Top Design of Digitalization Specialty in a Power Company Based on TOGAF Framework

Yiwei Tong[1], Weineng Wang[2], Xin Huang[1], Bingqiang Gao[3], Chunlan Guo[*3]

Chunlan Guo:E-mail: guochunlan1081096@163.com

[1]State Grid Information & Communication Company of Hunan Electric Power Co. Ltd,ChangSha, Hunan, 410002

[2]State Grid Hunan Electric Power Co. Ltd., Changsha, Hunan, 410002

[3]Beijing State Grid Xintong Accenture Information Technology Co. Ltd., Xicheng District, Beijing, 100052

Abstract. Starting with the concept of top-level design, this paper analyzes and introduces the significance, ideas and contents of top-level design. And taking the digital professional system of an electric power company as an example, according to the strategic planning of the digital professional of the company, combined with the current situation of the digital professional, the top-level design of the digital professional business system of the company is carried out by means of TOGAF enterprise architecture model, including business process, organizational structure, digital support and so on. It simplifies the business process, effectively improves the digital professional level of the company, and plays a supporting role in the future digital transformation and the construction of new power systems of the power company.

Keywords: TOGAF; Enterprise architecture; Top design; Business structure; Architecture governance.

1 Introduction

TOGAF is the abbreviation of TheOpenGroup Architecture Framework, which was initiated and developed by a non-profit technology industry alliance, The Open Group, and defined it as "the global standard of enterprise architecture" (including business architecture, digital architecture, application architecture and technology architecture). The original version was released in 1995, and has been updated to TOGAF9.1, which is generally used in commercial enterprises and is the enterprise architecture framework with the highest market share at present[1]. TOGAF framework is a tool to assist in the design, evaluation, acceptance, operation, use and maintenance of the overall framework of informatization. In this paper, the TOGAF framework is used for reference in the top-level design of the digital professional business system of a power company, and the business architecture, application architecture and digital architecture of the digital professional of the power company are planned and designed. This helps to understand the cooperation and mutual influence among business, technology and projects, and can form a more standardized and universal result, which can find a way for other power companies to do top-level business design and architecture design.

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2 The overall design

(A) Power industry digital professional top-level design driving force analysis

In recent years, the strategic goal of "peak carbon dioxide emissions, Carbon Neutralization" or "Double Carbon" has been fully integrated into all aspects of economic and social development. It is the need of the intelligent digital development of the power industry to promote the low-carbon energy transformation through the digital reform of power enterprises. While the business of electric power companies continues to grow, some deep-seated problems are gradually emerging, and the development of digital professional support business is still not perfect, so it is necessary to continue to strengthen the digital transformation and construction of enterprises.

In order to achieve this goal, it is necessary to plan and improve the top-level design of digital specialty from a higher level, and from the perspective of the integration of employees, through the method of top-level design. From the perspective of the overall situation, this paper makes an overall plan for all aspects, levels and elements of digital specialty of a power company, and promotes the transformation of digital specialty mode by concentrating effective resources, empowering the power grid and business, and helping to realize the goal of "double carbon".

(B) Design process of enterprise architecture framework based on TOGAF

Taking the digital professional architecture planning of a power company as an example, referring to TOGAF planning methodology, the digital professional architecture planning of the company focuses on business architecture, application architecture and digital architecture. In the process of top-level design, we defined the target orientation of the digital professional system of the power company, determined the design focus, designed the implementation path, and finally formulated a set of evaluation system, which scientifically strengthened the digital operation and maintenance and support capabilities of the power company, as shown in Figure 1.

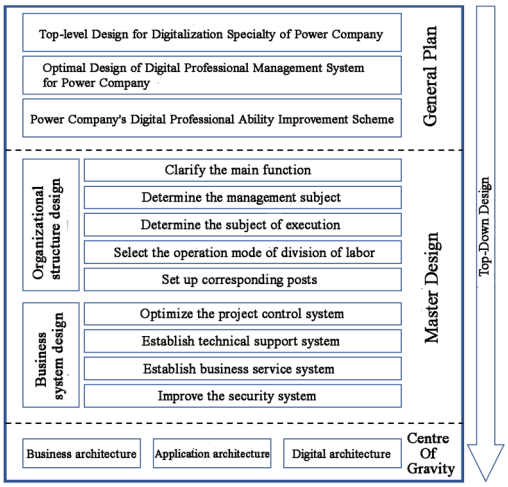

Fig. 1. Design process of digital professional architecture in a power company

3 The implementation strategy

(A) Preparatory stage and framework vision stage

In the preparatory stage and the framework vision stage, we first made clear the design objectives and key points of the power company [2], that is, to build an infrastructure with high security, stable connectivity, strong reliability and all-day real-time performance that supports enterprise strategy, combines enterprise business, and has the ability of process control and information service. Strengthen the development and utilization of information and data resources, make every effort to build an enterprise structure with three advantages: promoting business collaboration, strengthening data management and coordinating application systems, and integrate internal information flow, value flow and business flow of the company. Promote the transformation and upgrading of the company through digital means, and maintain the leading position in digital construction and application in the power industry.

In the process of formulating the top-level design of the digital professional system of the power company, we decided the architecture capability based on the company's organizational needs, so as to develop the high-level capability demand vision and business value realized by the enterprise architecture to be delivered. In this project, the architecture vision is to decode the digital professional strategy of the power company, make clear the company's digital professional strategic needs, current business architecture and IT status quo, and design related future architecture with the goal of helping the enterprise's digital professional strategy land. By analyzing the internal and external environment of the company and optimizing some organizational processes, the digital professional structure of the power company will be gradually promoted. Identify stakeholders, and formulate a set of evaluation system that meets the strategic needs of the enterprise's digital specialty, so as to ensure that the needs of all stakeholders are met and attention is paid to the construction process of digital specialty.

In the actual situation, the power company has a wide business coverage, high technology content, and complex organizational structure. After years of rapid development, problems such as diminishing marginal benefits, unsmooth business processes, difficulties in IT collaboration, and departmental walls have become more and more obvious. The way to realize this process is to sort out the business strategy of the target enterprise, lock in the key business capabilities of strategy implementation, and then systematically solve complex organizational problems by digital means, and then plan the digital professional structure of the enterprise through top-level design, as shown in Figure 2.

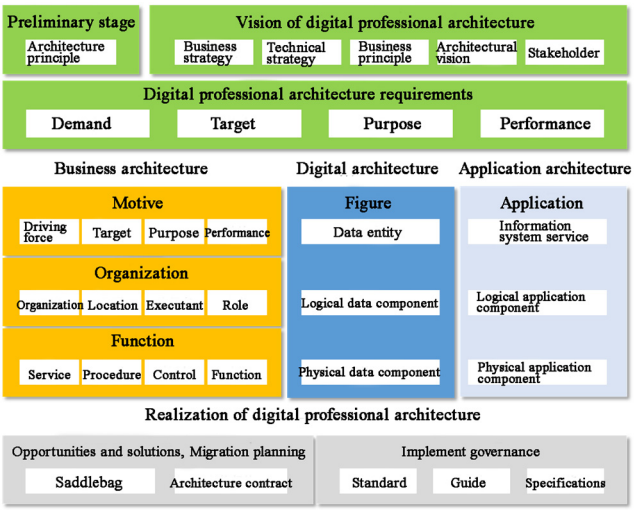

Fig. 2. TOGAF architecture content framework

(B) Business framework stage

The focus of business architecture is to integrate the functions of scheduling, monitoring, application, operation and maintenance closely related to the company's information technology, and it is an important part of enterprise architecture. In order to achieve the company's business objectives and respond to the strategy-driven, it is necessary to adjust the organizational structure on the premise of structural work requirements and through the requirements of business structure adjustment. Starting from the future business development strategy, based on the definition of business architecture, we will design the business architecture and then export the design basis of application architecture and digital architecture [3-4], as shown in Figure 3.

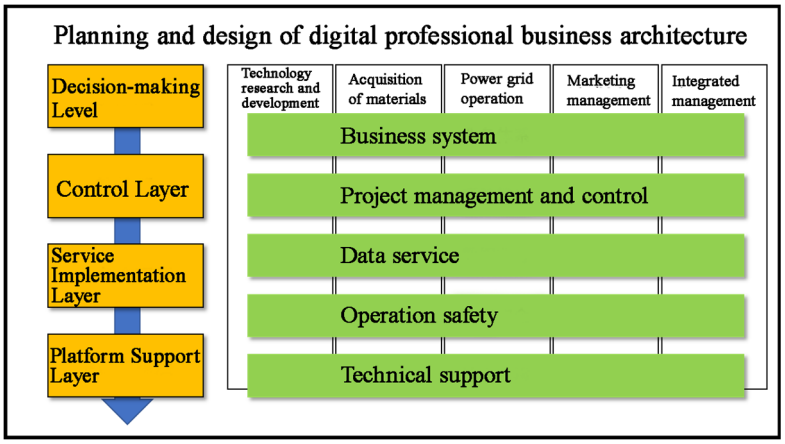

Fig. 3. Business architecture planning and design ideas

According to TOGAF content framework, business architecture is mainly divided into three aspects.

3.1 Strategic objectives. By using strategic tools such as IBSC comprehensive balanced scorecard, strategic objectives, KPI indicators and performance appraisal are taken as the carriers of strategic objectives of business structure. The strategy, annual target and measurement index in TOGAF content framework are all reflected in IBSC. In the process of this project, through the analysis of the current situation and problems of the power company, combined with the overall thinking of digital professional planning, the strategic objectives and key work of digital professional are finally put forward[5].

3.2 Organizational structure. Organizational structure is an important means to realize the strategic landing, and it should be adjusted according to the strategic needs. In the design of business architecture, we should not only make clear the departments, posts and responsibilities of the enterprise, but also make clear the relationship between the organization and the business and establish the corresponding combination matrix. This project has strengthened the business collaboration ability of the power company by optimizing the organizational functions at all levels and defining the corresponding business function undertaking departments at all levels according to the business relationship.

3.3 business process. Business process is the key content of business architecture and the core of business architecture analysis. It is designed step by step according to value chain, business domain, logical relationship layer and activity layer, which is the process support and carrier of TOGAF architecture design in this project. The power company's business scope covers various fields such as power transmission and transformation, power distribution and new energy, and its business covers a wide range. In order to define the digital professional business structure of the target company, we need to understand the functional coverage of the information system corresponding to each business. According to the classification of the power company's business capabilities, it is divided into five major capabilities: project lean management and control capability, digital technology support capability, data service capability, operation service capability and operation safety guarantee capability.

4 The implementation effect

(A) to achieve simple business processes

By completing the adjustment of the digital professional business structure of the target power company, the process execution cycle is shortened, the work efficiency is improved, the refined management is strengthened, and the degree of control is improved. Reduce the number of process nodes to reduce the cost and strengthen the control of process nodes. Through process optimization management, the rational allocation of resources is improved, the business process system and norms are improved, the hidden loopholes are more obvious or clear, the information management system process is solidified, and the fluctuation in implementation is reduced. Through the completeness and standardization of supporting system documents, the work efficiency is improved, the customer satisfaction is improved through good quality, and the healthy and sustainable development of the company is promoted[6].

(B) Effectively improved the management efficiency.

According to the development strategy requirements of the company's digital specialty, combined with the company's development status, on the basis of optimizing the existing organizational structure and clarifying the functional orientation and responsibilities of existing departments, an organizational management and control model suitable for the development of the company's digital specialty is established. At the same time, the construction of digital work system has been continuously strengthened, which has promoted the efficiency improvement at all levels such as management and daily work.

5 Conclusion

This paper attempts to explore the specific methods of enterprise architecture design and practice under the guidance of TOGAF architecture framework. At the same time, as a pioneer in the practice of digital professional architecture method in domestic power enterprises, it points out the direction for the architecture governance in the process of digital transformation of power industry. Taking a power company with mature informatization construction as an example, under the background of the company's digital deepening transformation strategy, based on TOGAF's architecture planning method, this paper analyzes the digital strategy development direction, organizational architecture system, business system and coverage of the power company, and constructs the enterprise digital professional architecture model. And from the enterprise digital professional architecture, the business architecture, application architecture and digital architecture are planned and designed. This has better guided the planning and construction of the digital professional structure of the power company, and made effective support for the company to continue to promote digital transformation.

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