Application of Computer Artificial Intelligence and Information Technology In Industry Automation

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Abstract. Artificial intelligence (AI) has greatly changed people's lifestyles and habits, and has been widely used in life. AI is widely used in computer network technology, which accelerates the development of computer network technology. In order to make quick and scientific decisions on enterprise problems according to information, optimize enterprise resource allocation and improve enterprise core competitiveness, this paper puts forward the types and general situation of real-time software platform for enterprise automation and informatization and the core technologies of real-time software platform for enterprise automation and informatization according to the problems existing in the development of computer AI. So as to further research in related fields, make its role play effectively, and promote the stable development of modern society. This scheme makes effective use of all kinds of information in the office of enterprises, and arranges, processes, processes and feeds back all kinds of information in time, so as to facilitate the sharing and exchange of business information of enterprises. Systematic research on the theory and technology of real-time database under the network environment requires a lot of work, not only in theory, but more importantly, the theoretical results can stand the test of practice.

Keywords: Computer; Artificial Intelligence Information Technology; Enterprise Automation.

1. Introduction

Computer technology has made great progress in the context of continuous social and economic development. Modern technology plays an important role in people’s daily life and work. It is becoming more and more important in people’s lives. At the same time, people’s requirements for the level of science and technology are gradually increasing. In the process of modern technology development, AI technology has gradually become the main development direction, and AI technology has gradually been applied to all walks of life in society, and its technology has gradually changed people's daily life [1]. With the progress of the times and the development of society, the requirements of all walks of life for computer technology are constantly improving. In the past, computer technology was mainly used in numerical calculation and data statistics. With the proposal of intelligent concept, computer AI technology has attracted more attention, especially in service industries, Mature computer AI technology greatly reduces the workload of relevant personnel and brings convenience to people's
life. However, everything has its advantages and disadvantages. There are many problems in the application of computer AI technology, which need the attention of relevant technicians [2].

In today's society, the trend of world economic globalization has led to fierce competition in the world market. At the same time, the urgency of resources and environmental protection issues has put forward higher and higher requirements for industrial production. These push the process industry to continuously pursue advanced control and optimization, make full use of information and computer technology, and enable enterprises to continuously enhance their adaptability to the market, and organize and adjust production in time according to market needs [3]. To fully tap the production potential, improve efficiency, reduce consumption, protect the environment and other goals, it is urgent to realize the overall optimization of production process and business process [4]. In recent years, high-reliability, intelligent instrumentation and control system, fieldbus network control system (FCS) have been adopted. Develop advanced process control technology. Realize online optimization at all levels. The implementation of the management information system (MIS) and the development of a computer integrated management and control integrated system, namely the computer integrated automation system (CIPS), has become the standard development model for control and computer online applications in the process industry, especially the refining and chemical industry [5].

From a technical point of view, the automation technology of process industry has achieved great development in recent decades. From the perspective of the architecture of the control system, it has experienced four times: pneumatic, electric, direct digital control and distributed control (DCS), and is moving towards the fifth era, namely FCS. It will become a widely used structural form in the future. In terms of scale, the traditional control system may have only a few to dozens of I/O points or control loops, but now, a set of DCS control has up to hundreds or even thousands of I/O points and loops [6]. The control range of the system has also developed from the traditional loop-based control to the coordinated control of the whole device or production line and even the whole enterprise [7]. With the expansion of control scale and level, the structure of control system is becoming increasingly complicated. On the one hand, the whole control system is subdivided at different levels. From basic control, advanced process control to higher optimization control. On the other hand, the different levels of the control system also require more careful integration [8]. At the same time, with the promotion of control level, the relationship between control and management is getting closer and closer, and the functions are mutually infiltrated. This is the so-called integration process of management and control. They are gradually classified into the same framework under the norm of the same benefit index function, so as to realize the unification of control and management [9].

2. The concept of computer AI and enterprise automation

2.1. Basic concepts
The integration of computer technology and AI technology is the current computer AI technology, which is characterized by strong informationization and intelligence. The application of computer AI technology in various fields not only fully meets the development requirements of modern information age, but also better meets the needs of modern development, so it has gradually become a more and more popular technology [10]. As a comprehensive discipline, computer AI technology needs to use technologies in many fields. In practical application, computer AI technology can simulate the thinking of human brain through the effective application of computer programming, and can complete the corresponding work at the same time [11]. With the continuous development and progress of science and technology, the fields covered by computer AI technology are more complex. In theory, computer AI technology mainly involves automation technology, information basic theory, logic, biology and other aspects of knowledge. As a new discipline in the new era, it has broad market prospects in the future development [12].

In the initial stage of AI technology, the overall development situation is not optimistic. In the 1970s, intelligent systems and commercialized expert systems appeared, which were rapidly popularized in many countries and regions around the world, and the value created was recognized by
more people. Due to many defects in the expert system itself, the development of computer AI technology was further restricted [13-14]. Up to now, the theoretical basis and practical application of various disciplines are more perfect, and the functional integration between different disciplines is stronger, creating more functions.

2.2. Composition and function of integrated automation information system

With the rapid development of computer technology and network technology, a new mode of integrated information automation has emerged, which integrates control, optimization, scheduling, management and operation. That is to say, people hope to realize the integrated information automation from three aspects of enterprise management, production management and control process. It is divided into five layers: decision-making layer, management layer, execution layer, process control layer and support layer, as well as two databases (relational database system and real-time database system). Among them, the decision-making layer includes enterprise information department, business assistant decision-making, key business indicators and basic information. The management includes production scheduling, branch management, supply procurement, sales management, technology management, quality management, financial cost, measurement information, human resources, equipment management, energy management, safety and environmental protection. The executive layer includes real-time data monitoring, production scheduling, process simulation group and optimization control [15].

Although there are many ways to realize AI in theory, at present and in a foreseeable certain period of time, it is the most basic realization of AI that allows machines to "act or specify actions to make decisions" like "humans" through computer equipment and software. Way. Therefore, all links of the current AI industry chain are basically related to computer software. Figure 1 shows a typical way of dividing the AI industry chain.

![Figure 1. Distribution of artificial intelligence industry chain](image)

This system is designed with reference to the basic office needs of small and medium-sized enterprises, taking the functions that can meet the needs of small and medium-sized enterprises, and can handle and solve the basic office business of enterprises as the starting point. Therefore, three main functional modules are designed, namely, daily management module, business management module and user management module, as shown in Figure 2. Each different business module is subdivided into different functional modules, as shown in Table 1.
Figure 2. System function structure diagram

Table 1. Module function

| Functional module | Daily management module |
|-------------------|-------------------------|
| Module function   | Post management         |
|                   | Collection management   |
|                   | Meeting management      |
|                   | HR management           |
|                   | Instruction management  |
|                   | Personal office management |
| Module function   | Business Management Module |
|                   | User Management Module  |
| Module function   | Procurement plan management |
|                   | Production report management |
|                   | Inventory management    |
|                   | Index management        |
|                   | User add management     |
|                   | User authority management |
|                   | User logout management  |

The process control layer includes distributed control system (DCS) control, data acquisition remote terminal unit (RTU), transmission, security alarm, online quality inspection, etc. The support layer includes IT basic environment (network, computer equipment, system software, tool software). Among them, the management layer extracts useful information from the relational database to help solve the problem, while the execution layer and the process control layer extract various information in the real-time production process from the real-time database to manage and monitor the normal operation of the production. Of course, there is a difference between the two Data and information can also be exchanged and work together. The functional modules at all levels cooperate with each other and are closely connected through interfaces to complete the function of information integration. The function of the integrated automation information system is positioned as the plant level production real-time monitoring and management information system, focusing on the enterprise load and emphasizing the economy of the production process. The information source of integrated automation information system can be taken from MIS or DCS and RTU system, and shall have monitoring and control functions.

As a tool for monitoring, controlling and managing industrial automation control equipment and an important part of enterprise information management system, real-time monitoring software platform is increasingly used in industrial production. Table 2 is a list of the main commercial real-time monitoring software platforms in foreign countries.
TABLE 2. Market sales of major foreign commercial real-time monitoring software platforms

| Serial number | Company                  | The main products | Cumulative installed capacity |
|---------------|--------------------------|-------------------|------------------------------|
| 1             | American W0nder W are company | InT0uch           | 90000                        |
| 2             | American Intellution Company | Fix               | 85000                        |
| 3             | Israel PCsoft Company      | WizC0n            | 30000                        |
| 4             | Australia Citect company   | Citcct            | 35000                        |
| 5             | French ARC Company         | PCVUE             | 9000                         |
| 6             | other companies            |                   | 110000                       |

With the widespread application of enterprise resource planning management systems (ERP), supply chain management systems, and industrial process automation systems, the important role of the integrated information integration software platform between them will surely be used by engineering and technical personnel of the majority of enterprises and enterprises. Recognized by management personnel. According to incomplete statistics, more than 20000 enterprises in the refining, chemical, electric, food and pharmaceutical industries in the United States have applied this integrated software platform. Companies that develop such software are considered the most popular software development companies. Table 3 shows the market sales statistics of some major integrated commercialization software platforms.

TABLE 3. Market sales statistics of major commercial integrated integrated software platforms

| Serial number | Company                  | Products   | Number of application enterprises |
|---------------|--------------------------|------------|----------------------------------|
| 1             | OSI Software Corporation | PI         | 1005                             |
| 2             | CamStar System Company   | InSite     | 1004                             |
| 3             | Cimnet company           |            | 2005                             |
| 4             | RealtimeInfo Corporation | InfoLink   | 506                              |
| 5             | POMS company             | POMS       | 10007                            |

3. Application of computer AI in enterprise automation

3.1. Performance evaluation algorithm of CIPS real-time database

The design of a real-time database needs a quantitative performance evaluation method. "Performance evaluation" refers to the performance analysis of logical database structure. In addition, in practical application, such a method is needed to evaluate the actual performance of the system, so as to adjust the performance parameters of the system. The logical record access (LRA) algorithm is commonly used, which is called LRA algorithm for short. It was proposed by T. Teorey and J. Fry in 1980. The LRA method was originally designed to compare and evaluate network and hierarchical models. The number of records of each record type that needs to be accessed when an application is executed becomes the number of logical record accesses (that is, the number of LRAs). When calculating the processing frequency, the LRA number represents the access of the database. The specific process of LRA method is discussed below. LRA refers to the total number of records that all applications need to access in a unit time. Let $LRA_{ij}$ be the number of records accessed by the ith application to record type J, and f be the number of times application I is executed in unit time. Then:

$$LRA = \sum_{i=1}^{M} \sum_{j=1}^{N} LRA_{ij} * F_i$$  \hspace{1cm} (1)
Here, m is the total number of applications in the database and n is the total number of record types in the database.

The transmission amount of each application I is expressed by $TRVOL_i$, and the unit is byte. The total transmission amount per unit time is:

$$TRVOL = \sum_{i=1}^{M} \sum_{j=1}^{N} LRA_{ij} \cdot RECSIZE_j \cdot F_i$$

(2)

Where RECSIZE represents the space occupied by a record of logical record type j.

The storage space is composed of two parts: data space and pointer space.

The calculation of the data space (DSTOR) is as follows:

$$DSTOR = \sum_{j=1}^{N} RECSIZE_j \cdot NREC_j$$

(3)

Where, the data space is represented by bytes. $NREC_j$ is the total number of records of record type J in the database.

The pointer space (ptrstor) is calculated as follows:

$$PTRSTOR = \sum_{j=1}^{N} NREC_j \cdot PS \cdot NPTR_j$$

(4)

Where the pointer space is expressed in bytes. PS is the size of pointers, and $NPTR_j$ is the average number of pointers used by record type j.

3.2. Application

(1) the application of network security management. (2) Application of artificial neural technology. (3) Application of (3)AI Agent technology. (4) Application in teaching

The rapid development and wide popularization of various advanced technologies such as Internet, big data and AI have strongly promoted the development and reform of all walks of life. (5) With the steady improvement of economy, AI is also applied to smart home, which makes people get more convenience in living.

The login module is used to verify the correctness of the user name, password and verification code when the user logs in to the system. If the authentication information entered by the user matches the information in the database, the user is allowed to log in to the system for related operations; otherwise, the current user will not be allowed to log in to the system, and the system will feed back error prompt information to the current user according to the authentication information. Here, the administrator can view, modify and delete the data of all users.

4. Conclusions

In this paper, a computer AI enterprise office automation management system is designed and implemented, which adopts B/S network architecture mode and exchanges data with background database by ADO data connection. This scheme makes effective use of all kinds of information in the office of enterprises, and arranges, processes, processes and feeds back all kinds of information in time, which facilitates the sharing and exchange of business information, improves the office efficiency and business management level of enterprises as a whole, and conforms to the development trend of the information age. Systematic research on the theory and technology of real-time database under the network environment requires a lot of work, not only in theory, but more importantly, the theoretical
results can stand the test of practice. Compared with other modern technologies, computer AI technology has higher information and intelligence characteristics, so people pay more and more attention to computer AI technology. However, computer AI technology still has certain limitations and will be hindered in its development process, so it is necessary to strengthen the analysis and research of computer AI technology.

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