

# *Research on stimulating employees' market-oriented innovation willingness from the perspective of configuration*

Jian Sun<sup>1,\*</sup>, Chenchen Zhang<sup>1</sup>, Chao Luo<sup>2</sup>, Fan Chen<sup>1</sup>

<sup>1</sup>State Grid Anhui Electric Power Research Institute, Hefei, Anhui, China

<sup>2</sup>State Grid Anhui Electric Power Co., Ltd, Hefei, Anhui, China

\*Corresponding author: 963336269@qq.com

**Keywords:** Market-oriented innovation activities, Innovation willingness, Configuration analysis

**Abstract:** Market-oriented innovation activities are significant to improve the efficiency and beneficial result of enterprise innovation activities. Carrying out market-oriented innovation activities poses great challenges to employees, so stimulating their willingness to participate has become an important proposition in enterprise organization innovation activities. We use the qualitative comparative analysis method (fsQCA), based on the theory of planned behavior, and considering the mechanism of organizational innovation climate and error management climate on employees' participation in market-oriented innovation activities, four paths were identified to stimulate employees' willingness to participate in market-oriented innovation activities. The research enriches the relevant theories of employees' participation in market-oriented innovation activities, and provides specific suggestions for managers to motivate employees to participate in market-oriented innovation activities.

## 1. Introduction

Innovation is the source of sustainable competitive advantage for enterprises, and innovation activities emphasize the creative thinking and solutions of employees. Market-oriented innovation activities are guided by market demand, aiming to realize the transformation of achievements and market promotion, which is of great significance in improving the efficiency and beneficial result of enterprise innovation activities.

Employees' willingness to participate is the premise for enterprises to carry out market-oriented innovation activities. Compared to general innovation, market-oriented innovation activities place great emphasis on the market-oriented orientation of innovation activities. In addition to proposing ideas, employees also need to pay attention to the subsequent stages such as incubation of creativity, transformation of achievement, and market promotion. Cross-field cooperation[1]and sufficient resource support are required, making the challenges even greater. How to stimulate employees' willingness to participate in market-oriented innovation activities has become an important proposition in the organization of enterprise innovation activities.

The theory of planned behavior (TPB) suggests that the behavioral intention of the individual is

influenced by behavioral attitudes, subjective norms, and perceived behavioral control. The practicality and robustness of this theory have been widely validated in organizational behavior research in China[2]. On individual level, innovation attitude is an individual's psychological inclination towards innovation activities, while perceived behavioral control is an individual's perception of the difficulty of innovation. At organizational level, innovation subjective norms refer to the social pressure individuals feel when engaging in innovation. In addition, individual behavior is inseparable from the influence of the organizational environment, and the overall organizational climate has a significant impact on employees' participation in innovation activities, such as the organizational innovation climate and error management climate. There are complex causal relationships among the three elements of TPB[2], and there may also be a complex causal relationship between the organizational innovation climate, error management climate, and the three elements of planned behavior theory. There is currently no research exploring the multiple concurrency mechanisms and co-effects of their different combinations on employees' willingness to participate in market-oriented innovation activities.

This study intended to use the fuzzy set qualitative comparative analysis (fsQCA), attempting to construct a configuration model of stimulating employees' willingness to participate in market-oriented innovation activities from the perspective of TPB; and explore the configuration effect among multiple factors through empirical study.

## **2. Literature Review and Model Construction**

Organization is a complex social system, and the various factors that stimulate employees' innovation willingness, and behavior do not exist in isolation. Scholars have studied the influencing factors of employees' innovation behavior from multiple perspectives, including organizational and individual perspectives, providing a reliable theoretical basis.

### **2.1. Organizational Level**

Organizational innovation climate (OIC) refers to the working atmosphere in which the organization fully supports employees to carry out innovative activities. Market-oriented innovation usually requires cross-disciplinary cooperation, involving expertise and resources in technology, design, and marketing[1], and requires bearing certain risks. When the organizational innovation climate is better, employees can obtain more innovation resources, opportunities, and work autonomy<sup>[3]</sup>, and are more willing to try new ideas and challenging work. Finally, efficient and mutually trusting team collaboration is conducive to communication among members and access to key information and knowledge resources for innovation.

Error management climate (EMC) is the perception of employees towards organizational sharing, communication, and error-handling behaviors[4]. Market-oriented innovation activities tend to face higher risks. Firstly, in a positive error management climate, employees could communicate and share errors, which is conducive to creating a free communication space and enhancing employees' willingness to innovate. Secondly, employees tend to have more autonomy in organizations with a high level of error management, and the inclusiveness of the organization helps employees to act more freely according to their innovative perspectives, which is conducive to stimulating employees' willingness to participate in market-oriented innovation activities.

Innovation subjective norms (ISN) reflect external influences on individual behavior decisions and generally include directive norms and exemplary norms[5]. Directive norms are the requirements of superiors for employees. Exemplary norms mainly come from the demonstration effect of leaders and colleagues actively participating in market-oriented innovation activities. China's highly collectivist organizational culture will encourage employees to participate in market-oriented innovation

activities when they are infected by the innovative behaviors of leaders and colleagues.

## 2.2. Individual Level

Perceived behavior control (PBC) is an individual’s perception of the difficulty of a certain behavior, including two factors: self-efficacy and control. Innovation self-efficacy refers to the individual’s confidence in creatively accomplishing their work tasks. Employees with high self-efficacy in innovation dare to accept the challenges and risks in innovation, and their willingness to innovate will be stronger. Control is the evaluation of an employee’s level of innovation control after considering factors such as their own knowledge, skills, and resource availability[2]. The market-driven nature of products requires employees to understand and decisively grasp fleeting business opportunities when participating in market-oriented innovation activities, which requires not only employees’ insight but also sufficient internal and external resources to support the implementation of actions. Employees are more willing to participate when they feel they have a great grasp of market-oriented innovation activities.

Innovation attitude (IA) is an individual’s preference for innovation, which is an important factor determining their willingness to innovate, including endogenous and exogenous attitudes. The former is a preference for the heart, and the latter is a preference for demand stimulation. A strong internal drive arises when individuals perceive that they can derive pleasure and satisfaction from innovative activities[6]. Second, the successful commercialization of creativity may bring them rewards, promotion opportunities, or other personal rewards, which are more directly related to personal career development and benefits. Employees with a positive exogenous attitude may be more willing to participate in market-oriented innovation activities.

## 2.3. Model Construction

As analysed above, the three elements of TPB, along with the error management climate and organizational innovation climate, may stimulate employee participation in market-oriented innovation activities. Employees’ willingness has multiple concurrent causal relationships and equivalence characteristics. In practice, diverse combinations generated by linkage matching of different antecedent conditions may achieve the same results. To deeply explore the complex causal relationship between antecedent conditions and employees’ willingness to participate in market-oriented innovation activities, this study constructed a configuration model (Figure 1) based on TPB. The organizational innovation climate, subjective innovation norms, and error management climate, as well as individual innovation attitude and perceived behavior control, were included in the model for configuration analysis.

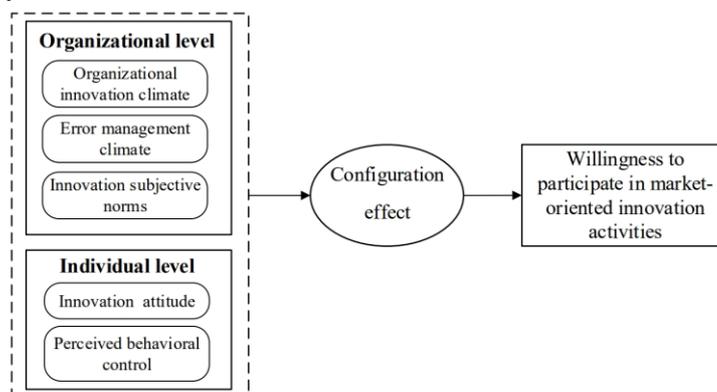


Figure 1: Configuration model.

### 3. Method

This study used the fsQCA method to examine the impact of organizational and individual factors on employees' willingness to participate in market-oriented innovation activities.

#### 3.1. Sample and Measurement

The State Grid Electric Power Company has been vigorously promoting entrepreneurship and innovation work for a long time, encouraging employees to participate in market-oriented innovation activities. Therefore, selecting employees from the State Grid system as research samples has a certain representation. A total of 1063 questionnaires were collected and 731 valid questionnaires were retained, with an effective rate of 68.86%.

The questionnaires used in this study were all mature scales. The measurement of OIC adopted the scale designed by Liu Y.[7] based on the Chinese context. The four-dimensional scale of Cigularov[8] was used to measure the EMC. IA was measured using the two-dimensional scale of Phillip H. Phan[9]. PBC was measured using the Innovative Self-Efficacy Scale[10] and the Control Strength Scale[11]. ISN was measured using the two-dimensional scale of Ajzen[2]. The scale of employees' willingness to participate in market-oriented innovation activities was modified from the Ajzen[12] Innovation Willingness Scale.

#### 3.2. Reliability and Validity Tests

Before the reliability and validity test, the collected questionnaire data were totaled and averaged, and SPSS25.0 was used for reliability and validity analysis, Cronbach's  $\alpha$  of all scales is greater than 0.9 and KMO are greater than 0.7, indicating that the reliability and validity results of each scale are very good.

### 4. Result

#### 4.1. Calibration and Necessary Condition Analysis

The first step of the fuzzy set qualitative analysis method is calibration. We calibrated the data according to the criteria of 5(complete non-membership), 95(complete membership), and 50(crossover point) proposed by Ragin[13]. The next step is necessary condition test, which could explore the consistency between variables. The consistency values of the variables are all lower than 0.9, which does not meet the standard of becoming a necessary condition.

#### 4.2. QCA Results

This study used fsQCA software to conduct configuration analysis, and the case frequency was set as 3, the consistency as 0.80, and the PRI consistency as 0.70. We identified 4 paths for IW with an overall consistency of 0.90, exceeding the threshold value of 0.8, and the coverage rate is 0.78%, indicating that these configurations are sufficient conditions causing high level of innovation willingness. Table 1 shows the fsQCA results.

Organizational Climate-driven type. The first configuration takes the EMC and OIC as the core conditions. Path H1a and H1b respectively use ISN and PBC as auxiliary conditions. It means that when creating a positive error management climate that encourages employees to think and communicate about errors, the organization should also provide employees with the support, information, funds, and other resources needed for innovation; set successful examples of innovation

in the organization, encouraging leaders to lead by example and everyone to innovate.

Table 1: Configurations for employees Innovation Willingness.

	H1a	H1b	H2	H3
IA		⊗	●	●
PBC		○	●	○
EMC	●	●		●
ISN	○		●	○
OIC	●	●	●	
Consistency	0.92	0.94	0.93	0.96
Coverage	0.70	0.29	0.36	0.63
Unique coverage	0.004	0.01	0.02	0.01
Consistency of solution	0.90			
Coverage of solutions	0.78			

Note: ● Indicates the existence of core conditions; ⊗ Indicates the absence of core conditions; ○ Indicates the existence of edge conditions; ⊙ Indicates the absence of edge condition.

Attitude-Control-Norm-driven type. Configuration H2 takes IA, PBC, and ISN as the core conditions, and OIC as the auxiliary conditions. It means that managers should also pay attention to improving employees' perceived behavioral control level when cultivating employees' innovative attitudes, in which innovation self-efficacy and control are two dimensions of perceived behavior control. On the one hand, managers should provide employees with the information, funds, and time resources required for market-oriented innovation activities, and relax the use rights to improve employees' perception of control. On the other hand, managers should continuously recognize employees' innovative abilities, and provide a variety of innovation-related learning and training opportunities, so as to stimulate the improvement of innovation self-efficacy.

Attitude-Climate-driven type. Configuration H3 is based on innovation attitude and error management climate as the core conditions and perceived behavioral control and innovation subjective norms as the auxiliary conditions. This means that managers should also improve the way they deal with errors as they cultivate employees' innovative attitudes. When errors occur, employees should be actively encouraged to communicate with other members to correct errors timely, reduce the negative effects of errors, reflect on errors, and encourage the production of positive effects.

## 5. Conclusions and Future Prospects

### 5.1. Conclusions

By studying 731 questionnaire data, based on and expanding TPB, and using fsQCA, this study explored the mechanism of the five elements at the organizational and individual level on the willingness of employees to participate in market-oriented innovation activities, enriching the relevant theories of TPB and employee willingness to participate in market-oriented innovation activities. The main conclusions are as follows:

Firstly, this study revealed the different mechanisms of motivating employees to participate in general innovation activities and market-oriented innovation activities. According to the existing research and the analysis results of this study, it can be seen that colleague support and resource supply[14], organizational innovation climate[15], innovative self-efficacy[14], and inclusive climate[16] are more important in stimulating employees' willingness to participate in market-oriented innovation activities. Secondly, through the necessity test it is found that a single factor at a single level is not a necessary condition to stimulate employees' willingness to participate in market-oriented innovation activities, indicating that managers should attach importance to the synergy between organizations and individuals in stimulating employees' participation in market-oriented innovation activities. Managers could deliver positive information to employees, make them aware

that actions related to market-oriented innovation are feasible, and provide the necessary resources needed for innovation. Organizations should treat the errors with a positive attitude, create a climate of innovation for everyone, and establish a successful model of innovation. Thirdly, the differentiated matching of different factor levels reflects the multiple equivalent paths of employees' willingness to participate in market-oriented innovation activities. Based on different paths to stimulate employee innovation passion, enterprises can accurately analyze individual differences among employees and provide corresponding management measures and work support, which can achieve twice the result with half the effort.

## 5.2. Research Limitations and Future Directions

In this study, organizational innovation climate and error management climate were selected as supplements to the mechanism of TPB on employee willingness to participate in market-oriented innovation activities. However, there may be many factors that affect employees' willingness to innovate, which can be studied in the future. In addition, the data in this study came from State Grid Anhui Electric Power system, we hope to further investigate other types of enterprises, and enrich the sample types of this study.

## References

- [1] JIA JF, ZHANG LT, LIU Z. *Feel at ease and revitalize the company: influencing mechanism of inclusive leadership to employees' intrapreneurship* [J]. *Journal of Northeastern University*, 2023, 44(7): 1049.
- [2] AZJEN I. *Residual effects of past on later behavior: habituation and reasoned action perspectives* [J]. *Personality & Social Psychology Review*, 2002, 6(2): 107-122.
- [3] XIN BL, DAI JL. *Research on the mechanism of innovation climate to employees' innovative intention—evidence from knowledge intensive business service industry* [J]. *Science & Technology Progress and Policy*, 2021, 38(9): 109-116.
- [4] YIN K, SONG HJ, XU Y, et al. *Research experiences, error management climate and enhancement of research creativity* [J]. *Science Research Management*, 2018, 39(9): 8.
- [5] LING L, YAN Y. *Formation mechanism and organizational guidance strategy of employee's innovative behavior based on the perspective of employability* [J]. *Science and Technology Management Research*, 2002, 42(16): 154-160.
- [6] AMABILE T M. *Motivating creativity in organizations: on doing what you love and loving what you do* [J]. *California Management Review*, 1997, 40(1): 39-58.
- [7] LIU Y, SHI JT. *A study on the relationship between effects of the organizational innovative climate and those of motivational preference on employees' innovative behavior* [J]. *Management World*, 2009, (10): 88-101.
- [8] Cigularov K P, Chen P Y, Rosecrance J. *The effects of error management climate and safety communication on safety: a multi-level study* [J]. *Accident; analysis and prevention*, 2010, 42(5): 1498-1506.
- [9] Phan P H, Wong P K, Wang C K. *Antecedents to entrepreneurship among university students in Singapore: beliefs, attitudes and background* [J]. *Journal of Enterprising Culture*, 2002, 10(02): 151-174.
- [10] Carmeli A, Schaubroeck J. *The influence of leaders' and other referents' normative expectations on individual involvement in creative work* [J]. *The Leadership Quarterly*, 2007, 18(1): 35-48.
- [11] Taylor S, Todd P A. *Understanding information technology usage : a test of competing models* [J]. *Information Systems Research*, 1995, 5(2): 91-108.
- [12] Fishbein M, Ajzen I. *Belief, attitude, intention and behaviour: an introduction to theory and research*. addison-wesley, reading MA [J]. *Philosophy & Rhetoric*, 1977, 41(4): 842-844.
- [13] RAGIN C C. *Fuzzy-Set Social Science* [J]. *University of Chicago Press Economics Books*, 2000.
- [14] Liu Xm, Zhang Yt, Xu Cy. *Research on the configurations of promoting employee innovation behavior—qualitative comparative analysis based on fuzzy set* [J]. *Science of Science and Management of S. & T.*, 2020, 41 (12): 114-128.
- [15] Liu H, Li Xy, Zuo F. *Research on promoting the innovative behavior of R&D personnel in science and technology-based small and medium-sized enterprises* [J]. *Journal of Zhejiang Sci-Tech University (Social Sciences)*, 2023, 50 (1): 10.
- [16] HU WA, CHENG JQ, LUO JL. *Research on the activation path of new employees' creativity in R&D teams from the perspective of configuration* [J]. *Science Research Management*, 2023, 44 (04): 185-192.