Research on synergetic of multinational intellectual capital based on perspective of dynamic innovation

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Abstract: In the processes of organization international expansion, dynamic innovation management directly affects the development of organization’s dynamic capabilities and the advantage of sustainable competitive among international competition. The existing intellectual capital is the basis of organization international expansion, while intellectual capital flow and synergy decided the organization can effective transfer, configuration, integration and development of organization’s knowledge and culture. At the same time, the organization must have the ability to adapt to the new technology. In the process of the internationalization, the existing intelligence capital flow, synergy and upgrade form the ability of organization dynamic innovation. Among these three elements, there is dynamic change and interplay, which decided the efficiency of organization in the international competition. Learning ability, absorption ability, transfer competence and the ability of use network are important factors which affect synergy and upgrade efficiency among multinational intellectual capital.

Key words: Intellectual Capital; Dynamic Innovation; Multinational Synergy; Learning Ability

1. Introduction
During recent 20 years, there are great changes in the management of the organization environment: one is that economic globalization will remove the separate barriers between domestic market and overseas market and participate in the international competition for many organizations is the thing that become a necessary and not have freedom of choice; The other one is that intellectual capital is gradually be regarded as an important source of competitive advantage of organizations. In the turbulent international environment, the ability to adapt to the global knowledge has become the key property and key source of organizational specific rent. More and more organizations began to realize that the intelligence capital is not only valuable asset, but also potential source of sustainable competitive advantage, which led directly to the different performance among international competitors. With the research of management of multinational enterprise, there are many literatures which are related with an intellectual capital management, while most of them focus on the research of transfer of intellectual capital, embodied premise of knowledge transfer, the process and the results, or equating transferring of intellectual capital, investment and knowledge management. in which there is some problems such as existing obscure concept, lacking of system and failing to gives the clear conceptual framework, and lack of deeply thinking about how the intelligence capital dynamically form mechanism of sustainable competitive advantage in the processes of organization in international expansion.

2. About intellectual capital synergetic
2.1 Intellectual capital
The age of the knowledge economy, the intelligence capital is the key factor that helps an organization obtain sustainable competitive advantage and improve performance so that no matter in theory or in practice field, the intelligence capital has caught people's attention. Most of the research
thought the intellectual capital is a kind of resource that connected with value and invisibility.

Intellectual capital (IC), John Kenneth Calbraith who put forward the concept, which was defined as a kind of intellectual activity and dynamic capital rather than a fixed form, is the reason that causes the difference between book value of the organization and the market value. He stressed that the knowledge and skills and pointed out that intellectual capital is a kind of activities. This view suggests that the role of various relations and flow which changing personal knowledge into products and service process. There is far-reaching significance about putting forward the concept of intellectual capital, which will take concept of human capital to organization level and deepen the concept of traditional capital. From the organization level, intellectual capital is a kind of resource which can obtain advantage of sustainable competitive for organization and is also the source of value creation of organization; It is mainly integrated dynamically by the knowledge of the staff, skills and organizational structure, process, practices, customers, suppliers. It has the invisibility, value-added, cumulative, hard to measure sexual characteristics.

2.2 Three-dimensional dynamic structure model of Intellectual capital

In order to comprehensively and clearly describe intelligence capital, European and American researchers tend to identify the intelligence capital structure and analyze through a set of index system, which leads to a wide variety of intellectual capital formation model and complex index system. Through summarize the results of their study, we can get a classification model of intellectual capital which is accepted by most scholars. And we can find that intellectual capital is consisted of three elements: Human Capital (HC), Structure Capital (SC) and relationship capital (RC). (Sveiby, 1997; Rooseta. l 1997; 1997; Edvinson Stewart and Ma lone, 1997; Edvinsson Stenfeh-1999; Bontis, 2000). The original definition about Human Capital which formed by the investment and existed as the sum of physical of the human body's physical (health), knowledge, skills, values the sum of (Schulz, 1962). In the 1990s, intellectual capital theory explained the concept of human capital from an organizational level and make the study of human capital entered a new stage of development. Rooseta.1 (1997) thought that human capital mainly come from the employee's mental agility, attitude and professional skills; This paper consider that human capital is an organization mainly for the realization of future value with increment, added by specific actors with the purpose of investment and access to, and it is attached to the main body of a particular health behavior, knowledge, experience, ability, etc. of the total stock; structure Capital is born within an organizational force and is the assets of the organization level, which is not only referred to the organizational structure itself. (Sweby, 1992) It directly reflects the integration of various resources of an organization and the ability to play the system efficiency, including organizational structure, organizational systems, organizational culture, organizational image, information systems, intellectual property rights by the company of all of the internal capital; Relational capital, also known as customer capital, external capital, market assets, is the organization's proprietary resources, organization and external stakeholders based on an accumulation of long-term contact, and maintain long-term friendly cooperation and mutual recognition to build a series of beneficial relationship (Bruce Morgan, 1987). It includes the organization and customers, suppliers, partners, government, community, network of relationships and
other relationships.

In the three-dimensional structures, human capital reflected that connection among the competition between organization and people, and the competition between capital structure and the flow of organization and R&D activities. Relationship activity is related with competition based on the relationship among customers, suppliers and other stakeholder, Bontis (1999) clearly describe the structure of the intellectual capital with concept map of intelligence capital.

This kind of intellectual capital of static three points while stressing that the different intellectual capital of the elements of the difference, but ignore the intellectual capital of the relationship between the internal and mutual flow and transformation. Intelligence capital element is together, the role of the intellectual capital between elements overlaps. In the existing "three points method", and on the basis of comprehensive consideration of the intellectual capital between elements of crossover and overlap, can get intelligence capital dynamic classification model, see left-hand chart. Intelligence capital dynamic classification model of intellectual capital, 3 d is not absolute isolation, but related with each other. This relationship is the formation of the intellectual capital through three elements of the internal interaction with the result that the coordination of intellectual capital.

2.3 Synergic theory and intellectual capital synergetic

Synergetic is the main part of theoretical system of self-organization, which is established by Harken in the 1970th, and is also in a status of dynamics methodology from the aspect of methodology of the whole self-organization. Synergetic research rules and characteristics which is about the system changed from disorder to order, which is a cross-sectional science crossed natural science and social science, and it focus on how the neutron system among themselves cooperate and produce space structure of macro scale space, time structure or functional structure, it is also called self-organization. It deals with not only problems but also random process. It's not to restore the object as the sum of decomposed parts, but based on the interaction among the various parts of that system’s behavior is not the simple superposition of its subsystems'. The macroscopic nature and behavior formed by the subsystems' interaction, adjustments and organization, is the synergy effect of its subsystems.

Although the three-dimensional structure of intellectual capital will separately affect organization performance, generally speaking, the organization performance is the outcome of interaction among the three part and synergetic rather than the result of isolate effect of the three-dimensional structure of intellectual capital. The synergetic of three dimensional structure of intelligence capital is a complicated system engineering, which stressed that we should reflect on the whole enterprise from the system. Based on exactly understanding the factor of synergetic of intelligence capital, we can work out the scientific reasonable strategy to promote the sharing of intelligence capital, transfer, transformation and structure optimization and finally realize the elevation of innovation ability of organization so that we can build competitive advantage of the organization. Especially about multinational organization faced with its internal and external environment which is more complex and organizational operational management which is the most difficult. It is necessary to research the synergetic of intellectual capital.
Edvinsson (1997), 1997 () Petrash Onge and puts forward the earliest clover model of value creation of intelligence capital (similar to this paper figure 2 the dynamic structure of model). In this model, they thought that cross space of three factors of intellectual capital (HC + SC + RC) is value. The more closely three factors contact each other, the greater the space of the value of enterprises, which will create enterprise value. Synergic principle is well supported the model. About the synergetic of three-dimensional structure of intellectual capital, human capital is the starting point which is the source of enterprise value because human is a carrier of knowledge. However the realization of value of knowledge must be finished by human’s behavior; And human capital create wealth need capital structure which is the foundation to support or we can say that the structure capital is the role of human capital as "infrastructure" and "the knowledge platform"; To create enterprise value we need relationship capital which is the guarantee to realize, we also can mean that relationship capital is the important basic to provide enterprise the condition to survive and develop. Therefore, the interaction of three-dimension of intelligence capital is the process of continuous loop, which take human capital as a starting point and core, structure capital as the foundation, the relationship capital as guarantee, see pictured.

Because human is the subject of the organization, the process of interaction of three dimensions of intelligence capital is likely to produce contradiction and conflict due to interest problems so that make the organization in low efficiency or unsteady state. This kind of contradiction is more complex and profound in multinational organization. Only the internal three-dimension of intellectual capital and the synergy of three-dimension well cooperate, it can solve the contradictions of the interest and meet various elements of the interest demand, and then common lead promotion of organization performance, to win more effect. In this paper, according to dynamic innovative framework we will study the effective mode of synergy and optimal path about multinational organization and then proposal for improving the theory of organization performance.

3. Analysis framework of dynamic innovation abilities

Dynamic innovation ability is defined as the competency which help enterprise adapt to the rapid changes of environment to create, integrate and reconstruct enterprise inside and outside (Teece, 1997; Li Qiong, 2006). Dynamic innovation which consistent with environmental changes is update and self-surmounting mechanism and is the strategic management which is in order to meet the requirements of environmental changes to integrate, organize internal and external skills, reconstruct resources and functional ability in the process of the key role. The basic logic of framework of dynamic innovation ability is that the management ability of management is the key difference between market and enterprises, because organizational capacity formed by behavior management of the internal non-trading organization, which is hard to replicate through market transactions. Theory coming from Porter (1984), Teece (1997) determined the three dimensions of management of dynamic innovation: endowments (or location), process and path.

The endowments, an enterprise-specific assets or capital, is including technology capital, complementary assets, financial assets, reputation capital, structural capital, markets assets and institution capital. In all of these assets, it is important that non-tradable intellectual capital and

![Figure 3: Three-dimensional Synergy](image)
complementary assets.

The process, can be divided into three processes under the drives of some motives: integration, learning and reconstruction.

The path can be divided into: path dependence and technological opportunities. Technology opportunities, is the basic science of communication, popular with the function of the speed of new technological breakthroughs, but does not completely born outside the industrial activity, which partially determines the speed and space of industry activities, and has a business trait. As the organizational capability include a large number of specific tacit knowledge, the organizational capacity is difficult to imitate and copy.

Impact from the changes of external environment (such as: technological progress, market changes, competition changes, etc.) formed the power to change , take acts such as learning, innovation or reconstruction of various resources according to the existing position (endowments) to seek improving the progress and performance of organization. This process, the organization's intellectual capital embedded in the convention which is determined by the internal operation of the position and the process and formed a sustainable competitive advantage.

4. Multinational intellectual capital synergetic under the dynamic innovation framework

Intellectual capital in multinational organizations is more rich and colorful compared with general organization on the content and extension of meaning, because the environment multinational organizations face is the most complex, Factors change fast, and the opportunity to grasp difficultly. Moreover, the internal management faced the impacts of the differences in cultural and resources between branch organizations. Therefore, researches on Intellectual capital synergetic of multinational organizations are necessary. Subtleness

4.1 Existing intellectual capital endowment—the location

Existing intellectual capital endowment refers to the specific assets and knowledge which organization already has and distinguish with other organizations, including specific assets, knowledge or ability, These are organization-specific, difficult to imitate and thus can generate economic returns and competitive advantage. Existing intellectual capital represents the "cross-ownership advantages" in traditional organization studies, it is the conditions of the organization to control cross-border trade,
direct investment and organization growth. Including briefly:

(1) International experience and knowledge; Organization Internationality Stage Model (Johanson & Vahlne; 1977, 1990) and Net Model (Johanson & Mattsson; 1988) have pointed out the relationship between international knowledge and experience and the degree of organizations internationalization as well as market internationalization. The former believed that the increase in market knowledge leading organizations to increase market pay, and divided market knowledge into Objective Knowledge and Experience Knowledge, emphasized the accumulation of organizational Experience Knowledge gradually expand their level of involvement in overseas markets; The latter insisted that external actors and organizations also existed impact on the organization internationalization, emphasized that In addition to the accumulation of experience and knowledge of their own, organization in which the market also represents a source of knowledge. An important part of organizational knowledge is often linked with the network members to create and maintain. Measure of international experience knowledge, it can be divided into three components: Internationalization knowledge, international business knowledge as well as international system knowledge. Knowledge of international business including customers knowledge, competitors knowledge, competitors and market in connecting one. Knowledge of the international system relate with the government, culture and institutional framework and guidelines. These two types of knowledge can help the organization know “why”. Accordingly, Internationalization knowledge can help the organization know “how”, it determines international expansion model of the organization and the location choice.

(2) Technology knack; Technology knack is the key of organizational technical knowledge, Including patents, trade secrets, proprietary designs, production development and process innovations and so on. These is more difficult to cross-border transfer, can be influenced by consumption patterns and industry support in different nations. Successful international expansion requires the efficient allocation of knowledge in foreign markets, in order to gain a competitive advantage.

(3) Organize and management system; Organize and management system can form the organizational capacity, Including cross-border management skills and experience. Multinational organizational ability including: international human resource management, effective information flow management, cross-border coordination system, organizational structure and management as well as effective control. The ability to conduct effective cross-border coordination is an important organization in the capacity of international expansion, It includes not only identify the location for regional differences in consumption patterns of responsiveness, also cross-cultural human resource management, as well as rapid and effective decision-making.

Existing intellectual capital is the basis for organizing international expansion, it is embedded in the differentiation of organizational practices, it is the source stable and cannot mimic ability, and format the organization's assets strengths and transaction advantages. However, if organization do not update existing knowledge and improve it, it will depreciate to migrate over time.

4.2 Intellectual capital flows - the process

According to the traditional theory of multinational organizations, the organization's intellectual capital can be packaged and transferred with a cost. It ignored the unique intellectual capital stability, and stable characteristics of the transfer of assets with a difficult. Therefore, the traditional theory cannot reveal the process of cross-border flows of knowledge. Intellectual capital flow is a process with choice, learning, mergers, restructuring, leveraged the use and development, include not only the flows of organizations and inter-organization, but also flows in community and business networks.
(1) The composition of multinational intellectual capital flow

Organizations transfer the unique intellectual capital to different location through international expansion. With joint efforts of environmental selection pressures and management debugging, determine the pay, configuration, integration and reconstruction of intellectual capital. Multinational intellectual capital flow can divide into 4 kinds of forms. The flows from headquarters to the branches: it like the traditional meaning, the intellectual capital advantage based on national industrial development, enabling organization to seize international business opportunities, and overcome the associated risks by the copy or partly copy of these advantages; The flows from the branches to headquarters: This flows constitute the base of leverage use of intellectual capital for transnational organizations network. If the flows has a high level, organization can not only avoid the waste bring by investment duplication, but also help the headquarters integrate the internal intellectual capital by the use of local branches abilities as a medium. Flows from competitors to organizations: In competitive markets, the behavior of competitors will undoubtedly affect the organization’s decision-making. Organizations can learn, imitate, or establish network relationship with competitors to obtain valuable intellectual capital. Flows between locate branches: Such flows including learning in branches, utilization of local capacity and resource, its implementation depends on the improving of the organizational capacity to evaluate, filter, select information and capability to absorb those. Organizations, through international expansion can be close to the local community and business networks, access to the benefits of tissue cluster.

(2) The process of intellectual capital flows

Intellectual capital can be divided into explicit one and implicit one. Explicit intellectual capital can spread between organizations and in the organization’s internal, It is the source of positive externalities. Absorptive capacity is a key factor significantly affecting the organization to obtain the explicit intellectual capital. Implicit intellectual capital is based on the experience, even in the organization’s internal is also difficult to spread, making it difficult to copy and imitate. It allows the organization both internally and externally to use scale and scope economies. Here we use an intellectual capital create dynamic model (Nonaka, 1998) to describe the process of intellectual capital flows. The four modes of Intellectual capital transform determine its shift. Subtleness, Refers to the transfer implicit intellectual capital into implicit intellectual capital, that is implicit intellectual capital shared between the individual. Externalization, the transfer implicit intellectual capital into the explicit transformation, that is conducive to the transfer within the organization. Combination, the implicit and explicit intellectual capital are combined, it will display the level of explicit intellectual capital into the organization from the individual. Organizations will form a new concept and model through the combination of explicit intellectual capital from different sources, the result can be used for the entire organization. Internalization refers to the conversion from explicit intellectual capital to implicit intellectual capital, that is the process of the new explicit intellectual capital display in the implicit intellectual capital of the individual and re-use in practice.

Through the conversion of the four modes, we can form a link of intellectual capital between personal and organizational and a spiral of that. Its efficiency determine the organization can allocate resources in the international market quickly or not before the intellectual capital become obsolete (to be replaced or imitated). The abilities of learning and absorbance are keys factor impact intellectual capital flows effectively. According the analyses above, flows of multinational intellectual capital make organizations’ based intellectual capital continuously updated. In which core competencies can be formed, the core competencies determine the length of the logic time (the ease of competitors to copy,
imitate, and substitute) that organizational core competitive advantage sustained.

4.3 Intellectual capital to upgrade – path

Over time, some of the core competencies will be replaced, especially in the industries in which the organization's life cycle turn, the scientific and technological breakthroughs or the management concept update could make organizations’ intellectual capital lost its competitive edge completely. Path dependence refers to the historical practice of previous investments restricted the future behavior. And technology opportunities often depends on the development of basic science, it is not entirely external to the industry, because some of the organizations ability to engage in basic research and technological opportunities are often innovative activities by the organization itself. So, the prospect of path dependence can be determined by considering the technology opportunities. In terms of access to technology opportunities, organizational leadership and absorptive capacity plays an important role. The predictability of leaders can trigger a variety of new combinations produce from internal and external resources, such as the generation of new practices, new management, new products and services. In the turbulent environment, organizations must identify and seize opportunities to achieve the intellectual capital upgrade and make a significant change in existing practices. The creation of new intellectual capital by the new generation compatible with the changing situation constitutes the core competencies or dynamic capabilities development, and then, creating a sustainable competitive advantage in international. If the management of intellectual capital cross-border flows format a competitive advantage in a logic time, then the upgrade ability of intellectual capital will form a competitive advantage in the continuous logical time, which is a sustainable competitive advantage.

3.4 Conceptual model of the multinational organization's intellectual capital synergetic in dynamic innovation

In the international expansion, organizations establish R & D center they good at around the world, and coordinate these scattered research centers, to achieve the capabilities to upgrade intellectual capital. That is the reason why R & D investment in foreign increasing so fast since the 1980s. Then, we can draw the conceptual frame of the multinational organization's intellectual capital synergetic management, the three elements of Intellectual capital management affect each other and jointly determine the performance of the organization in international expansion. Effective and efficient management of intellectual capital is the key to sustainable competitive advantage of organization in international competition.
When the external and internal environment changes, multinational organizations can insight into the changes quickly based on the ability of environment insight, and to match their existing capabilities with the changes they insight, find out the incompatible resources prepare programs and intellectual capital structure (that is differences between resources and intellectual capital) in the changing environment. The result is the appearance of power source for intellectual capital synergy. Under the guidance of the dynamic innovation, organization integrates and restructures the existing resources, through organizational collaborative learning in the synergetic chain, to collaborate and innovate. With the role of the ability organization to change and update, new intellectual capital will generate. In the contrary, the update and application of intellectual capital will promote the enhance of dynamic capabilities and competitiveness. Due to environmental dynamics and variability, organization must continue to carry out collaborative and innovative in order to gain market competitiveness continuously. Then, organization will be able to continuously produce new knowledge, the dynamic innovation and competitiveness can be improved continuously based on the original endowment.

5. **Methods to improve the efficiency of multinational intellectual capital synergetic management**

   (1) Improve the learning capacity

   Those who learn the most quickly will be the winner, because many of scale economies learning
associated with demand and especially supply become the key to successful in international expansion. Organizations must promote and upgrade the flow of intellectual capital through learning. The traditional "learning by doing" waste too much time, and the market opportunity fleeting fast, so organization should learn quickly. Rapid learning methods include: learning through the network, learning through the acquisition, learning through imitation and learning through searching and so on. Clearly, the rapid learning can enhance the efficiency of knowledge management and accelerate the process of internationalization.

(2) Increase the absorptive capacity

Absorptive capacity refers to the organization to identify and digest new internal and external value of information, and then use these in the output of the production and service process. The development of absorptive capacity is critical to update the existing competitive advantages and create new core competencies and competitive position. Absorptive capacity is not only master new technologies, but also include commissioning organization systems to adapt new technology opportunities abilities. Few organizations failed because they cannot master new technologies, most is due to the lack of adequate absorptive capacity. Absorptive capacity determines the ability of the business faster and more complete transfer of intellectual capital and internal behavior of a particular ability.

(3) Improve conversion capability

Conversion capacity refers to the organization through collecting, digesting, integrating, and re-configuring the internal existing knowledge to develop new knowledge and technology in order to meet the practical needs of the organization or specific ability. Conversion capability is an internal drive the process, which helps organizations extend the existing competitive advantages to create new production and production processes which more efficient.

(4) Master the ability to use network

In the rapidly changing environment, to establish cooperation with external actors who have complementary skills -- use the Internet-- can help organizations to get the required intellectual capital and provide learning opportunities for businesses. It will provide organizations with a diverse platform for the development of internal capacity. This is especially important for the small and medium companies those in the international expansion lack of internal capabilities. The early 1980s, the Japanese company used alliances to reduce risk and accelerate the internationalization process. In some Asian countries, multinational companies make up their own problems of lack of internal capacities in addition to the use of business networks, but also through the use of social cultural and ethnic networks, achieved rapid international.

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