Research on the Evolution Trend of Energy Enterprise Organization Form

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Abstract. With the development of digital technology, energy enterprises have turned to digital transformation. In this context, the organizational form of energy enterprises will also change. This study put forward the path of energy enterprise organizational reform. Taking EDF, Tokyo Electric Power Company and other companies as examples, the study summarized the factors that influence the choice of energy enterprise organization. Finally, the study pointed out the future evolution direction of energy enterprise organization.

1. Introduction
In recent years, energy enterprises such as EDF and Tokyo Electric Power Company have carried out digital transformation. The organization form of energy enterprises has also changed accordingly. The evolution process of enterprise organization form has its laws and trends. Studying the path and direction of the evolution of energy enterprise organization forms is of great value for energy enterprises to adapt to digital transformation.

2. Evolution path of energy enterprise organization form
The connotation of organizational form can be divided into a narrow sense and a broad sense. The narrow organizational form refers to the organizational structure. The broad enterprise organization form refers to an invisible and relatively stable state formed by vertical hierarchical relationships and horizontal collaborative relationships. The broad organizational form also includes two elements of division of work and collaboration among members of the organization. Among them, the division of work is mainly reflected in the external organizational structure, and the collaboration is mainly reflected in the internal management mode of the organization.

According to the influence of economic and social development, enterprise scale expansion, policy environment and other factors, the corporate organizational form has continued to develop and evolve, mainly including the following six forms.

2.1. Linear organization
The linear organization is the oldest and simplest organization form. In a linear organization, powers are directly transferred and decomposed from the top to the bottom, and reach the lowest level of the organization through several management levels, where a single decision-maker conducts vertical management. The linear organizational form appeared in the early stages of industrialization, and the organizational form was simple and efficient. The application of linear organization forms has promoted the development of industrial society. With the further development of society and economy,
large-scale production activities need to strengthen the "division of work" and "cooperation" capabilities among members of the organization. A functional organizational form came into being.

2.2. Functional organization
Functional organization is a vertically integrated organizational form that divides departments by function. Each functional department directly commands subordinates within the scope of their business. Functional organizations usually show the characteristics of detailed division of work, increased functional units and job levels, and generally adopt a functional organizational structure. Energy enterprises under this organizational form have rapidly achieved scale expansion, and individual enterprises have gradually developed into group enterprises. However, with the expansion of the scale of the enterprise, the horizontal functional departments and vertical position levels continue to increase, and the phenomenon of independent administration and prevarication becomes more and more obvious. When market demand changes frequently, the functional organizational structure will reduce the efficiency of enterprise operations.

2.3. Departmental organization
A departmental organization is a highly centralized and decentralized management organization that realizes business management of the organization by setting up divisions (or large subsidiaries) according to products, regions, or customers. Business department is an organizational form of hierarchical management, hierarchical accounting, and self-financing. Each business department has its own relatively complete functional organization. The departmental organizational form is still a vertical management organizational form. With the uncertainty of the market environment and increasingly fierce competition, the company's development is more focused on business processes and customer needs. Energy enterprises will develop towards flatness by compressing management levels.

2.4. Matrix organization
The matrix organization is an intersecting organizational form that includes a vertical leadership system divided by functions and a horizontal leadership relationship divided by products (projects). In this organization, each department and project has a manager, and each employee accepts the dual-headed leadership of the project team and the functional department at the same time. By increasing the organization's horizontal management methods, matrix organizations can effectively enhance market competitiveness. Compared with the vertical organization, the matrix organization is more able to adapt to the flexible and changeable external environment.

2.5. Ecological organization
In order to get rid of the traditional pyramid-shaped power structure, the organization began to build an agile front desk, empowered middle desk, and flexible backstage internally. An organizational platform is gradually formed, and through the establishment of ecological links with other external organizations, it will eventually transition to an ecological organization. At this time, the boundaries of the enterprise are gradually blurred and more open. Customers of the industrial chain can be integrated into the "ecology" of the organization, and ecological links with other organizations can be established within the enterprise. Through the resource aggregation and scale effect of operating the ecological platform, users, participants, and suppliers on the platform will significantly reduce transaction costs, optimize resource allocation, and form an ecological organization.

2.6. Virtual organization
A virtual organization is a dynamic alliance composed of independent organizations (such as suppliers, customers and even competitors) through division of work and collaboration with the help of modern information technology to achieve specific corporate goals. The virtual organization form is the development direction of the future enterprise organization. It can be formed between organizations or
between internal and external business units. It has strong adaptability to market ecology. At this time, the organizational boundaries will disappear and become a borderless organization.

The alternate evolution process of the above-mentioned six corporate organizational forms is the result of companies constantly adjusting their organizational structures and management models. According to the evolution of the management model and organizational structure, the organizational form can be divided into three quadrants (as Fig.1). The evolution of the organizational form from Quadrant 1 to Quadrant 3, from the perspective of the vertical organizational structure, is a process of gradual evolution from a pyramidal vertical organizational structure to a flat, borderless organizational structure. From the perspective of horizontal management mode, it is a process of evolution from a high degree of centralization to authorized empowerment and independent operation.

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**Fig. 1. Evolution path of energy enterprise organization form**

### 3. Case study of enterprise organizational evolution

Through case studies of typical enterprises with Internet enterprise characteristics, advanced energy enterprises, network infrastructure enterprises and other typical enterprises, it is concluded that the evolution of large group enterprises has the following characteristics.

#### 3.1. Match with strategy

The organizational form of the enterprise needs to be matched with the enterprise strategy, and continuously optimized and perfected according to the adjustment of the enterprise strategy. Since its establishment, Huawei has successively formulated many strategies such as centralized development of single products, diversified development, and cross-market and cross-regional operations. In order to adapt to strategic changes, the organizational form has undergone a series of transformations from function to business department, then to matrix and platform. At this stage, Huawei has adopted a large-scale platform organization with R&D platforms, business platforms, and functional platforms as the core. Through the aggregation of R&D, sales, and management, Huawei's strategic competitiveness has been effectively improved. China Mobile has successively proposed four phases of corporate strategy during its 20-year development, and adjusted its organizational structure accordingly for each strategic phase. At the beginning of its establishment, in line with business development, a linear functional organizational structure was adopted. In the business expansion stage, in order to achieve "centralized decision-making and decentralized operation", the regional business unit system was implemented to achieve a leap from excellence to excellence. In order to realize the strategy of sustainable development, many wholly-owned subsidiaries have been established, forming a matrix organizational structure of product divisions and regional divisions. In order to cope with the digital transformation, China Mobile has carried out the "Five Modernizations" reform to realize the professionalization of front-end business and the centralization of back-end functions.
3.2. Promote collaboration

Innovating organizational forms is an effective means to break professional barriers and promote collaboration within the enterprise, and it helps to promote the establishment of an operating mechanism that maximizes overall benefits. China Mobile builds an internal collaborative management system. It has set up a provincial-level fund payment center, a business audit center, and a network "three fee" centralized audit center. It has established a centralized operation organization for terminals, procurement services, IT research and development, product research and development, and IT planning and operations. Through the centralized operation of the business, the difficulty of business coordination between regional companies and professional institutions has been solved. In order to solve the problems of multiple management of emerging businesses and insufficient internal coordination, EDF has created a transformation and operational efficiency department for digital business, responsible for IT systems, procurement, assets and shared services, and provided digital business services for other EDF businesses. EDF established a subsidiary specifically responsible for the integrated energy business, which is completely isolated from the power grid business in terms of assets, personnel, and office space, and achieves professional operations.

3.3. Focus on customers

Paying attention to the value of the market and customers is the consideration factor in the choice of corporate organizational form. Customer-centric organizational structures are widely adopted in large group companies. TEPCO is oriented towards being close to the needs of customers in the market and shaping a "customer-centric" organizational form. In 2016, in accordance with the goal of "providing customers with better services", TEPCO reorganized its competitive energy retail business. It merged the customer service company and the power sales department of the headquarters into Tokyo Electric Power Partners Co., Ltd. It sets up business units based on business scenarios to enhance operational efficiency and improve user experience. Since 2015, GE has gradually established a customer-centric organization and management model. GE Store is the core of the entire structure. GE Digital Group, Global Operation Center, R&D and Global Growth Organization are the four pillars surrounding GE Store. The GE store allows the group to become a whole, exchange knowledge, technology and tools on a global scale, and realize R&D sharing and service sharing. Customers only need to face one entrance, and GE can provide products that integrate 300,000 employees and various business groups to form a complete and systematic solution.

3.4. Integrate resources

With the in-depth application of digital technology in enterprises, platform-based organizations have become an inevitable choice for enterprises, with the functions of integrating middle and back-end internal resources, empowering front-end business lines, and improving user responsiveness. Alibaba has promoted a flatter organization and management through the reform of the organizational model of "small front desk and big middle desk". This makes management more efficient, organizational operation efficiency improved, and business more agile and flexible. The front-end business is more agile, faster, and more adaptable to the ever-changing market. At the same time, the front-end business gradually accumulates data, knowledge, and experience in the innovation process to promote the upgrade of the middle office. The middle station will gather the operational data capabilities and product technical capabilities of the entire group. The middle station can centrally manage and maintain the data and business modules used in high frequency, empower the front-end business team in a platform-based way, and form a strong support for each front-end business. Huawei has built a platform-based organizational form and put the core products and technologies of BG such as operators and enterprises on the R&D platform for development. A large research and development platform focusing on products and solutions and laboratories has been formed to improve the sharing and scale effect of research and development. Huawei has strengthened its business operation capabilities and has established four major business groups and regional companies as specialized operating organizations. The entire business group shares the core products of the R&D platform and
closely integrates internal application development and sales. Huawei strengthened its functional support and established numerous group functional platforms to focus on business support, service, and supervision. By forming a similar supply chain, procurement, and manufacturing supply chain platform system, the functional platform provides timely, accurate and effective services to the front end of the business, which not only ensures full authorization, but also strengthens supervision.

4. Future evolution direction of energy enterprise organization

4.1. Digitalization
The application of Internet technology directly promotes the transformation and upgrading of corporate strategy. The way of enterprise development needs to change from an enterprise in the industrial age to an enterprise in the digital age. The organizational form also needs to be adapted to digital organizations, and the overall development trend of information digitization, business digitization, and digital business will be presented. Relying on information technology, energy enterprises can realize automatic collection and digital conversion of information, thereby improving the efficiency of information storage, processing and transmission. At the same time, energy big data itself has commercial value. Digital resources and related infrastructure can be used as independent businesses to carry out business model innovation.

4.2. Platformization
In order to effectively meet the highly complex market demand, the unstable competitive environment and the increasing self-management needs of knowledge workers, the company needs to integrate the scale advantages of traditional enterprises and the flexible advantages of Internet companies to form a more open platform organization. Faced with emerging business opportunities and challenges, from an internal point of view, energy enterprise need to promote efficient coordination of various resources to achieve dynamic matching of supply and demand and optimal allocation of resources. From an external point of view, energy enterprise need to unite with different ecological partners to connect different industries and different business models. The organization will present an independent small front end, a large-scale support platform, a diverse ecosystem, a bottom-up entrepreneurial spirit, and a flexible value sharing mechanism.

4.3. Ecologicalization
Enterprises evolve into ecological organizations, through resource sharing and individual self-organization, to achieve continuous collaborative evolution with changes in the external environment. Through the platform, connect and share various resources of relevant subjects, and realize co-evolution in a mutually beneficial and symbiotic manner. According to the continuous evolution of environmental and strategic changes, the company maintains a dynamic balance and optimal organizational efficiency. Enterprises will open up the vertical boundaries of the internal hierarchy of the organization, open the horizontal boundaries between internal departments, and open the boundaries between the outside and the social environment.

4.4. Empowerment
The company will give employees more development possibilities and greater development space. Talents need to have an open and innovative mind, the kinetic energy to forge ahead, the power to make independent decisions, an attitude of proactive work, and brave and positive actions. The company needs to change the traditional management methods, stimulate the internal vitality and innovation of employees, give play to the greater talents and potential of talents, and fully meet the individual demands of talents. Therefore, energy enterprise need to give more resources to the company's internal departments, business units, and teams to allocate more resources, to promote faster access to resources for each business unit, and to better serve customers. On the other hand,
energy enterprise need to give more rights, responsibilities, and personal growth space to the staff in the team, so as to better realize the potential and value of employees.

5. Conclusion
With the changes of environment, the organizational form of energy enterprise also needs to be optimized and adjusted adaptively. The evolution of energy organizational form, from the perspective of the vertical organizational structure, is a process of gradual evolution from a pyramidal vertical organizational structure to a flat, borderless organizational structure. From the perspective of horizontal management model, it is a process of evolution from a high degree of centralization to authorized empowerment and independent operation.

The evolution path of organizational form has gone through six stages, which are linear organization, functional organization, departmental organization, matrix organization, ecological organization and virtual organization. In the evolution of organizational forms, the vertical division of work has been weakening, and the horizontal collaboration has been continuously strengthened. The organization's structure, relationships, and boundaries of energy enterprise are developing toward flatness, networking, miniaturization, and flexibility. The organizational form of energy enterprise will eventually show the characteristics of digitization, platformization, ecologicalization and empowerment.

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References
[1] Y.X. Bai, S.K. Liu, Y.B. Chen, Enterprise reform and management, 90(2020)
[2] Z.Q. Sun, Q. Qiao, China Power Enterprise Management, 19(2017)
[3] L. Cheng, Economic Research Guide, 11(2018)
[4] R.R. Chang, Management observation, 20(2020)
[5] D.H. Li, Journal of Tsinghua University, 27(2000)
[6] J. Feng, L.G. Zhang, C. Fan, Human Resource Development of China, 157(2019)
[7] H.J. Li, Y. Li, Economic Management, 22(2019)
[8] G.M. He, Z.Z. Luan, Human Resource Development of China, 47(2014)