

# Thinking on the Application of Big-Data in Port Security Integration

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**Abstract—** With the rapid development of Internet technology, big data technology as a hot technology to solve complex computing and software development in distributed application environment is gradually being adopted by all walks of life. Port as a water transport hub, also need to use big data technology in the port security information management, through the exchange and sharing of information in the coastal, dynamic, etc., in the entire transport industry internal integration of the characteristics of each port information data base, to build a port security integrated management and control information platform framework, to solve the problem of information resources and scale efficiency is difficult to play. The introduction of large data analysis technology to analyze the mass data, improve the daily safety warning management and emergency management of the port near shore..

**Keywords-** Port security, emergency warning, big-data technology, virtualization, resource integration

## I. INTRODUCTION

World economic globalization and the development of major shipping alliance, triggering a new round of global water transport industry, a new round of adjustment. Under the background of the global big data, the control right of the data in the strategic sense, who caught the initiative and the initiative of development. At present, China's economy into the new normal, shipping industry is also in a critical period of structural adjustment, transformation and upgrading. Better use of water transport data, the maximum mining its intrinsic knowledge, insight and contains the value of the strategy, identify the key path to realize application essay is a topic that is worthy of serious consideration of the industry.

Along with the new economic normality, China's water industry port security is bound to enter the new normal, safe and driving factors will be significantly changed. Big data to the port security in the shipping industry, which does not only mean that the industry security management and service model change, but also means that the industry development concept and thinking, strategic decisions and profound changes in culture. Big data inclusion will help to break the boundaries between departments, "Information Island", "data bottleneck", "information chain breakpoint" phenomenon will be expected to cut sharply. At the same time, the high degree

of open and strong liquidity, meaning that data depth mining and knowledge application is more extensive, industry management and services more open and transparent, more differentiated, personalized information and services become possible.

## II. THE STATUS OF THE "BIG DATA TECHNOLOGY" APPLICATION OF THE PORT SECURITY "BIG DATA"

Port security is an important part of the healthy development of the transportation industry. In recent years, the port security has played an active role in the development of port security. It has accumulated a large amount of data, but with the continuous emergence of various kinds of security applications, the security data is growing.

Although the traffic information to achieve the level of the central nervous system, but it is far from playing the brain's wisdom. Achieve the "brain" of the "thinking" process, from extract, the information is really needed timely and accurate push, improve the port safety management science and organization service level, and improve the transportation efficiency, safety and overall efficiency, effectively solve the travel difficult, forcing in the traffic problem in the imminent.

## III. PORT SECURITY "BIG DATA TECHNOLOGY" APPLICATION DEVELOPMENT PROBLEMS

At the same time, there are four main aspects: the national ship, enterprise, port and other basic database has not been established, the overall effectiveness of information is not fully played; two is the existing port security system function is single, mainly for administrative licensing, data statistics service, in security and emergency warning management, public service, oil spill oil film fast and accurate alarm, management decision-making and other aspects of support is not enough; the three is a lack of integrated development and use of the industry, regional, regional, driven by the advantages of multi mass information is not obvious, it is difficult to achieve regional collaborative applications.

Therefore, based on the existing port offshore static and dynamic information, establish a stable and reliable industry data exchange network, strengthen industry data collection and information integration, the establishment of a large data based port security integration of intelligent

control platform, the port near shore static, dynamic information fusion, and the introduction of large data analysis techniques to analyze massive data, enhance the daily safety and emergency management and emergency response.

#### IV. PORT SECURITY "BIG DATA TECHNOLOGY" APPLICATION DEVELOPMENT PROBLEMS

- Based on the technology of seamless integration and display analysis of multi port information, the intelligent control platform of port security integration based on large data technology is established. The port near shore static and dynamic information can be effectively integrated, and large data analysis technology is introduced to analyze the massive data [9].
- An autonomous intellectual property, high performance sensing system is integrated with an integrated temperature sensor, a flow velocity sensor and a high precision oil film detecting device. Security port security integrated intelligent control acquisition platform to higher fidelity data, are used to detect the water temperature, water flow rate of the flow and oil spills the oil film of fast and accurate alarm, so in a timely manner to the potential risk factors for early warning port wife ship dam insurance avoidance port security.
- Improving the sensitivity and intelligence of the integrated sensor acquisition signal, a new ROF demising model based on Boltzmann Lattice is proposed and proved. The ROF model is improved by the introduction of the diffusion coefficient.
- The port security "big data" integration platform construction will follow the "top level design, integration of resources, unified standards, interoperability, step by step implementation" principle.

#### V. BASED ON BIG DATA TECHNOLOGY PORT SECURITY INTEGRATION OF INTELLIGENT CONTROL PLATFORM TECHNOLOGY PROGRAM

At present, transport and port security units of information is confined to the unit of service providing oriented, and a new generation of port "safety in numbers" characteristic is highly integrated and comprehensive utilization of information resources, port security chain on each node are combined with seamless. The role of each unit in the whole supply chain is weakened, and the information resources in each port unit have great social value and economic value. The integration of information flow, providing services for each port unit of the loose coupling, differentiation, personalized service.

Big data technology is a hot method to solve complex operation and software development in distributed application environment. In the technique, the loose coupling characteristics, can better adapt to the changing business environment, such as changing levels of business, business focus. Such a large data based architecture

provides a simple and practical way to integrate and provide the potential for the realization of the integration of distributed application systems and the interconnection of information islands [3].

The intelligent control platform is based on big data technology, through the establishment of a unified interface standard and interface specification, the traditional application of all kinds of dynamic and static data, which will be a theoretical level.

The framework of intelligent control platform for port security integration based on big data technology is shown in Figure 1.

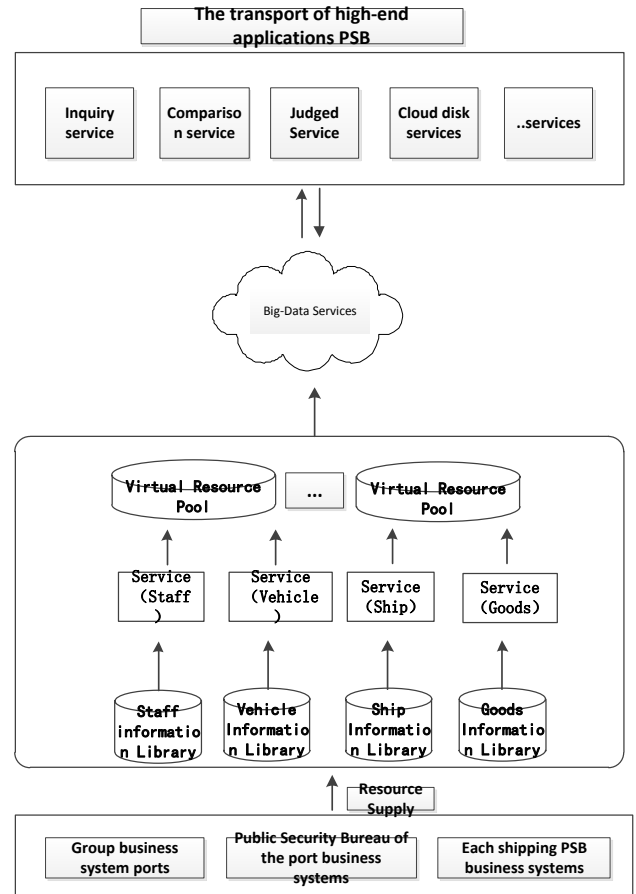


Figure 1. Port security and integrated control platform framework based on big data technology

As can be seen from the picture, the entire port security offshore static, dynamic characteristics of information platform, including the supply of resources, virtualization resources storage, large data services, high-end applications, respectively, as follows:

- Resource supply: it is an important part of the whole platform, which mainly provides the static and dynamic characteristics of the port security. The current port security features mainly come from the port group related production system, port security unit related business system, and industry related business system.
- The virtual resource storage is the Guan Jian part of the whole platform. The virtual resource is the characteristic information of the port security unit. The virtual resource pool is built, including the

dynamic, static, sensing (humidity, temperature), etc..

- Big data services: big data services are the core part of the whole platform, it is the entire platform framework for business application request hub, the user can apply the business application proxy services, in accordance with certain computational methods, to seek and respond to service requests, and to give feedback.
- High-end applications: the overall framework of the platform by the top, through the establishment of the entire port security data service standards, to provide the port security units of high-end applications, the real sense of the high-end application of big data.

## VI. RELATED TECHNOLOGY RESEARCH

The realization of intelligent control platform of port security integration based on big data technology will be faced with many design and technical problems. Therefore, the research and design of the platform should be carried out as follows:

### A. Data Aggregation Technology

Research data aggregation technology is mainly to the port group, port security units, industry related business system of dynamic, static, sensing and other related information to converge, the main port of the entire supply chain of effective data extraction, and then in accordance with the special class, dynamic class, based on the convergence, forming a single branch of the effective data repository, the various sub Bureau of data collection and unified into a large pool of data [1].

### B. Virtual Resource Storage Technology

Research on virtual resource storage technology is mainly based on the relatively mature virtualization technology (hardware) to gather the classified data for virtual resources storage, and establish a resource directory and data resource backup mechanism to ensure that data resources are alive and safe.

### C. Large Data Computing Technology

Big data computing technology is a technology used in conjunction with virtualization technology, in the research and design of the platform framework, the main use of large data computing technology to achieve the overall service platform, the use of the best algorithm for the port security of high-end applications to provide a virtual structure.

### D. Request Service Content

Request service technology is a relatively mature technology, the research and design of the platform framework, the main content and request permission to access the research service object acquired on the basis of analysis of some of the current application, tap the true sense of the cloud platform query cloud, cloud comparison, judged cloud, cloud storage, high-end applications.

### E. Internet + Technology

Internet + technology is a composite technology, research and design in the framework of the platform, the

main research of the Internet + security integration services, through the integration of port offshore static, dynamic information and other information, unified port and related units to provide security services platform, each port security unit can be customized according to their business needs, to provide convenient access to security information within the area.

### F. The Research On The Technical Standard Of Port Security Service Platform Based On The Large Data Computing Environment

Research on the technical standards and structure of the port security resource virtualization, and the architecture of the service object, and the standard of the platform frame and the standard of the standard of the standard. Research platform for the construction and operation and maintenance of protection standards, co-ordinate the port group, maritime, shipping and other main body, to fully mobilize the market forces, joint construction of the port security platform.

## VII. CONCLUSION

With the aid of data aggregation, virtual resource storage, large data computing, service content and large data in port security service platform technology standards and other related technologies, the port security integration of "big data" practical application, based on large data port security integration intelligent control platform, port near shore static and dynamic information fusion, and the introduction of large data analysis technology for mass data mining analysis, improve the port near shore daily safety warning management and emergency response capability.

However, due to the current national port ship, enterprise, port and other basic database which have not been established, the existing port security system function is single, security and emergency warning management, public services, oil spill oil film fast and accurate alarm, management decision-making and other aspects of support is not enough, security system integration is not enough, the data can not be shared, multi mass information integration advantages are not obvious, this work still needs a long-term process to address the problem of application.[4]

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