New Digital Infrastructure, Cross-border E-commerce and Global Vision of Creating Electronic World Trade Platform

Abstract

The rapid development of cross-border e-commerce has integrated with the global economy more closely in the past decade. How to create global digital customs to facilitate cross-border e-commerce on the basis of national Single Window system has become an important task for national governments and international organizations such as World Customs Organizations? The paper aims to explore the relationship between technological progress, cross-border e-commerce and the establishment of global digital customs from the dimensions of the latest development of new digital infrastructure, national Single Window system and global vision of creating Electronic World Trade Platform (eWTP). It is argued that cross-border e-commerce platforms, national Single Window and eWTP, all of which are indispensable for the establishment of global digital customs, have close linkages in business regulation, data sharing and information exchange. The establishment of global digital customs requires global governance through the joint efforts by firms, national governments and international organizations.

Key words: eWTP, Single Window, cross-border e-commerce platforms, new digital infrastructure

1. Introduction

Since the beginning of 21st century, economic globalisation has been deepening and the pace of cross-border flow of production factors such as labour, capital and technology has been accelerating (Friedman, 2007). The rapid development of digital economy has integrated with the global economy more closely in the past decade (Alcácer, Cantwell & Piscitello, 2016; UNCTAD, 2017). The cloud computing and big data have not only revolutionized the operation of traditional trading companies, but also laid a firm technological foundation for the rapid development of cross-border e-commerce (OECD, 2014).

The rapid development of cross-border e-commerce all over the world has laid a solid foundation for establishing global digital customs. In the past decade, new business models of cross-border e-commerce have emerged one after another (BOC, 2016). The leading global e-commerce giants such as Alibaba, Amazon, eBay are imposing more and more impacts on shaping global trade regulations. For example, the proposal to create an Electronic World Trade Platform (eWTP) initiated by Jack Ma, executive chairman of Alibaba, was included in G20 communique at Hangzhou summit in China in September 2016. The establishment of national Single Windows offers good support for creating global digital customs. In Doha Round negotiations, WTO members propose to create national Single Window to submit data only once to one agency so as to expedite and simplify the clearance of goods (WTO, 2017).

Digital Customs means 'any automated or electronic activity that contributes to the effectiveness, efficiency, and coordination of Customs activities, such as automated Customs clearance systems, the Single Window concept, electronic exchange of information, websites to communicate information and promote transparency, and the use of smart phones' (WCO, 2015). It can be regarded as one institutional arrangement that monitors and administrates the cross-border e-commerce transactions. As Figure 1 indicates, it is, in fact, one type of trade agreement signed by member states to govern online international trade transactions and accelerate customs clearance. The operation of digital customs depends on the establishment of standardised international regulations and national Single Window system of member states. However, digital customs is not isolated from physical customs. The clearance and inspection of commodities still need to be carried out offline.

The rapid development of cross-border e-commerce requires the establishment of global digital customs because global digital customs helps to reduce transaction costs of global e-commerce and simplify customs clearance procedures and improve customs clearance efficiency for digital trade. Digital customs can also increase regulatory transparency of national customs' operation and enhance the compliance of international trade rules by the stakeholders with increased access to regulatory information and services (WCO, 2015).

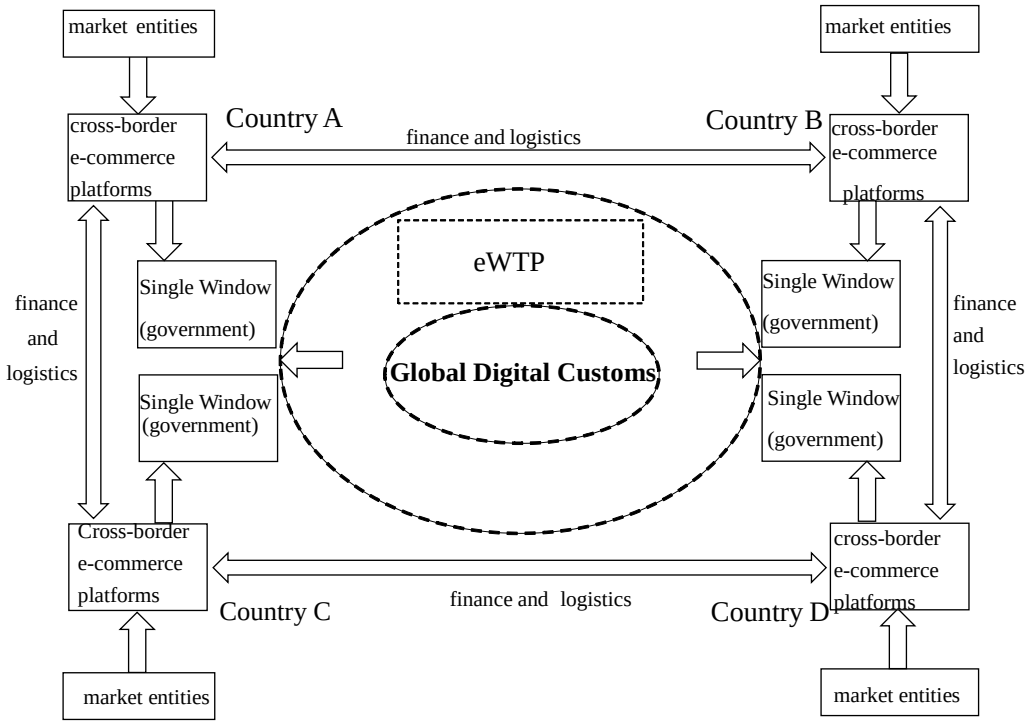


Fig. 1. The institutional design of global digital customs

However, establishing global digital customs still faces a lot of challenges. Firstly, there are substantial differences of e-commerce regulations among different countries. The privacy, data and intellectual property rights of trading entities in the cross-border e-commerce cannot be protected properly due to the various national legal and digital trade regulations. Secondly, there is uneven development of digital infrastructure between developed and developing countries. Thirdly, national customs has inadequate practical experiences of processing substantial cross-border e-commerce trading data. Due to the huge statistical differences among nations all over the world, the creation of a unified digital customs database needs more advanced multi-source data fusion technology. Therefore, how to create global digital customs to facilitate global digital trade on the basis of national Single Window system has become an important task for national governments and international organizations such as World Customs Organizations (WCO)? The paper aims to explore the relationship between technological progress, rapid development of cross-border e-commerce and the feasibility of establishing global digital customs from the dimensions of the latest development of new digital infrastructure, national Single Window system and global vision of creating eWTP.

There are six sections in the research paper. Section 2 discusses why the cross-border e-commerce platforms are the driving force of creating global digital customs. Section 3 explores the role of national Single Window in creating global digital customs. Section 4 analyzes the

relationship between eWTP vision and establishing global digital customs. Section 5 highlights how new digital infrastructure contribute to creating global digital customs. The final section are conclusions and policy implications.

2. The cross-border e-commerce platforms: the driving force of global digital customs

The cross-border e-commerce platforms are online trading providers that offer comprehensive services for consumers, individual trade merchants, Micro-, Small and Medium-sized Enterprises (MSMEs) (Ali Research, 2016). The public services and commercial services they offer link consumers, individual trade merchants and MSMEs home and abroad with relevant regulatory departments (Figure 2). The typical cross-border e-commerce platforms include foreign trade comprehensive services platforms, cross-border e-commerce retailing services platforms and cross-border e-commerce logistic services platforms.

The cross-border e-commerce platforms have standardised and digitalized international trade procedures, offering one-stop services for MSMEs including contracts, customs clearance, tax rebate and so on. As a result, the MSMEs can concentrate more on R&D, production and marketing. In addition, the cross-border e-commerce platforms can connect millions of online MSMEs with relevant government organizations and service providers, improving operation efficiency and reducing transaction costs of market entities. Moreover, the cross-border e-commerce platforms not only provide payment security to both buyers and suppliers, but also offer some financial services such as letter of credit buyout, letter of credit financing, forward foreign exchange settlement and sales to MSMEs (Ali Research, 2016).

The infrastructure of national digital customs mainly relies on corporate commercial platforms and e-government platforms. One of the most important corporate commercial platforms are cross-border e-commerce platforms. They can play an important role in linking MSMEs to different regulatory government departments, providing digital infrastructure and big data in establishing national single window and global digital customs.

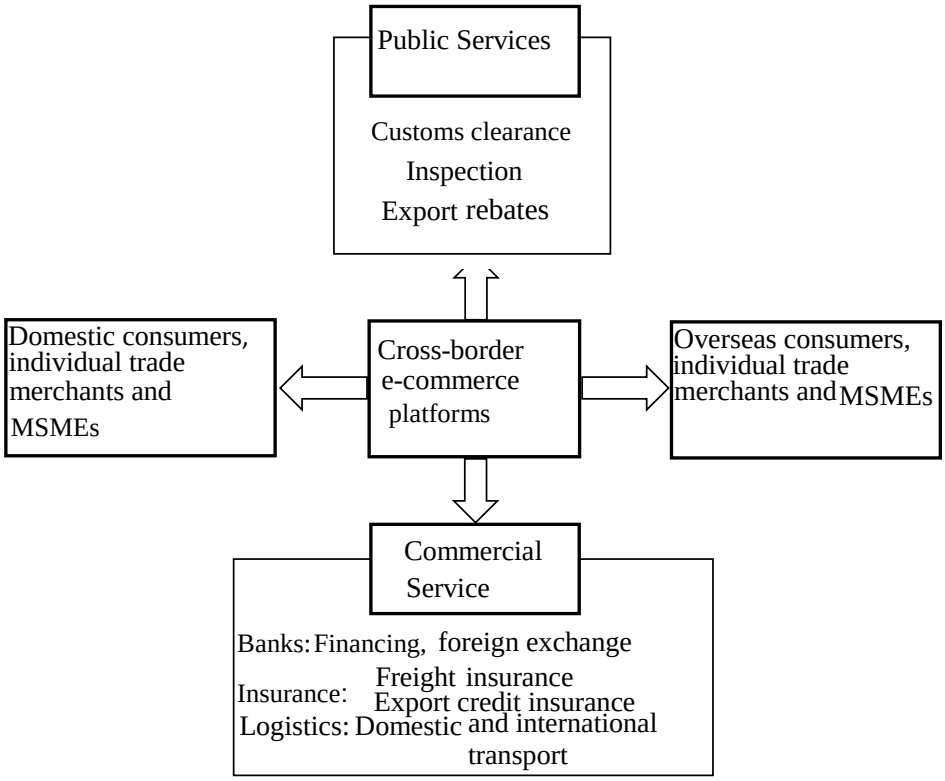


Fig. 2. The trading services offered by cross-border e-commerce platforms

3. Single Window: Foundation of establishing global digital customs

The Single Window is a platform which permits parties involved in trade and transport to submit standardized information and documents through a single entry point to fulfil all of the regulatory requirements regarding export, import and entrepot (UN/CEFACT, 2005). The global digital customs can be regarded as an advanced edition of Single Window, which integrates customs clearance, cross-border transactions and transport logistics. The latest development also includes payment-related banking services. The functions of a Single Window are shown in Figure 3.

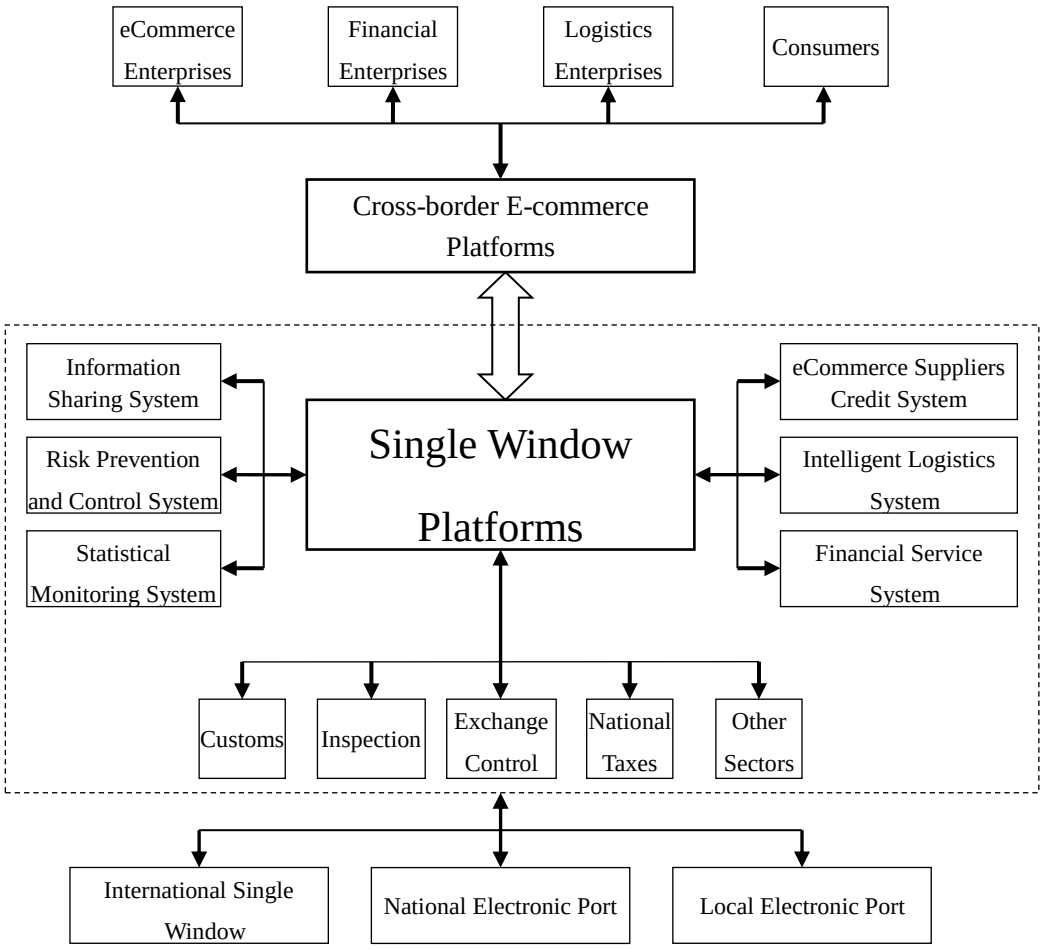


Fig. 3. The functions of Single Window

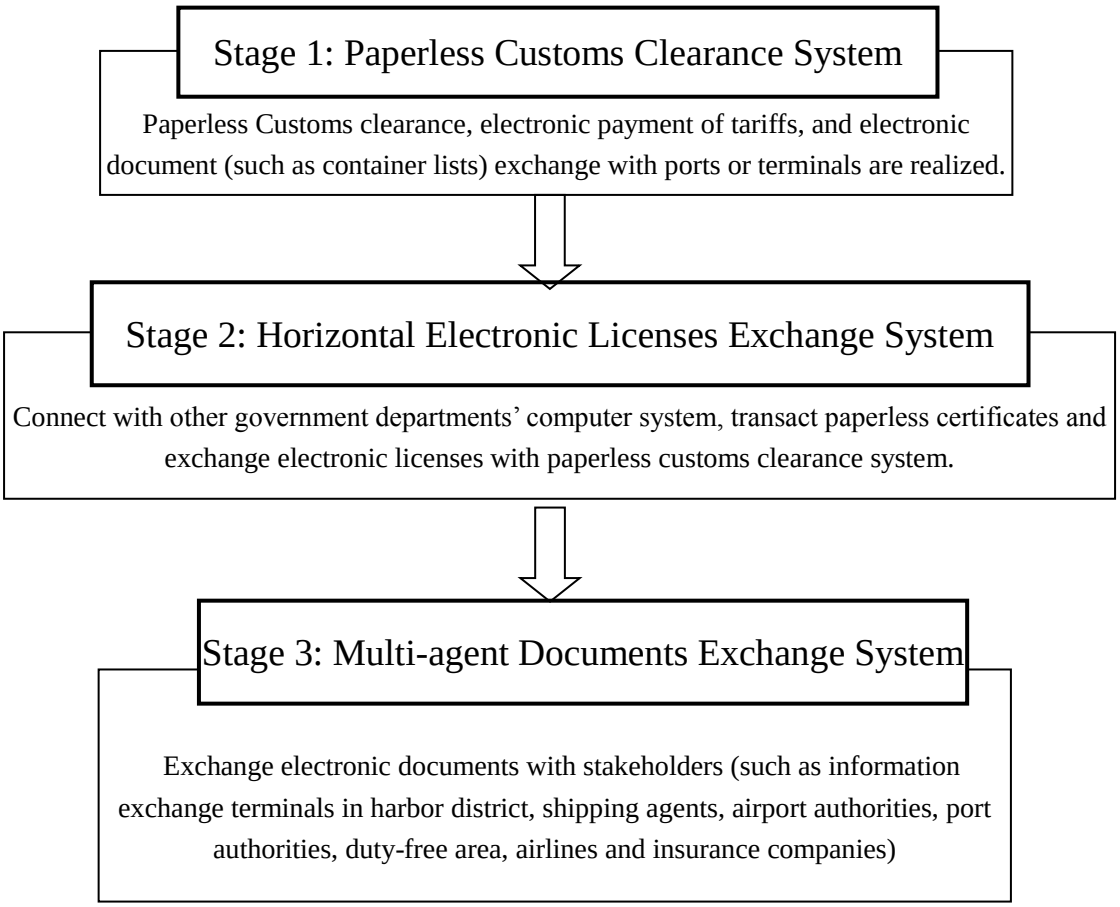
The technical framework of Single Window mainly relies on information and communication technology as well as internet technology represented by the Automated System for Customs Data and some guidelines published by WCO and the United Nations Network of Experts for Paperless Trade. There are three types of operation models of Single Window, namely, the non-government operation model in Germany and Guatemala, the public-private joint management model in Senegal and the public sector operation model in Finland, Sweden and the United States.

Single Window operates with three different organizational models. Under Single Authority Model,

a single government regulator (such as the customs) is established or authorized to receive and disseminate imports and exports data to all relevant government authorities either through paper or electronically. Sweden and Netherlands adopt this model. A Single Automated System Model means that a national government sets up an information system to handle all of the imports and exports transactions uniformly. All of the regulatory institutions remain independent from each other, with the operation system decentralized. The United States and Japan adopt this model. An Automated Information Transaction System Model provides traders with a unified portal or platform to process trade data electronically. Singapore and Mauritius adopt this model (UN/CEFACT, 2005).

The development of Single Window is moving towards regionalization and standardization. The cooperation between national governments and cross-border e-commerce platforms has been increasingly deepened. More and more countries will set up national Single Windows and connect them together regionally such as Association of Southeast Asian Nations Single Window (ASEAN SW). There is possibility of establishing a global unified Single Window network in the long run (Cao & Wu, 2015). International organizations such as WCO and the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) will play an important role in advancing and promoting the establishment of a unified global Single Window to facilitate international trade and cross-border e-commerce.

The evolution of Single Window can be roughly divided into the following five stages, which is shown in Figure 4.



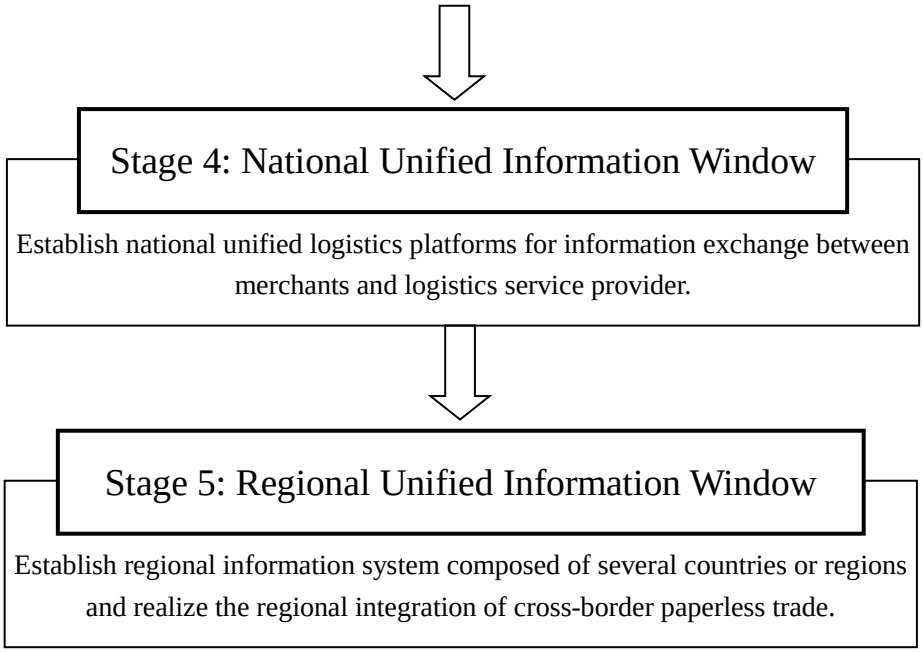


Fig. 4. The evolution of Single Window
Sources: Zhang, M.Z. The model, evolution and key factors of international trade Single Window. *Foreign Economic Relations & Trade*, 7 (2014) 14-15.

National Single Window can provide global digital customs with technical experience. At present the core technology of operating national Single Window is the single data element information exchange system based on internet technology, which provides national digital customs with basic technologies and trade data (UNECE, 2011). The extended functions such as credit assessment and digital authentication will be able to enrich the technological framework of digital customs. In addition, the existing institutional framework of national Single Window provides valuable practical experiences for the institutional development of global digital customs. The operation of national Single Window is based on a series of laws and regulations. Global digital customs, as an advanced edition of Single Window, needs to implement more rigorous rules and regulations because of its virtuality.

The deepening international cooperation among national Single Windows can facilitate the establishment and operation of global digital customs in the long run. The horizontal organization and coordination among relevant departments of national governments need to be strengthened. Since the number of market entities and stakeholders participating in the development of Single Window is expected to increase, the international cooperation among different government departments needs to improve. It is very important to formulate and implement effective organizational coordination plans and communication strategies to enhance mutual trust among the relevant departments and stakeholders in different countries and improve operation efficiency of national Single Window platforms, thereby laying a good foundation for the creation of global digital customs (Gao, 2014). The functional departments of member states need to adhere to the guidelines of participating in global digital customs (Ruan, 2015).

The emerging market entities such as global e-commerce enterprises and cross-border e-commerce platforms should be encouraged to participate in the establishment of national Single Window, improving credit security, data sharing, convenient logistics and financial service functions in their websites so as to provide powerful industrial support for the creation of global digital customs. Whether secure and effective cross-border supervision can be realized through regional Single Window depends on the degree of compatibility and sharing of national data. International standards and unified data elements introduced by international organizations such as WCO should be gradually adopted by national governments to promote the establishment of global digital customs.

4. eWTP: Global vision of establishing global digital customs

The multinational corporations or large enterprises usually play the leading role in the global trade system. In order to promote trade facilitation and inclusive trade, it is important to create a new multilateral platform such as eWTP to learn the demand and feedback of MSMEs since the current international trade regulations lag behind the rapid growth of internet economy and global e-commerce. As an increasing number of local, regional, national and international business transactions are taking place through a variety of e-commerce platforms, both the developed and developing countries should encourage and support firms of all sizes, in particular MSMEs, to participate in global digital trade (AliResearch, 2017).

The proposal to create eWTP was included in G20 Leaders' Communique Hangzhou Summit on 5 September 2016 (European Commission, 2016). It has received the responses and consensus from many countries and regions around the world afterwards (Chen, 2016). eWTP aims to develop and establish a new ecosystem system of international trade to promote global inclusive growth and cultivate a more equitable digital trade environment. It will help MSMEs around the world to overcome complicated rules, regulations and obstacles that prevent them from taking part in international business (Figure 5).

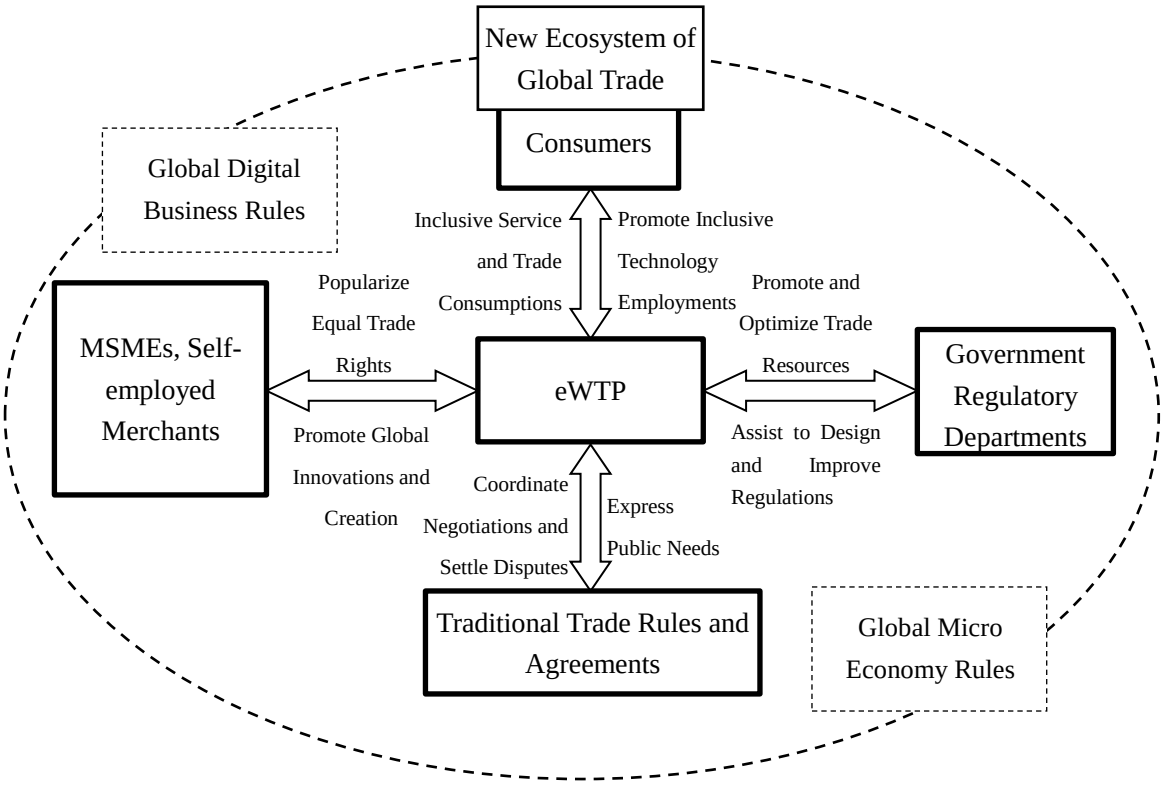


Fig. 5. The new ecosystem of global digital trade

Creating eWTP and formulating new global digital trade rules have significant strategic value for fighting poverty and improving the welfare of human beings (Figure 6). 'It has the potential to spark fundamental changes in the way international trade is conducted by lowering costs, reducing and streamlining intermediaries, improving access to information and financing, and shortening global supply chains' (AliResearch, 2017, p 49). The MSMEs in the developing countries, particularly low-income countries (LICs), have opportunities to connect with global market more easily, making use of inclusive finance, e-supplier credit and cross-border e-commerce services in the new international trade ecosystem. Inclusive employment can be promoted worldwide.

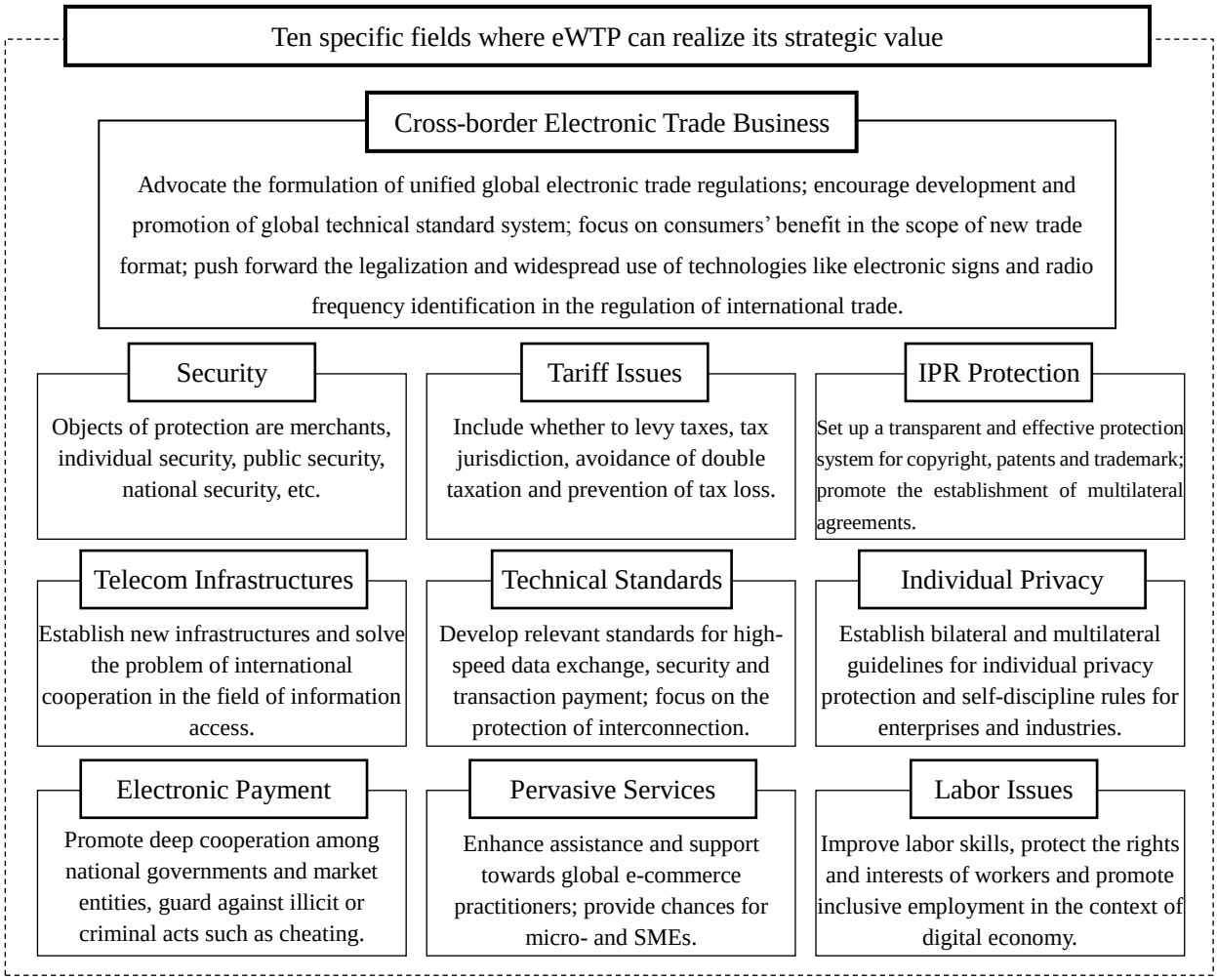


Fig. 6. Ten specific fields where eWTP can realize its strategic value

The vision of eWTP, which is in accordance with the institutional development of establishing global digital customs, encourages the formulation of new digital trade regulations and policies that conform to the rapid development of cross-border e-commerce. Negative list management system, universal mutual recognition inspection and quarantine system and product traceability system need to be gradually established in the process of creating global digital customs (Ji, 2016). The cross-border flow of international trade data will accelerate after establishing global digital customs. A faster and more efficient arbitration and conciliation mechanism will be established to solve global e-commerce disputes. In addition, the vision of eWTP promotes global economic cooperation. The accumulation and deposit of international trade data require horizontal cooperation between national governments. Moreover, the vision of eWTP promotes the establishment of cross-border e-commerce credit evaluation system. A new type of online trade credit evaluation system can be created for MSMEs on the basis of cross-border e-commerce trade platforms (AliResearch, 2015).

5. New digital infrastructure: Technical Support towards the establishment of global digital customs

New digital infrastructure include *Clouds*, *Nets* and *Terminals*. *Clouds* refer to infrastructures related to big data and cloud computing, which means to serve the clients through creating a data center by clustering the computers. *Nets* mean infrastructures concerning the Internet of Things (IoT)developed from the traditional Internet, including hardware (mainframes and network service devices used for data storage, processing and transmission, especially Radio Frequency Identification Devices, QR Codes, Global Positioning Systems and so on) and software designed for information accumulation, storage, retrieval, analysis, application and appraisal (Lin et al., 2016). *Terminals* refer to mobile internet infrastructures in terms of accessible terminals, such as personal computers, mobile devices, wearable devices, sensors and their respective software applications (Zhu et al., 2011) *Clouds*, *Nets* and *Terminals* have constituted a new landscape of new digital infrastructure as shown in Figure 7, which is gradually reshaping the daily lives of people around the world.

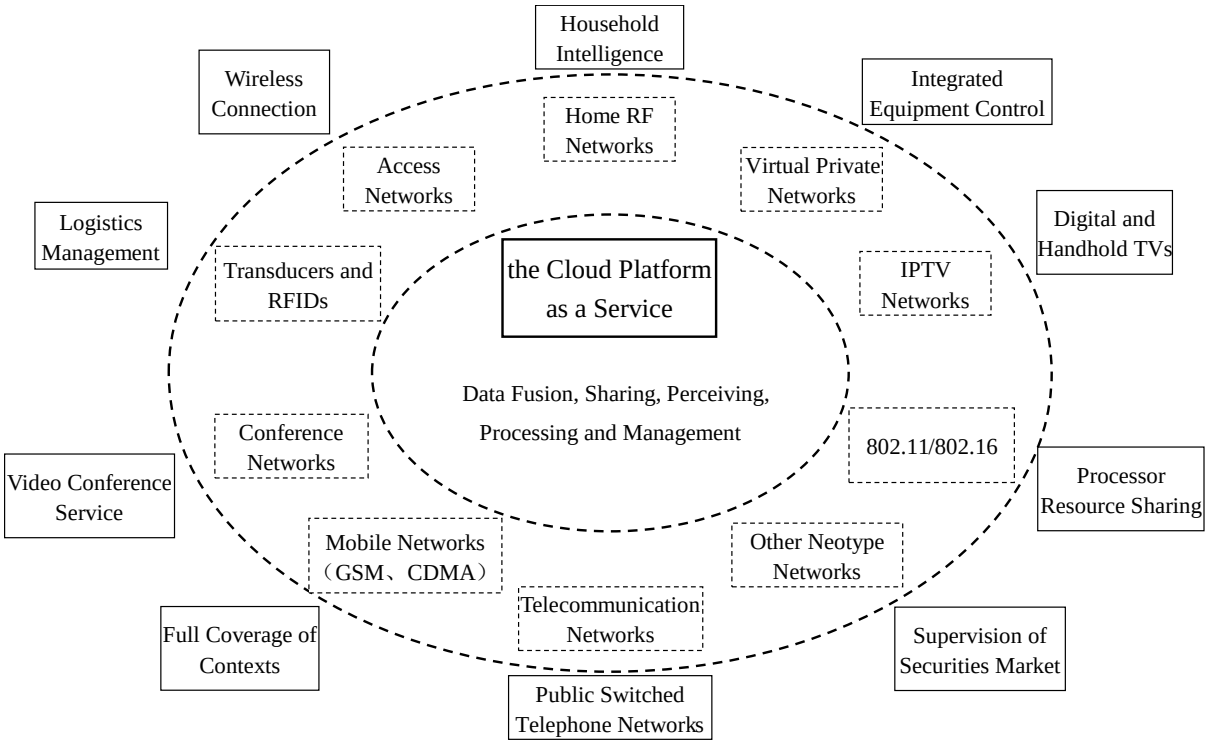


Fig. 7. An overall view of new digital infrastructure

Infrastructures such as big data and cloud computing have been enhanced comprehensively. Currently the information technology industry continues to witness rapid progress. The magnitude of network calculation capacity has been overall enhanced. The broadband is no longer facing a bottleneck of data transmission. The demand for data analytics has been increasing rapidly. Cloud computing and big data application meet new development opportunities (Amankwah-Amoah, 2016). IoT has a potential economic impact between $2.7 trillion to $6.2 trillion until 2025 (Ip, 2016). The application of intelligent terminals and apps has grown rapidly. User devices, represented by intelligent terminals, are becoming an important medium for big data collection and service provision. Wearable devices such as watches, eyeglasses, wristbands and clothing have been launched to the market frequently. Meanwhile, the content of Internet has been gradually changed from the domination by the web pages of portal sites to a great variety of apps.

New digital infrastructure have made significant contribution to the emergence of new forms of international trade. The synthesis between new digital infrastructure and e-commerce has been strengthened further. For example, during the first hour of Alibaba's Singles Day Festival in 2016, the order volume reached 175,000 orders in one second while the number of payments settled per second hit 120,000 at their peak (IPC, 2016). The success of the world's largest online shopping event was partly attributed to the constant technological innovation and new digital infrastructure development by the Alibaba Group such as Ali cloud computing, one of the largest hybrid cloud architectures in the world.

The individuals and private enterprises have become the main market entities. The dominant player of new digital infrastructure has gradually moved from the national government to the private or public enterprises. The users of mobile internet infrastructures are billions of ordinary subscribers. The user scale and technical level of new digital infrastructure established and operated by the world's leading e-commerce companies such as Amazon, eBay, Alibaba have leaped into the front ranks of the world. As a result, the governance of information economy has evolved from the previous centralized control model to the co-governance model on the basis of mass innovation.

5.1 Why does new digital infrastructure offer technical support for creating global digital customs?

Cloud computing can provide data analysis technique for the establishment and maintenance of global digital customs. In the course of creating global digital customs, it is necessary to apply the advanced IT technology such as cloud computing data center to reconcile different statistical systems and store massive data. The maintenance and upgrading of global digital customs are indispensable to the technological support from cloud computing resource management and scheduling algorithm. The creation of information security and privacy protection modules needs to adopt cloud computing core service layer model (Luo et al., 2011). Besides, Internet and Io T can provide credit authentication technology to establish global digital customs. They can also provide a basic framework for multi-network integration, data sharing and harmonization of standards between market entities and national governments, making it possible to create a credit authentication system for market entities of global digital customs and laying a firm technological foundation for the applications of customs exemption and negative list management (Chen et al., 2013). Moreover, smart client terminals provide market application big data for the operation of global digital customs. In the operation of global digital customs, smart client terminals are the important sources of market and trade big data and the receivers of data analytics. The data from individual smart client terminals can be used for the dynamic analyses of consumer preferences and consumption demand (Clegg, 2017). The mobile data from corporate terminals under global digital customs are important sources for making macro-economic decisions (McKinsey Global Institute, 2015).

5.2 How does new digital infrastructure contribute to creating global digital customs?

Institutional supports need to be cultivated to promote the development of new digital infrastructure. Special regulations and support policies should be formulated by national governments to guide the development of new digital infrastructure, including the introduction of information security and privacy protection standards. Market entities should be encouraged to participate in the development

of emerging technology and knowledge transfer such as cloud computing (AliResearch, 2017). The integration of production, teaching and research should be promoted. In addition, the establishment of global digital customs requires a high level of informatization of MSMEs. It is important to accelerate the connection between new digital infrastructure and industrial production network. Market entities, especially MSMEs, should be encouraged to explore, apply and innovate relevant technology and equipment to undertake effective data accumulation and integration. Moreover, massive nodes need to be created for establishing global digital customs through supporting the development of mobile terminals. The main joint nodes of consumers of global e-commerce platforms, which are important data sources for global digital customs, are being transferred to mobile terminals on a large scale. Thus, the development of mobile data terminals should be encouraged by national governments because they can generate analytical results more quickly and constitute one comprehensive information management loop.

6. Conclusions and Policy Implications

The establishment of global digital customs requires global governance through joint efforts by firms, national governments and international organizations. Firms need to establish their digital business platforms while national governments should upgrade their e-government platforms. These two types of platforms can be gradually connected, leading to the establishment of domestic regional Single Window and national Single Window. Subsequently, regional integration of national Single Windows will be gradually realized. The differences in national trade data, policies and regulations need to be harmonized. The criteria of standardization and fairness should be encouraged and maintained by national government. The ultimate goal of establishing global digital customs is to create eWTP. Figure 8 indicates a general planning of different stages of establishing global digital customs.

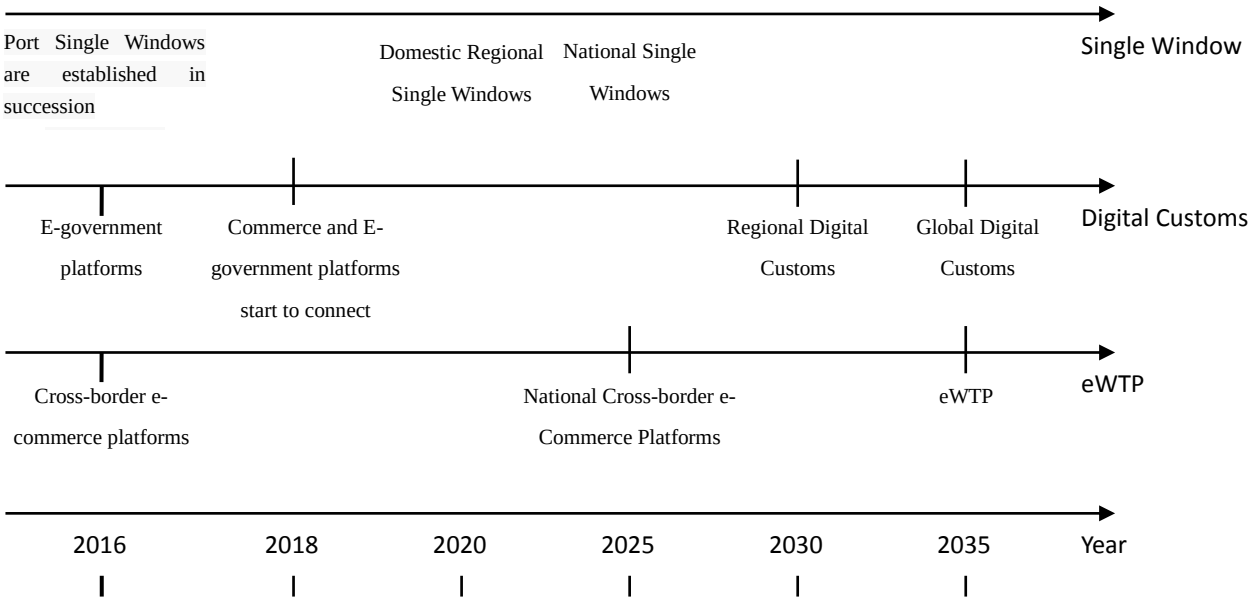


Fig. 8. Different stages of establishing global digital customs

Cross-border e-commerce platforms, national Single Window and eWTP, all of which are indispensable for the establishment of global digital customs, have close linkages in business regulation, data sharing and information exchange. For example, the cross-border e-commerce platforms are closely related to national Single Window in business practice, and eWTP will play an important role in mediating and coordinating international trade through national Single Window. The establishment of global digital customs is expected to generate synergy among eWTP, national Single Window and cross-border e-commerce platforms, which is shown in Figure 9.

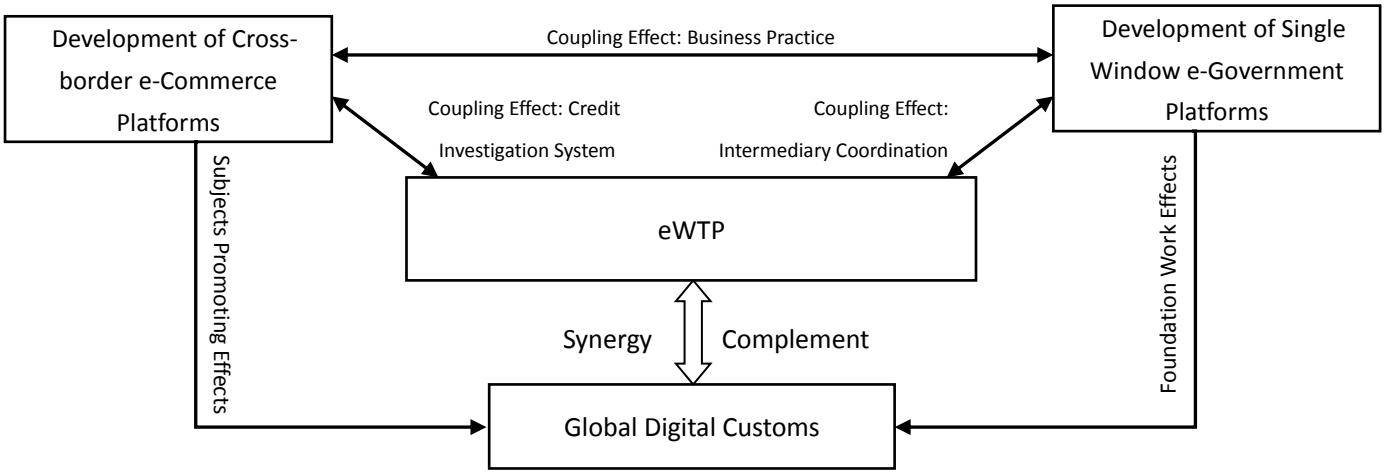


Fig. 9. The coupling effects among cross-border e-commerce platforms, national Single Windows and eWTP in creating global digital customs

Therefore, it is important to encourage and support the development and improvement of national Single Window and cross-border e-commerce platforms with national promotion policies, laws and regulations, strengthening their communication and integration in data sharing and regulatory decision-making, and guiding them to solve the difficult issues through joint efforts. The cross-border e-commerce platforms should improve business practices and standardize digital trade procedures to facilitate the regulation by the e-government platforms. Meanwhile, eWTP and the cross-border e-commerce platforms can cooperate in establishing worldwide credit appraisal system and guaranteeing the legal rights of trading firms in the long run. National governments should adopt an innovative regulatory model to monitor the operation of cross-border e-commerce platforms. They should avoid the multiple taxation, facilitate customs clearance and tax-free arrangements for small-scale trades and promote the development of bonded cargos and negative list management system in the digital era.

In the course of establishing global digital customs, a new global online trade system will gradually come into being on the basis of coordinating national legal systems, industrial self-disciplines and relevant regulations adopted by cross-border e-commerce platforms in different countries. National governments should cultivate fair and transparent business environment and encourage market entities to take an active part in formulating and implementing global online trade regulations and join forces to implement the widely accepted and acknowledged global digital trade standards to ensure the security, stability and credibility of the operation of global digital customs.

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