Design of Enterprise Digital Operation System Based on Enterprise-level Collaboration

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Abstract. At present, the built-in structure of enterprise digital operation system is mostly one-way, and the operation coverage of enterprises is limited, which leads to a significant reduction in the promotion rate of enterprise digital operation. Therefore, the design and verification of enterprise digital operation system based on enterprise-level collaboration are proposed. According to the changes of current testing requirements and standards, the operation objectives are first formulated, the operation coverage of enterprises is expanded, and the multi-level cross-digital operation structure is designed. The final test results show that: for the selected six test operation links, in different background environments, combined with the mechanism requirements of enterprise-level collaborative processing, the final promotion ratio of enterprise digital operation is kept above 35%, which shows that the practical application effect of the digital operation system designed this time is more flexible and changeable, with strong stability and reliability, more controllable operation direction and links, and has practical application value.

Keywords: Enterprise-level collaboration; Enterprise digitalization; Digital operation; Operating system; Enterprise management and control; Collaborative operation;

1 Introduction

At present, informatization and networking have gradually become the prominent features of the times, which provide great convenience for people's daily production and life [1] . Therefore, enterprises in all fields of society are also influenced by electronic information technology, and the built-in operating system is reformed and optimized [2] . Generally speaking, the operation system is a mechanism structure for the daily business processing, employee integration and information supervision of enterprises, which restricts the development of enterprises at all times and provides enough space for the expansion and extension of enterprises [3] . At present, the operation system of enterprises is mostly digital, although it can achieve the expected operation tasks, but it is extremely vulnerable to the influence of external environment and specific factors. In addition, the digital operation system is mostly set in a one-way form, and the overall efficiency is low, making it more difficult to control, which is also one of the important reasons for the problems and defects in the final enterprise development [4] . Therefore, this paper puts forward the design and verification research of enterprise digital operation system based on enterprise-level

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collaboration. The so-called enterprise-level collaboration mainly refers to the use of special methods and auxiliary mechanisms to help employees control the workflow in an enterprise way, and the initial daily management mechanism is more simplified and convenient, so as to complete the work content to be handled in the shortest time [5] . This time, in order to ensure the stability and authenticity of the test, it is necessary to compare and analyze the real enterprises, describe the enterprise-level collaboration principle and the design of enterprise digital operation system, further expand the actual operation coverage, strengthen the controllable effect of operation from multiple angles, and design a more flexible and changeable enterprise operation structure [6] . Moreover, for all aspects of enterprise operation, it is also necessary to make corresponding adjustments according to the actual development situation in combination with enterprise-level collaborative processing, and carry out targeted collaborative scheduling and replacement of content to enhance the flexibility and reliability of enterprise operation system [7] .

2 Design enterprise digital collaborative operation system

2.1 Headings, tables and figures

In the process of design, the operational objectives of an enterprise are not fixed, but are transformed and adjusted according to different development conditions and needs, so as to build a more complete, concrete and covered operational objective [8] . First, we can make the operational treatment indicators clear, design and build the phased objectives according to the sequence, and finally complete the operational tasks [9] . Different from the traditional operation mode, when designing the target, it is necessary to make multidimensional judgment on the key index values [10] . First, the directional and quantitative operational objectives, which are highly targeted, are used to reflect the implementation and development contents of enterprises, and the final collaborative operation results can be obtained through description and analysis [11] . As shown in the following Table 1:

Table 1. Setting Table of Targeted and Quantitative Operation Indicators of Enterprises.

Basic name of enterprise oriented and quantitative operational indicators	Initial Test Indicator Parameter Table	Design Test Index Parameter Table
Enterprise operational efficiency/%	89.34	92.16
Quantitative conversion ratio	4.16	5.12
Stage recognition mean	11.03	16.25
Preset optimization ratio	6.54	8.15
Enterprise operation direction	Extension based on business expansion	Full coverage expansion and extension
Cooperativity index	3.25	4.16

According to Table 2, complete the setting and analysis of the enterprise's directional and quantitative operation indicators. Then, based on this, after completing the construction of the basic environment, it is necessary to set the absolute and relative operation targets [12] . This part is generally dynamic and has strong pertinence [13] . Under different development backgrounds, enterprises set up independent operational objectives, but they should make corresponding adjustments at any time according to market changes or their own strategic

adjustments. The absolute value indicators in the form of ratio are expressed in different time periods, customer groups, competitive products, etc., which can help enterprises to further clarify the actual direction in the process of operation [14] . Finally, there are foresight indicators and hindsight indicators [15] . These two parts need to be implemented in combination, which is a prediction of the future operation direction and development goals of the enterprise [16] . For example: the adjustment and influence of the sales performance of the current month on the subsequent business [17] . The hindsight index can be used as the follow-up evaluation benchmark of enterprise operation, and when it is accumulated to a certain extent, it can be comprehensively analyzed to provide reference for the later development plan [18] .

2.2 Design multi-level cross digital operation structure

Compared with the traditional one-way digital operation structure of enterprises, the multi-step digital operation structure [19] is designed according to the actual operation requirements and standards and the actual development status and needs of current enterprises. You can first introduce the above-mentioned goals into the current operating structure [20] . At the same time, according to the basic objectives and tasks, complete the construction of the enterprise operating environment [21] . Then, based on this, the cross-type digital operation structure is designed [22] guided by the operation objectives of each link. As shown in Figure 1 below:

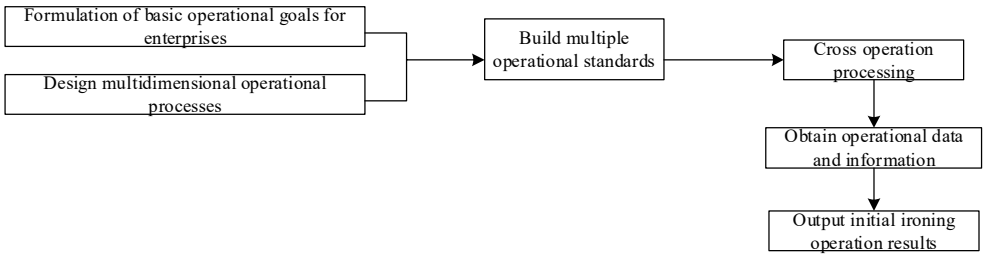

Fig. 1. Diagram of cross-digital operation structure.

According to Figure 1, the design and practical analysis of cross-digital operation structure are completed. Next, based on the current enterprise management and operation requirements, a prefabricated and matched multi-level cross digital operation structure [23] is designed. At this time, corresponding operation standards can be formulated according to the operation objectives. In different background environments, there are also great differences in the requirements for enterprise operation. To maximize the practical operation effect of enterprises, the multi-level operation structure can further improve the execution efficiency, which has practical operational control significance [24] .

2.3 Building an enterprise-level collaborative digital operation model

The digital operation of enterprises is usually very complicated and changeable, and it generally needs to be constantly adjusted according to the development of enterprises, so as to ensure the relevance and compactness of subsequent operations to the greatest extent. However, the traditional operation mode is difficult to transform, and the flexibility is not enough and the efficiency is low, which leads to different degrees of operation problems and defects. Therefore, combined with the enterprise-level collaboration principle, a collaborative

digital operation model[25] is designed. Firstly, the designed multi-stage cross-operation structure is imported into the current enterprise digital operation model, and then, based on this, a core control program is formulated, which is connected with the daily management and control plaorm of the current enterprise to form a complete and concrete operation framework. According to the actual operation requirements, combined with the obtained data and information, the expected optimization rate of collaborative operation is calculated first, as shown in the following formula 1:

$$D = (1+m)^2 \times \Re\mu + \frac{v-m}{w} \tag{1}$$

In Formula 1: D indicates the expected optimization rate of cooperative operation, m represents the average value of controllable operation conversion, $\Re$ represents the operating cycle of an enterprise, μ represents the directional coordination difference ratio, w represents collaborative coverage, v represents the average execution efficiency. According to the current test, the expected optimization rate of collaborative operation is calculated. Next, based on the enterprise-level collaborative operation standards and limited price adjustment, the corresponding digital collaborative operation model control indicators and parameters are set, as shown in the following Table 2:

Table 2. Numerical Table of Control Indicators of Enterprise-level Collaborative Digital.

Enterprise level collaborative digital operation model control indicator project	Basic collaborative control parameter values	Edge collaborative control parameter values
Collaborative conversion ratio	3.2	4.1
Digital collaborative operation hierarchy	Basic reality layer+operational target setting layer+collaborative processing layer	Basic reality layer+operational goal setting layer+collaborative processing layer+digital processing layer
Targeted control of operational content	Technical operation+directional operation+integrated operation	Technical operation+directional operation+integrated operation+development direction control
Adjustable operational objectives	Operational tasks, operational content, and operational mechanisms	Operational tasks, operational content, operational mechanisms, business volume control, sales management
Operating constant value	11.16	15.28
Operational efficiency/%	65.35	80.21

According to Table 2, the design and analysis of the control index values of enterprise-level collaborative digital operation model are completed. Next, based on the requirements and standards of enterprise-level collaborative processing, the application environment of the current digital operation model is adjusted, the current test objectives are completed, and the processing information and data of enterprise digital operation are obtained.

2.4 Cross-regional platform access to achieve enterprise collaborative operation control

The so-called cross-regional platform access mainly refers to a dynamic communication mode designed for enterprises with subsidiaries to facilitate daily operation and connection. First, the current platform can be defined as a basic identification coverage, and a plurality of monitoring nodes can be arranged at the edge of each area by using the system, and the nodes are overlapped with each other, which is convenient for the collection and summary of daily data and information. Next, through the enterprise-level collaborative management and control mechanism, the basic digital operation mechanism is designed by using the model, and it is imported into the digital system, and the directional program of collaborative transformation is constructed. The program is overlapped with the cross-regional platform to establish the connection of digital operation subjects, and the corresponding operation execution goals and tasks can be directly issued through the main control system, thus improving the overall operation efficiency, expanding the scope of operation identification and promoting the future development prospects of enterprises.

3 Experiment

This time, the practical application effect of enterprise digital operation system based on enterprise-level collaboration is mainly analyzed and verified. Considering the authenticity and reliability of the final test results, the analysis is carried out in a comparative way. According to the current test requirements and standards, professional equipment and devices are used to collect basic data information for the tested application system, and after summary and integration, it is ready for subsequent use. According to the current test requirements, adjust the actual test index information, and then, combine the enterprise-level collaborative standards to create the initial test environment and comparison conditions.

3.1 Experimental preparation

Combined with enterprise-level collaborative mechanism, the analysis environment of enterprise digital operation system is tested and verified. This time, enterprise A is selected as the main target of the test. At present, combined with the development situation of the enterprise at this stage and the collaborative management requirements of the enterprise level, the coverage of the current management test system is defined first, and monitoring nodes are set in the controllable area, and the nodes are connected with each other to form a cyclic operating procedure. Next, based on the operation requirements, set and adjust the test data. As shown in Table 3 below:

Table 3. Test Settings Adjustment and Correction Table.

Test Name	Directional parameter standard value	Actual parameter standard value
Division of enterprise operation cycle	Divided based on the initial set operational objectives, usually in a fixed form with fewer modifiable steps	Based on the actual operation situation of the enterprise, the division is made, and the cycle is flexibly adjusted. All execution links can be changed at any time

Number of cycles/piece	12	18
Outstanding optimization ratio	89.35	94.25
Controllable mean	13.02	15.28
Unit operation task time/day	60~70	65~85

According to Table 3, the adjustment and correction of test settings are completed, and the current test conditions and environment settings are basically realized. However, it should be noted that under the restriction of enterprise-level collaborative mechanism, it is necessary to add more controllable operation monitoring programs in the digital operation platform to facilitate the collection of daily data and information and provide a basis for the implementation of subsequent operation objectives.

3.2 Analysis of experimental process results

In the above-mentioned test environment, combined with enterprise-level collaborative management and control mechanism, the practical application effect of the selected digital operation system of enterprise A is analyzed and verified. At present, the data information of each period is collected and summarized by using the set nodes for subsequent use. Next, six test digital operation links are selected as the main target objects of the test, and the tasks, objectives, contents and even restrictions of each operation link are different. First, we can set and match the implementation and operation scheme of each cycle according to the actual operation requirements of the enterprise. Then, through the principle of enterprise-level collaborative processing, each execution goal and link is divided rationally, and the promotion ratio of enterprise digital operation is calculated according to the periodic data, as shown in the following formula 2:

$$P = \sum_{n=1} (nc + \upsilon)^2 \times \Im\omega - \frac{\lambda}{r} \tag{2}$$

In Formula 2: P indicates the promotion rate of digital operation of enterprises, c represent that standard value of unit operation, n indicates the current operation setting period, υ represents the conversion difference, $\Im$ represents the periodic collaborative optimization rate, ω indicate that frequency of collaborative processing, r represents the scope of digital operation, λ represents the operation link scheduling difference. According to the current test, the final test results are analyzed and compared, as shown in the following Table 4:

Table 4. Comparative Analysis Table of Test Results.

Initial testing and operation phase settings	Phase division of collaborative processing	Digital operation cycle setting under enterprise level collaboration/unit	promotion ratio of enterprise digital operation/%
Test operation process 1	Basic collaboration stage+scheme design stage	4	35.5
Test operation process 2	Basic collaboration stage+scheme design stage	4	40.2
Test operation process 3	Basic collaboration stage+solution design stage+digital operation integration	6	38.7

Test operation process 4	Basic collaboration stage+solution design stage+digital operation integration	6	37.6
Test operation process 5	Basic collaboration stage+solution design stage+digital operation integration	6	37.9
Test operation process 6	Basic collaboration stage+scheme design stage+digital operation integration+operation analysis	8	40.5

According to Table 4, the test results are analyzed: for the selected six test operation links, in different background environments, combined with the mechanism requirements of enterprise-level collaborative processing, the final promotion ratio of enterprise digital operation is kept above 35%, which shows that the practical application effect of the digital operation system designed this time is more flexible and changeable, and it has strong stability and reliability, more controllable operation direction and links, and has practical application value.

4 Conclusion

To sum up, it is the design and verification analysis of enterprise digital operation system based on enterprise-level collaboration. Compared with the initial enterprise digital operation mode, the digital operation mode designed this time is more flexible and changeable, and has strong stability and authenticity. Moreover, in different background environments, the current operation and processing links should be simplified as much as possible, the coverage control scope of enterprises should be expanded, and the development optimization effect of enterprises should be increased from multiple angles. In addition, the single digital operation structure is gradually replaced by the enterprise-level collaborative digital operation structure. With the help of the Internet and big data technology, the practical application effect of the internal management mechanism and structure of enterprises has been further improved, and the basic business has been effectively handled, pushing related enterprises to a new development step.

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