

# The Influence of Platform Leadership on Innovation Performance of Knowledge Workers: From the Perspective of Organizational Resilience and Innovation Self-Efficacy

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## Abstract

Knowledge employees' innovation performance, as an important factor in maintaining a firm's competitive advantage, assumes a critical role in firm development, and existing research has confirmed that managerial leadership style has a significant impact on it. Based on social exchange theory and social cognitive theory, a mediated effect model of being moderated is constructed. Using 552 knowledge employees as research subjects, empirical analysis was conducted using hierarchical regression and process test, and the findings revealed that: platform leadership has a significant positive predictive effect on innovation performance of knowledge employees; organizational resilience is an important process mechanism between platform leadership and innovation performance of knowledge employees; the direct contribution of platform leadership to innovation performance of knowledge employees and organizational resilience in The mediating role between the two is moderated by innovation self-efficacy. The results of the study provide useful implications for how firms can leverage leadership effectiveness to cope with crises and enhance the innovation performance of knowledge employees.

**Keywords:** platform leadership, organizational resilience, innovation self-efficacy, employee innovation performance, knowledge worker

## 1. Introduction

With the arrival of the era of knowledge economy, the competition between enterprises is increasingly fierce (Chen et al.,2020), innovation has undoubtedly become an inevitable choice for enterprises to cope with the complex market environment and maintain the competitive advantage of enterprises. In the context of innovation, as the main body of innovation, the improvement of knowledge workers' innovation performance will help enterprises win strong competitive advantages and promote the steady growth of enterprise performance. However, compared with ordinary employees, knowledge workers often have a strong desire for achievement and a strong sense of autonomy, and traditional leadership is difficult to effectively constrain and manage them. Existing studies have shown that active leadership behavior is a key factor affecting employee innovation and can significantly enhance employee innovation performance (Lin et al.,2022).As a new type of leadership, the organizational context of platform leadership is based on the historical background of the rise of knowledge workers, and the leadership's vision expression, care for employees and other personal characteristics and platform behavior are very consistent with the work needs of knowledge workers. Therefore, how to effectively exert the leadership effectiveness of the platform and stimulate the creativity of knowledge workers is of great significance for enterprises to achieve sustainable development.

Domestic and foreign scholars have made a lot of research on the relationship between leadership style and employee innovation performance. Existing research shows that leadership styles affecting employee innovation performance can be divided into two categories. One is traditional leadership style, such as transformational leadership (Feng & Zhang, 2014; Watts et al., 2020), transactional leadership (Huang & Tang, 2016); The other is the emerging leadership style, such as inclusive leadership (Zhu et al., 2018; Carmeli et al., 2010), ethical leadership (Yao et al., 2015), authentic leadership (Wang & Zhang, 2019), and moral leadership (Zhong et al., 2019; Tu et al.,2019), to a certain extent, have a positive effect on employee innovation performance. In addition,

some other scholars proposed that platform leadership based on the current knowledge economy background has a significant predictive effect on employee innovation behavior (Hao et al., 2021; Jiang et al., 2022; Xin et al., 2020), influencing subordinates' innovation performance. Some scholars have made a preliminary exploration on the internal mechanism and situational conditions of platform-type leadership and employee innovation or performance behavior based on individual level. Hao Xuguang et al. (2021) conducted an empirical study on 594 sample data of employees in Internet enterprises and MBA students in universities and colleges, and found that platform leadership can significantly promote the generation of employees' innovative behaviors by influencing their basic psychological needs, and is capable of creating beneficial follower outcomes, such as organizational commitment, employee job satisfaction, and more additional role behaviors. Based on team and individual levels, Li Ling et al. (2022) introduced team remodeling and creative self-efficacy as an effective cross-level intermediary between platform-type leadership and employees' innovative behavior. From the perspective of employee psychology and behavior, An Shimin et al. (2022) introduced two variables, psychological capital and personalized transaction, to reveal the process mechanism of *platform leadership* affecting individual role performance. Based on the perspective of employee cognition and behavior, Jiang Bing et al. (2022) introduced two variables, independent self-construction and job reshaping, to explore the process mechanism of *platform leadership* and employee deviant innovation. In addition, there are existing researches on the path between *platform leadership* and individual innovation or performance behavior, only a few scholars have confirmed that the sense of organizational support (An et al., 2022) and the atmosphere of error management (Jiang et al., 2022) can serve as important situational factors between the two.

To sum up, although existing studies have made a lot of exploration around platform leadership and individual innovation, there are still some deficiencies. First, existing studies have clarified the important influence paths of platform leadership and employee innovation behavior, individual role performance and employee deviant innovation. However, the research on the relationship between platform leadership and employee innovation performance is still unclear, especially the research on the impact of knowledge workers' innovation performance. Secondly, most scholars focus on the conduction mechanism between the two from the perspective of employee psychology, and pay little attention to the perspective of organizational or individual competence. In a rapidly changing market environment, as an important ability for employees to cope with crises (Liu et al., 2021), organizational resilience can promote employees' positive cognition and improve their innovative behaviors, so that employees can better adapt to the uncertain environment (Duchek, 2020). Positive leadership can significantly positively promote organizational resilience (Zhao et al., 2021), and organizational resilience also has a significant positive predictive effect on employee performance (Williams et al., 2017). Therefore, it is necessary to explore the important process mechanism between the two from the perspective of competence. Third, in terms of the selection of situational constraints, existing studies mainly involve organizational factors, while few scholars pay attention to the psychological effects of individual employees. Since enterprises highly rely on employees' innovative behavior to benefit, employees' awareness of the importance of individual innovation should not be ignored. As an individual positive psychological trait, innovation self-efficacy reflects the confidence evaluation on whether an individual can create innovative results (Tierney & Farmer, 2002). In view of this, this paper will focus on the causal mechanism between platform leadership and knowledge worker innovation performance, and in-depth analysis of the important process mechanism and situational conditions between the two. A mediator variable, organizational *resilience*, was introduced to explore the important internal mechanism between them. Innovation self-efficacy is selected as a situational factor affecting the path, and its moderating effect on the direct and indirect effect mechanism between platform leadership and knowledge workers' innovation performance is investigated. By putting organizational resilience and innovation self-efficacy into the same model for empirical test, the paper tries to open the "black box" and potential boundary between platform-type leadership and employee innovation performance while enriching social exchange theory and social cognitive theory, so as to provide useful guidance for organizational management practice.

## 2. Theory and Hypothesis

### 2.1 Platform Leadership and Innovation Performance of Knowledge Workers

As a new type of leadership, platform leadership means to motivate the development potential of employees by fully empowering them, building and optimizing the career platform and so on, so as to ultimately achieve mutual achievement and common development of themselves and their subordinates (Hao, 2016). On this basis, Hao Xuguang (2016) proposed a four-dimensional model of *platform leadership*, that is, focusing on the growth of leaders and subordinates, building and constantly expanding business platforms, shaping mutually fulfilling interactive relationships, and dynamic optimization of interactive processes. In terms of scale development, it

was re-summarized into a six-dimensional model. For inclusion, personal charm, change planning, platform building, platform optimization and common growth (Hao et al., 2021). Based on the perspective of leadership, Xin Jie et al. (2020) divided platform-type leadership into five dimensions, namely, sharing altruism, interactive collaboration, incubating makers, personalizing people, and empowerment equality. In management practice, Haier's "maker" mechanism, Alibaba's division separation system, and Morningstar's "employee self-management" mode all reflect the important value of platform leadership.

Employee innovation performance refers to the process in which employees propose new ideas about products, services, practices, methods or processes in the organization and put them into practice (Malik et al, 2015), which helps employees enhance their competitive advantages to cope with the dynamic environment. At present, as the main force of enterprise innovation, knowledge-based individual innovation is an important guarantee and inexhaustible driving force for enterprise reform, and the innovation performance created by it can effectively affect the innovation ability and stable development of enterprises. According to social exchange theory and existing studies, leader style is an important environmental factor affecting subordinates' innovation performance (Zhong et al., 2019), and can significantly affect subordinates' innovation performance through the process of social exchange with subordinates (Elkins & Keller, 2003). Different from transactional and transformational leadership styles, *platform leadership* can offer more inclusive, sincere care and favorable treatment to knowledge-based subordinates, achieve equal communication with them, provide platforms and resources for creative behaviors of knowledge-based subordinates, and stimulate innovative thinking and initiative of knowledge-based subordinates (Hao et al., 2021; Li et al., 2022). This paper argues that platform leadership affects the innovation performance of knowledge workers mainly through the following aspects. First, platform leaders advocate treating employees with tolerance, understanding, respect and trust in the process of interaction with knowledge workers, so as to give employees a full sense of organizational identity and psychological belonging (Chen & Cheng, 2020). Second, the unique leadership charm of platform-type leadership behavior. Its positive, optimistic and persistent qualities set a benchmark for employees and help promote more forward-looking behaviors of knowledge workers. Third, platform leadership emphasizes platform construction and continuous and dynamic optimization, builds a learning organization, allocates organization members to appropriate jobs and posts, provides subordinates with material resources needed for innovative work, and stimulates employees' motivation and behavior to innovate. In addition, platform leaders advocate change planning, can use their own knowledge and literacy to accurately grasp the changes in the market environment, fully empower subordinates, and stimulate their initiative. Based on the social exchange theory, knowledge subordinates are willing to take risks to innovate in order to reward their leaders and show a high level of innovation performance. Based on this, the following hypothesis is proposed:

*H1*: Platform leadership positively affects the innovation performance of knowledge workers.

## 2.2 Platform Leadership and Organizational Resilience

In the current VUCA economic environment, organizational resilience, as the core ability of enterprises to cope with crises, can help enterprises recover and rebound quickly in adverse situations and achieve sustainable development. Gilbert et al. (2012) proposed that organizational resilience emphasizes the development of organizational new capabilities and identification of new opportunities to ensure the continuation of organizational core capabilities to adapt to market and technological changes. Williams et al. (2017) pointed out that enterprises with strong resilience are more forward-looking, adaptable and aggressive, so adaptability, situational ability and anti-vulnerability ability are regarded as the capacity dimensions of organizational resilience. As a comprehensive system, the most basic group of an organization is its employees, who play a crucial role in an organization.

This paper takes Kuntz et al. (2017) 's understanding of organizational resilience from the perspective of employees as reference. The key source of organizational resilience is the positive characteristics of employees, such as the skills, abilities, cognition, behavior and self-monitoring process of employees. With the introduction of "Internet Plus" into the field of innovation, the importance of innovative performance of knowledge workers has been highlighted. Therefore, organizational resilience is defined in this study as the ability of knowledge workers to cope with dynamic uncertain situations. Based on the integrated systems perspective, Kuntz et al. (2017) proposed that the leadership style of managers can be regarded as an important antecedent affecting the generation and development of organizational resilience. Therefore, the enterprise needs a manager with positive cognition, strong adaptability and advocating change orientation, who can provide guidance to subordinates and take a role model to improve the organizational resilience of knowledge workers. According to the social exchange theory, when leaders provide more caring behaviors to subordinates, based on the principle of reciprocity, subordinates will show more active attitudes and behaviors to repay the organization. Platform

leadership emphasizes the common growth and equal communication between leaders and knowledge workers, removes setbacks and obstacles encountered by employees in the process of work, stimulates positive forward-looking behavior of employees to deal with dynamic crises, and thus enhances organizational resilience. As mentioned above, this study refers to the six-factor model summarized by Hao Xuguang et al. (2021) for the dimension division of platform leadership. Based on personal charm and common growth, platform leadership sets a benchmark for knowledge employees by virtue of positive and optimistic, good professional quality and perseverance. Employees can improve their own deficiencies in knowledge and skills through learning and imitation. At the same time, platform leadership creates a good working atmosphere for employees, emphasizes the common growth with employees, grants them certain decision-making rights, and enhances the adaptability of employees under uncertain environment. Based on the perspective of inclusiveness, Pal et al. (2014) took Swedish textile enterprises as the research object to discuss whether they have more adaptability to cope with the economic crisis. The research results found that advocating inclusive leadership style in enterprises can help enhance organizational resilience. Platform leadership emphasizes treating employees with an inclusive and non-critical attitude and establishing a good interactive relationship with employees, which helps employees show a positive working attitude and more adaptive behaviors, thus improving their resilience level. Based on the perspective of change planning, some scholars proposed that managers with a change thinking would show more insight and action power to the changes in external environment, which helps to create a positive atmosphere among organization members and promote employees to enhance their awareness of crisis prevention (Garcia-Guiu et al., 2015). Based on the perspective of platform construction and optimization, platform leadership builds and optimizes the platform for employees to learn and grow by means of cross-departmental cooperation, organizational learning, innovation cultivation, and shaping a culture of mutual trust. Based on this business platform, it provides adequate resource guarantee and institutional support for employees, which helps employees to improve their work enthusiasm and adaptability. To cope with the flexible organizational environment. Based on this, the following hypothesis is proposed:

*H2: Platform leadership positively affects organizational resilience*

### *2.3 Organizational Resilience and Innovation Performance of Knowledge Workers*

As an adaptive feature in a challenging market environment, organizational resilience can help enterprises maintain prosperity in the face of turbulence, risks and fierce competition (Gutierrez et al., 2009). Organizational resilience is flourishing, which not only has a positive impact on the organization, but also can significantly improve the positive cognition, attitude and behavior of employees. Zhao Jingjie et al. (2020) proposed that organizational resilience can promote organizational learning to shape subordinates' positive behaviors and influence subordinates' overall innovation effect to achieve innovation performance. Williams et al. (2017) found in his empirical study that organizational resilience can stimulate employees' positive attitude and improve employee performance when an organization is faced with a dynamic environment. Specifically, organization members with high resilience tend to have strong anticipatory ability, and have a good positive cognition of themselves. They will deal with setbacks and obstacles in a positive and optimistic manner. Organizational resilience, as a dynamic capability, contributes to the psychological construction of employees (Linnenluecke, 2017), and encourages employees to have more psychological security and enthusiasm for innovation. Resilient organization members see dynamics and uncertainty as opportunities and are more likely to be motivated in times of crisis. At the same time, employees with strong organizational resilience have good adaptability, which is the core component of resilience. Employees with strong adaptability will clearly recognize their own shortcomings, and be able to fully explore and rationally use internal and external resources of the organization to make up for deficiencies, improve their own learning and innovation ability, and promote the maintenance and promotion of their own innovation performance. In addition, employees with strong resilience and high situational awareness can quickly perceive changes in the external environment, integrate existing resources of the organization and optimize them according to the characteristics of the external environment, and establish an information sharing mechanism, so as to help them recover and "rebound" quickly from crises. Organizational resilience is therefore seen as an important factor in employee development and innovation. Based on this, the following hypothesis is proposed:

*H3: Organizational resilience positively affects the innovation performance of knowledge workers*

### *2.4 The Mediating Role of Organizational Resilience*

Due to the rapid development of Internet technology and the impact of COVID-19, the organizational environment has become increasingly volatile and fraught with crises. How to survive, adapt and develop in the competitive and challenging market environment has become the core issue that enterprise managers need to

solve. Platform leadership promotes organizational learning and innovation cultivation by optimizing business platform, and plays a positive role in promoting dynamic capabilities of perception, learning, integration and coordination (Gebauer, 2011). As an important dynamic capability of enterprises, organizational resilience is not only affected by *platform leadership* charisma, but also can help organization members actively integrate internal and external resources, resolve crises and achieve new development, thus playing a positive role in improving subordinates' happiness and organizational member performance and other proactive behaviors (Hao Xuguang et al.,2021;Kuntz et al.,2017).

According to the social exchange theory, platform leaders are highly perceptive and forward-looking about the market environment and can quickly perceive and respond to changes in the organizational environment. By spreading platform values to knowledge workers, they fully empower their subordinates and provide them with knowledge, skills, information and other resources support and institutional guarantee to improve their subordinates' behaviors. It helps subordinates to overcome negative factors such as crisis, failure and setback in the enterprise and recover and rebound quickly (Shin et al.,2012), thus enhancing organizational resilience. Resilient subordinates can make positive adjustments and changes when facing crisis situations, respond to changes in internal and external environment, and constantly innovate, thus improving individual innovation performance. At the same time, according to the individual needs of knowledge subordinates, platform leadership adopts diversified incentive policies, creates a learning organization and establishes a reasonable corporate knowledge training system to improve the learning and growth ability of employees, which helps to enhance the resilience of employees. When employees with resilience are in a crisis situation, they can stimulate their positive psychological emotions and generate positive behaviors (Shin et al.,2012), take the initiative to acquire knowledge to improve their work engagement, work ability and proficiency, exert their subjective initiative to adapt to the dynamic organizational environment and complex work requirements, and constantly summarize experiences and lessons to adapt to the crisis. Improve your ability to adapt. Based on this, the following hypothesis is proposed:

*H4: Organizational resilience significantly mediates the relationship between platform leadership and knowledge workers' innovation performance*

#### *2.5 The moderating effect of Innovative self-efficacy*

Although knowledge workers have the necessary knowledge, skills, experience and other advantages in the process of innovation, they will inevitably be helpless when faced with highly complex, fuzzy and uncertain innovation tasks. As an individual positive mental state, self-efficacy reflects an individual's expectation and confidence in achieving task goals and facing difficult situations (Bandura,1977). Innovation self-efficacy further explains an individual's belief in whether he can achieve innovative results, that is, whether he can creatively complete work tasks and achieve task objectives when facing challenging tasks (Tierney & Farmer, 2002). Ding He et al. (2018) found that innovation self-efficacy is an important internal psychological motivation, which can help individuals actively cope with difficulties and obstacles in the innovation process and adopt the strategy of focusing problems to solve them.

According to the social cognitive theory, employees' belief and confidence in whether they can achieve creative results and achieve innovation goals will affect their own cognition, motivation and behavior. Due to the natural uncertainty of innovation activities, employees need to have the positive psychological support and good mental state shown in the face of setbacks and challenges. As an employee's positive cognition, belief and motivation, innovative self-efficacy can help employees actively perform innovative behaviors. Employees with high innovation self-efficacy, when faced with obstacles, crisis, failure and other adverse situations in the process of innovation, can effectively summarize organizational resources to solve problems. Jiang Pinget al. (2020) pointed out that, as a special form of self-efficacy, innovative self-efficacy is not only affected by personal traits and psychological situations, but also by the leadership style of managers. When individual innovation self-efficacy levels are different, employees with different innovation efficacy levels will have different work behaviors when they are affected by the platform leadership thinking and concept. Compared with other leadership styles, platform leadership has unique appeal to knowledge workers. It not only emphasizes growing together with employees, but also provides a platform for employees to display their talents and timely encourages and helps employees when they encounter difficulties and challenges. Employees with high sense of innovation self-efficacy will be good at grasping the convenient conditions provided by leaders and show more proactive innovation behaviors. Even though the innovation process is full of thorns and obstacles, they will actively set individual goals and make efforts for it (Zhang et al., 2016). On the contrary, individuals with low innovation self-efficacy tend to show an unconfident attitude when faced with the situation of innovation failure. When they encounter innovation setbacks, they may generate defensive behavioral motivation and even choose

to give up. Even if the superior will not punish them, the fear of difficulties and other problems will reduce the motivation to innovate and affect their own innovation performance. Accordingly, the following hypothesis is proposed:

*H5: Innovation self-efficacy positively moderates the relationship between platform leadership and knowledge workers' innovation performance.*

Research shows that employees' positive self-efficacy, good emotional awareness and stable emotional state are important factors for enterprises to cope with dynamic organizational environment and improve individual performance (Linnenluecke, 2017). Based on social cognitive theory, individuals with high psychological traits are more likely to produce positive emotional responses and active work behaviors. Specifically speaking, on the one hand, when employees are fully supported by platform-type leaders, individuals with high innovation self-efficacy, due to their positive belief in their own innovation ability, will have a high level of adaptive behavior. In the daily innovation process, they proactively collect and process information to quickly identify innovation opportunities and respond, and actively integrate into the team or organization. Implementing target programs to cope with changes and risks in the innovation process (Lee et al., 2013); On the other hand, *platform leadership* is highly perceptive to the changes in the internal and external environment of the organization. Employees with high innovative self-efficacy will actively learn and accept the leadership concept, improve their anticipatory ability and situational awareness in times of crisis, take measures in advance to adapt to changes (Kim et al., 2012), and enhance their organizational resilience. However, due to the lack of confidence in their own abilities, employees with low self-efficacy in innovation find it difficult to make full use of resources provided by the organization and effectively meet managers' expectations on themselves, which is not conducive to improving their own behavior to cope with crisis challenges.

*H6: Innovation self-efficacy positively moderates the relationship between platform leadership and organizational resilience.*

Based on the above analysis, this paper comprehensively hypothesized the mediating effect of H2, H3 and H4 organizational resilience and the moderating effect of H5 innovation self-efficacy, and explored a moderated mediating effect mechanism, that is, the indirect effect of platform-type leadership on individual innovation performance through organizational resilience will be affected by the level of employees' innovation self-efficacy. As an individual positive psychological trait, innovative self-efficacy can help employees show more adaptive and forward-looking behaviors in uncertain crisis situations, and help employees generate proactive work behaviors (Lee et al., 2013).

When knowledge workers have a high sense of self-efficacy in innovation, they are highly confident in their own innovation activities and behaviors, and firmly believe that they can better implement innovative plans and complete tasks by relying on their own efforts. Moreover, knowledge workers have a stronger need for self-realization of value and autonomy. They are more inclined to advocate tolerance, pay attention to employee growth and meet employee achievement needs of platform leadership (Hao et al., 2021). In this leadership context, subordinates with high innovation self-efficacy can have a deeper understanding of platform leadership concepts and behaviors, gain more ability and beliefs about successfully completing innovation goals, and further implement them into the innovation process (Jiang et al., 2020). At the same time, he is good at learning and absorbing the existing knowledge and resources of the organization and successfully incorporating them into his own knowledge and capability system, so as to improve his own anti-fragile ability and psychological security in the innovation crisis situation, and increase the willingness and motivation of innovation behavior. On the contrary, individuals with low self-efficacy in innovation are often full of doubts about their own innovation ability and cannot effectively interpret the *platform leadership* behavior, and the relevant innovation work is difficult to get its positive influence, thus limiting their ability to resist innovation crisis and affecting individual innovation performance.

*H7: Innovation self-efficacy positively moderates the indirect effect of platform leadership on the innovation performance of knowledge workers through organizational resilience.*

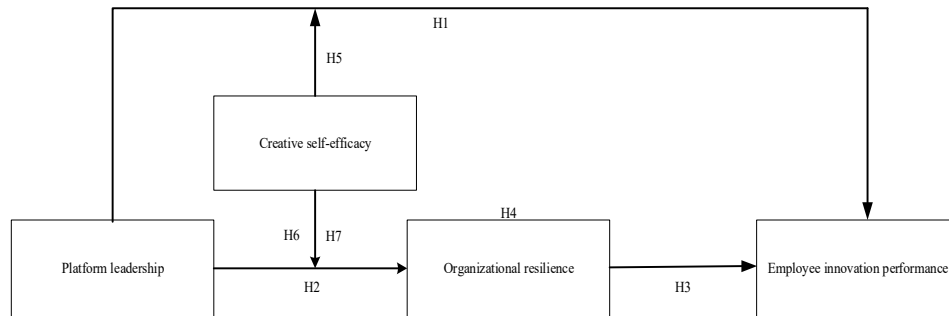


Figure 1. Theoretical model

### 3. Research Design

#### 3.1 Research Objects

In this paper, knowledge workers in Internet enterprises or enterprises with digital platforms are selected as research samples to conduct a questionnaire survey. Data were collected by issuing paper and electronic questionnaires. 678 paper questionnaires were distributed to platform enterprises represented by Alibaba and Haier at one time. In order to ensure data quality, questionnaires with short filling time and obvious regularity were excluded. After screening, a total of 595 questionnaires were collected. Knowledge workers tend to have college degrees or above, which mainly refers to professionals and managers who are engaged in mental work and have certain professional expertise and high comprehensive quality (Li & Fu, 2022). Therefore, in order to ensure that the investigated samples are knowledge workers, the samples below junior college degree level were first deleted, and then some non-knowledge employees were deleted according to job information, such as staff in logistics, security, customer service, etc., and 552 valid samples were finally retained, with an effective rate of 92.77%.

Among the valid samples in the survey, 88.6% of the total number of people with a bachelor's degree or above accounted for 26.8% of them with a master's degree or above. From the perspective of age distribution, samples aged 20-30 and 31-40 accounted for a large proportion, 53.4% and 38.9% respectively. 41-50 years old accounted for 6.5%; The smallest sample was aged 51 and above, accounting for 1.1% of the total. In terms of gender status, the sample numbers of male and female individuals were almost the same, accounting for 49.1% and 50.7% of the total population respectively. The nature of units shows that private enterprises account for the highest proportion of 44.4%, the rest are state-owned enterprises (34.4%), foreign enterprises (10.7%), and the others (10.5%). At the same time, a corresponding survey was conducted on the working years and job attributes of employees in the company, as shown in Table 1.

Table 1. Descriptive statistics of demographic variables of the sample

Statistical variable	Demographic characteristics	Sample number	Percentage (%)	Statistical variable	Demographic characteristics	Sample number	Percentage (%)
age	20-30 years old	295	53.4	tenure	3 years and below	197	35.7
	31-40 years old	215	38.9		3-5 years old	160	29.0
	41-50 years old	36	6.5		5-10 years old	121	21.9
	Age 51 and above	6	1.1		More than 10 years	74	13.4
gender	male	272	49.3	education	Junior college	63	11.4
	female	280	50.7		undergraduate	341	61.8
position	Ordinary staff	177	32.1		Master degree or above	148	26.8
	Technical staff	190	34.4		State-owned enterprise	190	34.4
	Junior management staff	95	17.2	Private enterprise	245	44.4	
	Middle management staff	77	13.9	Foreign-funded enterprise	59	10.7	
	Top management staff	13	2.4	other	58	10.5	

Note. N=552, data obtained from the survey questionnaire.

### 3.2 Measurement of Variables

In this study, mature scales at home and abroad that have been tested in the context of Chinese organization were selected. In order to ensure the reliability and validity of the scales, the teachers of management and English majors translated the foreign original scale and the existing domestic scale in a two-way way before the formal sending of questionnaires, carefully compared them, and fine-tuned the contents according to the specific context and on the premise of keeping the semantics unchanged. The questions of the questionnaire scale were Likert scoring on a scale of 1 to 5, with 1 representing "strongly disagree" and 5 representing "strongly agree".

**Platform leadership:** The scale developed by Hao Xuguang et al. (2021) is adopted, with a total of 25 items. The representative items include "My leader can make decisions quickly and accurately when encountering emergencies", and the scale Cronbach's  $\alpha$  is 0.982.

**Organizational resilience:** Learn from the maturity scale developed by Zhang Xiue and Teng Xinyu (2021) and adapt it, including 13 items, such as "I have the ability to respond to emergencies and solve problems creatively", the scale Cronbach's  $\alpha$  is 0.976.

**Innovative self-efficacy:** refer to the 8-item scale of employee innovative self-efficacy developed by Carmeli and Schaubroeck (2007) for measurement, such as "I will be able to achieve most of the goals I set for myself in an innovative way", and scale Cronbach's  $\alpha$  is 0.957.

**Employee innovation performance:** measured with reference to the 9-item scale compiled by Janssen and Yperen (2004), such as "I will generate new ideas to improve work efficiency" (Cronbach's  $\alpha$  is 0.964).

**Control variables:** In previous studies (An et al., 2022; Hao et al., 2021), gender, age, education, position, working years and company nature may affect individual innovation performance, so this study considers them as control variables to make research results more reliable.

## 4. Empirical Analysis

### 4.1 Common Method Deviation Test

In this study, the common method bias test was carried out as follows. First, reverse questions were set for some items of the scale to reduce the influence of common method bias. Secondly, Harman single factor test was used to test the possible common method deviation. SPSS25.0 software was used to conduct exploratory factor analysis on all the questions of platform leadership, innovation self-efficacy, organizational resilience, and employee innovation performance. The results showed that the unrotated principal component analysis obtained 4 factors (more than 1 characteristic root). 74.361% of the total variation was explained. Among them, the explanatory variance of the first factor accounted for 31.893%, which was less than 40%, indicating that the common method deviation of the scale was not serious.

### 4.2 Confirmatory Factor Analysis

To test the discriminant validity of the four variables mentioned above, confirmatory factor analysis (CFA) was performed using software Amos22.0. The results are shown in Table 2. Compared with other factor models, the four-factor model:  $\chi^2/df=1.173$ , CFI=0.993, RMSEA=0.018, SRMR=0.025, IFI=0.993, NNFI=0.992, NFI=0.952. All the indexes were within the required range, and the model fitting index and fit degree were the best, indicating that the discriminative validity of each variable met the requirements.

Table 2. Results of confirmatory factor analysis

Model	Factor	$\chi^2$	df	$\chi^2/df$	CFI	RMSEA	IFI	SRMR	NNFI	NFI
Four-factor model	(PL、CE、OR、EIP)	1669.967	1424	1.173	0.993	0.018	0.993	0.025	0.992	0.952
Three-factor model	(PL+CE、OR、EIP)	6057.512	1427	4.245	0.860	0.077	0.860	0.108	0.855	0.825
Two-factor model	(PL+CE+OR、EIP)	13500.251	1429	9.447	0.636	0.124	0.636	0.184	0.621	0.610
Single factor model	(PL+CE+OR+EIP)	18067.509	1430	12.635	0.498	0.145	0.499	0.201	0.479	0.478

Note. PL=Platform leadership, CE=Innovation self-efficacy, OR=Organizational resilience, EIP=Employee innovation performance.



### 4.3 Descriptive Statistics and Correlation Analysis

As shown in Table 3, the mean value and standard deviation of each variable are within a reasonable range, and the correlation coefficient between variables is not abnormal and there is correlation. Among them, there was a significant positive correlation between *platform leadership* and organizational resilience ( $r=0.323$ ,  $p < 0.05$ ), a significant positive correlation between *platform leadership* and employee innovation performance ( $r=0.490$ ,  $p < 0.01$ ), and a significant positive correlation between organizational resilience and employee innovation performance ( $r=0.252$ ,  $p < 0.01$ ), which provided preliminary support for the subsequent empirical tests of this paper.

Table 3. Descriptive statistics and correlation analysis

	M	SD	1	2	3	4	5	6	7	8	9	10
gender	1.510	0.500	1									
age	1.550	0.666	-0.107*	1								
education	2.150	0.599	0.102*	-0.164**	1							
position	2.200	1.107	-0.181**	0.137**	0.040	1						
tenure	2.130	1.048	-0.223**	0.137**	-0.036	0.481**	1					
unit property	1.970	0.934	0.092*	-0.058	0.040	-0.039	-0.028	1				
PL	3.649	1.032	-0.028	0.064	-0.060	0.109*	0.026	-0.019	1			
OR	3.185	1.226	0.040	-0.010	0.049	0.076	0.756	-0.013	0.323**	1		
CE	2.999	1.162	-0.014	0.043	0.012	0.079	0.065	-0.046	0.041	0.071	1	
EIP	3.318	1.190	-0.096*	-0.021	-0.070	0.064	0.056	-0.038	0.490**	0.252**	0.222**	1

Note. \* means  $p < 0.05$ , \*\* means  $p < 0.01$ , \*\*\* means  $p < 0.001$ , the same below.

### 4.4 Hypothesis Testing

#### 4.4.1 Main Effect Test

As shown in Table 4M3 and M4, after controlling variables such as gender, age, education, position, working years and enterprise nature, platform leadership has a significant positive influence on employee innovation performance ( $\beta=0.489$ ,  $p < 0.001$ ), so hypothesis H1 is valid.

#### 4.4.2 Intermediate Effect Test

In this study, a three-step method was used to test the mediating effect. According to Table 4M2, platform leadership had a significant positive effect on organizational *resilience* ( $\beta=0.320$ ,  $p < 0.001$ ), and H2 was established. According to M5, organizational *resilience* has a significant positive relationship with employee innovation performance ( $\beta=0.250$ ,  $p < 0.001$ ), and hypothesis H3 is valid. According to M6, after adding organizational resilience, the influence of platform-type leadership on employee innovation performance changes from ( $\beta=0.489$ ,  $p < 0.001$ ) to ( $\beta=0.455$ ,  $p < 0.001$ ), indicating that organizational resilience partly mediates the influence relationship between platform-type leadership and employee innovation performance. Hypothesis H4 is preliminarily verified. In addition, by testing the mediating effect of Bootstrapping with 5000 repeated samples of process program, this study found that the bootstrap95%CI of the direct effect of platform leadership on employee innovation performance and the mediating effect of organizational *resilience* were (0.428, 0.620) and (0.010, 0.073), neither passed 0, which further verified the validity of hypothesis H4.

Table 4. Hierarchical regression analysis results of platform leadership, organizational resilience and employee innovation performance

Variable	OR		EIP			
	M1	M2	M3	M4	M5	M6
gender	0.070	0.088	-0.070	-0.042	-0.088	-0.051
age	-0.025	-0.042	-0.053	-0.078	-0.046	-0.074
education	-0.097	-0.097	-0.064	-0.039	-0.04	-0.031
position	0.103	0.064	0.043	-0.017	0.018	-0.023
tenure	-0.030	-0.008	0.024	0.057	0.031	0.058
unit property	-0.015	-0.013	-0.029	-0.026	-0.025	-0.025
PL		0.320***		0.489***		0.455***
OR					0.250***	0.105**
CE						
EIP						
R <sup>2</sup>	0.019	0.120	0.017	0.251	0.078	0.260
ΔR <sup>2</sup>		0.100		0.234	0.061	0.010
F	1.795	10.555***	1.559	25.980***	6.600***	23.877***

4.4.3 Test of Regulating Effect

In this study, SPSS25.0 software was used to test the adjustment effect by hierarchical regression, and the results were shown in Table 5. In order to avoid the multicollinearity problem, the platform leadership and innovation self-efficacy were decentralized and the interaction terms were constructed. First, hypothesis 5 is tested, and employee innovation performance is taken as the dependent variable to test the moderating effect. According to Table 5 M3, the interaction term between platform leadership and innovation self-efficacy has a significant positive effect on employee innovation performance ( $\beta=0.074$ ,  $p<0.05$ ). Hypothesis H5 is verified. Secondly, to test H6, the dependent variable was changed to organizational *resilience*, while other variables remained unchanged. As shown in Table 5 M6, the interaction term between platform leadership and innovation self-efficacy has a significant positive effect on organizational *resilience* ( $\beta=0.091$ ,  $p<0.05$ ). Hypothesis H6 is verified.

Table 5. Regression analysis results of the moderating effect of innovation self-efficacy

Variable	EIP			OR		
	M1	M2	M3	M4	M5	M6
gender	-0.07	-0.044	-0.044	0.07	0.088	0.088
age	-0.053	-0.084	-0.076	-0.025	-0.043	-0.035
education	-0.064	-0.045	-0.043	-0.097	-0.082	-0.08
position	0.043	-0.028	-0.029	0.103	0.06	0.059
tenure	0.024	0.05	0.047	-0.03	-0.01	-0.014
unit property	-0.029	-0.017	-0.023	-0.015	-0.01	-0.017
PL		0.482***	0.482***		0.318***	0.318***
CE		0.204***	0.207***		0.057	0.062
PL*CE			0.074*			0.091*
R <sup>2</sup>	0.017	0.292	0.297	0.019	0.123	0.131
ΔR <sup>2</sup>		0.275	0.005		0.103	0.008
F	1.559	27.934***	25.428***	1.795	9.501***	9.07***

In order to show the adjustment effect more directly, a simple slope graph was drawn in this study. As shown in Figure 2, under the low level of innovation self-efficacy, the effect of platform leadership on employee innovation performance is weak ( $\beta=0.4476$ ,  $t=7.3884$ ,  $p<0.001$ ). Under the high level of innovation self-efficacy, the influence of platform leadership on employee innovation performance is stronger ( $\beta=0.6029$ ,  $t=9.6214$ ,  $p<0.001$ ). Hypothesis H5 is further verified. At the low level of innovation self-efficacy, the effect of platform leadership on organizational *resilience* was weak ( $\beta=0.2685$ ,  $t=3.9093$ ,  $p<0.001$ ). Under the high level of innovation self-efficacy, the effect of *platform leadership* on organizational *resilience* was stronger ( $\beta=0.4891$ ,  $t=7.0994$ ,  $p<0.001$ ). Hypothesis H6 was further verified.

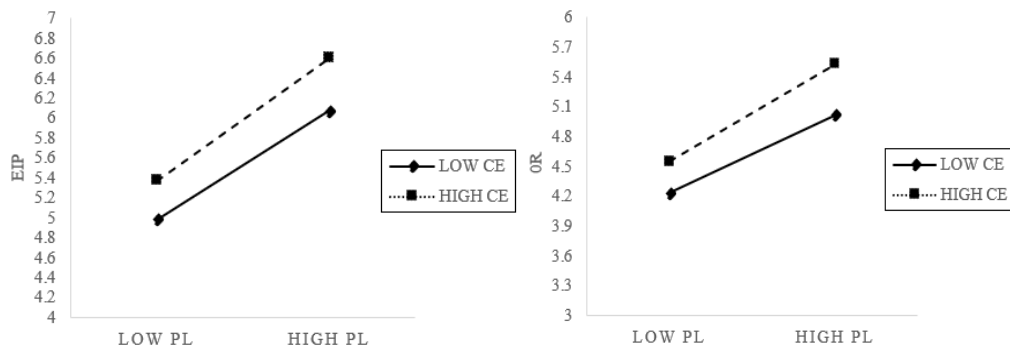


Figure 2. The moderating effect of innovation self-efficacy

#### 4.4.4 The Moderated Mediating Effect Test

In this study, the Bootstrap test was conducted through the Process plug-in of SPSS25.0 software. The results are shown in Table 6. Under different levels of innovation self-efficacy, platform-type leadership has a significant indirect effect on employee innovation performance through organizational resilience, and hypothesis H7 is valid.

Table 6. Results of Bootstrap test for moderated mediation effects

Regulating Variable	Indirect effects	Boot standard Error	95%CI	
			Boot LL	Boot UL
CE (low)	0.022	0.012	0.003	0.051
CE (middle)	0.032	0.015	0.005	0.065
CE (high)	0.041	0.020	0.006	0.083

### 5. Research Conclusions and Enlightenment

#### 5.1 Research Conclusions and Discussion

The Internet, big data, artificial intelligence and other emerging technologies are widely used in production or life, the economy of new employers develops rapidly, and the phenomenon of "decentralization" and "de-leadership" in organizations has become an important trend. The knowledge employees increase substantially and their demands for autonomy and sense of competence are increasingly strong. Leaders are facing a behavior change based on platform concepts and platform values. This study conducted an empirical analysis on the sample data of 552 knowledge-based employees in platform enterprises under the background of the Internet, and verified the correlation mechanism and situational mechanism between platform leadership and employee innovation performance. The main research conclusions are as follows.

Platform leadership has a direct and significant positive impact on the innovation performance of knowledge workers. Nowadays, knowledge workers in the workplace have increased greatly, and the traditional top-down leadership cannot meet the needs of their future development. Platform leadership has unique leadership charm. It can improve employees' positive behaviors and stimulate their creative potential to better complete innovative tasks through sharing altruism, interactive collaboration, incubating makers, personalizing people and empowering equality. To be specific, *platform leadership* fully empowers subordinates, builds strategic platforms to provide subordinates with resources needed for innovative work, and helps them achieve job promotion and career development. Based on the theory of social exchange and the principle of reciprocity, employees respond to the favors given by leaders, thus displaying more innovative behaviors. Empirical studies show that the standard path index between platform-type leadership and employee innovation performance is 0.489 ( $p < 0.001$ ), showing a significant positive correlation, which is consistent with the conclusion proposed by Hao Xuguang et al. (2021) that platform-type leadership can positively drive employee innovation and work performance.

Platform leadership can significantly influence the innovation performance of knowledge workers indirectly by enhancing organizational resilience. In the era of knowledge economy, organizational resilience places more

expectations on business leaders, who are required to clearly understand the current weaknesses and potential threats of the enterprise, and solve problems through creative ways in times of crisis (Zhao et al.,2021). *platform leadership* pays more attention to organizational development and innovation cultivation, has the courage to take risks, pays attention to organizational environment and actively responds to changes, and other leadership characteristics are highly consistent with the establishment and mechanism of organizational resilience. Moreover, platform leadership is more conducive to subordinates' talents and their own value by creating a career platform and innovation stage with the accumulation of various resources. When subordinates perceive the care, recognition, resources and institutional guarantees from superiors, they will show more positive behaviors, improve their organizational resilience and flexibly respond to changes in organizational environment. The frequency of employees' innovative behaviors will also increase significantly, which is conducive to the improvement of innovation performance. According to the empirical results, when the intermediary of organizational resilience is added, the standard influence coefficient of *platform leadership* on employee innovation performance decreases by 0.034, indicating that there is a partial mediating effect.

The direct prediction effect of platform leadership on knowledge workers' innovation performance was positively moderated by innovation self-efficacy. Different from previous studies that regarded innovative self-efficacy as the process mechanism of leadership traits and employee behaviors (Li et al.,2022), this study believes that innovative self-efficacy can be used as a situational factor of *platform leadership* and employee innovation performance. Specifically, compared with employees with low level of innovation self-efficacy, employees with high level of innovation self-efficacy, empowered by platform-type leadership, are more able to positively perceive and have confidence to fulfill expectations placed by leaders, and adopt creative methods to improve innovation performance. According to the data results, the path coefficient of influence of the interaction term of platform leadership and innovation self-efficacy on employee innovation performance is 0.074 ( $p < 0.05$ ), that is, the research conclusion is verified by empirical results.

Innovation self-efficacy significantly positively influences the relationship between platform-type leadership and organizational resilience, and also significantly enhances the indirect effect of platform-type leadership on the innovation performance of knowledge workers through organizational resilience. Whether employees can actively perceive the platform leadership behavior and improve their organizational resilience to cope with crisis is of great significance for the realization of innovation performance. It is found that subordinates with different innovative self-efficacy will show different degrees of resilience when they are influenced by platform leadership. Subordinates with high innovation self-efficacy can actively accept the leadership concept of the platform, perceive the changes of the enterprise and obtain useful information through leadership empowerment, capture new growth opportunities, improve their organizational resilience and promote innovation performance. According to the empirical results, the regression coefficient of the interaction term (platform leadership \* innovation self-efficacy) on organizational resilience is 0.091 ( $p < 0.05$ ), and for the test of the mediating effect, based on the Bootstrap interval and effect value gap, the above conclusions can be considered verified.

## 5.2 Theoretical Value

Firstly, it deepens the empirical research of platform leadership. Existing studies have confirmed that *platform leadership* has a positive impact on employee innovation behavior, organizational commitment, organizational citizenship behavior, etc. (Xin et al.,2020), but there is no organic correlation between *platform leadership* and innovation performance of knowledge workers. Through model building and empirical testing, this study explores the relationship between the two, expands the research paradigm of "leadership -- employee performance", and enriches the systematic cognition of platform leadership outcome variables and antecedent variables of employee innovation performance.

Secondly, it examines the mediating role of organizational resilience in the relationship between *platform leadership* and employee innovation performance. Existing studies are not clear about the influence mechanism of platform-type leadership and employee innovation performance. This study introduced organizational resilience as a variable and clarified the influence path of platform-type leadership on employee innovation performance from the perspective of resilience ability. At the same time, it also demonstrates the important significance of organizational resilience for employees to cope with the challenges and crises of the market environment and improve their innovation performance in the era of knowledge economy.

Finally, the theory of innovation self-efficacy is expanded. Previous studies usually regard innovative self-efficacy as the "bridge" between leadership style and individual behavior, but few pay attention to the boundary effect of innovative self-efficacy. Therefore, this study explores and verifies the situational constraint effect of innovation self-efficacy, expands the boundary conditions of the influence mechanism of

"platform-leadership -- organizational resilience -- employee innovation performance" and "platform-leadership -- employee innovation performance", and also provides empirical support for the theory of employee positive psychological capital.

### 5.3 Practical Enlightenment

Firstly, enterprises should attach importance to and cultivate platform leaders. Enterprises should fully guide and give play to the effectiveness of platform-type leadership of enterprise managers, establish a positive social exchange relationship between leaders and employees, and accelerate the construction of a platform-type organization integrating the organization, leaders and employees. In the daily work of enterprise managers, firstly, they should pay attention to the equal communication with employees, build a common career platform for employees, at the same time make the career platform bigger and stronger, provide employees with the opportunity to show their talents and the stage of career achievement by relying on the career platform, rationally use material rewards and spiritual incentives to stimulate the creative potential of employees; Second, leaders pay attention to the mutual achievement and common growth of employees, maximize the satisfaction of employees' self-realization needs, customize the innovation ability improvement plan for employees, encourage employees to "learn from" and "learn from", and inject continuous innovation vitality into the enterprise.

Secondly, enterprises should enhance organizational resilience to withstand crises and risks. In practice, enterprise managers should attach importance to empowering and motivating members of the organization to enhance the ability of employees to deal with the uncertainty of the organizational environment. In daily work, the training of simulated employees to deal with uncertain crisis should be enhanced to improve their ability to cope with external changes and respond quickly. At the same time, as an important link between enterprises and employees, leaders can regularly organize conversations with employees, strengthen communication with employees, timely understand the difficulties and needs of employees, and coordinate the relationship between various departments and employees. Only when enterprise members cooperate and understand each other, can they effectively coordinate internal resources to cope with changes when crises occur.

Thirdly, enterprise managers should pay attention to the cultivation of knowledge workers' sense of innovation self-efficacy. As a positive mental state of employee's mental capital, creative self-efficacy can be guided and developed. For leaders, they should pay attention to cultivating employees' awareness of innovative self-efficacy, strengthen psychological capital training for employees, encourage subordinates to complete challenging innovative tasks, and improve their sense of innovative self-efficacy. Secondly, leaders should consider the implementation of assessment indicators of management by objectives when examining the performance level of employees. The innovative self-efficacy of employees needs the support of goals. Only when employees complete the work objectives assigned by their superiors with their own efforts, their innovative self-efficacy can be improved and sublimated. In addition, leaders should provide employees with positive psychological support and innovative resources, actively encourage employees to recover quickly from failures, and encourage employees to accept more challenging work.

### 5.4 Research Limitations and Prospects

First of all, the adjustment questionnaires in this study were all completed by one employee, and the survey data were obtained by one measurement. Although the homologous deviation analysis was carried out on the sample data, the verification showed that the homologous deviation was not serious, but the measurement results still had some subjectivity. Therefore, a "leader-employee" matching questionnaire can be prepared in the follow-up research, and a two-hour or three-hour questionnaire survey can be conducted to enhance the scientific and rigorous results of the empirical study. Secondly, the research only confirms that the platform leadership existing in the Internet or platform enterprises can be the source of influencing the innovation performance of knowledge workers. However, platform leadership is not unique to the above enterprises. Whether non-Internet or non-platform enterprises, such as traditional manufacturing industries, need to apply this leadership to promote employee innovation remains to be explored. Thirdly, this study takes organizational resilience as an important intermediary between *platform leadership* and employee innovation performance, and builds a bridge between platform leadership and employee behavior from the perspective of competence. Whether there are other mediating variables remains to be studied, and whether knowledge sharing and organizational identity can serve as the link between the two in the future can be paid attention to. Finally, based on the perspective of employees' psychological perception, this paper selects innovation self-efficacy as a situational variable. Future studies can further consider other contextual variables (such as organizational culture, innovation climate, employee power distance, employee characteristics, etc.) to more comprehensively understand the mechanisms underlying the impact of platform leadership on employee innovation performance.

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