

# Discussion on Information Management of Project Management and Informationization of Human Resource Management under Network Economy

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**Abstract:** With the rapid development of science and technology, our life is increasingly inseparable from the network. With the network, we can buy any desired products without leaving home. The Internet is not just a global network of public information, it is also a manifestation of the network economy. The Internet economy is a new economy derived from the 21st century, which is closely related to our lives. The 21st century is an information age. In recent years, China has continuously increased its engineering construction, and the demand for project management has also increased. For modern engineering projects, information management is an inevitable trend of development. Whether it can realize the informationization of management determines the overall management level of engineering projects. In addition, in the face of fierce market competition, it is extremely urgent for managers to further improve their management and human resources management. Based on this, this paper first analyzes the development trend of network economy, then expounds the informationization of engineering project management, and finally analyzes the relevant content of human resource management informationization.

## 1. Introduction

The network economy is a new economic form based on computer networks and modern information technology. It not only refers to the rise and rapid growth of the computer-based information technology industry, but also the rise and rapid development of the entire high-tech industry based on modern computer technology [1]. In the 21st century, with the advent of the information age, engineering project management will surely move toward information management, and the core competitiveness of project management is increasingly dependent on information technology. Only by making full use of high-tech information technology including information technology to promote project management informationization, can we enhance project management capabilities and technical means, enhance competitiveness, achieve leap-forward development, and integrate with the international construction industry [2]. In the 1990s, the theory of human resource management continued to develop and mature. People are more concerned about how human resource management can serve the strategic needs of enterprises, and how the role of human resources departments can be transformed into strategic partnerships for business management [3]. The formulation and development of the strategic human resource management theory marks the modern human resource management stepping into a new stage.

## 2. The Development Trend of The Network Economy

We say that the network economy represents the trend of future economic development, not only because it has created a 10-year high growth miracle in the US economy, but more importantly because it has built a new technology platform for real economic growth, providing an efficient tool for turning information resources into economic benefits and creates a global business environment. Using advanced computer technology, computer automation, computer-aided design, computer-aided manufacturing, and computer integrated manufacturing can be automated to automate production, thereby greatly increasing production efficiency and minimizing the marginal cost of personalized small-volume production. People can use the developed computer network to

achieve rapid information transfer and resource sharing, so as to make full use of various information resources to serve decision-making, and greatly accelerate the transformation of high-tech to real productivity, and transform information resources into real economy resources; Through a global market that is connected by computer networks, people can implement a truly global business strategy, optimize global resource allocation, improve the efficiency of economic resource utilization throughout the human society, and promote the growth of the entire world economy. It can be seen that the true value of the network economy is not only how much tangible wealth and profit it can produce immediately, but more importantly, it creates a new social and economic form that provides the social development capability and economic creativity of all members of society. A platform that enables all industries to be built at a new starting point, making it possible for companies to achieve rapid accumulation and leapfrogging of wealth.

### **3. Introduction To Project Management Informationization**

#### **3.1. Project Management**

Project management refers to the process of planning, organizing, directing, coordinating and controlling the project under certain constraints to achieve the project objectives (to achieve the required quality within the specified time and budget costs).

#### **3.2. Information Definition**

Informatization refers to the use of information networks as a vehicle for project information exchange, so that the speed of information exchange can be greatly accelerated, the burden of daily management of project participants can be reduced, and the speed of information feedback and system response in the project management system can be accelerated, so that people can query the project in time. The information on the progress, in order to find problems in a timely manner, make timely decisions, improve work efficiency, and promote the process of continuous improvement of the management level of construction projects.

#### **3.3. Informational Content**

(1) Document and data management informationization: With the project, the whole life cycle as the object, all information is paperless, and a database for storing all engineering information is established, which is convenient for sharing and utilizing, and establishing a knowledge base closely related to the project (including expert library) for easy sharing and utilization.

(2) Informatization of information communication: Establish an Internet-based management information system, so that all parties involved in the project can use the network and electronic media to submit and receive information, and establish an exchange and collaboration platform so that all parties involved in the project can be remotely communicating, solve problems in time, build e-commerce website for construction industry, establish database of materials and equipment, reduce procurement cost and management cost through online inquiry, bidding and ordering, and provide new space for owners to optimize materials and equipment.

(3) Process control informationization: establish real-time monitoring system, realize remote expert consultation, remote control command engineering site, establish scientific pre-control system, and predict the next step in the process of project management, based on the current situation and experience, through a series of calculations. Possible problems will enable the participating parties to adjust the plan in time to avoid serious losses.

### **4. Analysis of The Status Quo of Information Management of Engineering Projects**

In recent years, the application of information technology in project management has been greatly developed. Some large enterprises have established information networks as an indispensable tool for information exchange and management of construction projects. Some enterprises have developed and applied construction project management information systems, and

a few engineering projects have applied monitoring and automatic control technologies. More enterprises have used various professional software in construction project management, such as construction project bidding, quotation software, schedule management software, contract management software, material management software, etc. The application of information technology in construction project management is mainly reflected in the following aspects:

(1) Application based on Internet database technology: application of database such as Oracle, DB2, etc., development and construction project management information system, effective storage of massive information generated during the progress of the project, including text, graphic documents and sound and video materials and quick queries.

(2) Application of Project Information Portal (PIP): PIP provides most of the information needed for project life-cycle management, such as project coding, authority management, expense management, schedule management, etc., quality management, etc.

(3) Application of automatic control technology: quantify the influencing factors of construction project cost, schedule and quality, organically combine system behavior and morphology, mathematical model and physical model and its spatio-temporal performance model, establish system simulation model and solve, corrective correction is performed then to achieve effective control of engineering construction goals.

(4) Application of advanced monitoring system: The camera monitoring system is used to cover the entire construction site to monitor the safety of the construction site and firefighting, which not only reduces the management difficulty of the construction site, but also improves the project management efficiency.

(5) Application of virtual reality (VR) technology: Applying virtual reality technology can establish a multi-dimensional information-aware model of engineering projects, and create specific working methods and environments to solve engineering project management that requires a lot of manpower, financial resources and energy to solve problem. The application of virtual reality technology enables engineering project managers to acquire an advanced tool for understanding the world and transforming the world.

## **5. Engineering Project Information Management Content and Requirements**

### **5.1. Contents of Project Project Information Management**

#### **(1) Document and data management informationization**

1) The entire life cycle of the project is targeted, and all information is paperless. 2) Establish a database that stores all engineering information for easy sharing and utilization. 3) Establish a knowledge base (including expert database) closely related to the project, which is easy to share and utilize.

#### **(2) Information communication informationization**

1) Establish an Internet-based management information system, so that all parties involved in the project can use the network and electronic media to submit and receive information. 2) Establish an exchange and collaboration platform so that all parties involved in the project can communicate remotely and solve problems in a timely manner. 3) Building an e-commerce website for the construction industry, establishing a database of materials and equipment, reducing procurement costs and management costs through online inquiry, bidding, and ordering, and providing the owner with a new space for material and equipment optimization.

#### **(3) Process control informationization**

1) Establish a real-time monitoring system to realize remote expert consultation and remote control command engineering site. 2) Establish a scientific pre-control system. In the process of project management, based on the status quo and experience, through a series of calculations, predict the next possible problems, so that the parties involved in the construction can adjust the plan in time to avoid serious losses.

## **5.2. Requirements For Information Management Of Engineering Projects**

(1) Business. In the process of information management, the computer as an auxiliary tool must play its role, effectively integrate the actual business, and carry out the informationized business management in combination with the management mode.

(2) Electronic. To implement information management, a database must be established to store relevant engineering data, while engineering drawings and project documents are produced through relevant software. For traditional paper documents, electronically save them by scanning, and improve the informationization level of engineering management.

(3) Networking. In engineering management, you must rely on the network environment to achieve information management. Data sharing and information communication can be realized by means of network environment and network conditions. Through computer hardware, build network work, as an information management carrier, implement information management of engineering projects.

(4) Standardization. The standardized management of the project bus company not only regulates the workflow, but also regulates the input of system information. For messy data, the computer cannot handle it.

## **6. Engineering Project Management Information Development Solution**

### **6.1. Increase Investment In Infrastructure**

Strengthening the construction of infrastructure is the basis for realizing the informationization of project management. In the process of information management of engineering project management, infrastructure is the carrier of informationization. The investment depends mainly on the profitability of each participating unit. In the cost accounting, the cost of information infrastructure should be considered to guide the investment of private funds, expand the investment power of third parties.

### **6.2. Vigorously Cultivate Interdisciplinary Information Technology Talents**

Information technology, like other industries, requires its people to have some of the most basic technical skills, such as computer technology skills, database technology skills, multimedia technology skills, etc., which are necessary for information processing. Therefore, through the establishment of training bases, training courses, increase the corresponding content of university education, online training, knowledge popularization and other forms, popularize the construction of information technology talents. In addition, information technology talents must have the basic qualities of comprehensive comparison and flexible use. Only in this way can we adapt and meet the needs of continuous development and change, and provide people with high-quality information services.

### **6.3. Strengthening The Application Research Of Project Management Information Technology**

Strengthening the application research of project management information technology, especially the research of key technologies, is the key to realize the informationization of engineering project management. In the process of engineering project management informationization, information management technologies such as voice recognition technology, edi, and mis systems can be used for project management. For example, when managing the cost of the project, the edi system can be used to manage the materials used in the purchase of the project, reducing the use of paper documents such as various bills, documents, and reports, and the resulting large amount of manual processing; Avoiding errors caused by repeated multiple input of the same data in paper file processing, effectively increasing the cost of the project.

#### **6.4. Strengthen The Information Awareness Of Project Management Personnel**

Improving information awareness is a guarantee for doing information work. For those who have a weak information concept, increase the publicity and education on the significance and role of the construction industry informatization, and prove that informationization is to optimize resource allocation, improve project investment efficiency, reduce errors and waste, improve management level, and achieve the inevitable choice for sustainable development. In the management process, the information system is used to store engineering documents, and information technology is used for quality control, schedule control and investment control, and informationization is actively promoted, so that all participants, especially the owners, feel and recognize the importance of informationization.

### **7. Information Management Model of Engineering Project Based on Bim Technology**

#### **7.1. The Implementation Of The Central Database With Bim As The Hub Provides a Platform For Collaborative Communication Between The Parties**

From the information management model of engineering projects based on bim technology, we can know that the bim central database not only removes the drawbacks of the “professional collision” that exists in the traditional information management mode, but also increases the difficulty of construction. More importantly, the resources and data of each integration stage are effectively linked, and the extremely complicated project information is represented in a digital way through intelligent and parameterized means. In the integration of key indicators, it also effectively solves the problem that the engineering quantity calculation in the traditional information management mode can not lead to the “misalignment” of the project cost, and realizes the model of the engineering entity through the three-dimensional or four-dimensional mode.

#### **7.2. Central Database With Bim As The Hub To Effectively Meet The Information Sharing Needs Of All Parties Involved In The Project**

In the process of traditional engineering project information management, due to the lack of a powerful information sharing and communication platform, the unfavorable situation of individual administration often occurs during the construction of the project, which brings many hidden dangers to the construction of the construction project. The creation of the project management model based on bim technology effectively integrates every process, every profession, every key indicator, every organization, every project and other information in the whole life cycle of engineering project management. So that the "members" in the project are no longer "isolated" from each other, each member can smoothly realize the interactive sharing in the bim information platform to meet the information needs of each member.

#### **7.3. Project Management Mode Based On Bim Technology Can Realize Dynamic Control Of The Entire Project**

Based on the realization of the information management mode of engineering project under bim technology, it can optimize the coordination between the professional in the traditional drawing design, and the energy saving and emission reduction problems, construction progress, engineering cost control, etc. The important parameter data or information involved in construction safety management and pipeline collision problems can also be simulated management to ensure dynamic control management of the entire project. In turn, the quality, work efficiency and scientific management level of engineering design, construction and maintenance management are improved, reflecting the dynamic optimization of information on engineering project services.

## **8. The Role of Human Resources Management Informationization**

### **8.1. Improve The Efficiency Of The Human Resources Management Department**

The main tasks of the human resources management department now include: the calculation and distribution of employee salaries, the specific time schedule for vacations, and the management of employee personal information. This kind of work information is large, complicated and cumbersome, which greatly affects the work efficiency of human resources management departments. The application of information technology in human resource management will greatly improve the completion efficiency of such work.

Through the management of enterprise information, the management of employees' compensation, holidays and personal information is managed scientifically and uniformly by the information system, which can carry out manpower management work faster and more accurately.

### **8.2. Effectively Reduce Management Costs**

The introduction of information management in enterprise human resource management can make the training of employees more convenient and save. In the past, it was necessary to go to the field to participate in the training courses and participate in the network, which not only saved the training costs, but also saved the transportation for the enterprise. cost. In terms of performance appraisal, foreign employees can submit their personal performance through the online information system, avoiding the trouble of going back and forth. According to statistics, after the implementation of human resources management informationization, employees' telephone enquiries can be reduced by 75%. After implementing the employee self-service system, Ericsson saved more than \$1 million in the first year, and Cisco saved \$24 million a year through the e-learning system.

### **8.3. Provide Various Forms Of Self-Service**

With the implementation of information management, the employee's personal work information can be displayed in front of the enterprise manager, which provides an important basis for the company's managers to make correct personnel adjustment decisions. For example, promotion, adjustment, rewards, etc.; and ordinary employees can learn about the real-time dynamics of the company through the network, care about the development trend of the enterprise, and also provide suggestions for the company and increase the interaction between employees and enterprises.

## **9. The Status Quo And Existing Problems of Human Resource Management Informationization In Chinese Enterprises**

### **9.1. Human Resource Management Informationization Lack of Manager Support And Capital Investment**

In the business of capital, technology, market and talent and many other elements of business, human resource management is the most ambiguous. Many enterprises often regard human resources as a kind of cost. Enterprises pay less attention to the informationization of human resources management and do not pay attention to the long-term effect system construction. Whether to develop or purchase software products is a major investment. Some enterprises, especially small and poorly-performing enterprises, have difficulty investing huge amounts of money in the construction of human resources management information.

### **9.2. The Foundation Of Human Resources Management Informationization In Chinese Enterprises Is Weak**

Many Chinese enterprises pay attention to the business level of human resources management, and simply change the traditional personnel administration department into the human resources management department. This makes many enterprises in China still in the basic stage of human resource development and management. Some companies have low computer penetration rates.

Although it has been widely used in computers, server performance, network status is imperfect, and many problems are in the implementation process. The basic work of human resources management in many enterprises is not enough, the management process is not smooth, the standards are lacking, the information misleading phenomenon is serious, the information integration is not high, and there is no widely used human resource data. Enterprises in the relatively harsh environment and poor management level, limited domestic enterprises, human resources management informationization has a long way to go.

### **9.3. Human Resource Managers Have Lower Application Capabilities**

A prominent problem in the human resources management of Chinese enterprises is the general application ability in human resource management. The implementation of enterprise human resources management information, the application ability of human resource management managers faces enormous challenges. According to the survey data of China's enterprise human resources management informationization status, more than half of the surveys of human resources management and application capabilities in China have more than half of the respondents' application ability, that is, they are proficient in office software operation capabilities.

## **10. The Basic Strategy of Promoting The Informationization of Human Resources Management In Chinese Enterprises**

### **10.1. Leaders Must Recognize The Urgency and Necessity of Human Resources Management Informationization**

On the one hand, we must thoroughly update our concepts, establish modern concepts and advance awareness, and fully understand the new trend of human resources management informationization development. We cannot think that human resources management informationization does not matter. On the other hand, as a senior leader, we must actively participate in the design, planning and implementation process of human resources information management. Strengthen policy propaganda, participate in the design and planning of human resources management information system, and carry out the smooth implementation of human resources management informationization.

### **10.2. Basic Management of The Standard, Creating Conditions For Enterprises To Implement Human Resource Management Informationization**

Improving the management level of enterprises depends on efforts to standardize the basic management work. According to standardized management, it is the informationization condition for enterprise human resources management. The management of the specification mainly includes: First, basic data management. If the employee's resume, attendance, and salary should be accurate; the second is the basic business process design and management of commercial transactions, mainly the internal business procedures of the human resources management department. If the employee's recruitment, interview notification work training, in accordance with the prescribed procedures; third, internal control and its implementation process management; fourth, work and employee behavior management.

### **10.3. High Human Resource Manager's IT Application Ability and Staff Quality**

To make the human resources management information system run smoothly, it also depends on the improvement of the quality of employees. The implementation and application of human resources management information systems, in particular, managers at all levels of the enterprise need to make more creative decisions. While enterprises enjoy the government's support policies, employees should be given appropriate education and training to help employees change their mindset and adapt to the organization's goals. Let the company's employees accept the education and training of the new economy, new ideas, new theories, help them adapt to the ever-changing

system, and promote the development of application human resources management information systems.

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