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# The Impact of Team Performance Assessment on Team Atmosphere in Chinese Science and Technology-based Enterprises

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## Abstract

The role of contemporary social science and technology enterprises in the national economy is becoming increasingly significant. This paper selected technology-based enterprises as an example to study the impact of team performance assessment on team atmosphere. Based on systematic review of team performance assessment and team atmosphere and empirical research data, team performance assessment had a significant positive impact on the team atmosphere. Through research, this paper proposed relevant suggestions for enterprises to formulate performance assessment, thus creating a harmonious corporate team atmosphere, enhancing employees' sense of identity and improving the overall performance of the company.

**Keywords:** technology-based enterprises, team performance assessment, team atmosphere

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## INTRODUCTION

Nowadays, the pace of globalization of the world economy is increasingly faster, and the competitive environment of the business market are facing huge challenges. If enterprises aim to maintain strong competitiveness in the market economy, they need to own fast and flexible reacting ability towards market and organizational efficiency. As the fundamental structure of the business organization, the team plays an important role in the holistic business activities of the enterprise, it is more common especially in science and technology enterprises, conducting research on the performance assessment and team atmosphere of team members in science and technology enterprises to help enterprises to develop a set of clear and measurable employee performance assessment system is in line with the actual situation is of great importance, scientifically perfecting assessment system can effectively link the employee's work goals and organization activities. At the same time, it integrates the individual or team performance of the enterprise into the holistic performance of the enterprise through

certain means, so that the enterprise forms a unified situation, thus creating a harmonious enterprise atmosphere, which is undoubtedly an important management tool for realizing the strategic goals of the enterprise and enhancing the competitiveness of the enterprise.

## LITERATURE REVIEW

### Team Performance Assessment

Compared with foreign scholars, Chinese scholars' research of team performance assessment focuses on enormous cases and explores the problems and pressures of enterprise team performance assessment under the current social background.

From the perspective of team characteristics, Zhang (2015) focused on the impact of team diversity on performance assessment. It was found that the characteristics of each team were different, and the assessment system should be developed in a targeted manner according to the characteristics of each team, thus, maximizing the management effectiveness and improving the holistic performance of the team. Xiao

(2016) argued that enterprises should define team performance according to the uniqueness of the team. Team performance included both the holistic performance of the team and the individual performance of the team members. According to the results of the assessment, the employees were appropriately trained, promoted and paid. From the perspective of selecting the indicator system, Li et al. (2015) mainly explored the impact of team culture on team performance assessment. It showed that setting performance assessment criteria, selecting assessment methods and selecting assessment objects would affect the final result of team performance assessment to different extents. Meanwhile, it was also suggested that if the scale of the enterprise itself was not large, it should pay attention to the establishment of the team performance assessment index system. Chen et al. (2017) mainly conducted performance assessment on the internal team of the entrepreneurial team. The analytic hierarchy process was used to determine the weight value of the performance assessment indicators of the internal enterprise team. The performance assessment indicator system of the enterprise team is established within the enterprise to realize the healthy and sustainable development of the enterprise and gain a competitive advantage.

### **Team Atmosphere**

The analysis of existing identified that many scholars began to study and analyze the atmosphere as early as 70 years ago. From the perspective of team atmosphere, Wang et al. (2012) believed that team atmosphere refers to the common psychological cognition and experience formed by team members on team goals, team tasks, team operations, etc. This cognition was psychologically formed and can promote mutual understanding, mutual tolerance and cooperation among members, thus promoting the realization of team tasks and goals. Gee-Woo (2005) divided the team into three dimensions that were friendship, innovation and fairness to study the atmosphere of a knowledge-sharing team. From the perspective of organization atmosphere, Wang et al. (2012) proposed that the organization atmosphere was a process of long-term development of the organization, which had formed an atmosphere within the organization that had the characteristics of the organization and can persistently affect the behavior of the members of the organization. Duan et al. (2014) thought that the organization atmosphere referred to the feelings of members in their work environment under the specific organization, and this feeling was mainly based on the subjective psychological feelings of

the individual, which was related to the relationship between members and organizations and can influence the behavior of their members.

According to the literature analysis, the research on team performance assessment more emphasized on the aspect of team performance assessment for team characteristics and indicator selection, while the research on team atmosphere was mainly from different perspectives. Above all, this paper mainly studied the impact of the performance assessment of the technology-based enterprise team on the team atmosphere.

## **RELATED CONCEPT DEFINITIONS AND THEORETICAL ASSUMPTIONS**

### **Definition of Team Performance Assessment**

Jin (2012) replaced team atmosphere with team effectiveness and pointed out that team effectiveness included task performance and peripheral performance. Among them, task performance mainly referred to the team's work performance output; peripheral performance referred to the indirect effectiveness of the team to achieve the work objectives, including the relationship between the team members, the motivation to maintain a good relationship, the willing to help others to complete the work and the willing to stay in the team, etc. Hu et al. (2017) adopted the methods of fuzzy comprehensive evaluation and analytic hierarchy process to select performance assessment of the technology innovation team in terms of team skills, teamwork and team performance, and proved the assessment through a series of data, which verified that the assessment method was effective and feasible. Team assessment, namely, team performance assessment, was the core content of performance assessment and the assessment of team responsibilities and the completion of work results, which was an objective measure and assessment of the contribution of work. Performance assessment of the team was actually to summarize its recent work, and make phase adjustments and modifications to ensure that the team work was always in the right direction.

### **Definition of Team Atmosphere**

The psychological atmosphere was first proposed by Kurt Lewin, who believed that the atmosphere was the same perception and the same cognitive part that generated at the time when people are conducting activities. This was the core of the concept of atmosphere, and it also contained the same view of individual on social environment. Schneider Barlett (1968), from the organizational point of view or from

**Table 1.** Team performance assessment content scale

Variable	Measurement indicators	Source
Team performance assessment	The team completes the mission goal within the scheduled time	Yu (2003)
	The team's mission is completed and the standard is met.	
	The team is very efficient	
	The extent to which personal compensation is affected by the size of the team's achievement contributed by the personal completing of tasks	
	The extent to which personal task performance assessment results are affected by the holistic team performance	
	Cooperation and interpersonal relationships of team members are improved	
	Team members' work abilities and knowledge skills are improved	
	Team members are satisfied with working and communicating together	
	Team members' cooperation and interpersonal skills are improved	
	The enthusiasm of team members to learn is improved	

**Table 2.** Team atmosphere scale

Variable	Measurement indicators	Source
Team atmosphere	Team members are willing to contribute to the achievement of team goals	Zhang (2009)
	Team members have a high sense of belonging in the team	
	I am proud to be a member of this team.	
	Team members depend on each other and trust each other	
	I am willing to make extra efforts to help the team succeed.	

the perspective of the team, wrote that the description of the atmosphere formed was more convincing in his article, the atmosphere was the perception and feelings of interpersonal relationships and communication goals formed by team members or organization at daily cooperation. Beaulieu et al. (2013) argued that the atmosphere was formed in the atmosphere in which the members of the organization and the members of the team perceive a certain thing or phenomenon in the same environment and resonate psychologically.

In general, team atmosphere refers to the common psychological cognition and experience formed by the team members' team goals, team tasks, team operations, etc.

#### Relationship between Team Performance Assessment and Team Atmosphere

In the process of performance assessment, it is aimed at team performance assessment, and it can not only promote rational-based cognitive trust and emotional-based emotional trust among team members. Besides, the content of team performance assessment will make members pay more attention to team performance and use it as their own task. They will think that the holistic performance of the team can be improved by their own efforts and they can bring more benefits. At the same time, they also believe that other members of the team will have the same ideas as they do. Therefore, in the performance assessment of the enterprise team, it not only increases the individual's cognition of the other team members' ability to work, but also enhances mutual trust between members and creates a good team atmosphere. In addition, team performance assessment can strengthen the interdependence of team members

by emphasizing the holistic performance of the team, and encourage members to spontaneously form an awareness of sharing to achieve a common goal. In such a process, the feelings between the team members will be greatly enhanced since this kind of emotion can enable the members feel they are closely connected, and the other party's behavior will not damage their own interests, thus giving trust to each other and creating a positive team atmosphere. Ultimately, benefits can be maximized. Hence, the theoretical hypothesis of this paper was proposed: H1: Team member performance assessment has a positive impact on team atmosphere.

## RESEARCH DESIGN

### Scale Design for Team Performance Assessment

The selection of team performance assessment indicator of the paper was based on the questionnaire of team performance assessment compiled by Yu (2003). This paper modified the questionnaire based on its original version and identified the measurement scale of the team performance assessment. There were 10 questions in the scale that were stated in a positive tone, the measurement was performed by Likert 5-point scale, as specifically shown in **Table 1**.

### Scale Design of Team Atmosphere

In this paper, the selection of the team atmosphere measurement indicator was based on the scale designed by Zhang (2009), combined with the research of this paper to make corresponding revisions, and the scale of the team atmosphere was determined. The scale had a total of 5 questions and adopted positive statement, using the Likert 5-point scale, as shown in **Table 2**.

**Table 3.** Summary of the reliability analysis on the factors scale

Variable	Number of measurable variables	Cronbach's Alpha
Team performance assessment	10	0.915
Team atmosphere	5	0.884

**Table 4.** KMO values of team performance assessment and Bartlett test

Taking enough Kaiser-Meyer-Olkin measurement		0.950
Bartlett's Test of Sphericity	Approximate Chi-Square	1104.287
	Sig.	0.000
	df	45

**Table 5.** Total variance of team performance assessment

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Eigenvalues	Variance (%)	Cumulant (%)	Eigenvalues	Variance (%)	Cumulant (%)
1	5.687	56.869	56.869	5.687	56.869	56.869
2	0.701	7.005	63.874			
3	0.600	5.998	69.872			
4	0.515	5.151	75.023			
5	0.488	4.879	79.902			
6	0.450	4.498	84.400			
7	0.440	4.402	88.801			
8	0.410	4.097	92.898			
9	0.357	3.568	96.467			
10	0.353	3.533	100.00			

**Table 6.** KMO values of team atmosphere and Bartlett test

Taking enough Kaiser-Meyer-Olkin measurement		0.881
Bartlett's Test of Sphericity	Approximate Chi-Square	553.046
	Sig.	0.000
	df	10

## DATA ANALYSIS AND HYPOTHESIS TESTING

In this paper, the employees in some science and technology enterprises were selected as the research objects, and the questionnaires were distributed through field research. A total of 260 questionnaires were sent out, and a total of 238 questionnaires were received. After eliminating the invalid questionnaires, the number of valid questionnaires was 222, and the efficiency rate of collecting the questionnaires was 85.38%.

### Reliability Analysis

Since the focus of the research in this paper was combined in the design of the scale, the existing scales had been revised and supplemented, and the reliability and validity of the scales needed to be further tested. Therefore, in order to ensure that the final analysis was true and effective, the paper tested the reliability and validity of the scale used in this paper. The results of the specific analysis were summarized in **Table 3**.

According to the data analysis results in **Table 3**, it can be seen that the Cronbach's  $\alpha$  coefficients of each variable were 0.915 and 0.884 respectively, which were greater than 0.7, indicating that the data collected in this

questionnaire meet the internal consistency requirements.

### Validity Analysis

#### *Analysis of the factors of team performance assessment*

As can be seen from **Table 4**, the KMO value of the factor of team performance assessment was 0.950, and the P value of Bartlett's test of sphericity was 0.000, indicating that the sample data of this questionnaire can be regarded as factor to analyze.

As shown in **Table 5**, the team performance assessment extracted a common factor, and the contribution rate of the cumulative variance was 56.869%, including the measurable variable NR1-NR10.

#### *Team atmosphere factor analysis*

According to **Table 6**, the KMO value of the factor of its team atmosphere was 0.881, and the P value of the Bartlett's Test of Sphericity was 0.000, representing that the sample data of the questionnaire can be regarded as factor to analyze.

It can be seen from **Table 7** that the team atmosphere extracted a common factor, and the contribution rate of the cumulative variance was 68.332%, including the measurable variable FW1-FW5.

**Table 7.** Total variance of team atmosphere

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Eigenvalues	Variance (%)	Cumulant (%)	Eigenvalues	Variance (%)	Cumulant (%)
1	3.417	68.332	68.332	3.417	68.332	68.332
2	0.489	9.780	78.112			
3	0.415	8.307	86.418			
4	0.364	7.287	93.705			
5	0.315	6.295	100.000			

**Table 8.** Team performance assessment has an impact on team atmosphere

Variable		Team atmosphere
		Model 1
independent variable	Team performance assessment	0.355***
	Value of F	25.871***
	Value changes of F	25.871***
	Value of R <sup>2</sup>	0.105
	Value changes of R <sup>2</sup>	0.105

### Research on the Impact of Team Performance Assessment on Team Atmosphere

This paper employed SPSS16.0 to test the two factors of team performance and team atmosphere, as shown in **Table 8**.

As can be seen from **Table 8**, the team performance assessment and the team atmosphere had a significant positive impact (Model 1,  $\beta = 0.355, P < 0.001$ ), hypothesis H1 was supported.

## CONCLUSIONS AND RECOMMENDATIONS FOR POLICY

### Conclusions

Team performance assessment has a significant positive impact on team atmosphere. This paper used regression analysis to conclude that team performance assessment can enhance the team atmosphere, that was, the more comprehensive the performance assessment content of the technology-based enterprise team was, the more active the team atmosphere in the enterprise was. Team performance assessment enabled individuals to gain rewards in the enterprise, and the interdependence between members became stronger. It was expected to improve the holistic performance of the team and gain more benefits from it, thus creating a harmonious enterprise atmosphere. Therefore, in modern technology-based enterprises, when assessing the team, it is necessary to select some relatively comprehensive and fair assessment content, so that employees can accept it spontaneously instead of resisting it, striving to complete the team task and gaining more benefits from it. Hence, this can create an active team atmosphere and win more profits for enterprises.

### Recommendations for Policy

First, according to the difference of different positions, different assessment criteria should be set. The difference in the position of a company are the working way of it and the difficulty level of the task. The second is to establish a scientific and reasonable assessment system and distribution system to improve employees' degree of job satisfaction. Based on the characteristics of the enterprise itself, a scientific team performance assessment system and a fair and reasonable distribution system should be established to improve employees' satisfaction of work environment and lay a solid foundation for the improvement of employees' work performance. The third is to improve communication channels and create a good team atmosphere. Organizations can enhance the effectiveness of communication between employees through certain technical means and perfect communication channels within the organization, improving the relationship between the superior, the subordinates and the other personnel.

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## REFERENCES

- Beaulieu MD, Crchum F, Family (2013) Do the Team Atmosphere Inventory as a Measure of Team Processes: Validation of the French Version. *Risk Management and Health Care Policy*.
- Duan J, Wang J, Zhu Y (2014) Organization Atmosphere Research: Conceptual Measurement, Theoretical Basis and Evaluation Outlook. *Advances in Psychological Science*, 22(12): 1964-1974.
- Gee-Woo B (2005) Behavioral Intention Formation in Knowledge Sharing: Examining the Roles of Extrinsic Motivators, Social-Psychological, and Organizational Atmosphere. *Mis Quarterly*, 29(1):87-111.
- Hu Z, Liu J, Mo Q (2017) Research on Performance Assessment of Science and Technology Innovation Team Based on DEA-FCA Model. *Science and Technology Management Research*, 14: 64-69.
- Jin H, Yang S (2012) Research on the Influence of Research Team Cooperation Factors in College on Team Effectiveness—Based on Shared Mental Model. *Journal of Zhejiang University of Technology (Social Science)*, 11(1): 16-21.
- Li L, Wang R, Wei W (2015) The Impact of Team Culture on Team Performance. *Human Resources Development of China*, (5): 30-32.
- Schneider B, Barlett CJ (1968) Individual Differences and Organizational Atmosphere: The Research Plan and Questionnaire Development. *Personnel Psychology*, 21(3):323-333.
- Wang G, Zhao S, Zeng Q (2012) Team Atmosphere and Team Psychological Empowerment: The Intermediary Role of Team Trust. *Studies of Psychology and Behavior*, 10(3): 202-208.
- Wang Y, Yu J, Li Y (2012) The Impact of Organization Atmosphere on the Effectiveness of Employee Behavior. *Psychological Exploration*, 32(2): 188-192.
- Wu P (2009) Chen T Empirical Study on the Impact of the Orientation of Performance Management on Team Performance. *Nankai Business Review*, 12(6): 51-59.
- Xiao Y (2016) Study on the Performance Assessment System Optimization of the Enterprise Equipment Team, A. Wuhan, Wuhan Institute of Technology.
- Zhang J, Zhou D, Liu Y (2013) Construction of Indicator System For Performance Assessment of Node Enterprises By Core Enterprises of Value Chain. *Commercial Times*, (5): 97-98.
- Zhang X (2015) Research on the Impact of Team Diversity on Team Performance. Xi'an: Northwest University.