Research on the Trend of Intelligence Port Development

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Abstract. Investigation on construction and running of intelligence port in recent years, the paper aims to study the current status of the intelligence port infrastructure and the development trend of it. Meanwhile, it is beneficial to the China intelligence port construction.

Foreword

In recent years, China has repeatedly introduced marine strategy, and put forward higher requirements to the innovation and upgrading of port enterprises. Meanwhile, marine strategies provide the direction of the development of professional service industry in port. In 2014, China proposed the construction strategy of the economic zone of the Silk Road and the 21st Century Maritime Silk Road. As the core node of international trade, transportation, warehousing and information services, port is becoming a critical part of “The Belt and Road Initiative” and is confronted with big chance of development. The transport of information "13th Five-Year" development plan issued by the Ministry of transport in 2016, pointed out that we should accelerate the coordinated development of Beijing, Tianjin and Hebei Province. Meanwhile, we should promote the Yangtze River economic belt development and other major national strategies, push transportation facilitation and integration by the interconnection, Co-construction and sharing of information. One of the key points is the model project construction-the Intelligence Port. Achieve digitization goals of human, vehicle, ship, road, waterway and other elements, change port operation mode, improve operational efficiency, and establish a new type of port enterprise which is green, environment friendly and intelligent integration.

The Construction of “Intelligence Port” in China

In November 2008, IBM company released a report named The Intelligence of the earth: the next generation leader agenda in which the concept of "Intelligence earth" firstly expounded. And then elaborated and analyzed the meaning of "Intelligence city". Under the concept of "Intelligence city", intelligent transportation is a main part, as the core node and critical part of Intelligent transportation, “Intelligence Port” is much more important.

The Intelligence Port is called Intelligent port or Internet of things port as well, there is no standard definition in China or overseas. The Intelligence Port can conduct a thorough understanding, connect extensively, make depth calculation of port production and logistics operation of the core system of key information, with the help of the Internet of things, sensor networks, cloud computing, decision analysis and optimization techniques. To make things and things, things and people, people and people, and the port logistics resources and various participants can be more extensive interoperability, then promote the construction of modern port. With formation of technology integration, integrated application, high-end development of modern, networking, information technology, the modern port is going to be more perfect.

Intelligence port construction presents a comprehensive expansion from the eastern coast, and extending to the center along the Yangtze River. Fifteen ports of the key arrangement in “The Belt and Road Initiative” will gradually introduce intelligent information technology in port construction. Take Dalian port as an example, from “Yi Gang Tong” App to “Unattended” Intelligent container bayonet, and from the inspection and Quarantine of “Mobile quick detection” to the “one-stop”
intelligent sea transit service. It can be readily seen that “Intelligence application” has been embedded into the entire logistics chain, covering the various sections of port operations, and built a Intelligence port platform in ports, enterprises, and government. [1] Nanjing port constructs “one platform two centers four markets six services”, which means building ports comprehensive service platform. Building ports and information service center. Developing four markets including ship trade, freight transportation, shipping finance, and shipping talents. Providing six services including shipping logistics port, information, trade, transportation, finance, and personnel. In addition, other ports are making a useful attempt to build Chinese "Intelligence port" as well. Finally, in the construction process of "Intelligence port", it focuses on the port production, logistics, electricity providers, finance and other aspects of business, while promoting the construction of multi-unit and multi-service information exchange and sharing mechanism, as well as the overall collaborative operation, making the port ecosystem bigger and stronger, and escorting the local industrial transformation and upgrading.

The Content Analysis of the Construction of “The Intelligence Port”

Information Flow Analysis

Information flow analysis is the basic analysis of “The Intelligence Port”, and it is one of the most important part of seeking for Big data as well. As an example, picture 2 shows us some messages which regards port as the core and collects, classifies, counts and analyzes the information of ship, cargo, dock, station, agency and government. This will benefit both parties, break the island of information, and accomplish the aim of efficient utilization of port information, improve the ability of decision making and risk resisting in port operation at the same time.

User Group Analysis

In the whole supply chain, though the size of the port's throughput is not the same, the connected customer groups are relatively large, which include manufacturing enterprises, trading enterprises, transport enterprises, regulatory authorities, the owners of enterprises, banks and insurance, other platforms, etc.

Construction Content Requirement Analysis

The construction content of “Intelligence Port” can be divided into three parts. First, government regulation and large data collection and utilization; Second, port operation information fusion and sharing; Third, establishment and improvement of infrastructure standards. Furthermore, it can be divided into twelve aspects.

The enhancements of port communications network and production infrastructure intelligence are core aim and play a leading role. Embodiments are as follow:

① Communication network infrastructure requirements

Enhance the comprehensive carrying capacity of information network, and the comprehensive utilization of facility resources, as well as the ability of information communication.

② Intelligent sensing network construction needs

Use information technology to speed up the construction of intelligent network, and to realize the automatic collection and information interconnection of the infrastructure, such as environment, road, traffic, communication network, equipment and so on.

③ Network monitoring intelligent management needs

Completing information network monitoring management system can realize the problem of automatic discovery, deal with the accident initiatively, monitor from remote real-time, collect information automatically, and automatic alarm information processing, etc.. of daily management of the facilities and the whole system.

④ Intelligent demand for production infrastructure

  (1) Intelligent gate

  (2) Intelligent terminal equipment
The Construction Content of “Intelligence Port”

Intelligent Infrastructure Platform

The intelligent platform based on sensing device and network transmission equipment will focus on the content and development trends of “Intelligence Port” in the future.

Intelligent Support Platform and Application Platform

As the core of the port data center, the government information, vehicle information, cargo information and production information combining with geographic information platform, data exchange platform and video monitoring platform will form a smart port wisdom support platform. Take the advantage of which, establish the intelligence port, intelligent logistics, intelligent port, intelligent business and intelligent scheduling application platform.

Based on the above data, network and applications, providing data services and macro decision-making services, form the early foundation of the intelligent development platform.

Developing Trend of “The Intelligence Port”

New Information Technology will be Widely Used

VR, AR technology and other new information technology will be quickly applied to the port production and services in this area. Comprehensive perception of port information will be further improved, and the application of computer aided decision making system will be more extensive, automated terminals will evolve to Intelligent pier.

More Emphasis on Value-Added Services

The data inside or outside the port will be widely interconnected and highly shared, value-added services of big data will be paid more attention. And based on the results of “Big data”, its intelligent application terminals will penetrate into various areas of port production.

Pay More Attention to the Standard Construction

The data standard will be a product of the repeated struggle in the construction of “Intelligence Port”. At present, all ports in China are building their own “Intelligence Port”. However, its data coding, communication or other fields have no uniform standard yet. This will cause some negative effects on the realization of the true meaning of “Intelligence Port’s” inter-working.

Thus, during the period of 13th Five-Year, China’s “Intelligence Port” standardization construction will avoid the fight among every ports and avoid ports change from little island to big island.

In a word, “Intelligence Port” in the future will become a new type of ports which is fully aware, widely interconnected, highly shared, and intelligent applications.

Summary

From perception to decision making, from decision making to execution, from execution to feedback (perception), from feedback (perception) to modification (decision making), such a seemingly endless cycle of mechanical movement is biggest bright spot which can distinguish “Intelligence Port” from “Intelligent port” in the future. The production and operations of “Intelligence Port” must be based on the overall perception of the system. There will be no “Intelligence” without overall perception. In the near future, sensing equipment in port infrastructure will be the primary task and it will provide protection for intelligent applications, wide range of interconnected and highly shared.
References
