

# Exploration of Data Science Construction in Big Data Environment

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**Abstract:** With the development of science and information, building an informatized army in a big data environment and building military data science has become the strategic goal of China's military construction. To realize this goal, it is necessary to obtain the data advantage. As a result, the level of military data science construction has become an important symbol to measure the capacity of military informatization. For this reason, the article puts forward the idea of constructing the basic theoretical framework of military data science from three perspectives in view of the necessity of carrying out the exploration of military data science construction under the big data environment.

**Keywords:** Big data; Military data; Science building

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Facing the trend of change in information technology, our military construction must make good use of data to speak. Therefore, in this new period, for how to extract data more effectively, a new discipline, namely, data science, has emerged, and its emergence has attracted a certain amount of attention in the academic community as well as other industrial circles.

## 1. The necessity of military data science construction inquiry in the big data environment

### 1.1 Current work needs cannot be met

Under the new era of big environment data, intelligence science and data science have begun to integrate and develop. The previous knowledge structure framework of intelligence science cannot be satisfied for the current military work. To some extent, intelligence and data science still have some common ground, both are the study of information and data, and integrate valuable information. However, intelligence science emphasizes "speaking with data" and data science emphasizes "letting data speak", the former is to make certain adjustments to the disordered data, the latter is to reduce people's empirical methods, use data to dig out the desired answers and relationships, and more objectively Understand the actual situation of things. In the face of the current situation, it is necessary to introduce data science related theories and technologies to promote the overall development of<sup>[1]</sup>.

### 1.2 Data science does not meet the special needs of military data work

Data science is not the same as big data, but it is also a little bit similar. With the research done in recent years, data science has become a separate discipline and has gained popularity. There are more and more books, research organizations, etc. related to data science. Due to the military data work there are certain special needs, so data science can not meet the following aspects: First, the object of research is different, military data is mainly studied, analyzed military data, confrontational, high confidentiality requirements, the need for specific theoretical guidance. Second, the working environment is not the same, military data need to take into account the special scenarios of data processing and application. Third, the theoretical focus is also different, military data also need to focus on practical elements and value elements. Fourth, military data work has its own special needs. Existing algorithms and models, in the absence of application scenarios, the data can not play its own value. Since the scenarios of military activities are different from those of general scenarios, military data work should be carried out under the guidance of relevant theories.

## 2. Exploring the construction of military data science with "three perspectives" in the big data environment

The so-called "three perspectives" are elements, processes, and values. Data science in which the relevant works are mainly to describe the technology and methodology, rarely from the theoretical structure. To build military data science, the core task is to integrate the current

military data work in China, but also military data theory and methodology research and construction, so as to establish a theoretical framework to improve the scientific and efficient military data work<sup>[2]</sup>. For this reason, this article breaks the practice of data science with workflow to discuss, and proposes three perspectives to build the basic theory of military data science, as follows:

### **2.1 Military data science grounded theory from an elemental perspective**

This perspective on conducting military data science grounded theory is discussed in terms of the static components associated with military data science activities. Essentially, military data science is a way of extracting useful data from military big data based on scientific methods, processes, and algorithms. In this process, it is aimed at providing data services to the needy users. And to obtain certain information from the data, there are many points included in this series of activities. The most important of them are demand, resources, technology, standards and products. In other words, grounded theory under the elemental perspective is a description of the above points to form a whole.

Among them, demand plays a guiding role, military data demand is the starting point for constructing the data system, which is the basis for subsequent research. Data also has an irreplaceable role, military data resources are from the perspective of the data to describe the military, determine the military data processing process, elements and other relationships, to provide data to different levels of personnel, build a bridge between the military business and data. Technology is the core, there is an important role, it is the military data science, the focus of the relevant personnel to explore the issue, mainly is the military data management and application, as well as other technologies combined into a technical whole with many functions. In fact, military data science is the use of relevant technologies to achieve data analysis, modeling, and ultimately realize the full value of the data. Standard is the foundation and guarantee, and for the construction of military informatization and intelligence, the standardization of military data is the fundamental work. In the construction of military data science theory, this is the core and focus as well as the key to realizing the value of data. The final presentation of military data science activities is military data products.

### **2.2 Military data science grounded theory from a process perspective**

This session is an exploration based on the key stages of the military data lifecycle process. The goal of military data science is to study military data, and to use data statistics and machine learning as the theoretical basis, and then carry out data processing, analysis and other activities. It can be considered that military data science not only to design static elements, but also need to use some technology to revitalize military data, from which valuable and meaningful data can be mined. The whole process is the whole life process of military data under the guidance of military data theory<sup>[3]</sup>.

This stage can also be effectively decomposed, and after decomposition are the stages of sensing and acquiring military data, integrating and saving military data, organizing military data, effectively analyzing military data, visualizing military data, and developing military data products. The first stage of perception and acquisition is to solve the problem of the source of data and is the beginning of a series of activities. The second stage mainly addresses the organization and preservation of data. The third stage of organizing is to address the quality of the data. The effective analysis stage is to solve the problem of increasing the value of military data by using appropriate statistical as well as analytical methods, etc., and to work on developing other functions of military data. Military data visualization is mainly used to solve the problem of the final presentation of military data, and it is an important form of presentation<sup>[4]</sup>.

### **2.3 Military data science grounded theory from a value perspective**

This process is mainly discussed from the main application scenarios of military data. In summary, military data science is a science of realizing the value of data. Since every military activity generates a large amount of data in the process, data is also the core resource of the military sector. But in the past situation, data is just a resource and does not create value. But in fact, if the data can bring certain military benefits, it also has value and significance. Therefore, the essence of military data science is to take military data as the basis and object of inquiry, and to devote itself to realizing the value of military data. If the data all-round begins to integrate into the military field, it can become an important strategic resource. Therefore, the basic theory of military data science under the value perspective is to clarify the driving role of

military data in all aspects.

### 3. Conclusion

In conclusion, in the context of the big data era, military data science construction is an important part of China's military informatization construction. Relevant staff need to adjust China's informationization construction based on the latest development of big data technology, strengthen the innovation of data science construction, and commit to promoting the comprehensive development of military data science construction.

### References

- [1] Tang Shanhong, You Hongliang, Gao Qiang, et al. Reflection on Promoting Military Data Science Construction in the Big Data Environment [J]. *Intelligence Theory and Practice*, 2022, 45 (7): 5.
- [2] Tao Wan, Shi Jianguo. Exploration of the Construction of Data Science and Big Data Technology Majors in Ordinary Local Universities - Taking Anhui Engineering University as an Example [J]. *Journal of Huanggang Normal University*, 2018, 38 (6): 4.
- [3] Gao Jie. Exploration of Digital Library Data Resource Construction in the Big Data Environment: A Survey and Analysis Based on the National Science and Technology Digital Library [J]. *China Basic Science*, 2018, 020 (003): 53-57.
- [4] Liu Jingtao, Lin Zhiwen, Liu Chao. Research and Reflection on Military Big Data Construction [J] [2023-12-15].