On Modular Interface of Emergency Logistics

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Abstract: Through the interface research of emergency logistics, the paper puts forward the assessment index of logistics interface. The design idea and method of the interface of emergency logistics are put forward. This paper analyzes the design of functional partition and physical partition, and solves the problem of modular design of emergency logistics. Finally, the future prospect of artificial intelligence in modular application is presented.

1. Introduction

Emergency logistics plays a fundamental role in solving social crisis. Standardized emergency logistics not only requires high operational efficiency, but also requires good results. Containerized emergency logistics generally has better operational efficiency, but not necessarily has better results. because the operational effect of containerization involves many levels of evaluation. this involves the scope and granularity of the study.

Containerized emergency logistics has many research dimensions, which can be studied from scale economy, scope economy and asset specificity. This kind of classification research from economics has guiding significance for the measurement of efficiency of enterprises and organizations. Similarly, for containerized emergency logistics, the use of modular strategy, can also use the above three economic analysis methods. This involves introducing a concept of module granularity. This granularity has the concept of measurement in a physical sense, as well as the concept of economies of scale. In theory, multi-dimensional research can be integrated from multiple theoretical perspectives.

2. Interface Analysis of Emergency Logistics Modularization

2.1 Modular Granularity Studies

The basic requirement of the rapidization of emergency logistics is to be able to combine each logistics unit quickly. The difficulty of this combination will affect the speed of the combination. The difficulty of the combination process is generally composed of several factors. the granularity of the modular process has good research significance. The size of granularity not only determines the speed problem of combination, but also affects the interface matching problem between modules. When the granularity of modularization becomes smaller, the combination of modules becomes more difficult. The interface between modules is more complex. The difference of interface between modules is the difficulty and key point of modular application. This paper takes the modular interface as the logical starting point to study the granularity of the module.

2.2 Modular Interface Dimensions and Assessment Metrics

Modular friendly interfaces are a key issue. Friendly interface has several aspects of the assessment indicators. The first indicator is the complexity of the interface. The second indicator is the regularity of the interface. The third indicator is the scalability of the interface. The fourth indicator is the agility of the interface. The fifth indicator is the level of intelligence of the interface. The following is a detailed analysis from these five aspects.

The first index first describes and evaluates the complexity of the module interface. The complexity of the interface mainly includes the types of business information of the interface, as well as the relevance and heterogeneity of these kinds of business information. The traffic of business information will also affect the complexity of interface interface to a certain extent, but the impact is not significant. The uniqueness and heterogeneity of business information is the main difficulty of module interface interface. this complexity leads to modular interface uncertainty and instability. The complexity of the module interface directly limits the matching with other modules, increases the difficulty of modularization, and reduces the friendliness of the modular interface. This objective difficulty needs to be addressed. The solution path is the standardization of complex modules. Simplify heterogeneous information through standardization. Another path is to modularize the super-complex interface twice to reduce the complexity of the interface. This degree of complexity can be reduced by clustering, especially accurate clustering. Of course, fuzzy clustering can also be used when accurate clustering can not be realized. Secondary modularization of modular excuse is a research direction in the future, once it is mature in theory, it can realize multi-dimensional modularization. The proposed path is also the theoretical contribution of this paper.

2.3 Matching between Modular Dimensions and Granularity of Emergency Logistics

Emergency logistics has significant characteristics relative to general logistics. These features include standardization, rapidity, interchangeability, robustness and adaptability. Among them, standardization is the basis. robustness and adaptability are external requirements.

The module has more dimensions, the module contains more information and functions, will reduce the number of modules, module granularity will become larger. Larger granularity makes the modular process simple. has the advantage of system identification for a modular system environment. Large granularity does not necessarily mean many dimensions, but multidimension means large granularity. This involves a deeper standardization of knowledge and management. The standardization level of the system determines the standardization level of the module, which directly reflects the interchangeability of the module, and indirectly supports the robustness and fault tolerance of the system. This is the development trend of emergency logistics.

Large-grained modules often have more management information, and the complexity of the order of these information is related to the dimension of the module. In general, the higher the dimension of the module, the higher the order of the information. the granularity of modularization can affect the complexity of the population. the more the number of granularity, it will make the system coupling more difficult. the coupling difficulty of the modules in the system directly affects the rapidity and robustness of the emergency system. the complexity of the coupling process has a direct effect on the matching between modules. the simpler the coupling between modules, the better the robustness of the system. the simpler the coupling between modules, the better the fault tolerance of the system. This is of great significance to the emergency function of logistics.

3. Construction Research of Emergency Logistics Modularization

3.1 Design Path of Emergency Logistics Module

The design of emergency logistics module has unique requirements. Fastness is its ultimate requirement. Standardization is its logical starting point. Standardization is not unique or immobilized. standardized applications are often associated with serialization. The combination of serialization and standardization will have practical significance. There is no serialization of standardization, is no practical use value. The serialization of emergency modules is as important as standardization. Serialization is given to standardization. Serialization is related to economies of scale and also to speed economy. The more series, the effect of economies of scale will be affected, and the matching speed between modules will be reduced. The more series, the more sensitivity and accuracy of modular construction will be improved. At this point, there is a temporary contradiction between the efficiency and effect of matching between modules. The rapid improvement of efficiency often affects the effect of modular matching.

On the basis of serialization and standardization, the emergency module designs the kernel and external interface of the module according to the distinction of function. It requires perfect kernel function and friendly external interface. These are two aspects of a functional module. The kernel design of emergency module is similar to the design requirements of ordinary module. The external interface design of emergency module is more demanding than that of ordinary module. The external interface design of emergency module embodies the characteristics of emergency function.

3.2 Study on Partition Optimization of Module Interface

Modular interfaces are key to modularization. Modular interface needs to be optimized, this optimization needs to use the idea of partition. This kind of partition optimization interface is the concrete application of standardization and serialization thought. The partition of the interface may have many methods. These methods include functional partitions and physical partitions. The author puts forward the idea that the two methods are not suitable for mixed use. The following is the study of functional partition and physical partition respectively.

Modular interfaces are often practical and are the most direct and effective partitioning methods for users. In theory, it is user-oriented interface design. This idea is the mainstream of future system design. This partition method, for the bright design, has a higher difficulty, increases the design difficulty of the module kernel. But this design improves the efficiency and effect of application. with realistic superiority. The interface design which gives the function partition involves the standardization and serialization of the interface function. Standardization of functions is a routine design process. The function standardization of the module interface of emergency logistics is also a conventional design. serialization and standardization of this function, mainly based on data characteristics.

Modular interface according to physical partition, is based on module kernel features to design module interface. This is an original partitioning method. This method is simple and reliable, but does not meet the requirements of emergency logistics.

After the above analysis, in the interface design of emergency logistics, we should first select the method of functional partition. When the functional partition method is constrained, the physical partition method is used.

4. Interface Research Trend of Emergency Logistics Modularization

The rapid development of artificial intelligence in the future will impact the design system of emergency logistics. Change may come in the coming years. The author thinks that big data and block chain will play a more important role in the functional partition of the module.

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