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Elements and evolution mechanism of dynamic capabilities: The perspective of knowledge

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ABSTRACT

It is the competition principle to “Select the superior and eliminate the inferior, the survival of the fittest”. The firm is the knowledge system and the capabilities system, the knowledge is the capabilities of nature. Based on the knowledge, the dynamic capabilities include knowledge absorptive capabilities, knowledge creation capabilities and knowledge integration capabilities. In accordance with the requirements of the firm, three elements of the dynamic capabilities don't operate automatically. The driving forces are required, it is a complete mechanism for the evolution of dynamic capabilities, including response mechanism, matching mechanism, learning mechanism, incentive mechanism. © 2014 Trade Science Inc. - INDIA

KEYWORDS

Competitive advantage;
Firm resource;
Dynamic capabilities;
Firm knowledge

INTRODUCTION

The survival and development is the fundamental problem of a firm. The core issue of firm's survival and development is corporate performance, and competitive advantage is the core of the corporate performance in the competitive market^[5]. However, in contemporary world, customer demand diversification and rapid development of economic globalization, technology and environmental turbulence change of competition, the source of competitive advantage is gradually being created or eroded. In the super-competitive environment, a stay on the basis of existing advantage or only pursuit the source of competitive advantage, will soon be replace. In this environment, success is not an effort to maintain long-term competitive advantage, but through

constant innovation to pursue a series of temporary advantages. In the super-competition environment, the strategy should be dynamically adaptive, but sunk cost, substitution effect and the existence of path dependence make the strategic adjustment presents certain rigidity, which makes the firm unable to keep the strategic adaptability.

Based on this thought, Teece et al.^[5,7] suggested that firms will win in super-competitive environment should use capability, effectively coordinate and reconfigure the firm inside and outside the capability to cope with these changes in the environment, and this capability is the dynamic capabilities. Dynamic capabilities meet the need of firm competition in the rapidly changing environment. Dynamic capabilities theory was accepted by the academic circles until 2000.

The current focus in the research field of firm resources is the study of firm knowledge, is also the study focus of the dynamic capabilities. So this paper from the perspective of knowledge is to study the constituent elements and evolution mechanism of dynamic capabilities, it is a combination of cutting-edge firm resource theory, and combines the firm competence theory frontier.

CONCEPT OF KNOWLEDGE AND THE DYNAMIC CAPABILITIES

The concept of knowledge

Knowledge is a very broad concept. Knowledge is about reasoning of information and data, which can improve performance, problem-solving, decision making and learning performance^[1]. This view emphasizes the formation process of knowledge and its use to guide decision-making and behavior.

Knowledge can be understood as: one is the structural experience, value idea, the correlation information, and combination of expert knowledge flow. The second is to assess and absorb new knowledge experience and information provides a framework; Three is produced in knowledge and applied to the knower of the brain; Four is in the organizational structure, the knowledge is often not only exists in file or a library, is also rooted in the organizational structure of daily work, procedures, practices and norms^[2]. This definition integrates the morphology of knowledge, composition elements, main function and the main body of storage and other factors.

Knowledge is a kind of information that can change someone or something (i.e., making information become a basic way of action, enabling an individual or organization to change or conduct more effective patterns of behavior through the use of the information). This kind of view addresses that knowledge is no longer a simple unordered collection, all kinds of elements, but was brought into a dynamic, interaction with people or organization system.

According to the definitions of knowledge above, to define the knowledge, we should first understand the data and information, as well as the relationship between the data, information and knowledge. Data are the original numbers and facts reflecting the motion state

things, and are the carriers of information and knowledge. Data form information in a meaningful environment, and information is the description and historic facts; information is the raw material of knowledge, the accumulation of information and organization to form the knowledge. Knowledge is a kind of effective information. Therefore, the data and information is the raw material, whereas knowledge is a kind of useful information for the specific job.

The concept of dynamic capabilities

From the perspective of knowledge, the domestic and foreign scholars had defined dynamic capabilities. Foreign representative definition was: dynamic capabilities is applied to the ability of technical and knowledge which firms must master for technology evolution^[4]. Dynamic capabilities includes firms to obtain and absorb the external knowledge, turning it into a new unique ability and creative ability, and the formation of dynamic capabilities evolution process is also the dynamic process of knowledge formation; Dynamic capability level is largely related to the active learning process^[3].

Domestic representative definition was: capacity is the collection of firm knowledge, technical knowledge has the ability to change ability and to the process of the firm's ability to change is the process to pursue new knowledge. Dynamic capability is the use of absorption ability and innovation ability to acquire new knowledge, through the integration of new knowledge to improve the organization conventional capacity and improve the efficiency that the company to cope with change of market environment and achieve sustainable competitive advantage.

From the above representative definition of domestic and foreign, we can define dynamic capabilities was firms acquire knowledge from the internal and external environment, and constantly update their knowledge. It reveals the essence of dynamic capabilities; it enables us through the firm dynamic ability appearance to see the real of knowledge, so that they can study of dynamic capabilities in-depth. The purpose of dynamic capabilities is to make the firm obtain sustainable competitive advantage; Dynamic capability is to cope with the firm internal and external environmental changes; Knowledge is the foundation of dynamic capabilities.

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Dynamic capability is the firm to adapt itself to the changing internal and external environment, through the absorption of external knowledge and internal innovation knowledge to constantly updated firm knowledge, as well as to the ability of knowledge integration, so as to form a new knowledge system that make the firm obtain sustainable competitive advantage.

Composition of dynamic capabilities based on knowledge

Knowledge is the foundation of dynamic capabilities. Dynamic capability is through organizational learning and incentive mechanism to absorb the external new knowledge, through external new knowledge and internal knowledge to innovative new knowledge, and integrative of knowledge in stock, so as to realize the update of firm capability.

From the perspective of firm knowledge, some scholars put forward elements of dynamic capabilities. Jihai Jiang (2005) argue that the components of dynamic capabilities is the knowledge absorptive capacity, transfer capability, integration and restructuring ability, innovation ability, these abilities are related to the complexity of knowledge transmission. The more complex the knowledge conduction, the deeper ability to build. Zhihan Zhou etc. (2008) argue that core capability including technical ability and organization ability. Organizational ability including coordination and integration ability of people who acts in the development of coordination ability that is the ability of firm coordination and integration the technical flow. Meanwhile, organization ability also includes learning ability and transformation ability which belongs to activists in ability development, dynamic capabilities is simply the transformation ability and learning capability on the part of organization ability. Ability to learn including transfer and accept ability. Transformation ability including absorption ability and integration ability. Wei Zhang (2009) argues that dynamic capabilities were composed of the ability of knowledge acquisition, knowledge innovation and knowledge integration capability.

On the basis of the above study, the author thinks that based on the knowledge of dynamic capabilities was composed of absorbing ability, innovation ability and integration ability.

The essence of dynamic capabilities is not knowl-

edge stock, but knowledge flow. It absorbs external new knowledge, through external new knowledge and internal knowledge to innovate new knowledge, and to integrate the stock of knowledge, so as to realize the update of firm competence, gain new competitive advantage, make the firm obtain sustainable competitive advantage.

Dynamic capability was composed of knowledge absorptive capacity, knowledge innovation capacity and knowledge integration ability (shown in Figure 1).

Firms acquire new knowledge mainly by the absorption of external knowledge and internal knowledge innovation. Knowledge absorptive capacity is firms to identify, evaluate, digest and utilize external new knowledge ability. Knowledge absorptive capacity determines the number and level of the firm external knowledge acquisition, it plays a key role in firm acquire and use external knowledge. Knowledge innovation ability is the ability to generate new knowledge on the basis of firm existing knowledge and absorbing knowledge from the external innovation. Knowledge innovation ability to decide the number and level of the firm internal knowledge innovation, which play a key role in the firm internal knowledge innovation.

The external absorb through knowledge absorptive capacity and the new knowledge through knowledge innovation ability cannot directly add value for customers, but through the integration of knowledge integration capability to form a new knowledge system, so as to form a new ability that bring new value for customers, this new knowledge and matching with the external environment makes the firms gain new competitive advantage, eventually make the firm obtain sustainable competitive advantage.

Knowledge absorptive capacity

Knowledge absorptive capacity usually refers to the ability of firms identifies, evaluate, digest and utilize external new knowledge. firms have a lot of ways to get external knowledge, by purchasing, hiring experts, mergers and with other organizations to acquisitions in the form of knowledge firms, and to outsourcing and consulting (such as industry-university-institute cooperation), the purchase of related knowledge of products (such as patents, authorization, and franchise rights, buy blueprint) to acquire knowledge.

In addition, the firm can also through an informal network of relationships and external stakeholders communicate knowledge gain relevant knowledge, communicate with customers and suppliers to gain knowledge, the relationship between formal long-term contract, investment, joint venture with other organizations such as formal knowledge sharing, communication and cooperation for a long time, entrepreneur's social network. Technical knowledge can also by consultants, customers, national laboratories, universities and other competition with the company for external sources.

From the point of view of knowledge acquirement, both can be divided into direct and indirect ways. Direct access there are many kinds of knowledge, such as through external investigation, access to licensed patent and process, the use of competitive intelligence, obtain knowledge from external sources, check the professional literature, monitoring technology, external training and participate, cooperation and so on. Indirect access to knowledge is to acquire knowledge by other indirect action, such as by strategic alliance and acquisition of knowledge intensive companies, joint ventures with other organizations.

Content is different from knowledge, knowledge acquisition can be categorized into explicit knowledge acquisition, tacit knowledge acquisition and knowledge acquisition as a whole. Explicit knowledge acquisition can through the data access, data of purchasing, intelligent agent, distributed search, data mining, licensing, marketing and sales agreement. Tacit knowledge acquisition can be through the brainstorming meeting, action learning and expert lecture, benchmarking learning, analysis, experience learning, structured interview, comprehensive study, dry middle school, mentoring heritage, such as interactive learning way. The overall knowledge acquisition can be obtained by way of strategic alliances, mergers and acquisitions, etc.

Through the above ways to obtain external knowledge with high speed, good quality, low cost, strong ability and avoid the advantages of behind closed doors. firms, however, too dependent on external knowledge acquisition may make the firm internal loss of innovative culture, motivation and ability.

Important is the ability to learn knowledge absorptive capacity. Learning ability including individual learning and organizational learning ability. Of prior knowl-

edge, research and development investment and firm external environment on the absorptive capacity plays a decisive influence. Prior knowledge level will directly affect the firm identification and judgment of external knowledge and attitude to the new knowledge, research and development activities is the main mode for firms to accumulate knowledge.

Knowledge innovation capabilities

Knowledge innovation ability is the ability of innovative new knowledge on the basis of firm existing knowledge system. Within the firm knowledge innovation formed the basis of continuous value innovation and innovation^[6]. Knowledge innovation is inexhaustible, it increases firm knowledge increment.

Internal knowledge innovation directly provides the required knowledge elements such as process, technology, experience, creative and so on, and make the firm found innovation environment revolution chance in the process of exploring new knowledge. Knowledge innovation can be make full use of knowledge, as well as explore new knowledge. Knowledge innovation can be divided into personal innovation, group innovation and organizational innovation.

Individual innovation can obtain knowledge by free association, intuitive, rational logic analysis, deductive method, as well as through the model of doing and learning. Group innovation can also through the dialogue between teacher and pupil inheritance, staff and brainstorming to obtain new knowledge. Organization innovation is generated by solving the problem of the current organization of the experiment and the experience of the prototype design, implementation and integration as well as knowledge, the introduction of external knowledge and absorption of new knowledge. Nonaka and takeuchi^[6] describe the process of firm knowledge innovation with common, watch out, internalization and connecting four patterns.

Good knowledge innovation ability can help firms to improve the ability to evaluate, absorption, digestion and use of external knowledge. If firm itself did not have a good knowledge and technology foundation, it cannot buy external knowledge and technology smoothly, the firm knowledge innovation also has an important effect on the select partners and ability to benefit from the partnership.

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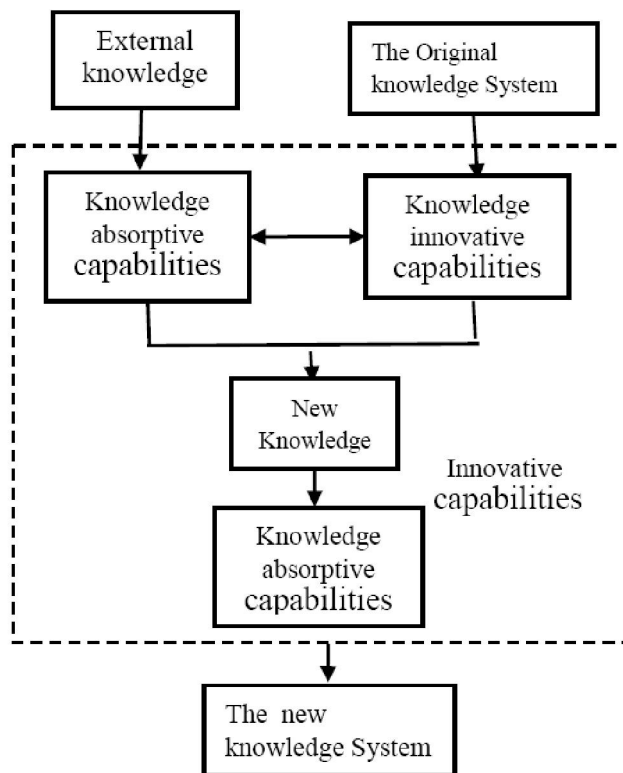


Figure 1 : Based on the dynamic capabilities elements of knowledge

Knowledge integration capability

Through the absorption of external knowledge and internal innovation knowledge, firms will accumulate a large number of all kinds of knowledge, but this knowledge does not work automatically. Knowledge integration is composed of internal sharing and transfer.

Knowledge sharing is the process of people having knowledge passed knowledge to the recipient by some way, and absorbed by the recipient. Knowledge sharing include sharing technology, sharing organization, sharing process, influencing factors of sharing and sharing channels and so on.

Knowledge transfer is refers to the firm transfer of knowledge purposely and formally. Due to limitation of professional, working experience, position, so personal master's knowledge is limited. Only transfer the personal knowledge into firm overall knowledge can provide impact for firms.

Knowledge transfer is a complicated process. Knowledge integration capabilities is one of the most important stages in depth of the capabilities evolution, on the one hand, it can obtain and digestive firm external knowledge, on the other hand it will integrate with

the firm internal knowledge, and finally used for the firm.

EVOLUTION MECHANISM OF DYNAMIC CAPABILITIES

Evolution of dynamic capabilities is a complex system, effective operation needs some mechanism to support and promote. Mechanism of the dynamic capabilities includes the reaction mechanism, learning mechanism, incentive mechanism and matching mechanism, as shown in Figure 2. Reaction mechanism can ensure timeliness of update firm knowledge, incentive mechanism can promote firm knowledge change, learning mechanism is the core of firm knowledge changes, matching mechanism ensure shrink the gap between firm knowledge and environment requires knowledge as possible.

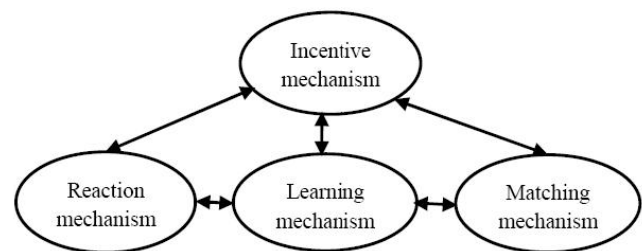


Figure 2 : Based on the mechanism of dynamic capabilities evolution of knowledge

Dynamic capabilities emphasize the absorption of knowledge, innovation and integration ability, at the same time requires it adapt to the environment. firm absorption, innovation and integration of new knowledge is not always suitable for firm development needs, this should require the reaction mechanism and the matching mechanism to ensure that the new knowledge of firm absorption, innovation and integration was consistent of the requirements of environmental change. The absorption of new knowledge, innovation and integration can achieve by the support of the learning mechanism and driving of incentive mechanism.

The absorption of firm knowledge, innovation and integration is not a one-off, but constantly, the nature of the evolution of dynamic capabilities is mechanism of firm to preserve the absorption of knowledge, innovation and integration of effective operation.

Reaction mechanism

Reaction mechanism is the mechanism that firm rapid

response to external environment changes. Reaction mechanism requires firms have rapid response ability. When the environment changes, the firm existing knowledge cannot keep pace with changes in the environment, so it requires companies to have a new knowledge system.

Reaction mechanism was consisting of environmental scanning, problems and opportunities of recognition and strategic response ability. Environmental scanning is monitoring for the environment, and found the environment change and the problems.

By scanning the environment, it can identify appeared or potential opportunities and problems. firms should establish perfect reaction mechanism, in addition to the regular environmental scanning, problems and opportunities identification, and also need a systemic and strategic thinking and reactions.

Learning mechanism

Learning mechanism is to promote the integration of organization knowledge absorption and innovation or integration a group of institutional. Learning can make the transfer of explicit knowledge, but also can realize the transfer of tacit knowledge. firms need to learn by experiment, trial and error, doing and learning, in the form of improvisation and learning.

Learning in firm can be divided into individual learning and organizational learning. Personal learning including the explicit knowledge and tacit knowledge learning. Explicit knowledge learning can directly obtain through documents, newspapers and magazines, books, network media and so on; it also can through the school learning, training and self-study to obtain. Tacit knowledge learning mainly through doing and learning and teacher and pupil inheritance system. Doing and learning is an important way to access tacit knowledge for personal. It is very suitable for learning tacit knowledge which can't use language to teach. The master boot is the most efficient way of learning tacit knowledge. the learning effect of tutorial system inheriting can impacted by their common knowledge background, beliefs, interests, hobbies and other factors.

Organizational learning is the process of began with individual learning, forming cognitive and memory of the individual and used to share organizational knowledge. Organizational learning can be divided into the

development of learning and exploration learning. Development of learning is organization further development and utilization of existing policies, rules and other of knowledge. Exploration study refers to the organizations actively looking for new strategy, found the new rules, innovation of new knowledge. Organizational learning was affected by four factors: environment, organizing, leading and task.

Individual learning is the foundation of organizational learning. Effective organizational learning requires improving organization learning ability for everyone.

Learning mechanism is composed of organization structure, management system; firm culture. Perfect learning mechanism requires firms to establish a reasonable organizational structure. Effective management system is the guarantee of learning mechanism. Good corporate culture is the environment of learning mechanism.

Matching mechanism

Matching mechanism is an interaction and matching of dynamic process between firm knowledge system and the external environment. Only make the firm knowledge and environment to provide opportunities for dynamic matching, it will form a competitive advantage.

Matching mechanism is prompted internal knowledge system and the external environment maintains interactive and adaptative. The match between the knowledge and the external environment is firm continuous make quick, timely response and matching for dynamic changes of external environment.

Incentive mechanism

Incentive mechanism is the interaction way by a rational system to reflect the subject and object of incentive. "Shock" is induced motivation, "excited" is intensive behavioral. Incentive is essentially a process of external guide behavior to stimulate the internal motivation. Incentive mechanism was composed of the system of prompt action and (or) conditioned behavior.

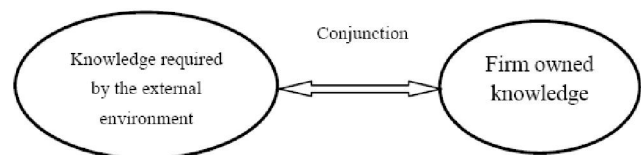


Figure 3 : The principle of matching mechanism

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ior. Excitation system of behavior mainly motivates members to absorb knowledge, innovation knowledge and integrated knowledge system, such as reward. firms can use spirit, material, honor or work motivation way to motivate employees. At the same time, there is some constraints mechanism, such as some punishment.

The relationship between the mechanisms

Promote the evolution of dynamic capabilities between four mechanisms are not independent, but influence each other and it has certain internal relation. Reaction mechanism is the precondition and foundation of dynamic capabilities evolution. Its pointed out the direction of absorption, innovation and integration of knowledge for the firm to ensure consistent between the firm knowledge and the external environment change. Learning mechanism is a necessary condition for the evolution of dynamic capabilities, learning mechanism is the guarantee the key technologies of firm to absorb, innovation and integration knowledge. Incentive mechanism as the driving force of dynamic capabilities evolution, it is the driving force of the firm absorption, innovation and integration knowledge. Matching mechanism is the guarantee of dynamic capabilities evolution, is the foundation of learning mechanism and incentive mechanism, and it ensures that the correct direction, adjust the size of the degree. Learning mechanism is the guarantee of reaction mechanism and the matching mechanism; it can ensure the absorption of knowledge, innovation and integration, as well as the normal operation of the reaction mechanism and the matching mechanism. incentive mechanism is the power supply, the power of this all was depend on the incentive mechanism to provide, otherwise, reaction mechanism, the matching mechanism and learning mechanism will not automatically.

CONCLUSION

Knowledge is the essence of dynamic capabilities. From the perspective of knowledge research dynamic capability is to research on the nature of dynamic capabilities. firm competitive advantage comes from the knowledge system, and dynamic capability is through changing the flow knowledge and stock of knowledge to change the firm knowledge system, make the new

knowledge system to obtain a new competitive advantage, thus makes possible the continuation or update of firm competitive advantage.

Dynamic capability was composed of knowledge absorptive capacity, knowledge innovation and knowledge integration capability organically. Through these three kind of ability firm can get knowledge system for environmental changes, namely, through the organic combination of the three ability effect can change the flow of firm knowledge, thereby according to the needs of the environment change the stock of knowledge to form a new knowledge system that match with the environment.

Three elements of dynamic capability cannot be effective by itself, but through a set of effective operating mechanism to advance. This mechanism is the evolution mechanism of dynamic capabilities, namely, it was composed of the reaction mechanism, matching mechanism, learning mechanism and incentive mechanism. The four mechanisms interact with each other, and promote the dynamic capability of knowledge absorptive capacity, knowledge innovation and knowledge integration capability to run effectively, so as to make the firm according to the changes in the environment need to change the corresponding knowledge system, and make them obtain a new competitive advantage.

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