

# Research on the Development of Scientific Management Decision Supported by Enterprise Production Data

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**Abstract:** Under the trend of digital transformation, the enterprise information architecture is undergoing the transformation and upgrading of Internet. Because the information platform of traditional systems can not fully meet the needs of digital transformation, enterprises can build a new generation of digital platform processes that are data-driven, can be widely connected and connected, can be flexibly assembled, and can quickly build fast iterations, to adapt to the operation, interaction and integration of the real world and the digital twin world in the future, and creatively meet the business needs of enterprises in different scenarios when making decisions by processing data Management, ecological construction and other comprehensive needs.

**Keywords:** Digital Transformation; Enterprise Information; Platform; Administration; Ecological Construction

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## Introduction

The Internet of Things is the premise of realizing the digital twin and the metauniverse. Only when everything in the real world can be visualized in the virtual world based on digital means can digital twins and the metauniverse be realized.

### 1. Current situation of enterprise data management

The concept of data management was born and developed with the application of database technology in various industries in the 1980s. The goal is to store and access data in computer systems more effectively. In the process of development and evolution, data management has formed a number of core management functions, including data quality, data security, data standards, data interoperability, data sharing and circulation, to achieve the availability and ease of use of data in a systematic way, so as to better play the value of data.

#### 1.1 The implementation of industrial enterprise data management lags behind

The importance and understanding of data by enterprises is the premise of data management. With the popularization of information technology in industrial enterprises and the rapid development of the industrial Internet, industrial enterprises are gradually improving their understanding of the importance of data management, but the actual implementation is worrying. According to the survey, 98.6% of enterprises think that data management is worth investing, and 77% of them believe that data management is important and that data management is a long-term process and will bring value to enterprises.

#### 1.2 Industrial data centralization introduces new security risks

With the massive use of sensors and the data collection brought by cloud computing, big data and other emerging technologies, industrial data and applications are showing a rapid growth trend, and the storage and management of enterprise data is facing new challenges. When industrial enterprises choose to deploy industrial Internet platforms or cloud service providers locally for data and business hosting, the first consideration is cost and security. According to 2018 statistics, reducing infrastructure investment and meeting the demand for rapid expansion of resources are important reasons for enterprises to choose public cloud, but the biggest concern is still the security of public cloud;

### **1.3 Strong demand for industrial data circulation but great resistance**

The value of industrial Internet is reflected in the sharing of data across fields and industries. With the development of data application demand and big data technology, the demand of industrial enterprises for data cooperation has increased significantly. According to the survey, more than half of enterprises said they needed to use external data or provide external data. The growth of data flow demand will bring many problems and challenges, such as data quality, data pricing and data flow compliance. The research on data circulation at home and abroad has been accumulated for a period of time.

## **2. It is necessary to establish a three-layer basic architecture necessary for the digitalization of the capability layer**

### **2.1 Top technical capability**

Decision analysis capability: realize scientific decision-making driven by data, transparent assumptions, automation, and predictable results, and realize automatic decision-making in some clear and clear scenarios. Precise planning accurately controls the production process in terms of production management, and comprehensive budget management realizes the refined management of the company's budget funds. Monitoring and early warning capability: monitor the whole process of business operation in real time, find abnormal situations in time and give early warning.

### **2.2 Technical capabilities of the middle tier**

Data processing capability: the system can identify, collect, analyze and evaluate information and data, and use the data processing results to solve practical problems. AI capabilities: The core capabilities of AI can be divided into three levels, namely computational intelligence, perceptual intelligence and cognitive intelligence. Online communication ability: people and machines can realize online communication based on the system, and cooperate with each other at multiple intelligent levels such as perception, analysis, reasoning, learning and decision-making.

### **2.3 Underlying technical capabilities**

Object modeling capability: realized through metadata management. Metadata, as the lowest level atomic data object, supports the basic management ability of metadata. At the same time, metadata itself is the basic data dependency for establishing data entities. It can build multi-level data entities by associating multiple metadata. In the digital system, the land code platform develops innovative applications to expand ERP, forming a highly cohesive and low-coupling system, providing a strong technical entry for the integration and migration of traditional ERP and new technology systems.

## **3. Improve management decision-making through BI**

The value of BI is mainly to provide management basis and improve management level, that is, first to see data, see accurate data, see real-time data, and then find problems based on data, insight into the future, so as to improve problems, make scientific decisions, and improve the management level of managers. The data-driven decision-making management mode emphasized by BI can foster the thinking and atmosphere of data management for enterprises, and make the digital transformation of enterprises not only stay at the technical level, but spread to the enterprise strategy and organizational culture, and help the digital transformation succeed.

## **4. Open up the enterprise data analysis section and sublimate the data value**

### **Generally speaking, the manufacturing data of an enterprise's factory is mainly divided into the following categories: static data**

Such data usually does not change, such as material information, product name and personnel information; Dynamic data. This kind of information will change with the manufacturing process, which belongs to the content that must be collected in a timely manner, such as processing conditions, planned progress, etc; so that the business systems that were originally reported by a single department but could not form a whole in series can be aggregated and analyzed, such as ERP, CRM, OA, MES, etc., to promote the transformation of enterprise management mode and the improvement of management level. The cloud chart uses an intuitive kanban to

display the overall business dynamics of the enterprise, without the need for multiple people to report, without the need for technical barriers, to help the decision makers easily understand the data, and to sublimate the value of the data to provide more scientific and accurate reference basis for the optimization and transformation of the enterprise's business, process, and organization, thus promoting and accelerating the process of digital transformation of the enterprise.

## **5. Nurture data management thinking and realize digital transformation**

The cloud chart can help managers build the data templates required by the enterprise according to the operating conditions, so as to predict and make decisions on the generated data, and then control various organizational links, providing an efficient and closed-loop operation monitoring platform for the company's strategic implementation, financial control, production planning, marketing analysis, and human management. form a certain incentive mechanism and improve the management level.

### **5.1 Management requirements**

The intelligent management system must carry out all-round control over the working conditions of the NC equipment in the production process of the enterprise, carefully collect the data information during processing, and then share the application with the enterprise resource planning system. Generally speaking, the functional requirements of the management system are mainly reflected in the following points: First, effectively connecting the computer platform and the workshop CNC equipment will help improve the management level of manufacturing enterprises in the production of CNC equipment;

### **5.2 Overall architecture of data acquisition and intelligent management system**

When designing the data acquisition system, we should combine the distributed acquisition and centralized management to carry out practical work. This can not only better handle different types of CNC machines, but also provide shared information for employees at all posts. The collection system mainly receives different types of equipment data and stores them in the data system.

### **5.3 Data transmission and storage**

It provides a platform for the information transmission between the workshop level and the management level, which can not only deal with the problem of information exchange, but also ensure the system operation efficiency. By connecting the former and the workshop layer, and combining industrial Ethernet to build a communication network platform for the manufacturing workshop, and storing the collected data into the data system after effective processing, it is helpful to provide effective basis for the management.

## **Conclusion**

End To sum up, in the face of various problems emerging from the enterprise's production decision-making management, the construction of data acquisition and intelligent management system architecture can not only break through the constraints of traditional management mode, but also improve the actual production and processing level. Therefore, in the new era, all industries must strengthen the exploration of digital production work, pay attention to the combination of previous work experience and scientific reference to modern technology concepts.

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