Simple Analysis on Large Data in the Application of Special Vehicle Life Cycle Management

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Keywords: Large Data; Special Vehicle; Life Cycle Management

Abstract. The basic concepts and the role of large data and life cycle management is briefly elaborated. The application of large data in special vehicles life cycle management is discussed from the side of optimizing the allocation of resources, carrying out the predicable maintenance, training and using personnel, scientific management, perfecting laws and regulations and system, improving design and manufacture and so on. The key problems in the application of large data are proposed such as the unified platform standard, collecting reliable data, data timely processing and sharing, ensuring the security of information, reducing the cost of data mining and so on. A useful exploration is made for the application of large data in special vehicles life cycle management, and has important economic and special benefits.

Introduction

With the number of channels of data acquisition and the development of data storage and mining technology, large data has become the current popular hot word, constantly innovation in all areas of application. Life cycle management has become the mainstream of special vehicle management. It can effectively reduce costs and improve efficiency. How to apply large data in the special vehicles life cycle management to improve the level of systematic scientific and information management has become a subject worth exploring research.

Large Data and its Role

What is called "large data"? Gartner gives such a definition: "large data" is the high rate of growth and diversification information assets which need deal with the new model to get better decision-making, insight found force and the process optimization ability. Large data has the characteristics of four of the "V", namely the Volume, Variety, Velocity, Value [1]. Large data is significantly different from traditional data application. Large data needs all data samples rather than sampling, focuses on efficiency rather than accuracy, focuses on correlation rather than causality.

The rise of large data concept is the inevitable result of the development of network information technology. Large data has been used widely in many fields, and achieved good results. It can make all kinds of services more accurate. Such as Wisdom City, Smarter Healthcare, Intelligent Transportation, Wisdom of the financial is inseparable from the support of large data. Large data can be accurate to all kinds of risk early warning, and even can predict the popularity of movies, TV shows, songs, etc. As schon berg said in "the era of large data", the core of the large data is predicted. Large data will create unprecedented quantifiable dimension for human life, and it has become a source of new inventions and new services. The U.S. government raises the strategy of "large data" for the national will, invested $200 million to pull large data related industry development. The possession and control of the data is regarded as a core national asset. A country has the size of the data, activity and the ability to use explain as an important component of the comprehensive national strength [2].

Life Cycle Management of Special Vehicles

Life cycle management appeared in the United States special in the early 1960s, mainly used for the management of special aircraft carrier, laser guided missile, advanced fighter aircraft and other high-tech weapons. Starting in the 1970s, the life cycle management concept has been widely used in transportation system, aerospace science and technology, national defense construction, energy engineering, etc [3]. A life cycle management, is starting from the long-term benefits, though a series of advanced technology and management method, each link of overall planning, construction, production, operation and decommissioning and so on, under ensuring reasonable planning, engineering quality, the production of safe and reliable operation, to promise optimal overall life cycle of the total project as the management goal.

Life cycle management of special vehicles is the application of modern management theory in the management of special vehicles, is a complete scientific management of using the system theory and system engineering method for special vehicles from birth to death the whole process of implementation. Covered the whole life cycle management needs of special vehicle demonstration, design, manufacture, use, maintenance, retired scrap process, involving integrated management of the time, assets, costs, quality, human resources, communication, risk and procurement. It pays close attention to special vehicles of reliability, maintainability, supportability, testability, security. To realize the optimal special benefit and economy benefit as the management goal.

Applications of Large Data in Special Vehicle Life Cycle Management

Although life cycle management has become the mainstream of the special vehicle management thought and practice, there's no real implementation to each concrete work. At this stage of special vehicle management is still given priority to with vulgar, sectional management, the life cycle management costs has further compression space, every stage of the technical development and personnel training is lack of overall coordination. And the prediction of large data can improve special vehicles life cycle management scientific, fine management level and management efficiency, raise the scientific nature of the decision.

Application of large data can optimize the allocation of resources. Efficiency and cost savings can be improved by Various resources flow smoothly and accurate configuration. Life cycle management goal is to be in the full cycle with minimum cost to achieve the largest value. Through fully analysis to large amounts of data at various stages, can optimize the process of special vehicle development and maintenance, optimize configuration of personnel and equipment in the process of special vehicles used. To better distribution of the stages of manpower and material resources, financial resources and other resources, with minimal resources, the quickest way to achieve the established special targets.

Application of large data can carry out timely maintenance and predict repair. Maintenance and repair of the vehicle directly affects the play of performance and length of service.At present, special vehicles usually according to the use of time and external environment change in maintenance and repair, proved to be more scientific and reasonable, but still belongs to the pattern of "one size fits all", cannot be completely accords with the actual situation of each vehicle, caused a waste of resources. Through in-depth mining all sorts of data and environmental data in the process of special vehicle use, The first can be more targeted to maintenance, can not only save manpower material resources, also can effectively reduce the failure rate. The second can realize predicting maintenance. Before the failure happens, can accurately predict the failure time and parts of each vehicle, so as to take timely effective maintenance measures, to prevent the spread of the fault, reduce the accident caused by failure. The three is to reduce the impact of special action due to the failure. Through a more scientific and reasonable configuration of using vehicles in special operations, realize special benefit and economy benefit maximization of every vehicle.

Application of large data can realize more targeted training and use of talents. In the process of special vehicles use, management and maintenance support, people's subjective initiative has always been in a dominant position, staff capability directly affects the effectiveness of special

vehicles. Therefore, to do a good job in the life cycle management, must cultivate high quality talent team. Application of large data can make the training more targeted, make people of configuration and use more scientific and reasonable. Through the analysis of the data made in the special vehicles use and personnel training, The first can find out the emphasis and difficulty in the technology, use and maintenance of the different vehicle models, strengthen training pertinence. The second can find out demand characteristics of the staff for different vehicle models, provide strong support in choosing and employing persons. The third can find out the law of personnel training, thus more rigorous training organization, more accurate evaluation of the training objects and training effect.

Application of large data can promote scientific and fine management level. Management of special vehicles and their using and maintaining personnel, is to realize the goal of "Make and develop people ". Through the analysis of the data of vehicles and using personnel, the first can optimize a management process, reduce the use and maintenance. The second can keep vehicles reliable operation and prolong the service life of vehicles. The third can accurate optimize vehicles and personnel, improve the ability of carring out special tasks. The fourth can find accident signs early, effectively prevent accidents.

Application of large data can perfect various regulations and systems and standards. Through the analysis of the vehicle status data, people's behavior data and accident data, can find out the blind spots and weak links of using management and maintenance management, and further improve the relevant laws and institutions. Through analyzing and mining the data of operation and maintenance, can be further optimized maintenance time, organization and resource allocation, improve various standards and specifications of the maintenance management.

Application of large data can improve the design and manufacture of new vehicles. Through the analysis of vehicles' use and maintenance data, provide data support for the design and manufacture of the new vehicle. The first can improve the overall performance of the new vehicles, especially intelligent level. The second can improve the maintainability of vehicles, improve the convenience of maintenance and vehicle test, save maintenance resources. The third can improve the reliability of the vehicle, reduce the failure rate. At the same time the design of vehicle is more intensive and optimized. The fourth can make man-machine ring be more harmonious, increase the convenience of operation and riding comfort.

Key Problems Need to be Solved of Large Data Application in the Special Vehicles Life Cycle Management

To bear in mind the total situation and to complete the top-level design. The full life cycle of special vehicles involves many departments and units. And the top-level design needs to be strengthened. First, to unite a thought and complete the system design, make the army and special enterprises in a same game of chess, and avoid the formation of barriers. Second, to unify organization and complete the overall coordination, allocate the manpower and material resources and financial resources reasonable, maximize the benefits. Third, to unify the planning, determine the immediate and long-term goals, complete the correlation policies and to supervising and implement.

To unify the platform and data and standards and to develop life cycle management system software of special vehicle. The information network of the army special vehicles full life-cycle management should be established and perfected, and the life-cycle management system software should be developed for full life information tracking about special vehicles. First, the development, the design and improvement condition of special vehicle can be grasped in time. Second, the detection and inspection condition of special vehicle production and quality can be known. Third, the distribution, use and maintenance information of special vehicle can be grasped in good time, the reliability and failure rate of special vehicle can even be calculated what is used for real-time monitoring of special vehicles.

To hold the entrance strictly and to guarantee the authenticity and timeliness of data acquisition. Reliable data is the foundation of effective data analysis, and is the premise to educe a guidable

conclusion. Human disturbance can be reduced and the authenticity of the data will be improved by the Internet of Things technology. The awareness technology which is based on sensor technology and fingerprint identification technology and coordinate positioning technology is the foundation of the Internet of Things. Various sensors of special vehicles can measure and record the information at any time such as position, motion, vibration, temperature, humidity and the change of the chemical substances in the air. Through a series of wearable equipment, personnel information such as physiology and behavior can be obtained. To establish connectivity big Internet system can realize all kinds of real time data collection.

To process and share data timely and efficiently. Timely and efficient data processing is very important, and data will lose its significance if processing slowly or not because of its large number. Building distributed processing system and making full use of the personal computer computing resources can realize large data mining and analyzing without supercomputers. Data sharing can improve the utilization rate of the data and give full play to the benefit of the data. To storage different kinds of data to cloud computing terminal centrally and in time can save resources effectively and improve efficiency which can be used for users to download and analyze and use.

To ensure the safety of data storage. Data security is very important. The data security mainly includes two aspects of security. One is data leaked, especially stolen by enemy, which will bring enormous threat to the state and the consequence is unimaginable. The other is data destroyed, which is caused by natural disasters or accidents. Therefore, in addition to strengthen the safety protection, data is respectively stored by classification. The loss of data were leaked can be reduced in a certain extent. Data destruction will be effectively prevented by the data long-distance backup storage.

To dig valuable data information with a low cost method. Strategic significance of large data does not lie in mastering huge data information, but in specialized processing these meaning data contained, implementing the data value. The value of data contained and the mining cost of data is more important than the number. Therefore, to develop the analysis and mining technology of data, to achieve to mine the information with high application value with low economic cost and time cost, will be able to greatly improve the efficiency of the large data applications.

Conclusion

Challenges and opportunities coexist in large data era. The life cycle management thought has been attached great importance to in the management of special vehicles. But it isn't carried out well actually because of the restriction of some objective factors. Using large data correctly can achieve the innovation of the research methods, design methods, manufacturing process, using management, maintenance management and so on, and can further coordinate overall cost, technology, talent resources, etc. Large data widely used in the life cycle management of special vehicles will lead to the total life cycle cost further reduced, each stage of technological development more coordinated, and personnel configuration of each position more reasonable. Efficiency of special vehicles will be brought into play greatly. The maximization of special and economic benefits will be realized.

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