Study on the TMT Shared Mental Model of Private Enterprise and Mechanism of Team Performance

(Apply for Executive DBA, University Paris-Dauphine)

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Abstract

In the complicated and changeable environment of globalization, leaders of private enterprises obviously feel that it is difficult for them to take control of enterprises’ fates with their personal strengths. The management mode in which Top Management Team (hereinafter referred to as TMT) leads the enterprise development has been gradually attached great importance to by private enterprises. Theoretical circles also have done abundant research around TMT. It can be found by reviewing the previous research achievements that research on TMT has experienced a tortuous and complicated process from the initial focus on TMT population characteristics to approximately express TMT cognitive process to the subsequent research on effects of its decision-making behavior and organizational performance directly from the perspectives of team process and situational moderator variables. The research conclusions are also diversified and no unanimous conclusion can be drawn. TMT cognition, this decisive “black box” has not yet been uncovered. TMT population characteristics can not effectively replace TMT cognitive characteristics and the element which drives TMT behavioral process is TMT cognition. Therefore, TMT research needs to focus on TMT cognition. Previous studies also have found that the vast majority of TMT research takes the organizational performance as the outcome variable and regards that team performance is equivalent to organizational performance or neglects that TMT characteristics first function on team performance indicators which then affect the logical relevance of organizational performance. However, actually, seen from the management practice of many private enterprises, for an enterprise with dissatisfactory performance, its TMT often shows poor performance, such as severe internal team consumption, high turnover rate, low team satisfaction and so on. Therefore, how to realize the efficient operation of TMT has become an issue which the theoretical circle and private businesses are faced with and needs to be solved urgently. Meanwhile, the development of cognitive psychology has made increasingly more studies tend to focus on the cognitive component of team performance. As the psychological representation of team cognition, shared mental model has gradually become the gripper to explain team performance differences, predict and enhance team performance’s important contents and management practice. Therefore, combining shared mental model with TMT to explore TMT shared mental model and the mechanism of team performance is not only an effective approach to uncover the “black box” of TMT cognition, but also an theoretical exploration into the private enterprises’ urgent needs to improve TMT performance.

This research subject selected is based on frontier issues in TMT research field and regards private enterprises’ TMTs as the research objects. Considering that the team shared mental model is an evolutionary process, this research selects the team life cycle as the research perspective and makes an in-depth exploration of evolution characteristics of TMT shared mental models and mechanisms of team performance in private enterprises from the perspective of life cycle. The specific content of this research includes the following issues: a.
making content analyses of interview materials of 25 enterprises in Zhejiang, Guangxi and Hunan provinces and summarizing stage characteristics of TMT shared mental model in private enterprises; b. putting forward and verifying the process mechanism of team performance of TMT shared mental model in private enterprises; c. giving relevant management suggestions according to the research conclusions.

The main conclusions drawn in this research include:

1. TMT shared mental model of private enterprise also shows obvious life cycle phase differences. Specifically, task-based TMT shared mental model of private enterprise has significant differences between the forming and storming, forming and performing, storming and norming, storming and performing and norming and performing. However, differences between forming and norming are not significant. In addition, in the four stages of forming, storming, norming and performing, the task-based shared mental model level manifests as performing > norming > forming > storming. However, team-based shared mental model has significant differences between forming and norming, forming and performing, storming and norming, storming and performing and forming and performing, but differences between forming and storming are not significant. In the four stages of forming, storming, norming and performing, team-based shared mental model level manifests as performing > norming > storming > forming.

2. Characteristics of high-performance TMT shared mental model mainly manifest as general task-based shared mental model and relatively low team-based shared mental model in the forming, low task-based shared mental model and general team-based shared mental model in the storming, general task-based shared mental model and relatively high team-based shared mental model in the norming and relatively high task-based shared mental model and very high team-based shared mental model in the performing.

3. TMT process of private enterprise plays an intermediary role in the relationship of TMT shared mental model and team performance. Specially, team work and information exchange play a complete intermediary role in the process that TMT task-based shared mental model has a positive effect on the team performance, while information exchange play a complete intermediary role in the process that TMT team-based shared mental model has a positive effect on the team performance.

Combining TMT with shared mental model and regarding team life cycle as the perspective, this research systematically discusses the evolution characteristics of TMT shared mental model and the mechanism of team performance. The research conclusions obtained can not only help to enrich TMT theories, shared mental model and cognitive behavior theories, but also provide systematic theoretical guidance for TMT construction of the private enterprise.

**Key Words:** Private Enterprise, Top Management Team, Shared Mental Model, Team Process, Team Performance
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Chapter 1 Introduction

1.1 Research Background and Significance

In the complicated and changeable environment of globalization, leaders of private enterprises obviously feel that it is difficult for them to take control of enterprises’ fates with their personal strengths. The management mode in which Top Management Team (hereinafter referred to as TMT) leads the enterprise development has been gradually attached great importance to by private enterprises. Efficiently operated TMT is highly valuable, scarce and imperfectly imitable. It is the core competence to construct the sustainable development of private enterprises and have attracted increasingly more concerns and attention from private enterprises and academic circles.

TMT research originated from “Upper Echelons Theory” proposed by Hambrick and Mason (1984). When this theory was put forward, it regarded that psychological structures like cognition behind TMT decision-making behaviors were decisive factors for the strategic decision process and corresponding performance results. It also thought objectively measurable demographic characteristics, such as age, educational background and professional background, could approximately represent psychological structures like top management cognition which were difficult to measure \([1]\). Inspired by “Upper Echelons Theory”, a large number of TMT research has focused on the relationship of TMT demographic features and organizational performance. However, research results have indicated that the relationship between TMT characteristics and organizational performance is not stable\([2]\) and the “black boxes of organizational characteristics”\([3]\) described by Lawrence (1997) still exist. Later researchers have begun to break through the disquisition vision which only focused on TMT demographic characteristics and emphatically study scene moderator variables (Cannellaetal, 2008, etc.)\([4]\) and TMT process which affects the organizational output mechanism of TMT demographic characteristics (Li Mai et al., 2009; Parayitam and Dooley, 2009, etc.)\([5-6]\).

Although these studies have made up for some defects of the method of TMT population characteristics to some extend, they still failed to involve the psychological mechanism behind the team process. Therefore, more general conclusions which can be used to promote have not been drawn, which also leaves space for this subject research to explore. Cheng Guanping et al. (2009) regarded the root cause of the above mentioned research predicament was that demographic characteristics and discrepancy could not effectively reflect the cognitive process of TMT \([7]\) and the element behind that drove TMT behavioral process was TMT cognition, so TMT research still needed to return to
TMT cognition research. Although some researchers have realized this point, they always failed to find an effective research pointcut. Researchers’ confusions come from two aspects. The first one is that team cognition is a relatively abstract concept and there have been plenty of its presentations in the literature, such as interactive memory, shared understanding, shared beliefs, shared mental model, etc. If this point is reflected on TMT, then it will involve issues like the definition of TMT cognition. The other one is TMT cognition changes and develops constantly, so how to depict its evolution features in the process of dynamic change is another difficulty. Previous studies have also found most of TMT research regarded organizational performance as the result variable and thought team performance was equivalent to organizational performance or neglected that TMT characteristics first functioned on team performance indicators which then affected the logical relevance of organizational performance. However, actually, seen from the management practice of many private enterprises, for an enterprise with dissatisfactory performance, its TMT often shows poor performance, such as severe internal team consumption, high turnover rate, low team satisfaction and so on. Therefore, how to achieve efficient operation of TMT has become an issue which both the theoretical circle and private businesses are faced with and needs to be solved urgently. Among descriptions of the concept of team cognition, shared mental model is the team cognition concept winning the most attention and recognition\[8\]. Shared mental model, as the psychological representation, has occupied the frontier position of cognition research and gradually become an important indicator to explain team efficiency differences, predict and enhance team performance. However, at present, few researchers have combined these research achievements with TMT research. Actually, through the review on previous research on shared mental model, it is not hard to find that shared mental model is a feasible research path to study TMT cognition. Meanwhile, it should be noted that as time goes on, shared mental model, as the group hierarchical structure, also changes and develops continuously. As for the depiction of dynamic change process of shared mental model, the team life cycle provides a commendable perspective. With the evolution of TMT life course, TMT shared mental model will present different phase characteristics of life cycle. Revealing the life cycle phase characteristics of TMT shared mental model can depict the evolution trend of TMT shared mental models and then the team performance process mechanism of TMT shared mental model can be discussed. Therefore, based on research results of TMT and shared mental model, it is quite essential and of vital significance to study the construction, evolution characteristics and team performance mechanism of TMT shared mental model of private enterprises from the perspective of team life cycle both in theory and in practice. Theoretical significance is mainly manifested in the following aspects. First, this study
represents cognition with TMT shared mental model and conducts an in-depth analysis of the construction of TMT shared mental model from the perspective of TMT interactive dynamic characteristics. It not only enriches TMY theories, but also replenishes the shared mental model construction theories in specific situations. Second, investigating phase characteristics of high-performance TMT shared mental model from TMT life cycle is a supplement to the phase evolution theories of shared mental model. Third, this study is based on the logical relevance that “TMT shared mental model, as the driving factor behind the TMT process, its development will affect the TMT process and then influence TMT performance” and follows the relation chain TMT shared mental model-TMT process-TMT performance to discuss TMT shared mental model and the mechanism of TMT performance. Therefore, it deepens the team cognition and behavior theory, offers new evidence to TMT shared mental model’s team performance process mechanism and helps to uncover black boxes of TMT characteristics and organizational performance.

Practical significance is mainly manifested in the following aspects. First, in private enterprise management practice, how to construct TMT shared mental model is more complicated and vague. Therefore, private enterprises can be guided to purposefully build effective team shared mental models in management practice by making clear the interactive dynamic features affecting private enterprises’ TMT shared mental models. Second, through revealing phase characteristics of high-performance TMT shared mental model of private enterprises, it can help private enterprises to cultivate shared mental model characteristics conforming to high performance in different life cycle phases. Third, by promoting the cooperation, information exchange and other team behavioral processes between TMT members, TMT shared mental model can improve TMT performance, which is an issue worthy of high attention from domestic private enterprises. Fostering effective TMT shared mental models and promoting close cooperation and information exchanges between TMT members have direct influences on TMT efficient operation and will also be conducive to the enterprises performance improvements.

1.2 Definitions of Important Concepts
Conceptual definition is the starting point of the research question. It relates to the scope of research contents and research focuses. To make the research train of though clear and accurate, this section will define and expound important concepts which appear in this paper. This research includes three important concepts involved in “top management team”, “team life cycle” and “shared mental model”. “Shared mental model” will be elaborated in Literature Review in Chapter Two. This section will define and illuminate “top management team” and “team life cycle”.

1.2.1 Private Enterprises
Based on the author’s long-term working practice, research vision and convenience of field investigations, the research objects have been defined explicitly as private enterprises in China, namely, Chinese private enterprises. Chinese enterprises can be roughly divided into state-owned and state holding enterprises, sino-foreign joint ventures, joint stock enterprises and private enterprises.

At the present stage, management resources in Chinese private enterprises are in an obviously disadvantaged situation relative to their own capital resources and business resources. Prominent characteristics are mainly manifested in the following points:

a. Attach great importance to business, but neglect management. China's private enterprises were born in the 1980s. Based on the perspective of enterprise life cycle, most private enterprises are basically in the late growth or the initial stage of maturity. In this context, private enterprises generally share the following phenomena: When an enterprise was first founded, most of top managers gave priority to business development and lacked cognition of management. Even though they have recognized the importance of management, they failed to respond with practical actions. The contradiction of “large enterprises, weak management” has been increasingly prominent. In the face of such a situation, if enterprises want to construct new development space, they should strengthen internal foundational management, comb business, plan management procedures, adopt innovative management modes, consummate incentive and constraint mechanisms and perfect the management system. Otherwise, the enterprise’s management risk will inevitably increase and further development will also been restricted. The more serious consequence will be bankruptcy for an enterprise.

b. Team work mode is confined. Standard organizational operation system and regulations are challenges Chinese private enterprises lack extremely and need to resolve urgently. Rule of man is the basic normality for private enterprises’ operation, so individual behaviors greatly affect an enterprise’s decision-making in management and factors like personal traits and personalities also affect the enterprise’s normal operation. On the other hand, relevant functions of basic organizational forms like department, workshop, top management team have been weakened in the enterprise operation. Furthermore, some of them even have become managers’ personal clients or administrative bodies.

c. A few individuals highly monopolize enterprise information and resources. Serious individual behavior orientation has brought great troubles to organizational behavior. Individual monopoly has replaced the role of department or team and individuals have mastered all kinds of information and resources (market resources and organizational resources) in the process of enterprises operation. Therefore, the entire enterprise or department, team management, management information and resources thus have
become individuals’ private information (instead of organizational information). Consequently, the real owners or authorizers of capital have been actually out of control in the enterprise operation.

Top managers in relatively small-sized enterprises can be directly involved in various production and management activities and all production and business activities are in their charge, so such top managers own strong control power of an enterprise. However, when an enterprise has been expanding its production and operation scales, top managers need to pull away the focus from specific production and business management and pay attention to operational and strategic management. They should assign specific production and business management to managers in the inferior layer or even directly dispatch to the department team. With the expansion of business scale, these managers can also accredit to subordinates successively.

1.2.2 Top Management Team
Existing research on the definition of Top Management Team (TMT for short) mainly adopts the following methods: questionnaires are directly issued to the President or general manager of a company to investigate and TMT members are determined by the President; through the depth interview with the President or general manager, the researcher determines the composition of TMT according to the actual circumstances of the enterprise; according to the positions of managers disclosed in reports, yearbooks and other documents of listed companies which can be queried, a person can be determined whether he belongs to TMT members. To accurately identify top managers who are really involved in strategic decision-making, in the empirical studies of TMT, researchers mostly adopt the methods of directly issuing questionnaires to CEO or the general manager and conducting depth interviews with CEO or the general manager. In addition, the above two methods are mainly based on the premise with the support of CEO or the general manager, so they are more advantageous for the collection of data that empirical studies need.

Different researchers select diversified approaches to define TMT and contents are also different, but they share one point in common: TMT members are in the top management level of the organizational pyramid. They belong to the layer of organizational strategy formulation and execution and have great decision-making and control power in organization operation. Based on the comprehensive considerations of the above all definitions of TMT, this research adopts the view of Ge Yuhui (2007) and defines TMT as “relevant groups participating in an enterprise’s management decision-making and strategic decision-making with great power to make decisions and control the enterprisers’ operation and management, including the Chairman, general manager, directors of various departments (such as the director of
human resources, director of operations and director of finance), etc.\textsuperscript{[24]}

1.2.3 Team Life Cycle
Since the 1950s, life cycle theory has been widely applied in many fields of traditional management and produced lots of research results, such as enterprise life cycle theory and product life cycle theory \textsuperscript{[25]}. Team life cycle was evolved from the enterprise life cycle and the initial research on team life cycle can be traced back to the model of “Development Stages of Small Groups” proposed by the scholar Tuckman (1965). In this model, Tuckman divided group life cycle into Forming, Storming, Norming, Performing and Adjourning. This division has been widely recognized by the academic circles and the industry. Considering that this research is mainly on the TMT existence period, so it is not necessary to consider team conditions in the adjourning stage. Therefore, this research divides TMT life cycle into forming, storming, norming and performing stages.

1.3 Research Methodology and Technical Route
1.3.1 Research Methodology
a. Literature Research. The author describes and makes comments systematically on related research achievements of TMT and shared mental model and forms scientific understanding of the research object. Then the author sorts out shared mental model, team performance and related literature, hoping to provide some useful ideas for revealing the evolution characteristics of TMT shared mental model and team performance mechanism.
b. Interview. This research interview mainly focuses on the following two aspects: 1. acquiring materials which can reflect evolution stage characteristics of TMT shared mental model; 2. gaining cases’ information and data based on evolution characteristics of TMT shared mental model and team performance mechanism.
c. Questionnaire Survey. According to the research content, on the basis of literature research and interviews, the author designs questionnaires about TMT shared mental model, TMT process, TMT performance and selects large-scale samples to obtain required data in this research to prepare for the following statistical analysis.
d. Data Analysis. Based on the questionnaire survey and interviews, the author uses exploratory factor analysis, confirmatory factor analysis, variance analysis and structural equation modeling and other methods to conduct corresponding analyses and processing of various data. Analysis software tools adopted include SPSS17.0 software and AMOS 20.0 software.

1.3.2 Technical Route
Through the theoretical review of team life cycle and cognitive behaviors and summaries of TMT, shared mental models and related research, the main line of this research can
be gained: TMT shared mental model-TMT process-team performance. This research mainly follows the technical route shown in Figure 1-1:

![Technical Route Diagram]

- **Question raising and significance, definitions of important concepts**
- **Introduction**
- **Research methodology, technical route, contents and innovations**
- **Upper echelons, team life cycle, cognitive behavior and other theories**
- **Theoretical basis and research review**
- **TMT, shared mental model and relevant research**
- **Interview content analysis, variance analysis**
- **Research on evolution characteristics of high-performance TMT shared mental model**
- **Factor analysis, structural variance modeling**
- **Team performance process mechanism of TMT shared mental model**
- **Conclusion, enlightenment and outlook shared mental model**
1.4 Research Contents

The overall goal of this study is to reveal TMT shared mental model evolution and the mechanism of team performance based on life cycle. This paper is divided into five chapters and main research contents are as follows:

Chapter 1: Introduction. Based on putting forward research questions and expounding research significance, this chapter defines and elaborates related concepts and puts forward research methods, technical route, research contents and main innovations.

Chapter 2: Literature Review: after expounding upper echelons, team life cycle, cognitive behavior and other theories and based on the review of related studies on TMT and shared mental model, this chapter seeks deficiencies of previous studies and finds out the research space to lay the theoretical foundation for the construction of analysis framework of TMT shared mental model evolution and team performance mechanism.

Chapter 3: Research on Evolution Characteristics of High-performance TMT Shared Mental Model. This chapter will analyze contents of interview materials, summarize stage characteristics of high-performance TMT shared mental model and conduct questionnaire data support for the high-performance enterprise samples to further verify the conclusion that there are level differences between TMT task-based shared mental model and team-based shared mental model in four stages of team life cycle. In addition, it also obtains life cycle stage characteristics of the evolution of TMT shared mental model.

Chapter 4: Research on Team Performance Process Mechanism of TMT Shared Mental Model. Through questionnaire surveys and structural equation modeling analysis of a large number of samples, this chapter will verify the intermediary role of TMT process between TMT shared mental model and team performance.

Chapter 5: Conclusion, Enlightenment and Outlook. This part will summarize important conclusions drawn in this research. It will probe into the enlightenment for management practice and point out deficiencies and the subsequent further research direction.

1.5 Main Innovations

This research has innovations in the following three aspects:

a. This research reveals stage characteristics of the evolution of TMT shared mental model in private enterprises from a new perspective, life cycle, which is a new attempt on how to depict the evolution difficulty of shared mental model in dynamic changes.

b. This research first constructs the two-dimensional TMT shared mental model analysis framework “TMT task-based shared mental model-TMT team-based shared mental model” and then reveals the team performance process mechanism of TMT shared
mental model, which has made up for the deficiency that previous studies on team performance mechanism of shared mental model focused more on team types, such as virtual team or project team, but paid less attention to enterprise management team. It is also new exploration trying to uncover the "black box" of the relationship between TMT characteristics and organizational performance.

1.6 Summary
This chapter embarks from the bottleneck among studies of TMT and puts forward problems and significance this research is to explore. Based on definitions of TMT, team life cycle and other concepts, it introduces the adopted research methods and technical route and presents, research framework and content arrangements and points out possible innovative points to make sufficient preparations for the full research development.
Chapter 2 Basic Theories and Literature Review

This chapter mainly reviews the relevant theoretical bases and makes comments on literature related to this research. First of all, this chapter reviews theories closely related to this study, including upper echelons theory, theory of group interactive dynamic characteristics, theory of team life cycle and theory of cognitive behavior. Second, this chapter sorts out and make comments on research on TMT and shared mental model. The final part is a summary of this chapter.

2.1 Theoretical Bases

2.1.1 Upper Echelons Theory

The theoretical cornerstone of top management team is Upper Echelons Theory (UET for short) put forward by Hambrick & Mason (1984). The essence of the theory lies in its emphasis that the subject of an enterprise’s decision-making should be top management team rather than individual leaders. Because in the view of Hambrick and Mason, individual leaders were unable to observe every aspect of an enterprise’s internal and external environments, so their final understandings of internal and external environment and ultimate choices had defects. The way to avoid defects was team decision making. They also appealed to more focus on the observable TMT characteristics, including age, tenure, professional background, education and financial conditions \(^1\).

The research model that Upper Echelons Theory has proposed expresses the following views \(^1\): a. TMT cognition, values and other psychological characteristics can affect the strategic choice; b. TMT cognition, values and other psychological structural characteristics are not easy to identify and measure, but TMT age, professional background, social foundation and other observable demographic characteristics can be used to represent differences of TMT cognition, values and other psychological structural characteristics. These characteristics and their functional processes can affect the enterprise’s strategy choice and performance; c. In different objective internal and external environments, there are differences between TMT characteristics and performance, so studies should distinguish specific industries and types of enterprises.

Upper Echelons Theory has laid a foundation and pointed out the direction for subsequent TMT studies. Based on basic thinking “TMT characteristics-strategic choice-performance” determined according to the Upper Echelons Theory model, researchers have conducted considerable studies, which will be elaborated in the subsequent TMT literature review.

2.1.2 Theory of Group Interactive Dynamic Characteristics

The earliest Theory of Group Dynamic Characteristics can be traced back to the Field Theory of Group Behavior first proposed by the founder of Gestalt psychology school K. Lewin in 1945\(^{27}\). This theory holds that the existence of group behavior is like the “filed” in physics,
having the characteristics of dynamics, such as communication. The earliest research on
dynamic characteristics of TMT interaction is the TMT Q-sort Theory of Organizational Group
Dynamic Characteristics proposed by Peterson et al. (1999)\(^{[28]}\). Based on the reference to
GDQ (group dynamics q-sort) theory of Tetlock et al. (1992)\(^{[29]}\), this theory put forward eight
TMT interactive dynamic characteristics: a. rigidity and flexibility of intelligence; b. control
consciousness of crisis; c. optimism and pessimism; d. strength of leadership influence; e.
factionalism and cohesion; f. legitimacy and corruption; g. decentralization and centralization;
h. risk avoidance and risk bearing. Afterwards, Ensley and Pearson (2005) put
forward four TMT interactive dynamic characteristics, namely, cohesion, conflict, group
effectiveness and shared strategic cognition in comparisons of TMT behavior dynamics in
family and non-family startups \(^{[30]}\). Ensley and Pearson (2005) compared TMT behavior
dynamic characteristics (cohesion, conflict, group effectiveness and shared strategic
cognition) of college-based high-tech startups with those of independent of new high-tech
enterprises and found that TMT interactive dynamic characteristics were more prominent
in the later type of enterprises\(^{[31]}\).

In recent years, domestic scholars also have studied TMT interactive dynamic characteristics.
Zhang Liangjiu and Zhou Xiaodong (2006) established TMT Conflict Dynamic Analysis Model
on the basis of regarding TMT conflict as a dynamic process \(^{[32]}\). Li Mao, Wang Guofeng and
Jing Runtian (2009) conducted an empirical study on TMT internal dynamic characteristics,
such as communication and conflict. The study results show that communication
specification is beneficial to the formation of high quality decisions, and communication
frequency and emotional conflict are negatively correlated to decision quality in the
communication dimension \(^{[5]}\).

**2.1.3 Theory of Team Life Cycle**

Along with the increasingly refined social division of labor, teamwork becomes more and
more important and teamwork mode has become the normal in organizational work. Many
scholars who study the organization agree that the team is like a living organism and has also
experienced a process of forming, developing and declining. The model of Developmental
Stages of Small Groups proposed by Scholar Tuckman (1965) is regarded as the start of
research on team life cycle. Tuckman’s division of five stages of group life cycle (Forming,
Storming, Norming, Performing and Adjourning) has been widely recognized by scholars \(^{[26]}\).
On this basis, scholars began to discuss the team life cycle from different perspectives.
Katzenbach and Smith (1993) drew the graph of team performance and described the
relationships between different team features and team performances \(^{[33]}\). Steven R. Reina
(1999) put forward team leadership power change cycle corresponding to the life cycle\(^{[34]}\).
Domestic scholars focused on team types like virtual team and project team and put forward
the corresponding team lifecycle management model (Chen Chunhua and Ye Fei, 2002; Zhan
Yihong and Sui Rui, 2006, etc.) \(^{[35-36]}\). These studies have provided beneficial references for
the research of TMT life cycle. Compared with other life cycle theories, research on team
life cycle theory is relatively lagging, which has caused that the theory has not been widely applied in team management and practice. Research combined with TMT is rarer. However, these scarce studies of TMT life cycle have provided enlightenments for the author to investigate the evolution of TMT Shared mental model. For instance, Kilduff, Angelmar & Mehra (2000) found that TMT cognition was interactively correlated with corporate performance as time went by [37]. Beckman, Christine, Burton & Diane (2008) found that the enterprise which had a TMT with completely structural functions when it was established was more easily to be listed and subsequent TMT structure and functions could be predicted according to the early TMT structure and functions [38]. Liu Bing and Li Yuan (2008) studied the evolution process of enterprise TMT from the perspective of life cycle and proposed a conceptual model for different stages of life cycle enterprise TMT evolution [39]. Deng Jingsong and Liu Xiaoping (2008) analyzed three phase characteristics in TMT trust development, namely, schemed trust, knowledge trust and identity trust. They also discussed team members' psychological interaction processes in the three stages and finally summarized various measures to improve TMT trust management in different development stages [40].

2.1.4 Theory of Cognitive Behavior
Theory of Cognitive Behavior is formed based on behaviorism and cognitive theories. Early behaviorism scholars represented by Wason thought human behaviors were mainly passive responses to external stimuli and stressed the direct link between external stimuli and human behaviors [41]. Successive behaviorism scholars represented by Skinner further expanded Wason's behaviorism theory and introduced intermediate variables like understanding and strengthening into research relations between external stimuli and human behaviors [42]. Cognitive Theory regards that human daily actions are affected by people's cognition of the current things. Different from behaviorism's stress of stimulus-response, the theory lays particular emphasis on interpretation and perception of the external environment and believes that the change of human behavior starts from human cognition [43]. Behaviorism theory and cognitive theory lay too much emphasis on the environment or the role of subjective consciousness and make external environment antagonistic mutually to man's subjective consciousness. Therefore, both of them have certain limitations. E. C. Tolman (1886~1959) put forward the theory of cognitive behavior based on behaviorism theory and cognitive theory. This theory advocates explanations principles of behavior, objects to regarding stimulus-response as a means to describe and explain behaviors and illustrates that human behaviors are results of combined actions of environments, individuals and behaviors, behind which are actually people's cognitive abilities and results. An individual's personal characteristics will affect his cognition of environments and behaviors and then further affect the individual's attitude and decision [44]. The cognitive behavior theory proposed by Tolman unified the cognition process and behavior process and opened the key to the research on cognitive psychology thought.
2.2 Literature Review

2.2.1 Research on Top Management Team

Upper Echelons Theory proposed by Hambrick and Mason in 1984 laid a theoretical foundation to the research of TMT [1]. Since Upper Echelons Theory put forward that strategic choices of the organization and enterprise performance could be predicted partially by organizational TMT characteristics, it has triggered a great upsurge in studying TMT characteristics in strategic management academic circles. Throughout the review of TMT research literature, the existing TMT research can be summarized into two major aspects. One is related research on TMT demographic characteristics and heterogeneity, namely, the direct effects of TMT demographic characteristics and heterogeneity on outcome variables, such as strategic decision-making, team effectiveness and enterprise performance. The other aspect is the research on TMT interaction process, mainly focusing on impact of communication, conflict, cooperation and behavioral integration on the team and enterprise outcome variables.

a. Research on TMT demographic characteristics and heterogeneity

Upper Echelons Theory emphasizes the important role of TMT cognition in the process of strategic decision-making, which means psychological structures like TMT cognition determines the strategic decision-making process and the corresponding performance results. Therefore, TMT initial research thinking is oriented to psychological structure characteristic variables which can not be measured easily, such as TMT member cognition. However, because cognition and other recessive traits are difficult to measure [45], researchers draw lessons from existing research about team demographic characteristics, replace the above recessive trait variables with TMT demographic characteristics, such as age, educational background, professional background and so on, and conclude that these characteristics will affect the quality of an enterprise’s strategic decisions and then impact enterprise performance [16]. Influenced by this thinking orientation, subsequent researchers generally turn to study top management functional background, industrial and enterprise tenures, educational qualification and other demographic characteristic variables and the relationships between their differences and the strategic decision-making and organizational performance.

Bantel (1989) confirmed that there was a potential relationship between TMT demographic characteristics and corporate performance [9], but the relationship was not stable between TMT demographic characteristics and their discrepancies and corporate performance [2]. Among reasons for this, Hambrick(2007) [46] and Cannella et al.(2008) [4] held it was caused by the effect of situational variables. Therefore, some scholars have added many situational variables to try to resolve the above research predicament in recent years. For instance, Cannella et al. (2008) regarded the environment stability would affect differences of demographic characteristics and the performance would be better if demographic characteristics reflected by rapidly changing environment compared with the stable
environment, had greater discrepancies [4]. Goll et al. (2008) studied the regulating effects of the President’s degree of management freedom and job requirements based on the background of deregulated USA aviation industry [47]. Jing Runtian and Meng Taisheng (2008) studied the regulating role of culture [48]. Chen Zhongwei and Chang Ji (2009) conducted a study of the regulating role of team innovation ability [49]. By analyzing TMT research literature, He Yuanqiong et al. (2009) found that the industry and country which an enterprise belonged to were also two crucial regulating variables [50]. Huang Yue et al. (2009) investigated the regulating role of ownership concentration in the relationship of top management team heterogeneity and enterprise performance [51]. Zachary et al. (2013) studied the regulating effect of participatory culture and management strategy diversification [52].

The addition of situational variables does have improved the predictive validity of TMT demographic characteristics and their differences, but there has not reached a consistent conclusion on the relationship between TMT characteristics and corporate performance [2,50]. Cheng Guanping (2009) [7], Wu Han and Yao Xiaotao (2012) [53] and others held the view that the root cause of the above research dilemma was that demographic characteristics and their differences could not effectively reflect TMT cognition process and its behavioral representations. Just as Smith et al. pointed out when summarizing TMT research results, “it is not a direct relation or not a simple relation as the scholars had previously thought between team demographic characteristics and organizational performance. Homogeneous demographic characteristics do not necessarily produce homogeneous recessive characteristics, such as attitudes, values or the team atmosphere [15] “. The use of demographic characteristics indicators has made it hard for researchers to recognize the real psychological and social processes which drive top management behaviors. This is exactly the “issue of black box” which has not yet reveled.

b. Research on TMT interaction process

In view of the predicament that there is an instable relationship between TMT demographic characteristics and organizational performance, some scholars have realized that TMT characteristics not only directly affected the organization performance, but also were more likely to be regulated by team process variables, such as team conflict, team communication, team cohesion and behavioral integration. In addition, these decision-making variables might have more direct effects on strategic output and organizational performance than the demographic characteristic variables. Therefore, they began to turn the focus of TMT research into TMT interaction process from demographic characteristics and their differences. Research on TMT interaction research was mainly carried out from the following three aspects:

i. directly start from a single team process variable (such as communication, cohesion or conflict) and study its effects on he decision-making behavior and organizational performance. For instance, Amasno (1996) verified that cognitive conflicts in TMT had enhanced the decision-making quality, decision-making commitment and decision-making
degrees of understanding and acceptance and then further affected organizational performance, but emotional conflicts had the opposite effect. Yan (2013) validated the effect of TMT cohesion on enterprise performance; Wang Guofeng et al. (2007) regarded TMT cohesion, conflict and others as team process variables and studied their effects on enterprise performance. Parayitam and Dooley (2009) conducted an in-depth study of the role mechanisms of conflict and trust in strategic decision-making; Smith et al. (1994) and Lauring and Selmer (2012) studied the relationship between communication and performance. Yan (2013) validated the effect of TMT cohesion on enterprise performance; Wang Guofeng et al. (2007) regarded TMT cohesion, conflict and others as team process variables and studied their effects on enterprise performance; Parayitam and Dooley (2009) conducted an in-depth study of the role mechanisms of conflict and trust in strategic decision-making. Smith et al. (1994) and Lauring and Selmer (2012) studied the relationship between communication and performance.

ii. study the intermediary role of team process variables (such as conflict, debate, cooperation and information sharing) between TMT demographic characteristics heterogeneity and strategic decision-making and enterprise performance. Knight et al. (1999) studied and found that interpersonal conflict and consensus-seeking behavior played intermediary roles in TMT demographic characteristics heterogeneity and decision-making consensus. The study of Cai et al. (2013) indicated that TMT cognitive conflict and affective conflict played intermediary roles between TMT heterogeneity and startup performance. Simons, Pelled & Smith (1999) found that team debate served an intermediary between TMT demographic characteristics heterogeneity and decision-making understanding. Michie, Dooley & Fryxell (2002) reached the findings that collaborative effort between team members worked as an intermediary between TMT demographic characteristics heterogeneity and strategic decision-making quality, and the consistency of team members’ cognition of organizational goals played a regulating role in TMT demographic characteristics heterogeneity and strategic decision-making quality. Bunderson & Sutcliff (2002) information-sharing behavior between TMT members acted as an intermediary role between TMT demographic characteristics heterogeneity and team effectiveness.

iii. study TMT behavior integration. “Behavior integration” proposed by Hambrick (1994) has offered a new train of thought for the study of TMT interaction process. This concept includes three interrelated TMT key process factors, namely, cooperative behavior, information exchange and joint decision-making. In the view of Hambrick, previous research on team process variables emphasized the single behavior dimension. However, different from general interpersonal processes, the inherent complexity and dynamics of TMT process were difficult to capture only from a single process dimension. Behavior integration stressed the team’s engagement in several interrelated processes, so it could better capture TMT significant characteristics and effectively predict the enterprise level results. Simsek et al. (2005) confirmed the impact of TMT behavior integration on enterprise performance. Carmeli et al. (2009) discussed the influence mechanisms of TMT behavior integration and behavioral complexity on organizational outcome. Yao Zhenhua and Sun Haifa (2010) studied the relationship of TMT composing features and behavior integration. Carmeli (2011) and other scholars believed that CEO empowering leadership improved TMT behavior integration and efficiency and further boosted the corporate performance.
Liu Jingjiang (2012) conducted a study of the relationships of TMT behavior integration and innovative behaviors and innovation performance [67]. Leung et al. (2013) launched research on the relationships of TMT trust and behavior integration and the performance of an international joint venture [68].

2.2.2 Research on Shared Mental Model
a. The Concept of Shared Mental Model
Shared mental model was put forward based on the concept of mental model. Scottish psychologist Kenneth (1943) first proposed the concept of “mental model”. He thought that the mind could construct reality into a “small model” and use it to describe, explain and predict events [69]. Since the 1990s, as the team has increasingly become the effective work form of organizations, people began to realize that there has been not only the individual mental model, but also the team mental model in the team, because it often can be observed in some effectively operational teams that team members tend to have a kind of tacit agreement with each other without too much communication in the process of performing tasks. This tacit agreement is essentially a team mental representation. Based on the concept of mental model, Cannon-Bowers and Salas (1993) first proposed the concept of shared mental model which has been widely recognized. In their point of view, shared mental model referred to the knowledge structure that the team members had in common. It allowed team members to be capable of forming correct explanations and expectations of team tasks so as to coordinate their actions to adapt to team work tasks and requirements of other team members [70]. Eccles and Tenenbaum (2004) held the view that if team sharing had been established, team members would have common expectations of team behaviors and the composition [77]. The proposition of this concept is of great help for the understanding of team performance. After Cannon-Bowers and Salas (1993), some scholars have made further perfect definitions of shared mental model. For instance, Klimoski and Mohammed (1994) thought Shared mental model was an individual’s representation of team tasks and sharing knowledge related to the team process [8]; Mohammed and Dumville (2001) regarded that shared mental model referred to team members’ sharing and organized understandings and mental representations of critical factors in the team environment [72]. Salas & Fiore (2002) thought the team mental models was not the sum of individuals’ mental models, but a kind of collective cognition which would affect team collaboration and bring good team performance in the process of group interactions[73]. Ge Yuhui (2009) pointed out that shared mental model was a kind of mental representation related to team cognition. It was a latent structure behind the team behavior and this latent structure would affect organizational performance through the impacts on the team behavior and effectiveness [74]. With the deepening research on the shared mental model, some scholars thought that contents of shared mental model should not only be confined to the single dimension, team knowledge structure, but should include attitudes and beliefs. For instance, Kraiger and Wenzel (1997) considered shared mental model included not only knowledge, but also team
members’ common attitudes, judgment standards and shared expectations to achieve team tasks, goals and related behaviors. Mohammed and Klimoskiet al (2000) pointed out that the consistency or sharing of team knowledge structure was admittedly important, but similar attitudes and beliefs were also very important and essential for a teams’ efficient operation; Long Fei et al. (2007) also held that contents of the shared mental model included both the sharing of knowledge structure and meaning structure; Xu Hanyi and Ma Jianhong (2008) also put forward that sharing should include concrete underlying frame, superior abstract structure and attitudes and beliefs pointing to the shared contents. These studies have expanded the extension of the concept of shared mental model put forward by Cannon et al. and offered a more comprehensive perspective for the research on shared mental model and the mechanism of team performance.

In addition, interactive memory, teamwork scheme, cognitive consistency and relevant definitions of team cognition have been put forward in fields, such as social psychology, cognitive psychology and management decision-making. But on the whole, shared mental model occupies a dominant position in the research of team cognition. This study also focuses on the application of shared mental model and holds that contents of the shared mental models should include knowledge structure, attitudes or beliefs that team members have in common. It enables team members to form the correct explanation and forecast for the team tasks, coordinate behaviors of members to adapt to team tasks and meet the requirements of other team members so as to further improve team performance.

b. The Connotation of “Shared” in Shared Mental Model

Since Cannon-Bowers and Salas (1993) proposed the shared mental model, plenty of presentations have appeared in allusion to the connotation of “shared” in the shared mental model. For instance, Cannon-Bowers and Salas (1993) interpreted shared mental model as the members’ having common or coexisting and compatible mental model; Klimosld and Mohammed (1994) thought the word “shared” in shared mental model was easily misunderstood and made people believe that shared mental model only emphasized the consistency. However, shared mental model actually also stressed team members’ distributed characteristics in knowledge structure; Marks (2000) thought that shared mental model was the overlap, resemblance or consistency of knowledge; Rentsch and Klimoski (2001) regarded shared mental model as the overlap of knowledge, attitudes and beliefs.

Based on the summary of previous studies, Cannon-Bowers and Salas (2001) further illustrated four levels of connotations of “shared”: overlap (team members need to master some common knowledge which is not necessarily identical completely), resemblance or consistency (team members have similar or consistent knowledge), coordination or complementarity (knowledge team members own may not be shared or similar, but it is likely to play a role in performance or be distributed (refers to the coverage of team knowledge. That means heterogeneous knowledge from members is distributed in the team)). Wu Xin and Wu Zhiming (2006) stated that shared mental model was a kind of distributed
cognition and “shared” was the process that team members extracted information from other members [83]. The interpretation made by Cannon-Bower and Salas (2001) [82] for the connotation of “shared” has been recognized by most researchers. For instance, after summarizing existing literature of the connotation of shared mental model, Wang Liying put forward “the so-called shared includes not only the overlap, resemblance and consistency of cognitive representations between team members, but also cognitive representations’ complementarity and cooperation as well as the composition of distribution in the team” [84], which actually adsorbed the view of Cannon-Bowers and Salas (2001) [82] about the connotation of “shared”.

c. Structure of Shared Mental Model

Many researchers, like Morris and Rouse (1986) [85], Mohammed and Klimoski (1994) [8] and Cannon (2000) [86] thought shared mental model was not the only one. Complexity and changeability of team tasks and team coordination requirements caused that there might be multiple mental models coexisting in team members. Based on the review of related literature about shared mental model structure, shared mental model structure is mainly divided into four-dimensional structure, three-dimensional structure and two-dimensional structure.

i. Four-dimensional structure of shared mental model. The division of four-dimensional structure is the earliest about the shared mental model. When first putting forward the concept of shared mental model, Cannon-Bowers and Salas (1993) divided shared mental model into four types, namely, equipment model (shared mental model of technology or equipment involved in the process of team task performing), task model (shared mental model related to strategies or procedures used to complete the task), team interaction model (shared mental model about each other's roles, responsibilities, communication channels and patterns and other knowledge) and team member model (knowledge structure relevant to team members’ knowledge, skills, attitudes, etc.) [70]. Kimoski and Mohammed (1994) thought shared mental model included the sharing of relevant tasks, equipment, working relations and situations [8]; Xu Hanyi et al. (2008) divided shared mental model into four types: homogeneous-dependent, homogeneous-independent, heterogeneous-dependent and heterogeneous-independent shared mental models [78].

ii. Three-dimensional structure of shared mental model. Rentsch and Hall (1994) held that four-dimensional structure of shared mental model put forward by Cannon-Bowers and Salas (1993) could be further simplified. Based on the teamwork process, they divided shared mental model into team, task and technical equipment shared mental models [87]; Kriger and Wenzel (1997) brought forward knowledge-behavior-attitude three-dimensional model from team members’ knowledge, behaviors and attitudes [75]; Webber and Chen et al. (2000) divided shared mental model into declarative knowledge structure, procedural knowledge structure and strategic knowledge structure [88].

iii. Two-dimensional structure of shared mental model. Cannon and Blickensderfer (1999)
divided shared mental model into two types: team mental model and team situational model [89]; Reinhard et al. (2013) divided shared mental model into shared language and shared understanding [90]; Mathieu et al. (2000) [91], Bai Xinwen, Wang Erping et al. (2006) [92], Lee and Johnson (2008) [93], Lv Xiaojun (2009) [94], Sikorski (2009) [95], Travis and Lucy (2014) [96] divided shared mental model into team work model (or task model) and team interaction model (or team model), in which team work model or task model included the mental model related to equipment or technologies and the mental model about tasks; team interaction model or team model included the mental model about team interactions and the mental model about teammates; Based on research conducted by Cannon-Bowers and others, Jin Yanghua and Wang Chongming et al. (2006) divided shared mental model into identified shared mental model (corresponding to definitions like overlap, resemblance or identification, it contains five aspects: objective sharing, unified specification, strategy sharing, communication mode and team identification) and distributed shared mental model (corresponding to compatibility, complementarity and distribution, it contains distribution expertise, role distribution and progress synergy [97]; Wang Liying and Chen Jin (2010) divided shared mental model into task shared mental model and collaborative shared mental model, in which the former was corresponding to definitions like overlap, resemblance or identification in previous studies and contains knowledge, attitudes, beliefs and others; the latter was corresponding to compatibility, complementarity and distribution in past research [98].

Comparatively speaking, in terms of three kinds of structure divisions, the three-dimensional structure of shared mental model has relatively divergent contents and it is difficult to achieve a consensus when shared mental model and its effect on performance are discussed. The four-dimensional structure of shared mental model appears to be too cumbersome and not sufficiently concentrated. The two-dimensional structure of shared mental model possesses the advantages of simplified concept and the suitability for measurement and analysis [84]. Therefore, among numerous studies of shared mental model structure, there are relatively common studies and analyses of the two-dimensional structure of shared mental model.

d. Research on Influence Factors of Shared Mental Model

The formation of shared mental model will be affected by plenty of factors. In particular, these factors can be classed into three levels: individual, team and organization.

i. Individual level. Individual-level effects on the shared mental model are mainly reflected in the effects of team members’ personality characteristics and differences on the shared mental model. Klimoski and Mohammed (1994) [8], Kraiger and Wenzel (1997) [75], Marks, Mathie and Zacearo (2001) [99] studied and pointed out that characteristics and differences of team members influenced the development of shared mental model; Christian (2004) [100] and Du Yifei (2007) [101] thought that five personality characteristics (adaptability, extraversion, openness, altruism and the sense of responsibility of team members affected the development of shared mental model. For instance, the stronger senses of responsibility,
more open and flexible thinking and more stable sentiments team members have, the greater they will promote the formation and maturity of shared mental model and affect the team performance.

ii. Team level. Studies of team-level influence factors of shared mental model in the academic circles mainly focus on team tasks, work characteristics, team composition, team interaction process, team leadership and team time and other aspects. Team task and work characteristics, such as the complexity of team work Kraiger and Wenzel (1997) thought [75], the routinization of team tasks that Mathieu, Heffner, Goodwin, et al. (2000) believed [91] and team task dependency in the view of Jin Yanghua, Wang Chongming et al. (2006) [97], were important factors influencing the development of shared mental model. Team composing elements like team types that Stout, Cannon & Salas (1999) thought [102], composite features that Xie Xiaoyun, Wang Chongming and Xi Liuchun believed [103] and team member homogeneity and scale in the opinion of Rentsch & Klimoski (2001), had significant influenced on the formation of shared mental model[81]. Team interaction processes, such as interactions between team members in the view of Stout, Cannon & Salas (1999) [103], team feedback Rasker et al. (2000) thought [104] and team communication[111] that Wu Xin and Wu Zhiming (2005) [105] and McComb and Simpson (2014) [106] agreed, were conducive to the formation of shared mental model. Cannon & Edmondson (2001) [107], Marks, M. A. et al. (2001) [99] thought that demonstration and guidance from the team leaders played an important role in the formation of shared mental model; Kraiger and Wenzel (1997) [75] and Jin Yanghua, Wang Chongming, et al. (2006) [97] regarded that the length of the team establishment also influenced the formation and development of shared mental model.

iii. Organization level. Research on the organization-level factors affecting the formation of shared mental model mainly focuses on discussions of organizational systems and cultural atmosphere. Kraiger and Wenzel (1997) pointed out compensation system, training system and other organizational factors would influence the development of shared mental model [75]. Studies of Cannon and Bowers (1999) [89] and Marks et al. (2001) [99] showed that cross training promoted the formation of shared mental model. The study of Lv Xiaojun (2007) indicated that collectivism cultural background could promote the formation of shared mental model [108]. The study of Long Fei (2008) confirmed that the organizational learning, cross training, organizational incentive mechanism were significant influence antecedents of the shared mental model.

e. Measurement of Shared Mental Model

The measurement of shared mental model mainly involves measurement characteristics and measurement methods of the shared mental model. Due to diversified understandings and views that previous different researchers held in the connotation of “shared” and the structure of shared mental model, so their measurement features and methods of shared mental model were also different.

i. Measurement Characteristics of Shared Mental Model

Discussions related to measurement characteristics of shared mental model mainly manifest...
in the similarity, accuracy and distribution of shared mental model. With the review of numerous previous empirical studies of the measurement of shared mental model, the measurement of shared mental model mainly focuses on the measurement of similarity characteristics of shared mental model [81, 107, 109, 110], which is mainly due to the reason that it is very difficult to unify the discriminating standards of the accuracy of shared mental model and the universality of measurement has been curbed. The current accuracy indicators of shared mental model are obtained from the contact ratio of team members’ mental model and that of experts in the field. This measurement method should be based on the premise that mental models between experts are highly similar [80][98][111]. However, some scholars believed that mental models between experts were not highly similar and there might be various different expert mental models (Mathieu, et al., 2005) [112]; Meanwhile, Wang Liying and Chen Jin (2010) and other researchers held that the distributivity of shared mental model could be solved by measuring the similarities of shared mental models, because shared mental models, on the one hand, emphasized the overlap or consistency of relevant knowledge, attitudes or beliefs, but also underlined the peculiarity of compatibility, complementation or coordination between individual mental models and this peculiarity actually referred to the distributivity of shared mental model[98]. Although massive studies of the measurement of shared mental model supported the measurement of shared mental model similarities, these studies mainly investigated the overlap and consistency of team members’ knowledge structures for the measurement of shared mental model, ignoring the measurement of the compatible and complementary cognitive similarities of team members’ knowledge structures, attitudes or beliefs [91]. Only describing the similarities of shared mental models from the overlap and consistency perspectives was not universally applicable in theory. Researchers should further expand the understandings of the connotation of similarities and measurement contents. That means similarities of shared mental models include not only the overlap and consistency of team members’ knowledge structures, but also the compatibility and complementation of team members’ knowledge structures, attitudes or beliefs.

ii. Measurement Methods of Shared Mental Method
Different from the individual mental model, there are great difficulties in measuring the shared mental model. Some scholars in academic circles have also conducted active exploration and developed some measurement methods. From the application sphere, measurement methods can be used in field research and experimental research. With the review of measurement methods of shared mental model, more methods have been applied in experimental studies, such as similarity ratings (pathfinder technology, multidimensional scaling measurement), cognitive map, card sorting and other methods. What is relatively commonly applied in field studies is the questionnaire method. Some methods are applicable in both field and experimental research, like concept mapping and content analysis.

f. Effect of Shared Mental Model on Team Performance
Among studies on the shared mental model, the effect of shared mental model on the team performance is also an important direction. Cannon-Bowers et al. (1993) [70], Klimoski and Mohammed (1994) [8], Salas and Fiore (2004) [119] agreed that shared mental model allowed team members to form consistent explanation and forecast in performing team tasks so as to coordinate their behaviors to adapt to needs of the situation and meet other members’ demands to improve team performance. There are two views in previous studies about the impact of shared mental model on the team performance.

i. Direct impact of shared mental model on the team performance. Kraiger & Wenzel (1997) and other scholars put forward that shared mental model (knowledge, behavior and attitude) would directly influence the team performance [75]. Studies of Smith-Jentsch, Mathieu, & Kraiger (2005) [111], Wu Xin and Wu Zhiming (2005) [105], Edwards, Day, Arthur, & Bell (2006) [120], Lim & Klein (2006) [121], Lv Xiaojun (2007) [108], Du Yifei (2007) [101], DeChurch & Mesmer-Magnus (2010) [122] and Il-Hyun (2012) [123] suggested that the more consistent the team members’ mental models are, the better the team performance would be.

ii. Indirect impact of shared mental model on the team performance. Studies indicated that shared mental model had impacts on team performance through team processes. That means shared mental models indirectly improved the team performance though team processes like cooperation, communication and support behaviors (Mathieu, Heffner, Goodwin, Salas, & Cannon-Bowers, 2000; Marks, et al., 2002; Mathieu, et al., 2005; Lv Xiaojun, 2009; DeChurch & Mesmer-Magnus, 2010; Sara & Vicki, 2014) [86][114][112][113][122][124].

In brief, the connotation of shared mental model, different interpretations of multidimensional structures and diversity of measurement methods have resulted in diversiform relationships between shared mental model and team performance. The relationship between shared mental model and team performance needs to be studied further.

2.2.3 TMT Characteristics of Current Private Enterprises in China

At present, management resources of private enterprises in China compared with their own capital resources and business resources are at a distinct disadvantage. Prominent characteristics are mainly demonstrated in the following points.

a. Attach great importance to business, but neglect management.

China’s private enterprises were born in the 1980s. Based on the perspective of enterprise life cycle, most private enterprises are basically in the late growth or the initial stage of maturity. In this context, private enterprises generally share the following phenomena: When an enterprise was first founded, most of top managers gave priority to business development and lacked cognition of management. Even though they have recognized the importance of management, they failed to respond with practical actions. The contradiction of “large enterprises, weak management” has been increasingly prominent. In the face of such a situation, if enterprises want to construct new development space, they should strengthen internal foundational management, comb business, plan management...
procedures, adopt innovative management modes, consummate incentive and constraint mechanisms and perfect the management system. Otherwise, the enterprise’s management risk will inevitably increase and further development will also been restricted. The more serious consequence will be bankruptcy for an enterprise.

b. Confined team work mode

Standard organizational operation system and regulations are what Chinese private enterprises lack extremely and difficult issues need to resolve urgently. Rule of man is the basic normality for private enterprises’ operation, so individual behaviors greatly affect an enterprise’s decision-making in management and factors like personal traits and personalities also affect the enterprise’s normal operation. On the other hand, relevant functions of basic organizational forms like department, workshop, top management team have been weakened in the enterprise operation. Furthermore, some of them even have become managers’ personal clients or administrative bodies.

c. A few individuals highly monopolize enterprise information and resources.

Serious individual behavior orientation has brought great troubles to organizational behavior. Individual monopoly has replaced the role of department or team and individuals have mastered all kinds of information and resources (market resources and organizational resources) in the process of enterprises operation. Therefore, the entire enterprise or department, team management, management information and resources thus have become individuals’ private information (instead of organizational information). Consequently, the real owners or authorizers of capital have been actually out of control in the enterprise operation.

Top managers in relatively small-sized enterprises can directly participate in various production and management activities and all production and business activities are in their charge, so such top managers own strong control power of an enterprise. However, when an enterprise has been expanding its production and operation scales, top managers need to pull away the focus from specific production and business management and pay attention to operational and strategic management. They should assign specific production and business management to managers in the inferior layer or even directly dispatch to the department team. With the expansion of business scale, these managers can also accredit to subordinates successively.

2.2.4 Research Evaluation and Analysis

The initial TMT research train of thought was based on the cognitive orientation. However, it was hard to depict and measure TMT cognition, so the observable TMT demographic characteristics were expected to replace TMT cognition for the study. However, seen from the research results, the relationships were not stable between TMT characteristics and discrepancies and organizational performance. Subsequent researchers tried to add the situational variables and focused the research perspective on the team process, hoping to
eliminate the above dilemma, but it appeared to be little effective. For its reasons, both TMT demographic characteristics perspective and team process perspective steered clear of TMT cognition, the key variable which played a decisive role in strategic decision-making and organizational performance. Actually, TMT demographic characteristics and their differences can not replace TMT cognition effectively and similar demographic characteristics do not necessarily produce similar attitudes or perceptions; team process is an explicit team behavior and the driving factor behind TMT behavior process is TMT cognition. Making clear the mechanism of TMT behavior acting in strategic outputs and organizational performance should rely on TMT cognition. Research situation of TMT has fully shown that TMT research should finally return to that of TMT cognition combined with research on team process orientation along the research main line: TMT cognition-TMT process-performance. Only in this way, the decisive "black box", TMT cognition, can be uncovered and the research dilemma of the unstable relationship between TMT characteristics and organizational results is expected to be broken through. Meanwhile, it should be noted that most of previous TMT research chose organization performance as the result variable and regarded team performance as an equivalent of organizational performance or ignored the process influence mechanism of TMT characteristics→team process→team performance→organizational performance. However, actually, TMT characteristics first act on team performance indicators which then affect organizational performance. Organizational performance is difficult to guarantee without good team performance. Therefore, TMT result variables should pay more attention to team performance indicators. As the mental representation of team cognition, shared mental model has occupied the forefront of team cognition research. Researchers have carried on beneficial exploration of the concept, connotation, structure, influence factors, measurement methods of shared mental model and its effects on team performance. However, there are at least the following aspects which need further development for shared mental model research. First, the existing studies of shared mental model mostly stayed in the team knowledge structure dimension and ignored dimensions of attitudes and beliefs. In addition, interpretations of the connotation of “shared” and measurement mostly focused on overlap, similarities or consistency of cognitive representation between members. Scarce studies were conducted on the complementation, collaboration and distribution that the connotation of “shared” should contain. Second, existing discussions of factors affecting shared mental model mainly concentrated on team task characteristics, team structure and other static indicators and relatively rare studies were made for the effects of team interactive dynamic characteristics on shared mental model, especially rarer studies were done to discuss how team interactive dynamic characteristics changed and how these changes affected shared mental model from the perspective of team life cycle. However, exploring differences of team interactive dynamic characteristics at different stages of the team life cycle could help researchers better understand the changes of shared mental model, because it was team life cycle phase differences of team interactive dynamic characteristics that had driven shared mental model
to evolve and develop continuously. Third, the relationship between shared mental model and team performance has not yet been undefined among previous studies and the mechanism how the shared mental model acts on the team performance also needs to be studied further. Finally, previous research achievements of shared mental models were mainly concentrated in team types, such as virtual team and task team. Fewer studies were carried out combining with the management team, especially TMT. This study also has noticed that a large proportion of analyses in the past research on TMT and shared mental model were static analysis methods based on the cross-section data with the lack of an investigation of dynamic time evolution. Actually, TMT is just like a living organism, experiences a process from birth to death and goes through different development stages of the life cycle. With the evolution of TMT life course, TMT characteristics change and this change is not limited to dominant characteristics such as age and educational background. Recessive characteristics like TMT cognition also change correspondingly, so shared mental model representing its characteristics will also evolve and develop continuously. Previous studies set TMT and shared mental model to be static, which means regardless of which life cycle stage TMT was in, they regarded TMT characteristics to be stationary and changeless. However, team samples that were selected usually in studies may be derived from the different development stages of team life cycle. Such an indiscriminating treatment is bound to cause the above unstable research result.

As the mental representation of team cognition, shared mental model has brought revelations to research conducted to uncover TMT cognition “black box”, which means researchers can use TMT shared mental model to represent TMT cognition. In fact, there have been some researchers who have made the beneficial attempts and achieved some results in virtual team shared mental model, task team shared mental model and other shared mental models of team types. These results have enlightened researchers that TMT shared mental model, as the mental representation of TMT cognition, is a feasible path to research TMT cognition. Even though rare studies have been conducted with the combination of TMT and shared mental model, it can yet be regarded as an effective means to crack the "black box" of TMT cognition. Although there is still not a definite answer to the difficulty in depicting the evolution of shared mental model among most of the current studies, this paper thinks that the perspective of team life cycle is a sally port. With the evolution of TMT life course, TMT shared mental model will present different life cycle stage characteristics. After revealing the life cycle stage characteristics of TMT shared mental model, the research can depict the evolution trend of TMT shared mental model and then investigate the performance process mechanism of TMT shared mental model. In this way, the “black box” of TMT cognition also is expected to be uncovered. Therefore, research on the evolution of TMT shared mental model under the perspective of life cycle will be bound to become a span-new focus.

In conclusion, although researchers have launched massive studies around TMT and shared mental models, there is still the lack of studies conducted to explore the construction and
stage evolution characteristics of shared mental model and the mechanism of team performance in the process of TMT life cycle. In view of the space which can be further expanded mentioned in the above analyses, adopting TMT shared mental model to represent TMT cognition on the previous theoretical basis, such as Upper Echelons Theory, Theory of Group Interactive Dynamic Characteristics, Team Life Cycle Theory, Cognitive Behavior Theory and TMT and shared mental model research achievements, this study will explore comprehensively TMT interactive dynamic characteristics, TMT shared mental model, and the internal relationship between TMT process and TMT performance from the perspective of team life cycle. It mainly contains TMT interactive dynamic characteristics, the construction of shared mental model, stage characteristics of the evolution of TMT shared mental model and the performance process mechanism of TMT shared mental model. The research thinking is illustrated in Figure 2-2.

![Figure 2-2: Research Thinking](image)

### 2.3 Summary

This chapter first briefly reviews Upper Echelons Theory, Theory of Group Interactive Dynamic Characteristics, Team Life Cycle Theory and Cognitive Behavior Theory to lay a foundation for subsequent research. Then it makes a theoretical review of relevant studies of TMT and shared mental model. The related research of TMT mainly includes two aspects, namely research of TMT demographic characteristics and heterogeneity and that of interaction process. Research of shared mental model mainly includes the concept, connotation, structure, influence factors and measurement methods of shared mental model and its effects on the team performance. Finally, this chapter evaluates and analyzes relevant research literature if TMT and shared mental model and puts forward aspects which need further research and exploration.
Chapter 3 Research on Evolution Characteristics of High-performance TMT Shared Mental Model

3.1 Introduction
Based on the clarification of the TMT shared mental model construction mechanism of the private enterprise, this study further explores the evolution characteristics of the TMT shared mental model of the private enterprise in different life cycle stages.

As previously mentioned, since the concept of shared mental model was put forward, academic circles launched a large amount of research around the shared mental model. However, the development of shared mental models is a very complicated process, thus there are scarce studies on the evolution of shared mental model. Among the handful of research literature, He Guibing (2002) put forward the STC mechanism of the evolution of shared mental model from the perspective of cognition, which meant that three types of knowledge transfer (distributed sharing, adaptive transformation and interactive construction) occurred in the evolution of shared mental model \[^{165}\]; Based on knowledge sharing and other theories, Lv Xiaojun (2007) constructed four stages of the evolution of shared mental model: initial stage, collision stage, coupling stage and mature stage, and described activities in each stage \[^{166}\]; On the basis of previous studies, Lang-Fox (2004) came up with Acquisition and Development of Team Mental Model (ADTMM) which divided team mental model into forming stage (or novice team mental model), adjusting and fluency stage and high-performance stage (or expert mental model) \[^{167}\]. Both He Guibing (2002) \[^{165}\] and Lv Xiaojun (2007) \[^{166}\] emphatically discussed the evolution of shared mental model from knowledge transfer or sharing and failed to cover constituents in the connotation of shared mental model, such as attitudes and beliefs. The division of Lang-Fox’s (2004) three stages of the development and evolution of shared mental model was still in the theoretical description and its effectiveness has not been supported empirically. All the above studies did not cover evolution characteristics of shared mental model in different life cycle stages.

Due to the reason that team cohesion, cognitive conflict and effective communication in enterprise TMT interactive dynamic characteristics present diversified characteristics in different stages of TMT life cycle, so TMT shared mental models will also show stage characteristics of the life cycle.

For the stage evolution characteristics themed with TMT, previous studies mainly focused on the evolution characteristics of TMT conflict. Jehn and Mannix (2001) revealed process conflict, relationship conflict and task conflict in TMT conflict types of high-performance TMT in initial, interim and late stages of interaction. These process, relationship and task conflicts in different stages were high process conflict, low relationship conflict and low task conflict; low process conflict, low relationship conflict and high task conflict; high process conflict, low relationship conflict and low task conflict \[^{168}\]. This has provided a beneficial enlightenment for this study. This study mainly focuses on the life cycle stage characteristics
of the two-dimensional structure of high-performance TMT shared mental model, namely, task-based shared mental model and team-based shared mental model.

3.2 Research Objectives
This study pays significant attention to the life cycle stage characteristics of high-performance TMT shared mental model and mainly analyzes whether TMT has particular shared mental model features in different life cycle stages of the TMT. If there are, the study will further reveal the stage features of shared mental model. In this study, interview method and questionnaire investigation are applied to reveal and verify stage features of the evolution of high-performance TMT shared mental model in private enterprises. It mainly contains two aspects: obtaining first-hand information of the TMT shared mental model evolution through in-depth interviews and conducting deep analysis and summary of interviews by using content analysis; supporting the research results of the above interviews through the questionnaire survey.

3.3 Steps of Interview Research
3.3.1 Interview Outline Design
With the evolution of TMT life course, the TMT shared mental model also evolves and develops constantly. For the TMT which has been established for a long time, it also has occupied longer time for its development. If only cross-sectional data are intercepted by the means of questionnaire survey, it is quite difficult to obtain detailed information needed for this study. In comparison, semi-structured interviews can overcome above disadvantages of the questionnaire to a certain extent and be beneficial to capturing and understanding deep-seated information so as to acquire more comprehensive, abundant and dynamic data (Wang Chongming, 2001) [182]. Therefore, this study adopts the semi-structured in-depth interview to attain first-hand data relevant to stage evolution characteristics of enterprise TMT shared mental model. According to the research content, this study designs problems in three aspects: “enterprises and TMT background information”, “TMT shared mental model” and “TMT performance”.

Enterprises and TMT background information mainly include the following questions:
  a. When was the enterprise established? How is it operating?
  b. How are the staff composition and internal division of labor when the TMT was established?
  c. How do members change and how is the present situation after the establishment of TMT?

TMT shared mental model mainly includes the following questions:
  a. What extent do TMT members share in strategic goals, means of competition, environmental awareness, operation regulations, and access to external resource support? Are there differences between the consensus degrees in these aspects in TMT’s different development stages?
  b. What extent do TMT members understand in expertise distribution, style distribution, role distribution and expertise complementation? Are there differences between the extents of understanding in these aspects in TMT’s different development stages?

TMT performance mainly includes the following questions.
a. How do TMT members evaluate the team work? How satisfied are TMT members with the team work? How satisfied are TMT members with their own performances of expertise and abilities?
b. How satisfied are TMT members with the sales growth rate? How is the enterprise’s access to market shares compared with competitors? How is the enterprise’s sales growth compared with competitors?

3.3.2 Implementation of Interviews
Enterprises interviewed in this study are from Zhejiang, Guangxi and Tianjin. TMT members were very busy with work and this study spanned a period of time, so enterprises interviewed were limited. Recommended by the author’s friend, seven enterprises in Zhengjiang, including Yixiang Hardware Products, Co., Ltd., were interviewed. Introduced by a university MBA student, Duoxin Industrial Limited Company and other eleven enterprises in Guangxi were interviewed. Six enterprises in Tianjin, including Boyu Landscape Co., Ltd., were interviewed through the introduction of the author’s relatives and classmates. Main objects interviewed in this study are general managers and senior top managers, because these two categories of leaders have witnessed the development of enterprises and are helpful for the author to acquire comprehensive information. Generally, each interview with one person lasted one hour or so. In this way, the author obtained first-hand information through in-depth interviews with TMT members.

3.3.3 Analysis of Interview Materials
a. Methods for the Analysis of Interview Materials
Content Analysis is adopted to analyze data from interviews. Content Analysis was first proposed by Krippendorff in the late 1860s. It is a kind of qualitative research method based on the quantitative analysis (Ma Wenfeng, 2000) [160]. Content analysis is used to find out characteristics and quantify them mainly through the analysis and classification of information contents [170]. At present, the content analysis can be divided into different kind according to diversified standards. Based on the analysis methods and process characteristics, it can be divided into interpretative content analysis, empirical content analysis and computer-assisted content analysis. Interpretative content analysis is used to intensively read, understand and explain contextual contents. Empirical content analysis includes quantitative content analysis and qualitative content analysis. Quantitative content analysis refers to dividing contextual contents into specific categories, counting the frequency of each category of content and then describing obvious content characteristics. Qualitative content analysis is to describe and conduct the rational analysis of connections and organizational structures between various conceptual elements (Bos and Tamai, 1999). Computer-assisted content analysis is a method used to analyze contents by using content analysis software with the aid of computer (Qiu Junping and Zou Fei, 2003). Content analysis was originally applied in communication studies and political science research field. Then it has been widely used in fields of organization and strategic management and regarded as a kind of effective method to study management problems (Chan, Lau and Man, 1997).
Given that previous research lacked the analysis of stage characteristics of TMT shared mental model, this study tries to analyze TMT shared mental model characteristics in different life cycle stages from first-hand interview information through content analysis technology and regards it as the trial test before hypotheses are put forward to obtain hypotheses of stage characteristics of the TMT shared mental model evolution.

According to the study needs, this study first develops a coding table (Table 3-1), TMT shared mental model coding table (Table 3-2) and TMT performance coding table (Table 3-3) which can be quantified easily. According to TMT background information, TMT shared mental models, TMT performance and relevant details acquired from 25 interviewed enterprises, this study adopts the quantitative semantic content analysis to make quantitative coding classifications with relatively complete sentences as the minimum analysis units. Finally, it classifies in accordance with different development stages of TMT life cycle, calculates and records respectively the matching share mental model characteristics and the classification data of the corporate performance. For instance, below is the brief interview information collated after the general manager of a landscape company in Tianjin was interviewed.

The company was founded six years ago. Initially, three of my friends who grew up with me and I invested 2 million Yuan respectively established the company which was mainly engaged in all kinds of nursery stocks and undertook various landscaping projects. I served as the general manager and three of my friends were deputy general managers. Now, there are five members in the TMT, including three members when the company was just founded and Deputy General Manager Li who joined us three years ago. Mr. Li also grew up with us together, so we are quite familiar with each other. He worked as a deputy general manager in a landscape company in Shenzhen before joining us. He had no shares when he just entered our company. A year later, due to Mr. Li’s outstanding performance, four of us transferred our own 2% of the shares to him as a kind of affirmation and inspiration for his work. Now we five mesh with each other smoothly.

On the product competition strategy, we have a coincidentally basic thought, namely the combined thinking of breeding green sweeping willows, Koelreuteria paniculata, camphor trees, orange osmanthus, metasequoia and other products with local advantages and introducing foreign varieties. Of course, we sometimes have disagreements in some specific implementation. For example, we had internal divergences some time ago when introducing foreign species. But we finally reached a consensus after a few months’ market research. As the company has completed the market system in our province, the strategic goal of marching to other provinces and striving to be a first-class brand in domestic landscape industry has become the consensus of me and other several deputy general managers. As various systems of our company have been well established, we all feel that each of us has clear respective responsibilities, rights and obligations. Taking the performance assessment of the last year for example, they had different rewards as deputy general managers. The gap between the highest and the lowest bonuses was up to more than a half million Yuan. However, no one complained, because this was linked with the
performance. In recent years, I have been touched by a growing sense that homogeneous competition in the industry market has been increasingly severe. Several deputy general managers share the same feeling with me, so our company has been fostering or introducing competitive products in front of other companies, such as Japanese red maples and Korean Taxus chinensis in recent years. Our company is quite among the first batch of companies which have introduced these varieties in China. When solving planting technological difficulties, such as seedling cultivation and introduction, we all agree that we should take advantage of “external brains”. Now we have employed experts from Hunan University of Forestry and Technology and other institutions as our technical advisers.

When the company was just established, members had certain understandings of each other’s respective expertise. After working together for several years, we have deepened the understanding of each other’s specialties. Now, members’ jobs are divided based on our own special skills and we are very familiar with roles that the other parties are assuming. Members are childhood friends, so we have known well about each other’s personality and way of doing things. For example, Deputy General Manager Zhang is straight and speaks bluntly. Deputy General Manager Li always likes to argue with others. Deputy General Manager Xiao does things discreetly and carefully.

I think we all are quite satisfied with the whole team work. We have strong awareness of teamwork and relatively harmonious team relationship. Our products and landscaping projects have been well received by the customers and the industry. In 2012, we won the first prize in Hunan Landscaping Project Planning Contest. At present, our market business has 100% covered cities and 80% covered counties in the province. We also have expanded our business to other a dozen provinces. Now the company enjoys good performance and has been increasing by 30% a year in the industry. We are relatively satisfied with our return on investment.

According to the predesigned coding tables of TMT life cycle stages, TMT shared mental model characteristics and TMT performance, this study takes sentences as analysis units, conducts detailed classifications and specific coding, analyzes and attains the stage characteristics of TMT shared mental model. In accordance with the practice that D’Aveni and MacMillan (1990) and Kolbe and Burnett (1991) put forward, namely, adopting the coding scheme of having more than or equal to 2 people when content analysis is used, this study adopts the coding scheme of three people composed of one Doctor of Management, one expert in enterprise management and one Doctor of Management who are familiar with content analysis coding.

b. Construction of Coding Tables

As what mentioned before, the average life expectancy is just 2.5 years for small and medium-sized enterprises in China and the average life span for the group companies is only 7-8 years. Therefore, generally speaking, enterprises are mostly in the storming stage 2-3 years after they were established. Most TMTs in enterprises which have sustained for more than 8 years have experienced four stages of the life cycle. Without doubt, the determination
of TMT life cycle stages can also be embodied from the stability of TMT members to some extent. In general, TMT members in storming leave more frequently and members are not stable. TMT members in norming are relatively stable. Few of TMT members in performing leave (except people who leave due to age or physical reasons) and are extraordinary stable. However, for enterprises which have been established for comparatively long time and whose TMT members are not stable, the team development stage can be regarded as the return to the adjacent preceding stage. This study determines the TMT life cycle stages of development mainly according to fixed number of years of enterprises’ establishment and the stability of TMT members. In this study, enterprises which have been established for less than one year belong to the forming stage. Those which have been established for 2-3 years and whose TMT members are not stable or relatively stable and those which have been established for 4-7 years and whose TMT members are not stable and leave frequently are classified into storming ones. Those which have been established for more than 4 years and whose TMT members are relatively stable stay in the norming stage. Those which have been established for more than 4 years and whose TMT members are stable belong to the performing stage. Concrete contents of the coding table of TMT life cycle stages are shown in Table 3-1.

Table 3-1 Coding Table of TMT Life Cycle Stages

<table>
<thead>
<tr>
<th>1. Years of Enterprises’ Establishment ( )</th>
<th>(1) within 1 year (2) 2-3 years (3) 4-7 years (4) over 8 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Stability of TMT Members ( )</td>
<td>(1) unstable, leave frequently (2) relatively stable (3) stable</td>
</tr>
</tbody>
</table>
| 3. TMT Development Stages                | Forming: 1 (1) +2 (1); 1 (1) +2 (2); 1 (1) +2 (3)  
  Storming: 1 (2) +2 (1); 1 (3) +2 (1)  
  Norming: 1 (3) +2 (2); 1 (4) +2 (2)  
  Performing: 1 (3) +2 (3); 1 (4) +2 (3) |

According to previous research, the TMT shared mental model is divided into task-based shared mental model and team-based shared mental model whose development levels are represented with very high, relatively high, general, relatively low and very low. Combinations of the two’s development levels will be generated as shown in Table 3-2. Characteristics in Table 3-2 that TMT shared mental model will present in different stages of the life cycle remain to be determined after the results of content analysis and questionnaire survey are gained.
## Table 3-2 Coding Table of TMT Shared Mental Model

<table>
<thead>
<tr>
<th>1. Task-based Shared Mental Model</th>
<th>Very High (1)</th>
<th>Relatively High (2)</th>
<th>General (3)</th>
<th>Relatively Low (4)</th>
<th>Very Low (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Team-based Shared Mental Model</td>
<td>Very High (1)</td>
<td>Relatively High (2)</td>
<td>General (3)</td>
<td>Relatively Low (4)</td>
<td>Very Low (5)</td>
</tr>
<tr>
<td>3. TMT Shared Mental Model</td>
<td>Very High Task-based Shared Mental Model: 1 (1) +2 (1)</td>
<td>Very High Task-based Shared Mental Model and Relatively High Team-based Shared Mental Model: 1 (1) +2 (2)</td>
<td>Very High Task-Based Shared Mental Model and General Team-Based Shared Mental Model: 1 (1) +2 (3)</td>
<td>Very High Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model: 1 (1) +2 (4)</td>
<td>Very High Task-Based Shared Mental Model and Very Low Team-Based Shared Mental Model: 1 (1) +2 (5)</td>
</tr>
</tbody>
</table>
TMT performance will be evaluated according to the team satisfaction and growth performance involved in interview research. If for an enterprise has two relatively low or one relatively low and one general for the evaluation of the above aspects, it will be classified into the category of low-performance enterprises. An enterprise which has two general or only one relatively high for the evaluation of the above aspects will be a general performance enterprise. With relatively high evaluation in both of the two aspects, the enterprise will be a high-performance one. Specific details are shown in Table 3-3.

### Table 3-3 Coding Table of TMT Performance

<table>
<thead>
<tr>
<th>TMT Performance</th>
<th>Relatively Low: 1 (1) +2 (1); 1 (1) +2 (2); 1 (2) +2 (1)</th>
<th>General: 1 (2) +2 (2); 1 (1) +2 (3); 1 (3) +2 (1); 1 (2) +2 (3); 1 (3) +2 (2)</th>
<th>Relatively High: 1 (3) +2 (3)</th>
</tr>
</thead>
</table>

**c. Analysis Results of Interview Contents**

**i. Reliability and Validity Tests of Content Analysis Results**

Reliability and validity tests are indispensable links to ensure research results’ objectivity and authenticity. Reliability is used to test the consistency of literature coding, accuracy of classification and stability of methods. Validity refers to the coincidence of a conclusion with facts and the applicability of theoretical research (Qiu Junping and Zou Fei, 2003) [172]. Perreault and Leigh...
(1989) [176], Li Benqian (2000)[177] and others held that the reliability of content analysis could generally be obtained by calculating the consistency of coders. This study uses the calculating formula of the coding reliability test given by Ding Yuefeng (2006) for reference [178]:

\[ CA = \frac{T_1 \cap T_2 \cap T_3}{T_1 \cup T_2 \cup T_3} \] (3.1)

In which, CA represents the coding reliability. T1, T2 and T3 denote respectively the coding numbers of coder 1, coder 2 and coder 3. The formula represents that coding reliability can be expressed by dividing the intersection of coder 1, coder 2 and coder 3’s coding results in each category by the union of coding results in each category. If the coding degree of consistency in the content analysis is more than .80, it is an acceptable level. If the degree is more than .90, it will be a relatively good level (Inschetal., 1997; Ormerod, 2000) [179-180]. Coders’ consistency coefficients of TMT life cycle stages, TMT shared mental model and TMT performance are specifically shown in Table 3-4. From the table, it can be seen that all coders’ consistency coefficients are more than .80, reaching the acceptable level of reliability.

Table 3-4 Coders’ Consistency Coefficients of TMT Life Cycle Stages, TMT Shared Mental Model and TMT Performance (N=25)

<table>
<thead>
<tr>
<th>Coders’ Consistency Coefficient of TMT Life Cycle Stages</th>
<th>1. Years of Enterprises’ Establishment 1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. TMT Performance</td>
<td>Relatively Low: 1 (1) + 2 (1); 1 (1) + 2 (2); 1 (2) + 2 (1)</td>
</tr>
<tr>
<td></td>
<td>General: 1 (2) + 2 (2); 1 (1) + 2 (3); 1 (3) + 2 (1); 1 (2) + 2 (3); 1 (3) + 2 (2)</td>
</tr>
<tr>
<td></td>
<td>Relatively High: 1 (3) + 2 (3)</td>
</tr>
</tbody>
</table>

In the validity of the content analysis, because coding tables of TMT life cycle stages, TMT shared mental model and TMT performance in this study are designed based the previous literature, investigation and interview practice, thus it can ensure that the content analysis is based on the reliable theory basis. In addition, coders have rich experience in coding, which has further guaranteed that the content analysis of this study is of high validity.

ii. Descriptive Statistics Analysis Results of Content Analysis

Table 3-5 shows that among 25 enterprises interviewed, enterprises whose TMTs are in the norming of the life cycle account for a larger proportion, 32%. Enterprises whose TMTs are in the forming, storming and performing stages account for 20.00%, 24.00% and 24.00%, respectively. In the TMT performance, relatively high occupies 60.00%. Relatively low and general hold 16.00% and 24.00%, respectively.

Table 3-5 Analysis of Coding Frequency of TMT Life Cycle Stages and TMT Performance (N=25)
<table>
<thead>
<tr>
<th>Element</th>
<th>Category</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT Development Stages</td>
<td>Forming</td>
<td>5</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>6</td>
<td>24.00%</td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>8</td>
<td>32.00%</td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>6</td>
<td>24.00%</td>
</tr>
<tr>
<td>TMT Performance</td>
<td>Relatively Low</td>
<td>4</td>
<td>16.00%</td>
</tr>
<tr>
<td></td>
<td>General</td>
<td>6</td>
<td>24.00%</td>
</tr>
<tr>
<td></td>
<td>Relatively High</td>
<td>15</td>
<td>60.00%</td>
</tr>
</tbody>
</table>

Table 3-6 Analysis of Coding Frequency of TMT Current Shared Mental Model (N=25)

<table>
<thead>
<tr>
<th>TMT Shared Mental Model</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>2</td>
<td>8.00%</td>
</tr>
<tr>
<td>Relatively Low Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>7</td>
<td>28.00%</td>
</tr>
<tr>
<td>Relatively Low Task-Based Shared Mental Model and General Team-Based Shared Mental Model</td>
<td>2</td>
<td>8.00%</td>
</tr>
<tr>
<td>General Task-Based Shared Mental Model and Relatively High Team-Based Shared Mental Model</td>
<td>4</td>
<td>16.00%</td>
</tr>
<tr>
<td>General Task-Based Shared Mental Model and General Team-Based Shared Mental Model</td>
<td>4</td>
<td>16.00%</td>
</tr>
<tr>
<td>Relatively High Task-Based Shared Mental Model and Very High Team-Based Shared Mental Model</td>
<td>6</td>
<td>24.00%</td>
</tr>
</tbody>
</table>

It can be seen from Table 3-6 that among interviewed enterprises, relatively low task-based shared mental model and relatively low team-based shared mental model have the highest frequency, accounting for 28% of the total. Relatively high task-based shared mental model and very high team-based shared mental model win the second highest frequency, accounting for 24.00% of the total. However, general task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental model and general team-based shared mental model appear least frequently. Both of them occupy 8.00% of the total.

Table 3-7 Classification Frequency of TMT Current Shared Mental Model Characteristics (N=25)

<table>
<thead>
<tr>
<th>Items</th>
<th>Forming</th>
<th>Storming</th>
<th>Norming</th>
<th>Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>High performance TMT</td>
<td>General Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relatively Low Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relatively Low Task-Based Shared Mental Model and General Team-Based Shared Mental Model</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Low performance TMT

| General Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model |
| Relatively Low Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model |
| Relatively Low Task-Based Shared Mental Model and General Team-Based Shared Mental Model |
| General Task-Based Shared Mental Model and Relatively High Team-Based Shared Mental Model |
| General Task-Based Shared Mental Model and General Team-Based Shared Mental Model |

| Relatively Low Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model | 1 |
| General Task-Based Shared Mental Model and Relatively High Team-Based Shared Mental Model | 3 |

Seen from the classification frequency of TMT current shared mental model characteristics reflected in Table 3-7, there are three high-performance TMTs in the forming and their shared mental models are mainly general task-based shared mental models and relatively low team-based shared mental models. One high-performance TMT shared mental model manifests as relatively low task-based shared mental model and general team-based shared mental model, which is mainly due to the fast industrial growth. Two TMTs in the storming show high performance and their TMT shared mental models are embodied as relatively low task-based shared mental models and general team-based shared mental models. Three TMTs in the storming present the low performance and their shared mental models are embodied as relatively low task-based shared mental models and relatively low team-based shared mental models. Four TMTs in the norming show high performance and their TMT shared mental models are mostly reflected as general task-based shared mental models and relatively high team-based shared mental models. The other four TMTs show the general performance and their shared mental models are presented as general task-based shared mental models and general team-based shared mental models. There are six high performance TMTs in the performing and their shared mental models are presented as relatively high task-based shared mental models and very high team-based shared mental models.

Meanwhile, to have a longitudinal and intuitionistic understanding of single TMT, in view of the TMT that has developed into a certain stage, such as the TMT in the storming, norming or performing, this study reviews its shared mental model characteristic representations in the previous life cycle stages and conducts frequency statistics of the information. Statistical results are shown in Table 3-8.

Table 3-8 Table of Classification Frequency of TMT Shared Mental Model Characteristics in Multiple Stages

<table>
<thead>
<tr>
<th>Items</th>
<th>Forming</th>
<th>Storming</th>
<th>Norming</th>
<th>Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Performance</td>
<td>General Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Relatively Low Task-Based Shared Mental Model and Relatively Low Team-Based Shared Mental Model</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In Table 3-8, individual coding is made according to the situations of various stages that each interviewed enterprise’s TMT has experienced in the life cycle. For example, in terms of the enterprise TMT in norming at present, coding is conducted in allusion to its situation of the stage where it stays now. In the meantime, recoding is adopted in accordance with TMT’s memories of situations in forming and storming. For another example, as for the enterprise TMT in performing at present, this study codes according to situations in forming, storming, norming and performing stages. It can be seen from the results of frequency analysis that the main characteristic forms of shared mental model for high-performance TMT in forming are general task-based shared mental model and relatively low team-based mental model, including 12 enterprises. In addition, there are 11 enterprises having high-performance TMTs which show relatively low task-based shared mental models and general team-based mental models for their characteristic forms of shared mental model in storming. 10 enterprises having high-performance TMTs display general task-based shared mental models and relatively high team-based mental models for their characteristic forms of shared mental model in norming. 6 enterprises having high-performance TMTs display relatively high task-based shared mental models and very high team-based mental models for their characteristic forms of shared mental model in performing. This law is basically similar to what has been reflected in Table 3-7.

### 3.3.4 Summary of Interview Research

**a.** There are different shared mental model characteristics in the TMT.

Levels of TMT task-based shared mental model and team-based mental model are graded into very high, relatively high, general, relatively low and very low. Combinations of levels of TMT task-based shared mental model and team-based mental model can present different TMT shared mental model characteristics. It has been found from the interview research that there are six kinds of different TMT shared mental model characteristics: general task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental model and general team-based shared mental model, general task-based shared mental model and relatively high team-based shared mental model, general task-based shared mental model and general team-based shared mental model, relatively high task-based shared mental model and very high team-based shared mental model.
b. Stage characteristics of TMT shared mental model
A preliminary conclusion can be drawn from the content analysis results of 25 interviewed company samples. In private enterprises, the main characteristics of high-performance TMT shared mental model in forming are general task-based shared mental model and relatively low team-based shared mental model; main characteristics of shared mental model in storming are relatively low task-based shared mental model and general team-based shared mental model; main characteristics of shared mental model in norming are general task-based shared mental model and relatively high team-based shared mental model; in performing, the main characteristics of shared mental model are relatively high task-based shared mental model and very high team-based shared mental model.

3.4 Research Hypotheses and Questionnaire Design
Top managers are very busy and depth interviews are time consuming, so it is extremely difficult to select large samples for the interview. Although this study has adopted the content analysis technology to analyze 25 interviewed enterprises and make clear the stage characteristics of the TMT shared mental model, general speaking, limitations of the study samples will affect the study’s external validity. To make up for this deficiency, this study adopts massive questionnaires to carry out statistical analysis of stage characteristics of the TMT shared mental model and further support the interview results, because the questionnaire study can make up for the defect of interview research to a certain extent and further improve external validity of the study [181].

3.4.1 Research Hypotheses
a. Stage difference characteristics of TMT shared mental model
In previous studies of shared mental model, some scholars believed that shared mental model was a dynamic process and there were also some scholars who began to explore stage differences of shared mental model. Langan-Fox (2004) described the development of team shared mental model into three different stages: stage of team forming and developing, stage of team process and interaction and stage of expert shared mental model [167]. The study of Bai Xinwen et al. (2006) suggested that the development of two classes of shared mental models (team work model and team interaction model) had stage differences [92]. Based on the theory of knowledge sharing, Xiaojun (2007) put forward four different stages of development and evolution of shared mental model: personal mental model in the initial stage, knowledge codification, collection and game in the collision stage, knowledge transfer, sharing and innovation in the coupling stage and shared expert mental mode in the mature stage [166]. However, past studies of shared mental model lacks studies of stage characteristics of TMT shared mental model.

Due to the reason that TMT interactive dynamic characteristics have a significantly positive impact on the construction of TMT shared mental model and TMT interactive dynamic characteristics are not identical in different TMT life cycle stages, so TMT shared mental model will also present diversified stage characteristics of the life cycle. TMT members generally expressed in the interview there were discrepancies between members’ consensus
degrees in strategic targets, means of competition, environmental awareness, operation regulations and the access to external resources for support in different stages of TMT life cycle and differences also existed in members’ understandings of expertise distribution, style distribution, role distribution and expertise complementation in different stages of TMT life cycle. Therefore, this study puts forward the following hypotheses:

Hypothesis la: There are significant differences for TMT task-based shared mental model in different life cycle stages.

Hypothesis lb: There are significant differences for TMT team-based shared mental model in different life cycle stages.

b. Hypotheses of TMT shared mental model’s stage evolution characteristics

Although a small amount of studies involved discussions of stage differences of shared mental model, these all stayed only in the theoretical description and empirical studies were insufficient in this field. Particularly, rare empirical studies have been seen on stage evolution characteristics of TMT shared mental model. The team life cycle theory holds that a team’s life cycle includes four stages, i.e. forming, storming, norming and performing. Although not every team will inevitably go through these four life cycle stages in sequence, the vast majority of teams which have experienced a fixed number of years would undergo these four life cycle stages. Moreover, for TMTs in different life cycle stages, their shared mental models also will also present different characteristics.

Due to the lack of work adaption and emotional communication for an private enterprise’s TMT in forming, members know little about each other’s specialties, abilities and styles of doing things. If TMT wants to win high performance in this stage, TMT members must have a certain degree of consensus in the enterprise’s development strategy, competition strategy, the external environment interpretation and other respects. Only in this way, members can have longings for the enterprise development and be passionate and energetic about work. Behaviors of team members can be task-oriented and conducive to the achievement of objectives, which can also be seen from the previous interview content analysis. High-performance TMT task-based shared mental model is general in forming and team-based shared mental model in this stage is relatively low. Certainly, individual TMTs based on relatively low task-based shared mental model and relatively low team-based shared mental model also show high performance. This is mainly because the industry environment they are in is especially favorable or owns specific resources. Therefore, this study puts forward a hypothesis:

Hypothesis 2a: The shared mental model of high-performance TMT of private enterprise in forming is primarily presented as general task-based shared mental model and relatively low team-based shared mental model.

In storming, private TMT members begin to take the intuitive to fully express their views. Due to the heterogeneity of members, internal contradictions among the team began to emerge and emotional conflicts also appear. Members focus more on the processing of interpersonal relations and naturally pay little attention to team tasks. In this stage, if the TMT wants to
have high performance, TMT members need to strengthen mutual communication with each other and promote understandings of each other’s specialties, abilities, styles of doing things and job roles. Only in this way, the pertinence of information exchanges between members can be enhanced and members’ enthusiasm of taking the initiative to seek communication and exchanges can be lifted. Members will present the inclusive mentality and dissenters will also have reservations and choose to follow the crowd or accept the team authority’s point of view. Without certain mutual support and understanding between members, TMT can not be supported to show high performance, which can be seen from the above analysis of interviews. Compared with high-performance TMT shared mental models in storming and forming, the level of task-based mental model comes down slightly and shows to be relatively low, but that of team-based mental model increases somewhat and shows to be general. Therefore, this study puts forward a hypothesis:

Hypothesis 2b: The shared mental model of high-performance TMT of private enterprise in storming is mainly shown as relatively low task-based shared mental model and general team-based shared mental model.

After transiting into the norming from storming, with the continuous expansion of enterprise business, private enterprise TMT will be faced with increasingly complex external environment and more uncertainties in their interactions. In this stage, if TMT wants to achieve high performance, on the one hand, TMT members need to pay attention to team tasks and objectives. Although it is difficult to eliminate disagreements of members in team tasks and objectives, competitive strategies and other aspects, it should ensure that members should have certain consensuses in these aspects. On the other hand, TMT members should strengthen communication with each other, respect individual differences and clearly know roles they are obliged to play. By deepening the understanding of each other’s expertise, dissent can be reduced when decisions and discussions are made and faster consensuses can also be reached. Simultaneously, deeper interactions between members can enhance the trust in one another and help members be willing to believe that their expertise can play a complementary effect and is what is needed to complete team tasks. This can be seen from the above interview content analysis. Compared with high-performance TMT shared mental models in norming and storming, the level of task-based mental model rises slightly and presents to be general, but that of team-based mental model continues to rise and shows to be relatively high. Therefore, this study puts forward a hypothesis:

Hypothesis 2c: The shared mental model of high-performance TMT of private enterprise in norming is primarily presented as general task-based shared mental model and relatively high team-based shared mental model.

After transiting into the performing from norming, if TMT wants to achieve high performance, on the one hand, TMT members need to highly recognize task objectives and ensure that members focus on how to achieve team task objectives fast. At this moment, complying with team regulations should be the team members’ conscious activity. Members should also reach
basic consensuses in competitive strategies, environmental awareness and access to external resources support and they have formed a tacit understanding. On the other hand, TMT members should interact with each other efficiently to be very familiar with each other in knowledge expertise, styles of doing things, job responsibilities and other aspects. Once there are new tasks, they would know the roles they should assume and play, which can also be seen from the above interview content analysis. Compared with high-performance TMT shared mental models in performing and norming, the level of task-based mental model continues to rise and presents to be relatively high, while that of team-based mental model keeps the rising trend and shows to be very high. Therefore, this study puts forward a hypothesis:

Hypothesis 2d: The shared mental model of high-performance TMT of private enterprise in performing is mainly manifested as relatively high task-based shared mental model and very high team-based shared mental model.

3.4.2 Questionnaire Design and Data Analysis

a. Study samples
Study samples are TMT members from 143 enterprises in Zhejiang, Guangxi and other provinces. 426 questionnaires of 128 enterprises have been recovered. Removing questionnaires with missing contents and invalid ones in which TMT members written are less than 2 people, this study has gained 398 valid questionnaires of 125 enterprises eventually. All the people who filled in the questionnaires are serving as deputy general managers or above.

b. Study measurement
TMT shared mental model scale adopted in this study is drawn up based on research achievements of scholars like Cannon & Salas (2000)[86], Lv Xiaojun (2002)[94], Jin Yanghua and Wang Chongming (2006)[97] and Wang Liman(2009)[84] and has been proved highly reliable and valid. This scale contains task-based shared mental model and team-based mental model. The former includes “TMT members have a consensus on team operating regulations”, “TMT members have a consensus on strategic targets” and other three items. Team-based shared mental model includes “TMT members get to know each other’s knowledge structures and specialties”, “TMT members know well about each other’s styles of doing things and personalities” and other two items. TMT shared mental model scale is a five-point scale, including nine items.

c. Data analysis
First, this study differentiates between high-performance TMT, general performance TMT and low-performance TMT. It adopts 35th and 56th percentiles to distinguish between research data. After sorting TMT performance average scores from high to low, samples over the 56th percentile show high-performance TMT and samples lower than 35th percentile show low-performance TMT. The rest of samples show general performance. As seen in Table 3-9, 55 enterprises among 125 samples have high-performance TMTs, 49 enterprises have general performance TMTs and 25 enterprises have low-performance TMTs, accounting for
42.4%, 37.6% and 20.0%, respectively. This study mainly analyzes stage differences of high-performance private enterprises’ TMT shared mental models.

Table 3-9 Analysis Table of High, General and Low TMT Performance Frequency (N=125)

<table>
<thead>
<tr>
<th>TM Performance Category</th>
<th>TMT Quantity</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>High-performance TMT</td>
<td>5</td>
<td>42.4%</td>
</tr>
<tr>
<td>General Performance TMT</td>
<td>4</td>
<td>37.6%</td>
</tr>
<tr>
<td>Low-performance TMT</td>
<td>2</td>
<td>20.0%</td>
</tr>
<tr>
<td>Total</td>
<td>11</td>
<td>100%</td>
</tr>
</tbody>
</table>

The descriptive test of stage differences of TMT shared mental model are as shown in Table 3-10. From the table, sample distributions, means and standard deviations of high-performance TMT task-based shared mental model and team-based shared mental model in four stages of TMT life cycle can be seen obviously. There are respectively 9, 5, 19 and 20 high-performance TMTs in forming, storming, norming and performing. Seen from the mean values of task-based shared mental model and team-based shared mental model in various stages, they are 3.16, 2.61, 3.28 and 4.39 respectively for the task-based shared mental model, and 2.81, 3.12, 4.30 and 4.69 for the team-based shared mental model. The order of mean values of task-based shared mental model in four stages of TMT life cycle from high to low is performing, norming, forming and storming and that of mean values of team-based shared mental model in four stages of TMT life cycle from high to low is performing, norming, storming and forming.

Table 3-10 Descriptive Test of High-performance TMT Shared Mental Model in Different Life Cycle Stages (N=35)

<table>
<thead>
<tr>
<th>TMT Shared Mental Model</th>
<th>Team Life Cycle Stages</th>
<th>Samples</th>
<th>Mean</th>
<th>Sd</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-Based Shared Mental Model</td>
<td>Forming</td>
<td>9</td>
<td>3.156</td>
<td>0.463</td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>5</td>
<td>2.614</td>
<td>0.369</td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>1</td>
<td>3.282</td>
<td>0.419</td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>2</td>
<td>4.389</td>
<td>0.382</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Team-Based Shared Mental Model</td>
<td>Forming</td>
<td>9</td>
<td>2.812</td>
<td>0.291</td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>5</td>
<td>3.121</td>
<td>0.630</td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>1</td>
<td>4.303</td>
<td>0.573</td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>2</td>
<td>4.686</td>
<td>0.438</td>
</tr>
</tbody>
</table>

Variance analyses are conducted on 53 high-performance TMT samples. 1, 2, 3 and 4 denote TMT forming, storming, norming and performing. It can be seen from the variance results
after the comparisons between groups in Table 3-11 that there are significant differences between TMT task-based shared mental model and team-based shared mental model in four stages of TMT life cycle. The F-value of task-based shared mental model is 17.911 with the significance level .000; the F-value of team-based shared mental model is 43.148 with the significance level .000. In four stages of forming, storming, norming and performing, comparisons between groups have indicated that the performance of task-based mental model manifests as performing > norming > forming > storming and that of team-based mental model manifests as performing > norming > storming > forming. Specific changes are described as shown in Table 3-11.

Table 3-11 Variance Analysis of High-performance TMT Shared Mental Model Stages (N=53)

<table>
<thead>
<tr>
<th>TMT Shared Mental Model</th>
<th>Sum Of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig</th>
<th>Between groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-Based Shared Mental Model</td>
<td>14.326</td>
<td>3</td>
<td>4.775</td>
<td>17.911***</td>
<td>.000</td>
<td>4 &gt; 3 &gt; 1 &gt; 2</td>
</tr>
<tr>
<td>Team-Based Shared Mental Model</td>
<td>21.644</td>
<td>3</td>
<td>7.215</td>
<td>43.148***</td>
<td>.000</td>
<td>4 &gt; 3 &gt; 2 &gt; 1</td>
</tr>
</tbody>
</table>

Note: ***the mean difference is significant at P<0.001 level; ** the mean difference is significant at P<0.01 level; * the mean difference is significant at P<0.05 level.

Figure 3-1 Analysis of High-performance TMT Shared Mental Model Stage Differences (N=53)

Table 3-12 shows the variance analysis results of TMT shared mental model’s life cycle stage differences. In the table, comparisons are made on mean values of two dimensions of TMT shared mental model in different life cycle stages. There are significant differences for the task-based shared mental between forming and storming, forming and performing, storming and norming, storming and performing and norming and performing, but this study has found no significant difference between forming and norming. Differences between forming and storming are significant at .001 level. Differences between forming and performing, storming and norming, storming and performing and norming and performing are significant at .000 level. For the task-based shared mental, there are significant differences between forming and norming, forming and performing, storming and norming, storming and performing and norming and performing, but no significant difference has been found
between forming and storming. Differences between forming and norming, forming and performing, storming and norming and storming and performing are significant at .000 level. Differences between norming and performing are significant at .05 level. These have indicated that with the downtrend of TMT task-based shared mental model from forming to storming, there is a modest rising trend after the transition into norming. After entering the performing, there is an impressive increase. TMT team-based shared mental model has presented a slight rise from forming to storming, a sharp rise after the transition into norming and a small increase after entering the performing. Comparatively speaking, team-based shared mental model has more obvious changes than the task-based shared mental model as a whole.

Table 3-12 Variance Analysis of Life Cycle Stage Differences of High-performance TMT

<table>
<thead>
<tr>
<th>TMT Shared Mental Model</th>
<th>(1) Stages</th>
<th>(J) Stages</th>
<th>Difference (1) —</th>
<th>Std. Error</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-Based</td>
<td>Forming</td>
<td>Storming</td>
<td>.742***</td>
<td>.228</td>
<td>.002</td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>-2</td>
<td>.166</td>
<td>.100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>-1.233***</td>
<td>.164</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Storming</td>
<td>Forming</td>
<td>-.742</td>
<td>.228</td>
<td>.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>-1.019***</td>
<td>.205</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>-1.975***</td>
<td>.205</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Norming</td>
<td>Forming</td>
<td>.2</td>
<td>.166</td>
<td>.100</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>1.019***</td>
<td>.205</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Perform</td>
<td>Performin</td>
<td>-.856***</td>
<td>.131</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forming</td>
<td>1.233***</td>
<td>.164</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>1.975***</td>
<td>.205</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>.956***</td>
<td>.131</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>.109</td>
<td>.288</td>
<td>.706</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>-.882***</td>
<td>.209</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>-.265***</td>
<td>.207</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forming</td>
<td>-.109</td>
<td>.288</td>
<td>.706</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>-.991***</td>
<td>.260</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>-1.374***</td>
<td>.258</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forming</td>
<td>.882***</td>
<td>.209</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>.991***</td>
<td>.260</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Performing</td>
<td>-.383***</td>
<td>.165</td>
<td>.025</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Forming</td>
<td>1.265***</td>
<td>.207</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Storming</td>
<td>1.374***</td>
<td>.258</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norming</td>
<td>.383***</td>
<td>.165</td>
<td>.025</td>
<td></td>
</tr>
</tbody>
</table>

Note: ***the mean difference is significant at P<0.001 level; ** the mean difference is significant at P<0.01 level; * the mean difference is significant at P<0.05 level.
difference is significant at $P<0.05$ level.

From the scatter Figure of stage characteristics of high-performance TMT shared mental model drawn in Figure 3-2, the change characteristics can be further seen: high-performance enterprise TMT in forming is basically in the area of general task-based shared mental model and relatively low team-based shared mental model; high-performance enterprise TMT in storming is mainly in the area of relatively low task-based shared mental model and general team-based shared mental model; high-performance enterprise TMT in norming is mainly in the area of general task-based shared mental model and relatively high team-based shared mental model; high-performance enterprise TMT in performing is mainly in the area of relatively high task-based shared mental model and very high team-based shared mental model. However, a few enterprise TMTs in relatively low task-based shared mental model and relatively low team-based shared mental model also can achieve high performance, which implies that some factors beyond the TMT shared mental model are in action, such as industry factor, the possession of specific resources and so on. In brief, throughout the whole course of TMT life cycle, TMT shared mental model experiences on the whole the evolutionary process of general task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental model and general team-based shared mental model, general task-based shared mental model and relatively high team-based shared mental model, relatively high task-based shared mental model and very high team-based shared mental model.

![Figure 3-2 Three-Point Differential Analysis of High-performance TMT Shared Mental Model Stage Characteristics (N=53)](image)

3.5 Analysis of Results

3.5.1 Characteristics of Stage Differences of Enterprise TMT Shared Mental Model

Enterprise TMT shared mental model has significant differences in development stages of
the team life cycle. Differences of task-based shared mental model manifest as performing > norming > forming > storming and those of team-based mental model manifest as performing > norming > storming > forming. Therefore, hypotheses la and lb are tenable.

In the forming of TMT, TMT members are relatively confident of the enterprise’s development vision, which is also the reason that they can cooperate and work together with each other. In this stage, members are task-oriented, but there are still disagreements about what means of competition members should adopt for the realization of strategic goals and access to support of external resources. They also have diversified environmental awareness and understandings of team operation regulations. Therefore, in forming, TMT task-based mental model is not high-leveled. Although most of members know each other or have certain indirect understandings of each other when the TMT is established, they generally have no common work experience and know little about each other’s expertise distribution, style distribution, role distribution and complementary expertise, so TMT team-shared mental model stays in the surface level. After TMT enters the storming stage, disagreements and contradictions between team members begin to emerge and interpersonal relations become tense. More time of TMT members is spent in handling how to reduce internal frictions and members have naturally paid less attention to team tasks. Consequently, in this stage, there will be usually a drop in the level of TMT task-based shared mental model compared with the former stage. In the meantime, as time passes by, TMT members know more about each other’s respective expertise and other aspects, but this recognition may be based on mistrust. With escalated emotional conflicts, TMT members still have doubts about whether other members’ expertise can really bring benefits to the team and think that it still takes time to observe the different styles that members display with the former stage. Therefore, in this stage, the level of the TMT team-based shared mental model goes up slightly. When the TMT has transited into the norming, with the deepening of the interactions and effectively enhanced communication between members, the tense relations have been mollified gradually. They are also able to better understand team tasks and have ascending consensuses of strategic goals, means of competition, environmental awareness, operation regulations and access to the support of external organizational resources. However, because there is a decline for the TMT task-based shared mental model in storming, so although the level of the TMT task-based shared mental model rises compared with the former two stages, in general, TMT task-based shared mental model in this stage has a slow rise and still stays in a not high level. As TMT members have deeper understandings of each other’s expertise knowledge, behavioral styles, job responsibilities, etc, their methods and skills of communication and coordination also have been improved and TMT team-based shared mental model will continue the rising trend like the pervious two stages. After TMT enters the performing stage, TMT members focus on team tasks and their consensuses are also further enhanced in strategic objectives, means of competition, environmental awareness, operation regulations and access to the support of external resources. Furthermore, they have been quite familiar with each other’s expertise
knowledge, behavioral styles, job responsibilities and other aspects. Once there are new tasks, they would know the roles they should assume and play, and communicate and cooperate with each other whole heartedly relying on the established team norms and standardized procedures. Therefore, in this stage, both TMT task-based shared mental model and team-based shared mental model will also get further improvements.

3.5.2 Stage Characteristics of Enterprise TMT Shared Mental Model Evolution

Enterprise TMT shared mental model mainly manifests as general task-based shared mental model and relatively low team-based shared mental model in forming, relatively low task-based shared mental model and general team-based shared mental model in storming, general task-based shared mental model and relatively high team-based shared mental model in norming and relatively high task-based shared mental model and very high team-based shared mental model in performing. Therefore, hypotheses 2a, 2b, 2c and 2d are tenable.

In forming, TMT shared mental model mainly manifests as general task-based shared mental model and relatively low team-based shared mental model. On the one hand, in this stage, TMT members are generally relatively optimistic about the enterprise’s development prospects and identify with the strategic objectives TMT has formulated, but they still have disagreements in cognition involving in the selection of competition strategies, access to external resources, team operation regulations and other aspects. In this stage, TMT members may only generally retain their opinions opposite to other members and tend to follow the crowd or accept the view of the TMT leader. On the whole, TMT task-based shared mental model in this stage shows general performance; on the other hand, due to the lack of common work experience, interactions between members are not deepgoing enough and even some team members seem to be relatively cautious when they communicate. In consequence, members have shallow understandings of each other’s expertise and behavioral styles, know faintly about their own roles and rarely take into account whether members have complementary expertise. Therefore, the team-based shared mental model in this stage presents relatively low performance.

TMT shared mental model mainly manifests as relatively low task-based shared mental model and general team-based shared mental model in storming of the TMT. On the one hand, the heterogeneity of TMT members intensifies conflicts within the team and members begin to be suspicious of and dissatisfy with each other. The team begins to have cracks and discussions around tasks between members are reduced. More time is spent on how to maintain the team interpersonal relationship. In addition, turbulent changes of the external environment may shake the members’ team goals. In this stage, members require expressing opposite personalities to the team and fail to reach consensuses on the regulations. Thus, the TMT task-based shared mental model in this stage presents lower performance compared with the former stage. On the other hand, in this stage, TMT members have deeper understandings of each other’s responsibilities and roles they should undertake, but
intensified emotional conflicts result in uncertainties for whether their respective expertise can play a complementary role. As members’ personalities are unleashed fully in this stage, members have deeper understandings of each other’s styles. However, due to not high trust in this stage, they all think that this cognition remains to be further inspected and amended. Hence the TMT team-based shared mental model in this stage presents a slight improvement compared with the former stage, but still shows general performance.

TMT shared mental model mainly manifests as general task-based shared mental model and relatively high team-based shared mental model in TMT norming. On the one hand, tense relations between TMT members begin to thaw and unfreeze. Members gradually focus on team task objectives and show more support and cooperation with each other with more understanding and tolerance of different points of view. The team begins to gradually establish wok rules that members generally follow and achieves increasingly rising consensuses on means of competition, environmental awareness, access to external resources support and other aspects. However, due to the emergence of low ebb in the former stage of TMT task-based shared mental model, so although there is a steady increase for the performance of TMT task-based shared mental model in this stage, it still shows general performance as a whole. On the other hand, with the management institutionalization and the programming communication and interaction patterns, members are relatively clear about responsibilities and obligations with which their roles endow them. Meanwhile, members have deeper understandings of each other’s characters and specialties and also believe that specialties of members can be complementary and exactly what they need to complete team tasks. In this stage, the TMT team-based shared mental model earns a continued upward trend presented in the former stage and shows relatively high performance.

TMT shared mental model mainly manifests as relatively high task-based shared mental model and very high team-based shared mental model in performing. On the one hand, TMT members highly agree on strategic goals and shift attention to quickly implementing team objectives. In this stage, team norms have been formed and members begin to consciously comply with the team norms. They also have reached high consensuses on competitive strategies, environmental awareness, access to external resources support and other aspects. The TMT task-based shared mental model has been further enhanced and shows a relatively high level. On the other hand, TMT members have been quite familiar with each other’s knowledge, expertise, styles of handling affairs, job responsibilities and other aspects. Once there are new tasks, they would know the roles they should undertake, and communicate and cooperate with each other with concerted efforts relying on the team norms and standardized procedures that have been established. The TMT team-based shared mental model has been further improved and shows a very high level.

3.6 Summary
This chapter has studied and verified stage characteristics of the evolution of high-
performance enterprise TMT shared mental model, namely, evolving from general task-based shared mental model and relatively low team-based shared mental model in forming to relatively low task-based shared mental model and general team-based shared mental model in storming, and then transiting into general task-based shared mental model and relatively high team-based shared mental model in norming and finally developing into relatively high task-based shared mental model and very high team-based shared mental model in performing.

Although the questionnaire survey has been supplemented to support interviews in this study, only 25 enterprises have been interviewed and the final research conclusion is obtained from questionnaire analysis. Even though it is equivalent to study four development stages of the same enterprise’s TMT shared mental model characteristics in different periods and four development stages of four different enterprises’ TMT shared mental model characteristics in the same period, the addition of time factor will still trigger changes of many factors. The cross sectional study of TMT shared mental model characteristics can not completely replace the longitudinal study of TMT shared mental model characteristics after all. Longitudinal analysis of the evolution characteristics of the TMT shared mental model through typical cases is the direction of further research, which will be studied in the fourth chapter.
Chapter 4 Team Performance Process Mechanism of TMT Shared Mental Model

4.1 Introduction
There are two views on the acting paths of shared mental model for the team performance in previous studies. One view holds that the shared mental model affects team performance directly and the other one regards that the shared mental model affects team performance through team process. Discussions about this aspect have been expounded above and it is unnecessary to go into details in this chapter. Among previous discussions of the relationship between the shared mental model and team performance, most of them focused on virtual team, specific task team and other variety of teams, but rare studies have been seen on the relationship between the shared mental model and team performance. This study mainly centers on the team performance process mechanism of TMT shared mental model.

On the team process composition, academic circles have not yet formed a consistent view and perspective. Jewell and Reitz (1981) held the view that communication, teamwork and competition were the dominant factors of the team process. Salas (1993) thought the team process included three key elements: communication, coordination and teamwork. When studying TMT interaction process, Hambrick (1994) put forward team process elements, such as cooperation behavior and information exchange. Research results of Mathieu et al. (2000) showed that both of two types of share mental model, namely, task-based shared mental model and team-based shared mental model, had effects on teamwork, information exchange and other team process variables, and these variables played completely intermediary roles in shared mental model and team performance. When studying the relationship between the heterogeneity of TMT demographic characteristics and team effectiveness, Bunderson & Sutcliff (2002) found that information sharing behavior acted as an intermediary role between them. Cai Yangfeng (2011) thought the team process included cohesion, trust, sense of identity, goal commitment, teamwork, innovation and other dimensions. Xiao Dingding and Zhu Guilong (2012) took advantage of teamwork and communication to depict the team process.

Synthesizing the above scholars’ expositions, this study divides TMT process into two dimensions: teamwork and information exchange. This study mainly discusses the relationships between TMT shared mental model, team process and team performance. That is to say, it investigates the relationship between TMT shared mental model and team performance and whether TMT process play an intermediary role in the relationship of the two.

4.2 Research Hypotheses
4.2.1 TMT Shared Mental Model and TMT Process
Since Cannon-Bowers et al. (1993) and Klimoski and Mohammed (1994) put forward the concept of shared mental model, some researchers have begun to explore the connection between shared mental model and team process, because in their view, team process was the result of team shared mental model (Klimoski and Mohammed, 1994; Mathieu et al., 2000) and team shared mental model was a significant predictor of team process (Minionis, 1994; Heffner, 1997; Ensley and Pearce, 2001). After reviewing the research literature of the relationship between team shared mental model and team process, this study has found that teamwork and information exchange were analysis variables that some scholars had adopted when they selected team process variables. Minionis (1994) was one of the earliest scholars who studied the relationship between team shared mental model and team process. His study suggested that for a task requiring multiple members to complete, the team with the shared mental model promoted teamwork and thus made the team more likely to succeed. The study of Stout et al. (1999) indicated that the team with the shared mental model played a driving role in teamwork and helped the team interact more effectively. When discussing the relationships between team shared mental model, team information exchange and team performance, Marks et al. (2000) found the shared mental model had a stronger connection with team information exchange by comparing the abnormal environment with the conventional environment. Research results of Mathieu et al. (2000) showed that both the shared mental model related to the team and the shared mental model related to the task had impacts on teamwork and team information exchange. The study of Resick (2005) also indicated that task-based shared mental model improved teamwork and enhanced the sense of efficacy. Lv Xiaojun (2009) held that the relationship between team shared mental model and team efficacy would be affected completely by intermediary process elements like team communication and cooperation. The above studies have shown that the shared mental model played a role in promoting teamwork, information exchange and other team process variables, which forebodes that the TMT with a high-level shared mental model also can show high-level teamwork and information exchange. Therefore, this study puts forward the following hypotheses:

Hypothesis 1a: TMT task-based shared mental model has a significant positive effect on teamwork.
Hypothesis 1b: TMT task-based shared mental model has a significant positive effect on the information exchange.
Hypothesis 1c: TMT team-based shared mental model has a significant positive effect on teamwork.
Hypothesis 1d: TMT team-based shared mental model has a significant positive effect on the information exchange.

4.2.2 TMT Process and Team Performance

Since the 1990s, studies of team process have gradually come into sight of TMT researchers. One of the research directions is to explore the relations between teamwork, information
exchange and process variables and team result variables. Studies of Michie, Dooley & Fryxell (2002) and Kerr and Tindale (2004) suggested that the more open and cooperative the team was, the better it could improve the quality of strategic decision-making and accelerate the organization development. Bunderson & Sutcliffe (2002) found that information exchange and sharing between TMT members played intermediary roles between heterogeneity of TMT demographic characteristics and team effectiveness. Cheng Jin and Bai Haiqing (2002) thought highly behavioral integrated TMT should form more effective interactions and information exchanges for solutions and decision-making and these interactions and communication could promote the improvement of organizational performance. Tao Jianhong (2013) considered that full exchanges of information between TMT members could provide the team with directions and contents of communication and keys to enhance the decision-making and team performance. Cooperation between TMT members can allow them to make efficient use of complementary resources, give full play to the wisdom of each other, make satisfactory decisions and achieve better team performance. Information exchanges or sharing between TMT members can integrate different information and resources of members. Comprehensive and abundant information provides a resource base for the improvement of team performance and helps TMT make scientific and effective decisions. It will also enhance members’ satisfaction with the team and promote enterprises to have better development. The TMT in which team members are highly satisfied and the enterprise presents high growth performance more indicates active, timely and full information exchanges with high cooperation. Therefore, this study puts forward the following hypotheses:

Hypothesis 2a: Teamwork has a significant positive effect on team satisfaction.
Hypothesis 2b: Teamwork has a significant positive effect on enterprise growth performance.
Hypothesis 2c: Information exchange has a significant positive effect on team satisfaction.
Hypothesis 2d: Information exchange has a significant positive effect on team enterprise growth performance.

4.2.3 Intermediation of TMT Process

The shared mental model does not necessarily work on team performance directly. Research has shown that the shared mental model plays an indirect role in team performance through team process like teamwork and information exchange (Minionis et al., 1994; Stout et al., 1999; Mathieu et al., 2000; Resick, 2005; Mathieu, Heffner, Goodwin et al., 2005; Lv Xiaojun, 2009; DeChurch & Mesmer-Magnus, 2010). The more consistent TMT members have understandings of enterprise strategic goals, means of competition, environmental awareness, operation regulations, access to the support of external resources and tasks, the less the team in-fighting will be and the stronger the teamwork awareness will be. Members are willing to exchange information when completing tasks. Therefore, the more satisfied TMT members are with the team, the more likely an enterprise will be to win higher market shares and sales growth relative to its competitors. In general, TMT task-based shared mental model improves the team performance by promoting teamwork and information exchanges (team satisfaction, growth performance, etc.)
Meanwhile, the deeper TMT members have understandings of each other’s expertise distributions, the greater suggestions of TMT members with special skills in some aspects will be attached importance to in making decisions and the less dissent will be in decision-making discussions. The more TMT members know about each other’s work styles, the more easily members show more tolerance for each other. The better TMT members know about each other’s roles that they should take, the more unlikely buck-passing situations will be to happen at work. The deeper TMT members have understandings of each other’s expertise complementation, the higher initiative they will take to seek cooperative, because they all hope to have the complementary effect of $1 + 1 > 2$. All these will improve teamwork and the possibility of information exchange. The more TMT members have command of means of team collaboration, the fewer there are obstacles for the information exchange and the easier the information exchange is to achieve. All these will enhance team members’ satisfaction with the team and improve enterprise growth performance. Broadly speaking, TMT shared mental model promote teamwork and information exchange and then further improve team performance.

Therefore, this study puts forward the following hypotheses:

Hypothesis 3a: TMT process acts as the mediator in the relationship between TMT task-based shared mental model and team performance.

Hypothesis 3b: TMT process acts as the mediator in the relationship between TMT team-based shared mental model and team performance.

4.3 Research Design

4.3.1 Description of Samples

Research samples still include two parts: trail-test samples and formal test ones. Trail-test samples are TMT members from 55 enterprises in Hunan. 208 copies of questionnaire were issued and 182 copies from 46 enterprises have been retrieved. After removing questionnaires with missing contents and invalid questionnaires in which the numbers of TMT members were less than 2, the author finally obtained 112 effective questionnaires from 42 enterprises. Formal test samples are TMT members from 142 enterprises in Zhejiang, Guangxi and other provinces. 564 copies of questionnaire were issued and 426 copies from 128 enterprises have been retrieved. Eliminating questionnaires with missing contents and invalid questionnaires in which the numbers of TMT members were less than 2, the author finally obtained 398 effective questionnaires from 125 enterprises. All people who answered the questionnaire in the above mentioned two kinds of samples serve as the deputy general manager or above posts.

4.3.2 Measurement

This research questionnaire includes three scales: TMT shared mental model, TMT process and team performance. The scale of TMT shared mental model includes task-based shared mental model and team-based shared mental model with nine measuring items and five
points. The scale of TMT process includes two dimensions: information exchange and teamwork. Measuring items of information exchange dimension are formulated and revised based on views of Hambrick (1994), Simsek et al. (2005), Carmeli and Schaubroeck (2006)\[194\], etc. Measuring items of teamwork dimension are formulated and revised based on views of Simsek et al. (2005), Carmeli and Schaubroeck (2006), Carmeli and Halevi(2009). The measurement of team performance contains objective evaluation and subjective evaluation. The scale of team performance is made and revised by referring to studies of Naalder(1990) and Venkatraman(1989), including subjective evaluation of team satisfaction and objective evaluation of growth performance. After discussing with two professors of business management, the author finalized the team process scale with 6 items and the team performance scale with 7 items. Teamwork dimension in the team process scale was measured through three items, such as “when a TMT member is busy at work, the other TMT members will actively offer to help and share tasks with him”. The information exchange dimension was measured through three items, such as “communication between TMT members can produce effective solutions to problems”. In the team performance scale, team satisfaction was measured through four items, such as “the general evaluation of teamwork made by TMT members”. The growth performance dimension was measured through three items, such as “satisfaction of sales growth”. The above all items were measured by Likert five-level scale.

4.3.3 Research Procedure and Statistical Analysis

After questionnaire scales had been made, trial tests were conducted on 112 subjects from 42 enterprises. Exploratory analyses of TMT process and team performance were done in this study. By removing items with relatively small loading values in the questionnaire and modifying blunt and ambiguous semantic expressions, formal measurement was conducted. Formal samples including 398 subjects from 125 enterprises were adopted for the confirmatory analysis. Then this study investigated the relationships between TMT shared mental model and team process and between TMT process and team performance. Furthermore, it also verified the mediating effect of TMT process. When analyzing, this study adopted SPSS17.0, AMOS20.0 and other software to conduct factor analysis, variance analysis and structural equation modeling.

4.4 Research Results

4.4.1 Exploratory Factor Analysis and Reliability Test of TMT Process

Exploratory factor analyses of TMT process were made on TMT questionnaire data of 42 enterprises in trial-test samples by adopting SPSS17.0. First, KMO (Kaiser-Meyer-Olkin) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity were carried out on sample data. The test results are as shown in Table 4-1. KMO statistics is 0.743. Based on the view of Kaiser (1974), if KMO was more than 0.7, factor analysis was suitable. In addition, the significance probability of the statistical value of Bartlett’s Test of Sphericity is 0.000, less
than 0.001, which has further indicated that factor analysis is suitable for the sample data.

Table 4-1 KMO and Bartlett’s Test of Sphericity (N=42)

<table>
<thead>
<tr>
<th></th>
<th>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</th>
<th>Bartlett’s Test of Sphericity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>.743</td>
<td>93.486</td>
</tr>
<tr>
<td>Approx. Chi-Square</td>
<td></td>
<td>Df</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sig.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>.000</td>
</tr>
</tbody>
</table>

Principal component analysis was used to extract the common factor whose eigenvalue was greater than 1.0. The method of varimax in orthogonal rotation was utilized to extract factors. According to the test criterion put forward by Kaiser(1974), results of factor analysis were obtained as shown in Table 4-2 by rejecting items with the factor having lower load or two or more factors having roughly the same load.

Table 4-2 Exploratory Factor Analysis of TMT Process (N=42)

<table>
<thead>
<tr>
<th>Measuring Items</th>
<th>Factor1</th>
<th>Factor2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor1: teamwork</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3 when a TMT member is busy at work, the other TMT members will actively offer to help and share tasks with him</td>
<td>.868</td>
<td>.012</td>
</tr>
<tr>
<td>C1 In the face of complicated tasks and work that must be finished within the time required, TMT members are willing to help each other</td>
<td>.851</td>
<td>.233</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Factor2: information exchange</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>C5 Communication between TMT members can produce high-level creativity and spirit of innovation</td>
<td>.073</td>
<td>.894</td>
</tr>
<tr>
<td>C4 Communication between TMT members can produce effective solutions to problems</td>
<td>.239</td>
<td>.820</td>
</tr>
<tr>
<td>C6 Communication between TMT members can produce valuable ideas and concepts</td>
<td>.156</td>
<td>.756</td>
</tr>
<tr>
<td>Percentage of each factor’s explained variation</td>
<td>50.38</td>
<td>23.233</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>3.023</td>
<td>1.394</td>
</tr>
</tbody>
</table>

Finally, two common factors whose eigenvalues were more than 1 were separated out. The two factors were named teamwork (three measuring items) and information exchange (three measuring items), respectively. Two factors’ cumulative explained variations were up
to 73.620% (>60%), in which “teamwork” explained 50.387% of the variation and factor load ranged from 0.826 to 0.868 (>0.7); “Information exchange” explained 23.233% of the variation and factor load ranged from 0.756 to 0.894 (>0.7), which indicated that each item had relatively good structural validity.

The reliability test was conducted on TMT process from exploratory factor analysis, as shown in Table 4-3. Results suggest that coefficients of Corrected Item-Total Correlation of various structural manifest variables are greater than 0.5 and the reliability coefficients after items have been removed are smaller than the overall α reliability coefficient in the structural dimension. All structural overall α reliability coefficients are greater than 0.7, which indicates that two-dimensional structural factors of TMT process have relatively good reliability.

<table>
<thead>
<tr>
<th>Factor Structure</th>
<th>Item</th>
<th>CITC</th>
<th>α Reliability Coefficient after Item Deletion</th>
<th>α Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>C1</td>
<td>0.723</td>
<td>0.737</td>
<td>0.833</td>
</tr>
<tr>
<td></td>
<td>C2</td>
<td>0.701</td>
<td>0.761</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C3</td>
<td>0.656</td>
<td>0.805</td>
<td></td>
</tr>
<tr>
<td>Information Exchange</td>
<td>C4</td>
<td>0.638</td>
<td>0.702</td>
<td>0.787</td>
</tr>
<tr>
<td></td>
<td>C5</td>
<td>0.712</td>
<td>0.617</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C6</td>
<td>0.543</td>
<td>0.709</td>
<td></td>
</tr>
</tbody>
</table>

### 4.4.2 Confirmatory Factor Analysis and Validity Test of TMT Process

AMOS20.0 was adopted to make confirmatory factor analyses (CFA) of 398 copies of questionnaire from 125 enterprises in the formal test. According to the output data fitted by the identified model, the study has analyzed and judged (Table 4-4) and thought TMT process factor model has good construct validity and can be accepted.

<table>
<thead>
<tr>
<th>Confirmatory Analysis</th>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute Fitness Indicators</td>
<td>2/df</td>
<td>&lt;2.00</td>
<td>1.115</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>RMR</td>
<td>&lt;.05</td>
<td>.016</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GFI</td>
<td>&gt;.90</td>
<td>.977</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>AGFI</td>
<td>&gt;.90 good</td>
<td>.940</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;.80 Acceptable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
It can be seen from Table 4-5 that all standardized coefficients are over 0.7, showing very high significance and indicating relatively good convergent validity. In addition, all indicators’ $R^2$ is more than 0.5, which suggests that the measurement of all latent variables has shown good internal consistency and two-factor structure of TMT process has good construct reliability. Finally, the study acquires the fit path Figure of TMT process two-factor structural model. Fit results of all models’ standardized parameters are shown in Figure 5-1.

### Table 4-5 Estimate Table of Factor Structural Parameters of TMT Process (N=125)

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Coefficient</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>Significance Probability</th>
<th>Multivariate Square Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>0.893</td>
<td>0.080</td>
<td>11.417</td>
<td>***</td>
<td>0.722</td>
</tr>
<tr>
<td>C2</td>
<td>0.822</td>
<td>0.083</td>
<td>12.268</td>
<td>***</td>
<td>0.775</td>
</tr>
<tr>
<td>C3</td>
<td>0.871</td>
<td>0.083</td>
<td>12.268</td>
<td>***</td>
<td>0.711</td>
</tr>
<tr>
<td>C4</td>
<td>0.843</td>
<td>0.085</td>
<td>11.446</td>
<td>***</td>
<td>0.676</td>
</tr>
<tr>
<td>C5</td>
<td>0.880</td>
<td>0.091</td>
<td>11.083</td>
<td>***</td>
<td>0.798</td>
</tr>
</tbody>
</table>

Note: *** means it is significant at $P<0.001$ level; ** means it is significant at $P<0.01$ level; * means it is significant at $P<0.05$ level.
Main fit indicators of the model indicate that the value of CMIN/DF is less than 2 and values of GFI, NFI, IFI, TLI and CFI are greater than 0.90. RMSEA is less than 0.08. All indicators have very high fit degrees, showing that conceived and measuring items of TMT process are acceptable. Figure 5-1 displays the mutual relations between items and factors. Therefore, two-factor model of TMT process is completely tenable. Two factors are teamwork and information exchange, respectively. Teamwork refers to more willing mutual help actions in TMT and TMT members are willing to adjust the scopes of their duties for the smooth teamwork. TMT members will take the initiative to help other members and share the work tasks when one member is busy or faced with complex tasks which should be finished within required time. Information exchange means communication between TMT members can produce effective solutions to issues, valuable ideas and concepts and high creativity and spirit of innovation.

4.4.3 Exploratory Factor Analysis and Reliability Test of TMT Performance

Exploratory factor analyses of TMT process were made on TMT questionnaire data of 42 enterprises in trial-test samples by adopting SPSS17.0. First, KMO (Kaiser-Meyer-Olkin) Measure of Sampling Adequacy and Bartlett’s Test of Sphericity were carried out on sample data. The test results are as shown in Table 4-6. KMO statistics is $0.801 > 0.7$. Based on the view of Kaiser (1974), if KMO was more than 0.7, factor analysis was suitable. In addition, the significance probability of the statistical value of Bartlett's Test of Sphericity is $0.000$, less than $0.001$, which has further indicated that factor analysis is suitable for the sample data.

<table>
<thead>
<tr>
<th>Table 4-6 KMO and Bartlett’s Test of Sphericity (N=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kaiser-Meyer-Olkin Measure of Sampling Adequacy</td>
</tr>
</tbody>
</table>

Figure 4-1: Confirmatory Factor Analysis of TMT Process
Principal component analysis was used to extract the common factor whose eigenvalue was greater than 1.0. The method of varimax in orthogonal rotation was utilized to extract factors. According to the test criterion put forward by Kaiser(1974), results of factor analysis were obtained as shown in Table 4-7 by rejecting items with the factor having lower load or two or more factors having roughly the same load.

Table 4-7 Exploratory Factor Analysis of TMT Process (N=42)

<table>
<thead>
<tr>
<th>Measuring Items</th>
<th>Factor1</th>
<th>Factor2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Factor1</strong>: Team Satisfaction</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D1 General evaluation made by TMT members on teamwork</td>
<td>.842</td>
<td>~</td>
</tr>
<tr>
<td>D2 Outside evaluation on TMT members</td>
<td>.794</td>
<td>.094</td>
</tr>
<tr>
<td>D3 TMT members’ satisfaction with teamwork</td>
<td>.776</td>
<td>.206</td>
</tr>
<tr>
<td>D4 TMT members’ satisfaction with the display of their expertise and abilities</td>
<td>.739</td>
<td>.328</td>
</tr>
<tr>
<td><strong>Factor2</strong>: growth performance</td>
<td>.162</td>
<td>.879</td>
</tr>
<tr>
<td>D6 Satisfaction with the sales growth</td>
<td>.177</td>
<td>.873</td>
</tr>
<tr>
<td>D7 The enterprise's acquisition of market shares relative to competitors</td>
<td>.351</td>
<td>.794</td>
</tr>
<tr>
<td>D5 The enterprise’s sales growth relative to competitors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage of each factor’s explained variation</td>
<td>38.143</td>
<td>34.032</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>3.790</td>
<td>1.263</td>
</tr>
</tbody>
</table>

Finally, two common factors whose eigenvalues were more than 1 were separated out. The two factors were named team satisfaction (three measuring items) and growth performance (three measuring items), respectively. Two factors’ cumulative explained variations were up to 72.175% (>60%), in which “team satisfaction” explained 38.143% of the variation and factor load ranged from 0.739 to 0.842(>0.7); “Growth performance” explained 34.032% of the variation and factor load ranged from 0.794 to 0.879(>0.7), which indicates that each item has relatively good structural validity.

The reliability test was conducted on TMT performance from exploratory factor analysis, as shown in Table 4-8. Results suggest that coefficients of Corrected Item-Total Correlation of various structural manifest variables are greater than 0.5 and the reliability coefficients after items have been removed are smaller than the overall \( \alpha \) reliability coefficient in the structural dimension. All structural overall \( \alpha \) reliability coefficients are greater than 0.7, which indicates that two-dimensional structural factors of TMT performance have relatively good reliability.
Table 4-8 Reliability Test of Two-Dimensional Structure of TMT Process (N=42)

<table>
<thead>
<tr>
<th>Factor Structure</th>
<th>Item</th>
<th>CITC</th>
<th>α Reliability Coefficient after Item Deletion</th>
<th>α Reliability Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Satisfaction</td>
<td>D1</td>
<td>0.763</td>
<td>0.739</td>
<td>0.831</td>
</tr>
<tr>
<td></td>
<td>D2</td>
<td>0.611</td>
<td>0.808</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D3</td>
<td>0.638</td>
<td>0.799</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D4</td>
<td>0.655</td>
<td>0.798</td>
<td></td>
</tr>
<tr>
<td>Growth Performance</td>
<td>D5</td>
<td>0.703</td>
<td>0.813</td>
<td>0.852</td>
</tr>
<tr>
<td></td>
<td>D6</td>
<td>0.737</td>
<td>0.789</td>
<td></td>
</tr>
<tr>
<td></td>
<td>D7</td>
<td>0.745</td>
<td>0.779</td>
<td></td>
</tr>
</tbody>
</table>

4.4.4 Confirmatory Factor Analysis and Validity Test of TMT Performance

AMOS 20.0 was adopted to make confirmatory factor analyses (CFA) of 398 copies of questionnaire from 125 enterprises in the formal test. According to the output data fitted by the identified model, the study has analyzed and judged (Table 4-9) and thought TMT performance factor model has good construct validity and can be accepted.

Table 4-9 Summary Table of the Overall Model Fitness Test of TMT Performance Scale Confirmatory Analysis

<table>
<thead>
<tr>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Fitness Indicators</td>
<td>$\chi^2$/df</td>
<td>&lt;2.00</td>
<td>1.265</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RMR</td>
<td>&lt;.05</td>
<td>.019</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GFI</td>
<td>&gt;.90</td>
<td>.964</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>AGFI</td>
<td>&gt;.90 good</td>
<td>.922</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;.80 Acceptable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td></td>
<td>&lt;.08</td>
<td>.046</td>
<td>Yes</td>
</tr>
<tr>
<td>Value-Added Fitness Indicators</td>
<td>NFI</td>
<td>&gt;.90</td>
<td>.978</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RFI</td>
<td>&gt;.90</td>
<td>.964</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>TLI</td>
<td>&gt;.90</td>
<td>.992</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>IFI</td>
<td>&gt;.90</td>
<td>.995</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CFI</td>
<td>&gt;.90</td>
<td>.995</td>
<td>Yes</td>
</tr>
<tr>
<td>Parsimonious Fitness Indicators</td>
<td>PGFI</td>
<td>&gt;.50</td>
<td>.547</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>PNFI</td>
<td>&gt;.50</td>
<td>.605</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>PCFI</td>
<td>&gt;.50</td>
<td>.616</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>AIC</td>
<td>Theoretical model value is less than the independent model value and less than 46.442 &lt; 56.000</td>
<td>46.442 &lt; 746.510</td>
<td>Yes</td>
</tr>
</tbody>
</table>
the saturated model value

<table>
<thead>
<tr>
<th>CAIC</th>
<th>Theoretical model value is less than the independent model value and less than the saturated model value.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>103.867 &lt; 163.193</td>
</tr>
<tr>
<td></td>
<td>103.867 &lt; 773.309</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>Yes</td>
</tr>
</tbody>
</table>


It can be seen from Table 4-10 that all standardized coefficients are over 0.7, showing very high significance and indicating relatively good convergent validity. In addition, all indicators’ R² is more than 0.5, which suggests that the measurement of all latent variables has shown good internal consistency and two-factor structure of TMT performance has good construct reliability. Finally, the study acquires the fit path Figure of TMT performance two-factor structural model. Fit results of all models’ standardized parameters are shown in Figure 4-2.

Table 4-10 Estimate Table of Factor Structural Parameters of TMT Process (N=125)

<table>
<thead>
<tr>
<th>Path</th>
<th>Standardized Coefficient</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>Significance Probability</th>
<th>Multivariate Square Coefficient (R²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1 &lt;- team satisfaction</td>
<td>.864</td>
<td>.080</td>
<td>13.618</td>
<td>***</td>
<td>.747</td>
</tr>
<tr>
<td>D2 &lt;- team satisfaction</td>
<td>.933</td>
<td>.066</td>
<td>16.141</td>
<td>***</td>
<td>.871</td>
</tr>
<tr>
<td>D3 &lt;- team satisfaction</td>
<td>.913</td>
<td>.073</td>
<td>15.372</td>
<td>***</td>
<td>.834</td>
</tr>
<tr>
<td>D4 &lt;- team satisfaction</td>
<td>.884</td>
<td></td>
<td></td>
<td></td>
<td>.781</td>
</tr>
<tr>
<td>D5 &lt;- growth performance</td>
<td>.890</td>
<td>.107</td>
<td>10.992</td>
<td>***</td>
<td>.792</td>
</tr>
<tr>
<td>D6 &lt;- growth performance</td>
<td>.766</td>
<td>.114</td>
<td>9.404</td>
<td>***</td>
<td>.587</td>
</tr>
<tr>
<td>D7 &lt;- growth performance</td>
<td>.830</td>
<td></td>
<td></td>
<td></td>
<td>.689</td>
</tr>
</tbody>
</table>

Note: *** means it is significant at P<0.001 level; ** means it is significant at P<0.01 level; * means it is significant at P<0.05 level.

Figure 4-2: Confirmatory Factor Analysis of TMT Process
Main fit indicators of the model indicate that the value of CMIN/DF is less than 2 and values of GFI, NFI, IFI, TLI and CFI are greater than 0.90. RMSEA is less than 0.08. All indicators have very high fit degrees, showing that conceived and measuring items of TMT performance are acceptable. Figure 5-2 displays the mutual relations between items and factors. Therefore, two-factor model of TMT performance is completely tenable. Two factors are team satisfaction and growth performance, respectively. Team satisfaction refers to TMT members’ and outside overall evaluation and direct feelings of TMT work and members themselves in team work, outside evaluation of TMT and TMT members’ satisfaction with the display of their expertise and abilities. Growth performance refers to the overall evaluation of sales growth and acquisition of market shares in the enterprise’s development, including satisfaction with sales growth rate, the acquisition of market shares and the enterprise’s sales growth relative to competitors.

4.4.5 Multilevel Data and Total Verification
In the study, variables like teamwork, information exchange, team satisfaction, growth performance are evaluated by multiple top managers, so it needs to polymerize to the TMT level from data of team members in the operation of variables. The coefficient of intra-group consistency $r_{wg}$, intra-group correlation coefficient ICC(1) and ICC(2) and other indicators are shown in Table 4-11.

<table>
<thead>
<tr>
<th>Variables</th>
<th>$r_{wg}$</th>
<th>ICC (1)</th>
<th>ICC (2)</th>
<th>F-test</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Work</td>
<td>0.79</td>
<td>0.33</td>
<td>0.61</td>
<td>5.65</td>
<td>***</td>
</tr>
<tr>
<td>Information Exchange</td>
<td>0.74</td>
<td>0.29</td>
<td>0.56</td>
<td>3.23</td>
<td>***</td>
</tr>
<tr>
<td>Team Satisfaction</td>
<td>0.87</td>
<td>0.59</td>
<td>0.82</td>
<td>12.00</td>
<td>***</td>
</tr>
<tr>
<td>Growth Performance</td>
<td>0.82</td>
<td>0.36</td>
<td>0.63</td>
<td>6.03</td>
<td>***</td>
</tr>
</tbody>
</table>

Note: *** means it is significant at $P<0.001$ level; ** means it is significant at $P<0.01$ level; * means it is significant at $P<0.05$ level.

It can be seen from the above table that ICC(1) and ICC(2) of all variables are greater than 0.05 and 0.50, the critical values recommended by James (1982). All F statistics are above 1 and have passed through the test of significance. ICC test results show that inter-group variations of these research variables are significantly higher than intra-group ones. Therefore, seen from the comprehensive results of $r_{wg}$, ICC [1] and ICC [2], all variable data meet the empirical criteria and accord with the conditions of team aggregation. Therefore, individual measurements can be totaled averaged to represent the team measurement.

4.4.6 Impact of TMT Shared Mental Model on Team Process
As discussed above, the study has defined that TMT shared mental model includes task-based shared mental model and team-based shared mental model and has verified that TMT process includes teamwork and information exchange. In addition, this study has elaborated theoretically that there are direct connections between task-based shared mental model and team-based shared mental model and TMT process. AMOS20.0 has been adopted to analyze 125 enterprise samples gained in the formal test and verify the relationship between TMT shared mental model and TMT process. The model of the relationship between TMT shared mental model and TMT process is shown in Figure 4-3.
Figure 4-3 Model of the Relationship between TMT Shared Mental Model and TMT Process

According to analysis and judgment of the output data fitted by the identified model (as shown in Table 4-12), the fitness of TMT shared mental model and TMT process model is relatively good, so the model of the relationship between TMT shared mental model and TMT process is tenable.

Table 4-12 Summary Table of the Model Fitness Test of Relationship between TMT Shared Mental Model and TMT Process

<table>
<thead>
<tr>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\chi^2/df$</td>
<td>$&lt;2.00$</td>
<td>1.156</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>RMR</td>
<td>$&lt;.05$</td>
<td>.045</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>GFI</td>
<td>$&gt;.90$</td>
<td>.910</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>AGFI</td>
<td>$&gt;.90$ good</td>
<td>.873</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$&gt;.80$ Acceptable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td>$&lt;.08$</td>
<td>.035</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>NFI</td>
<td>$&gt;.90$</td>
<td>.941</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>RFI</td>
<td>$&gt;.90$</td>
<td>.928</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>TLI</td>
<td>$&gt;.90$</td>
<td>.990</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>IFI</td>
<td>$&gt;.90$</td>
<td>.992</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>$&gt;.90$</td>
<td>.992</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>
The standard path coefficient of TMT shared mental model to TMT process is shown in Table 4-13. It can be seen from Table 4-13 that the standard path coefficient of task-based shared mental model to teamwork is significant at .01 level and standard path coefficients of task-based shared mental model and team-based shared mental model to information exchange are significant at .05 level, which indicate that task-based shared mental model and team-based shared mental model have significant impacts on the cooperative behavior in team process, while team-based shared mental model has no significant impact on the cooperative behavior in team process. Moreover, the path coefficient of team-based shared mental model to teamwork is relatively low.

4.4.7 Impact of TMT Process on TMT Performance

As discussed above, the study has defined that TMT performance includes team satisfaction and growth performance and has verified that TMT process includes teamwork and information exchange. In addition, this study has elaborated theoretically that there are a direct relationship between TMT process and team performance. AMOS20.0 has been adopted to analyze 125 enterprise samples gained in the formal test and verify the relationship between TMT process and team performance. The model of the relationship
between TMT process and team performance is shown in Figure 4-4.
According to analysis and judgment of the output data fitted by the identified model (as shown in Table 4-14), the fitness of TMT process and TMT performance model is relatively good, so the model of the relationship between TMT process and team performance is tenable.

Table 4-14 Summary Table of the Model Fitness Test of Relationship between TMT Process and TMT Performance

<table>
<thead>
<tr>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Fitness Indicators</td>
<td>2/df</td>
<td>&lt;2.00</td>
<td>1.399</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RMR</td>
<td>&lt;.05</td>
<td>.049</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GFI</td>
<td>&gt;.90</td>
<td>.905</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>AGFI</td>
<td>&gt;.90 good</td>
<td>.855</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;.80 Acceptable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RMSEA</td>
<td>&lt;.08</td>
<td>.057</td>
<td>Yes</td>
</tr>
<tr>
<td>Value-Added Fitness Indicators</td>
<td>NFI</td>
<td>&gt;.90</td>
<td>.937</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RFI</td>
<td>&gt;.90</td>
<td>.918</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>TLI</td>
<td>&gt;.90</td>
<td>.975</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>IFI</td>
<td>&gt;.90</td>
<td>.981</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CFI</td>
<td>&gt;.90</td>
<td>.981</td>
<td>Yes</td>
</tr>
<tr>
<td>Parsimonious</td>
<td>PGFI</td>
<td>&gt;.50</td>
<td>.596</td>
<td>Yes</td>
</tr>
</tbody>
</table>
After the fitting, all path coefficients between various latent variables and manifest variables in the model of the relationship between TMT process and team performance have passed the test of significance. The standard path coefficients between various latent variables are shown in Table 4-15. It can be seen from Table 4-15 that the standard path coefficients of teamwork to team satisfaction, information exchange to team satisfaction and information exchange to growth performance are significant at .01 level and the standard path coefficient of teamwork to growth performance is significant at .05 level, which indicate that teamwork has a significant impact on the team satisfaction; information exchange and growth performance have significant impacts on team satisfaction and growth performance.

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficient (E)</th>
<th>Standard Error (S.E.)</th>
<th>Critical Ratio (C.R.)</th>
<th>Significance Probability (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team satisfaction &lt;- teamwork</td>
<td>.327***</td>
<td>.131</td>
<td>3.425</td>
<td>***</td>
</tr>
<tr>
<td>Growth performance &lt;- teamwork</td>
<td>.201*</td>
<td>.12</td>
<td>2.077</td>
<td>.038</td>
</tr>
<tr>
<td>Team satisfaction &lt;- information exchange</td>
<td>.369***</td>
<td>.13</td>
<td>3.729</td>
<td>***</td>
</tr>
<tr>
<td>Growth performance &lt;- information exchange</td>
<td>.407***</td>
<td>.12</td>
<td>3.997</td>
<td>***</td>
</tr>
</tbody>
</table>

Note: ***means it is significant at P<0.001 level; ** means it is significant at P<0.01 level; * means it is significant at P<0.05 level.

### 4.4.8 Impact of TMT Shared Mental Model on TMT Performance

The study adopts formal test samples of 125 enterprises to analyze the relationship between TMT shared mental model and TMT performance. The impact of TMT shared mental model on TMT performance is shown in Figure 4-5.
According to analysis of the output data fitted by the identified model, as shown in Table 4-16, indicators like $2/df$, RMR, AGFI, RMSEA, NFI, TLI, IFI, CFI, PGFI, PNFI, PCFI, AIC and CAIC have reached the model fitness standards. GFI is 0.873 and in close proximity to 0.9. Thus it can be seen that the model fitness effect of TMT Shared mental model on TMT performance is relatively good.

Table 4-16 Summary Table of the Model Fitness Test of Relationship between TMT Shared Mental Model and TMT Process

<table>
<thead>
<tr>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2/df$</td>
<td></td>
<td>$&lt;2.00$</td>
<td>1.505</td>
<td>Yes</td>
</tr>
<tr>
<td>RMR</td>
<td></td>
<td>$&lt;.05$</td>
<td>.049</td>
<td>Yes</td>
</tr>
<tr>
<td>GFI</td>
<td></td>
<td>$&gt;.90$</td>
<td>.873</td>
<td>Yes</td>
</tr>
<tr>
<td>AGFI</td>
<td></td>
<td>$&gt;.90$ good</td>
<td>.825</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&gt;.80$ Acceptable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td></td>
<td>$&lt;.08$</td>
<td>.064</td>
<td>Yes</td>
</tr>
</tbody>
</table>
After the fitting, all path coefficients between various latent variables and manifest variables in the model of the relationship between TMT shared mental model and TMT performance are shown in Table 4-17. It can be seen that the standard path coefficients of task-based shared mental model to team satisfaction and growth performance, team-based shared mental model to growth performance are significant at .05 level, indicating that task-based shared mental model has significant positive impacts on team satisfaction and growth performance; team-based shared mental model has a significant positive impact on growth performance; team-based shared mental model has no significant impact on team satisfaction.

Table 4-17 Standard Path Coefficients of TMT Shared Mental Model to TMT Performance (N=125)

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficient</th>
<th>Standard Error (E)</th>
<th>Standard Error (S.E.)</th>
<th>Critical Ratio (C.R.)</th>
<th>Significance Probability (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>team satisfaction ← task-based shared mental model</td>
<td>.283*</td>
<td>.118</td>
<td>2.570</td>
<td>.010</td>
<td></td>
</tr>
<tr>
<td>Growth performance ← task-based shared mental model</td>
<td>.228*</td>
<td>.112</td>
<td>2.075</td>
<td>.038</td>
<td></td>
</tr>
<tr>
<td>team satisfaction ← team-based shared mental model</td>
<td>.228*</td>
<td>.105</td>
<td>2.084</td>
<td>.037</td>
<td></td>
</tr>
<tr>
<td>Growth performance ← team-based shared mental model</td>
<td>.205</td>
<td>.109</td>
<td>1.889</td>
<td>.059</td>
<td></td>
</tr>
</tbody>
</table>

Note: *** means it is significant at P<0.001 level; ** means it is significant at P<0.01 level; * means it is significant at P<0.05 level.

4.4.9 Analysis of the Mediating Effect of TMT Process

Baron and Kenny (1986) held that a variable which is determined to have the mediating effect must meet the following four conditions: a. regression coefficient of the mediating variable to the independent variable must reach the significant level; b. regression coefficient of the dependent variable to the mediating variable must reach the significant level; c. for the regression of the dependent variable to both the independent variable and the mediating variable, the regression coefficient of the mediating variable reaches the significant level and the regression coefficient of the independent variable decreases. When
the regression coefficient of the independent variable decreases to a non-significant level, it shows that the mediating variable plays the role of complete mediation and the independent variable affects the dependent variable completely through the mediating variable; when the regression coefficient of the independent variable decreases, but still reaches the significant level, the mediating variable only plays a partially mediating role at this moment. That is to say, the independent variable not only affects the dependent variable indirectly through the mediating variable, but also has a direct impact on the dependent variable. This study will adopt structural equation modeling to validate hypotheses in accordance with the above four conditions and determine the impact of TMT shared mental model on team performance is accomplished through the mediating effect of team process.

After conditions a, b and c used to determine whether team process acts as a mediating role in the relationship of TMT shared mental model and team performance have been confirmed, this section will further analyze the condition d in the mediating effect to ascertain partial mediation model and complete mediation model whether partial mediation model or complete mediation model is tenable.

4.4.9.1 Analysis of the Partial Mediation Model of TMT Process

After the fit analysis of the partial mediation model of TMT process, the summary results of the model fitness test are shown in Table 4-18.

<table>
<thead>
<tr>
<th>Overall Fitness Evaluation Indicators</th>
<th>Statistical Test Quantity</th>
<th>Fitness Criteria or Critical Value</th>
<th>Test Result</th>
<th>Model Fitness Judgment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Fitness Indicators</td>
<td>$\chi^2$/df</td>
<td>$&lt; 2.00$</td>
<td>1.303</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RMR</td>
<td>$&lt; .05$</td>
<td>.049</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>GFI</td>
<td>$&gt; .90$</td>
<td>.846</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>AGFI</td>
<td>$&gt; .90$ good</td>
<td>.802</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$&gt; .80$ Acceptable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RMSEA</td>
<td></td>
<td>$&lt; .08$</td>
<td>.049</td>
<td>Yes</td>
</tr>
<tr>
<td>Value-Added Fitness Indicators</td>
<td>NFI</td>
<td>$&gt; .90$</td>
<td>.903</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>RFI</td>
<td>$&gt; .90$</td>
<td>.885</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>TLI</td>
<td>$&gt; .90$</td>
<td>.971</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>IFI</td>
<td>$&gt; .90$</td>
<td>.976</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>CFI</td>
<td>$&gt; .90$</td>
<td>.975</td>
<td>Yes</td>
</tr>
<tr>
<td>Parsimonious Fitness Indicators</td>
<td>PGFI</td>
<td>$&gt; .50$</td>
<td>.656</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>PNFI</td>
<td>$&gt; .50$</td>
<td>.766</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>PCFI</td>
<td>$&gt; .50$</td>
<td>.827</td>
<td>Yes</td>
</tr>
<tr>
<td>AIC</td>
<td></td>
<td>Theoretical model value is less than the independent model value and less than the saturated model value</td>
<td>369.290 $&lt; 506.000$</td>
<td>Yes</td>
</tr>
<tr>
<td>CAIC</td>
<td></td>
<td>Theoretical model value</td>
<td>587.504 $&lt; 1474.563$</td>
<td>Yes</td>
</tr>
</tbody>
</table>
It can be seen from Table 4-18, indicators like $2/df$, RMR, AGFI, RMSEA, NFI, TLI, IFI, CFI, PGFI, PNFI, PCFI, AIC and CAIC have reached the model fitness standards. GFI is 0.846, slightly less than 0.9. RFI is 0.885 and in close proximity to 0.9. The above fit indicators show that the partial mediation model fit of TMT process basically accommodates the requirements. The fit path Figure of the partial mediation model of TMT process is shown in Figure 4-6.

![Figure 4-6 Partial Mediation Model of TMT Process](image)

The standard path coefficients of the partial mediation model fit of TMT process are as shown in Table 4-19.

**Table 4-19 Standard Path Coefficients of the Partial Mediation Model Fit of TMT Process (N=125)**
seen from the effect of the independent variable (TMT shared mental model) on the mediating variable (team process), one path coefficient does not reach the significant level. The standard path coefficient of the effect task-based shared mental model on teamwork is 0.020 (not significant difference at 0). Other path coefficients reach the significant level. The standard path coefficients of effects of task-based shared mental model on teamwork and information exchange are 0.353 (significant at 0.01 level) and 0.256 (significant at 0.05 level) respectively. The standard path coefficient of the effect of task-based shared mental model on information exchange is 0.284 (significant at 0.05 level).

Seen from the effect of the mediating variable (team process) on the dependent variable (team performance), all path coefficients reach the significant level. The standard path coefficients of effects of teamwork on team satisfaction and growth performance are 0.314 (significant at 0.001 level) and 0.191 (significant at 0.05 level) respectively. The standard path coefficients of effects of information exchange on team satisfaction and growth performance are 0.298 (significant at 0.01 level) and 0.331 (significant at 0.01 level) respectively. From the effect of the independent variable (TMT shared mental model) on the dependent variable (team performance), all path coefficients have failed to reach the significant level. Specifically, the standard path coefficients of effects of task-based shared mental model on team satisfaction and growth performance are 0.101 (not significant difference at 0) and 0.078 (not significant difference at 0) respectively; the standard path coefficients of effects of team-based shared mental model on team satisfaction and growth performance are 0.116 (not significant difference at 0) and 0.132 (not significant difference at 0) respectively. Compared the effect of TMT shared mental model on team performance in Figure 4-5 with that of shown in Table 4-16, after the mediating variable, team process, has been introduced, the path coefficient of the effect of the independent variable (TMT shared mental model) on the dependent variable (team performance) becomes non-significant. According to the condition d used to determine the mediating effect, for the regression of the dependent variable to both the independent variable and the mediating variable, the regression coefficient of the mediating variable reaches the significant level and the regression coefficient of the independent variable decreases to a non-significant level, which demonstrate that the mediating variable plays a completely mediating role. The independent variable affects the dependent variable completely through the mediating variable. Therefore, it can be determined that team process plays a completely mediating role between TMT shared mental model and team

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficient (E)</th>
<th>Standard Error (S.E.)</th>
<th>Critical Ratio (C.R.)</th>
<th>Significance Probability (p)</th>
</tr>
</thead>
<tbody>
<tr>
<td>teamwork &lt;--task-based shared mental model</td>
<td>.353**</td>
<td>.089</td>
<td>3.043</td>
<td>.002</td>
</tr>
<tr>
<td>information exchange &lt;--task-based shared mental model</td>
<td>.256*</td>
<td>.092</td>
<td>2.324</td>
<td>.020</td>
</tr>
<tr>
<td>teamwork &lt;--team-based shared mental model</td>
<td>.020</td>
<td>.081</td>
<td>.173</td>
<td>.863</td>
</tr>
<tr>
<td>information exchange &lt;--team-based shared mental model</td>
<td>.284*</td>
<td>.086</td>
<td>2.588</td>
<td>.010</td>
</tr>
<tr>
<td>team satisfaction &lt;--teamwork</td>
<td>.314***</td>
<td>.116</td>
<td>3.457</td>
<td>***</td>
</tr>
<tr>
<td>growth performance &lt;--teamwork</td>
<td>.191*</td>
<td>.112</td>
<td>2.059</td>
<td>.040</td>
</tr>
<tr>
<td>team satisfaction &lt;--information exchange</td>
<td>.298**</td>
<td>.114</td>
<td>3.061</td>
<td>.002</td>
</tr>
<tr>
<td>growth exchange &lt;--information exchange</td>
<td>.331**</td>
<td>.112</td>
<td>3.256</td>
<td>.001</td>
</tr>
<tr>
<td>team satisfaction &lt;--task-based shared mental model</td>
<td>.101</td>
<td>.947</td>
<td>.947</td>
<td>.344</td>
</tr>
<tr>
<td>growth performance &lt;--task-based shared mental model</td>
<td>.078</td>
<td>.699</td>
<td>.699</td>
<td>.444</td>
</tr>
<tr>
<td>team satisfaction &lt;--team-based shared mental model</td>
<td>.116</td>
<td>1.125</td>
<td>1.125</td>
<td>.261</td>
</tr>
<tr>
<td>growth performance &lt;--team-based shared mental model</td>
<td>.132</td>
<td>1.232</td>
<td>1.232</td>
<td>.218</td>
</tr>
</tbody>
</table>

Note: ** means it is significant at P<0.001 level; * means it is significant at P<0.01 level; means it is significant at P<0.05 level.
4.4.9.2 Analysis of the Complete Mediation Model of TMT Process

After the fit analysis of the complete mediation model of TMT process, the summary results of the model fitness test are shown in Table 4-20.

| Table 4-20 Summary Table of the Model Fitness Test of the Complete Mediation Model of TMT Process |
|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|-------------------------------------------------|
| Overall Fitness Evaluation Indicators | Statistical Test Quantity | Fitness Criteria or Critical Value | Test Result | Model Fitness Judgment |
| Absolute Fitness Indicators | 2/df | <2.00 | 1.301 | Yes |
| | RMR | <.05 | .047 | Yes |
| | GFI | >.90 | .947 | Yes |
| | AGFI | >.90 good | .901 | Yes |
| | >.80 Acceptable | | | |
| | RMSEA | <.08 | .048 | Yes |
| Value-Added Fitness Indicators | NFI | >.90 | .948 | Yes |
| | RFI | >.90 | .921 | Yes |
| | TLI | >.90 | .978 | Yes |
| | IFI | >.90 | .986 | Yes |
| | CFI | >.90 | .985 | Yes |
| Parsimonious Fitness Indicators | PGFI | >.50 | .666 | Yes |
| | PNFI | >.50 | .779 | Yes |
| | PCFI | >.50 | .843 | Yes |
| | AIC | Theoretical model value is less than the independent model value and less than the saturated model value | \[368.689 < 506.000 \] | Yes |
| | | | \[368.689 < 2667.477 \] | |
| | CAIC | Theoretical model value is less than the independent model value and less than the saturated model value. | \[571.589 < 1474.563 \] | Yes |
| | | | \[587.504 < 2751.700 \] | |

It can be seen from Table 4-21, indicators like 2/df, RMR, AGFI, RMSEA, NFI, TLI, IFI, CFI, PGFI, PNFI, PCFI, AIC and CAIC have reached the model fitness standards. The above fit indicators show that the complete mediation model fit of TMT process meets the requirements. The fit path Figure of the
complete mediation model of TMT process is shown in Figure 4-7. The standard path coefficients of the complete mediation model fit of TMT process are as shown in Table 4-22.

Figure 4-7 Complete Mediation Model of TMT Process
Table 4-22 Standard Path Coefficients of the Complete Mediation Model Fit of TMT Process (N=125)

<table>
<thead>
<tr>
<th>Path</th>
<th>Path Coefficient</th>
<th>Standard Error</th>
<th>Critical Ratio</th>
<th>Significance Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>teamwork &lt;--task-based shared mental model</td>
<td>.358**</td>
<td>.088</td>
<td>3.086</td>
<td>.002</td>
</tr>
<tr>
<td>Information exchange &lt;--task-based shared mental model</td>
<td>.264*</td>
<td>.091</td>
<td>2.420</td>
<td>.016</td>
</tr>
<tr>
<td>teamwork &lt;--team-based shared mental model</td>
<td>.027</td>
<td>.081</td>
<td>.237</td>
<td>.813</td>
</tr>
<tr>
<td>Information exchange &lt;--team-based shared mental model</td>
<td>.298**</td>
<td>.086</td>
<td>2.742</td>
<td>.006</td>
</tr>
<tr>
<td>team satisfaction &lt;--teamwork</td>
<td>.347***</td>
<td>.111</td>
<td>3.961</td>
<td>**</td>
</tr>
<tr>
<td>Growth performance&lt;--teamwork</td>
<td>.218*</td>
<td>.106</td>
<td>2.457</td>
<td>.014</td>
</tr>
<tr>
<td>team satisfaction &lt;--information exchange</td>
<td>.396**</td>
<td>.103</td>
<td>4.449</td>
<td>**</td>
</tr>
<tr>
<td>Growth exchange&lt;-- information exchange</td>
<td>.429**</td>
<td>.101</td>
<td>4.592</td>
<td>**</td>
</tr>
</tbody>
</table>

Note: ** means it is significant at P<0.001 level; * means it is significant at P<0.01 level; * means it is significant at P<0.05 level.

4.5 Conclusion and Discussion

4.5.1 Dimension of TMT Process

According to the pervious research achievements of TMT and team process and questionnaire survey data gathered in this study, there are two dimensions in the TMT process of Chinese enterprises: teamwork and information exchange. Teamwork refers to more willing mutual help actions in TMT and TMT members are willing to adjust the scopes of their duties for the smooth team work. TMT members will take the initiative to help other members and share the work tasks when one member is busy or faced with complex tasks which should be finished within required time. Information exchange means communication between TMT members can produce effective solutions to issues, valuable ideas and concepts and high creativity and spirit of innovation.

4.5.2 Dimension of TMT Performance

According to the pervious research achievements of TMT and team performance and questionnaire survey data gathered in this study, there are two dimensions in the TMT performance: team satisfaction and growth performance. Team satisfaction refers to TMT members’ and outside overall evaluation and direct feelings of TMT work and members themselves in team work, including TMT members’ evaluation of the team work, TMT members’ satisfaction with the team work, outside evaluation of TMT and TMT members’ satisfaction with the display of their expertise and abilities. Growth performance refers to the overall evaluation of sales growth and acquisition of market shares in the enterprise’s development, including satisfaction with sales growth rate, the acquisition of market shares and the enterprise’s sales growth relative to competitors.

4.5.3 The Relationship between TMT Shared Mental Model and TMT Process

4.5.3.1 The Relationship between TMT Task-based Shared Mental Model and Teamwork

The research hypothesis that TMT task-based shared mental model has a significant
positive effect on teamwork has been supported empirically. In the structural equation model (as shown in Figure 4-3) established in this study, the standard path coefficient of the effect of TMT task-based shared mental model on teamwork is 0.354 (significant at 0.01 level), showing TMT task-based shared mental model has a significant positive effect on teamwork. This study conclusion suggests that the higher TMT members have consensuses on team goals, operation regulations, means of competition, external environment interpretations and external resource acquisition, the more voluntary mutual help TMT members will show. When one member is busy or faced with complex tasks which should be finished within required time, TMT members are willing to take the initiative to help other members and share the work tasks and adjust the scopes of their duties for the smooth team work. Therefore, Hypothesis 1a passes the validation.

4.5.3.2 The Relationship between TMT Task-based Shared Mental Model and Information Exchange

The research hypothesis that TMT task-based shared mental model has a significant positive effect on information exchange has been supported empirically. In the structural equation model (as shown in Figure 4-3) established in this study, the standard path coefficient of the effect of TMT task-based shared mental model on teamwork is 0.253 (significant at 0.05 level), showing TMT task-based shared mental model has a significant positive effect on information exchange. This study conclusion suggests that the inclination of consistent understandings of members in team goals, operation regulations, means of competition, external environment interpretations and external resource acquisition allows more sufficient information exchanges when TMT members discuss and formulate these specific implementation schemes. Some valuable ideas and concepts are also generated in the process. Therefore, Hypothesis 1b passes the validation.

4.5.3.3 The Relationship between TMT Team-based Shared Mental Model and Teamwork

Empirical findings have failed to support that TMT team-based shared mental model has a significant positive effect on teamwork. That is to say, Hypothesis 1c fails to pass the validation. Through in-depth interviews with enterprises’ top managers, possible reasons include the following three points. First, although TMT members have certain understandings of each other’s expertise, roles and styles and also believe that expertise complementation is important for team development. However, TMT members lack trust and straight-out communication with each other. Therefore, closely cooperative relationship can not be established. Second, although TMT members have certain internal communication, exchanges and certain understandings of each other’s expertise, role and style distributions, they still have relatively great disagreements in strategic targets, competitive strategies and other aspects. Even though they have reached
consensuses on strategic targets, competitive strategies and other aspects, some top managers do not really identify but just agree with others ostensibly out of not destroying the harmony. The situation in which some top managers pander to the TMT leader or follow the crowd without the real resonance deep inside will be bound to be lack of work motivation displayed in the team interactions. They would skimp their work perfunctorily and do not make concerted efforts in many occasions. Finally, although TMT members have certain understandings of each other’s expertise, role and style distributions and also believe that expertise complementation is essential for team development, the team stays in storming. Even though TMT members have certain internal communication and exchanges in this stage, these communication and exchanges are more consumed on how to eliminate intense interpersonal relations in the team rather than how to complete team tasks. With increasingly tense interpersonal relations and intensified emotional conflicts, it will be more and more difficult to form the teamwork atmosphere.

4.5.3.4 The Relationship between TMT Team-based Shared Mental Model and Information Exchange

The research hypothesis that TMT team-based shared mental model has a significant positive effect on information exchange has been supported empirically. In the structural equation model (as shown in Figure 4-3) established in this study, the standard path coefficient of the effect of TMT team-based shared mental model on teamwork is 0.283 (significant at 0.05 level), showing TMT team-based shared mental model has a significant positive effect on information exchange. This study conclusion suggests that the deeper TMT members know each other in knowledge, expertise, speciality complementation and other aspects, the stronger pertinence information exchange will enjoy and the higher enthusiasm they will have to actively seek communication and exchanges. The more TMT members know about each other’s styles of doing things, the easier it will be for them to show more tolerance and utilize appropriate methods and techniques in communication and coordination, which have promoted information exchanges between members. Therefore, Hypothesis 1d passes the validation.

4.5.4 Relationship between TMT Process and TMT Performance

4.5.4.1 Relationship between Teamwork and Team Satisfaction

The research hypothesis that TMT teamwork has a significant positive effect on team satisfaction has been supported empirically. In the structural equation model (as shown in Figure 4-4) established in this study, the standard path coefficient of the effect of teamwork on team satisfaction is 0.327 (significant at 0.001 level), showing TMT teamwork between members has a significant positive effect on team satisfaction. This study conclusion suggests that the mutual cooperation between TMT members creates a kind of team atmosphere with interdependency, solidarity, mutual care, mutual trust
and sharing of responsibilities and enhances the members’ satisfaction with and senses of belonging to the team. Therefore, Hypothesis 2a passes the validation.

4.5.4.2 Relationship between Teamwork and Enterprise Growth Performance

The research hypothesis that TMT teamwork has a significant positive effect on enterprise growth performance has been supported empirically. In the structural equation model (as shown in Figure 4-4) established in this study, the standard path coefficient of the effect of teamwork on enterprise growth performance is 0.201 (significant at 0.05 level), showing TMT teamwork between members has a significant positive effect on enterprise growth performance. This study conclusion suggests that cooperation between TMT members can give full play to talents and intelligence of the team, help the team to make satisfactory decisions and jointly promote the implementation of strategies so as to make the enterprise achieve rapid growth. Practice has also proved that TMT with good spirit of teamwork embraces higher efficiency and less internal consumption, which is the foundation of TMT to success and one of the key factors affecting an enterprise's success. Therefore, Hypothesis 2b passes the validation.

4.5.4.3 Relationship between Information Exchange and Team Satisfaction

The research hypothesis that information exchange has a significant positive effect on team satisfaction has been supported empirically. In the structural equation model (as shown in Figure 4-4) established in this study, the standard path coefficient of the effect of information exchange on team satisfaction is 0.369 (significant at 0.001 level), showing the information exchange between members has a significant positive effect on team satisfaction. This study conclusion suggests that the information exchange between TMT members can integrate various information and resources of members. The more thoroughly TMT members exchange information, the more openness members will feel in the team. Furthermore, open and frank communication between members is conducive the establishment of mutual trust relationship. All these have increased the TMT members’ satisfaction with the team. Therefore, Hypothesis 2c passes the validation.

4.5.4.4 Relationship between Information Exchange and Enterprise Growth Performance

The research hypothesis that information exchange has a significant positive effect on enterprise growth performance has been supported empirically. In the structural equation model (as shown in Figure 4-4) established in this study, the standard path coefficient of the effect of information exchange on enterprise growth performance is 0.407 (significant at 0.001 level), showing the information exchange between TMT members has a significant positive effect on enterprise growth performance. This study conclusion suggests that the information exchange promotes the conveyance of
information related to tasks and enables the information related to strategic decisions to be fully gathered, discussed and demonstrated. Moreover, it is beneficial for TMT to make scientific and effective decisions, improve the quality of strategic decisions and thus further promote the enterprise growth. Therefore, Hypothesis 2d passes the validation.

4.5.5 Mediating Effect of TMT Process
As can be seen from the above analyses, the path coefficients of task-based shared mental model to team satisfaction and enterprise growth performance do not reach the significant level, nor do those of team-based shared mental model team satisfaction and enterprise growth performance. Path coefficients of task-based shared mental model to teamwork and information exchange. Path coefficients of teamwork and information exchange to team satisfaction and enterprise growth performance also reach the significant level, which indicates that teamwork and information exchange play the complete mediating effects in the process in which TMT task-based shared mental model acts positively on team performance. Therefore, Hypothesis 3a passes the validation. The path coefficient of team-based shared mental model to information exchange reaches the significant level and path coefficients of information exchange to team satisfaction enterprise growth performance also reach the significant level, suggesting that information exchange plays a complete mediating effect in the process in which TMT team-based shared mental model acts positively on team performance. However, the path coefficient of task-based shared mental model to teamwork does not reach the significant level, indicating that teamwork does not plays a complete mediating role between TMT team-based shared mental model and team performance. Therefore, Hypothesis 3b is verified partially.

4.6 Summary
Based on the research hypotheses, taking TMTs of 125 enterprises as samples and using factor analysis, reliability analysis, validity analysis, structural equation model and other methods, this chapter has verified that teamwork and information exchange play the complete mediating effects in the process in which TMT task-based shared mental model acts positively on team performance, and information exchange plays a complete mediating effect in the process in which TMT team-based shared mental model acts positively on team performance. However, it has not found the mediating role of teamwork between TMT team-based shared mental model and team performance. Overall, the fit effect of the research model and the measured data is relatively ideal, which indicates the consistency between research sample data and theoretical hypotheses. Among the ten research hypotheses put forward in this study, there is one
research hypothesis that has failed to pass the validation (Hypothesis 1c) and one research hypothesis that has been verified partially ((Hypothesis 3b). All the rest of research hypotheses have passed the validation.
Chapter 5 Case Demonstration

5.1 Introduction
All the questionnaire survey studies conducted above are cross-sectional ones. Although studying the same one enterprise’s four different TMT stages in the life cycle and doing four different enterprises’ four different TMT stages at the same time are statistically equivalent, the addition of the time factor will still result in changes of many factors. Cross-sectional study can not be a substitute for the longitudinal study. Therefore, this chapter will conduct a longitudinal case study of the evolution of TMT shared mental model and team performance mechanism to make up for the limitation.

Since the large samples of enterprises’ TMT historical data are difficult to obtain, this paper adopts the longitudinal case study, selects Feixiang Industrial Group (hereinafter referred to as Feixiang, abiding by the practice of case study, aliases are used for names of enterprises and people to protect enterprises and TMT information) as the research object and analyzes interactive dynamic characteristics affecting the enterprise’ TMT shared mental model construction, such as team cohesion, cognitive conflict and effective communication. From the team life cycle of Feixiang, it analyzes the evolution characteristics and team performance process mechanism of TMT shared mental model and more intuitively demonstrates the rationality of the logical framework proposed in this study, namely, “TMT interactive dynamic characteristics → TMT shared mental model → TMT process → TMT performance”, and further provides support in practice for the research approach.

As for the issue, how to carry out standard case study, Robert Yin (2004) put forward the research route including five basic steps: design the case study method → select cases → collect data → analyze evidence → write the case study report. In this paper, the case study will be conducted in strict accordance with the above procedures.

5.2 Study Design
When the case study is designed, the single-case or multi-case method can be adopted and there is no specific border between the two methods (Yin, 2003). Eisenhardt (1989) et al. hold that multi-case study can support the study conclusions through the repetition of cases to improve the validity, but scholars like Pettigrew (1990), Chakravarthy and Doz (1992), Zhou Changhui (2005) and Shang Hangbiao (2010) think that the single-case study can guarantee the depth of the case study, help find and track new problems and new phenomena emerging in management practice and reflect the changes of cases to be studied at different stages. This study attempts to reveal the evolution characteristics of TMT shared mental model and team performance mechanism, so it adopts the
longitudinal single-case study method.

5.3 Case Selection
Case selection is an important step in the case study with the purpose of ensuring that researchers can carry out the experimental study smoothly according to the research design approach. As for the selection of the case sample, Eisenhardt (1989), Yan and Gray (1994) and others give three suggestions: a. the sample selected for the case study should be representative enough; b. the case sample have been operated for quite a long time and can meet the historical data requirements for the related indicators; c. various information that the study needs can be acquired handily from the case sample. According to the above three suggestions, this study chose Feixiang Industrial Group as the case study sample. As one of the largest domestic privatively-run enterprises, Feixiang Industrial Group has experienced from a company with single motor development business to a Group with a number of business dominated by motorcycle production and integrated with automobile engine, new energy, real estate development, etc. The history of the company can be regarded as an epitome of domestic successful private enterprises. The study of such a successful private enterprise can lead to better inspiration. In addition, the enterprise’s TMT has experienced the forming, storming, norming and performing stages, so it is of certain representativeness. Established in 1997, Feixiang Industrial Group has developed for nearly 20 years which can ensure the acquisition of time requirements for the measured data, such as TMT interactive dynamic characteristics, TMT shared mental model, TMT process and TMT performance. In 2008, the author participated in Feixiang’s consulting project as a principle member and our team established a good relationship with the company TMT, facilitating the access to various information needed for the study. In addition, the company, as one of the more successful private enterprises in China, has been reported massively in web sites, newspapers, magazines and other media, which also enriches the data sources and is useful for mutual verification and comparison.

5.4 Methods of Data Collection
Robert K. Yin (2004) thinks that evidence for the case study can come from literature, interviews, direct observation, archival records, participatory observation and physical evidence and a successful case study should try to get information by various sources. Combining with the characteristics of this study, main methods, namely, field interviews, referring to internal team records and related literature data are adopted to obtain evidence to constitute an evidence triangle of cases and guarantee the construction validity of cases. Meanwhile, the author has also revisited part of the
interview objects to further acquire information to form a complete chain of evidence and improve the reliability of the case study. Specific implementation of each method is as follows:

a. Literature
Searching with the theme “Feixiang” in China National Knowledge Infrastructure (CNKI), 2819 records can be acquired, including 1189 periodicals, 28 academic dissertations, 1263 newspapers, 144 pieces of scientific and technological achievements, 102 pieces of patent data, 76 yearbooks and 17 conference papers. In the Electronic Book Database, 109 pieces of book information related to “Feixiang” can be gathered.

b. Archival Records
Through the company’s website, the author has collected information, such as development strategies, corporate governance, company history, organizational structure, industry layout, the information, business and strategic cooperation. 108 pieces of relevant data information have been obtained by logging in Moabc and 64 pieces of related information can be acquired by collecting the company’s internal publications, meeting records and other internal data.

c. Interviews
With interviews with the company’s TMT personnel, the author has gathered the company’s information related to strategic decisions, competitive strategies, operational regulations, interpretations of the external environment and access to external resources as well as information in such aspects as feat distribution, role allocation, style distribution and complementary specialties. Moreover, through TMT members’ confirmation on the materials collected for the study, problems difficult to determine can be solved when data are collected. Through interviews with industry association directors and senior fellows, the author can also know indirectly the evaluation of TMT members and company performance. There are 31 interviews with relevant personnel in total and each interview generally takes an hour or so.

5.5 Case Analysis
5.5.1 Basic Information of the Case Company
Feixiang Industrial Group was established in 1997 and grew out of “Feixiang Motorcycle Co., Ltd.” founded in 1991. After years of development, it has developed to a private company with business dominated by motorcycle production and integrated with automobile engine, new energy, real estate development, etc. Nowadays it has grown to be a large enterprise group with more than 13,000 employees, total assets of 20 billion, annual sales incomes over 15 billion Yuan and taxes 700 million Yuan. Its business covers more than one hundred countries and regions around the world and
sales have been in front among the domestic peer enterprises. It has successively won honorary titles like China’s Top 500 Manufactures, China Machinery Top 500, China’s Top 500 Private Science and Technology Enterprises and China’s Top 500 Enterprises. The trademark of “Feixiang” motorcycle produced by the company has been recognized as a “Well-known Chinese Brand” by SAIC (the State Administration of Industry and Commerce). It is now expanding the industrial chain and creating diversified strategic investment platform with industry as the link.

5.5.2 Analysis of the Case’s TMT Life Cycle Stages
To reveal Feixiang’s evolution characteristics of TMT shared mental model and team performance mechanism, this study conducts in-depth analysis of critical events or important interviews in Fexiang’s four stages of TMT life cycle, which can reflect such variables as TMT inactive dynamic characteristics, TMT shared mental model, TMT process and TMT performance. By interviewing with the senior management and based on advice of experts, this study divides the company’s life cycle of top management team into four stages: forming (1991-1998), storming (1999-2004), norming (2005-2010) and performing (2011-).

a. Forming
Feixiang Industrial Group grew out of “Feixiang Motorcycle Co., Ltd.” On May 20, 1991, Chen Feixiang registered “Feixiang Motorcycle Co., Ltd.” in the Administration for Industry and Commerce for the main business motorcycle engine production with 150,000 Yuan accumulated from his motorcycle repair shop and 350,000 Yuan borrowed from friends and relatives. When the company was just founded, it was small not large and most employees members were family members with Chen Feixiang as the General Manager, his brother Chen Feihu as the Deputy General Manager of Sales, his brother-in-law Guo Jie as the Deputy General Manager of Production Research and Development, Xiao Bin who was an Office Director of a local factory as the Deputy General Manager of daily administrative management and his wife, Guo Haiyan, as the Deputy General Manager of Finance. He also recruited 25 workers. After a few years, the company’s engines were widely acclaimed by the market due to good quality and performance and the brand “Feixiang” were gradually recognized by consumers. In 1997, “Feixiang Motorcycle Co., Ltd.” was renamed “Feixiang Industrial Group” and its main business was also transformed from motorcycle engine production to motorcycle production and manufacturing. The composition of the Groups’ TMT is as follows: Chen Feixiang serves as the President and Chairman; Chen Feihu works as the Deputy General Manager in charge of marketing; Guo Jie is the Deputy General Manager responsible for production research and development; Xiao Bin holds the Deputy General Manager in charge of daily administrative management and Guo Haiyan takes
the post of the Deputy General Manager of Finance. After organizing this stage with the company’s relevant archival records, documents and interview evidence, the author elaborates and illustrates key events and interviews which can reflect the TMT’s interactive dynamic features, shared mental model, team process and team performance:

Key Event I: Team Cohesion

Key Event I happened in August 1991, three months after the founding of the company. Deputy General Manager Guo in charge of the finance was worried about the normal payment of this month’s wages, because the company was just established and start-up capital had almost entirely been put into production and working capital was not much left. For this situation, General Manager Chen convened the company management to discuss countermeasure and finally they agreed to pay the workers first. And the management’s wages were not paid until the performance showed signs of a rise.

“All managers were not paid for half a year when the company was just established. No one had any complaints, because everyone knew how hard staring a business would be. All of us would be not preoccupied with personal gains and losses. We all worked from dawn to night and willingly bore the burden of hard works. During that period of time, all managers shared a common aim: gain market shares and establish our own brand as soon as possible...To reduce the human cost, management members were both managers and workers in the initial stage. Although it was really tough, we thought days we spent staring a business together were very sweet...”

--Deputy General Manager Chen

Key Event II: Effective Communication

Key Event II happened in the latter half of 1996. General Manager Chen proposed that the company would spend half a year overcoming the motorcycle manufacturing technical problems while continuing to produce motorcycle engines so that the business could be transformed from production of motorcycle engines to motorcycle production and manufacturing in 1997. In the next nearly half of year, Mr. Chen designed the appearance style of the motorcycle by himself and also solved the motorcycle body’s high frequency shiver and chain gearing that perplexed the motorcycle manufacturing with other main members, which cleared the obstacles for the smooth realization of the motorcycle manufacturing.

“Mr. Chen really liked aggressive motorcycle appearance, so he personally designed the appearance which could show motorcycle aggressiveness like convex front face, wide-angle front forks and negative sweeps and high handles. About this, another Deputy General Manger and I thought that design would take more raw materials, but
it was not good to raise an objection since General Manager designed by himself and he really liked that appearance and style. After all the company’s startup capital was pooled by him. In dealing with the motorcycle body’s high frequency shiver, chain gearing and other technical problems, General Manager communicated more with us. After all we had accumulated some experience in such aspects as motorcycle repair and engine production, so he would like to listen to our advice...”

--Deputy General Manger Guo

Key Event III: Cognitive Conflict
Key Event III occurred in June 1996 when General Manger Chen proposed the strategic vision of transforming the business from production of motorcycle engines to motorcycle production and manufacturing. Deputy General Manger Chen in charge of marketing very supported the strategic plan put forward by General Manger. Motorcycle production and manufacturing, in his opinion, were the dream of us for many years. Despite the company's main business was the production of engines and showed good sales performance in recent years, it was obviously difficult for the company to become bigger and stronger only with production of engines and it was disciplined by others, so motorcycle production and manufacturing should be deployed in advance. However, Deputy General Manger Guo responsible for the production and research and development held that we must take the motorcycle production and manufacturing road to get more profits and maintain competitive advantages in the motorcycle market on a long view, but motorcycle production and manufacturing would involve many techniques and technologies which were hard to master for the company in the short term. Therefore, the company must have detailed planning and prove one by one to implement the plan.

“At that time I held the view that strategic matters should be determined finally by General Manager. We just needed to offer advice and follow up. Reasons for doing these were that we should maintain his authority and the company's venture capital was raised by him...”

--Deputy General Manager Xiao

Key Event IV: Strategic Target
Key Event IV happened in May 1991 when Mr. Chen put forward the strategic positioning of the company in the initial stage was put in the production of motorcycle engines and we strived to achieve motorcycle engine’s annual sales 100,000 after five years. Deputy General Mangers in charge of sales and production development showed confidence in the strategic objective proposed by General Manager Chen. Both of them thought motorcycle engines enjoyed good market and most of the main TMT members had over ten years’ experience in motorcycle repair and had accumulated some experience in motorcycle engine principle, structure, operation and trouble
removal. Therefore, it was completely possible to realize the objective proposed by General Manager Chen.

“I used to work in the administrative management and was relatively unfamiliar with the motorcycle field. But I knew that General Manager Chen and other Deputy General Manager had been engaged in motorcycle maintenance for many years with flourishing business. Excellent skills and high quality services were widely known locally...They would be bound to accomplish great results with cooperation with each other. However, I still felt stressed for the target proposed by General Manager Chen., namely, annual sales of 100,000 engines within 5 years. After all, it was a great number at that time...”

--Deputy General Manager Xiao

Key Event V: Team Operation Regulation
Key Event V occurred in September, 1995, the Deputy General Manger in charge of sales got a phone call from an old customer who said he needed 200 sets of motorcycle engines, but he had cash difficulties. He requested to first prepay 50% for products and offer the residual payment after a month. At that time, the Deputy General Manger regarded that this customer had good credit because he used to pay in full before the delivery of goods for almost four years. Then the Deputy General Manger agreed with the customer’s request, which violated the company’s sales regulation that “customers should generally pay not less than 80% of the total price of products before delivery and the payment lower than this bottom line can only be executed after being approved by the TMT with meeting discussion”. Although the customer fulfilled his promises after a month, Mr. Chen was quite grouchy after knowing this matter. He criticized Deputy General Manager Chen for the violation of the company’s provisions in the TMT meeting and required that such things should not take place again in the future. Deputy General Manager of Administration also believed that since the company system was set, it should be strictly implemented. Even if special cases appeared, they should also exchange views and make decisions together.

“In the face of criticism and complaints of General Manager Chen and Deputy General Manager of Administration for Deputy General Manager of Marketing, I could say nothing. After all, as top managers of the company, we should obey the rules, but I think we should also be flexible in actual management...”

--Deputy General Manager Chen

Key Event VI: Competitive Strategy
Key Event VI took place in the latter half of 1996 when the motorcycle engine market began to enter the low-profit era, which was resulted from the growing number of companies which produced motorcycle engines, increasingly serious product
homogeneity and more intensified price war between enterprises. In consequence, sales of motorcycle engine began to show slow growth. In this context, General Manager Chen put forward diversified competitive strategy, namely, expanding from the past single production of motorcycle engines to the production of thermally powered products, such as miniature automobile engines, outboard machine engines and high-speed yacht engines. Deputy General Manager in charge of sales was very supportive for Mr. Chen’s competitive strategy, because in his view, it would be tougher and tougher to expand the motorcycle engine market. However, according to the market information, there were promising markets for thermally powered products, such as miniature automobile engines, outboard machine engines and high-speed yacht engines. Nevertheless, Deputy General Manager in charge of production, research and development held that motorcycle engine market still had 20% of the growth space based on the present popularity of motorcycles. As long as more efforts were put on the quality and sales of engines, the company still could maintain a higher market share. Diversified competitive strategy would distract the company’s attention and the effect could not necessarily be actualized. Deputy General Manager in charge of administration was more cautious. He regarded that one of thermally powered products among miniature automobile engines, outboard machine engines and high-speed yacht engines could be put into the market first and whether other engine products could be developed should depend on its market performance.

“To be frank, I thought everyone’s opinion was reasonable at that time, but since General Manager and Deputy General Manager of Sales were quite optimistic about the diversified competitive strategy, I thought we should give it a try. After all, it would be impracticable to limit the company to one kind of product if we wanted to have long-term development...”

--Deputy General Manager of Finance

Key Event VII: Access to External Resources

Key Event VII occurred in April 1995 when the company began to prepare for entering the international market in the face of increasingly fierce competition in the domestic motorcycle engine market. It reached a cooperation intention with a famous German enterprise AB and both sides contributed $5 million respectively to set up a joint venture in China and borrowed ships to deliver motorcycles to the international market. Most of TMT members were very supportive initially when the plan was proposed by General Manager Chen. They all believed that doing business internationally was a matter of time if the company aimed to be bigger and stronger with the increasingly faster pace of economic globalization. Therefore, it had to be adept in using foreign outstanding resources and technical force to take the preemptive opportunities in the
international market. Certainly, some senior managers were fearful of not gaining the corresponding resources or being likely to be disciplined by others when cooperating with foreign enterprises. In view of some senior managers’ questions, General Manager Chen explained that cooperation with foreign enterprises was a “win-win” process. He also listed some successful examples of domestic enterprises cooperating with foreign ones.

“Frankly speaking, although Mr. Chen listed some classical cases of successful cooperation between domestic enterprises and foreign ones, I was still not optimistic about the cooperation prospect with German AB Company in the initial period of time…”

--Deputy General Manager Guo

Key Event VIII: External Environment Perception

Key Event VIII occurred in the second half of 1997. The company began to adjust the domestic market development strategy and focused on in rural areas. 2000 sales outlets were established in the rural areas and activities like “no accidents in thousands of kilometers” were carried out. In the President’s view, all motorcycle enterprises had been basically positioned to conduct sales activities in urban regions over these years. However, there was little space for the urban market which would be further restricted due to factors like environmental protection, transportation and some families changing their traveling tools to automobiles. Rural markets enjoyed tremendous potentials because they just emerged. Deputy General Manager in charge of production, research and development believed that an increasing number of peasants would choose to buy motorcycles with the improvement of rural living standards, because motorcycles could be both travel tools and vehicles for the transporting of agricultural materials for the large number of peasants. However, Deputy General Manager of Administration was not optimistic initially about this market strategy for the view of backward rural economic development and low purchasing power, so he thought the motorcycle market strategy should still focus on urban areas.

“I had been primarily responsible for the urban market over these years with the increasingly strong feelings that there would be small space for the urban market expansion. Moreover, we all came from rural areas, deeply knowing the inconvenient transportation. Having a motorcycle was a dream for many peasants. Therefore, the market development strategy into rural areas struck a chord among most of senior executives when it was proposed initially…”

--Vice President Chen

Key Event IX: Specialty Distribution

Key Event IX took place in May, 1991. In the founding conference of the company, Mr. Chen declared he would be the General Manager and several others served as Deputy
General Managers: Chen Feihu as the Deputy General Manager of Sales, Guo Jie as the Deputy General Manager of Production Research and Development, Xiao Bin as the Deputy General Manager of daily administrative management and Guo Haiyan as the Deputy General Manager of Finance.

“Most members were relatives. Although we did not work together before, we still had certain understandings of others’ professional experience and backgrounds...An important reason for Mr. Chen’s arrangement of my sales post was that he considered that I was a vendor before entering the motorcycle industry, combined with these years’ engagement in motorcycle repair and certain understanding of the motorcycle industry. Therefore, in comparison, Deputy General Manger of Sales was more suitable for me; Mr. Guo possessed the longest experience in motorcycle repair and General Manager Chen and I entered the motorcycle repair industry under his influence, so it would be relatively appropriate for him to be the Deputy General Manager of Production, Research and Development. I did not know much about Deputy General Manager Chen, but I knew that he once worked as an Office Director in a factory, so he might be qualified for the daily administrative management. Mrs. Chen was the only woman in the management. Although she had no financial experience before, women were generally more meticulous, so she was also appropriate for the financial work...”

--Director of Finance

Key Event X: Style Distribution
Key Event X occurred in the second half of 1996, the next day after General Manager Chen proposed to surmount the technical difficulty in the motorcycle manufacturing within half a year. Mr. Chen moved life supplies to the company vigorously and effectively, eating and living there. In the next few months, Mr. Chen would personally check and inspect all things from the installation and testing of a small part to the product’s technical drawings.

“Recalling that period, Mr. Chen was exactly a workaholic. I felt that everyone was somewhat not adapted. Although most of members were relatives, we basically did not really work together before the founding of the company and therefore could not have deep understanding of each other’s styles of doing things...”

---Deputy General Manager Xiao

Key Event XI: Teamwork
Key Event XI was in the second half of 1996. Finding technical solution to the motorcycle manufacturing was a work focus of the company. The Production, Research & Development Department in the charge of Mr. Guo was naturally faced with high pressure and heavy tasks, but General Manager Chen and Deputy General Manager Chen offered to share the work. In additions to overcoming some technical difficulties like motorcycle body’s high frequency shiver and chain gearing with the Production,
Research & Development Department in the charge of Mr. Guo, Deputy General Manager Chen also took the lead to undertake the manufacturing design of the spiral gear, a key part for the deceleration. General Manager Chen also found a way to solve the motorcycle frame manufacturing. Without stamping equipment, Chen adopted "friction pressure" pressure to produce large pressure to stamp out the motorcycle frame.

“I was not familiar with the motorcycle filed and naturally unable to help in the process of surmounting the motorcycle manufacturing technical difficulties. During that period of time, seeing everyone concentrated their attention to the overcoming of motorcycle manufacturing technical difficulties, I was moved. Despite of some difficulties, members still focused unwaveringly on the common goal. Especially in the face of the motorcycle body’s high frequency shiver and chain gearing, we stayed up all night for 20 days and finally conquered them after repeated discussions, tests and experiments.”


In this stage, the team could be said to develop in twists and turns. On the one hand, the motorcycle industry began to fully enter the winter due to turbulences of industry environment and increasingly intensifying competition. The domestic profit margin once dropped to the hardpan; on the other hand, great changes took place among TMT members. First, the Vice President in charge of sales left in 2002 and Vice President Zhou as the professional manager covered the position. Later, with the social implementation of the company management team, Vice President in charge of production research and development and Vice President of Administration responsible for daily management faded out from the management in the early 2004. Three other professional managers joined the TMT. At this time, posts responsible for the production and research and development were separated with production in the charge of Vice President Zhang and research and development under the management of Vice President Li. In addition, previous Vice President of Administration responsible for daily management and Vice President of Finance renamed Director of Human Resources and Director of Finance. The former post was held by Director Wang and the latter one was still taken by the former Deputy General Manager Guo in charge of finance. So far, TMT members increased to six people. After sorting out the company’s relevant records, documents, interviews and other evidence in this stage, the author expounds and describes the events and interviews which can reflect the TMT’s interactive dynamic features, shared mental model, team process and team performance:

Key Event I: Team Cohesion
Key Event I took place in February 2002 when the Vice President of Sales submitted the resignation and Feixiang’s TMT started to change, triggering much outside speculation. Although the President of Feixiang Group proclaimed that the resignation of Vice President of Sales would not bring much impact to the Group, insiders thought the Locomotive Corporation founded by the Vice President of Sales after resignation would be a rival for Feixiang Group and he also poached many previous important customer resources.

“There were no prominent contradictions or they were concealed by other problems when a company was just founded. After it was bigger and stronger, contradictions might not be avoided. The resignation of Vice President of Sales was actually a kind of fission occurred when a family enterprise developed to a certain degree. Many people inside and outside the company thought that one of main reasons for the resignation of Vice President of Sales was that his only 2% of the stock equity did not match his Group Vice President’s status and contributions…”

--Top Manager of a Motorcycle Company

Key Event II: Effective Communication
Key Event II happened in the latter half of 2000. In the face of increasingly intense competitions in the domestic motorcycle industry market and the company encountering malignant competition of “low price war” in Southeast Asian market, President Chen put forward that the company should take the road of diversified development and cover biological engineering and mining industry to make up for the present simplex development model. Although the Vice Presidents of marketing and production research and development dissented President Chen argued that the road of diversification was the only way for the company’s sustainable development. He communicated with the Vice Presidents of marketing and production research and development several times, but they still thought that it should be discreet to take the road of diversification. President Chen finally implemented his own plan. Feixiang Biotechnology Co., Ltd. and Feixiang Mining Co., Ltd. were soon established in succession.

“Although I did not venture an objection, I thought it was reasonable that the two Vice Presidents showed dissenting views. Biological engineering and mining were two new fields for the company, so it was really quite adventurous for the investment in these two sectors without sufficient demonstration. However, President Chen regarded that the company’s rapid development over the years was the result of company’s courage to blaze new trails and bold innovation. The later situation for Feixiang Biotechnology Co., Ltd. was that it was still in the red and Feixiang Mining Co., Ltd. profited little. In 2003, the company announced the seceding from mining and biological domains…
Cognitive Conflict
“In 2002, the resignation of Vice President of Sales cast a shadow over the internal relations of TMT. During that period of time, General Manager also expressed to “create professional managers and socialize management authority” in some occasions, making me and another Vice President feel tense internal relations of TMT. We were also worried about our own career development with naturally reduced communication about the company’s strategy and operation. Moreover, for so many years’ operation of the company, it was the President Chen that finalized the major decisions and arrangements. We were accustomed to the route in which General Manager determined the corporate strategy and we just executed with the lapse of time…”

---Vice President Guo

Key Event III: Strategic Target
Key Event III occurred in the second half of 2000 when the domestic motorcycle industry entered the winter and pessimistic feelings about the market began to spread within the company’s TMT. Despite the General Manager cheered the team on many occasions and called on everyone to build confidence and face the difficulty, some senior managers privately lamented it was difficult to regain confidence. After all, the overall situation was before everyone. As the Vice Presidents of marketing and production thought when communicating in private the market downturn caused by the global financial crisis in 1998 would continue. If there was no economic recovery, the strategic targets set in early 1999 would be hardly accomplished.

“Recalling the moment when the General Manager proposed strategic targets of sales of one million motorcycles and sales revenues 5 billion within 5 years in early 1999, everyone was highly confident, but the continuous market depression caused by the global financial crisis gradually shook the targets proposed at that time. Although the company also took some measures to actively respond to the situation, such as consolidating the rural market and taking the path of diversification, these measures failed to have obvious effects…”

---Director of Finance

Key Event IV: Competitive Strategy
Key Event IV happened in 2001 when more than 10 large and medium-sized domestic cities began to issue the ban on motorcycles and “National II Emission Standard” was introduced at that time with greatly increased requirements for motorcycle production technology. The motorcycle industry fully stepped into the winter and domestic motorcycle companies’ profit margins dropped to the ground. Under this background,
President Chen proposed the company on the one hand needed to broaden the industrial chain and on the other hand must introduce foreign well-known motorcycle enterprises’ advanced manufacturing technologies to improve the brand competitiveness. He also put forward the preliminary ideas to cooperate technically with the world’s top motorcycle manufacturer Italian PIAGGIO, and acquire Liaoning Fengfan Mini-car Manufacturing Co., Ltd. For the technical cooperation with the foreign well-known motorcycle enterprise, most of TMT members basically accepted, but there were larger divergences within the TMT for the acquisition of Liaoning Fengfan Mini-car Manufacturing Co., Ltd. into the mini-car field. Certainly, though disagreements existed, the company still acquired Liaoning Fengfan Mini-car Manufacturing Co., Ltd. at year end.

“I fully agreed with the technical cooperation with the Italian company, but I was against the acquisition of Liaoning Fengfan Mini-car Manufacturing Co., Ltd. into the mini-car field, because I was of not much confidence in the face of a company on the brink of collapse and a new field…”

--Vice President Xiao

Key Event V: Access to External Resources
Key Event V took place in March, 2002. TMT members launched a fierce debate on the replacement for the Vice President Chen after his resignation. According to the President Chen’s management authority socialization, an excellent professional manager outside the company should be found to replace the Vice President of Marketing. However, the other two Vice Presidents held that after all professional managers were strangers who would not be of one mind with TMT and the appropriate person should be found from the family to take the post.

“I thought the resignation of Vice President Chen was an opportunity for the company to implement the management socialization and I also understood the other two Vice Presidents’ concerns, but the company must carry out a reform for the family management mode, introduce professional managers and establish normative governance structure if it wanted to be bigger and stronger…”

--President Chen

Key Event VI: External Environment Perception
Key Event VI took place in June, 2002. After having investigated the European market for over 20 days, President Chen told in the TMT conference convened at the end of June the greatest experience for the European market investigation was its high-quality, environment-friendly and energy-saving motorcycle products. He also thought that Feixiang had been considering motorcycle quality as the company’s life, but failed to give more considerations to the environmental protection. As industrial pollution worsened the environment and national industrial policy was adjusted, environmental
protection would be another key factor affecting the rise and fall of manufacturing industry after the product quality. Therefore, the company should adjust motorcycle product development strategy in advance and would develop and produce “good quality, environment friendly and energy saving” motorcycles. The new Vice President of Marketing extremely agreed with President Chen's concept, but Vice Presidents of Production Research and Development and Administration held the view that the current domestic consumers had relatively weak environmental awareness and environment friendly models were not necessarily their favorites.

"European market was quite different from the domestic one. Domestic consumers pursued cheap and fine products. How to improve the quality of products and cut down the cost of production was the absolute truth. It was still premature to talk about environmental protection according to the current domestic industrial economic environment...”

--Vice President Zhou

Key Event VII: Access to External Resources
Key Event VII happened in February, 2002. The resignation of Vice President of Marketing triggered great shock within the company, which meant that TMT which had been in industrial circles’ good books began to have fission. Although President and the Vice President of Marketing made no mention about the resignation, the most rumored explanation was that they two had increasingly bigger divergences over some major decisions. Resignation therefore would be the best choice for the Vice President.

“The resignation of Vice President Chen cast a shadow over the previous good teamwork atmosphere. Although a professional manager replace Vice President Chen and the company worked normally on the surface, employees all felt that there were barriers between the TMT members and the professional manager and it was hard to return to the close cooperation between team members when the company was just founded...”

--Vice President Zhou

Key Event VIII: External Environment Perception
Key Event VIII occurred in October, 2004. A meeting for production and operation was convened to discuss how to solve the problems emerging in production and business operation over the nearly half a year. For example, customers complained several times about the failures of delivering goods in time; sometimes production disconnected with sales, which was reflected in the serious warehouse backlogging of some products and mass production of the production department; some products were out of stock on the market, but the production department delayed the supply for a long time; sometimes although products had been sold out, the rate of capital collection was low.
At the meeting, the President made the Vice President of Production speak first, as he served as a Vice President in charge of production in one of China’s Top 500 enterprises before. In the President’s view, Vice President of Production surely met the problems the company was encountering before. Vice President of Production thought the solution was to strengthen the company’s informatization construction, and launch the ERP project construction as soon as possible. Only in this way would problems in such fields as finance, production planning and inventory, material procurement and sales management be smoothly solved. Other executives agreed with Vice President of Production and also had in-depth communication about their former enterprises’ practice of informatization construction.

“We also communicated and exchanged ideas about the production and operation, but we always thought of solutions after problems emerged rather than find the cruxes of problems and try to solve them. In addition, communication conducted before was mostly limited to exchanges between the departments. For example, when products were out of stock or unsalable, Vice President of Sales would communicate with Vice President of Production; when money could not be collected normally, Director of Finance would communicate with Vice President of Sales. Scenes as all departments gathered together to analyze problems were still rarely seen...”

--Vice President Zhou


The external environment has both unfavorable factors and favorable policies in this stage. The outbreak of the financial crisis inflicted heavy losses on the domestic motorcycle industry and the company’s business volume also fell sharply. National II motorcycles would be phased out of the market and the rumor that National III Standard would be fully implemented would undoubtedly spark a revolution in the motorcycle industry in advance. Certainly, issuances of detailed documents for providing subsidies for rural residents to purchase motorcycles in 2009 brought good news to lots of motorcycle companies. In this stage, a change for the TMT was that Director of Finance Guo withdrew from the management and Director Zhao as the professional manager replaced her in 2005. So far, all entrepreneurial TMT members had been out of the management except the President Chen. After organizing this stage with the company’s relevant archival records, documents and interview evidence, the author elaborates and illustrates key events and interviews which can reflect the TMT’s interactive dynamic features, shared mental model, team process and team performance:

Key Event I: Team Cohesion

Key Event I happened in March, 2005 when the Group’s ERP in the charge of Vice
President Li in the Information Technology Department started. The project covered finance, production planning and inventory, material procurement, sales management, project management, etc. and departments needed to coordinate and cooperate to complete it. After the project was launched, all senior managers were cooperative and convened department meetings, requiring their own departments and staff to actively cooperate with the project team. ERP had its official launch at the end of 2005.

“I took the lead for this work under great pressure. ERP was a systematic engineering, involving many departments. If senior managers did not cooperate or coordinate, this project would be difficult to implement. But then I found that departments and staff were friendly and cooperative with the project team work and able to quickly get the materials and data the project team needed, which showed that senior managers more supported this work…”

--Vice President Li

Key Event II: Effective Communication

Key Event II took place in March, 2009. A meeting for analyzing the operation was convened and President said frankly that the domestic motorcycle industry had been hit hardest since the last year’s financial crisis and the business volume also fell sharply. Under this situation, it was necessary for the company to adjust itself. He also told the specific train of thought: highlight the core business of motorcycle, suspend or streamline the budget for the industries outside the main business, such as mining, the aging industry, Feixiang motorcycle team and other diversified business. The Vice President Zhou in charge of marketing thought global companies usually started from single business, expanded compressively to a certain scale and then began to implement diversification strategy. Finally, after the crisis, twists and turns, they adjusted business and then highlighted the main business. Therefore, the train of thought proposed by the President was feasible. Meanwhile, he also suggested suspending the mining, aging industry, Feixiang motorcycle team and other vice industries. However, Vice President Zhang in charge of Production held that it was good to highlight the main business, but Feixiang motorcycle team had been well-known in the industry and it was actually a business card of the company, so its suspension was likely to be coupled with disadvantages. The budget could be reduced. Director of Finance Zhao considered that the capital was tight affected by financial crisis. If the company could suspend part of vice industries and streamline the budget, money could be saved and diverted to put into the main business. Director Wang in charge of human resources regarded if vice industries were suspended, labor transfer and training should be properly arranged. Eventually, after listening to all senior managers’ views, General Manager made a decision to develop the motorcycle main business with concentrated resources, suspend mining and ageing industries, retain Feixiang
motorcycle team and reduce the budget, which was supported by all senior managers.

“With active meeting atmosphere, everyone expressed freely their views and opinions and had further communication over specific questions after the meeting. All attendees communicated with each other basically without barriers and satisfied with the communication effect…”

--Vice President Li

Key Event III: Cognitive Conflict
Key Event III occurred in March, 2008. To seek new economic growth points, authorized by the company, Vice President of Marketing investigated the European and American motorcycle markets for half a month. During the investigation, he found high-emission motorcycles took a place in the European and American markets and motorcycles with more than 400 cc emissions exceeded 600,000. Vice President of Marketing gave feedback of the information in the senior management meeting after returning from the investigation. The President thought although there were large outputs of low-emission (below 2,500cc) motorcycles, years of vicious competition had resulted in narrow profits and high-emission motorcycles had been markets neglected. If the company could take a place in the high-emission motorcycle markets controlled by Europe, the United States and Japan, there would be considerable profits. At the meeting, some senior managers also expressed their own views: Vice President in charge of production thought such a project really embraced a good prospect, but the “ban on motorcycles” launched recently by the state was still a large obstacle for the growth of high-emission motorcycle market and it was not the mature time for the production of high-emission motorcycles. Director of Finance held that capital factors should also be considered, after all a 400 cc motorcycle production line cost at least 30 million Yuan, so everyone should be cautious for this project. According to the Vice President of Marketing, there were certain risks for any projects. If the company failed to try first to grab the commanding height, it would be late to get involved when the market was mature, let alone there were already about 250,000 domestic consumers having high-emission motorcycles and annual consumption was more than one billion. These numbers would increase year by year.

“TMT members had divergences over the production of high-emission motorcycles. Some senior managers supported and some were against it, but there was not heated argument at the meeting, but relatively gentle view collisions. In my view, everyone held a piece of truth. The eventual decision would be made by the President and we just cooperated and executed…”

--Director of Human Resources

Key Event IV: Strategic Target
Key Event IV occurred in the 2005 annual work meeting before the Spring Festival. Based on the summary of the past five years’ work, the President put forward the next stage’s strategic objective: the realization of more than 10 billion sales income after five years and being ranked among the industry leading enterprises.

“After the President proposed the strategic target at the meeting, we several senior managers all thought it quite accorded with the company’s future development direction, because the company had been proceeding basically in catching up with peer companies in recent years. It could be said that there were changes from year to year. Certainly, we all admitted that we were under great pressure due to the increasingly dynamic, complex and uncertain business environment…”

--Vice President Zhou

Key Event V: Competitive Strategy

Key Event V happened in the end of 2009. The rumors that “National II motorcycles would be phased out of the market and National III Standard would be fully implemented swirled and triggered a discussion among TMT members. President thought d, National III Standard would surely be implemented and it was just a matter of time under the era background of advocating environmental protection and low carbon. The company should have advance planning to be likely to seize the preemptive opportunities. In addition, he also proposed to seek technologies to develop and produce battery-operated motorcycles. In the discussion meeting, some senior managers thought that traditional energy sources were replaced by new energy resources in some fields and motorcycle industry would go the same route. Using the existing electric automobile development experience for reference to develop battery-operated motorcycles could yet be a good competitive strategy. Some senior managers thought National III Standard did not restrict the development of motorcycles but put forward higher requirements on the motorcycle emission. Certainly, part of enterprises with backward production capacity would be eliminated in this process. Therefore for the company, the top priority should be on the technological improvement to make all motorcycle indicators reach National III Standard. In this way, the company could remain invincible in the new round of competition and the production of battery-operated motorcycles could be put aside or at least should not be a major competition strategy of the company.

“Sometimes people were indecisive. Motorcycle national standards were upgraded continuously. At that time, if we did not plan in advance but follow the national standards, the company would always be at a disadvantage in the market. The research and development cycle of the battery for the electric motorcycle was long, which would restrict the development of the electric motorcycle. Although the electric motorcycle was finally determined preliminarily at the meeting, I was still worried…”
Key Event VI: Access to External Resources
Key Event VI took place in February, 2010. The company held a senior management meeting about the launch of electric motorcycle project. At the meeting, the President pointed out that a core component of electric motorcycle was the battery which could be developed independently or introduced with the external technology for the company. Part of senior managers thought the independent research and development cycle was long and external technology should be introduced to prompt the launch of the projects as soon as possible. Some others held that with cooperation with external forces, the company might be disciplined by others and it should independently research and develop to grasp the core of battery production technology, by which it could go further in the electric motorcycle industry. After listening to senior managers’ views, General Manager pointed out the company was relatively mature for the motorcycle production technology. If the electric vehicle project was launched at present, the company only lacked the battery production technology. Foreign battery technologies were more mature, so the company could fully cooperate with foreign battery companies and introduce external technologies to shorten the project cycle. Only in this way could the company take the preemptive opportunities in a rapidly changing market environment.

“Worries about cooperation with external forces were not unreasonable. There were common cases in which domestic enterprises were subject to the other party when cooperating with external forces especially multinational enterprises...”

--Vice President Zhang

Key Event VII: External Environment Perception
Key Event VII happened in December, 2005 when the Southeast Asian market management analysis meeting was convened in the company headquarters. At the meeting, the President first pointed out that the company’s overseas markets were mainly in Southeast Asia, but the company’s performance dropped dramatically in Southeast Asian markets over the years and its former glory of sweeping the Southeast Asian markets in 2001 no longer appeared. Then the President analyzed the main reasons for this situation: low barriers for the Southeast Asian markets allowed plenty of domestic many enterprises to enter them in succession, and forcing prices down with vicious competition among domestic enterprises to contend for customers made the markets extremely disordered. Vice President of Marketing thought the market disorder caused by the vicious competition between domestic enterprises was an important reason, but Southeast Asian motorcycle enterprises grew rapidly over the years. For the low-end market, they preferred to buy their local brands, which was another reason for the performance drop of many Chinese motorcycle enterprises
including Feixiang in Southeast Asian markets. Vice President of Production thought that the growing market competition pressure caused by Japan and other foreign companies to Chinese motorcycle companies was also a non-negligible reason.

“We all had deep feelings about the company’s business startup in 1999 to brilliant performance in 2001 and then to the sales slump in recent years in Southeast Asia. In my view, causes of the downturn in sales were multifaceted, including closely interwoven factors, such as Chinese motorcycle enterprises, local factors of Southeast Asian countries and factors of foreign enterprises in Japan and other countries...”

--Vice President Zhou

d. Performing (2011-)

In recent years, development of domestic motorcycle industry began to enter the bottleneck period. On the one hand, the domestic enterprise products are seriously homogeneous with intensifying competition, generally declining profits in manufacturing industry and continuously floundering market. On the other hand, the domestic enterprises compete extraordinarily fiercely in foreign markets, which can be called “scrambling” especially in Southeast Asian market. In this environment, the TMT has further perfected the organizational structure, business process, operation specification, performance management and other aspects and the company also has transformed from an industrial group to an investment holding group through resource integration and strategic transition. Through the integration of industry and production and industrial chain expansion, it has worked out a characteristic path. In recent years, TMT has been stable without member changes. After organizing this stage with the company’s relevant archival records, documents and interview evidence, the author elaborates and illustrates key events and interviews which can reflect the TMT’s interactive dynamic features, shared mental model, team process and team performance:

Key Event I: Team Cohesion

Key Event I happened in May, 2011 when the company started the management reengineering and ERP enhancing implementation project which covered such contents as control and operation mode, organizational structure, business process optimization, operation specification and performance management. During the project promotion, all senior managers attached great importance and considered it their own work. They also personally attended each project promotion and coordination meeting in addition to dispatching capable forces in their departments to fully cooperate with the project team. It was this teamwork spirit that could ensure such a large and complex systematic engineering could be conducted smoothly and implemented effectively.
“The company launched ERP in 2005, but it was not straightened fully like this. It could be regarded as “major surgery” this time. In the project propulsion, TMT members coordinated closely and did a lot of detailed work so that the project won its official launch two months in advance and achieved the expected effect…”

---Director of Finance

Key Event II: Effective Communication

Key Event II happened in February, 2013 when the company convened a business strategy analysis meeting at which the President pointed out that domestic sales and exports were the lowest for the domestic motorcycle industry in 2012 over the nearly seven years and the domestic motorcycle development started to enter the bottleneck period. Therefore, the company should consider diversified strategic layout and he put forward the idea of entering the agricultural machinery industry. Vice President of Production thought agricultural machinery manufacturing business fitted highly the company’s existing engine business. It was a good idea to enter the agricultural machinery field and it was also a new way for the company to seek for denotative expansion, but the agricultural machinery market had been a downturn in recent years, so the company could not take the old road of agricultural machinery enterprises and products must have their own bright spots and distinctive characteristics if the company wanted to enter the agricultural machinery field. Vice President of Marketing viewed that it was the last year for the dividend policy of subsidies for the motorcycle to the countryside. With the disappearance of the dividend, rural motorcycle market would continue to be flagging and diversified investment pattern was the inevitable choice for the sustainable development of the company. Investment in agricultural machinery was worthwhile, although the agricultural machinery market was in the doldrums at present. The Ministry of Agriculture was drafting documents to encourage agricultural cooperatives to transfer contracted land, which would be bound to bringing new development opportunities to the agricultural machinery market and agricultural machinery enterprises. Director of Finance held that the depressed agricultural machinery market was greatly related to the single function of the present agricultural machinery products. To enter the field of agricultural machinery, the company should emphatically consider developing multifunctional agricultural machinery products to make up for the weakness of the current agricultural machinery products’ single function.

“The atmosphere was active and everyone expressed ideas freely, basically forming a consensus on the issue of entering agricultural machinery industry. After meeting, senior managers communicated several times and formed the resolution of developing “Feixiang General Machine” which could mow grass, shatter, husk rice, pump and thresh to meet wide demands of peasants...”
Key Event III: Cognitive Conflict

Key Event III took place in February, 2012 when a Southeast Asian market management meeting was held. At the meeting, the President pointed out domestic motorcycle enterprises competed extraordinarily fiercely, which could be called “scrambling” in Southeast Asian markets which had been the company's main market abroad, especially Vietnam market accounted for half of the sales in foreign markets. Although there was a market downturn, the company could not give up the Southeast Asian markets. After all, relatively mature marketing networks gradually established all these years were hard-earned, so the company should have a good plan for the Southeast Asian markets. Vice President of Marketing thought Vietnam’s market downturn was difficult to change in a short term, and the company could retain part of market in Vietnam and focus on expanding other Southeast Asian countries. Vice President of Production expressed that the company must change the competitive pattern of previous product homogeneity and make products stay “owning what others do not have and owning what better than others” if it wanted to break through the dilemma in the Southeast Asian markets. Vice President of Research and Development indicated that the largest foreign competitors in Southeast Asia were Japanese companies, so the company needed to manufacture a batch of new products with positioning functions different from Japanese vehicles. Director of Finance thought that to ensure the motorcycle sales in Southeast Asian markets, the company could adopt mortgage guaranteed installment plans in some Southeast Asian countries with relatively sound credit systems to stimulate consumer demand.

“Around how to expand Southeast Asian markets, we launched a heated discussion, but there were not emotional conflicts, because we all were very clear that the starting point was for the company’s better development. It was quite normal to have differences. Collisions of different points of view tended to make the team consider problems in as much detail as possible for decisions…”

--Vice President Zhang

Key Event IV: Strategic Targets

Key Event IV happened in January, 2011. At the annual work meeting, General Manager put forward the next stage’s strategic targets: transform from an industrial group to an investment holding group, realize sales income 50 billion and have the ability to enter Club of Hundred Billion in five years or so.

“Under the background of descending profits and market downturn in the manufacturing industry, General Manager put forward strategic transformation which was supported by everyone and most of senior managers expressed that they were confident on the realization of sales income 50 billion in five years or so. But for me, I
“was under tremendous pressure. If the target was 40 billion, then I was confident…””  
--Vice President Zhang

“The transformation from an industrial group of traditional motorcycle manufacturing to a strategic investment holding group was a need for the company to expand industrial chain and walk out of the low-profit domain of manufacturing. Although the new model was a big challenge for the company, I believed the strategic target put forward by General Manager was expected to achieve…””  
--Vice President Li

Key Event V: Competitive Strategy  
Key Event V took place in March, 2011. The company established Changhai Equipment Investment Fund in Shenzhen for special investment in high-end equipment manufacturing industrial chain and it also began to step into the transformation from an industrial group to an investment holding group, which was the competitive strategy proposed when the company was in a dilemma in the motorcycle industry development. Most of senior managers were supportive for this strategy. Vice President of Marketing thought high-end equipment manufacturing industry was a field greatly supported by the State from fiscal and financial aspects to imports and exports and other various aspects. The implementation of this strategy was believed to have a characteristic road with integration of industry and finance. Vice President of Production expressed although domestic equipment manufacturing enterprises had begun to take shape, they still lacked cutting-edge core technologies and research and development capabilities and high-end equipment was still dependent on imports with extremely high maintenance costs. If the company has the ability to take advantage of excellent resources of the equipment manufacturing industry at home and abroad, and make breakthroughs in the key technology of high-end equipment manufacturing industry, it would take the lead in the domestic high-end equipment manufacturing industry. Some senior managers held that high-end equipment manufacturing industry had large investment, long cycle and slow returns.  
“Although the domestic equipment enjoyed very high self-sufficiency rate, it was mainly concentrated in the middle and low-end markets with severe homogenized competition. However, sales income of high-end equipment manufacturing industry accounted for only 8% of the equipment manufacturing industry. High-end equipment still mainly relied on imports, which was both a soft spot and a potential opportunity for the domestic manufacturing industry. Most of the TMT members were optimistic about the prospect of the high-end equipment manufacturing industry and the establishment of equipment investment fund for high-end equipment manufacturing industrial chain was a test to enter this industry…””  
--Vice President Li
Key Event VI: Access to External Resources

Key Event VI occurred in April, 2013 when the company convened a high-end agricultural machinery investment strategy seminar in which the President spoke bluntly the current domestic high-end products of agricultural machinery lagged far behind similar products of developed countries in the main technical and economic indicators, product reliability and other aspects. He also expressed the company must use external resources, take overseas mergers and acquisitions or establish joint ventures with the world’s leading agricultural machinery enterprises if it wanted to achieve in high-end agricultural machinery industry. Most senior managers agreed with the President’s viewpoint. They thought that only the company cooperated or introduced internationally advanced high-end agricultural machinery manufacturing technology, it could complete the industrial upgrading from “fine small and medium-sized agricultural machinery” to “high-end large agricultural machinery”. Some senior managers worried about the prospect of the cooperation with foreign enterprises. “TMT reached a basic consensus for the high-end agricultural machinery investment issue, facilitating the rapid launch of the joint project of large high-end agricultural machinery with Australia only a month later…”

--Director of Finance

Key Event VII: External Environment Perception

Key Event VII took place in October, 2011. Under the background of continued fermentation of European debt crisis and the U.S. debt crisis, some countries like Brazil grew rapidly and required abundant offshore funds. The President who had been paying close attention to the overseas markets keenly felt the opportunity was coming and it was time for the company to show its strength, so a senior management meeting about the Brazilian market analysis was held in the Group’s headquarters. Vice President of Marketing thought Brazil had become one of the world's fastest-growing regions with a huge population, massive traffic jams and large demands for motorcycles which all suggested that the market was worth exploiting. Vice President of Production expressed that although the company’s motorcycles were exported to Brazil, they were entire ones. The company did not have its own or a joint cooperative local production and manufacturing base in Brazil. Under the new situation, the company should speed up the implementation of the administrative localization strategy and it was imminent to establish a production and manufacturing base in Brazil. Director of Finance thought that although Brazil’s economic development was slower than China, it was much higher than China in finance and capital market maturity due to its keeping close relationship with the United States and Europe; some international investment companies were very bullish on the market in Brazil, so funds required for the Brazilian manufacturing base could absorb Brazil’s
domestic funds and international investment companies.  
“Senior managers were optimistic on the Brazilian market and thought it was the best time to invest in Brazil. And I also believed that taking advantage of the establishment of the production and manufacturing base, the company could radiate its own motorcycles, general machines and agricultural machinery products to the whole South America through this production and manufacturing base...”  
--Vice President Li

5.6 Case Discussion

5.6.1 Feixiang TMT Interactive Dynamic Characteristics

The above cases have depicted the interactive dynamic characteristics of Feixiang TMT from team cohesion, effective communication and cognitive conflict. From the cases it can be seen that levels of team cohesion, effective communication and cognitive conflict change constantly from TMT’s forming to performing.  

a. Team Cohesion. In forming, TMT members are mostly relatives and family ties make team members banded together closely and not care about personal gains or losses. When the company is faced with financial difficulties, they agree to postpone the pay of team members to tide over the difficulties. In storming, fission and contradictions appear in the team. The most typical event is departure of Deputy General Manager Chen who went away with many previous important customer resources. In norming, TMT members are relatively cooperative which can be embodied by the smooth launch of ERP. In performing, TMT members are very cooperative and also personally attend each project promotion and coordination meeting in addition to dispatching capable forces in their departments to fully cooperate with the project team when starting the management reengineering and ERP enhancing implementation project.  

b. Effective Communication. In forming, TMT members do things in some aspects completely according to the will of the General Manager, but they still communicate much about the joint technical tackling. In storming, TMT members have certain communication, but the President acts willfully in some aspects, which can be demonstrated by the road of diversification. In norming, TMT members have sufficient communication which can be reflected by the company’s decision of centralizing resources to develop main motorcycle business, suspend mining and the aging industry and retain Feixiang motorcycle team but streamline the budget. In performing, TMT members speak out freely and communicate more frequently. The resolution of entering the agricultural machinery industry and developing “Feixiang General Machine” is the result of good communication between team members.  

c. Cognitive Conflict. In forming, strategic plans are determined by the General Manager and other senior managers also put forward some suggestions. In storming, discussions focusing
on tasks decrease and interpersonal relations have been strained at times. In norming, members have disagreements on some things with a few but moderate arguments. In performing, members have disagreements on some major events with more arguments, but these do not trigger emotional conflicts. On the contrary, collisions of different points of view tend to make the team consider problems in as much detail as possible for decisions and help achieve the consensus.

The author summarizes based on the above descriptions and analyses of the case’s TMT interactive dynamic characteristics in four development stages of team life cycle from team cohesion, effective communication and cognitive conflict, as shown in Figure 5-1.

**Figure 5-1 Summary based on Descriptions and Analyses of the Case’s TMT Interactive Dynamic Characteristics in Different Development Stages of Tem Life Cycle**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dimensions</th>
<th>Forming</th>
<th>Storming</th>
<th>Norming</th>
<th>Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team Cohesion</td>
<td>Members unite closely, do not care about personal gains or losses and get through the capital</td>
<td>Resignation of a Vice President</td>
<td>Smooth launch, cooperative between TMT members</td>
<td>Cooperative and do things by themselves on many occasions</td>
<td></td>
</tr>
<tr>
<td>TMT Interactive Dynamic Characteristics</td>
<td>TMT members do things in some aspects completely according to the will of the General Manager, but they still communicate</td>
<td>TMT members have certain communication, but the President acts willfully in some aspects, which can be demonstrated by the road of diversification.</td>
<td>Sufficient communication, which can be embodied by developing the main business, suspending vice industries</td>
<td>Express freely, communicate more frequently; the development of “Feixiang General Machine” is the result of sufficient result.</td>
<td></td>
</tr>
<tr>
<td>Effective Communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cognitive Conflict

Strategic plans are determined by the General Manager and other senior managers also put forward some suggestions.

Discussions focusing on tasks decrease and interpersonal relations have been strained at times.

Members have disagreements on some things with a few but moderate arguments.

Members have disagreements with more arguments, but these do not trigger emotional conflicts. Collisions of different points of view tend to make the team consider problems in as much detail as possible for

Based on the case’s summary of TMT interactive dynamic characteristics, assessment and scoring are conducted on the TMT interactive dynamic characteristics in four stages of the team life cycle and interviewed persons and experts are invited to make reviews and rectification. The author uses “very good”, “relatively good”, “general”, “relatively bad” and “very bad” to express the levels of TMT interactive dynamic characteristics in the three dimensions, as shown in Figure 5-2.

**Figure 5-2 Encoding Analysis of the Case’s TMT Interactive Dynamic Characteristics**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Dimensions (Indicators)</th>
<th>Forming</th>
<th>Storming</th>
<th>Norming</th>
<th>Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMT Interactive Dynamic Characteristics</td>
<td>Team Cohesion</td>
<td>Relatively High</td>
<td>Relatively Low</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Effective Communication</td>
<td>General</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Cognitive Conflict</td>
<td>General</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
</tr>
</tbody>
</table>

Information from: organized from this study.

It can be seen from Figure 5-2 that Feixiang TMT’s team cohesion, cognitive conflict and other interactive dynamic characteristics have differences for the development levels in four stages of the team life cycle and with the evolution of the team life course, team cohesion and cognitive conflict experience a downward trend from forming to
storming and a rising trend from storming, norming to performing, which is consistent with the conclusion in Chapter 3. Effective communication has no obvious changes in forming and storming, but it rises steadily after entering norming and performing stages. It can be known from further repeated visits that effective communication between TMT members shows a drop in the first half stage of storming, but it picks up in the latter half stage of storming, especially the period close to the norming. Therefore, effective communication does not have very obvious changes in forming and storming, it does have a drop process, which is also basically consistent with the conclusion in Chapter 3.

5.6.2 Evolution of Feixiang TMT Shared Mental Model
With the evolution of the team life course, the level of Feixiang TMT’s task-based shared mental model is in constant changes. a. Strategic Target Consensus. In forming, Feixiang’s strategic target is formulated by the general manager, about which most of senior managers are confident, but some others are worried. In storming, domestic motorcycle industry enters the winter and the market pessimism spreads within Feixiang’s TMT team. Most of TMT members are pessimistic about the realization of the strategic target. In norming, team members think the strategic target accords with the company's future development direction, although they all are under great pressure. In performing, TMT generally recognizes the strategic transformation of the company from an industrial group to an investment holding group, but individual members feel pressure about the target 50 billion. b. Team Operation Regulation Consensus. In forming, the team operation regulation has not yet been formed. Although some systems have been formulated, they fail to have binding effects in the eyes of some senior managers and sometimes individual subjective consciousness is above in the systems. In storming, there are specific provisions for members to work and intersections like the situation in the initial stages rarely exist, but the decision-making and management mechanisms need to be improved. In norming, team members work according to rules with thicker participatory decision-making atmosphere. The team operation regulation is gradually formed. In performing, a consensus has been reached in the team operation regulation. c. Competitive Strategy Consensus. In forming, team members have disagreements about whether the diversified competition strategy can be adopted, but more senior managers tend to implement the diversification strategy. In storming, team members can reach a consensus on the competitive strategy orientation, but they still have divergences on the concrete implementation. In norming, team members have different views for the competitive strategy adopted to cope with Motorcycle National III Standard. Although a final agreement is reached for the production of electric motorcycles, some
senior managers still voice their concerns about the competitive strategy decision. In performing, most senior managers are optimistic about the investment in high-end equipment manufacturing industry, but some members express concerns about the prospects. d. Consensus for the Access to External Resources. In forming, most team members hold positive attitudes towards the cooperation with German well-known enterprise AB Company to get its excellent resources, but some senior managers worry about the prospect. In storming, team members have relatively large differences for the introduction of a professional manager to obtain external resources. Rejection is the attitude of most of the TMT members for the introduction of a professional manager. In norming, team members have different views on the cooperation with foreign enterprises with the co-existence of support and concerns. In performing, most of the team members share a consistent understanding of the adoption of overseas mergers and acquisitions or the establishment of a joint venture with the world leading agricultural machinery enterprises to get external resources, but individual members fear for the prospect. e. External Environment Perception Consensus. In forming, most of the team members have a consistent understanding of the company's operating environment and are positive about the strategy of capturing the rural market. In storming, team members hold apparently different attitudes towards the external environment perception. Some senior managers think that different from the foreign market, domestic consumers pursue cheap and fine products. For the current domestic industrial economic environment, domestically produced environment-friendly and energy-saving motorcycles may not be popular abroad. In norming, while the Southeast Asian markets continue to fall, TMT members have both consensus and disagreements for the reasons. In performing, in the face of the continued fermentation of European debt crisis and the U.S. debt crisis, members share a consistent understanding of Brazilian market and think it is the best opportunity to invest in this market.

With the evolution of the team life course, the level of Feixiang TMT’s team-based shared mental model is also in constant changes. a. Speciality Distribution. In forming, most of TMT members are relatives, so they understand each other’s professional backgrounds to a certain extent. They also work with their professional backgrounds as much as possible for the team division of labor, but whether they are competent for the positions of management needs time to inspect due to their technical backgrounds. In storming, entrepreneurial TMT members have certain understandings of each other’s work ability and expertise. Later after three senior members out of the management, three professional managers join the TMT in succession. Although they have never worked with each other, they still have certain understandings of each other’s capability in the industry. In norming, as the interaction between team
members deepens, members have a relatively deep understanding of each other’s expertise. In performing, with deeper interactions between team members, they have a deeper understanding of each other’s expertise. Whenever requiring certain aspects of knowledge and information around decisions, they know clearly whose opinions should be highly valued. b. Style Distribution. In forming, team members have not yet understood each other's work style and attitude so that part of the TMT members a bit do not adapt to each other’s style. In storming, a wide range of replacement of team members makes them only have a shallow understanding of each other’s style. In norming, members have new understanding of each other’s working style and attitude. For instance, General Manager is hot-tempered, rigorous, resolute and decisive. Deputy General Manager of Marketing is outgoing, eloquent and does not stand on trifles. Deputy General Manager of Production is a man of few words and keeps a low profile. Director of Human Resources is an exquisite person. In performing, members have deeper understanding of each other’s working style and attitude. For instance, members thought General Manager is hot-tempered, but now they find he is also gentle and moderate and is willing to listen to everyone's views. For another example, they thought Deputy General Manager of Production talked not much and kept a low profile, but now they find that he talks eloquently about matters involved in production. c. Role Distribution. In forming, although TMT members have preliminary division of labor and have certain understanding of roles they assume, the short-handed reality when the company was founded makes members have to work together to complete the work. In storming, there are few cases for the short-handed reality making TMT members have to work together to complete many affairs. Although some members are replaced, professional managers who join later have experience in senior management and all have certain understanding of the positions they stay and responsibilities and roles they shall undertake and play. In forming, as the company gradually establishes various standards and member interaction deepens, members have more clear understandings of responsibilities and roles they shall undertake and play. In performing, with effective interactions between members, they are extremely clear about the responsibilities and roles they shall undertake and play. d. Expertise Complementation. In forming, TMT members gather together due to the affection and experience in motorcycle repair. They consider little about the expertise complementation. In storming, replacement appears among TMT members. Although new and old senior managers know each other not deeply, their previous experience in senior management and excellent performance make them believe that team combination is complementary on the expertise. In norming, as the team interaction deepens, TMT members have relatively deep understandings of the expertise complementation. For example, General Manager is very sensitive to the market.
Deputy General Manager in charge of production and research and development and Deputy General Manager of Marketing show good execution performance and can execute the company’s major decisions. Director of Human Resources have stronger coordination skills and are adept in resolving contradictions. In performing, TMT members have very deep understandings of the expertise complementation. For example, General Manager has strategic thinking and strong ability to control overall situation. Deputy General Manager of Marketing is capable of market development. Especially when the company encounters difficulties, he can always break the plight and create better market performance under the guidance of corporate strategy. Deputy General Manager of Production and Research and Development is strong in innovative consciousness and capability and can develop products with high market shares both in the company and cooperation with other sides. Director of Finance is skilled in the capital operation and quite familiar with overseas financing.

Based on the description and analysis of the case’s TMT shared mental model data, assessment and scoring are conducted on the TMT shared mental model in four stages of the team life cycle and interviewed persons and experts are invited to make reviews and rectification. The author uses “very high”, “relatively high”, “general”, “relatively low” and “very low” to express the levels of TMT shared mental model in various dimensions, as shown in Figure 5-3.

<table>
<thead>
<tr>
<th>Types</th>
<th>Dimensions (Indicators)</th>
<th>Forming</th>
<th>Storming</th>
<th>Norming</th>
<th>Performing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Task-based Shared Mental Model</td>
<td>Strategic Target Consensus</td>
<td>Relatively High</td>
<td>Relatively Low</td>
<td>Relatively High</td>
<td>Relatively High</td>
</tr>
<tr>
<td></td>
<td>Team Operation Regulation Consensus</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Competitive Strategy Consensus</td>
<td>General</td>
<td>General</td>
<td>General</td>
<td>Relatively High</td>
</tr>
<tr>
<td></td>
<td>Consensus for the Access to External Resources</td>
<td>Relatively High</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
</tr>
<tr>
<td></td>
<td>External Environment Perception Consensus</td>
<td>Relatively High</td>
<td>Relatively Low</td>
<td>General</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>General</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
</tr>
<tr>
<td>Team-based Shared Mental Model</td>
<td>Speciality Distribution</td>
<td>General</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Style Distribution</td>
<td>Relatively Low</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
</tr>
<tr>
<td></td>
<td>Role Distribution</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Expertise Complementation</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
</tbody>
</table>
It can be seen from Figure 5-3 that the development level change rules of Feixiang TMT’s task-based shared mental model and team-based shared mental model in four stages of the team life cycle are: task-based shared mental model shows a decreasing trend from forming to storming and a rising trend from storming to norming and then to the final performing, which indicates that with the evolution of Feixiang’s TMT life course, Feixiang TMT shared mental model experiences in turn general task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental model and general team-based shared mental model, general task-based shared mental model and relatively high team-based shared mental model, relatively high task-based shared mental model and very high team-based shared mental model. Meanwhile, the author also finds that Feixiang TMT task-based shared mental model and team-based shared mental model have not identical development evolution speeds. The latter evolves faster than the former, showing that the development of Feixiang TMT task-based shared mental model is more difficult than its team-based shared mental model, which is consistent with the conclusion in Chapter 4.

5.6.3 Impact of Feixiang TMT Interactive Dynamic Characteristics on the Shared Mental Model Evolution

From Figure 5-4, it can be seen that with the evolution of the team life course, team cohesion and cognitive conflict in Feixiang TMT interactive dynamic characteristics and TMT task-based shared mental model are descending from forming to storming and present rising trends from storming to norming and then to the final performing, which further proves the conclusion in Chapter 3. In other words, the improvements of team cohesion and cognitive conflict help improve the task-based shared mental model. In addition, cognitive conflict and task-based shared mental model present the completely consistent change trend, indicating compared to team cohesion, cognitive conflict has a more remarkable impact on the task-based shared mental model. In the case, although effective communication has no obvious changes in forming and storming, it shows steady rises in norming and performing. It can be known from further repeated visits that effective communication between TMT members shows a drop in the first half stage of storming, but it picks up in the latter half stage of storming, especially the period close to the norming. Therefore, effective communication does not have very obvious changes in forming and storming, it does have a drop process and shows another rising trend. Therefore, the overall change trend of effective
communication is also consistent with that of the task-based shared mental model, which also approximately agrees with the conclusion in Chapter 3. Moreover, it also demonstrates that TMT enters the storming stage from the forming and then transits to norming and performing stages. Both effective communication and team-based shared mental model experience in turn the change trend from General, Relatively High to Very High, further supporting the conclusion in Chapter 3. In other words, improving effective communication level is conducive to improving the team-based shared mental model level.

Figure 5-4 Encoding Analysis of Feixiang TMT Interactive Dynamic Characteristics and Shared Mental Model

<table>
<thead>
<tr>
<th>Stages</th>
<th>Team Cohesion</th>
<th>Effective Communication</th>
<th>Cognitive Conflict</th>
<th>Task-based Shared Mental Model</th>
<th>Team-based Shared Mental Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forming</td>
<td>Relatively High</td>
<td>General</td>
<td>General</td>
<td>General</td>
<td>Relatively Low</td>
</tr>
<tr>
<td>Storming</td>
<td>Relatively Low</td>
<td>General</td>
<td>Relatively Low</td>
<td>Relatively Low</td>
<td>General</td>
</tr>
<tr>
<td>Norming</td>
<td>Relatively High</td>
<td>Relatively High</td>
<td>General</td>
<td>General</td>
<td>Relatively High</td>
</tr>
<tr>
<td>Performing</td>
<td>Very High</td>
<td>Very High</td>
<td>Relatively High</td>
<td>Relatively High</td>
<td>Very High</td>
</tr>
</tbody>
</table>

Information from: organized from the study.

Throughout the life cycle of Feixiang TMT in the case, the above correlations can also be found:

a. Forming. On the one hand, family ties make the TMT have relatively high cohesion and most of TMT members have motorcycle experience, which allow TMT members to form consensuses easily in the strategic target and external environment perception. However, in this stage, members communicate more in aspects involved in technical solutions. They have little communication in such aspects as competitive strategy, access to external resources and team operation regulation. TMT members still conduct completely according to the will of General Manager in some respects and many TMT members think that the company’s initial capital is gathered by General Manager, so competitive strategy, access to external resources and team operation regulation should be determined by General Manager and other members just give advice. Naturally, there are fewer arguments in competitive strategy, access to external resources and team operation regulation. However, the lack of view collisions makes the team unable to consider in detail when making decisions about these aspects.
Although they have a unified opinion finally, this “consensus” is not a true team consensus, which means the task-based shared mental model shows a general level in this stage. On the other hand, although most of TMT members are relatives, they actually work together for the first time. In addition, members are task oriented in this stage, opening up a new prospect as soon as possible is what everyone wants. Therefore, they spend little time in communication and exchanges for expertise and complementarity, work style and attitude and role arrangement, even though some of TMT members neither adapt to each other’s work style nor consider communicating and exchanging ideas to adapt to each other. That is to say, the team-based shared mental model presents a relatively low level in this stage.

b. Storming. For one thing, Feixiang’s top management turmoil, prominent contradictions and the resignation of a Deputy General Manager result in low team cohesion in this stage. Members being out of one mind and turbulence in the external environment make most of TMT members generally pessimistic about the realization of the strategic target and hold different views on the understanding of the external environment perception. It therefore is hard to reach a consensus on the strategic target and external environment perception. Meanwhile, General Manager disclosed the thought of management socialization in some occasions, making some senior managers fear for their career development. A wide range of displacement among team members makes the personal relations tense. Although TMT members communicate more around the maintenance of interpersonal relations, they spend less time arguing about the team work. Naturally, less attention is paid to the competitive strategy, access to external resources and team operation regulation. Therefore, task-based shared mental model shows a relatively low level. For another, although members have more interactions, communication and understanding of each other’s expertise and complementarity, work style and attitude and role arrangement, a wide range of displacement among team members makes them have constantly changing understanding of the above aspects. In general, the cognition of the above aspects is not improved greatly. Compared to the forming stage, the team-based shared mental model presents a general level in this stage.

c. Norming. On the one hand, with the deeper interactions and stronger team cohesion, team members generally think the strategic target formulated accords more with the company’s future development direction and are increasingly more confident in the realization of the strategic target. Meanwhile, President’s growing emphasis on the suggestions given by top managers leads to gradually thick participatory decision-making atmosphere, which makes team members start to communicate and have increased satisfaction with the communication effect. Moreover, members feel that the team operation becomes more and more normative. They try to express freely
their views and opinions and argue with each other in this stage, but they fear that too
many arguments would destroy the harmony, so they are more cautious and modest
and fail to express their real viewpoints when discussing around the competitive
strategy and access to external resources. In consequence, the consensus is not high
in such aspects as competitive strategy and access to external resources, which means
the task-based shared mental model performs generally in this stage. On the other
hand, due to the deeper interactions and enhancing effective communication,
members have more in-depth understanding of each other’s expertise and
complementarity, work style and attitude and roles they should play. In other words,
the team-based shared mental model displays a relatively high level in this stage.
d. Performing. On the one hand, top managers are very cooperative and conduct
personally in lots of work requiring coordination in this stage, and the team shows high-
level cohesion and effective communication. Therefore, even if the company is faced
with strategic transformation, most team members are still confident about the
strategic target and can generally reach consensuses on competitive strategy and
access to external resources. What is more, high-level effective communication and
free expression of ideas in discussion make team members have a consistent
understanding of team operation regulation and external environmental perception,
which means the task-based shared mental model wins relatively high performance in
this stage. On the other hand, with further enhancement of effective communication,
TMT members have much deeper understanding of each other’s expertise,
complementarity, work style and attitudes and know very clearly about roles and
responsibilities they shall play and bear, which means the team-based shared mental
model shows a very high level in this stage.

5.7 Summary
Regarding Feixiang Group as the research case and starting from team life cycle, this
chapter analyzes longitudinally the evolution characteristics of Feixiang Group’s TMT
shared mental model and the team performance mechanism. It matches dynamically
Feixiang TMT interactive dynamic characteristics and TMT shared mental model with
the team process and team performance and reveals the interrelations between these
factors: with the evolution of TMT life course, TMT interactive dynamic characteristics
drive TMT shared mental model to evolve and develop with the level changes in
different development stages, and TMT shared mental model is positively correlated
to the team performance through such team process factors as team cooperation and
information exchange. The case reveals precisely the evolution characteristics of TMT
shared mental model and the team performance mechanism based on the life cycle
and further supports the preceding research conclusions.
Chapter 6 Conclusion, Enlightenment and Outlook

6.1 Introduction
Through the research in the above six chapters, this study has conducted a systematic and in-depth analysis and verification of the evolution characteristics of TMT shared mental model based on the life cycle and the mechanism of team performance. This chapter will first elaborate the main conclusions of this study and enlightenment for the practice of management and then put forward the future research direction in allusion to the limitations and deficiencies existing in this study.

Around the study subject “evolution characteristics of TMT shared mental model based on the life cycle and the mechanism of team performance”, this study has made the integrated use of a series of research methods like documentary research, interview, questionnaire survey and case study and mathematical statistical analysis tools such as SPSS and AMOS and launched a series of related research on TMT interactive dynamic features, the construction of shared mental model, stage characteristics of shared mental model and performance process mechanism of shared mental model. After the research on these issues, this study has been clear about the evolution characteristics of TMT shared mental model based on the life cycle and the mechanism of team performance and formed the following main research conclusions.

6.2 Main Research Conclusions
6.2.1 Stage Characteristics of Shared Mental Model Evolution
TMT interactive dynamic characteristics have important impacts on the construction of shared mental model. TMT interactive dynamic characteristics would present obvious differences in different stages of TMT life cycle, so TMT shared mental model can also demonstrate distinct life cycle stage differences. TMT task-based shared mental model has significant differences between the forming and storming, forming and performing, storming and norming, storming and performing and norming and performing. However, differences between forming and norming are not significant. In addition, in the four stages of forming, storming, norming and performing, the task-based shared mental model level manifests as performing > norming > forming > storming. However, team-based shared mental model has significant differences between forming and norming, forming and performing, storming and norming, storming and performing and forming and performing. In the four stages of forming, storming, norming and performing, team-based shared mental model level manifests as performing > norming > storming > forming. These findings show that with the evolution of TMT life course, the TMT task-based shared mental model level goes down at first and then rises and the storming stage is the watershed between the rise and fall. TMT team-based shared mental model level
presents an upward trend. After TMT enters the storming stage from forming, disagreements and contradictions between team members begin to emerge and interpersonal relations become tense. More time of TMT members is spent in handling how to reduce internal frictions and members naturally pay less attention to team tasks. Consequently, in this stage, there will be usually an obvious drop in the level of TMT task-based shared mental model. In the meantime, as time passes by, TMT members know more about each other’s respective personal styles, role distribution, expertise, complementation and other aspects. That is to say, the overall level of TMT task-based shared mental model will also be lifted in this stage. After entering the norming, members begin to seek harmonious interpersonal relationship with mutual trust and assistance. Therefore, members have relatively straight-out and frank communication with each other without confrontations any more. With the deepening of interactions, members have deeper understandings of each other’s expertise, roles, styles and speciality complementation, which means there is a larger ascension for the level of TMT team-based shared mental model. In this stage, members begin to turn their attention to team tasks and objectives and the level of TMT task-based shared mental model naturally begins to rise again slowly. Therefore, the level of TMT task-based shared mental model in this stage is significantly different from that in storming, but not significantly different from that in forming. In addition, the level of TMT task-based shared mental model in storming drops relatively significantly, so the level of TMT task-based shared mental model in this stage is still lower than that of team-based shared mental model. After entering the performing stage, members begin to focus on team tasks and the tacit understanding has been formed between members. How to quickly achieve team objectives has become the key issue which each member attaches importance to. Therefore, the level of TMT task-based shared mental model in this stage embraces a larger rise in this stage. Further deepened interactions make members have further consolidated and deepened understandings of each other’s expertise, roles, styles and expertise complementation. In consequence, the level of TMT team-based shared mental model still has a slight rise which is relatively smaller than that of TMT task-based shared mental model. But in general, the level of TMT task-based shared mental model is still lower than that of MT team-based shared mental model.

In this study, levels of TMT task-based shared mental model and team-based mental model are graded into very high, relatively high, general, relatively low and very low. Different combinations of levels of TMT task-based shared mental model and team-based mental model can present different TMT shared mental model characteristics. It has been found from the interview research that there are six kinds of different TMT shared mental model characteristics: general task-based shared mental model and relatively low team-based shared mental model, relatively low task-based shared mental
model and relatively low team-based shared mental model, relatively low task-based shared mental model and general team-based shared mental model, general task-based shared mental model and relatively high team-based shared mental model, general task-based shared mental model and general team-based shared mental model, relatively high task-based shared mental model and very high team-based shared mental model. Based on the evidence of content analysis results of interviews from company samples, results show that the main characteristics of high-performance TMT shared mental model in forming are general task-based shared mental model and relatively low team-based shared mental model; main characteristics of shared mental model in storming are relatively low task-based shared mental model and general team-based shared mental model; main characteristics of shared mental model in norming are general task-based shared mental model and relatively high team-based shared mental model; in performing, the main characteristics of shared mental model are relatively high task-based shared mental model and very high team-based shared mental model.

In forming, TMT members work under the team prospect described by team leaders. Although team members have been clear about team task goals and enjoyed similar views of the interpretation of the enterprise’s industry environment, they still have disagreements on the selection of specific competitive strategies and means. TMT members are inclined to acquire useful resources outside the TMT, but they have little communication about methods and information they use to obtain resources. When major issues of the enterprises need to be decided, the team leader would generally organize members to discuss, but he still tends to adopt the view that he has guided when a decision is made eventually. Therefore, generally speaking, TMT task-based shared mental model in this stage shows the general level. When private enterprises are first established, TMT members are relatively few and are generally composed of people who are closely associated with or have know something about each other. However, in general, they have not worked together really, so they have shallow understandings of each other’s styles of doing things, expertise and other aspects. In this stage, although TMT members have a division of labor, the few TMT members in this stage often result in the wearing of multiple hats for one member or work intersections when members are busy sometimes. Few considerations have not been given to whether the expertise is complementary between members when the TMT is established. Therefore, as a whole, TMT team-based shared mental model presents a relatively low level in this stage.

In storming, disagreements and contradictions between team members begin to emerge and interpersonal relations become tense. Much time of TMT members is spent in handling how to reduce internal frictions and members naturally pay less attention to team tasks. Combined with the turbulence in the external environment, team goals may
be oscillatory sometimes. Hence, generally speaking, TMT task-based shared mental model presents a relatively low level in this stage. Meanwhile, in this stage, TMT members know more about each other’s respective personal styles, role distribution, expertise, complementation and other aspects, but this recognition may be based on mistrust. With intensified emotional conflicts, TMT members still have doubts about whether other members’ expertise can really bring benefits to the team and think that it still takes time to observe the different styles that members display with the former stage. Therefore, in this stage, the level of the TMT team-based shared mental model goes up slightly compared with the former stage. The TMT team-based shared mental model presents to be a general level in this stage.

In norming, with the deepening of interactions and effective communication between TMT members, sharp contradictions between TMT members will be resolved gradually and the tense relations have been mollified gradually. Members have ascending consensuses of strategic goals, means of competition, environmental awareness, operation regulations and access to the support of external organizational resources. However, because there is a decline for the TMT task-based shared mental model in storming, so although the level of the TMT task-based shared mental model rises a little, in general, TMT task-based shared mental model in this stage shows a general level. In the meantime, as TMT members have deeper understandings of each other’s expertise knowledge, behavioral styles, job responsibilities, etc, their methods and skills of communication and coordination also have been improved. Therefore, TMT team-based shared mental model in this stage presents a relatively high level. After TMT enters the performing stage, TMT members focus on team tasks and how to reach team goals becomes members’ common wish. Their consensus on tasks also has been improved to a higher level. In this stage, TMT task-based shared mental model shows a relatively high level. Meanwhile, TMT members have been quite familiar with each other’s expertise knowledge, behavioral styles, job responsibilities and other aspects. Once there are new tasks, they would know the roles they should assume and play, and communicate and cooperate with each other whole heartedly relying on the established team norms and standardized procedures. They can handle interpersonal relationships properly. Therefore, TMT team-based shared mental model shows a high level in this stage.

6.2.2 Mediating Effect of TMT Process in the Relationship between TMT Shared Mental Model and Team Performance

Previous many researchers thought that the shared mental model did not work on the team performance directly and there were still some process factors in the relationship between TMT shared mental model and team performance. That is to say, the shared mental model exerts an effect on team performance through the team process. Conclusions in this study indicate that the direct relationship between TMT shared
mental model and team performance is not significant and team process acts a complete mediating role in the relationship between TMT shared mental model and team performance. To be specific, teamwork and information exchange play the complete mediating effects in the process in which TMT task-based shared mental model acts positively on team performance, and information exchange plays a complete mediating effect in the process in which TMT team-based shared mental model acts positively on team performance. Therefore, the conclusions drawn in this study about the relationship between TMT shared mental model and team performance are basically consistent with those of previous much research on team shared mental models.

6.3 Enlightenment from Management

This study has conducted a systematic in-depth analysis of the evolution characteristics of TMT shared mental model based on the life cycle and the mechanism of team performance and obtained the following enlightenment for management practice.

a. Contrapuntally inspire and cultivate the team’s interactive dynamic characteristics which are conducive to the construction of TMT task-based shared mental model. Team cohesion, cognitive conflicts and effective communication have significantly positive impacts on TMT task-based shared mental model. Effective communication has a significantly positive effect on TMT team-based shared mental model, especially effective communication has significantly positive effects on both TMT task-based shared mental model and TMT team-based shared mental model. Therefore, in TMT management practice, efforts should be made to improve the level of effective communication so as to build a good communication atmosphere and allow the TMT members express their views and opinions freely in communication; TMT should not only attach importance to formal communication in the meeting and other occasions, but also pay attention to the private communication between members; A multi-channel and multi-media communication platform should be established. By these means, TMT member can be promoted to reach consensuses in the strategic targets, means of competition, operational regulations, external environment perception and access to external resources and deepen their understandings of expertise distribution, styles of doing things, role distribution and expertise complementation. At the same time, in the TMT management practice, TMT should make efforts to improve team cohesion and inspire cognitive conflicts between TMT members. For this purpose, the TMT leader should take advantage of affection, remuneration and career advancement opportunities to retain talents, enhance members’ senses of belonging to the team, guide and encourage members to have constructive dialogues and debates. Through these efforts, TMT member can be promoted to reach consensuses in the strategic targets, means of competition, operational regulations, external environment perception and access to external resources.
b. Specifically develop life cycle stage characteristics based on high-performance TMT shared mental model

TMT life cycle typically goes through four stages: forming, storming, norming and performing. Conclusions in this study have shown that high-performance TMT shared mental model presents different characteristics in different life cycle stages, namely, general task-based shared mental model and relatively low team-based shared mental model in forming, relatively low task-based shared mental model and general team-based shared mental model in storming, general task-based shared mental model and relatively high team-based shared mental model in norming and relatively high task-based shared mental model and very high team-based shared mental model in performing. Therefore, in early days for a private enterprise, the team should focus on making TMT members know clearly about team goals as soon as possible and trying to reduce TMT members’ disagreements on specific competition strategies and operational specification to prevent the expansion of such disagreements. In TMT storming, the team should center on strengthening communication and exchanges between TMT members and promoting members to know more about each other’s working styles, roles, expertise and complementation. In the meantime, considerations should be given to reduce the internal consumption and prevent interpersonal relationships from deteriorating to result in team disruption and even team dissolution. In TMT norming, on the one hand, efforts should be made to create atmosphere of open communication and promote TMT members to have deeper understandings of each other’s working styles, roles, expertise and complementation. On the other hand, TMT needs to strive to improve the effectiveness of communication between TMT members and enhance members’ consensuses in the strategic targets, means of competition, operational regulations, external environment perception and access to the support of external resources. In TMT performing, members should be actively guided to focus on team tasks and goals and close interactions between members should be strengthened to make TMT members very familiar with each other’s knowledge expertise, working styles and job responsibilities. Once there are new tasks, they can be clear about the roles they should play in the team.

c. Strengthen the cooperation and information exchanges between TMT members

Results have shown in this study that teamwork and information exchange play complete mediating roles in TMT shared mental model and team performance, which means TMT shared mental model can dramatically improve members’ satisfaction with the team and promote the enterprise to grow rapidly by strengthening the cooperation and information exchanges between TMT members. However, at present, in practice of many private enterprises, TMT members think that it is weak cooperative consciousness and low intention of information exchange and sharing between members that lead to poor
TMT performance. Therefore, in TMT management practice, the private enterprises should strengthen TMT members’ cooperative behaviors and promote information exchanges between members. For this purpose, the TMT leader should create collaborative work atmosphere of solidarity and mutual assistance within the team and organize team training activities irregularly to make TMT members experience the importance of teamwork and enhance the friendship between members in activities. In addition, private enterprises should make that information grasped by TMT members having different social backgrounds and social networks can be transferred and integrated efficiently and allow the quantity, type, quality and value of information to be embodied to the largest extent.

6.4 Research Limitations and Outlook

Due to the complexity of research questions and limited time and energy, there are still some limitations in contents and research methods and problems to be studied in the future.

a. Research Contents
First of all, for construction of the TMT shared mental model, this study holds that it is more persuasive to take interactive dynamic characteristics in TMT interactions into account to construct the TMT shared mental model, because compared with the static antecedents of the TMT shared mental model, interactive dynamic characteristics of TMT (dynamic antecedents) have more profound influences. However, when selecting interactive dynamic characteristic indicators, this study only has selected three kinds of interactive dynamic characteristics which are most closely associated with TMT shared mental model: team cohesion, effective communication and cognitive conflict. It has not given considerations to other interactive dynamic characteristics like team leadership and these interactive dynamic characteristics beyond considerations may have impacts on TMT shared mental model, which remains to be discussed and verified further.

Second, private enterprises can be divided into family enterprises and non-family ones. This study has not distinguished between the differences of effects of interactive dynamic characteristics of the two kinds of private enterprises on the construction of the TMT shared mental model or the differences of two kinds of private enterprises in evolution characteristics of TMT shared mental model, which are also issues on which future studies need to focus.

Finally, confined to the author’s time and capability, this study has failed to analyze the feedback mechanism of team performance to TMT shared mental model. Rasker(2000), studies of Bai Xinwen et al. (2006) and other scholars have shown that team performance feedback has important effects on adjusting and developing shared mental model, which
also needs to be further researched in the future.

b. Research Methods
First, due to constraints of time, resource and ability, this study has adopted the cross sectional method in the questionnaire study of stage characteristics of TMT shared mental model, which has brought certain limitations to this study. Although the longitudinal case study adopted finally has made up for deficiencies of the cross sectional method, if longitudinal data gathered in the questionnaire survey could have been used to reflect the stage development of longitudinal TMT shared mental model, the study reliability and validity would be lifted, which is the point to be further improved in future studies.

Second, the number of valid enterprise TMT samples adopted when this study uses structural equation modeling to analyze is 125, which has been more than the required number of samples (at least 100 samples) acknowledged by the academic circles when structural equation modeling is used to analyze. However, if more samples are selected (many scholars suggest to select 200 samples or so when researchers conduct the structural equation modeling analysis), conclusions would be more reliable. Therefore, the size of samples needs to enlarge further for the analysis in the future.
Appendix

Questionnaire

Questionnaire of the Study on the TMT Shared Mental Model of Private Enterprise and Mechanism of Team Performance

Dear Sir or Madam:

Thanks for your time to complete this questionnaire. This is an academic research questionnaire, aiming to investigate the evolution characteristics of private enterprise TMT shared mental model based on the life cycle and the mechanism of team performance. The information you provide will be used for academic research only. To protect your privacy, the names of your enterprises and TMT members are all adopted by aliases. Meanwhile, the interview contents that are likely to expose the TMT members’ identities will be processed technologically. To get valid conclusions, we hope you can provide your real information.

Thanks again for your selfless assistance sincerely! Wish you success in work and good luck!
Part One: Basic information (please tick √ in the corresponding parentheses according to your situation)

Question 1: Your gender
(      ) male                     (      ) female

Question 2: Your age
(      ) 25 to 35 years old           (      ) 36 to 45 years old
(      ) 46 to 55 years old           (      ) 56 years old or above

Question 3: Your education background
(      ) under a junior college diploma (      ) a junior college diploma
(      ) undergraduate diploma       (      ) postgraduate diploma

Question 4: Your enterprise has registered for
(      ) 1 to 2 years                 (      ) 2 to 3 years
(      ) 3 to 5 years                 (      ) more than 5 years

Question 5: The belonging industry of your enterprises:
(      ) manufacturing               (      ) business and trade
(      ) service                     (      ) the real estate
(      ) other industries, please write down the name in the front bracket

Question 6: How many years have you entered your enterprise?
(      ) less than one year           (      ) 1 to 2 years
(      ) 2 to 3 years                 (      ) more than 3 years

Question 7: What stage of development do you think is your TMT in? (The detailed characteristics of every stage are as follows)

(      ) Forming: At this state, the operation of TMT absolutely relies on core members’ guides. Driving by TMT’s bright future, new members are vigorous and full of passion for work. But they are lack of communication along with a low degree of trust. At the same time, they haven’t understood TMT’s tasks and goals, so they are now at a loss about how to work coordinately.

(      ) Storming: At this state, more conflicts emerge in TMT, and the interpersonal relationships also become strained. Besides, TMT members’ personalities begin revealing. The members’ working passion debase along with a relatively low level of the cohesion. Their attention was paid to how to deal with the upgrading emotional conflicts. Norms of TMT haven’t founded. However, they have understood deeply each other’s specialty, style and role.

(      ) Norming: At this state, members start to seek founding norms for settling emotional conflicts. Their relationships take on a harmonious scene by communicating more and showing more supports, understanding and tolerance. Gradually, the cohesion grows strong, and attention was attracted to discuss more about TMT’s tasks and goals. Under this circumstance, norms gradually take its shape.
Performing: Members have a distinct knowledge about their roles, show a high level of trust, and build a harmonious relationship and a strong cohesion. They communicate with each other by norms that have formed. At the same time, emotional conflicts are less than before. Their attention has converted to how to achieve TMT’s tasks and goals fast. At this stage, they are active in sharing viewpoints freely and information constructively.

Part Two: The following sentences describe TMT interactive dynamic characteristics. Please read carefully and evaluate according to the following descriptions based on the actual situation of the TMT you are in. Please tick √ on the corresponding number. All options described do not distinguish right or wrong.

(Note: TMT is a group of people who can participate in business decision-making and strategic decision-making and have a power of controlling and making decisions. They are the chairman, general manager, deputy general manager, directors of all Departments, etc.)

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A1. The team leader is mighty.  
A2. I have feelings for the top management team  
A3. I have a strong sense of belonging in the top management team.  
A4. I regard myself as a part of the top management team.  
A5. Team members are optimistic about the enterprise prospect.  
A6. Team members have active minds.  
A7. Other TMT members regard me as a part of them.  
A8. The team I am in is one of the best TMTs in the industry.  
A9. TMT members would propose plenty of different schemes when discussing and making decisions.  
A10. I am very glad to work in such a TMT.  
A11. TMT members often have a lot of arguments due to different views they hold when making strategic decisions.  
A12. The team pays much attention to the feeling of power sharing.
A13. We will expound and prove fully as much as possible when making decisions.

A14. TMT members often have different views of important issues.

A15. There are large differences between TMT members’ views and opinions of some critical issues.

A16. TMT members can freely express their own views and opinions in communication.

A17. TMT members also communicate with each other privately besides formal communication in the meeting and

A18. TMT members are very confident.

A19. I am satisfied with the information that TMT members transmit and the effectiveness that information has brought

A20. There are varied methods and channels for TMT members to communicate

Part Three: The following sentences describe some manifestations and features of TMT shared mental model. Please read carefully and evaluate according to the following descriptions based on the actual situation of the TMT you are in. Please tick √ on the corresponding number. All options described do not distinguish right or wrong.

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B1. TMT members have a consensus on the team’s operating regulations.

B2. TMT members have a consensus on competitive strategies that have been adopted.

B3. TMT members have a consensus on the access to the organizational external resources

B4. TMT members have a consensus on the strategic goals.

B5. TMT members have a consensus on the external environment perception.
B6. TMT members know much about each other’s family backgrounds.

B7. TMT members think their professional knowledge they possess are what should be needed to complete tasks.

B8. TMT members know much about each other's styles of doing things and personalities.

B9. TMT members know much about each other’s knowledge structures and expertise.

B10. TMT members have command of means and techniques for mutual coordination.

B11. TMT members know much about each other's job duties and contents.

Part Four: 4. The following sentences describe the enterprise TMT process. Please read carefully and evaluate according to the following descriptions based on the actual situation of the TMT you are in. Please tick √ on the corresponding number. All options described do not distinguish right or wrong.

C1. In the face of complicated tasks and work that must be finished within the time required, TMT members are willing to help each other.

C2. TMT members are willing to adjust their spectrums of duties for the smooth progress of team work.

C3. When a TMT member is busy at work, the other TMT members will actively offer to help and share. tasks with him.

C4. Communication between TMT members can produce effective solutions to problems.

C5. Communication between TMT members can produce high-level creativity and spirit of innovation.

C6. Communication between TMT members can produce valuable ideas and concepts.

C7. TMT members are able to argue with each other when having different views.

Part Five: The following sentences describe the enterprise TMT performance. Please
read carefully and evaluate according to the following descriptions based on the actual situation of the TMT you are in. Please tick √ on the corresponding number. All options described do not distinguish right or wrong.

1. extremely dissatisfied  2. relatively dissatisfied  3. generally  4. relatively satisfied  5. very satisfied

| D1. General evaluation made by TMT members on teamwork | 1 2 3 4 5 |
| D2. Outside evaluation on TMT members | 1 2 3 4 5 |
| D3. TMT members’ satisfaction with teamwork | 1 2 3 4 5 |
| D4. TMT members’ satisfaction with the display of their expertise and abilities | 1 2 3 4 5 |
| D5. The enterprise’s sales growth relative to competitors | 1 2 3 4 5 |
| D6. Satisfaction with the sales growth | 1 2 3 4 5 |
| D7. The enterprise’s acquisition of market shares relative to competitors | 1 2 3 4 5 |

This is the end of the questionnaire. Please double check whether you have missed something. After you finish, please choose one of the following ways to return your questionnaire results.

a. Return to the people who have issued the questionnaire.
b. Send E-mail to: XXX@163.com

Thanks again for your cordial help.
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Statement

Statement: I solemnly declare that this dissertation submitted is my own original and independent achievement conducted under the guidance of my supervisor. As far as I know, all research achievements of this dissertation do not contain any contents that others enjoy copyrights on except those that have been given sources for reference. Other individuals and collectives that have contributed to the research work involved in this dissertation have been indicated explicitly in the text.

Signature: Date:
Resume

Basic Information

Name: Tong Zhiying                     Gender: Male
Date of Birth: Dec. 17th 1969            Age: 47
Nationality: the Han Nationality              Marital Status: Married
Census Register: Hexi District, Tianjin     Residence: Hexi District, Tianjin
Highest Education: College                 Graduated from:
Tel: 13820266587                           E-mail: admin@tjlongxing.com.cn

Main Work Experience

From 1993 to 1997  Shenzhen Design Engineering Firm     Manager
From 1997 to 2001  Tianjin Kaida Decoration Engineering Co. Ltd     Manager
Since 2002 to now  Longxing (Tianjin) Decoration Engineering & Design Co. Ltd General Manager

Main Work Achievements

1. From 1993 to 1997  Shenzhen Design Engineering Firm     Manager
Shenzhen Engineering Design Firm is a scientific and technological firm which focuses on engineering design and provides full services for engineering construction projects. During my employment in this firm, I had led all the colleagues to explore constant innovations and continuous improvements, and the firm had been enhanced in strength and expanded in capacity. The firm accredited the ISO 9001 certification in 1995 and acquired the QEOHS certification in 1996. During these 5 years, the firm had completed hundreds of projects ranging in different fields like civil buildings, EPC contracts, engineering cost consultations and engineering construction supervision, etc. distributed in various provinces, cities and municipalities all over our country, and these projects had achieved 10 provincial awards inclusive of awards for excellence, awards for scientific and technological advancement and awards for consultation.

2. From 1997 to 2001  Tianjin Kaida Decoration Engineering Co. Ltd     Manager
Tianjin Kaida Decoration Engineering Co. Ltd is mainly focused on building decoration, engineering design and construction, inclusive interior and exterior finishes works for office towers and large public buildings. During my employment here, I recruited, cultivated and selected high-quality and high-talent managing staff and technical staff,
and I attached importance to the overall quality and technical level of the staff. With the application of the advanced project management method and the joint efforts of the whole staff, the corporation gained both social benefits and economic benefits, and won praises from all the clients.

3. Since 2002   Longxing (Tianjin) Decoration Engineering & Design Co. Ltd   General Manager (Legal Person)
This is my own company and its main business covers interior and exterior finishes works, engineering design and advertisement service. There are Purchase Department, Budget Department, Design Department and Financial Department in this corporation. The highest bid that the corporation used to be awarded has reached an amount of ¥ 97,000,000. The representative projects we used to carried out include Project of Interior Finishes for the Ground Operation & Control Room of T-3 of Beijing International Airport, project of Refined Decoration Works for the C Tower of Tianjin Taida Square, Project of Interior Finishes for the Conference and Exhibition Center of Zaozhuang, Shandong Province, and the Project of Interior and Exterior Finishes for the Office Building of Tianjin Xinguang Pharmaceutical Co. Ltd. With insurance of work quality, the corporation is expanding its size and capacity. As the managing director, I attach importance to corporation culture and business process reengineering to achieve normalization, standardization and internationalization on management, and have set a good example in the industry.