Research on Innovation of Enterprise Value Network Based on Cloud Computing in Internet Economy

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Abstract. With the rapid advancement of information technology, there has been a varying impact on people's production and daily lives, and the problems of traditional economy have become increasingly prominent. The innovative advantage of Internet economy is that economic activities can be carried out through the Internet platform. With the rapid development of Internet economy, the traditional business model can no longer meet the requirements of the current market economy development. Revised sentence: “To achieve sustainable development in the era of the Internet economy, enterprises must prioritize network innovation and commence from an innovative framework within their value networks.” So as to strengthen their market competitiveness, create more benefits for the society and realize their sustained and stable development. Cloud computing is a new stage in the development of computer network technology. Its appearance is not only the progress of technology, but also creates new value for enterprises, while avoiding the risks that could not be avoided in the past. Based on cloud computing technology, this paper discusses and analyzes the innovation of enterprise value network in Internet economy.

Keywords: Information technology; Internet economy; enterprise value network; innovation.

1. Introduction

The advancement of Internet technology has brought about a new pinnacle, and its influence is increasingly formidable. It can be said that the Internet has completely subverted the traditional society, and it is also an important symbol of human modernization [1]. With the continuous development and enrichment of the Internet economy, the traditional business model has been unable to meet the development needs of the market economy, and it is of great significance to realize enterprise value network innovation [2]. With the increasing competition among enterprise groups, the research on the overall innovation ability of enterprise value network is becoming increasingly important [3]. In the real business competition, strategic decision-making has crossed the boundary of a single enterprise and evolved into the confrontation between network strategy and network strategy. Nowadays, the traditional business model is still unable to meet the needs of modern society, and enterprises must realize value network innovation to adapt to the development of the times [4]. The role of computer in the transformation of enterprise information in the past few decades is significant. More and more enterprises have greatly improved the management level and production efficiency of enterprises by deploying enterprise level computer system solutions [5]. In the Internet economy, the competition among enterprises is more and more fierce, and this kind of competition will tend to a virtuous circle. As long as the enterprise finds the correct positioning, actively constructs and innovates the value network, and ensures the stability and rationality of the enterprise value network, it can effectively avoid and reduce risks and realize the modern development of the enterprise [6].

In recent years, with the continuous development and progress of Internet technology, it is no longer a pure entertainment tool for people, but a part of people's life, including the continuous progress of Internet economy [7]. With the rise of all kinds of shopping software, China's Internet economy has achieved unprecedented development [8]. With the increasing competition among enterprises, the research on value network innovation capability is becoming more and more important. Enterprise value network is a subset of network concept, and innovation is the source of

building competitive advantage. Entrepreneurs realize that the innovation ability of a single enterprise is limited. With the trend of networked strategic problems, innovation problems gradually become networked. The innovation advantage of Internet economy is that it can carry out economic activities through the Internet platform [9]. With the rapid development of the Internet economy, the traditional business model has been unable to meet the requirements of the current market economy development. Under the Internet economy, although enterprises have gained huge profit space, the competitiveness among enterprises has also been strengthened [10]. With the continuous development of China's market economy, the competition between the same industry is becoming increasingly fierce. If enterprises want to occupy a place in the modern market, they must pay more attention to network innovation, build a system that meets the needs of their own development through the value network innovation framework, improve their core competitiveness, and achieve sustainable development [11]. In this paper, cloud computing technology, for the Internet economy enterprise value network innovation are discussed and analyzed. Therefore, if enterprises want to occupy a place in the competitive Internet economy, they must realize value network innovation.

2. Enterprise Value Network's Innovation Framework in the Era of Internet Economy

Modularity, as the basic feature of value network, means that in the diversified and complex network environment, the system is automatically divided into different modules, and each module can be quickly reorganized, so as to play its own important functions, promote the promotion of network core competitiveness, and ensure that enterprises have certain market advantages. The main basic feature of value network is modularization, which means that in the complex and diverse network environment, the complex network system can be automatically divided into multiple modules, and then multiple modules are reorganized again, so as to maximize the role and function of different modules. At present, the informatization of enterprises mostly depends on the Information Department of enterprises. Regardless of the size of enterprises, there must be employees who are proficient in computer technology [12]. Relying on these employees, enterprises build their own hardware and software systems, but also carry out daily maintenance work, in order to ensure the safe and accurate operation of various businesses in the computer environment. In the actual production and operation process, if it is difficult for general business operators to obtain certain benefits from different fields, they can be fixed in a certain field and constantly innovate technology and scale, so as to reduce the cost in the division of labor and strengthen their professionalism and competitiveness in this field. In the Internet economy, one of the important organizers of organizational competition platform is the core enterprise. Although Internet technology can effectively promote the development of enterprises, the implementation of network strategy still needs the leadership of core enterprises, which can be said to be the benchmark of the same industry. Value network is a network system based on the perspective of value management, pursuing the maximization of value. Value network can help enterprises to improve the efficiency of resource allocation and establish cooperation or business alliance with other enterprises or individuals.

Enterprises can choose the services they need according to their own needs, and different enterprises can share or make use of various application services provided on the cloud. Network mode of production has formed multi class and multi-level module suppliers in the development of modules. When optimizing and innovating a single module, the supplier can provide a complete scheme, give full play to the overall function of the module, and move the innovation down to the decision point, so as to build a reasonable network value module. In the modern market environment, the core competitiveness of enterprises is directly proportional to their industrial status, which significantly enhances their market position in terms of competitiveness. While traditional operations and production only require innovation within the value network to achieve objective benefits, in the Internet economy, enterprises must not only innovate but also play a guiding role [13]. The enterprise value network represents a new business management model under the Internet economy. With the

development and utilization of Internet resources, traditional supply and demand chains are disrupted as a new value network is constructed through Internet platforms leading to changes in enterprise operation and management systems. The Internet economy has distinct operational characteristics. In the Internet economy, customers can express their individual needs more freely. Economic entities break the time limit of transaction, and the transaction frequency is high, and the competition pattern changes quickly. In the Internet economy, there are positive feedback mechanisms of node innovation and network value, and positive feedback mechanisms of enterprise innovation and industrial status. Figure 1 shows the main value creation process of cloud computing business model based on value net, including the main links of value creation activities.

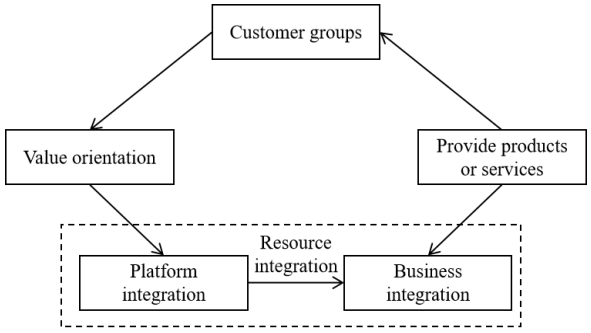

Fig. 1 Cloud computing business model based on value network.

The current economic environment exhibits a robust positive feedback loop between enterprise innovation and industrial status, thereby enhancing the strategic decision-making position of core enterprises to a certain extent. In the traditional production and operation process, enterprises typically focus on innovating their value network; however, in the context of the Internet economy, they must assume a leadership role. When core enterprises embark on value network innovation, they should thoroughly consider their development strategy and goals, continuously foster technological advancements and conceptualize value networks while breaking free from conventional business paradigms. Furthermore, it is essential for them to appropriately adjust and reorganize their industrial chain and supply chain based on their unique circumstances. When innovating value network, core enterprises should actively innovate their own development goals and concepts, update the concepts and technologies of value network, get rid of the shackles of traditional industrial structure, and reconstruct related supply chains and industrial chains. The cross-regional restriction of the Internet rapidly spreads high-quality customer experience, and excellent software suppliers gain economies of scale and enjoy high profits. Customer experience requires software suppliers to exert competitive pressure. Suppliers find that using hardware performance to create customer identity and realize that innovation is the only way to gain competitive advantage in Internet economy. The structure of enterprise's technological innovation capability is shown in Figure 2.

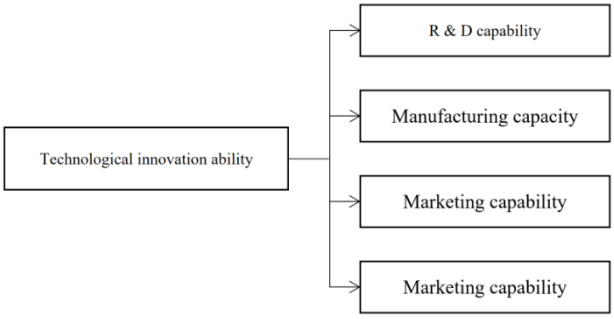

Fig. 2 Structure of technological innovation capability of enterprises

Through the framework of value network, an enterprise can form a network system of internal resource management, which is helpful to find out the existing problems of resource management in real time and make adjustments, so as to achieve the effect of optimizing resource management and promoting the competitiveness of enterprises. In addition, by constructing the value network, it helps

to promote the smooth communication among internal institutions, realize the effective coordination and cooperation among various departments, increase the cohesion of enterprises, and share valuable business information in time through the interconnected network. Under the development mode of Internet economy, the business scope of enterprises has been further expanded. At the same time, the development of Internet economy has also led to the improvement of consumers' awareness and the change of market model. Relying on the fast-developing Internet economic model, enterprises must find their own market position as soon as possible, determine their own consumer groups, analyze the market by relying on network data, timely adjust business strategies according to market demand and consumer preferences, and actively develop new technologies and products to expand their advantages in market competition. Enterprises must use Internet technology to construct and integrate into the value network, enhance their market adaptability, and cooperate with other enterprises to establish business alliances, effectively share risks, form industrial chains and value networks, and expand economic development advantages.

3. The Main Strategies of Enterprise Value Network Innovation Under the Background of Internet Economy

3.1. Management Innovation

Under the Internet economy, while the Internet technology is developing continuously, it is also expanding its application scope and producing diversified data. In the process of collecting and managing data, more advanced information and network technology should be adopted, so as to improve the service quality of enterprises, provide customers with more timely and accurate information, and thus improve the management efficiency and operation level of enterprises. For the development trend of the Internet, whether the overall development concept of enterprises can keep up with the development of the times is a problem that enterprises must consider at present. At the same time, the concept should fully show the equality between core enterprises and node enterprises in the value network. Enterprises in the establishment of benefit distribution mechanism, for a single enterprise to achieve long-term economic growth and its lack of rationality in measuring profits, need to take the operational value network as the main reference, to innovate across enterprise boundaries, and then promote their long-term development [14]. Selecting the leading enterprises in the industry as the key part of constructing the value network will prompt the key enterprises to change the old development ideas, adapt to the new economic development mode in the Internet era, and pay attention to the scientific integration of innovation mode and traditional business operation mode. On the premise of retaining the advantages of the traditional model, the economic benefits can be effectively superimposed. According to the concept of network culture, it is necessary to give reasonable guidance, respect the interests of other enterprises while gaining economic benefits, ensure the scientific and rational concept of network and ensure the coordinated development among enterprises.

When innovating the value network, the traditional concept of enterprise development is bound to have a certain restrictive effect. In order to further innovate the enterprise value network, it is necessary to establish a positive and reasonable network culture and emphasize the innovation and scientificity of the enterprise value network. The data mining process in financial analysis is shown in Figure 3.

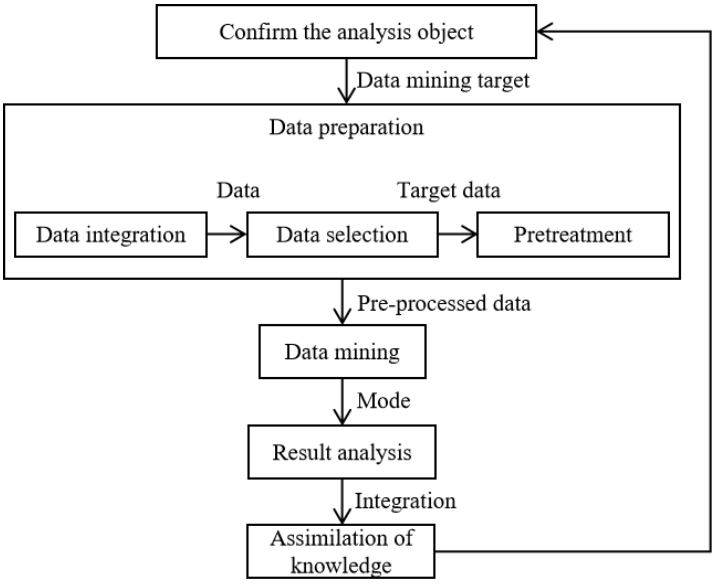

Fig. 3 Data mining process in financial analysis and management

Let the expected output be $z_k^{'}$, and define the global error between the expected and actual output as L:

$$L = \frac{1}{2}\sum_{k=1}^{m}\left(z_k - z_k^{'}\right)^2 \tag{1}$$

Through the process of back propagation, the error expands to the hidden layer as follows:

$$L = \frac{1}{2}\sum_{k=1}^{m}\left[f\left(\lambda_k\right) - z_k^{'}\right]^2 = \frac{1}{2}\sum_{k=1}^{m}\left[f\left(\sum_{k=1}^{t} w_{jk} y_j + b_k\right) - z_k^{'}\right]^2 \tag{2}$$

The final backward transmission to the input layer is:

$$L = \frac{1}{2}\sum_{k=1}^{m}\left[f\left(\sum_{k=1}^{t} w_{jk} y_j + b_k\right) - z_k^{'}\right]^2 = \frac{1}{2}\sum_{k=1}^{m}\left[f\left(\sum_{k=1}^{t} w_{jk}\left(\sum_{j=1}^{n} w_{ij} a_i + b_j\right) + b_k\right) - z_k^{'}\right]^2 \tag{3}$$

The network error is a function of the weights w_{ij} and w_{jk}, thus altering the weight of the neuron can lead to changes in error E, thus:

$$\Delta w_{ij} = -\varepsilon \frac{\partial L}{\partial w_{ij}}\left(i = 1\ldots m,\ j = 1\ldots n\right) \tag{4}$$

$$\Delta w_{jk} = -\varepsilon \frac{\partial L}{\partial w_{jk}}\left(j = 1\ldots n, k = 1\ldots t\right) \tag{5}$$

Among them, ε represents the rate, and $\varepsilon \in (0, 1)$.

Under the development mode of Internet economy, when enterprises develop and innovate value networks, they must also ensure the independence and flexibility of the whole enterprise. In particular, the node enterprises that lack the strength of core enterprises and occupy the Internet economy mode need to combine their own characteristics, give full play to their unique advantages, and gradually integrate them into the value network of supply chain and industrial chain, thus breaking the single mode of supply, production and marketing in the traditional supply system. With the continuous expansion of the application scope of information technology, new data are emerging. In collecting data, enterprises should actively introduce and apply advanced information technology to provide users with effective information in time, thus improving their own work efficiency. The value network model takes customers as the center, pays attention to the real needs of customers, and through a series of design of value activities, reconsiders the service to customers, keeps close contact with customers, coordinates suppliers, and creates value together with customers to achieve a win-win situation. Under the background of Internet economy, organizations of innovation strategy

platform need to have a reasonable and concrete benefit distribution mechanism. The benefit distribution of enterprise value network innovation activities is a difficult point for enterprises.

3.2. Institutional Innovation

The construction and operation of a value network enables enterprises to transcend their boundaries in terms of innovation activities. In the process of innovating an enterprise's value network, attention must be paid to the positive role of governance mechanisms. Enterprises should take measures to improve the operational efficiency of these mechanisms, allowing different node enterprises to establish connections in various production environments and realize complementary functions, thereby enhancing network utilization efficiency. With the continuous development and expansion of information technology applications, cross-space and cross-time information transmission, cloud storage and computing have become possible, further improving information utilization rates. The Internet of Things ensures effective exchange of information and data, fundamentally enhancing competitiveness. In the information service market, key participants include application service providers, equipment providers, solution providers, hardware vendors, and software developers. Within the value network-based cloud computing business model, the cloud computing service provider assumes the role of a value network target designer by establishing strategic objectives for the value network and leveraging its extensive customer resources along with robust capabilities in business provisioning and integration to identify and define target market segments. In the benefit distribution mechanism, a single enterprise cannot quickly obtain considerable economic benefits, nor can it measure the value of the distributed benefits. In view of such problems, enterprises can expand the design field of enterprises and realize cross-border innovation based on value network, thus ensuring the self-development of a single enterprise.

The arrival of the Internet era has changed people's lives and facilitated the dissemination of information, but at the same time it has increased the difficulty of protecting innovative achievements. How to protect innovative achievements is a problem that puzzles every innovative individual. Enterprises must change their traditional ideas and gradually realize that starting a business by employees is not a phenomenon of brain drain. Enterprises can effectively encourage employees to start businesses, realize their personal dreams, and create more benefits and values for enterprises by realizing their personal values. In the process of innovating benefit distribution mechanism, enterprises must have a comprehensive understanding of cross-shareholding, long-term contract and joint investment, so as to ensure that the leading role of core enterprises and the role of building network platform organizations can be fully played [15]. In the new era of Internet, not only information and data are very important, but the effective link between them and real objects can be transformed into the real competitive advantage of enterprises, and the Internet of Things is the bridge between data and real objects. The Internet of Things constantly influences the development mode of Internet economy, and constantly improves the efficiency of value member enterprises to complete their own value activities. Many employees in modern enterprises are young people in the new era, and their creative thinking is relatively strong, which is also a great advantage of employees in the new era under the condition of Internet economy. Therefore, in the development of modular network economy, enterprises should make clear their own development strategies, integrate their market positioning and encourage employees to innovate, so as to strengthen their core competitiveness.

4. Conclusions

In the context of the Internet economy, enterprise value networks have undergone significant transformations. With the continuous advancement of networking and informatization, enterprises face strategic and governance challenges that hinder innovation within their value networks and impede sustainable business growth. The ongoing progress in informationization and networking further exacerbates issues related to governance and implementation of economic strategic objectives within enterprises, creating substantial barriers to innovation within value networks. To thrive in a

modular network economy, enterprises must establish clear development strategies, effectively integrate market positioning, and foster a culture that encourages employee innovation to enhance core competitiveness. The value network is not only necessary in the current era, but also an inevitable path for economic transformation and development. As a novel economic model, the value network possesses unparalleled advantages compared to traditional enterprise management models. In the realm of the Internet economy, enterprises must embrace modular management, expedite both internal and external innovation, and evolve their value networks to enhance core competitiveness. By establishing an enterprise value network within the context of the Internet economy while incorporating contemporary characteristics, enterprises can effectively drive development.

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