Interactive Technology between OCS and OMS Based on Artificial Intelligence Technology

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Abstract: In order to realize the interaction between OCS and OMS. The author gives the artificial intelligence technology to analyze the interaction technology between CS and OMS. High-speed data bus and general service bus are deployed in OCS and OMS systems respectively. Through real-time data interaction, service invocation such as static security analysis, sensitivity analysis and the construction of integrated operation and maintenance management subsystem, the cross-region interaction method is validated. The test results show that through the construction of this scheme, it not only meets the secondary security requirements of power, but also improves the real-time and reliability of information exchange between OMS and OMS, and ensures the effective circulation of various dispatching services.

1. Introduction

Artificial intelligence is a discipline about knowledge, how it represents knowledge and how to acquire knowledge and use knowledge [1]. As a scheduling management industry with very complex data information and object attributes, the OMS system (scheduling operation management system) is also one of the professional software products for software technology development [2]. It plays a huge role in major engineering projects related to people's livelihood, such as power dispatching operations and hydraulic dispatching. The OMS system is a power grid dispatching application support platform based on the integration of modern power grids and the concept of safe production and land-saving interaction [3]. The system is based on the original DMIS system, combined with the latest OMS concept of the State Grid Corporation, three analysis systems, and distributed queries [4]. As well as SG186 project safety production management application requirements and other dispatching system information ideas and development situation, a new dispatching production management system [5]. Owing to the 56 Kbps dial-up mode adopted by OMS in power plant visiting ground dispatching during system construction, it can not meet the current demand in terms of information rate and channel stability, which brings great inconvenience to daily dispatching and operatio [6]. Establishment and implementation of production management standardization system covering the whole process of power grid production, horizontal integration and vertical penetration, and construction of unified, strong and smart grid put forward higher requirements for power dispatch management [7].

ABB's OCS system is an open, integrated and distributed automation control system, which integrates DCS and QCS control systems [8]. Recently, when we pay attention to OCS system, we find that operators, especially China Telecom and China Unicom, are in a tense stage of deployment because of the demand for full-service operation. The control advantage of OCS system is that it can not only control timely and accurately, but also can see the real-time control effect and trend chart of the circuit. The display time of trend chart can be extended to about 15 days [9]. However, the solution to these problems cannot be considered from the normal system failure handling methods, and it is necessary to start from another angle, so as to finally solve the problem and ensure the normal production of the workshop [10]. The trend map configuration of the OCS system is a bit cumbersome, and if you don't understand it properly, you may not be able to display the trend graph you need. With the development of society and the improvement of automation level,

major enterprises have adopted OCS distributed control system in new projects. Under the "four unification" guiding ideology, China Unicom' s operational support system is rapidly advancing, and China Telecom' s OCS system is also under construction in a low-key and orderly manner. At present, the problems encountered and solved by local operators are also the concerns of OCS vendors.

2. Methodology

The emergence of software engineering has led to the development of development methods, development tools and development processes in software development. Up to now, it has achieved remarkable results in many important areas related to intelligent control. The functions defined by artificial intelligence are defined as functions that are usually performed by intelligent machines and are related to human intelligence, such as judgment, reasoning, proof, recognition learning, and problem solving. As the working platform of production management and first-line team, OMS system finally realizes risk pre-control and auxiliary decision-making for production management through standardization, process monitoring and safety monitoring. However, the original DMIS can not meet the requirements in terms of scheduling data sharing and exchange and scheduling database structure of the integrated data platform. The failure rate and dropout rate of dial-up authentication are very high. Users need to dial repeatedly to establish connections. In 2013, the success rate of dial-up in small and medium-sized power plants was only 30%. These problems bring inconvenience to power plant users when developing OMS related processes. High-speed data bus is a bus system that provides efficient and reliable inter-process communication mechanism, access interface and bus management function for real-time applications. Operators will have a process of exploration and familiarity with the business model changes and operation management brought about by OCS.

In order to improve the poor stability and real-time performance of dial-up access, three solutions are proposed in this paper. The comparison results of the three construction schemes are shown in Table 1.

Table 1 Comparison of advantages and disadvantages of three construction schemes

Program	Option One	Option two	Option three
Name	Telephone dialing	Professional OMS communication channel + secure access control method	Power dispatch data network + secure access control
Real time	Poor real-time performance	Page call latency	Meet the requirements
Safety	Private line dialing meets the requirements	Restriction of access to firewalls	Conceal safety requirements through horizontal isolation devices
Maintenance difficulty	Simple, but not sTable	Low hardware failure rate	Maintenance is more complex
Construction cost	Very low	50 thousand yuan	250 thousand yuan

Artificial intelligence was born in 1956 at a historic gathering. Although the operational efficiency, reliability and extensibility of data exchange of the current OMS system have been developed. However, with the gradual decrease of water resources and power production resources in the world, people's demand for basic energy is increasing. This puts forward higher requirements for the efficiency and reliability of electric power dispatching and hydraulic dispatching, as well as for the speed of large-span information exchange among regions to balance the demand for limited resources. Protection management: inquiry and management of annual verification plan and completion of annual verification. Real-time record protection actions, exceptions, and rollback

records for future query and maintenance. In recent years, with the expansion of the scope of the Northwestern network, the number of dispatching services has increased dramatically. It is also urgent to realize the process management and improve the management efficiency of the main business through information construction. Because it is a problem with signal transmission, we looked at the signal interface board of the scan head. After viewing, the signal interface board is very good and free of dust. In this case, the trend graph of this parameter is impossible in the system, and we can't see its real-time curve, so we can't understand its control effect.

According to the above simulation results and its protection action logic, the protection form is compared with the traditional current protection, distance protection and the performance of the neural network line protection which has a lot of research results. The results are shown in Table 2.

Table 2 Comparison of Action Performance of Different Types of Transmission Line Protection Schemes

Type of protection	Motion performance	
	Instantaneous segment protection range	Delay time
Current protection	Not fixed, up to 80%	About 500ms
Distance protection	About 80%	About 500ms
Neural network protection	85%	At present, there is no relevant discussion.
Neural network type channelless protection	85%	About 40ms

3. Result Analysis and Discussion

OSB bus is a logic bus connecting the functional modules of the integrated power grid intelligent system, which includes high-speed data bus and general service bus. It is the infrastructure to provide horizontal and vertical interconnection, and the carrier of interconnection and interoperability within and among grid operation systems at all levels. At the same time, based on the different choices of product provision and market competition strategy, telecom operators need to take the introduction of OCS as an opportunity. To build a unified and integrated billing environment to meet operators' billing support needs for future complex business scenarios. For example, prognosis payment integration billing, cross-network/product bundling and portfolio marketing, multi-payment, etc. The trend database we configured is not necessarily obtained directly from the field, it may be obtained from another set of records database. If this is the case, and we have not done this step configuration, then there is no possible trend graph in the coordinates. According to the attributes and interaction methods of various objects in the OMS system, it can be considered to adopt mature software engineering methods, which is very valuable for expanding the applicable field of software engineering methods and improving the comprehensive operation capability of the OMS system. If the communication personnel do not enter the substation to complete the work, such as the local terminal or the peer end through the network management and other means, data changes or inquiries. And these jobs are not involved in the OMS system.

The entire learning phase of the two-stage learning rule has a fast convergence rate and is less sensitive to the initial value of the weight coefficient. The two-stage learning rule converges more than four times faster than the first two learning rules, as shown in Figure 1.

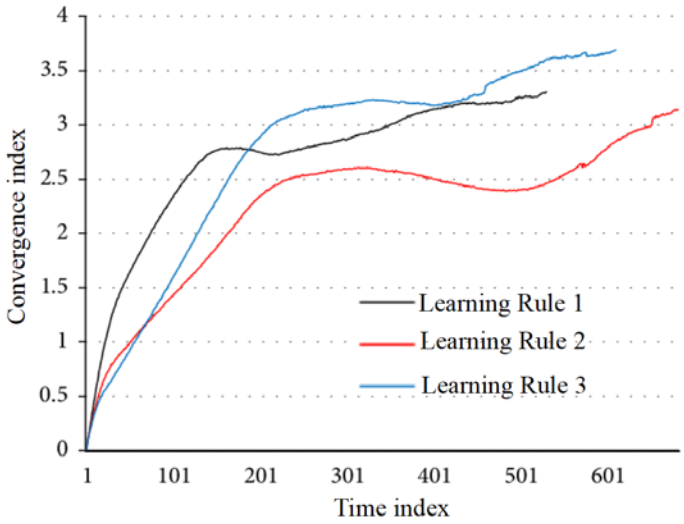

Fig.1. Comparison of Convergence Performance of Three Learning Rules

In OMS system, there are only operation tickets and work tickets. We can only grasp the basic content of this work on the ticket. For example, start-up time, completion time, the person in charge of the work and the work content, etc. In order to promote the fine and standardized management of power grid dispatching operation, improve the scientific dispatching level and the ability to control the operation of large power grid, and strengthen the construction of dispatching security guarantee system and internal security supervision system. The next step is to open the lower part of the quantitative water content and find that the lower part of the head is full of oil, because the interface board transmits micro-signals, and the signal may not be transmitted if the intensity is very small and a little interference. So we cleaned up the oil thoroughly, and then the power transmission system was normal after cleaning. If we carefully scrutinize according to the manual and operate correctly, we do not need to do the work of adding nodes. That is to say, the previous step is useless and is the result of not fully understanding the explanation of the manual. Therefore, the OCS charging model needs to be consistent with the existing network charging system. The charging capacity of the two is equal and balanced. The OCS is smoothly integrated into the charging domain, and a unified charging platform with core functions is established in the BSS charging domain. At the same time, the OMS server is connected to the router in a network manner.

4. Conclusion

In the integrated grid operation intelligent system, through the construction of the grid OS2 system, the way of running the service bus in different isolation areas for information interaction is fully practiced, and the interaction effect between OCS and OMS is demonstrated. Selecting the dedicated OMS communication channel + secure access control mode, the redundant configuration of each OMS network from the power plant to the ground is realized, and the reliability is improved. At the same time, the use of independent 2M private line makes the OMS service of the power plant access to the ground quickly and effectively, which provides a means for scientific dispatch and lays a foundation for the integrated management of the dispatch plan. From the aspect of technology driving, first, with the development of NGN, IMS, VAC and FMC, the network is developing in a continuous convergence, which promotes the convergence trend of accounting. For a mature system, we just follow the manual to do, if not wrong, the process will not damage the system, the biggest result may only be that we do wrong, can not achieve the desired effect. In fact, it is impossible for them to really understand the specific situation and the process of handling the scene in the telephone, so they may not be able to give a correct solution, but can only give some suggestions as a reference. Combining OMS system with quasi-real-time production information step by step, mining production and management information data, and building a real production decision support platform.

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