Research on Enhancing the Innovation Ability of Top Management Team Based on Knowledge Integration

Liping Dai\textsuperscript{1}, Yuhui Ge\textsuperscript{2}, Yueming Chen\textsuperscript{3}

Management School, University of Shanghai for Science and Technology
Room 4-401, No.334 Jungong Road, Shanghai, China, 200093
\textsuperscript{1}dailiping027@163.com; \textsuperscript{2}gyh5688@163.com; \textsuperscript{3}cym23@163.com

Abstract- The innovation ability of top management team (TMT) has a direct influence on the enterprise’s strategic decision. How to enhance their innovative capacity becomes a problem that needs urgent solution in both the academic field and business field. Integrating the pluralistic knowledge behind diverse characters of TMT provides a solution to this problem. Firstly, this article defines the innovation ability of TMT, and then discusses its influencing factors from the angle of knowledge combined with upper echelons theory and team process. Finally, based on the point of view of knowledge integration, the paper suggests three ways to improve TMT’s ability. They are structural optimization, process optimization and result optimization. What’s more, this research picks one of telecommunication companies as a case to develop an understanding of the issues about enhancing the innovation ability of TMT.

Keywords- Knowledge Integration; Top Management Team; Innovation Ability

I. INTRODUCTION

In a company, innovations which involve organizational innovation, technological innovation, management innovation, and strategic innovation, tend to affect the development prospects of the whole enterprise, while these important and innovative decisions are made by the top management team (TMT). As the core team of the firm, TMT’s innovation activities have not been given enough attention. Theoretical researches at home and abroad mainly focus on analysis of the constituents of the team and its attributes as well as the relevance and influence process between business decision-making and performance, while TMT’s innovation capacity and its enhancement have been rarely probed into and analysed. At present, scholars have not yet clearly defined TMT’s innovation ability, the paper attempts to define this. TMT is a small group made up of senior managers who are able to participate in strategic decision-making and implementation of the company’s strategies, including the CEO, general manager and senior managers who report directly to the former\textsuperscript{1,2}. Participation in strategic decision-making and implementation is TMT’s principal responsibilities, so from this perspective, TMT’s innovation ability can be mainly considered as strategic innovation capability of the decision-making. For decision-making, Simon has pointed out that human decision-making can only be boundedly rational due to the incompleteness of information and the limitations of understanding \cite{3}. Hambrick and Mason have believed that the strategy is actually a result filtered and selected by the firm’s top decision-makers’ bounded rationality on the basis of environmental factors \cite{4}. Strategic decisions are provided with considerable risks, so TMT with higher cognitive abilities are really needed. Strategic innovation is an ability that reconstructs the existing model of creating value for customers and wealth for shareholders \cite{5}. Yu Laiwen and Chen Ming have suggested that competitive advantage and strategic capabilities are closely linked to entrepreneurs’ intuition and perception of internal and external environment and the abilities of cultivating, enhancing and integrating internal and external resources \cite{6}. Accordingly, we define the innovation ability of TMT as a synthesis of abilities shown in their process of strategic decision-making and implementation, such as identifying and grasping the market opportunities, controlling risks, deploying resources and creating value, and all of these will ensure that enterprises acquire sustained competitive advantage.

II. INFLUENCING FACTORS OF TMT INNOVATION ABILITY

The upper echelon theory (Hambrick and Mason, 1984) is mainly about the influence of TMT characteristics on the corporate strategic options \cite{4}, and it reveals the mechanism of TMT characteristics (including the dominant demographic characteristics and the hidden psychological characteristics) acting on strategic innovation (shown in Figure 1). According to the view of cognitive perspective of strategic decision-making, there is usually a self-serving attributional bias in TMT’s interpretation of internal and external environment and information, that is to say, the strategy is affected by their cognitive basis and values, etc. However, psychological characteristics such as cognitive competence and values are formed during TMT’s past education and work practice, and these education and experience consist of the TMT members’ explicit and tacit knowledge, including common knowledge, cross-knowledge and the unique knowledge, which again constitute a knowledge network of TMT. McNamara et al. suggest that TMT’s knowledge structure is their basis of developing strategies, and their empirical researches validate the important relationship between the complexity of TMT’s knowledge structure and business performance \cite{7}. Ran Min, a Chinese scholar, thinks that the complexity and focus of TMT’s knowledge structure reflect the ability of conceiving of the strategic innovation program \cite{8}. Luo Ling and Diao Zhaofeng believe that entrepreneurs’ market...
insights and abilities to grasp chances require a continuous strategic learning ability to expand and update their own knowledge base. The scholars have unanimously affirmed the important role of knowledge in TMT’s strategic decision-making. As the possessors of knowledge, TMT’s knowledge structure is rooted in the structure of their characteristics. The diversity of the team features bring about multi-discipline knowledge. Amazon and Sapienza think that the diversity of senior management team’s backgrounds is helpful to improve the quality of decision-making, because they can analyse a complex problem from different perspectives. West also believes that the integration of different points of view is conducive to providing a variety of potential idea combination from different fields and perspectives, and the diversification of the education among members is beneficial to the implementation of innovation. Because this variation is helpful to discover in advance, to analyse synthetically and to solve effectively the potential problems in order to take the lead in promoting innovation. Therefore, this paper holds the view that the composition of TMT’s characteristics has an impact on the innovation capability of TMT, and TMT’s knowledge structure may be one of the mediating variables.

![Diagram](image)

Fig. 1 The Framework of Upper Echelons Theory

Since the 1990s, in order to open the “black box” of the mechanism between TMT’s cognitive processes and output of business, some scholars have shifted the focus to the team process, involving team leadership, team conflict, team communication and team atmosphere. The team process is considered to be the critical means of making strategic decisions, and both formal and informal interaction mechanisms among the TMT are able to smooth the flow of TMT’s knowledge and skills inside as well as absorption of knowledge and skills outside, and can stimulate the generation of new ideas and new concepts. Their knowledge has different sources, level, structure and content. Differentiated knowledge endows them with different competencies, integrating views, and supporting innovation in the decision-making; team conflicts mainly include task conflict, relationship conflict and process conflict. De Dreu et al. believe that more conflicts present in the aspect of task conflict, and point out that the resolution to team conflict are basically from the two points: the “constructive debate” and the “minority influence” and the latter has been verified by empirical researches which show that it would affect the team’s innovation; team communication is divided into two kinds: formal and informal, involving talks, meetings, letters, non-work interest and emotional exchange, etc. What’s more, the frequency and depth of communication have an impact on the amount and quality of information exchange. Excellent team atmosphere helps to release the energy of TMT member to promote their enthusiasm for work, and to enhance the passion of the entire team. When the team, as a whole, shows a high EQ, the team’s knowledge sharing and absorption can be promoted and they can improve the quality of decision-making and innovation greatly. Therefore, we believe that team process will also affect the innovation ability of TMT.

In addition, strategic decision-making is not a one-time process, as internal and external environment may change significantly at any time, and during the implementation of the decision-making, a variety of new information and knowledge may emerge continuously. If that happens, TMT will need to conduct periodic assessment and improvement for risks and benefits of strategic decision-making. The gap, between the current and the future or between the fact and the plan, requires TMT to constantly optimize results to enhance the capacities of risk control, resource allocation and value creation, etc. In summary, this paper considers TMT’s innovative ability is influenced by three main factors: team characteristics, team process and decision-making effect. And knowledge plays an important role in these.

III. THE MECHANISM OF KNOWLEDGE INTEGRATION TO TMT’S INNOVATION ABILITY

During the strategic decision-making process, it’s difficult for the CEO or any individual of the team to cope with the rapidly changing and complex environment only using his or her knowledge and skills. Moreover, Ford and Baucus have pointed out that managers usually filter information that is not consistent with their understanding framework due to their long experience and study, that is to say, there is cognitive inertia. Knowledge diversity behind the characteristic diversity of TMT does not necessarily bring strategic innovation of team decision-making. It depends on TMT’s knowledge integration ability. TMT always has diverse knowledge backgrounds, involving a variety of functions, such as financial, legal, manufacturing, engineering, R & D and marketing, etc. Their knowledge has different sources, level, structure and content. Differentiated knowledge endows them with different ways of thinking, perspectives of looking into issues, problem-solving paths and discourse patterns, which may cause knowledge conflict. The result of knowledge conflict can be benign and malignant. On one hand, it may be hard to mobilize the interest of team members, stimulate knowledge innovation and improve the quality of strategic decision-making; on the other hand, it may also be hard to share and assimilate knowledge, and
prejudice or emotional conflict may arouse among members and lead to reduce effectiveness of knowledge. So knowledge integration is really needed in the decision-making process. Knowledge Integration is not the simple sum of existing knowledge, but a knowledge innovation process [15]. Through knowledge integration, a dynamic, highly flexible knowledge network is formed, and TMT can not only obtain pluralistic information, but also enhance capabilities of understanding in the process of knowledge sharing, coordinating and cooperating. It will help to reduce the risk, improve the quality and innovation of decision-making.

Zhang and Shan have suggested that knowledge integration include four aspects: personal knowledge and organizational knowledge, tacit knowledge and explicit knowledge, existing knowledge and new knowledge, internal knowledge and external knowledge [16]. The classification is very comprehensive. We take this point of view, and propose a mechanism model of knowledge integration to the innovation capacity of TMT, as shown in Figure 2.

![Fig. 2 The mechanism model of knowledge integration to TMT’s innovation ability](image)

First of all, based on existing knowledge background, members of TMT, perceive and identify chances both in internal and external environment, have access to some valuable information related to decision-making, such as technology, products, services and management. At this stage, as information “gatekeepers” of important sectors, members of TMT control the “valve” of critical information. However, the respective elements of knowledge they know well cannot produce a strong overall effect alone. Only by realizing the team system synergy and depending on coordination, will they have all the information relevant to decisions. Secondly, through comparison, analysis, judgment and communication and so on, TMT fully integrate knowledge resources, develop and improve their own expertise in-depth, in order to serve the decision-making, implementation and control. Throughout the process from the beginning of making a decision to achieving its stated goals, TMT needs to dynamically add to, adjust and improve the knowledge system under the company’s vision and strategic direction, to make the decision-making more strategic and innovative. Finally, efficient knowledge integration and application will form into implicit knowledge which is difficult to imitate and transfer and accumulate in the team. It also can influence TMT’s cognitive structure, increase TMT’s flexibility of thinking and develop TMT’s intellectual ability (the ability of discrimination, judgment and invention as well as action competence of putting something into practice [17]), thereby enhancing the innovative capability of TMT.

IV. THE FRAMEWORK OF ENHANCING THE INNOVATION ABILITY OF TMT BASED ON THE PERSPECTIVE OF KNOWLEDGE INTEGRATION

Combined with previous influencing factors of innovation ability of TMT, this paper puts forward the framework of enhancing the innovation ability of TMT based on the perspective of knowledge integration, as shown in Figure 3:

![Fig. 2 The framework of enhancing the innovation ability of TMT based on the perspective of knowledge integration](image)

A. Structural Optimization

The structure optimization is to build a TMT with a reasonable characteristic structure through effective mechanisms of selection and appointment, as well as training. TMT characteristics mean level and the degree of heterogeneity should be combined with the corporate strategic innovation needs to arrange. Take age for example. The older, the more inclined managers may be risk-averse decision-making, resulting in a lack of strategic innovation; on the other hand, the higher the age, the more abundant their experience may become more informed to grasp the risk of strategic innovation, and the deeper the awareness would be, and then the decision-making may be more far-sighted. The demographic characteristic differences are the sources of cognitive ones and other psychological characteristic ones. Thus, optimizing TMT’s structure includes demographic characteristics and psychological characteristics, and based on the two points, we can build a
competency model of senior executives, and set related standards for the selection; if necessary, we can also broaden the selection approaches, like choosing outside the enterprise, or even all around the world. In addition, we can hold trainings for related TMT staff to complement their functional needs, such as leadership, strategic management, production management, marketing management, financial management, human resource management, public relation management and so on in the hope of improving their knowledge structure. Structural optimization has an active role in TMT’s ability to identify and grasp market opportunities, control risks, allocate resource and create value.

B. Process Optimization

Tables Process optimization contains three dimensions: optimization of information collection, information processing, and emotional atmosphere.

Information-collection optimization, aims to get a wealth of information to contact with knowledge easily, know it and study it well, to deepen their awareness of internal and external environment, and to lay a solid foundation for strategic decision making, choice and innovation. The following measures can be taken.

1. As a result of TMT’s various knowledge and experience, they can produce new ideas and collect information through the brain storm, interviews and investigations, etc.

2. The team leader should encourage their members who also encourage their respective departments to reach out to the field of information, to search extensively for technologies, products, services and other information, and to create top-down delivering channels of information needs and quick and timely bottom-up feedback channel.

3. With the application of information network technology, build knowledge networks and knowledge server to provide services for Knowledge Management. TMT and the ordinary employees exchange directly on the network platform to reduce the loss of information dissemination.

4. TMT can invest actively in the knowledge collection, foster knowledge cross-border talents, learn advanced science and technology and management expertise both at home and abroad, participate in the forefront of meeting or take root in a university laboratory. All in all, concern the top of related fields.

5. Remain open learning. Local culture and multiculturalism can merge together. And then TMT can grasp customer needs and compare competitors’ strengths and weaknesses with theirs so as to improve the predictability of product and market. The optimization of information collection, on the one hand, enriches the source, structure and content of their knowledge. On the other hand, it also reduces the information asymmetry and helps to improve TMT’s opportunity identification and risk-control capability.

The optimization of information processing is to raise information utilization and the effect of knowledge integration and finally to improve TMT abilities of resource allocation and value creation. Information processing involves a series of related processes, like the reception of information among its members, transformation, dissemination and issuing. In order to keep these processes smooth, the leader of TMT should maintain free, relaxed, democratic management to increase the members’ sense of participation and identity and encourage them to share knowledge. Owing to a variety of TMT members’ background, when they exchange their understanding of the information with others on their own cognition, they may need to convert the expression of the jargon for other members to be understood easily, such as simplified tables, cause-and-effect diagrams, histograms, flow charts, and analysis of sphere of influence, etc. It is good for members to maintain regularly formal and informal communication. This will improve the communication level, and be helpful to combine with multiple areas and integrate different perspectives and knowledge to explore and compare the decision-making alternatives. What’s more, it is also beneficial to rationally allocate demands of different projects and departments to enhance the ability of creating value. In addition, thanks to tacit knowledge’s hard transferability, the change of a key member may lead to lack of core knowledge, and affect the absorption and integration of team knowledge. It’s not conducive to TMT innovation capabilities. Therefore, it is necessary to pay attention to the continuity of the role of TMT members, so as not to influence the optimization of information processing.

The optimization of emotional atmosphere is mainly to create a team atmosphere conducive to TMT’s making innovations. Emotional atmosphere, including the interpersonal attraction, interpersonal trust, friendship, like-minded relationship, kinship and the value of identity [18], has a great impact on TMT stability and knowledge integration. Trust can promote team learning, strengthen organizational citizenship behaviours, increase cooperative behaviours and enhance the ability to solve problems. At the same time, it also can promote the exchange of information and knowledge and accelerate decision-making and improve the quality of decision-making [19]. Francis and Sandberg have pointed out that the team of high friendship relies more on the implicit psychological contract, rather than the explicit contract to carry out organizational activities, it has greater participation in decision-making, and during the decision-making process it experiences more cognitive conflict and less emotional conflict. It has more stability, and team members have fewer replacement rates and the team has a higher survival rate in the face of difficulties [20]. Innovation activities are not only intellectual, but also emotional ones. Therefore, TMT should promote team spirit and enhance the cohesion, mutual support and dependance.

C. Result optimization

The decision has certain timeliness, so TMT tends to make timely decisions and take action not to miss opportunities without delay. However, any decision is not perfect in the beginning. Maybe a firm is dedicated to independent research and development, but due to high cost
or rapidly changing economic environment, in the end it only has to buy certain technology. In the optimization of results, TMT needs dynamic tracking and feedback, flexibly mine information from customers, employees, partners and competitors, as well as other related groups. While in implementation, TMT may have continuous testing, evaluation, comparison with the plan, balance risks and benefits, or give up, adjust and transfer duly. It is also need to be concerned about the way how the decision problem emerge and the changes the environment gets, so that they will not miss important information which can result in misunderstanding or incomplete understanding.

V. THE CASE: A TELECOMMUNICATION COMPANY

China’s telecommunications industry finished a new round of reorganization in 2008, entering into an era of tripartite confrontation. China Mobile’s monopoly advantage has gradually disappeared. CM not only faced innovation of technology, management and operation, but also met the challenges brought about by all-round innovation of product and service. And one of the most difficult and most fundamental innovations was the one of people’s mode of thinking and idea. After the reorganization, CM had a high level for several times to change, experiencing a structural optimization. For example, Xi Guohua was appointed to be the Vice Chairman, his government background would bring some resource superiority, in favour of its operating TD-SCDMA. As for the process optimization, CM’s branch company in Shenzhen encouraged Intersection Learning among the top management team, which contains four aspects: cross-industry, cross-field, cross-culture and cross-time/space. Through intersections of rationality and emotion, today and tomorrow, they seek for innovative idea, and integrate it with their own field and development strategy requirements. The in-depth exchanges and internal sharing indeed expanded their industry horizon. In the result optimization process, they always care about whether the innovations conform to the needs of customers; whether they adapt to the financial requirements; whether they are sustainable; whether they will be profitable and how. With a sense of innovation in mind, TMT has a deeper understanding and analysis of organization innovation and product innovation, and understands the enterprise orientation and development direction from a higher point of view.

VI. CONCLUSIONS

This paper initially defines the concept of TMT’s innovation ability, and discusses the influencing factors from the perspective of knowledge, combined with Upper Echelon Theory and team process. Based on the knowledge integration, we put forward the framework of enhancing TMT’s innovation ability: structure optimization, process optimization and result optimization. The case presented in this paper shows some companies have already thought highly of TMT’s innovation abilities and do something to improve. Through knowledge integration, it is expected to promote TMT members’ acquisition absorption and use of knowledge, complement their knowledge and capabilities, and improve decision-making to make decision more strategic and innovative. This study expands into a new way of thinking in the area of research on TMT. The existing researches on TMT cognition research have been mostly carried out from human capital, social capital or shared mental models. Most scholars agree with the idea that the knowledge structure of TMT would affect the communication and interaction among team members, thereby have an impact on team performance and organizational performance, but they do not do in-depth study from the perspective of knowledge. Knowledge integration may be one of the important process variables. There are still some shortcomings in this article, the definition, the formation and influencing factors of TMT’s innovation ability need to be further improved and deepened, and to collect relevant data to do some empirical researches to verify the idea. Moreover, the different stages of TMT knowledge integration process are also in need of further exploration.

REFERENCES


