Review and future prospect of enterprise strategic change from the cognitive perspective

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Abstract. Strategic change is an important means to deal with the rapidly changing market environment and build a sustainable competitive advantage. In the process of shaping and realization of enterprise strategic change, cognition is the key pre-variable factor, which has the different influence mechanisms and effects. Currently, some progress has been made in the strategic change research from a cognitive perspective, but a systematic review on the topic is missing. By dividing the decision-making subjects in the context of strategic change into two levels: team and individual, this paper systematically combs and reviews the existing studies, and constructs the existing research framework of strategic change from the cognitive perspective. This paper finds that most of the existing studies focus on the issue of "how to promote strategic change", ignoring the importance of the way of action subject processing and processing information in the context. Therefore, this paper proposes that in the future, we should pay attention to the excavation of the unique situation of strategic change, deepen the understanding of different levels of cognitive representation, and build the cognitive basis of strategic change from the perspective of system dynamics.

Keywords: strategic change, cognitive perspective, uncertain environment, future outlook.

1. Introduction

With the rapid and dynamic change of the environment, the survival and development of enterprises are facing more and more challenges. As an important means to deal with the uncertain environment, strategic change is crucial for enterprises to obtain sustainable competitive advantages [1], which has become one of the hot topics discussed in the theoretical and practical circles. However, with the changes of the time background of the organization and the organization itself, the strategic change is increasingly complicated, which makes it difficult for the organization to grasp the laws of various subjects in the process of strategic change, which has also become an important reason for the repeated failure of strategic change. For example, Jianlibao, once the first brand of national drinks, was due to the long-term lack of clear strategic goals, so that it artificially shelved the development of new products, thus missing the opportunities and declining. Therefore, the research of strategic change urgently needs a new theoretical perspective to reveal the internal nature of strategic change and promote the successful implementation of strategic change.

The cognitive school of strategic change emphasizes that the cognitive characteristics of the industry influence the occurrence of strategic change, and how cognition affects the enterprise strategic change behavior has become an important topic in the research of strategic change [2]. The research on strategic change from the cognitive perspective mainly draws on upper echelons theory and social cognition theory, and tries to reveal and supplement the process of strategic change and the cognitive nature behind the behavior which cannot be fully revealed by the traditional macro or medium research perspective. From the current research situation, the decision-making subjects are widely distributed, and the scholars mainly conduct their research on the cognition at the two levels of team and individual. However, most of the existing studies directly explore the direct effect of managers’ cognition on strategic change, ignoring some important situational factors. Cognition is only the content of the current consciousness level, and whether this "consciousness" can be successfully translated into a strategic action is influenced by many other factors, such as the inertial
forces within the organization. Therefore, it is incomplete and inaccurate to directly study the impact of managers' cognition on strategic change by ignoring situational factors.

Accordingly, based on the existing research on strategic change from the cognitive perspective, this paper is committed to answer the two questions of "what are the cognitive causes behind the behavioral differences of strategic change, and what is the interaction process between the strategic change situation and different levels of cognition". On this basis, the contribution of the existing research and the pointed direction are discussed, in order to contribute to the construction of the theoretical framework of strategic change, and help the incumbent enterprises and their managers to better grasp the ways to stimulate the vitality of strategic change.

2. Connotation, Classification and Measurement of Strategic Change

2.1. Connotation of Strategic Change

As for the connotation of strategic change, the academic circle mainly interprets it from the content of strategic change and the strategic decision-making process.

Scholars defined from the perspective of strategic content changes mainly focus on the strategic changes at the company level, management level and functional level, such as the changes in resource allocation mode, business scope, competitive means, etc. At the corporate level, scholars mainly define strategic changes based on Mintzberg (1978) through the degree of change in the allocation of several key strategic resource dimensions of the enterprise. Among them, the most representative and broad concept definition is led by Finkelstein and Hambrick (1990), who regard strategic change as a series of strategic resources in the allocation level and the industry mainstream and the degree of fluctuation in the annual range. At the operational level, scholars mainly emphasize the changes in the competitive direction and operating conditions of a specific business of an enterprise, including the changes of the enterprise's products and the changes in the enterprise's competitive strategy. At the functional level, scholars mainly believe that its definition is the corresponding functional adjustment made by the company's research and development, marketing, production, finance, human resources and other functional departments in response to the strategic change decisions at the corporate level and management level.

Scholars defined from the perspective of changing strategic decision-making procedures focus on the transformation of the formal management system, organizational structure and organizational culture of enterprises. The change of strategic decision-making process is mainly to support the implementation of strategic change. Scholars who define strategic change from the perspective of strategic decision-making process change pay more attention to the change of organizational structure, formal management system and organizational culture. This kind of research includes the strategic changes in the relevant organizational elements (such as corporate culture, organizational structure and management system, etc.) into the category of strategic change, which is a supplement to the perspective of strategic content change. For example, Snow and Hambrick (1980) argue that the technological, structural, and process changes required to effectively pursue a new strategy should also be classified as strategic change.

2.2. Process and Classification of Strategic Change

Some scholars have divided the process of strategic change according to different dimensions and different standards. The three-stage process is mainly the mode of strategic thawing, strategic change and strategic thawing. Strategic thawing is the change process of the original strategic thinking and strategic action, strategic change for the implementation of new strategic thinking and behavior mode, and strategic thawing for the consolidation of new strategic achievements. The four-stage process is the motivation and starting point of strategic change, the determination of strategic change projects, the implementation of strategic change, and the monitoring of strategic change. The five-stage process divides strategic change into clarifying change intention, drafting change copy, clarifying
change measures, strengthening the implementation of change and evaluating the effectiveness of change\cite{12}.

In terms of strategic change classification, scholars mainly divide strategic change into two directions: progressive change and radical change\cite{13}. Progressive change emphasizes the strategic change and difference, while the radical change is the complete subversion of strategy and emphasizes the radical change of organizational system structure. Strategic change can also be divided into two types: strategic vitality (stage change) and strategic uniqueness (deviation from the industry center)\cite{14}. Strategic vitality refers to the highly dynamic company in the allocation of resources across strategic selection (e.g., advertising, research and development, capital investment and capital structure). In addition, the strategic situation reflects the vitality of the company, and the combination and the relative size of the strategic uniqueness reflects the degree of compliance with or ignoring the general code of conduct.

2.3. Measurement of Strategic Change

At present, the measurement of strategic change has not yet reached a consistent conclusion. According to the content logic of strategic change, scholars measure objective indicators for the strategic changes at different levels of the company. At the company level, most scholars mainly according to the enterprise six strategic resources dimension index change degree to build strategic continuation-variation and strategic convergence-deviation from the two type variables, respectively, on the vertical and horizontal strategic change six indicators respectively: R&D intensity, advertising intensity, unproductive spending, fixed assets update rate, inventory levels and financial leverage ratio. On the operational level, Kelly and Amburgey (1991)\cite{15} adopted the product matrix to measure the strategic changes at the enterprise level and the business level from the perspective of company product change; Barker and Duhaime (1997)\cite{16} divided the strategic changes into company and operation based on the idea of Ginsberg. Among them, the content of the company's business level strategic change is mainly the product-market competition decision-making activities of the company's business level, which is divided into four dimensions: market change, manufacturing change, research and development change and financial policy change. A total of 19 measurement indicators are designed. In terms of decision-making procedures, it is mainly measured by whether enterprises enter or exit the international market and whether they increase or eliminate a certain product line\cite{1}.

3. Theoretical Basis of the Research on Enterprise Strategic Change from the Cognitive Perspective

Strategic cognitive theory that enterprise cognitive framework in the past limited choice space and tendency\cite{17}, due to the enterprise history, managers cognitive characteristics and the influence of the cultural environment, enterprises will form a specific cognitive framework, and the strategic cognitive will affect enterprises to adapt to the external environment and the implementation of change behavior\cite{17}. Therefore, this paper focuses on the "context-cognition-behavior" relationship of decision-making subjects in the study of strategic change. Among them, cognition is an important basic concept in the field of psychology, which mainly focuses on the main problem of "how people think". Later, it was widely used in the research of various interdisciplinary subjects, such as entrepreneurial cognition, management and organizational cognition, and social cognition. The cognitive perspective connects seemingly unrelated research to a new central focus and gives it new meaning, gradually becoming an important perspective for scholars to explain performance or behavioral differences. In order to sort out the research of enterprise strategic change from the cognitive perspective, this paper sorts out and summarizes the relevant theories.
3.1. Upper Echelons Theory

Hambrick and Mason innovatively the upper echelons theory in 1984[18], which provides a systematic interpretation of how top managers act under limited rationality. According to the advanced theory, as the initiator and executor of the corporate strategic change, the cognition of the corporate executives has an important influence on the corporate strategic change. Due to the limited insight and cognition of senior managers, they can only interpret the noticed stimulus, cannot examine all aspects of the organization and environment, and their strategic decision-making behavior is not completely rational. Therefore, the interpretation of senior managers on the internal and external environment of an enterprise is formed by filtering their existing cognitive structure and values. The cognitive structure of managers can reflect their preferences and determine them to adopt or abandon a specific strategic plan, such as product innovation, related and unrelated diversification.

In contrast, the executive team quality was more predictive than the characteristics of individual executive members. As the main body of enterprise strategic planning and execution, the senior executive team integrates the core competence, resources and knowledge of the enterprise, and participates in the strategic decisions and operational decisions of the enterprise. Each member of the executive team has a different demographic background and social relationship, so the cognitive basis of homogeneity or heterogeneity is formed within the team. The different cognitive bases, values, insights, and the functional processes of these characteristics can affect the relationship between corporate strategic change and corporate value.

In general, upper echelons theory believes that strategic change choices are made by senior managers based on their own reference frame cognition and selective interpretation of internal and external environmental information.

3.2. Prospect Theory

Prospect theory was proposed by Kahneman and Tversky in 1979[19], a theory about understanding the behavior of human risk decisions. Based on prospect theory, scholars found that there are two psychological processes: loss avoidance effect and gambling money effect in individual decisions[19,20]. These two psychological processes affect managers’ perception of risk and benefit, influence managers’ interpretation of performance feedback information, and ultimately affect the risk decision-making of enterprises[21].

In terms of the loss avoidance effect, prospect theory believes that individuals evaluate the current decision through the definite benefit, potential gain, definite loss and potential loss of a decision[22]. Although strategic change is accompanied by benefits and risks, the CEO is willing to take more risks for the benefit of successful change when measuring the risks and benefits of strategic change due to the difficulty of maintaining the expected surplus. In terms of gambling effect, Thaler et al.(1990)[20] put forward the gambling effect based on the prospect theory: individual decisions often consider sunk costs, and the benefits and losses in the early stage will affect the risk avoidance attitude in subsequent decisions. At this time, in order to achieve the performance expectation target after the growth, the CEO has a stronger willingness to use the excess returns to make exploratory strategic changes, and try to find new performance growth points and seek more benefits.

Therefore, the prospect theory mainly judges the future strategic decision behavior of the enterprise by analyzing the two psychological processes in the individual decision-making process.

3.3. Social Cognitive Theory

Social cognition theory emerged in the 1970s and 1980s, and developed rapidly in the 1990s. Social cognition is the product of the combination of social psychology and cognitive psychology, which has become an important research field of social psychology. The theory seeks to determine whether the apparently disorganized and heterogeneous phenomena associated with corporate strategic changes in the past will actually be influenced by some underlying cognitive rules. According to the social cognition theory, the overall environment of an individual can be described by the following two groups of factors: (1)cognition and motivation; (2)the individual in the
environment. When an individual processes information for the above two sets of factors, the model used to explain the individual's behavior approaches the perceived overall reality\textsuperscript{[23]}. Because entrepreneurs have the dominant position in the enterprise, in the process of long-term practice, through the interaction between external stakeholders, with the accumulation of knowledge, experience, emotion, practice and gradually form a structured knowledge framework and belief system, the structured framework or system for entrepreneurs cognition. Thus, the entrepreneur cognition become the entrepreneurs of information processing process, and entrepreneur storage, retrieval, conversion and use the unique ability of the information, and form different social cognitive mode or state, produce different effect, such as enterprise scanning and perception of the environment, and enterprise find and grasp the future opportunities\textsuperscript{[24]}. At the same time, due to each entrepreneur’s different educational background, professional experience, thinking mode and values, as well as the differences in the concept of the survival and development of enterprises, the cognitive style of entrepreneurs will also show their own uniqueness.

In general, from the perspective of social cognition theory, enterprise organization is essentially a cognitive entity, which will learn and create knowledge, and then form different cognitive models that will affect the strategic change decisions of enterprises\textsuperscript{[25]}.

4. Research Progress of Enterprise Strategic Change from the Cognitive Perspective

The process of strategic change is the cognitive and action process of enterprise senior managers after scanning the environment and constructing the significance of strategic change. In order to effectively analyze the strategic change behavior of the organization, it is necessary to shift from the static and deterministic paradigm of the traditional organizational theory to the cognitive paradigm focusing on individual perception and collective decision-making process. Therefore, based on different levels of analysis, this study divides the cognition of different decision-makers into two dimensions: individual level cognition and team level cognition, discusses the different levels of cognition and its antecedents and consequences respectively, and combs the interaction between different levels of cognition on this basis.

4.1. Individual Level Cognition

The research on individual level cognition in the context of strategic change mainly responds to scholars’ attention to human capital and micro basis of different management levels (high level, middle level and basic level of strategic change). Individual level cognition is an important entry point to understand strategic change behavior and decision-making, and cognitive subjects mainly focus on CEO, managers and employees at different levels. In the development of strategic change cognition, scholars mainly regard individual level cognition as a structured knowledge framework and belief system formed by the gradual accumulation of knowledge, experience, emotion and practice in the long-term cognitive practice, including cognitive deviation (overconfidence), configuration cognition, willingness cognition and ability cognition.

4.1.1 Cognitive antecedents of individual level

Individual level cognition is the knowledge structure used by individuals (including senior managers, middle managers, grassroots managers and employees) in making decisions in the context of strategic change, which is mainly influenced by the external environment, organizational and management characteristics as well as individual characteristics.

On the environmental level, some scholars mainly pay attention to the influence of the complexity, dynamics and richness of the environment on individual cognition. Strategic change is also a process of organizational rationality to adapt to the external environment. In the process of adapting to the environment, enterprises will be constrained by the system operating in a wider range of environmental levels, such as external rules and laws\textsuperscript{[26]}, and will also be constrained by the
internalization criteria of decision makers. At the organizational level, scholars mainly emphasize that the construction, maintenance and utilization of the existing valuable resources such as human capital and financial capital will have an important influence on the strategic choice. Hitt et al. (2016)\textsuperscript{27} once pointed out that historic and conservative resources are not conducive to the adaptive strategic change of enterprises, and the binding of open resources is directly proportional to the speed of strategic change. At the individual and team levels, scholars aim to explore the impact of CEO characteristics, CEO change, and executive tenure on the perception of strategic change. For example, Barron et al. (2011)\textsuperscript{28} paid attention to the role of non-CEO turnover in enterprise strategic change, and found that the joint change of CEO and non-CEO senior management members was related to the strategic interruption of the enterprise, which showed the importance of the whole senior management team in determining the enterprise strategy.

In general, the existing research gradually began to pay attention to the role of individuals in the study of strategic change, but the research on how the internal and external environments interact with individuals and thus jointly shape individual cognition is far from enough.

4.1.2 Results of individual level cognition

The strategic behavior of an enterprise is determined by managers by noting and explaining changes and transforming them into strategic choices. Based on this, individual cognition interacts with the internal and external environment of the organization, and jointly influences the resistance, way and performance of strategic change and more. Studies have shown that one-half to two-thirds of corporate change failures can be attributed to change resistance. George and Jones (2001)\textsuperscript{29} found that change resistance occurs when the original representation and the inconsistency. As two ways of strategic change, the process of causal change and effect change have attracted the attention of scholars. On the one hand, paradox cognition promotes the identification of hidden contradictory relationships in the organization, and the repeated test and iterative learning process facilitate enterprises to explore the potential and unexpected contradictory relationships and enter a virtuous cycle process to form continuous competitiveness, so the paradox cognition slows down the decision and delays the formation of cause and effect change plan, making it difficult to fully implement the strategic change, which is not conducive to the causal change process of enterprises. In addition, Helfat and Peteraf (2015)\textsuperscript{30} believe that differences in cognitive ability of different managers will lead to differences in dynamic management ability, which leads to different change performance under change.

4.2. Team Level Cognition

With the expansion and deepening of cognitive research, the concept of "cognition" no longer only belongs to the research category of individuals, and the research on "cognition" at the team level has gradually become a research hotspot in the intersection of cognitive psychology, organizational behavior and organizational ability theory. Team level cognition is the knowledge structure formed by team members and their continuous interaction with the embedded environment for team decisions. In the study of strategic change, the team level mostly refers to the senior management team. The information processing mode of the team is obviously different from that of individuals, and the team is not a simple mapping of the strategic change decision. Therefore, it is necessary to explore the influencing factors, cognitive processes and their influence on the strategic change behavior. Existing studies have relatively little cognition at the team level, mainly focusing on interactive memory system, team cognitive preferences, cognitive conflict, cognitive complexity, cognitive concentration and other aspects.

4.2.1 Cognitive antecedents of team level

The pre-variables of team level cognition mainly focus on external environment, organizational and management characteristics and team characteristics. As a form of group cognition, interactive memory system is mainly developed by team members by encoding, storing and retrieval knowledge and information in different fields. It is a cognitive system conducive to memory, learning and
communication\textsuperscript{[31]}. Team interactive memory system as a form of collective cognition, to improve the long-term adaptability, in the process, the international cultural background will affect the knowledge structure of team interactive memory system, and through the knowledge specialization, knowledge exchange and knowledge coordination process further team level cognitive complex\textsuperscript{[32]}. The cognitive concentration is reflected in the clear core concepts and edge concepts in the knowledge structure of the executive team; the cognitive complexity is reflected in the complex relationship between different concepts in the knowledge structure, both of which are affected by environmental dynamics and organizational inertia. The cognitive preferences of members of the strategic decision team are the emotional characteristics and behavioral tendencies shared by members of the strategic decision team in the face of environmental information and management cognitive mismatch in the process of strategic decision making. The preference of strategic decision-making team members is rooted in social situations, mainly influenced by team motivation, organizational legitimacy, team role commitment and other factors. Cognitive conflict is a conflict triggered by different perceptions of how to complete the task. According to the role theory, the organization is the system of the role composition, and the role is the basis of the organization composition. The cognition and behavior of the role reflect the basic social values, thinking tendency and dominant logic of the role. The senior, middle and executive levels play different roles. Due to the collective cognitive schemas of the senior, middle and executive levels, the vertical and horizontal conflicts will occur in the enterprise\textsuperscript{[33]}. In general, the environmental level (environmental dynamics, environmental complexity), organizational level (organizational inertia, organizational legitimacy), team level (team role commitment), and individual level (role conflict) will all affect the team cognition.

4.2.2 Results of team level cognition

As an important support for individual connected organizations, the existing research mainly discusses its influence on the speed of strategic change, strategic change conflict, strategic agility and so on. From the perspective of the knowledge structure network graph, Nadkarni and Narayanan(2008)\textsuperscript{[34]} found that the higher degree of strategic change stems from the higher cognitive complexity and lower cognitive concentration. Due to the differences in role positioning, attention and cognitive schema, the task cognitive conflict, process cognitive conflict, process cognitive conflict and relationship cognitive conflict are the main reasons for the formation of conflicts in the process of enterprise strategic change\textsuperscript{[33]}. Strategic agility is the ability of large and mature existing organizations to update themselves and inject innovative ideas into development in order to address external uncertainty and turbulence related to the level of vigilance of opportunity exploration and utilization. Compared with individuals, teams are more likely to develop interactive autobiographical memory systems to improve the long-term adaptability of the enterprise. Collective team awareness promotes corporate knowledge transfer and performance, helps to identify opportunities, and promotes corporate strategic agility\textsuperscript{[32]}.

4.3. The Relationship Between Different Levels of Cognition

In the context of strategic change, individual cognition has a complex relationship with team cognition. From the perspective of information processing results, different from individual cognition, the team needs to reach a consensus through information processing. The commonly used cognitive representations include a shared mental model and shared cognition. From the perspective of cross-level interaction, individual cognition will to some extent adjust shared mental models, and shared mental models will also affect individual cognition, which is often called "socialization" (i. e., top-down cognitive transmission mechanism). Under the support of social cognition theory, Shepherd et al. (2002)\textsuperscript{[35]} integrated team, entrepreneurship and cognition, and clearly propose the collective efficiency in the context of change, which is different from the beliefs that individuals hold in themselves or their team, but comes from the process of team interaction and collective cognition. This cognitive process is reflected in the collective acquisition, storage, processing or exchange of members or task information. However, few scholars have distinguished and sorted out the concept and formation process of the two cognition.
Based on the above combing, the existing research framework of strategic change from the cognitive perspective is shown in Figure 1. The part of box intersection reflects the formation of cross-level cognition.

**Fig. 1** The existing research framework of strategic change from the cognitive perspective

5. **Research Conclusions and Future Prospects**

5.1. **Study Conclusion**

In this study, we divided the decision-making subjects in the context of strategic change into two levels: team and individual, and summarized the causes and results from these two levels of cognition, respectively. On this basis, the existing research framework of strategic change under the cognitive perspective is constructed. Through the above literature review, it can be seen that strategic change is one of the important strategies for enterprises to deal with the complex and dynamic environment, and cognition plays a vital role in the change. Although the existing research has achieved some research results, it is found that the topic research still has the following shortcomings.

From the perspective of research, most of the existing research on "how to promote strategic change" focuses on the role of external environment and internal factors in the organization, aiming to explore to what extent an organization can create an environment suitable for strategic change. However, according to the view of the cognitive school, whether the action subject carries out
Strategic change behavior is a problem of independent choice, and the influence of the stimulus (information) provided by the environment on the decision and behavior of the action subject depends on how the action subject filters and processes this information. In this sense, it is very important to understand the way the action subject processes and processes information in the context of change, which is the key problem to be solved in strategic change research from the cognitive perspective. However, in the existing research of strategic change, this research perspective has no attracted full attention from scholars.

In terms of research system construction, the existing research on strategic change from the cognitive perspective is relatively scattered, and most of them only focus on the role of a single chain of "context-behavior" or "cognition-behavior", and fail to integrate "context-cognition-behavior". This makes the research of this branch on the one hand, and promotes the dialogue between scholars, and on the other hand, it is not conducive to guiding the practice of strategic change.

5.2. Future Outlook

Based on the above analysis, the following future research directions are specifically proposed in this study.

First, explore the uniqueness of the strategic change situation. Both mature companies and start-ups need to achieve long-term development through strategic change, but there are different environments embedded by different subjects. Therefore, how to classify and deconstruct the uniqueness of the strategic change situation from the systematic perspective has become a fundamental problem to be solved urgently in the research of strategic change. Moreover, strategic change is a planned complex behavior influenced by environment, organization, individual characteristics and other on. Therefore, the qualitative comparative analysis method (QCA) that can deal with complex causes can be used to explore the combination of organization, environment and individual factors, so as to classify the strategic change situations more systematically and continue to explore the differences of different strategic change situations from the combination.

Second, deepen the study of different levels of cognition. In terms of team cognition, in addition to emphasizing the importance of collective cognition for strategic change, the most concerned is the formation process and measurement of team cognition. Team level cognition is not a simple sum up of individual level cognition, but often involves the dynamic interaction between members and between members and the environment. Future studies can provide in-depth analysis and validation from case studies, scale development, and empirical studies. In terms of individual cognition, although the existing studies have discussed the roles of managers and employees at different levels in the context of strategic change, the cognition and its guiding role on behavior under different roles have not been deeply analyzed. The discussion on the internal motivation and cognition of managers at different levels and employees will be conducive to stimulating the vitality of strategic change and improving the ability of enterprises to respond to the changes of external environment.

Third, construct the cognitive basis of strategic change from the perspective of system dynamics. Strategic change involves the interaction of different levels and different decision-making subjects. The existing literature research on strategic change from the cognitive perspective mainly focuses on the role of a single role in strategic change. However, there are various participants in strategic change behavior, and managers and employees at different levels within the organization play different roles. In the future, cross-level analysis methods can be used to explore how individual level cognition converges into the team level, how team level cognition affects individual cognition, and how to combine top-down and bottom-up.

6. Summary

In this study, we divided the decision-making subjects in the context of strategic change into two levels: team and individual, and summarized the causes and results from these two levels of cognition, respectively. On this basis, the existing research framework of strategic change under the cognitive
perspective is constructed. Through the above literature review, it can be seen that strategic change is one of the important strategies for enterprises to deal with the complex and dynamic environment, and cognition plays a vital role in the change.

Acknowledgements

I wish to express our gratitude to Nanjing University of Science and Technology for providing hardware support for this article. I am grateful for the help and support of professional teachers for their intellectual help for this article.

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