A Digital Project Management Mechanism Based on Enterprise Architecture

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Abstract: In view of the problems faced by current digital project management, such as unclear project management positioning, difficulties in digital and business collaboration, and lack of effective data and tool support, combined with the advantages of enterprise architecture methodology, a digital project management mechanism based on enterprise architecture was constructed. Through the application practice in a power grid enterprise, digital project management was realized to reduce costs and increase efficiency, providing guarantee for high-quality development of digital transformation of the enterprise.

Keywords: Enterprise Architecture, Digital Project Management, Hierarchical Control

1. Preface

Enterprise digital project management has a wide range of objects, covering infrastructure, enterprise mid-plane, business applications, data value, safe operation and other aspects. The way and efficiency of digital project management will directly affect the overall quality and economic benefits of project implementation, thus affecting the speed and quality of the company's Digital transformation development. With the development and deepening application of new technologies, enterprise digital project management is facing new challenges. It is necessary to use the Enterprise architecture method to guide practical activities in various business areas, achieve enterprise level project management, and ultimately achieve the strategic objectives of the enterprise.

2. Overview of Enterprise Architecture and Digital Project Management

2.1. Concept of Enterprise Architecture

Table 1: Type of Architecture.

No.	Type of Architecture	Architecture Description
1	Business Architecture	Business strategy, governance, organization, and key business processes
2	Data Architecture	The structure of an organization's logical and physical data assets and data management resources
3	Application Architecture	A blueprint for the individual applications to be deployed, their interactions, and their relationships to the core business processes of the organization
4	Technical Architecture	The logical software and hardware capabilities that are required to support the deployment of business, data and application services; this includes IT infrastructure, middleware, networks, communications, processing, standards, etc.

The earliest idea of Enterprise architecture came from the field of enterprise modeling. The internationally popular architecture frameworks include TOGAF, Zachman, DoDF, FEAF, etc. At present, TOGAF is recognized as the most open, universal, complete and excellent Enterprise architecture framework. The TOGAF standard defines a second meaning depending upon the context: "The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time." [1] TOGAF covers the development of four interrelated types of architecture, which

are generally regarded as a subset of a complete Enterprise architecture, including business architecture, data architecture, application architecture and Technical architecture (Table 1).

2.2. Overview of Digital Project Management

2.2.1. Digital Project Management

Digital projects refer to digital consulting and design, information system development and implementation, optimization and transformation, updating and upgrading, comprehensive evaluation, data resource access, processing and application, Network Security Services, supporting software and hardware, data product purchase and other related projects, covering infrastructure, enterprise mid-plane, business application, data value, full scene security operation and other aspects.

Digital projects are classified and managed according to their nature. They are generally divided into consulting and design, development and implementation, business operations, data engineering, and product procurement categories.

● Consulting and design projects include top-level design, overall design, special research, and other consulting and design projects in the field of digitization.

● Development and implementation projects include functional design of information systems (platforms) and development using various programming languages (including requirement analysis, system design, and development work), as well as supporting installation, configuration, debugging, and training work after the completion of development work or purchase of software packages.

● Business operation projects include projects that carry out system optimization and transformation, application agile iteration, content update and upgrading, network security services, feasibility study evaluation, post evaluation, performance evaluation, and other related work based on normal statistical analysis of system operation, business applications, user behavior, etc.

● Data engineering projects include projects that integrate, process, and develop data resources, and realize data value through data analysis and mining.

● Product procurement projects refer to projects that support the digital construction of the power grid by purchasing supporting software, hardware, and data products, mainly including computer room infrastructure, cloud platform construction, network and security facilities, etc.

2.2.2. Issues in Digital Project Management

With the rapidly changing business environment, digital project management is constantly facing various challenges. Firstly, the project management positioning is unclear. Due to a lack of clear understanding of strategy and management objectives, it is difficult to integrate and prioritize numerous projects in a reasonable manner, resulting in many projects being delivered but still not meeting the management's original intention and expected value. Secondly, it is difficult to collaborate between digitalization and business, and it is difficult for digital departments to effectively cooperate with business departments. When managing project delivery in business departments, progress tracking can only be done in a general manner. Thirdly, there is a lack of effective data and tool support, resulting in inconsistent information coverage, delayed reporting, and inaccurate data, making it difficult to accurately assess project efficiency and identify project risks and issues.

2.3. The Role of Enterprise Architecture in Digital Project Management

Enterprise architecture is the organizational logic of business processes and IT infrastructure, reflecting the integration and standardization requirements of the company's operating model. Enterprise architecture is the bridge connecting the company's strategy and digital projects. By integrating Enterprise architecture into the digital project management methodology, it can reduce IT costs, improve IT responsiveness, improve risk management, improve management satisfaction, and enhance strategic business outcomes.[2]

3. Digital Project Management Process Based on Enterprise Architecture

A hierarchical control system of digital architecture base on the whole process of digital project management is established (Figure 1), which covering planning, design, construction, and operation phase. Under the system, it clarifies the division of responsibilities at each phase. It requires to conduct

overall architecture compliance check at requirements and feasibility study phases, to ensure the architecture connection between planning and design. It requires to conduct system architecture reviews at requirements, feasibility study, design, and launch phases, to ensure consistency in the architecture during whole project construction.
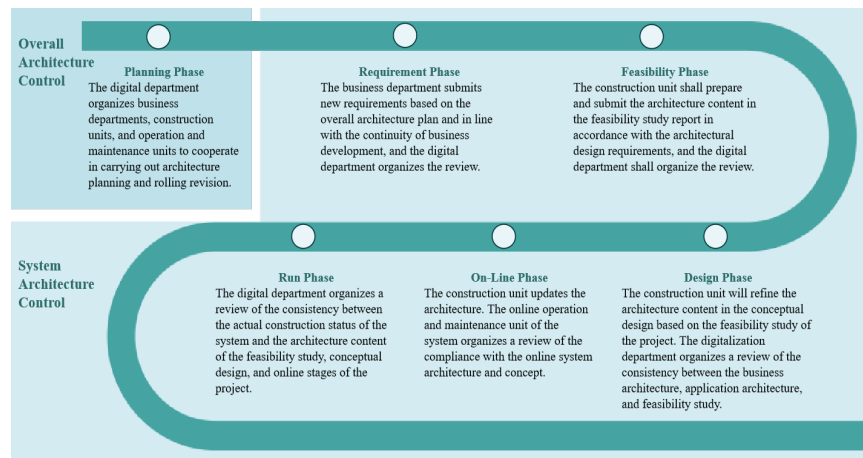

Figure 1: Digital architecture hierarchical control

3.1. Requirement Phase

At this phase, all investment channels of the company's digital construction projects are managed. Based on the overall architecture planning and in line with the continuity of business development, business departments submit new requirements. The digital management department organizes the review of architecture consistency between requirements and planning.

3.2. Feasibility Phase

At this phase, the construction unit prepares and submits a feasibility study report (including business architecture, application architecture, data architecture, and technical architecture content) in accordance with the architectural design of requirements. Based on the architectural compliance requirements and rules, the digital management department organizes the review of the consistency of business architecture, the repeatability of application architecture, and the compliance of data, technology and security architecture in the feasibility study report, to ensure the scientific and compliant nature of the project feasibility study.

3.3. Design Phase

At this phase, the construction unit refines the business architecture, application architecture, data architecture, and technical architecture content in the conceptual design based on the feasibility study report. The digital management department organizes a review of the consistency of business architecture, application architecture between feasibility study report and conceptual design report, reviews the compliance of the technical platform, technical components, deployment plan, and security protection plan, and reviews whether the data model complies with company standards, to ensure the project design guides the development of digital system effectively.

3.4. On-Line Phase

At this phase, the construction unit updates the business architecture, application architecture, data architecture, and technical architecture content based on the system function, performance, and security test reports passed in the evaluation, as well as database design plans and other materials. The system's online operation and maintenance unit organizes a review of the compliance with the online system architecture and concept to ensure consistency between system design and development, and is responsible for archiving and updating the architecture assets.

3.5. Run Phase

At this phase, if the architecture adjustment is involved in the maintenance, defect elimination, expansion, and version upgrade of the information system, the construction unit updates the architecture content according to management requirements. The digital management department organizes a review of whether the system version upgrade, application function optimization, data object modification, and other changes comply with the requirements of architecture management work to ensure compliance with the system change and release process.

4. Application Benefit

Through practical application in a certain power grid company, the "Implementation Rules for Digital Architecture Management" were issued, combined with the digital project management process and relying on digital architecture control tools to strengthen information system architecture control, achieving good results.

4.1. Economic Benefit

By building a unified digital architecture standard for the company, barriers between different professions are broken down, which promotes the co construction and sharing of business application system functions and data fusion and sharing, effectively reduces duplicate construction of system functions, avoids resource waste, and saves investment of more than 3.5 million RMB annually in project construction. Through the construction and application of the enterprise architecture digital management and control platform, the online preparation review of the feasibility study proposal and the intelligent audit of the architecture problems are realized, which greatly reduces the workload of the architecture management and control, promotes the burden reduction of the grass-roots unit, significantly improves the paperless office degree of the company's architecture management and control, and saves more than 1.2 million RMB every year.

4.2. Management Benefit

Through the application of a digital architecture hierarchical control system based on project management, the communication efficiency between business departments is strengthened, and the data resources of relevant systems of the company are further integrated to achieve deeper and wider cross business monitoring and analysis. This effectively promotes the transformation from scale construction to precision construction, optimizes the efficiency of company business operations and resource allocation, and strengthens the practical effectiveness of digital project construction and achieving an improvement in the overall operational efficiency of the company.

5. Summary

By constructing a digital project management mechanism based on enterprise architecture, the problems faced by current digital project management, such as unclear project management positioning, difficulties in digitalization and business collaboration, and lack of effective data and tool support, are solved. Through practical application in certain power grid companies, the unified digital architecture of the company is promoted, and joint construction and shared public use are improved, which helps the company's digital transformation and high-quality development.

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