The Development Status Quo and Counter Measures of Logistics Informationization Standards of China

XU Qian[1,*]

[1]School of Economics and Management, China Jiliang University, 310018, China
Lecturer, mainly engaged in logistics service supply chain, regional economic.
*Corresponding author.
Address: School of Economics and Management, China Jiliang University, 310018, China
Email: xuqian@cjlu.edu.cn

Abstract

The construction of logistics informationization standard system is related to the long-term development of the logistics industry. The domestic standard construction of logistics informationization is fairly lagged behind; problems such as few standards, incomplete systems, and low level of international conventions still exist. This paper studies the constitution of a logistics informationization standard system, differentiates ten categories of logistics informationization standards, and then elaborates on how to establish and improve various standards. Finally, this paper studies the countermeasures to promote the implementation of logistics informationization standards.

Key words: Logistics informationization; Standards; Status Quo; Countermeasures

INTRODUCTION

Standardization is the prerequisite and basis for industry development and division of labor in society[1]. In order to achieve coordination of logistics operation among enterprises in the upstream and downstream of supply chain as well as find a fundamental solution for the problems of repetitive operation, poor veracity and low reliability, the main task for modern logistics industry is to solve the problem of information island in a single enterprise or a system, establish a rapid, timely and transparent information transfer and sharing mechanisms and realize information interconnection among different industries.

At present, standards are quite a lot as to a certain sub-industry or domain of logistics industry. Some of them are relatively mature, such as cargo bar code standards, customs declaration system, banking and financial information systems, electronic port platforms and so on, but they are independent of each other, lacking a unified and integrated logistics informationization standard which can be used by all relevant functional organizations of the government and enterprises. The resulting effect is that the informationization efficiency of the logistics enterprises will be restricted and a lot of manpower and material resources will be repeated.

The fundamental way to solve these problems is the logistics information standardization, which means that we must work out a standard protocol or rule for information communication and processing among different logistics systems as a bridge for cross-system, cross-sectoral and cross-regional logistics operation. It aims at realizing smooth logistics informationization data exchange among different enterprises, different parts, different supply chain

systems and different logistics software systems and then eventually achieving the purpose of logistics systems integration and resources integration.

1. THE DEVELOPMENT CURRENT SITUATION AND PROBLEMS OF DOMESTIC OF LOGISTICS INFORMATIONIZATION STANDARDS CONSTRUCTION

1.1 Current Situation

With the rapid development of information technology as well as e-commerce, electronic data and supply chain of the logistics industry, international logistics industry has entered a rapid development stage. Standardization and normalization of logistics systems has become an important means for developed countries to improve efficiency and competitiveness. Based on the development of international container and EDI technology, many countries begin to carry out international unified standard in terms of trading conditions of logistics, technical equipment specifications, especially in the documents, the legal environment and management tools, making the domestic logistics and international logistics fused together.

In China, the construction of logistics informationization standard is lagged behind[2]. Directing at this issue, the National Standardization Technical Committee of Logistics Informationization Management drew up the "*Logistics informationization Standard System*" in August 2004, starting from the needs of the standard system, giving a national standard system of logistics informationization.

In September 2009, China's first standard of logistics informationization came into being. 39 logistics informationization service provider from Beijing, Shanghai and Guangdong jointly set up a "Logistics informationization co-construction union"[3] to develop uniform technical standards, set up a unified logistics exchange code and achieve the unified logistics data exchange. The co-construction union takes Zhejiang transportation and logistics public information system as its carrier, integrate various service suppliers of logistics informationization, including logistics software developers, logistics public platform developers and logistics informationization equipment providers, which supplies logistics informationization service to logistics companies. The logistics informationization standard is initiated and established by logistics informationization service providers, targeting at industry applications and is solving some problems in the logistics informationization standard system. However, there are obvious defects; the main one is that it does not formulate standard systematization based on the social dimension. Perfect logistics informationization standard system construction should be led by the government departments, and participated by legislative bodies, information technology, logistics companies, customs and the department of industry and commerce. In this sense, China has not established a true logistics informationization standard system.

1.2 The Existing Problems of Logistics Informationization Standard Construction

(1) A small number of standards. The number of Chinese logistics standards just accounts for one-tenth of the developed countries, standards related to logistics informationization is less. Lack of standards leads to the fact that the logistics enterprise informationization short of legal basis. There are many obstacles for information interoperability and data exchange, which severely restricts the development of logistics industry.

(2) No complete standard system. Although China has raised the logistics informationization standard system structure on the demand level, because of few standards and its narrow market coverage, complete standard system cannot be constituted. In addition, it does not construct and improve informationization standard system according to the demands of standard system structure.

(3) Low level of integration with international standards. Among the formulated standards, there are few mature standard that have can act on international conventions. Most of them are constructed based on our own country and within the industry, limiting the interoperability with the international logistics industry.

(4) Few enterprises participated in the formulation of national standards. Although the formulation of standards is led by government departments, it is essential for the enterprises to participate in the formulation of standards. From the current situation, the enterprises are not so enthusiastic in participating in the formulation of standards. Related enterprises know well about the industry development and their own needs. Only when enterprises participate in the standards formulation can we ensure in order to ensure the scientificity and operability of the standards.

(5) Insufficient consciousness of the implementation of standards. Standards should be mandatory industry norms, but the logistics informationization standards of China has met many problems during the implementation, mainly because companies are not enthusiastic about the implementation of standards, many are accustomed to act according to old experience, not realizing that standards are significant for enterprises development.

(6) Lack of supervision and inspection mechanisms. Standardized implementation is a process of abandoning old and establishing new. It may bring enterprises the problem of increasing costs in the short term and bring resistance to the implementation of standards. As a

result, there must be a special supervision and inspection mechanism as the guarantee for standards implementation. There is no such mechanism in China now.

2. ESTABLISH THOROUGH LOGISTICS INFORMATIONIZATION STANDARDS SYSTEM

In order to improve the level of logistics standardization construction, the first is to build a thorough logistics informationization standards system. The construction should comply with the basic principles of standardization and the industry needs. In addition, since modern logistics is no longer confined to one country or region, it is a cross-border, cross-regional and cross-industry operation system, so that domestic logistics informationization standards should integrate with international standards in order to blend in the international logistics system. This paper argues that the basic components of a complete logistics informationization standard system should include 10 categories like logistics terminology standards, logistics information classification standards, logistics information equipment standards and so on, as shown in Figure 1.
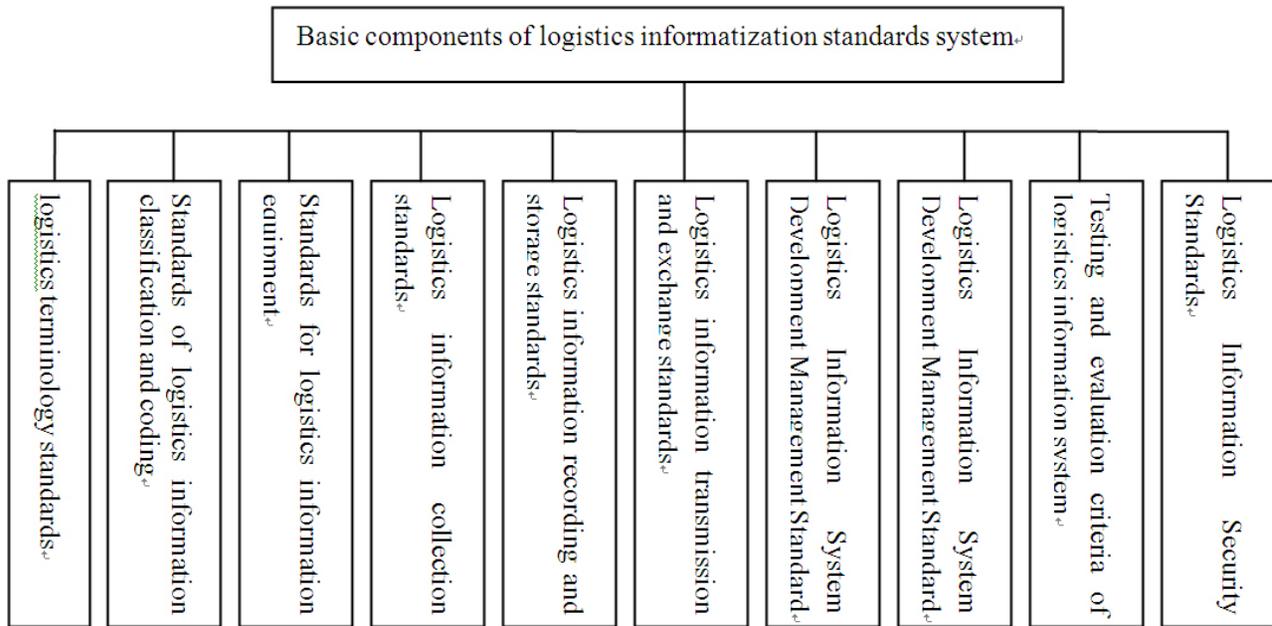
Figure1
The Components of Logistics Informationization Standard System

(1) Logistics terminology standards

Logistics terms often have different implications due to national, regional, industrial, and personal differences, so there may be misunderstanding or errors in the transmission of logistics information. Therefore, logistics terms must be unified, standardized language should be used in the exchange of logistics information, which is the basis for standardization of logistics information. In August 2001, China Federation of Logistics and Purchasing and Logistics Association of China promulgated the "*Logistics term*" national standard (GB/T18354-2001), it incorporated and determined 145 mature terms and definitions in the current logistics field, which made a good start for China logistics information standardization[4]. On December 22, 2006, the revision of "*Logistics term*" national standard (GB/T18354-2006) was officially released, the number of terms increased to 328 based on the original terms. The terms are divided into six categories: basic terms of logistics, service terms of logistics operations, terms of logistics technology and facilities equipments, terms of logistics information, terms of logistics management and international logistics. With the rapid development of logistics industry and the integration process of international logistics, logistics terminology standards also need to be improved ceaselessly. China should pay close attention to the term standards of international logistics, timely adjusts and supplements the existing "*Logistics term*" national standards.

(2) Standards of logistics information classification and coding

The standards of logistics information classification and coding classify a lot of logistics information, represent them with codes and constitute a standard information classification code in order to facilitate the information search and inquire manually or by computers.

This is a premise for normal operation of logistics information system. Logistics information classification and coding standards are divided into three categories; the first class is basic standards, which is an international and national unified standard that must follow during the standards formulation, with a longer period of stability; the second category is the business standard, which is technical standard aiming at logistics activities, it guides the construction of logistics information system; the third category is relative standards, it is special fields standards accompanied by the development of technological progress of human society, especially the technical process of communications and information processing technology, such as electronic data interchange (EDI) standards, EPC standards and so on. Since 1979, China started to develop the relative standards, it has released dozens of information classification and coding standards, it basically achieves the integration of data elements and classification codes, building a more complete code system[5]. However, from the current situation of classification and coding standards constitution, China still lacks some required standards, such as administrative regulations of information classification and coding standards, register regulations of information classification and coding standards as well as code rules of storage and cargo classification codes and so on.

(3) Standards for logistics information equipment

Logistics information equipments include switches, hubs, routers, servers, computers, uninterruptible power supply, bar code printers, barcode scanners, memories and data terminals. The relative national standards of this information equipment are GB/T 15533-1995 "*Information processing systems - small computer system interface*", GB/T 14715-1993 "*Information technology – technical conditions of uninterruptible power supply*", GB 9254-1998 "*Wireless interfering limits and measuring methods of information technology equipments*" and so on.

The development of logistics information equipment standards needs improving the existing information equipment standards, the method is to follow national standards of information equipment, extract the standards that related to logistics information equipment, revise them in accordance with the actual situation of the logistics industry, such as adding information equipment standards which is facing networking application.

(4) Logistics information collection standards

Logistics information collection standards require unifying the methods, means and form of information collection, which includes bar code standards, radio frequency identification tag standards, and Global Position System technology standards and so on. Relative standards are complete at present, so synthesizing these standards will form the logistics information collection standards.

(5) Logistics information recording and storage standards

Logistics information recording and storage standards prescribe the recording, storage and search modes of logistics information, which includes storage media, storage forms, storage procedures, database types, database structures, indexing methods, compression modes, query processing, data definition language, data query language, data manipulation language and integrity constraints and other criteria. The formation of this standard should follow the national standards of GB/T 16505.2-1996 "*Information processing systems –open systems interconnection— file transfer, access and management— part 2: virtual file store definition*", GB/T 6550-1986 "*Information processing -- 9-Track—12.7mm wide magnetic tape for information interchange recorded at 63rpmm — phase encoded*" and so on.

(6) Logistics information transmission and exchange standards

Logistics information transmission and exchange standards prescribe the communication protocols, transmission modes, transfer rate, data format, and safety as well as exchange programs of logistics information. National standards that should be followed include GB/T15191-1997 "*Trade data elements directory standard data elements*", GB/T16833-1997 "*electronic data interchange for administration, commerce and transport (EDIFACT)—code list*", GB/T16703-1996 "*EDIFACT syntax implementation guidelines*" and so on.

(7) Logistics Information System Development Standard

Logistics information system development standard is established for demand analysis, design, implementation, testing, manufacture, installation testing, operation and maintenance of the logistics information system. The standard can be divided into four categories: process standards (including methods, technology, quality and other standards); product standards (including requirements, design, parts, description, planning, reporting and other standards); professional standards (including professional ethics, certification , licenses, curriculum and other standards); notation standards (including language, representation and other standards.) National standards to be followed are GB/T 1526-1989 "*Information processing – documentation symbols and conventions for data, program and system flowcharts, program network charts and system resources charts*", GB/T 13502-1992 "*Information processing - program structure and conventions for their representation*", GB/T 17175.1-1997 "*Open technology interconnection of information base – administration information construction part1: Management Information Model*" and so on.

(8) Logistics Information System Development Management Standard

Logistics information system development management standard is formulated for quality control, process management, document management and software maintenance of logistics information system development. Existing national software development standards are here for reference: GB/T 16680-1996 "*Software Document Management Guide*", GB/T 12505-1990 "*Computer Software Configuration Management Specification*", GB/T 14394-1993 "*Reliability and maintenance of computer software of management*", GB/T 8567-1988 "*Documentation guidance of computer software product development*".

(9) Testing and evaluation criteria of logistics information system

Testing and evaluation criteria of logistics information system are unified prescriptions and requirements to test and evaluate logistics information system products. National standards to follow are: GB/T 17544-1998 "Information technology – software package quality requirements testing", GB/T 17917-1999 "Basic functional requirement for management information system of mart", GB 15532-1995 "*Software unit testing*", GB 13423-1992 "*Criteria for the evaluation of software used for industrial control*", GB/T 16260-1996 "*Information technology-- software product evaluation--quality characteristics and guidelines for their use*" and so on.

(10) Logistics Information Security Standards

Logistics information security standard is a standard formulated to prevent unauthorized access to logistics information system. It includes user authentication, encryption, firewall technology, data backup, port settings, logging, and virus prevention in the logistics information system. Current national standards that relate to information security standards are GB/T 18019-1999 "*Information technology – security requirements for packet filter firewalls*", GB/T 18020-1999 "*Information technology—security requirements for application level firewalls*", GB/T 15277-1994 "*Information processing – modes of operation for a 64-bit block cipher algorithm*", GB/T 15278-1994 "*Information processing- data decipherment - physical layer interoperability requirements*", GB 17859-1999 "*computer information systems - Safety protection levels division criteria*", GB 15851-1995 "*Information technology - Security techniques digital signature scheme giving message recovery*" and so on.

3. COUNTER MEASURES TO PROMOTE THE IMPLEMENTATION OF LOGISTICS INFORMATIONIZATION STANDARD

(1) Strengthen the publication of standards, promoting the implementation of standards. Establish and improve the publication and extension mechanism of logistics

informationization standards, strengthen the publication and training of standards, encourage the practical use of logistics informationization standards and enhance the influence of logistics informationization standards; work closely with leading departments of the industry, launch publication and training of standards, make it clear to the relevant enterprises the significance of implementing the standards and potential proceeds and so on.

(2) Establish a supervision mechanism for standard implementation, reflecting the coerciveness of national standards. On April 1, 1989, China implemented the "*Regulations for The Implementation of The Standardization Law of The People's Republic of China*", the provisions of Article XIV of is to "implement those mandatory standards" However, over the years, the problem of attention on formulation, neglect on implementation and non-supervision is very common. The main reason is the lack of appropriate supervision mechanisms. It is an important measure to guarantee the implementation of standards to supervise, inspect and manage the standard implementation. The supervision mechanism of standard implementation of the monitoring mechanism includes two aspects: one is that sectors in charge of standardization supervise enterprises' implementation of standards; the other one is enterprises' self-supervision to the implementation of standards.

(3) Strengthen technical guidance and support in the process of standard implementation. At present, the informationization degree of related businesses in logistics industry varies a lot; the existing informationization platforms are also different. The implementation of a unified logistics informationization standard is a large and complex project. Thus, a strong technical team is needed for support, especially in the early period of standard implementation.

(4) Emphasis on the protection of enterprise private data. The implementation of logistics informationization standard necessarily involves the standardization, transplanting and integration of various enterprises' available data. In such a process, it is easy for enterprise to leak out its private data, which can not be accepted by the enterprises. Besides a unified logistics informationization platform also provides higher requirements for data protection. Therefore, we need to take effective measures to ensure the data security of enterprises in the process of standards implementation.

(5) Give full play to the role of China Federation of Logistics and Purchasing and China Society of Logistics as a bridge to collect problems met in the standard implementation process and suggestions from various sides, improving the standards construction.

REFERENCES
[1] DING Yiping (2008). The Construction of Logistics

Informationization and Reflection. *Modern Business, 3*, 173-174.

[2] HU Linzhu (2005). Research on Standardization of Logistics Information. *Journal of Chongqing Vocational & Technical Institute, 14*(4), 41-43.

[3] ZHANG Qi-hua, & LIU Shu-zhen. Logistics Information Arena Open up a "Together Time" – The Founding Conference of Logistics Informationization Construction Coalition Held in Hangzhou. *Highway Transportation Digest, 10*, 46-47.

[4] JIANG Dali, PENG Liang, & YANG Xilong (2003). Research on Logistics Informationization Standardization. *Logistics Technology, 4*, 16-18.

[5] ZHOU Jianqin, & ZHANG Duo (2000). Research on Standard System of Logistics Information Classification and Coding. *Logistics & Material Handling, 2*, 7-39.