Multi-project Management Model based on ECRS Method

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Keywords: Business Process Reengineering; Project Orientation; Ecrs Method

Abstract: This paper refers to the business process reengineering and organization planning concept, and studies the process organization process reengineering of Guangzhou Metro Rail Transit Group. With the increasing scale of the Guangzhou Metro, the number of projects under construction is increasing, and the coverage area is becoming wider and wider. The traditional linear-functional project organization has gradually exposed problems such as bloated structure and inefficiency. Although the matrix model has become a common multi-project management model, it has proved that it does not fundamentally solve the management problems of multi-project enterprises. Based on the characteristics of multi-project management enterprises, this paper uses the ECRS method to establish a project-oriented organizational process model. Finally, by analyzing the specific situation of the organization and process reorganization of Guangzhou Metro Group, the rationality of the dynamic mechanism of organizational process reengineering management is further demonstrated.

1. Introduction

In recent years, with the large-scale construction of metros in domestic cities, the urban rail transit industry in which Guangzhou Metro Group Co., Ltd. is located is entering a new stage of rapid development, facing the simultaneous construction of large-scale and multi-line subways, while operating operations and resource development. Business has also begun to develop rapidly. There are three major problems in the original organizational process. First, the problem of project coordination. When the number of projects increases to a certain extent, it is necessary to ensure effective leadership by increasing the management level. Therefore, there are situations in which the deputy general managers divide and rule. The problem of difficulty in coordination between projects has always existed; the second is that the dual leadership of “function” and “project” is different in their positions. Both parties hope to maximize the benefits of the department and maximize the benefits of the project. Finding a balance point between the dual goals that is more conducive to their own interests, so that the members of the organization are overwhelmed by the dual orders of “function” and “project”; third, the project manager’s powers and responsibilities are not equal, and are deeply rooted by traditional bureaucratic organizations. Influence, the authority of the matrix organization still exists in the functional unit, and the project manager is lower in status than the functional department manager. When the interests of the project conflict with the interests of the functional departments, it is difficult for the project manager to direct and coordinate the functional departments to serve the project from the standpoint of the entire project, and it is even more difficult for them to understand and cooperate.

Based on the above problems, the original function-oriented organizational structure has been unable to adapt to the new requirements. This study combines the business process reengineering concept, re-designs the original organizational process of the Guangzhou Metro Group Construction Headquarters by using the ECRS method, and establishes a project organization model from the original function-oriented to project-oriented, and balances the project resources at the initial stage of project operation. Through the command of the project department to balance the resources of other functional departments, solve the communication difficulties of various departments, improve the operational efficiency of the company, and ensure that the project is completed as scheduled.

  DOI: 10.25236/erems.2018.013

2. Literature review

2.1 Application Analysis of Business Process Reengineering

In the early 1990s, American management scientists Michael Hammer and James Cippi proposed Business Process Reengineering (BPR), or BPR theory, which caused a second revolution in the history of management. In Hammer's basic definition, starting with the most basic issues, and asserting that process reengineering can greatly improve the organization in terms of cost, quality, service, and speed. To this end, Hammer's article shows that the successful implementation of BPR depends not only on process innovation, but also on organizational change. Focusing on the core competitiveness of the organization, we will fundamentally rethink and redesign the business process and organizational structure to achieve a huge improvement in organizational performance.

In 2009, Wu Lei reorganized the “BPR application” in the production planning business process, and analyzed the reorganized process using the basic framework. It was concluded that the restructured production planning process increased the value-added links and reduced the non-value-added links. And reduce the cost of the process. In 2010, Chen Fei proposed that enterprise BPR should be integrated with functional organizations, emphasizing the process-oriented organizational model re-engineering, in pursuit of the simplification and efficiency of enterprise organization, with a flexible, flat and team-based new organization. The structure replaces the traditional hierarchical structure.

In 2015, Xu Xiaohui analyzed the difference between the existing process of the financial system and the BPR theory. He used the BPR theory to design the financial business process, breaking the tradition of designing the post and re-establishing the job responsibilities, so that the financial department's business can have the first process and then the post. To achieve the fiscal reform goal of financial business processes that can adapt to social development.

Wang Yuhan proposed the business process reengineering theory in 2017, which is one of the most effective ways to realize the process organization, which can promote the organizational change of the enterprise. Secondly, the implementation of business process reengineering also means the redistribution of corporate rights. At the same time, business process reengineering must establish a supporting performance appraisal mechanism to ensure the feasibility and effectiveness of process reengineering, and avoid re-creation in formalization. Finally, by comparing the data of various parties, it can be proved that business process reengineering can effectively improve business performance and Reduce manpower and management costs.

2.2 Application Analysis of ECRS Method

In the process of business process reengineering, we can adopt scientific methods, which are derived from research results in related fields. These methods ensure the success of business process reorganization. ECRS is a widely used program analysis optimization method in industrial engineering theory. It includes Elimination, Combine, Rearrange, and Simple. It is a common method for analyzing whether the process is inefficient. When using this method for improvement, generally follow the principle of canceling the purpose, merging the location, time, personnel, merging or rearranging, and simplifying the method.

In 2016, Yu Jiang explored the application of ECRS method to optimize the outpatient service process in outpatient management. The results prove that ECRS can effectively optimize the outpatient service process, improve efficiency, improve medical experience and improve satisfaction.

In 2016, Feng Yan used the ECRS method to optimize the recruitment process of the company, which was in line with the particularity of the local operation and engineering work, which greatly saved the recruitment time and solved the recruitment work of the factory operation workers.

In 2018, Zhang Jia used the ECRS method in the management of tumor daytime chemotherapy infusion process, which can simplify the medical procedure, effectively shorten the waiting time of patients, improve the efficiency and quality of nursing work, and improve patient satisfaction.

3. Organizational process reengineering model based on ECRS method

Business process reengineering fundamental thinking and thorough design of the company helps the company achieve significant improvements in quality, cost, service and speed. A project-oriented organizational model process is a combination of a series of related activities that transform inputs into outputs that are useful to customers. Everything in the enterprise can be broken down into different processes, such as new product development processes, customer service processes, and so on. In traditional enterprises, processes are implicit in the functional systems of various departments, and no one pays attention to them. The concept of "business process reengineering" was put forward, only to realize that it is a "project" rather than a "function" to truly win customers and create profits for the company. Based on such considerations, the project-oriented organization completely broke the traditional ideological system of the theory of division of labor, emphasizing the establishment of a "project-oriented" instead of "function-oriented" organizational form. In a project-based enterprise, the project is the most important process of the enterprise. In a project-oriented multi-project enterprise, each project is a process that runs through all functional departments of the enterprise. The project manager leads the cross-functional team members to implement these processes and is responsible for the performance of the project. The project management center plans all processes from the overall level of the company, and authorizes and supervises the process manager, so that the general manager has enough time to consider the company's development strategy and public relations.

For these two purposes, the business process reengineering model proposed in this study requires three steps:

①Process diagnosis: Through field research, collect relevant data information in the original organizational model of the enterprise, and interview the company's senior staff and project manager, in this process to diagnose the hidden problems in the original process organization.

② Process design: The ECRS method is used to cancel, merge, rearrange and simplify the original organizational process, and analyze it to form continuous improvement on existing organizations, workflows, operating procedures and working methods. Based on the research results, the process is reorganized.

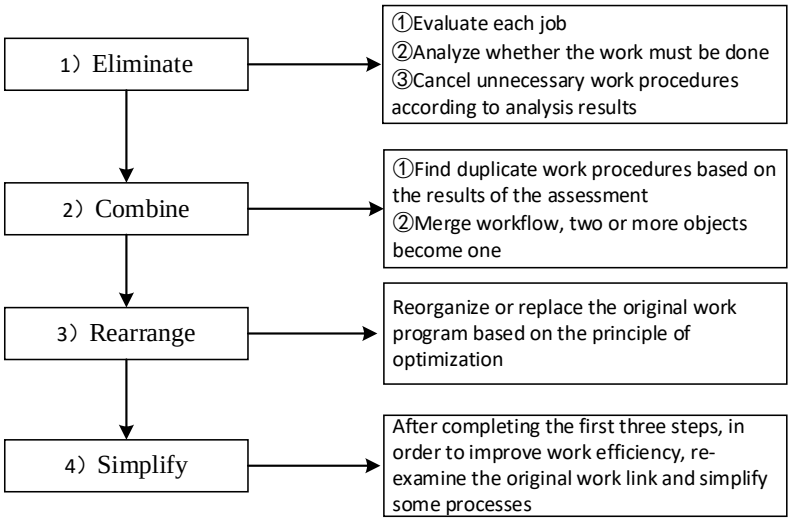

Figure 1 ECRS method design organization process establishment steps

③Create a project-oriented organizational model: Based on the new process model, use the team approach to integrate cross-organizational functionality into a specific process team. Project orientation is a model consisting of multiple project teams. Figure 2 is a theoretical model of a project-oriented multi-project organization.

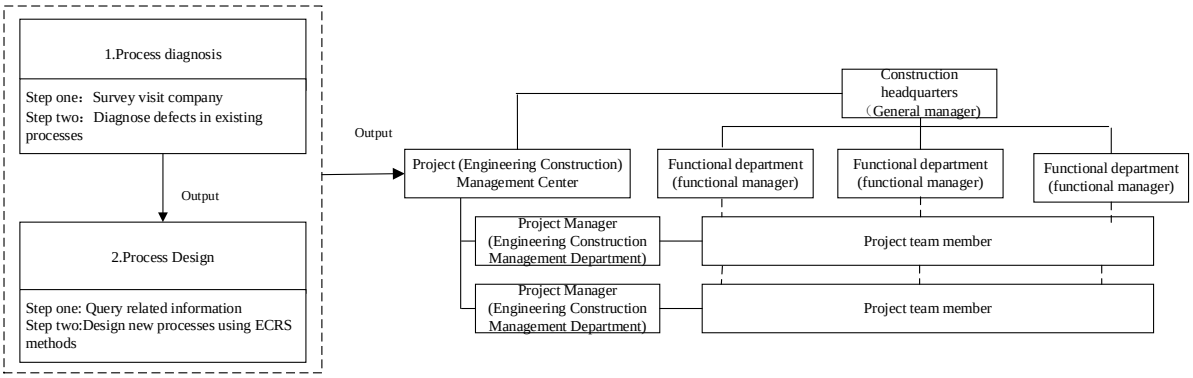

Figure 2 Project organization process model based on ECRS method

The project-oriented organization model can effectively solve the problem of multi-project management, not only get rid of the embarrassing situation that the linear functional organization responds to the multi-project management, but also avoids the matrix organization between the “function” and the “project”. A dilemma.

First, cross-functional process teams address the difficulty of collaboration between functional departments and the overall inefficiency of the business. In traditional organizations, people are accustomed to reporting information layers upwards and waiting for direct commands and instructions from the higher levels. Horizontal communication and work connections between departments are very difficult. In a project-oriented organization, the functional personnel involved in the process no longer report to the functional manager, but directly report the information related to the process to the project manager, and is unified command and coordination by the process manager. The project manager directly leads the team members in the cross-functional departments, internalizing each functional position into a team, making the cooperation between the various functional positions more frequent, and solving the mutual deduction and efficiency of the various functional positions scattered among the various departments. Low problem. At the same time, the authorized process team implements self-management and decision-making, which greatly improves the operational efficiency of the process and the responsibility of the process team.

Secondly, the full authorization of the process manager solves the dual leadership issues of “project” and “function”. In a process-oriented organization, the process manager is responsible for designing and improving each work step in the process, setting up a work plan and budget, and allocating budget amounts to the functional department based on the extent to which each functional department provides professional skills services to the project. They evaluate the performance of project team members based on “project performance” and use the results as an important indicator of each employee's annual assessment, directly linked to their compensation and promotion. The functional department manager gradually lost the traditional authority and became the professional "coach" and task coordinator in the organization. In normal times, employees are responsible for training and management by each functional department. When each project needs it, it enters each project team. Each project manager is responsible for use and management, and the functional department manager is responsible for guidance and support. The tilt of the power center to the project guarantees a practical project-centric principle and avoids the dual leadership of “project” and “function”.

In addition, the project management center coordinated all projects and solved the problem of difficulty in coordination between projects. The project management center performs two functions in a project-oriented organization: one is to coordinate all processes of the enterprise; the other is to authorize and supervise each process manager. The members of the project management center are generally composed of the highest level managers of the enterprise. They define the company's mission and strategy, and know the importance and priority of each business process, because they can assign weights to all processes from a global perspective, and allocate resources according to the weight of each process to achieve the whole The optimal input-output rate of the enterprise. The process management center's authorization and supervision of the process manager not only ensures

that the process manager directs and coordinates the power of the cross-functional team, but also prevents the process manager from abusing his authority and causing unnecessary losses to the enterprise.

4. Case Analysis - Organizational Process Reengineering of Guangzhou Metro Group

4.1 Field research and analysis of defects in the original process

One of the most difficult and important tasks in process reengineering is to identify the company's processes. Submit the results of the survey to the department managers to explore more in-depth details of the original management process. Therefore, the main purpose of the process representation is to develop a systematic definition of the process to help the company clarify and establish its management process. Process diagnosis is one of the core of the process reorganization phase. Its purpose is to analyze the rationality and effectiveness of the process according to the original flow chart. This study finds the hidden problems in the original organizational process of the Guangzhou Metro Group (shown in Figure 3) as follows.

①The coordination problem between the functional department and the project department, the department personnel according to the functions belong to the functional manager. When a project has a problem, the project manager needs to communicate with the functional manager to solve the problem, resulting in reduced communication efficiency.

②The work is not clearly defined. Due to the simultaneous construction of multiple lines in the subway construction, the workload is disproportionate to the functional task department. In fact, in a functional organizational structure, it is difficult to dynamically allocate the appropriate workforce to the appropriate project department.

③ Departmental Collaboration Issues: In functional organizations, resource allocation, information transfer, and performance evaluation are all based on departments. It is easy to produce inconsistencies in objectives and uncoordinated work between departments, thus affecting the maximum benefits of the entire enterprise.

④ Information transfer problems, the time spent on file circulation unexpectedly increased, because all documents must be submitted to management.

4.2 Using ECRS Method to Design Organization Process

In the original linear-functional organizational structure of the Guangzhou Metro Group, organizational operations are organized around functions and tasks or tasks that are decomposed. As the main body of the group construction business, the construction business headquarters plays a key role in controlling the construction progress, quality and investment of the subway project. This study used the ECRS method to redesign the construction business headquarters process of the original organization of the Guangzhou Metro Group.

(1) Eliminate

Evaluate whether this work is necessary. If it is not necessary and can be canceled, the work, process and operation studied should be canceled without affecting the quality and assembly progress of the semi-finished products. If it cannot be cancelled, partial cancellation can be considered.

The project construction, preliminary preparation, drawing design and construction of each line engineering construction project shall go through more than ten relevant departments of the company. With the expansion of the Guangzhou Metro Group, the increase of the management level, the extension of the command route, the cost of information transmission and communication has risen sharply, and information is often distorted in the process of transmission, resulting in low efficiency, high cost, high waste, and decision-making. Defects such as sluggishness hinder the further development of the company. In addition, the company's function-oriented multi-project organization model is likely to cause the core processes (projects) of the company to be unclear, ignoring the cooperation of the entire project construction team. In response to these problems, the original functional department of the Guangzhou Metro Construction Business Headquarters

canceled the original subordinate departments, the office, the civil engineering one center, the civil engineering second center, the mechanical and electrical engineering center, the depot and the follow-up engineering center. The establishment of multiple integrated management departments in the original organization was cancelled.

(2) Combine

Merging is to turn two or more objects into one. Such as the merger of processes or work, the consistency of tools. The purpose of the merger is to effectively eliminate duplication.

BPR theory emphasizes that departmental barriers must be broken so that managers can pay more attention to improving process performance. After a new process has been established, the organizational structure must be reformed to facilitate new processes. Therefore, the functions of multiple departments are integrated into one unit to facilitate functional interfaces and parallel process activities.

(3) Rearrange

Rearrangement is also known as replacement. It is to reorganize the order of work to achieve the purpose of changing work procedures and improving work.

The new organization integrates the multiple lines under construction of the Guangzhou Metro with the functional departments of the project in the order of the project process. In each project, these departments send professionals to undertake corresponding professional work according to the requirements of each project to form Guangzhou. The construction management department of a certain line of the subway directly participates in the project construction, is under the unified command and coordination of the project manager, and reports directly to the project manager.

(4) Simplify

Simplify the work content and links in the original work. This is not a cancellation, merger, or rearrangement. It is a re-examination of the original procedure and a streamlining of the content of the link. It is only a partial scope omission. After cancellation, consolidation, and rearrangement, the work is further deepened. Analytical research is to minimize work time and improve work efficiency.

After completing the above process, the Guangzhou Metro Construction Headquarters re-analyzed the defects of the process, simplified the functional layout of the original organizational process, and divided the functions of the office into five departments: the Party Group Comprehensive Department, the Planning and Control Department, the Investment Management Department, and the Quality and Safety Department. Chief engineer's office. At the same time, the Engineering Land Management Department was set up to eliminate the difficulties in the negotiation of multiple departments of the original organizational structure.

4.3 Application Analysis

In the original linear-functional organizational structure of the Guangzhou Metro Group, organizational operations are organized around functions and tasks or tasks that are decomposed. As the main body of the group construction business, the construction business headquarters plays a key role in controlling the construction progress, quality and investment of the subway project. The original organizational structure of the Guangzhou Metro is shown below.

In order to adapt to the new requirements of subway construction period, quality, investment and other aspects under the new situation, the Guangzhou Metro Construction Business Headquarters reorganized the original organizational structure. The work interface and the division of powers and responsibilities are further clarified, which guarantees the high-speed and safe subway construction goals. Therefore, this study adopts the ECRS method, and cancels, merges, rearranges, and simplifies the four steps of organizational process reorganization. The following picture shows the organization process of the construction division of the Guangzhou Metro Group after the reorganization. The restructured construction business headquarters consists of five functional departments, one engineering land management department and seven engineering construction management departments. Among them, five functional departments include the Party and Mass Division, the Investment Management Department, the Quality and Safety Department, the

Planning and Control Department, and the Chief Engineer's Office.

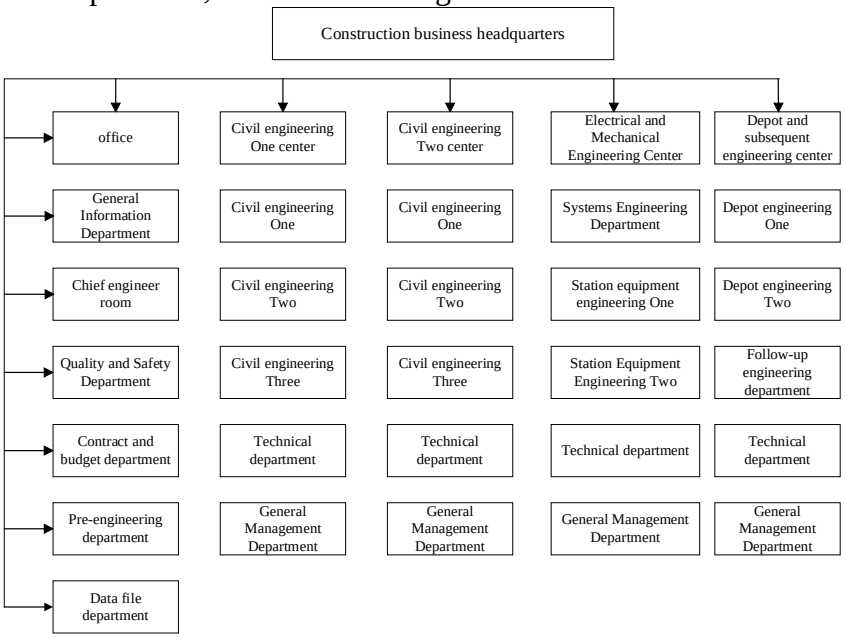

Figure 3 The original organizational structure of the Guangzhou Metro Construction Business Headquarters

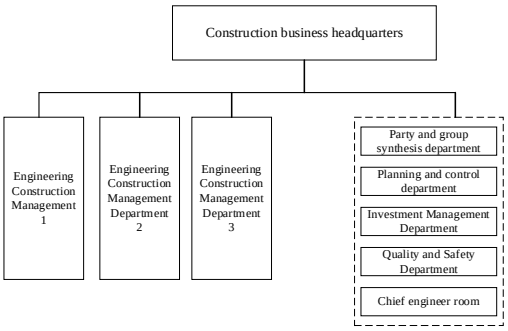

Figure 4 The existing organizational structure of the Guangzhou Metro Construction Business Headquarters

The restructured construction business headquarters consists of five functional departments, one engineering land management department and seven engineering construction management departments. Among them, five functional departments include the Party and Mass Division, the Investment Management Department, the Quality and Safety Department, the Planning and Control Department, and the Chief Engineer's Office. The duties of each department after reorganization are as follows:

① Party group general department

The DPP is the administrative department of the party building and organization work, discipline inspection and supervision, audit coordination, publicity and public relations, strategic planning, organizational structure, human resources, secretarial supervision, comprehensive administration, trade unions and the Communist Youth League.

② Investment Management Department

The Investment Management Department is the management department of the headquarters contract management, bidding and procurement management, budgetary management, settlement management and legal affairs.

③ Quality and Safety Department

The Quality and Safety Department is the comprehensive supervision department for the safety

and quality of the headquarters. It is the lead management department for the work of acceptance, letters and visits, emergency, land security and stability of the headquarters.

④ Planning and Control Department

The Planning and Control Department is the management department of the headquarters production planning, comprehensive budget, statistical management, organizational performance, internal resource regulation, comprehensive risk management, cooperative enterprise integrity management, construction unit management capability evaluation, information construction and application.

⑤ Chief Engineer Room

The chief engineer's office is the management department of the headquarters technical, electromechanical equipment, design, survey, measurement, planning and construction and scientific research.

⑥ Engineering Land Management Department

The Engineering Land Management Department is the administrative department responsible for the land acquisition and demolition of new line projects, the approval of land use, and the settlement of land use.

⑦ Engineering Construction Management Department

The Engineering Construction Management Department is the organization and implementation department for the construction of the new line project of the headquarters.

The new organizational model breaks down the strict hierarchy and the barriers of cooperation between departments, making the process of the project truly a process of observability, control and adjustment. These processes are closely related to customer needs and directly reflect the value chain of the company and its key indicators. The new organization integrates the multiple lines under construction of the Guangzhou Metro with the functional departments of the project in the order of the project process. In each project, these departments send professionals to undertake the corresponding professional supervisors according to the requirements of each project (projects are not When they need it, they will return to their respective departments. The project team will directly participate in the project construction, be unified command and coordination by the project manager, and report directly to the project manager. The project manager is the general manager of a specific line project. He has the right to unite his subordinate functional or functional departments to effectively control and control the resources of the organization, thus achieving the overall objectives of the project. The new organization has established an engineering construction management department consisting of senior executives of the company, responsible for coordinating all projects of the company and authorizing and supervising the project manager. Although the project manager does not have direct leadership over the functional manager, he can make the functional departments truly collaborate in the project team through the allocation of project funds and the assessment of the functional staff.

The organizational process after the reorganization has achieved three objectives: 1 it has a project manager who is responsible for the project and has considerable authority; 2 the project department has the professional skills of each functional department as support, and achieves the result of optimizing the configuration of the professional capability system; 3 project manager Through the decision-making and the supervision of various comprehensive departments, the room implements comprehensive coordination and monitoring of all projects to achieve the optimal performance of the overall performance of the enterprise.

5. Conclusion

The core of BPR's theory is business-oriented. BPR encourages managers to re-examine the operation of existing business processes and identify various problems in them, so as to solve these problems and improve enterprise efficiency. The ECRS method is a common method for business process reengineering and is used to optimize the design of organizational processes. This study proves that the traditional linear-functional organization and the commonly used matrix

organization can not effectively solve the management problems brought by multi-project management. The project-oriented organization mode is an effective method to solve the multi-project management problem.

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