-sized enterprises, which may be a huge burden. Secondly, data privacy and security issues have attracted much attention, and data leakage and cyber attacks have threatened personal privacy and business secrets. In addition, the quality and accuracy of data is also a problem, because big data usually contains a lot of noise and error information. Finally, the scale and complexity of data make it more difficult to analyze and utilize, which requires a higher level of technology and talents.

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How are these challenges related to international economy and trade? First of all, big data has become an important resource for international trade, especially in cross-border electronic commerce and the digital economy. International enterprises and trade organizations use big data to identify new market opportunities, optimize supply chains and improve production efficiency. However, the cross-border flow of data has also caused a series of problems, such as the inconsistency of data privacy laws and regulations, the inadequacy of international data standards, and the widening.

The application of big data has changed the competitive landscape of international trade. Those enterprises that can make better use of big data to gain insight into the market and optimize products and services can often occupy a competitive advantage in the international market [1]. This has led to changes in the status of some countries and regions in international trade, and at the same time increased the risk of some countries and regions facing the digital divide.

Therefore, meeting the challenges in the era of big data requires the joint efforts of the international community. First of all, international cooperation is crucial, especially in data privacy and security. International organizations and governments need to jointly formulate and implement data privacy laws and regulations to protect personal privacy and the security of business data. Secondly, the formulation of international data standards is also an important way to solve the problem of data standardization, which will help promote the convenience of transnational data flow and exchange. In addition, digital inclusion also needs attention to ensure that all countries and regions can share the benefits brought by big data, rather than further widening the digital divide. Finally, improving the transparency of data governance and establishing a fair and just international data governance mechanism will help solve the challenges in the era of big.

3. PRIVACY AND SECURITY RISKS: NEW THREATS IN THE ERA OF BIG DATA

With the wide application of big data technology, privacy and security issues have become new challenges in the era of big data. In this era of digital information explosion, the collection, storage and transmission of massive data provide unprecedented opportunities for various institutions and enterprises, but at the same time, it also gives birth to a series of threats and potential risks, especially the protection of personal privacy and sensitive information. This paper will deeply discuss the nature, impact and countermeasures of privacy and security risks in the era of big data.

One of the core characteristics of big data is the diversity and complexity of data, which means that a large number of data from different sources need to be integrated and analyzed. However, these data contain a lot of personal information, including but not limited to names, addresses, social media activities, consumption habits and so on. Therefore, the application of big data may lead to the disclosure and abuse of personal privacy. In terms of security threats, the storage and transmission of big data involves a lot of sensitive information, such as trade secrets, financial data and national security information. Hackers and network attackers may take advantage of the loopholes in the big data system to obtain this information, causing serious losses and leaks. Privacy and security risks may have a wide impact on both individuals and organizations [2]. For individuals, privacy leakage may lead to identity theft, financial fraud and abuse of personal information. This will damage personal trust and security. For enterprises and institutions, privacy and security risks may lead to financial losses, reputation damage and legal proceedings. Once the data of customers and partners are leaked, the enterprise may lose its reputation and its market share will decline, thus affecting its profitability.

In order to cope with the privacy and security risks in the era of big data, a series of strategies and measures need to be taken. Data encryption and access control are the keys to ensure data security. Data should be encrypted for storage and transmission, and only authorized personnel can access sensitive information. It is very important to establish strong data security regulations and privacy policies. The government and regulatory agencies should formulate and enforce strict data privacy regulations, requiring enterprises and organizations to handle personal information in compliance, and individuals also need to understand and protect their privacy rights. In addition, investing in network security technology and training is also an effective way to deal with security threats. Organizations need to constantly improve employees' awareness of network security, strengthen the network defense system, and timely detect and respond to potential threats.

Finally, cooperation and information sharing are essential to deal with privacy and security threats. Enterprises, governments and international organizations need to establish cooperation mechanisms to share threat information and best practices to strengthen the security of the entire ecosystem. Privacy and security risks are inevitable challenges in the era of big data, but by adopting appropriate strategies and measures, individuals and organizations can reduce risks and better protect privacy and data security. In the wave of digital transformation, the importance of privacy and security issues will continue to rise, and it is necessary to continuously strengthen supervision and technological innovation to ensure the legal and safe use of big data.

4. DATA STANDARDIZATION: OBSTACLES AND SOLUTIONS TO DATA EXCHANGE

With the advent of the era of big data, the diversity and complexity of data has become one of the main challenges in data management and communication. In this ocean of digital information, data from different sources and formats are growing at an alarming rate, which brings a series of problems to data integration, sharing and communication. This paper will discuss the problem of data standardization, how it becomes an obstacle to data exchange, and put forward strategies and methods to solve this problem.

Data standardization refers to the fact that data from different sources may adopt different formats, structures and naming rules, which makes the communication and integration of data between different systems and platforms complicated and difficult. These data may include text, numbers, images, audio and other forms, and their diversity and heterogeneity increase the complexity of data processing. For example, different enterprises may use different naming conventions to represent the same data fields, or store date and time information in different formats. Such differences make data integration and analysis complicated and easy to cause errors and confusion. In addition, international

trade involves transnational communication, and data standards and regulations in different countries and regions may be inconsistent, which increases the difficulty of data exchange.

Data standardization has a wide impact on enterprises and organizations [3]. Data standardization may lead to poor data quality and affect the accuracy of decision-making. If there are errors in the process of data integration and processing, it may lead to wrong business decisions and increase the risk of enterprises. Data standardization also increases the cost of data management. Enterprises need to invest more time and resources to deal with inconsistent data formats and standards, which may reduce work efficiency and increase the cost of maintenance and support.

Most importantly, data standardization may limit the availability and sharing of data. If data can't be easily shared with other organizations or systems, its potential value will be limited and its advantages can't be fully exerted. In order to solve the problem of data standardization, a series of strategies and methods need to be adopted. It is very important to formulate and comply with data standards and specifications. Enterprises and organizations should establish a set of clear data standards, including data format, field naming rules and data quality standards. This helps to ensure data consistency and accuracy.

Using data standardization tools and technologies can improve the efficiency of data processing. These tools can automatically identify and convert inconsistent data formats, reducing the workload of manual processing. At the same time, data standardization tools can also help enterprises maintain data consistency and reduce errors and confusion. In addition, strengthening data management and governance is also the key to solve the problem of data standardization. Enterprises should establish data leaders and data management teams to supervise the formulation and implementation of data standards. Data governance policies should clearly stipulate the use, sharing and security measures of data to ensure the legal and safe use of data. Data standardization is one of the important challenges in the era of big data, but enterprises and organizations can effectively deal with this problem by formulating clear standards, adopting standardized tools and technologies, and strengthening data management and governance. Solving the problem of data standardization will help to improve data quality, reduce costs and promote data sharing, so as to make better use of the potential of big data and promote innovation and growth.

5. THE WIDENING DIGITAL DIVIDE: INEQUALITY IN THE AGE OF BIG DATA

In the era of big data, although the technology and application of big data have made remarkable progress, at the same time, the digital divide is also expanding. Digital divide refers to the inequality in digital technology and information acquisition, which makes some people and organizations unable to enjoy the benefits brought by digitalization. This paper will discuss the essence, influence and possible mitigation strategies of the digital divide. The essence of digital divide lies in the unequal distribution of information and digital technology. In the era of big data, information and data have become an important resource, which can affect the competitiveness of individuals, enterprises and countries. However, access to and use of these information and technologies are not equal.

On the one hand, the digital divide is manifested in the inequality of infrastructure and technology. Some areas may lack the necessary digital infrastructure, such as high-speed internet and electronic equipment, which makes people living in these areas unable to make full use of big data technology. On the other hand, the inequality of education and training is also an important reason for the digital divide. People who lack digital literacy and skills are difficult to participate in the digital economy and society, thus missing many opportunities. The digital divide has a wide impact on society and economy. First, it aggravates social inequality. Those who have digital technology and resources can better integrate into the digital society and enjoy various conveniences such as information acquisition,

online education and remote work. On the contrary, those who lack digital skills and resources may be excluded from the digital society and fall into social.

The digital divide also threatens economic growth and innovation. If most people can't participate in the digital economy, the innovation ability of society will be limited and economic growth may be dragged down [4]. In addition, the digital divide may also lead to unequal access to data and hinder the development of research and science. In order to alleviate the digital divide, a series of strategies and measures need to be taken. First, providing universal digital infrastructure is the key. Governments and international organizations should devote themselves to promoting high-speed Internet, electronic equipment and other digital infrastructures to ensure that everyone can access these resources.

Digital education and training are also very important. Schools and training institutions should strengthen the education of digital skills and cultivate people's digital literacy. At the same time, governments and enterprises can provide online training and resources to help people improve their digital skills. In addition, promoting digital inclusion is also the key to alleviating the digital divide. Digital inclusion emphasizes that everyone in society has equal opportunities and rights to access and use digital technology and information. Governments and enterprises should take measures to ensure that digital products and services are accessible to all people, regardless of their social status, age, gender or geographical location. Digital divide is one of the important problems in the era of big data, but by providing digital infrastructure, strengthening digital education and promoting digital inclusion, we can alleviate this problem, ensure that everyone can enjoy the benefits brought by digitalization, and promote the inclusive and sustainable development of society.

6. STRATEGIES TO MEET CHALLENGES: DATA SECURITY REGULATIONS AND INTERNATIONAL DATA STANDARDS

In the era of big data, data security has become more and more important and complex. In the face of increasing data threats and privacy risks, it has become an urgent task to formulate effective data security regulations and international data standards. This paper will discuss in depth how to formulate and implement data security laws and regulations, and how international data standards provide a benchmark for global data exchange to meet the challenges of the era of big data.

Data security regulations are the key tools to ensure data privacy and information security. These laws and regulations stipulate the ways of data collection, processing, storage and sharing, and at the same time stipulate the legal responsibilities and penalties for data leakage and abuse. The goal of making data security regulations is to protect personal privacy, prevent data leakage, and ensure the legal and ethical use of data. The importance of data security regulations is self-evident. First of all, they provide a legal framework, clarify the rules and standards of data use, and help reduce the risk of data abuse and privacy violations. Secondly, they provide guidance for enterprises and organizations to help them ensure the compliance of data processing activities. In addition, data security laws and regulations also increase the trust of data users and help promote the development of digital economy.

International data standards are the basis of cross-border data exchange. In the era of globalization, the flow of data between different countries and regions has become more frequent, which requires a unified set of data standards and protocols to ensure the security and reliability of data. International data standards can provide a benchmark for data exchange and ensure data consistency and interoperability. The importance of international data standards is reflected in many aspects. First, they help to reduce the complexity of data exchange. If different countries and regions adopt different data standards, data exchange will become difficult and expensive. [5] International data standards can simplify this process and reduce the cost of communication. Secondly, they help to ensure the quality and accuracy of data. By adopting consistent standards, data errors and inconsistencies can be

reduced. Most importantly, international data standards can improve data security. They stipulate data protection and encryption requirements to help prevent data leakage and abuse.

In order to meet the data security challenges in the era of big data, a series of strategies and measures need to be taken. Making strong data security regulations is the key. The government and regulatory agencies should cooperate with the industry to formulate and implement data security regulations applicable to different industries and fields. These laws and regulations should clearly define the responsibilities and obligations of data privacy, data protection and data leakage, and at the same time formulate corresponding punishment and reward mechanisms. International cooperation is the key to solve the problem of data security. Data exchange between different countries and regions needs consistent standards and agreements, and international organizations and governments should strengthen cooperation and formulate and implement international data standards. These standards can cover data formats, encryption requirements, sharing rules, etc., to ensure the safety and reliability of data on a global scale.

Table 1. Comparison between data security regulations and international data standards

Aspect	Data security regulations	International data standard
Data privacy protection	Specify the legality and privacy protection requirements for data collection and processing	Global standards and frameworks for data privacy protection
Legal responsibility and punishment	To stipulate the legal responsibilities and penalties for data disclosure and abuse	Specify the legal consequences of data abuse and violations
Data formats and standards	May include provisions on data formats and standards to ensure data consistency	Provide global guidelines and recommendations on data formats and standards
Data encryption and security measures	Require data encryption and other security measures to prevent data leakage	Provide best practices and suggestions for data security
Data exchange and sharing rules	Specify rules and procedures for data exchange and sharing	Provide guidelines and principles for cross-border data exchange
International cooperation	It may include a framework for international cooperation to promote global harmonization of data security and standards	Emphasize international cooperation to ensure data security and interoperability

7. CONCLUSION

The era of big data has brought profound changes to international economy and trade, however, it is also accompanied by a series of challenges. First of all, the expansion of the digital divide highlights the inequality in the digital society. To solve this problem, we need to strengthen digital education, popularize digital infrastructure and promote digital inclusion. Secondly, with the application of big data, data security and privacy have become an urgent problem to be solved. It is necessary to formulate effective data security regulations, promote the formulation of international data standards, and raise awareness of data security. In addition, big data also provides important opportunities for market access and supply chain optimization. It is necessary to establish a data-driven culture, ensure data security, and strengthen supply chain cooperation to maximize the potential of big data. On the whole, to meet the challenges in the era of big data requires the joint efforts of the government,

enterprises and all sectors of society to realize the sustainable development of the digital economy and promote the prosperity of international economy and trade.

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