Establishment of the Logistics Information Standards

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Abstract: Logistics information acts as an important engine for economic development. While lacking of the unified standards for logistics information systems has become a critical obstacle for the economic growth. This paper investigates the status quo of the logistics information standards and emphasizes the importance of the establishing the relevant standards. A structure of the logistics information standard system is put forward and the important approaches for the standards setup are suggested.

Key words: standard; logistics; information system

With the logistics industry becomes one of the engines for the economy, development of the logistics hubs or logistics information platforms have become a critical approach for each local government in China. In Chinese 2006-2020 National Information Development Strategy, modern logistics and e-business are the two of the several major national investment areas. However, the lack of a unify logistics information standard system make sever information conflicts and repetitive constructions in logistics infrastructure. Furthermore, it also blocks fluent information exchange among the systems in related governmental agencies and enterprise's information systems. Thus, all those information systems that should be linked together into an integrated system or an e-business platform become much less efficient information islands.

Chinese rapid economic development and trade-oriented manufacture economy have made the traditional logistics enterprises corporations transforming to variety modern logistics entities. Using a well established information standard, all the logistics information systems in all the entities can involve into an integrated system which will reduce the logistics costs and improve the entity's efficiency and competitiveness[1]. And the government agencies also can benefit from the well organized information exchanges, such as effective control of the market resources and the supervision of the market.

1 Case review on logistics information standards

1.1 Oversea experiences

The application of ITS technology in the transportation monitoring system is hot area in the public logistics information platform in most developed nations. For example, a traffic monitoring platform (TranStar) which oversees and safeguards all the highways and manage the emergency relief operations, had been function since 2000 in Houston USA. Due to the different social system, the logistics information system are often set up and operated by major logistics corporations like UPS, FedEx. Singapore built an e-trade platform, TradeNet, to link 35 trade-related government agencies in 1998. With those cases, the logistics information standards are put forward gradually.

USA National ITS Framework has given relatively comprehensive standard system. Some standards are becoming the international industry norms and also adopted by Chinese industry. However, most of the standards, such as products code, vehicle plate, wireless communication method, must be modified or re-introduced in China[2].

1.2 Variety logistics information systems or public platforms in China

Chinese local governments constantly invest in the logistics information system development directly or indirectly. Shanghai operats a logistics public service platform; Ningbo municipal government has invested a e-port system, and are developing and operating a 4th Logistics Market. E-port system in Guangzhou provides the governmental information and data exchange service for their customers. Besides those systems sponsored by governments, there are also some commercial websites, for example, Jingcheng Logistics provides all kinds of logistics information, including vehicles, cargos, trade leads, agencies, etc. Some logistics related regulatory agencies also built e-government system to connect and disseminate information. However, all those systems are isolated due to the different data format, interchange protocol, and the user registration database.

The reality of small and medium corporations (SMC) domination in Chinese logistics industry has made it very difficult for one company to establish a public logistics information system and the information standards. Then, the central and local governments all pay huge attention on the logistics information standards infrastructure. The National Development and Reform Committee issued (the note to promote the development of the modern logistics industry) with other 8 ministries. The note clearly indicators that the logistics standard is a national heavy invested infrastructure development[3].

Afterwards, Ministry of Technology, Ministry of Information, and the National Office of Information put more importance on the logistics information standard in the National 11th Planning. The Ministry of the Commerce also corporate with the Customs Office to establish the sharable data format and certified user proceeds. The Ministry of Transportation has made the integration of the Toll System, Highway Monitory System, and Public Information System on the top of the project list. All the projects aim to combine the logistics information and logistics standard to reform and integrate the operation procedures, and apply the latest logistics technologies.

2   The benefit of the logistics information standard

The most important characteristic of the modern logistics industry is the use of information technology. A synthetic logistics information platform to serve all entities in the business becomes a critical area for modern logistics industry, as fig. 1 shows. A typical information system must have the modules of e-government information service, transportation service, credit service, data exchange service, etc[4]. All the data in any service should be able to fluent among all the entities using the system.

The protocol and standard for the information exchange plays a very important rule in the communication and coordination among various systems or platforms. The existing miscellaneous protocols were created for different applications, which are independent and non-compatible. The information standards must be proposed for the mutual information exchange and corporation among the systems. The proposed standards can also provide a viable tool for the
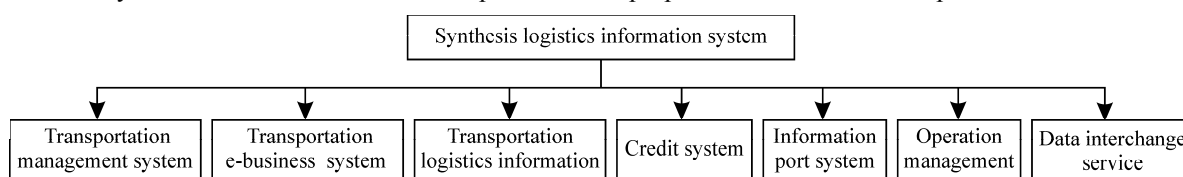

Fig. 1   A typical synthesis logistics information system framework

governmental agencies to establish a coordinated e-government system. And, the logistics industry's must have management systems, such as credit system and driver's management, can also be accelerated.

2.1 Requirement of the logistics information system

The various entities in the transportation market, such as logistics companies, vendors, individual users, and governmental agencies, are the demand of the logistics information. And, some public service providers, such as tax services, credit agencies, GIS/GPS service providers, mobile telecommunication services, also involved in the logistics information system. The logistics information system serving different area need linked together or linked with other information system, such as traffic control system, to better function.

The demand for a more integrated and versatile logistics information system makes the software and information infrastructure very complex. Without well established standards, the logistics information's flow efficiently among those entities becomes impossible.

2.2 Requirement of the public logistics information system

The public logistic information system or platform, usually proposed or supported by government, is a open and compatible system which allows a number of corporation and individual person to upload or download variety logistics information, such as vendors, vehicle providers, etc. The platform involves a number of information systems, operation systems, information protocols, invoices. Therefore, the demand for a uniform logistics information standard, which can or must be abided by all the entities, is very urgent.

3 Framework of the logistics information standard

Information standard is to set uniform protocol and procedure in the quality control, production process, technical platform, and service level for all the players to abide, to make the coordination or corporation among different functions or industries possible. The standard is proposed to coordinate the logistics data/information flow among the otherwise independent modules or functions of variety system. The standard can effectly reduce the repetitive data operation in the different system, then improve the entire logistics information network's reliability and efficiency by the in-time transparent information communication and share[5].

The proposed information standard should be able to make all the logistics data/information sharable among different computation platform. The standard framework also needs to compatible with the logistics function framework in three levels of national, industry and corporation standards, as showed fig. 2.

The top level in the logistics information standards is national standard which are those national or local laws and codes, and must be abided by all entities. Some international treaties or industry infrastructure criterions which have become agreements are also included in this level. The second level is the industry agreement, such as information interchange protocols, which are used usually by the entities in one industry. Those standards
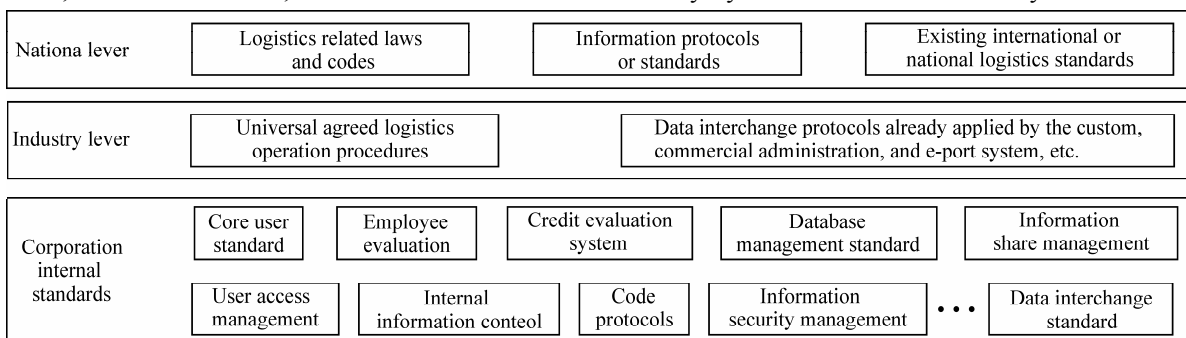
Fig. 2 A framework for the logistics information standards

include custom information system, bank information system, and some logistics operation procedures. The last level standards are the internal ones and management approaches within the corporation, such as a code system in company information system, core user's classification procedure, and information safety management, etc.

Establishment of the logistics information standard framework needs a series of researches as follows.

First, it is necessary to establish a framework of information standard which puts forward a list of the standards required based on the case study or experiences of the logistics information systems room and aboard. Those standards may include laws and codes, basic protocols, technical standard, logistics operation procedures, logistics information formats, and other codes or internal by laws.

Secondly, it is also absolutely important to sum up a list of existing international, national, industry standards or even some universal agreements among the logistics related corporations. Those standards, in most case, must be put in the top priority because of impossible whole system rebuild otherwise.

In the end, besides the existing ones, the new standards that need to be proposed in the framework should be listed as following works, such as a universal core user criterion, entity's codes, etc.

4 Techniques to establish logistics information standards

Establishment of the logistics information standards is a cross-subject and all-around task, and it is also an application-driving theory. There are a number of logistics standards, information standards existing, some of which have been universally recognized, such as barcode system. And, other information standards in the custom information system, bank information system, e-port system are also need to be considered. However, a general and uniform logistic information system that can be applied in any logistics related

systems is absolutely imperfect and urgent.

4.1 Put applied standards on the top list

The information protocols and standards currently used in the logistics industry are the two most concerned areas related to the establishment of the logistics information standards. Information protocols are often mature and can be applied directly. Comparatively, standards in the logistics industry are sluggish, yet to accomplish. Although, there are instructing documents and experiences can be found to reference. Those precedents should be on top priority from customer tradition, industry context, and transition of the systems.

National laws and governmental requirements must be adopted first and should be the infrastructure of the standard. On the industry level, the mature standards or universal agreements from other industries, such as public security, custom, should be incorporated into the logistics information standards framework. Those standards are required to make sure the information systems can be linked to logistics systems or platforms. Some logistics operation procedures are the sum-up of past experiences, should be considered too.

The existing logistics information standards from governmental e-systemes or other industries must be incorporated for the smothly information interchange. Particularly, the experiences in the precedent information systems, network framework, information transit procedure, code protocols, etc, should be analyzed and actively incorporated.

In the end, the corporation's internal management approaches and other operation standards can be summarized and promoted as agreements in the entire logistics industry.

4.2 New standards and the rapid development of technology

The absent of unify national logistics information standards indicators that there are a number of standards must be compiled. Those standards that vary or incompatible in the industries, corporations or areas also need to be modified or unified. Because of the rapid development of technology and management measures

in the logistics and information industries, the information system trends and latest development should be tracked and analyzed. All those new techniques, combined with the practices in China, need to be incorporated.

4.3 Unify the standards in the related industries with those in logistics industry

Because various industries and agencies are involved in the logistics information systems or public platforms, the unify standards for the entire logistics industry may require the supervision or preside of the related governments[6]. The government involvement is very important for the standard unification, and also for the compelling application of the new standards on any logistics related information systems compiled hereafter. And, the proposed standards should actively be correspond with the international standard organization, try to become the international standards directly.

5   Conclusion

The establishment of a unify logistics information standards can dramatically improve the development of the multimode transportation and trans-area logistics by linking information from and for all the participants in the supply chain. The standards can also provide the all-around logistics information and improve the operation efficiency and competitiveness, by reducing the existents of the "information island".

A framework and the content of the standards have been proposed. The approaches for establishment of the standards have also been identified. Those researches can be instructing and reference for the further study.

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