Research on Innovation of High and New Technology Enterprises under Big Data Environment

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ABSTRACT. In this paper, the author researches on the innovation of high and new technology enterprises under big data environment. Enterprise innovation network become the enterprise innovation resources to shorten the development time and reduce technology R&D investment cost and risk effective organization form. Based on the theoretical analysis on the system of enterprise network and according to the characteristics of enterprise innovation network, the paper proposed coupling mechanism of enterprise innovation network. The big data method and model is proposed to disposal the test data. The experiment result shows the proposed method is effective for the development of innovation of high and new technology enterprises.

KEYWORDS: Innovation, High and new technology enterprises, Big data environment

1. Introduction

With the economic and social development, human society has entered the era of knowledge economy, the era of knowledge economy relies on knowledge of human innovation and technological innovation and development of the times. With the endless stream of technological innovation to promote the rapid development of high-tech industries, the rise of high-tech industry and develop into world economic growth point in the development of new and more profound changes in the human mode of production and way of life. High-tech enterprises are the new knowledge era of the knowledge economy and high-tech product development is knowledge-intensive and technology-intensive enterprises and high-tech enterprises of the technological innovation capacity and technological level of the industry as a whole region or country the highest level is all about. Research on high-tech enterprises in technological innovation factors conducive to improving the competitiveness of enterprises, technological innovation; enhance the country's overall competitiveness. At present, the level of scientific and technological strength and innovation compared with the developed countries there is a wide gap between the need to narrow that gap, the most fundamental scientific and technological power is the road to go and take the path of technological innovation. This article is in this new environment, a decision under the new situation of China's high-tech enterprises of the impact of technological innovation system of factors [1-2].

In order to facilitate the research, this article before in the study of high-tech enterprises and the impact of factors related to the concept of defining the characteristics of high-tech enterprises in China have done a simple summary, and then, respectively, of foreign domestic technological innovation on the theory of the relevant summary. In this paper, these theories to provide a strong theoretical support. Technological innovation is a complex system, affected the normal operation of the system are many and complicated factors, the paper studies in specific high-tech enterprises in China the impact of technological innovation factors, all influencing factors into the impact of factors external and internal factors affect the two category. Among them, the external factors that affect the social environment include environmental factors and market factors. Social environment factors such as social systems, environmental and socio-cultural environment, social system environment on the high-tech enterprises in technological innovation financing, innovation and cost control, the realization of such innovations have a significant impact; social and cultural environment will affect the organizational structure and management control system, to influence decision makers or managers of the mental models and behavior patterns, thereby affecting their innovative decision-making, the impact of technological innovation. Market environment factors include market concentration, the market system, to enter the barriers and technical barriers to trade [3-7].

Market concentration in the high-tech enterprises in different sectors of the impact of technological innovation will be the difference; market system in the protection of intellectual property rights, to encourage competition in the market, reducing market externalities, such as lower transaction costs affect the technological innovation; entry barriers and technical barriers to trade on the spread of technological innovation and market-oriented innovations have had a significant impact. All of these are external factors that affect the impact of technological innovation, but not corporate

controls of the enterprises are non-controllable factors. Research in specific external factors that affect the application of the structural equation modeling study on some of the qualitative indicators quantify qualitative indicators is not easy to solve the problem of the proposed quantitative research.

2. Overview

Internal factors include non-investment factors, input factors (human and financial resources into the factors) and the effective achievement of three broad categories of factors. Internal factors are caused by the enterprises themselves, enterprises can control, is controllable factors. Factor is non-investment enterprises in a particular social environment and market environment after the formation of long-term development of enterprise scale, enterprise system, corporate culture and innovative mechanisms. Scale of the impact of technological innovation is mainly reflected in the organization of resources, the use of innovative capacity and efficiency. But the scale of the impact of technological innovation is non-linear, large enterprises and small and medium enterprises in technological innovation on the advantages of each. Enterprise system and the impact of technological innovation is mainly reflected in the property rights system, management system and organizational system of the three aspects of the impact of technological innovation. System of property rights arrangements will affect the efficiency of resource allocation in technological innovation; management systems and organizational system of innovation in technological innovation officers have an important impact on motivation [8].

Input factors, including human and financial resources into two types of input factors, these two types of factors is the most direct impact of technological innovation is the most important factor, therefore, we proposed the two types of factors on the innovation output conducted a quantitative study of the impact. The study by Douglas production function to improve the construction of their linear regression model, select the six provinces in central and western technological innovation related research data. The benefits of technological innovation to achieve the factors embodied in the output of innovation, including new products, sales revenues and number of patent applications for authorization, which are both a reflection of current innovations as well as the next innovation cycle of technological innovation and technical sources of funds.

External factors and internal factors affecting the impact of high-tech enterprises of technological innovation, they cannot be isolated. The human factor is the high-tech enterprises of China's internal effects of technological innovation factor the most important factor. In innovation, our large and medium-sized enterprises are the most inputs and outputs, and in technological innovation play an important role. At present, China's high-tech enterprises in technological innovation type are increased pay and expand the size and scale of production inputs to the formation of scale, companies can increase the size and scale of production inputs to increase yield innovations. The high investment is not able to bring high-yield in some areas of innovation input-output ratio needs to be improved. The majority of inadequate investment in innovation is still the main reason for the lower output, and medium-sized enterprises outside the main research funding innovative volatile input into instability. Finally, in accordance with the conclusion of the study made a number of policy recommendations, and pointed out the inadequacies of the article and some questions that haven't been resolved yet [9-11].

The element of enterprise innovation network refers to the organization and organization which is connected with the enterprise in networked cooperative relation, which is the node that forms the enterprise innovation network. Mainly include:

(1) The enterprise innovation input, the innovation activity and the income subject;

(2) Important sources of university and research institutions, research achievements and innovation;

(3) The main participants in the government's innovation process and the promoters of innovation activities;

(4) Financial support for enterprise innovation activities in capital markets

Each member of an equal network is independent legal entity.

(1) The interaction between each other is not determined by administrative relations, but by the principle of voluntariness and mutual benefit, which is driven by mutual complementarity and cooperation interests. The parties always have their own independent decision-making power. The cooperation process is the result of mutual agreement.

(2) Long-term relationship. Network relationship is not a one-time trade relation between organizations. But it is a long-term and stable cooperation body full of vitality, therefore, enterprises to participate in the network are in goal should not be a short-term interests. But hope that through continued cooperation to enhance their competitive ability, in order to realize the maximization of the long-term benefits. Figure 1 shows the enterprises innovation.

(3) Complementarity of overall interests. Enterprise network relationship is not a market exchange relationship between an enterprise and an outside organization. It is a complementary relationship between the interests of the whole

member. Each member has its own particular advantages, and based on this advantage establish its corresponding position in the network, through the complementary advantages between the various groups, can effectively reduce the transaction costs, produce "1 > 1 > 2" synergy effect.

(4) Openness of organizational form. Network relationships can be tightly organized in a way that is organized, or a loose strategic alliance. Openness also manifests itself as the independent control of the behavior subject's network connection, namely the establishment and interruption, strengthening and weakening of the network connection. In the whole layer of the network, the network boundary extension and contraction is important. On the other hand, in order to obtain the resources needed for innovation, the network needs to absorb other subjects, and the network boundary expands independently. On the other hand, when a network connection becomes invalid, network relations are interrupted and network boundaries shrink. Figure 2 shows the innovation process.

(5) The plurality of basic attributes. The establishment and maintenance of enterprise networks is sometimes dependent on economic or technical factors, and sometimes through interpersonal or social interaction. Therefore, network relationship is not only economical, but also has certain social and cultural characteristics. Network communication is multi-level and multi-channel, and there is a cross-boundary and cross-boundary communication between the various units of the network. In this way, the network provides a wider learning circle than the hierarchical organization, enabling innovation to occur in all layers and in multiple links.

Fig.1 Basic Enterprises Innovation.

Fig.2 The Innovation Process.

3. Big Data Model

A generic template structure is proposed and merged with Scam - ant. With such a mechanism, the final structure of the cluster will pay close attention to the configuration defined by the template. The center of the cluster in the template is based on the user's requirements, which does not depend on the data's characteristic space (the operator is a cluster). In order to compare the quality of the proposed continuous query distribution algorithm, two indexes are used to determine the distribution quality. These indicators are communication costs and imbalances. The total communication cost between different clusters reflects the quality of the distribution strategy. The second indicator is imbalance. The imbalance measure reflects the balance between the workload on the different processing nodes. From the experimental results, the obvious deception model has a great influence on the performance of the original KLS. Both of these two indicators confirm that clustering operations using the proposed model can achieve better clusters in a shorter time. The fraud model is effective because it reduces the number of ants that the ants need to transport. The experimental results show that Scam - ant has a good balanced distributed query plan and has the minimum communication ability compared with spectral, linear, dispersive and multilevel KL zoning. In more and more partitions, the garbage ant algorithm is more stable and balanced.

The third optimization level is the operator scheduling of the query. In scheduling these queries and its operators (selection, connection, for example), assuming that each operator in a thread (multithreaded) or all operators to run in the query plan, and running in a similar thread to chain algorithm. Both methods have serious defects because of high thread overhead and high operating costs. In some management system projects, the development of the original link algorithm is usually an important aspect of minimizing the maximum runtime memory and ignoring the output delay. When the input stream bursts, the link suffers from the hunger of the tuple, causing the high delay of the tuple. In order to overcome these shortcomings, a new method for clustering operation (COS) is proposed. Based on the selectivity and computational cost of the query, the s-means clustering method is adopted to combine the clustering operator of the query plan into multiple groups. - the mean is a similar set of drivers. It's like the k-mean, but there are some differences. The mean basically groups all the points into a new cluster whose height is less similar to that of an existing center than a given threshold. In the k-mean method, all points must belong to the existing K group, which is unfair to some points because they have a very low similarity to the recent center of mass.

This simple difference has a considerable impact on the output of the cluster. The unspecified k value provides a high degree of adaptability during the clustering process and leaves it to the nature of the data. (This means that we don't need to specify cluster k). The simulation model of data processing unit is established by discrete event simulation (DES), and different scheduling algorithms are compared. Compared with traditional FIFO, chain and multithreaded scheduling methods and compared with other technologies, the COS proves its high performance in all cases. In addition, the cosine scheduling execution is very good in terms of scalability and robustness. Cocos can also use memory and computational resources in a highly efficient manner, allowing them to continue working in limited resources while other technologies lose their stability. The experimental evaluation shows that the cosine scheduling can be used as a kind of adaptive, flexible, reliable, scalable and robust continuous query processor scheduling technology. As a final contribution, addsms is a data management that can be used to handle data streams with adaptive capabilities. Each optimization level provides a degree of flexibility based on data flow characteristics and user queries. Figure 3 shows the basic framework which is shown as following:
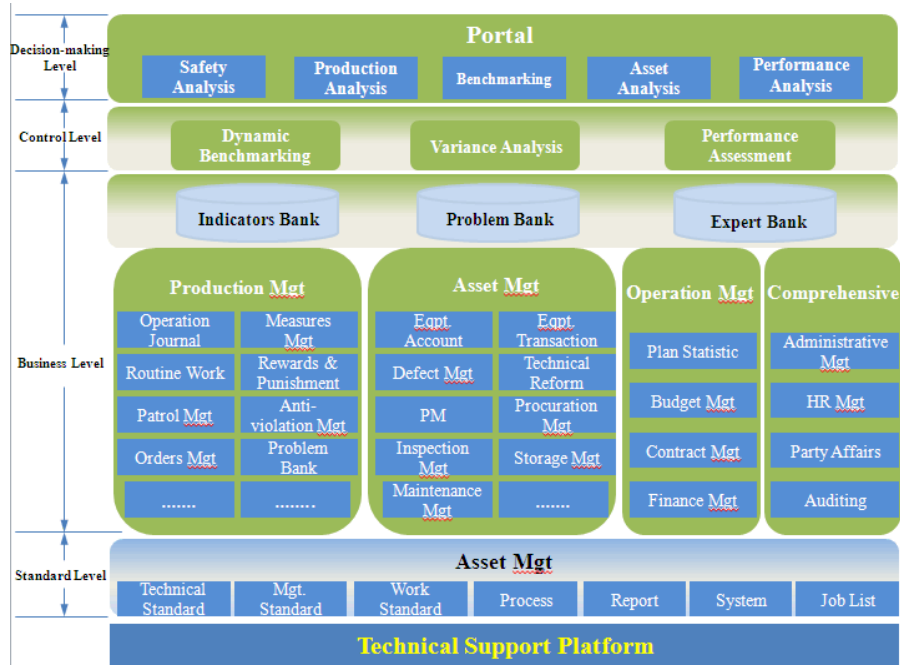
Fig.3 The Basic Framework

We can extract the following features from its application for data flow and processing requirements:

(1) A data stream is a potential unbounded sequence of data items generated by an active data source. A single data item is called a stream element. Stream elements continue to reach the system and are pushed by active data sources.

(2) The system can neither control the order of the flow of the stream, nor control the rate of arrival. The flow rate and order may be unpredictable and change over time.

(3) One data source is transmitted only once. Since the stream elements are accessed sequentially, the stream elements that have reached the past cannot be retrieved unless it is explicitly stored. The unbounded size of the flow excludes the complete materialization.

The basic algorithm is shown in the following equations [12-14]:

$$\hat{F} = \hat{W}^T \Phi(\mu) \quad (1)$$

It's provided by the adaptive weight law. So estimation error of the weight is

$$\tilde{W} = W - \hat{W} \quad (2)$$

The positive values Wmax as follows:

$$\|W\|_F \le W_{max} \quad (3)$$

The adaptive weights law is defined as

$$\dot{\hat{W}} = -kG\|z_2\|\hat{W} - z_2^T G\Phi(\mu) \quad (4)$$

$$\varphi_{ji}(\mu_j) = \exp\left(\frac{-\left(\mu_j - C_{ji}\right)^2}{b_{ji}^2}\right), \text{for } i = 1, 2, \ldots, H \quad (5)$$

In this space, the mth multidimensional receptive-field function is defined as

$$\Phi_m(\mu) = \prod_{j=1}^{L} \varphi_{ji}(\mu_j), \text{for } m = 1, 2, \ldots, N \quad (6)$$

The function can be written in a vector notation as

$$\Phi(\mu, C, b) = [\Phi_1, \Phi_m ..., \Phi_N]^T \ (7)$$

The weight memory space with N components can be expressed in a vector as

$$W = [W_1, W_m, ..., W_N]^T \ (8)$$

The activated weights in weight memory space, which can be written in a vector form as

$$y = W^T \Phi(\mu) \ (9)$$

The state variables and the desired values can be defined as follows:

$$z_1 = x_1 - y_d \ (10)$$

and

$$z_2 = x_2 - \alpha_1 \ (11)$$

The following tracking error dynamics is shown as:

$$\dot{z}_1 = \dot{x}_1 - \dot{y}_d = x_2 - \dot{y}_d = z_2 + \alpha_1 - \dot{y}_d \ (12)$$

The query of the data stream is expected to run continuously and return the new results when the new stream element arrives. The sorting of the flow elements may be implicit, that is. It is defined by the time of arrival of the system, or if the stream element provides an application timestamp representing the generation time. In addition to the pure flow model, some applications need to combine data streams with stored data. Let's simply compare the query processing of the traditional DBMS with the general challenge of the DSMSs in the data flow model. Figure 1 shows the query processing in DBMSs and DSMSs.

Data sources: DBMSs runs on passive, persistent data sources, that is, the limited relationship stored on the disk. In contrast, DSMSs runs on an active data source and pushes the data to the system continuously, which may be an infinite, fast, and transient flow of data. Because the response time of many streaming applications is very strict, data management mainly occurs in the main memory, while DBMSs overuses the external memory. In addition, DSMS cannot store the entire flow because of the unknown and potential unbounded stream size. Even if a larger stream fragment is written to the disk, the operation of this large amount of data will greatly reduce the performance of the system, and thus conflict with the fast response time. In most cases, when it is necessary to support the reference of past temporary queries, the fragment of the query result may be stored in the streaming media application. If the application needs to merge with the flow, it is also necessary to access the database.

4. Experiment Result and Data Analysis

5. 1 Motivation Mechanism

The networked cooperative relationship is loosely cooperative in the form, so the formation and normal operation of network organization requires strong and stable and lasting motivation of all parties. The dynamic mechanism refers to the internal dynamics and external power generated by the interaction of various innovative bodies within the network organization. Common interests, common needs and their respective development potential are the basic internal dynamics of cooperation between innovation bodies. Competition, the pressure of change and the policy thrust of the government are the external driving forces for the cooperation of innovation agents in network organizations, which together form the dynamic mechanism of enterprise innovation network connection. Under the influence of dynamic mechanism, enterprises actively cooperate with various organizations and organizations to find the joint point of realizing common development of all parties.

The cooperative relationship that enterprises choose to network under the internal and external motivation is determined by market environment and high technology competition. In the first place, the risks and difficulties of technological innovation are increasing in the environment of high technology competition and fast changing market. The dynamics of survival and development and the pressure of external environment promote enterprises to seek competitive resources from the outside to improve their innovation ability and reduce the risk of innovation. In pure technical market transactions, both sides power is hard to match, because the seller wants to sell second-class technology first-class prices, but the buyer is on the contrary, high transaction costs as a result, even difficult to reach an agreement. In the merger and acquisition, enterprises not only have to bear the risk of buying and purchasing, but also the internal consumption generated by the non-cooperation of the merger and acquisition party, and also not adapt to the

requirements of the fast-changing market environment in the future. And the network cooperation, the cooperation advantage complementary, the resource sharing, the enterprise obtains the necessary innovation resources and lowers the innovation risk. In this situation, both sides will have a strong incentive to cooperate. Such as production, cooperation innovation, enterprises in access to technology at the same time, also make the results of university scientific research institution is able to realize the industrial transformation, both sides has the strong desire of cooperation, at the same time, the government is also actively promoting production-study-research cooperation innovation.

6. 2 Organization Mechanism

Enterprise organization form innovation network with the characteristics of a flat, flexible, and flexibility to adapt to the modern enterprise external environment, the development trend of increasingly complex, the instantaneous change can have very strong strain capacity and competition.

The enterprise innovation network organization form mainly has the union, the fictitious organization, the project group etc. (1) Consortium organization (Consortium) is a kind of entity cooperation organization established on the basis of the agreement. In the united body, it has its own independent organization system and operation rules. It has a fixed office and staffing, which can be jointly managed or entrusted by one party. The organization form of the consortium is a kind of solidification of the network relationship, which is intended to strengthen the cooperation of all parties. The establishment of a consortium means that more resources will be devoted to cooperation between the online parties and will result in closer cooperation and lasting cooperation. Consortium to many types, such as enterprise cooperating with partners of various kinds of experimental base, engineering research center, laboratory, institute, etc., which is enterprise and the important way of colleges and universities, research institutes network connection.

Virtual Group, which refers to enterprises and external manufacturers, customers. A network organized by information technology and information network to achieve technical resource sharing, cost-sharing, and the purpose of meeting market demands through a network of information technology and information networks. The virtual organization has neither unified office nor formal organization chart, nor is there a multi-layered organizational structure like traditional enterprises. All parties, based on mutual benefit and trust, by integrating the core competence of members with resources and advantages, achieve a win-win goal, so that in a rapidly changing and competitive market environment have more chances. For virtual organization is the network according to the agreement with all parties together information network connection, and without any real organization, each member's cooperation content for drum cutting are completed in the parties within the organization, and organization of the virtual cost is lower, but the dynamic virtual organization and the characteristics of loose, with the cooperation opportunity to produce and produce, as cooperation projects to complete collapse. Usually both parties will maintain close cooperation. The virtual organization is based on information technology, in the form of dynamic cooperation, and quickly aggregates related resources to seek the competitive advantage of quick response to market opportunities.

Project team is the network connection is often used in a form of organization, 'has been organized by a group of the cooperation, the persons with different technologies designed people. Is to achieve a common goal and close cooperation, full of creativity and learning spirit of organic tissue. Item group generally assigned to protect the full mouth right and clear responsibility, in management decisions and have greater autonomy, the flat structure to reduce the delay between the decision and action, to avoid the traditional dissecting the degree, with greater initiative, independence, speeds up the dynamic change of reaction to the outside world.

7. Conclusion

This article takes high and new innovation network of the technique business enterprise as a research object. The study raises the concrete method of high and new innovation network execution of the technique business enterprise. With modern business enterprise theories, especially execution theories, combining innovation network theories and execution theories, it concretely analyses three greatest processes of the execution about the high and new technique business enterprise. It will detect the main problems about the high and new technique business enterprise in execution aspect, and investigate the suitable deployment road which would keep with the high and new technique industry development to prompt the execution in our nation .This article puts forward the concept of network execution from the organization level in studying each internal factor of the network. Relied on a related research topic, it emphasizes an execution of studying the high and new technique business enterprise, examines the concrete process of execution and circulates a mechanism from the strategic angle; withdraw main contents of setting up the organization execution from it.

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