DIALECTICAL LOGIC AND EXPERIMENTAL RESEARCH ON INNOVATIVE LEADERSHIP

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Abstract

Communication of the humanities and sciences is a very important task of the research on contemporary innovation leadership. Based on this, it is not only needed to interpret it from cultural aspect, but also from the logical angel and pay more attention to the integration of the humanities and sciences in the intelligent era. The Continuing Engineering Education of Tsinghua University adopts the model of experimental exploration and study, helping the learners understand how to innovate so as to achieve business success and promote sustainable and inclusive sense of social responsibility.

Looking back on the development experience of Tsinghua University Science Park and Tsinghua Holdings, as well as those enterprises with higher competitiveness under their help, it is innovative leadership that keeps them alive and prosper. By summing up the innovative leadership both the east and the west, this paper attempts to identify the key factors that determine the effectiveness of innovative leadership and its formation mechanism, so as to reveal the ideas and approach of innovative leadership that are practical for today's society. Through the experimental study of the dialectical logic of innovation, a new theory and practical approaches of innovative leadership with both advantages of the east and the west will be born.

Keywords: Innovation, dialectical logic, mind experiment, leadership lab.

Most western leadership theories focus on solving certain local problems of leadership, which use scientific empirical methods to dissect leadership issues into traits, behaviors, and contingency problems that can be interpreted by existing theories, but the intricate connections and transformations are destroyed and not able to be restored to the original living whole. In ancient Chinese philosophy, people and nature were considered as a whole, even local problems need to be interpreted from a global perspective. Efforts are made to study the overall characteristics that include both overall nature of the system and the ecological evolutionary properties, often lacking so-called scientific evidence and going to straightly the conclusion.

So, what are the "overall characteristics that include both overall nature of the system and the ecological evolutionary properties"? It has to be the dialectical logic. The so-called dialectics can be established by using the structure of the phenomenon, the number and the connotations in the Book of Changes[1], which is the living source of the three-stage dialectics of "thesis-antithesis-synthesis." The structure of the phenomenon, the number and the connotations constitute the objective foundation of dialectics, not only because dialectics conduct static concept processing in discrete natural circumstances without introducing time series vectors, but also because various elements and relationships can be inferred from the structure. In other words, the former is just a special pattern of the latter. To distinguish it from "dialectics", we call this mode of thinking based on the Five Elements of Yin and Yang, expanding and supplementing dialectics as the dialectical logic.

1 DIALECTICAL LOGIC AND MIND EXPERIMENT

What is obtained from dialectical logic is not a subsidiary of formal logic, but the fundamental deepening of formal logic, which will definitely lead to expansion of the entire logical horizon, just like the discovery of Europeans to the new continent and formation of the conception of the entire "earth"[2].

The structured mind map based on the Eight Diagrams(or Factors) from the Book of Changes is shown in Fig. 1. There are four Yin diagrams on the top: Kun, Xun, Li, Dui, and four Yang diagrams at the

bottom: Qian, Zhen, Kan, Gen. They are not symmetrical, but corresponding to each other, using motion to express calmness. Its four Yin diagrams can be changed into the four Yang diagrams when they are flipped and swapped; Its numbers contain 9 integers from 1 to 9, and the sum of the each vertical, horizontal and diagonal numbers is 15, which is a balanced match with dynamic equilibrium; It means that one dominates two, the minority dominates the majority, Yang diagrams have much Yin and vice versa. Its location is determined by the relationship of sky, earth, and four directions: Li of Fire located in the South; Kan of Water located in the North; Zhen and Yu of Wood located in the West; Qian and Dui of Metal located in the East. Therefore, these numbers of the Eight Diagram formulates a left-handed number cycle: 6(metal) → 1(Water) → 3、4(Wood)→ 9 (Fire) → 2, 5, 8 (Earth) → 7 (Metal). Every element is generated by the last element, and restricted by the element before the last one.

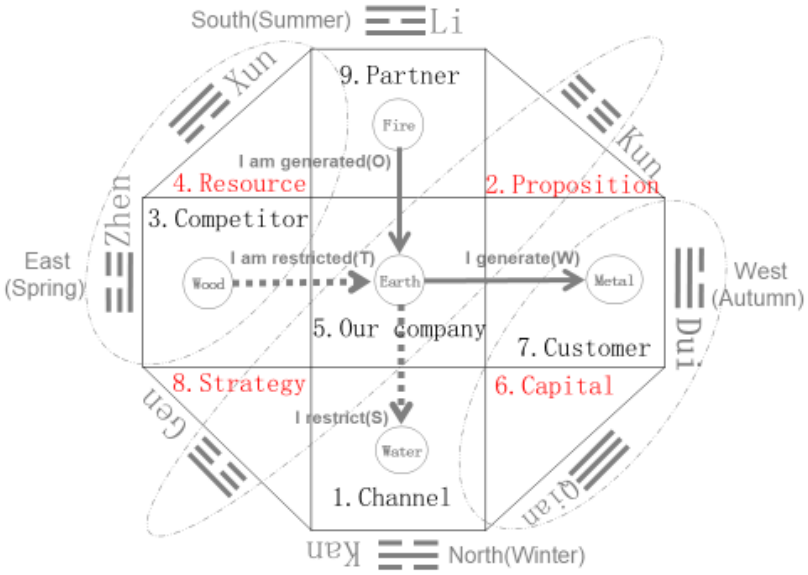

Figure 1 The structured mind map based on the Eight Diagrams

The study of dialectical logical leadership theory is not just staying at the level of summarizing the key factors of leadership effectiveness, but studying on and practicing in-depth with its generative mechanism. Taking revealing the true connotation and essential characteristics of leadership as the main clue, it clarifies the basic principles behind the leadership phenomenon of different levels and different areas, helps remove people's long-hold confusion and deep-rooted misunderstanding about leadership. The Book of Changes is the foundation and source of Chinese culture and the philosophy of leader growth. Through the study of innovative leadership, new leadership theories and practical skills that combine the advantages of the East and the West will be born. The research in this article is based on the Book of Change, the Chinese culture's gene to reinterpret innovative leadership.

The control-contrast-comparison experiment is a method to reveal the causal relationship between certain variables by artificially controlling certain factors. Theory, practice, and measurement have a cyclical relationship. The concept of the Leadership Lab originated from universities and training institutions in the United States. It aims to explore and study ideas and behaviors experimentally through leadership exercises, Q&A and evaluation. In 2008, Tsinghua University Press published the book, "Leadership Lab"[3]. This book tries to describe the key factors that determine the effectiveness of innovative leadership and its formation mechanism, based on summing up the classics of Eastern and Western leadership, and eventually reveals the proper thoughts and methods of leadership suitable for the modern society.

The remarkable economic development, political progress, and great practices of many politicians and entrepreneurs in China are closely related to the cultural background that determines the economic trends and political achievements in the future. In order to show the series of results of the Leadership Lab on the curriculum research, in the year of 2011, Tsinghua University Press published the book "Facilitative Leadership"[4]. This book aims to analyze the strength, weakness, opportunity, and threat of the Customer, Partner, Channel, and Competitor based on the structure of the Eight Diagrams, which is called SWOT analysis. The number of Sky is left-handed, while the number of Earth is right-handed. Its value Proposition, Resource, Capital, and Strategy can be matched with the number of Earth.

Fig. 1 shows the generation & restriction analysis of an actual business or organizational situation. It helps find the answers for the questions above, which means, "I restrict(S)" and "I generate(W)" refer to one's inherent strengths and weaknesses, while "I am generated by(O)" and "I am restricted by(T)" refer to the opportunities and threats brought by the environment. These problems are solved to bypass competitors, to invent new games and new game rules to lock customers and create a pattern of non-direct competition. The so-called mind experiment is an experiment that can't be conducted in practice with the current level of technology, but can be constructed in theoretical logic reasoning. The richness of alternatives determines the level of decision-making, and it is the effective innovation by decision makers the effective means that expands the diversity of alternatives.

2 LEADERSHIP LAB IN THE TECHNOLOGY-DRIVEN INNOVATION

The technological drive make the companies to become an automated missile of opportunity, searching for possibilities, otherwise they will become a "revolutionary martyr" who dies before the revolution is won.

The decision of major investment events cannot be made without prediction. People often say that "It would be ideal if I have known this beforehand". It is the key for survival to lead in the forefront of the industry and the times. Keen insight requires a high degree of mental and physical efforts and wisdom of the leaders themselves. Being born with keen eye may be the gift of the creator, but more leaders with keen eye rely on cultivation and practice. Under the specific cultural background of enterprises, the research and exploration of technology commercialization with mind mapping can provide answers for the leaders of government, enterprises, academic and research organizations on how to manage changes and lead innovation.

By analyzing the growing process of Tsinghua technology companies, it can be seen that high technology is the basic characteristic of these enterprises. Most companies rely on the technology developed in Tsinghua University. Their initial management teams come from the Tsinghua's high-level and high-input R&D team. During their growing process, they further strengthened the market operations. Through improving scientific research input, entering the entrepreneurial park, applying for angel investment and venture capital, research findings of Tsinghua University have been developed from incubation companies and growing companies to mature companies, and then to generate new companies[5]. Fig. 2 shows the technology transfer system of Tsinghua University and some companies and institutions stationed in Tsinghua Science Park.

Figure 2 The technology transfer system of Tsinghua University and some companies and institutions stationed in Tsinghua Science Park

The business model needs to define the scope and extent of its own investment, which means it should be defined properly who are the competitors in the developing industry, who are the customers of the enterprise, which businesses are supposed to be done by themselves and strategic alliances, and which can be entrusted to dealers and agents. Enterprises constitute the value network of the co-existence model with Customer, Partner, Channel, and Competitor. It must be identified that the roles and contributions of every member in the value network, and taking this as a basis to build a business model that can create the best benefits for the companies.

Due to the natural connection between universities and the knowledge economy, Tsinghua Science Park has become a window for the companies incubated there, and an entrepreneurial paradise with the humanistic characteristics of Tsinghua University, focusing on attracting and cultivating high-quality entrepreneurial enterprises in the key state-supported areas with a complete entrepreneurial team, outstanding trans-ocean research and development capabilities, internationally leading technology with

independent intellectual property rights, and huge industrialization potential. Tsinghua Science Park promotes construction in Tsinghua and its enterprise development through the interaction of government, industry, academia, and research, and cultivates a new economic growth point for the high-tech industries.

Looking back on the growing experience of Tsinghua Science Park and the companies in it, it is innovation that kept them alive and booming. Chinese companies should consider more about how to form alliances with universities, invest more in in-depth research and development and cultivate their R&D teams. Good technology does not mean being able to make profits. There are issues in relation to business models that need to be solved to turn new technologies into business profits. In the early stages of an start-up company, it is commonly seen that those first class investors are patient with growth while impatient with profit. So it is suggested to making quick profits early, and the success of a small step will lay the foundation for great success.

3 LEADERSHIP LAB IN THE MARKET-PULLED INNOVATION

The pull of the market is like a kind of historical locomotive. You can jump on the train while it is still moving slowly, or you will be run over and "go back to pre-liberation overnight".

The business model, using the enterprise as the essence and other factors as the performance, establishes the mind map with its logic and its structure of phenomenon, numbers and connotations through scenario simulation. The central subject is the "essence", which has multiple performances. Other related factors are drawn as branches leading from the central subject, so all relevant factors are clearly expressed. When innovators realize corporate profits in the value network, there are not only competition between competitors, but also a huge possibility for cooperation. Therefore, enterprises constitute a value network of the co-existence model with Customer, Partner, Channel, and Competitor. These four factors are the constituent elements of each enterprise value network, in which the Proposition, Resource, Capital, and Strategy have different contributions to the profit. The Proposition and Capital clearly define the value of the customer and the company, while the integration of Resources and Strategic response describe how to deliver these two kinds of values.

Take Tsinghua Holdings as an example. It achieves the industrialization of high and new technologies by means of capital operations such as investing, stock holding, mergers-and-acquisitions, and going public. From a strategic perspective, leaders systematically think and drive a series of innovative activities such as system innovation, mechanism innovation, value innovation, design innovation, process innovation, and product and service innovation[6]. The formulation and update of strategy should be considered in a holistic way, with the purpose of establishing a new model of market structure, rather than focusing on the improvement of behavior and performance to adapt to the existing market structure. Part of the equity investment of Tsinghua holdings is shown in Fig. 3.

Figure 3 Some of the assets investment of Tsinghua Holdings

A good business model positions the enterprise in a position conducive to creating profits, so as to clearly show that the enterprise has the ability to make profits. It must assure the enterprise's capability closely matching with the most important link in the value network. The value that disruptive technology brings to the market is entirely different from previous technologies. On the one hand, we must turn disadvantages into advantages, and take advantage of the inherent weaknesses formed in large companies or strong competitors in the process of establishing a successful model, and take advantages

of our own which embedded in our weakness, to create a brand-new game of "essence restricts performance" instead of "essence generates performance". On the other hand, we must find out opportunities in the threats, master the core processes to achieve professional division, create game rules of “performance generates essence” instead of “performance restricts essence”, and position ourselves in the most advantageous market position to make more profit.

According to this idea, we should realize that the person used to making the biggest contribution to his or her organization may usually not a qualified candidate when selecting leaders to lead innovation activities. Therefore, the potential candidate to lead innovation in an organization should be judged from whether one own the innovative ability required to cope with future situations or not, and from his performance handling three important responsibilities. The short-term responsibilities is to make decisions on which capabilities, assets and processes should be used in new business across the interface of innovative and growing business and sustaining mainstream business. The long-term responsibilities is to build an intellectual organizational structure, and creating a growth engine to help the organization hatch more successful growing business. The perpetual responsibilities is to feel the change in the environment and teaching employees about the signals that predict the change.

4 CONCLUSION AND CRITICISM

Technology commercialization is the process of transforming technology into products and then products into commodities. Only technology push or market pull cannot constitute core competitiveness. The core competitiveness means that everything holds the Yin and embraces the Yang, and gets together to create harmony. The process of creating harmony manifests as changing from nothing to existence and from virtual to reality. Qian, Kan, Gen and Zhen are four Yang diagrams, while Xun, Li, Kun and Dui are four Yin diagrams. To demonstrate the transformation of everything in the world, we have to see how the Yin and Yang flows in the four Yang diagrams and the four Yin diagrams, the core formulated by which is the transaction structure of a company’s business model. The Qian-Kun leading innovation is shown in Fig. 4.

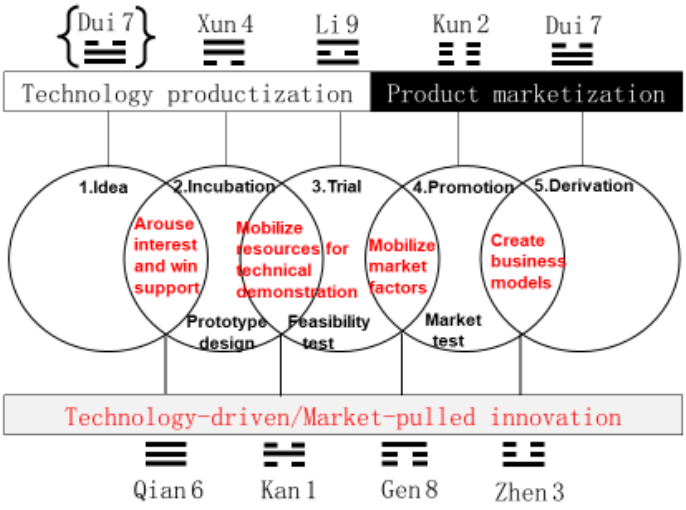

Figure 4 Qian-Kun leading innovation

The process of technology commercialization can be classified as technology productization and product marketization according to technology push and market pull. To sustain the operation of an enterprise’s growth engine, new technology must be used to promote time value, as Qian pushes from the left to the right in the figure, which is an upward path; there is also a downward path: market segmentation promotes space value, as Kun pulls from the right to the left. In other words, market entry depends on the timing, and the outcome depends on the product positioning in the market.

In order to explore the connotation of technology commercialization, product development is further divided into five phases: product Idea, Incubation, Trial and Demonstration according to the process and project management. The five stages are connected with each other. Interface resources to promote

technology commercialization need to be allocated at the later time of each stage to prepare for the next stage. Since the Eight Diagrams can be upward or downward, innovative behaviors can be up and down as well.

The Eight Diagrams show the growing and declining process of Yang from gradual prosperity (1 → 3 → 9) to fading (9 → 7 → 1) with the value of odd numbers, and of Yin from gradual prosperity (2 → 4 → 8) to fading (8 → 6 → 2) with the value of even numbers. The Book of Changes usually uses numbers as the basis for positioning. It finds out the numbers and attributes by artificial or natural means, converting them into Eight Diagrams, bringing into the Five Elements, and analyzes them based on dialectical logic. The mind-map-positioned strategic choice is systematic, vague and inclusive.

(1) Systematic

If A> B, B> C, then A> C. C will not be greater than A according to formal logic reasoning, which means that it is impossible for a smaller one to defeat a larger one and a weaker one to defeat a stronger one. But in the Five Elements Law, if wood generates fire, and fire generates earth, wood will not generate earth, but restricts earth. "Generating means Change" refers to a universal phenomenon in the universe: generated by the last element, restricted by the element before the last one, changing when facing the third, and booming all the time, which is “Change”. If "Change" is interpreted as the logic of innovation, the relationship between Qian and Kun will be great.

(2) Vague

As we can see in the Taiji Diagram, there is Yang in Yin and Yin in Yang. According to the diagrams in the Book of Changes, the prediction cannot formulate formal logic reasoning as a result of its vagueness, which makes the interpretation more casual and flexible: different people have different interpretations for the same diagram, and even opposite conclusions. This is very obvious in the Chinese culture. One of the characteristics of the Chinese culture is randomness and flexibility, which is also manifested in our understanding of policies and the implementation of laws. This characteristic has something to do with the ambiguity of thinking mode in the Book of Changes, which is not through strict formal logical reasoning, but through the use of dialectical thinking as a whole.

(3) Inclusive

The inclusiveness of thinking mode in the Book of Changes is the embodiment of balance and coordination. It formulates a complete, all-inclusive system with dynamic balance and a harmonious combination of nature and human. To clarify humanity with nature, there is a mutual sympathy between nature and man, which is also a major feature of Chinese culture. This system is so complete that encompasses the three components, i.e. sky, earth, and people, which has a great influence on our national culture: to be tolerant and broad-minded like the ocean containing water from every river.

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