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The Impact of TMT Interaction and Cognitive Sharing on Innovation Decision Performance in Technological Innovation Enterprises: A Mediated Moderation Effect Based on Team Reflexivity

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Abstract: *Drawing on a dual perspective of team interaction and cognitive sharing, and integrating team reflexivity theory, this study systematically reviews the relevant literature and offers a refined conceptualization of top management teams (TMTs) within a unified senior echelon framework. Based on this foundation, we propose theoretical hypotheses and construct a research model. Empirical analysis of 642 valid samples from 102 technology innovation firms reveals that TMT interaction exerts a significant positive effect on innovation decision-making performance. Moreover, TMT cognitive sharing partially mediates this positive relationship. In addition, TMT reflexivity plays a partial moderating role between TMT interaction and innovation decision-making performance, operating through the mediating effect of TMT cognitive sharing. Accordingly, technology innovation firms are encouraged to actively foster TMT interaction, promote cognitive sharing through multiple complementary approaches, and conduct regular TMT reflexivity activities to enhance innovation decision-making outcomes.*

Keywords: *Top Management Team (TMT), Team Interaction, Team Reflexivity, Cognition Sharing, Innovation Decision Performance*

1. Introduction

China's 15th Five-Year Plan represents a critical stage for achieving high-level technological self-reliance and leveraging technological innovation to drive the development of new-quality productive forces. In this context, top management teams (TMTs) in technology innovation enterprises, as the core of strategic decision-making and primary drivers of innovation practice, play a pivotal role. Despite this, research on the relationship between TMTs and innovation decision performance remains limited. Early studies predominantly adopted a "traits–outcomes" paradigm, providing preliminary insights into core relationships [1], while subsequent research focused on TMT team processes, examining how teams with specific demographic characteristics influence innovation performance. However, divergent research perspectives have left the link between TMT demographic attributes and innovation decision outcomes unclear [2]. Notably, the mechanisms through which TMT interactions impact innovation decision performance remain largely unexplored, creating a "black box" that warrants further investigation. Furthermore, whether TMT cognitive sharing mediates the effect of team interactions on innovation decision performance, and whether team reflexivity exerts a moderated mediation effect, has yet to be examined.

Building on existing literature, this study defines TMTs within a unified top management framework and integrates insights on cognitive sharing and team reflexivity into TMT theory. It systematically investigates how TMT interactions, cognitive sharing, and team reflexivity influence innovation decision performance in technology innovation enterprises. By doing so, the study not only expands the research on TMTs and innovation decision outcomes but also offers practical guidance for TMTs in exploring novel governance mechanisms to enhance innovation.

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2. Literature Review and Research Hypotheses

2.1. The Impact of TMT Team Interactions on Innovation Decision Performance

In the context of a complex and dynamic internal and external business environment, both board members and top executives within a unified top management framework serve as the core agents of innovation decision-making. Drawing on the conceptualization of TMT in the literature [3], this study defines TMT as a small group composed of key board members and top executives who, within the top management framework, hold absolute decision-making authority and control over various organizational resources. TMT team interactions refer to the interactive behaviors among TMT members within the top management framework, including information exchange, effective communication (both formal and informal), and joint decision-making [4]. Moreover, in this study, innovation decision performance is measured by decision quality and decision satisfaction.

At the critical stage of China's 15th Five-Year Plan, which emphasizes achieving high-level technological self-reliance and leveraging technological innovation to drive the development of new-quality productive forces, comprehensive, accurate, and timely information serves as a prerequisite and guarantee for TMTs in technology innovation enterprises to enhance innovation decision performance. However, based on Simon's "boundedly rational human" theory, any TMT member is a boundedly rational individual, whose time, knowledge, experience, cognitive needs, and cognitive capacities are inherently limited [5]. Corporate innovation decision-making is therefore a dynamic process in which information regarding the internal and external business environment is perceived, processed, retained, and selectively interpreted under conditions of bounded rationality. Consequently, in increasingly complex and dynamic internal and external environments, it is difficult for any TMT member to ensure the comprehensiveness, accuracy, and timeliness of information collection and analysis. To obtain comprehensive, accurate, and timely decision information, interactive behaviors among TMT members—such as information exchange, formal and informal communication, and joint decision-making—are necessary to integrate the knowledge, experience, and decision-related information of all members. Team processes, defined as the purposeful exchange of information and emotions among team members (Billups, 1987), allow TMTs, within a top management framework, to leverage collective intelligence to compensate for the limitations of individual members' knowledge, experience, cognitive needs, and capacities.

Moreover, TMT team interactions facilitate brainstorming, free expression of ideas, and the collection of information from multiple perspectives and levels, enabling the development of alternative solutions and the systematic, comprehensive analysis of these options using collective expertise, thereby ensuring the quality of innovation decisions. Additionally, team interactions help integrate the diverse information-processing abilities of individual TMT members and enable complementary and mutually reinforcing understanding and processing of the same decision-related information. Through transactive memory, the overall decision-processing capability of the TMT is enhanced, which further improves the quality of innovation decisions.

In summary, team interactions among TMT members contribute to enhancing the quality of innovation decisions, as the essence of team interaction lies in communication among members rather than the simple aggregation of individual behaviors, emphasizing deep interaction and organic integration at the levels of values, core principles, and practical actions. However, differences in age, tenure, cultural background, and functional expertise among executives inevitably lead to variations in cognitive preferences, abilities, and needs, and during specific innovation decisions, TMT members may engage in deliberate political behaviors to pursue or protect individual or group interests. Such self-serving political behaviors can distort or impede the transmission of critical decision information, easily leading to interpersonal and emotional conflicts among TMT members [6], and most scholars argue that emotional conflict reduces team identification and cohesion, thereby hindering strategic decision-making and negatively affecting innovation decision satisfaction.

Nonetheless, during the innovation decision-making process, TMT team interactions—including information exchange, effective formal and informal communication, and joint decision-making within the top management framework—can effectively reduce differences in cognitive preferences, abilities, and needs among members, mitigate self-serving political behaviors, and foster mutual understanding and empowerment. By promoting consensus through equal negotiation, TMT members can achieve innovation decisions that are satisfactory to all, and overall, given the complexity and variability of problems and the internal and external business environment, TMT team interactions facilitate communication, strengthen team cohesion, resolve political behaviors, enhance members' identification

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with decisions, and ultimately improve innovation decision satisfaction, demonstrating that TMT team interactions positively contribute to innovation decision performance. Based on this, the following hypothesis is proposed:

Hypothesis 1: TMT team interactions have a significant positive effect on innovation decision performance.

2.2. The Mediating Effect of Cognitive Sharing

This study, based on the two-dimensional TMT cognition theory (TMT cognitive ability and TMT cognitive needs) and the shared mental model, defines TMT cognitive sharing as the sharing of TMT cognitive abilities and cognitive needs. During the innovation decision-making process, TMT members with similar or overlapping cognitive orientations tend to form cognitive factions. The emergence of such TMT cognitive factions can easily lead to in-group favoritism and group polarization, forming "subgroups" or "cliques" that exclude dissenting opinions, suppress innovative ideas, hinder decision-making breakthroughs, and allow the interests of subgroups to override the overall interests of the enterprise, thereby negatively affecting innovation decision performance [7].

Team interactions among TMT members can effectively eliminate in-group favoritism arising from cognitive differences and facilitate the development of distributed cognition regarding team members' cognitive abilities and expertise. Members gradually identify "who knows what," "who excels at what," "who has strong cognitive discernment," and "who has strong cognitive adjustment abilities" and share this information during specific innovation decision-making processes. This enables the rapid retrieval and effective integration of distributed cognitive abilities within the TMT according to the demands of a complex and dynamic economic environment and the requirements of innovation tasks, promoting the sharing of TMT cognitive abilities. Similarly, team interactions facilitate mutual understanding among members regarding cognitive motivations, value orientations, cognitive needs, cognitive benefits, and willingness to engage in detailed cognitive processing during information handling, thereby enhancing the overall level of cognitive needs and the sharing of cognitive needs within the TMT. For members with relatively low cognitive needs, social recognition pressures and the desire to maintain interaction with other members may unconsciously increase their willingness to engage in cognitive thinking and share cognitive needs, gradually altering previous cognitive habits to improve their own cognitive needs and contribute to shared cognitive resources. In summary, the greater the degree of team interaction among TMT members, the more conducive it is to enhancing the sharing of TMT cognitive abilities and cognitive needs.

Facing a complex and dynamic innovation decision-making environment and challenging decision problems, TMT members exhibit significant individual differences in cognitive abilities. Members with lower cognitive abilities tend to rely on routine information inputs during the collection and processing of information, resulting in shallow and superficial analyses of the internal and external business environment and limiting their ability to capture industry innovation dynamics and development trends in a timely and in-depth manner. From the perspectives of information processing theory and upper echelons theory, TMT members with higher cognitive abilities can not only consciously select and unconsciously filter complex internal and external information, rapidly gather critical materials required for innovation decisions, and integrate them effectively within a short period, thereby accurately grasping the core essence of innovation decision problems and formulating high-quality innovation decisions, but also approach innovative information with greater depth and unique perspectives compared to other members. This distinctive cognitive viewpoint helps solve decision-making challenges with differentiated thinking, generate innovative interpretations of phenomena, and optimize the assessment of potential opportunities in the environment, further empowering the implementation of high-quality decisions and the occurrence of innovative actions.

In fact, the collective cognitive ability of the team exerts an even more significant influence on innovation decision-making, with the emphasis on the sharing of cognitive abilities. Cognitive abilities among team members can mutually influence and interact with each other, and through cognitive ability sharing, positively affect innovation decision performance [8]. Teams with high levels of TMT cognitive ability sharing are better able to rapidly identify information useful for innovation performance in a complex and dynamic competitive environment and flexibly apply it to innovation decisions, reducing knowledge acquisition costs and promoting unconventional knowledge innovation. High levels of cognitive ability sharing also encourage team members to expand their individual attentional scope, enhance responsiveness to decision-related information, aggregate team knowledge, experience, and wisdom, break rigid cognitive frameworks, compensate for individual knowledge gaps, and facilitate

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resource flow, integration, and value creation within the team, thereby effectively improving the quality of innovation decisions.

Furthermore, from the perspective of upper echelons theory, high levels of TMT cognitive sharing not only shape members' depth of thinking and intensity of engagement but also enhance the efficiency and sensitivity of external information perception, accelerating the capture of industry development trends and providing a critical foundation for improving enterprise innovation decision performance. Teams with high levels of cognitive needs sharing exhibit stronger willingness among TMT members to collect relevant information for active processing and reflection, greater readiness to engage in complex team tasks, and greater willingness to share information with other team members, thereby enabling more extensive acquisition and processing of rich informational resources [9]. Cognitive needs sharing among TMT members facilitates positive interactions, enhances consensus in interpreting the external environment and competitive dynamics, reduces decision-making conflicts, and improves identification with and satisfaction in innovation decisions. In summary, in the face of increasingly complex innovation decision environments and problems, TMT team interactions promote cognitive sharing among members, and TMT cognitive sharing, in turn, enhances innovation decision performance. Therefore, the following hypotheses are proposed:

Hypothesis 2: TMT team interactions have a significant positive effect on cognitive sharing.

Hypothesis 3: TMT cognitive sharing has a significant positive effect on innovation decision performance.

Hypothesis 4: TMT cognitive sharing mediates the relationship between team interactions and innovation decision performance.

2.3. The Moderating Effect of Team Reflexivity

Team reflexivity refers to a team's ability for self-reflection and introspection, through which members openly reflect and communicate, adjust corporate development strategies in response to changes in internal and external environments, and align tactical objectives with strategic goals, ensuring work progresses in accordance with strategic direction and avoiding directional errors. Team reflexivity plays a strong moderating role in achieving organizational goals, vision, and mission, and can be divided into cognitive reflexivity and affective reflexivity. Accordingly, this study conceptualizes TMT team reflexivity as comprising two dimensions: TMT cognitive reflexivity and TMT affective reflexivity.

TMT cognitive reflexivity reflects the extent to which top management team members reflect on various organizational issues and represents a characteristic of the TMT as the primary decision-making body actively responding to internal and external environments. It is considered critical for the team to monitor the environment and respond appropriately under complex tasks and turbulent external conditions, serving as a key mechanism for eliciting and processing diverse information within the TMT [10]. The complexity of the business environment and the importance of innovation decisions objectively require TMTs to engage in regular open reflection, strengthen communication and collaboration, and exchange information, thereby fostering new perspectives, strategic foresight, and future-oriented planning. Zhao (2019) [11] found that TMT cognitive reflexivity encourages open reflection, collective brainstorming, and timely adjustment of corporate strategies according to changes in the internal and external business environment, and as an extremely valuable resource, it effectively enhances innovation decision performance; higher levels of TMT cognitive reflexivity facilitate member participation in the innovation decision-making process, thereby improving decision satisfaction and commitment.

In addition, TMT affective reflexivity is considered an important factor in building positive interpersonal relationships, promoting information exchange, emotional communication, effective interaction, open collaboration, and achieving mutual gains [12]. Therefore, in the face of a complex and dynamic economic environment, higher TMT affective reflexivity during the innovation decision-making process enables team members to accept opinions different from their own, openly communicate and reflect, cultivate positive interpersonal relationships, conduct effective team interactions in a harmonious environment, promote sustainable corporate development, and enhance innovation decision satisfaction. Higher levels of TMT affective reflexivity also strengthen members' ability to manage emotional conflicts and interpersonal relationships, increase their willingness to engage in formal and informal communication, information exchange, and joint decision-making interactions, thereby effectively reducing differences in cognitive abilities and needs among TMT members, promoting consideration of overall organizational interests, mitigating the negative impacts of political behaviors and in-group favoritism on innovation decisions, and ultimately improving the quality and satisfaction

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of innovation decisions. Based on the above, the following hypothesis is proposed:

Hypothesis 5: TMT team reflexivity moderates the positive effect of team interactions on innovation decision performance.

At the current critical stage of rapid technological development and innovation-driven economic growth, top management teams (TMTs) in technology innovation enterprises are required to adopt a long-term perspective, focus on breakthroughs in core technologies, keenly capture emerging industry innovation trends, and provide strategic support for effective innovation decision-making through proactive action and dynamic adaptation. However, in the face of a complex and dynamic business environment, differences in values and cognitive preferences among TMT members lead to variations in cognitive abilities and cognitive needs. Consequently, both objectively and subjectively, TMTs are required to engage in effective cognitive sharing, team interactions, and team reflexivity during the innovation decision-making process.

Lines et al. [12] found that teams with higher levels of cognitive reflexivity exhibit greater willingness among TMT members to engage in information exchange, formal and informal communication, and knowledge and cognitive sharing, which helps the team more effectively collect and process internal and external environmental information and enhances innovation decision satisfaction. Compared with low-reflexivity teams, high-reflexivity teams demonstrate higher cognitive and affective trust among members, thereby reducing cognitive and emotional conflicts [13]. Therefore, higher TMT cognitive reflexivity encourages members to actively communicate, collect relevant information on internal and external environments, share their perspectives and insights, respect and accommodate diverse viewpoints, and foster an interactive atmosphere characterized by open communication, close collaboration, and efficient coordination, thereby enhancing mutual understanding, reducing monitoring and defensive behaviors, and promoting the sharing of cognitive abilities and cognitive needs among TMT members.

Accordingly, given the demands of innovation-driven competition and the cultivation of new-quality productive forces in this critical stage, higher TMT affective reflexivity further motivates members to engage in team interactions within a harmonious interpersonal and positive team climate, to accept opinions different from their own, and to gradually modify previous cognitive habits and preferences, enhancing their own cognitive abilities and cognitive needs while sharing them with other members. Based on the above, the following hypothesis is proposed:

Hypothesis 6: TMT team reflexivity moderates the positive effect of team interactions on cognitive sharing.

Based on the six hypotheses proposed above, the theoretical framework of this study is illustrated in Figure 1. As shown in the framework, part of the moderating effect of TMT team reflexivity on the relationship between TMT team interactions and innovation decision performance is realized through the mediating role of TMT cognitive sharing. Accordingly, the following hypothesis is proposed:

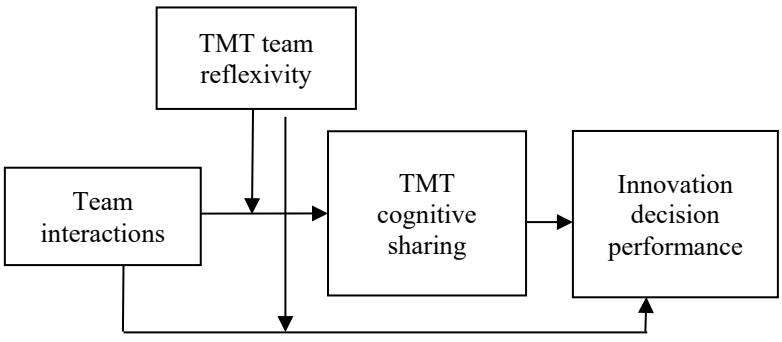

Figure 1 The theoretical framework of this study.

Hypothesis 7: The partial moderating effect of TMT team reflexivity on the relationship between team interactions and innovation decision performance is mediated by TMT cognitive sharing.

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3. Sample Data and Variable Description

3.1. Sample Data

This study collected research data using a questionnaire survey method. The data were collected between September 2025 and December 2025, primarily from technology start-ups located in the Yangtze River Delta region, including Shanghai, Jiangsu, Zhejiang, and Anhui provinces. A total of 1,152 questionnaires were distributed, and 772 were returned. After excluding incomplete responses and invalid questionnaires from enterprises with less than three responses, 642 valid questionnaires from 102 enterprises were retained for the final analysis.

In the final sample, 82.2% of respondents were male and 17.8% were female; 6.1% were under 30 years old, 46.1% were between 31 and 40, 40.9% were between 41 and 50, and 6.9% were over 51; regarding tenure, 16.3% had less than 3 years, 38.4% had 4–7 years, 32.3% had 8–11 years, and 13% had 12 years or more; in terms of education, 5% had a high school education or below, 14.7% had a diploma, 35.2% had a bachelor's degree, and 45.1% had a master's degree or higher.

3.2. Variable Description

3.2.1. Independent Variable: TMT Team Interactions

Measured based on the items from references [14], such as "TMT members attach great importance to consultation and collaboration with internal members on strategic decision issues," "TMT members highly value information exchange, sharing, and emotional communication regarding strategic decisions," and "TMT members frequently engage in formal or informal communication."

3.2.2. Mediating Variable: TMT Cognitive Sharing

Measured based on the items from references [15] and [16], such as "I am able to identify information useful for innovation decisions in a complex environment and actively share it with other members," "I am very willing to engage in careful cognitive processing with other members during innovation decision-making," "After learning new knowledge useful for research work, I will disseminate it so that more people can master it," and "I try to share the professional knowledge I have learned with team members in a more efficient way."

3.2.3. Moderating Variable: TMT Team Reflexivity

Measured based on the items from references [10] and [11], such as "The TMT in your company regularly discusses how to collaborate effectively," "TMT members reflect on and discuss past lessons or experiences," "The executive team can timely adjust objectives according to environmental changes," and "When interpersonal conflicts arise among TMT members, they are effectively resolved."

3.2.4. Dependent Variable: Innovation Decision Performance

Measured based on the items from reference [9], such as "Multiple criteria were used in making innovation decisions," "Decisions were made based on sufficiently collected internal and external information," and "You are satisfied with the way the leadership team reaches innovation decisions."

4. Hypothesis Testing

As shown in Figure 1, TMT team reflexivity not only moderates the relationship between TMT team interactions and innovation decision performance, but also moderates the relationship between TMT team interactions and cognitive sharing. Therefore, the moderating effect of TMT team reflexivity constitutes a moderated mediation effect. According to the testing method for moderated mediation effects, the results are presented in Table 1 and Table 2.

Table 1: Test of the mediating effect of TMT cognitive sharing

Variables	Innovation Decision Performance	TMT cognitive sharing	Innovation Decision Performance
	Model 1	Model 2	Model 3

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Team interactions	0.403**	0.512**	0.269**
TMT team reflexivity	0.437**	0.423**	0.327**
TMT cognitive sharing			0.261 **
R^2	0.576**	0.523**	0.787**
F	38.745	31.832	25.165
ΔR^2	0.576**	0.523**	0.211**
ΔF	38.745	31.832	12.408

**Note: ** indicates P < 0.01.

Table 2: Test of the moderated mediation effect of TMT team reflexivity

Variables	Innovation Decision Performance	TMT cognitive sharing	Innovation Decision Performance
	Model 4	Model 5	Model 6
Team interactions	0.376**	0.463**	0.278**
TMT team reflexivity	0.425**	0.412**	0.337**
TMT cognitive sharing			0.213**
Team interactions × TMT team reflexivity	0.384**	0.341**	0.311**
R^2	0.485**	0.434**	0.689**
F	29.549	27.135	17.598
ΔR^2	0.485**	0.434**	0.204**
ΔF	29.549	27.135	15.021

**Note: ** indicates P < 0.01.

As shown in Table 1, the regression coefficient of TMT team interactions in Model 1 is significant (β = 0.403, P < 0.01), indicating that TMT team interactions have a significant positive effect on innovation decision performance, thus supporting Hypothesis 1. In Model 2, the regression coefficient of TMT team interactions is significant (β = 0.512, P < 0.01), indicating that TMT team interactions have a significant positive effect on TMT cognitive sharing, thus supporting Hypothesis 2. In Model 3, the regression coefficient of TMT cognitive sharing is significant (β = 0.261, P < 0.01), and the regression coefficient of TMT team interactions is also significant (β = 0.269, P < 0.01), indicating that TMT cognitive sharing has a significant positive effect on innovation decision performance, thus supporting Hypothesis 3. Based on Hypotheses 1, 2, and 3, TMT cognitive sharing partially mediates the positive effect of TMT team interactions on innovation decision performance, thereby supporting Hypothesis 4.

As shown in Table 2, the regression coefficient of the interaction term between TMT team interactions and TMT team reflexivity in Model 4 is significant (β = 0.384, P < 0.01), indicating that TMT team reflexivity moderates the positive effect of team interactions on innovation decision performance, thus supporting Hypothesis 5. In Model 5, the regression coefficient of the interaction term is significant (β =

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0.341, P < 0.01), indicating that TMT team reflexivity moderates the positive effect of team interactions on cognitive sharing, thus supporting Hypothesis 6. In Model 6, the regression coefficient of TMT cognitive sharing is significant (β = 0.213, P < 0.01), and the regression coefficient of the interaction term is also significant (β = 0.311, P < 0.01), indicating that the partial moderating effect of TMT team reflexivity on the relationship between TMT team interactions and innovation decision performance is realized through the mediating effect of TMT cognitive sharing, thus supporting Hypothesis 7.

5. Conclusions and Implications

5.1. Conclusions

5.1.1. TMT Team Interaction Has a Significant Positive Effect on Innovation Decision Performance

Team interactions among TMT members in technology innovation enterprises have a significant positive effect on innovation decision performance. As shown in Models 1 and 3 of Table 2, the total effect of TMT team interactions on innovation decision performance is 0.403, and the direct effect is 0.269, both reaching significance at the 0.01 level. Therefore, team interactions among TMT members can effectively enhance innovation decision performance.

High-quality interactions within top management teams (TMTs) primarily integrate members' knowledge, experience, and decision-related information through information exchange, formal and informal communication, and joint decision-making. This can significantly deepen and broaden the information exchange process, systematically improving the team's efficiency in acquiring, processing, and interpreting the internal and external information necessary for strategic decisions. By fully integrating diverse perspectives and professional insights, the team can form a unified strategic consensus. This process not only reduces cognitive biases and opinion divergences caused by differences in age, tenure, cultural and functional background, cognitive preferences, abilities, and needs among executives, but also fundamentally enhances the scientific rigor, feasibility, and implementation adaptability of strategic decisions, while increasing members' recognition of and satisfaction with the decisions, thus laying a solid foundation for implementation.

5.1.2. TMT Cognitive Sharing Exerts a Partial Mediating Effect

Cognitive sharing among TMT members in technology innovation enterprises partially mediates the relationship between TMT team interactions and innovation decision performance. As shown in Model 2 of Table 2, the regression coefficient of TMT team interactions is 0.512 and significant. Model 3 indicates that the regression coefficient of TMT cognitive sharing is 0.261 and significant, while the regression coefficient of TMT team interactions remains significant at 0.269. Therefore, based on the testing method for mediation effects, TMT cognitive sharing exerts a partial mediating effect between TMT team interactions and innovation decision performance.

TMT team interactions not only have a direct positive impact on innovation performance but also indirectly enhance innovation performance by improving the level of team cognitive sharing, confirming that cognitive sharing serves as a critical bridge connecting team interaction behaviors and innovation outcomes. Through systematic TMT team interactions, technology innovation enterprises can effectively integrate the professional knowledge, practical experience, and decision-related information of TMT members, significantly improving the team's efficiency in acquiring, processing, and interpreting the internal and external information necessary for strategic decision-making. Meanwhile, TMT members with high cognitive ability can selectively filter complex information, accurately grasp the core essence of decision problems, and, through cognitive sharing, facilitate constructive interactions and enhance consistency in interpreting the external environment and competitive landscape. This consensus mechanism helps reduce decision-making conflicts, thereby increasing both identification with and satisfaction in innovation decisions.

5.1.3. TMT Team Reflexivity Has a Moderated Mediation Effect

TMT team reflexivity in technology innovation enterprises can moderate the positive effect of TMT team interactions on innovation decision performance, with part of this moderating effect being mediated by TMT cognitive sharing. As shown in Table 2, the regression coefficients of the interaction terms in Models 4, 5, and 6 are all significant, and the regression coefficient of TMT cognitive sharing on innovation decision performance in Model 6 is also significant. Therefore, based on the testing method for mediated moderation, TMT team reflexivity has a moderating effect on the relationship between TMT team interactions and innovation decision performance, with part of this moderating effect operating

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through the mediating role of TMT cognitive sharing.

Essentially, TMT team reflexivity refers to the team members' ability to actively examine, critique, and optimize their own and the team's decision logic, cognitive frameworks, and interaction patterns. The enhancement of this capability fundamentally activates high-quality team interactions and cognitive sharing, encouraging members to step beyond individual functional limitations and experiential biases, actively reflect on the partiality and positional bias of their own perspectives, and participate in team discussions with openness and inclusivity. This process effectively resolves conflicts arising from TMT heterogeneity, reduces interference from political behaviors and in-group favoritism, and enables the team to identify and address potential issues in innovation decisions through efficient collaboration, directly improving decision quality and implementation effectiveness, thereby injecting multiple layers of value into innovation decision-making.

5.2. Implications

5.2.1. Emphasize TMT Team Interaction and Improve Interaction Mechanisms

In the process of formulating innovation decisions, TMTs of technology innovation enterprises should place great emphasis on team interactions among members. Facing complex and dynamic economic conditions and innovation decision problems, TMTs need to continuously establish and improve effective mechanisms for team interaction. On one hand, long-term and systematic regular meeting systems can encourage TMT members to freely express their opinions on innovation decision issues, promote valuable knowledge sharing and experience exchange, and stimulate collective thinking. Moreover, integrating big data and AI technologies into the entire meeting process can enhance these interactions: prior to meetings, AI can automatically extract key decision-relevant information from vast internal and external data sources, generating visualized briefs to provide a unified discussion baseline; during meetings, AI semantic analysis can capture differences in opinions and cognitive blind spots in real time, pushing supporting data to guide discussions toward core issues; after meetings, AI can automatically summarize consensus points and pending tasks, forming a tracking ledger. This approach further fosters group decision-making thinking, enhances the enterprise's ability to anticipate and respond to external changes, and ultimately improves innovation decision performance.

On the other hand, leveraging the internet and smart mobile terminals, enterprises can build intelligent communication platforms that integrate AI and digital twin technologies to expand informal interaction scenarios. Such platforms can use big data to accurately match complementary knowledge among members, intelligently push discussion topics and tacit knowledge content, and effectively reduce differences in knowledge, experience, cognitive abilities, and cognitive needs among TMT members. Additionally, AI can identify and provide early warnings for adverse tendencies such as political behavior or in-group favoritism during interactions, while features like anonymous proposals and cross-functional random pairing for communication can mitigate negative interference. These intelligent informal communication methods further optimize the team interaction environment, reduce internal decision-making conflicts, and thereby enhance innovation decision performance.

5.2.2. Highlight TMT Cognitive Sharing and Give Play to Its Mediating Role

In the process of strategic formulation, TMTs of technology innovation enterprises should emphasize cognitive sharing among members and fully leverage the mediating role of TMT cognitive sharing between team interactions and innovation decision performance. For any organization, knowledge constitutes a strategic intangible asset. As a critical lever for developing organizational knowledge resources and enhancing competitive advantage, cognitive sharing directly determines the effectiveness of internal knowledge management. On one hand, attention should be given to team interactions such as information exchange, effective formal and informal communication, and joint decision-making to enhance the sharing level of cognitive abilities and cognitive needs among TMT members. At the same time, to fully harness the mechanism through which TMT cognitive sharing influences innovation decisions, it is essential to actively engage employees in cognitive sharing and create a favorable communication environment. By doing so, TMT cognitive sharing enables members to identify information relevant to innovation decisions from complex and dynamic economic conditions and apply it flexibly in the decision-making process, fostering greater willingness among TMT members to reach consensus on decision outcomes and thereby improving innovation decision performance.

5.2.3. Strengthen TMT Team Reflexivity and Establish a Sound Cultivation Mechanism

In the process of strategic formulation, TMTs of technology innovation enterprises should emphasize

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team reflexivity among members and establish a robust mechanism for fostering TMT team reflexivity, including the formulation of relevant regulations, institutional rules, implementation guidelines, and specific provisions, while advocating for a sense of overall responsibility and collective consciousness to create a harmonious and collaborative team atmosphere. Faced with a complex and dynamic business environment, TMTs need to perceive emerging trends, seize novel opportunities, and envision future development through innovative thinking and actions.

The partial moderating effect of TMT team reflexivity on the relationship between team interactions and innovation decision performance is realized through the mediating role of TMT cognitive sharing. On one hand, enhancing the level of TMT team reflexivity encourages team interactions among members, enabling the acquisition of diverse innovation decision information, effectively reducing various conflicts and disagreements arising from TMT heterogeneity, and mitigating the negative impacts of political behavior and in-group favoritism. This, in turn, facilitates timely problem identification and resolution, thereby improving innovation decision performance. On the other hand, increasing TMT team reflexivity promotes team interactions that serve as a conduit for "cognitive iterative sharing," leading to an overall enhancement of the team's collective cognitive capability. By breaking members' rigid cognitive habits, TMT members are encouraged to actively reflect on their previous cognitive patterns during interactions, gradually modifying past cognitive habits and preferences, enhancing their individual cognitive abilities and needs, and transforming individual cognitive progress into shared team cognitive assets, thereby providing a stronger cognitive foundation for subsequent innovation decision-making.

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