



# Impacts of Procedural Justice and Ethical Leadership on Organizational Innovation

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## ABSTRACT

Drawing on social exchange and reformulation of attitude theories, the research model is proposed to test the interrelationships of ethical leadership, procedural justice, organizational trust, work engagement, and organizational innovation. Organizational trust and work engagement are identified as sequential mediators to explore the relationships between procedural justice, ethical leadership, and organizational innovation. Furthermore, a proactive personality is identified as a moderator for the relationship between work engagement and organizational innovation. This article advances and extends the knowledge of the antecedents of organizational innovation from organizational fairness perspectives and ethical leadership style in the Chinese IT industry.

## KEYWORDS

ethical leadership, organizational innovation, organizational trust, proactive personality, procedural justice, work engagement

## INTRODUCTION

Organizational innovation is an important strategy to help companies lead the market and better meet diverse customer demands (Yang et al., 2018). As the IT industry faces rapidly changing technology and business environment, innovation should be integrated into the organizational strategy to achieve sustainable development. In 2021, the scale of the Chinese digital economy increased to 45.5 trillion yuan and ranked second in the world (Ma & Ge, 2022). The recent 20th National Congress of the Communist Party of China (CPC) stated that innovation would remain at the heart of China's modernization drive (Youth.cn, 2022). The word *innovation* appears often in the report of the 20th National Congress of the Communist Party of China (CPC). It continues to be the primary driving

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force highlighted by Chinese President Xi Jinping (China Government Bank, 2022). Chinese IT industry development should be based on consistently enhanced innovation.

In the future, the Chinese IT industry needs to integrate well with other industries, according to Wu He Quan (Ma & Ge, 2022). Thus, innovation for this type of industry is critical. Employee creativity has attracted many previous scholars' attention (Chaubey & Sahoo, 2021; Hughes et al., 2018). Small and medium-sized enterprises (SMEs) support and contribute to the Chinese national economy as the primary market entities with the most potential for economic growth (Hafeez et al., 2020). SMEs play an important and active role in the Chinese national economy, accounting for 99% of the enterprises and 60% of gross industrial output. SMEs highlight 75% of technological innovation and 80% of the new products in the Chinese market (Chen et al., 2017). Hence, this research targets the innovative performance of Chinese IT SMEs. In 2020, the number of employees in the Chinese IT industry reached 7.05 million. IT industry belongs to one of the hottest industries in China. Creativity is regarded as the core position of organizational innovation, which decides the organizational competitive advantages and surviving capability (Katila & Ahuja, 2002). To promote an innovative organization, the initiative engagements and participation of individual employees are the driving factors (Chaubey & Sahoo, 2021). Among the factors linked to organizational innovation, human resource practices (HRP) are often considered (Cao et al., 2021). There is a broad acknowledgment of the associations between work engagement and positive organizational outcomes (Alazmi & Alenezi, 2020; Karatepe et al., 2021; Kaya & Karatepe, 2020; Wang & Chen, 2020). However, few empirical studies have explored the potential impact of work engagement on organizational innovation via employee trust and fair and ethical perceptions (Shafique et al., 2019). Ethical leadership emphasizes ethical role models and organizational norms promotion through two-way communication between leaders and subordinates (Brown et al., 2005). Previously, ethical leadership has been linked with innovative climate and green innovation behavior (Liu & Zhao, 2019). However, ethical leadership as an imperative element for organizational innovation facilitation still needs more attention (Shafique et al., 2019). In the current study, the research framework would draw attention to organizational innovation facilitation from fair perspectives (ethical leadership and procedural justice adoptions) through the mediators of organizational trust and work engagement in Chinese IT companies.

The present research model draws at least four research gaps. First, this study addresses the research gap by considering the importance of ethics and justice for organizational innovation promotion. Secondly, the research framework investigates the mediating roles of organizational trust and work engagement between ethical leadership and organizational innovation in a sequence. To our knowledge, these indirect effects have yet to be examined in organizational innovation. Further, a proactive personality as an aspiring individual personality is usually linked with employee creative performance (Li et al., 2020; Maria et al., 2022; Zhang et al., 2022). Chaubey and Sahoo (2021) argued that proactive employees demonstrate a high level of creativity. Limited research has examined how a proactive personality spontaneously leads to employee work engagement and organizational innovation participation with fewer environmental constraints. Finally, the findings of this paper provide important practical implications for cultivating employee trust and work engagement in innovative organizational activities in Chinese IT SMEs from the individual, group, and organizational levels.

## **LITERATURE REVIEW**

### **Theoretical Background**

This section identifies the supporting theories and reviews the relevant literature, following the proposed research hypotheses and framework. The relationships among the independent variables, mediators, moderators, and dependent variables are established.

## **Social Exchange Theory**

Social exchange theory (SET) states that if one party acts in ways that could benefit another party, an implicit obligation is generated, which causes further reciprocity to the initial party by the beneficial party (Blau, 1964). SET reflects trust and stable exchange between employees and employers (Malla & Malla, 2021). Grounded in SET, employees tend to embody the exchange relationships with their supervisors and reciprocate for the organization when they perceive the decision-making and outcome distributions are fair (Shan et al., 2015). A trust association could be built through this exchange between the employees and employers (Darban et al., 2022). Through procedural justice, employee organizational commitments are enhanced when they gain a positive perception of the performance management system with a high-quality leader-member relationship (Sholihin & Pike, 2010). According to Beins (2013), organizational trust is developed through social exchange and interactions between employees and supervisors. The relationships between ethical leadership, procedural justice, and organizational trust are established under a high level of social exchange with supervisors. SET contends that mutual trust and commitments originate from highlighting reciprocity and repayment rules in the organizations (Cropanzano & Mitchell, 2005). As a result, SET also offers guidance about the relationship between organizational trust and work engagement through exchanging and trusting. Employees feel obliged to reward the organizations through high work engagement based on organizational trust.

## **Self-Determination Theory**

Self-determination theory (SDT) was proposed by Deci and Ryan (1985). This theory involves the internalization and integration process of personality development and behavioral self-regulation. SDT concentrates on two types of motivations, which are intrinsic and extrinsic. Intrinsic motivation tends to be more influential as it reflects a higher individual tendency towards learning and creativity (Ryan & Deci, 2000). Intrinsic motivation plays a vital role in creativity because of a high level of autonomous engagement in work (Kessler, 2013). SDT assumes that an inherent growing tendency exists within the people (Kessler, 2013). A proactive personality is positively and directly associated with employee creativity due to the important role of personality traits in shaping intrinsic motivation (Hornig et al., 2016; Karimi et al., 2022). Employee motivation stems from both the external environment and inner personality traits. Personality traits have more possibility in forming individual intrinsic motivation (Tan et al., 2019). SDT provides solid theoretical support for the moderating effect of a proactive personality on the relationship between work engagement and organizational innovation. A proactive personality as a stable characteristic tends to induce more autonomous work engagement through intrinsic motivation, which would be less constrained by external conditions.

## **Reformulation of Attitude Theory**

Bagozzi (1992) deepens the attitude theory, which addresses the role of cognitive and emotional self-regulatory mechanisms. Reformulation of attitude theory (RAT) contends that a mechanism exists from cognitive evaluation and emotional response to behavioral outcomes in a sequence. The appraisals of the employees are usually based on the past, present, and future timelines. After cognitive evaluation, if positive emotional responses are generated, employees would engage in positive work behavior (Bagozzi, 1992). It is said that through the reformulation of attitude theory application, a dualistic model is established (Chen, 2021). Specific actions of employees that derive from positive or negative emotions are following one's own and others' expectations. Under this mechanism, the role identity that links internalized expectations with the particular circumstances for individual actions should be considered. The role identity continues to evolve based on the events that happened or what is going on (Bagozzi, 1992). RAT is usually adopted to offer solid theoretical support for the relationship between management commitments and employee positive work behavior through emotional response (Darban et al., 2022; Karatepe et al., 2021; Rod & Ashill, 2013). In this research framework, employees gain a cognitive appraisal of procedural justice and

ethical leadership adoptions, which further fosters positively emotional responses (organizational trust and highly works engaged). These positive emotional responses would result in the positive behavioral outcome (organizational innovation). Underpinning theory reflects how relationships and hypotheses are established in the research framework. RAT is identified as the underpinning theory in the current study as it establishes the linkages among the independent variables, mediators, and dependent variable in a dualistic model.

### **Procedural Justice and Organizational Trust**

Organizational justice contains four dimensions: *distributive*, *procedural*, *information*, and *interpersonal justice*. Among these four dimensions, distributive and procedural justice are often connected with organizational trust (Chen et al., 2015). Shore and Shore (1995) said that compared to distributive justice, procedural justice has more influence on organizational commitment as it focuses on fairness in the decision-making process and, through this process, how outcomes can be distributed (Wang et al., 2010). Procedural justice indicates that employees think the organizational procedures are fair, involving employee performance measurement, performance feedback communication, payment system, and promotion (Sholihin & Pike, 2010). Evidence suggests that procedural justice could engender positive job attitudes and behaviors, such as job satisfaction and affective commitment (Klimchak et al., 2020; Malla & Malla, 2021; Park, 2018). The linkage between procedural justice and organizational trust has been discovered by previous scholars (Carr & Maxwell, 2018; Jiang et al., 2017; Pathardikar et al., 2022). When employees own fair perceptions of the organizational decision-making process, trust in the organization will likely increase. Thus, Hypothesis 1 is proposed:

H1: Procedural justice is positively related to organizational trust.

### **Ethical Leadership and Organizational Trust**

Ethical leadership (ETL) is the demonstration of normative and appropriate conduction through leaders' ethical actions, interpersonal relationships, and the promotion of such conduction to followers through two-way communication, reinforcement, and ethical decision-making process (Brown et al., 2005). There are some similarities between servant leadership and ethical leadership. For example, both leadership styles contain ethical behavior, ethical concentration, and the behavior of helping followers. However, servant leadership focuses more on serving others as a steward, while ethical leadership fosters ethical promotion in the workplace (Reddy & Kamesh, 2019). Ethical leadership includes normative appropriateness, communication behavior for ethical promotion, reinforcement of ethical behavior through rewarding and punishing, and decision-making behavior with ethical considerations (Bakar & Connaughton, 2022). This reflects that leaders with ethical leadership styles facilitate ethical organizations via personal ethical actions and interpersonal relationships.

Ethical leadership is highly related to employee positive job attitude and performance (Wang & Xu, 2021). It is argued that when the employees perceive that ethical leadership is integrated into the organizational implementation effectively, employee trust in the leaders and organization could increase (Xu et al., 2016). Ethical leaders are characterized by fairness, trustworthiness, honesty, morality, and ethics (Ko et al., 2018). With these characteristics, the employees are more likely to gain a positive perception and trust in the leaders and organization (Eluwole et al., 2022). Thus, Hypothesis 2 is proposed:

H2: Ethical leadership is positively related to the organizational trust.

## Organizational Trust and Work Engagement

Work engagement as a kind of employee work attachment refers to a positive and affective emotional status with vigor, dedication, and absorption (Schaufeli et al., 2002). Work engagement reflects employee willingness to put effort into their jobs through physical, cognitive, and emotional commitments (Kahn, 1990). Organizational trust was found to be a crucial determinant of work engagement generation (Agarwal, 2014; Lin, 2010).

*Organizational trust* means employees perceive the organization as credible and trustworthy (Gambetta, 1988). Employees with organizational trust usually tend to have confidence in organizational activities and decision-making as they think their personal interests will not be harmed (Yilmaz & Atalay, 2009). Organizational trust is regarded as an essential consequence of procedural justice (Carr & Maxwell, 2018; Jiang et al., 2017; Pathardikar et al., 2022) and ethical leadership (Newman et al., 2013; Tourigny et al., 2019) as well as an important antecedent for work engagement (Eluwole et al., 2022). Organizational trust is often considered a mediator between organizational justice and employee commitment (Alazmi & Alenezi, 2020). Employees who perceive the organization has a fair management system and decision-making process tend to trust the organizations and supervisors, leading to more work engagement in reciprocity (Ha & Lee, 2022). Organizational trust has been found as a significant mediation effect between procedural justice and work engagement by Agarwal (2014). Same as the findings of Sharma and Yadav (2018). Moreover, a trust-based mechanism between ethical leadership and organizational citizenship behaviors (OCB) has been discussed (Newman et al., 2013; Tourigny et al., 2016). Ethical leadership is also found to influence organizational innovation or employee just perceptions through organizational trust as the mediator (Shafique et al., 2019; Xu et al., 2016). Hereby, the mediating role of organizational trust between ethical leadership and work engagement needs to be explored further. Thus, Hypotheses 3 and 4 are proposed:

H3: Organizational trust is positively related to work engagement.

H4: Organizational trust plays a mediating effect between ethical leadership, procedural justice, and work engagement, respectively.

## Work Engagement and Organizational Innovation

Schaufeli et al. (2006) described that work-engaged workers are often full of energy and job pride even when the workload is intense. *Organizational innovation* refers to the new ideas and techniques implemented in the product development or service process. Organizational innovation could be fostered when the company prioritizes the employee's innovative activities (Punyasai et al., 2022). According to Rich (2010), highly work-engaged employees usually try their best to conduct work well as they feel proud of their jobs and make the effort with passion. Work engagement is usually applied to predict the work outcomes such as employee turnover intention, job performance, and pro-environmental behaviors (Asghar et al., 2021; Karatepe et al., 2022; Kaya & Karatepe, 2020; Wang & Chen, 2020). Mulligan et al. (2021) and Agarwal (2014) connected work engagement with innovative employee behavior.

Evidence still needs to be found about linking work engagement with organizational innovation. The relationship presented so far implicitly suggests the necessity to discover the role of work engagement in facilitating organizational innovation. Some scholars connected the leadership styles (transactional leadership, servant leadership, and authentic leadership) with work engagement to understand employee performance (Kaya & Karatepe, 2020; Strom et al., 2014; Blanch et al., 2021). Mulligan et al. (2021) examined the mediating role of work engagement between leader-member exchange (LMX) quality and innovative work behavior. In addition, Agarwal (2014) also treated trust and work engagement as the sequential mediators for the relationship between procedural justice and employee innovative work behavior. Thus, Hypotheses 5 and 6 are proposed:

H5: Work engagement is positively related to organizational innovation.

H6: Ethical leadership and procedural justice positively impact organizational innovation through casual-chain mediators (organizational trust and work engagement), respectively.

### **Proactive Personality as a Moderator Between Work Engagement and Organizational Innovation**

Employees with proactive personalities usually work with initiatives and opportunities in mind, seeking improvements in the current environment and persistently acting to achieve them (Crant, 2000). This indicates that employees with proactive personalities are unsatisfied with their current job situation and continually pursue self-improvement. It is argued that employees with proactive personalities seem to have more proactive work behavior and innovative work performance (Jiang & Gu, 2015; Zhang et al., 2012). Employees with proactive personalities are intrinsically motivated to pursue their career success or improvements through learning, work engagements, or job inputs (Fuller & Marler, 2009). Employees with proactive personalities are more likely to participate in organizational innovation activities because of their self-enhancing orientation (Srikanth et al., 2020). Proactive employees always seek new ways of career development and innovation (Li et al., 2020). Employees with proactive personalities are usually fearless of work challenges and advance job tasks independently with less external control and constraints (Zhang et al., 2022). In this research, procedural justice and ethical leadership provide a better person-fit for proactive employees under justice and ethical circumstances.

A proactive personality is usually identified as a moderator to understand its impacts on the relationships with employee creativity (Maria et al., 2022; Zhang et al., 2022). Hereby, a proactive personality is proposed as a moderator to examine if the degree of the positive relationship between work engagement and organizational innovation would be weakened with fewer external work environmental constraints.

H7: Proactive personality weakens the relationship between work engagement and organizational innovation.

## **RESEARCH FRAMEWORK**

Inspired by the positive status of organizational fairness and ethical atmosphere, the mechanism by which procedural justice and ethical leadership help achieve organizational innovation through organizational trust and work engagement is established. Figure 1 presents the research framework.

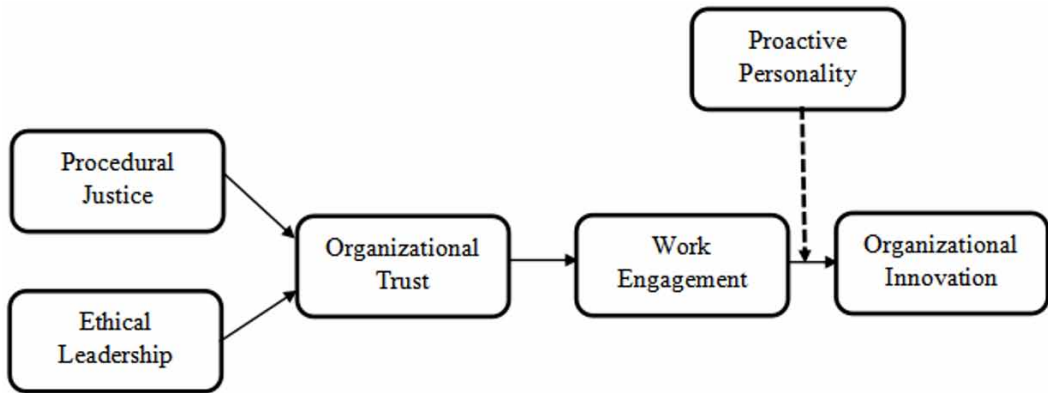
### **Methodology**

Based on the proposed research framework, this section focuses on how data was collected and analyzed, sample size calculation, and measurement of variables.

### **Unit of Analysis**

Chinese IT companies gain competitive advantages through achievements in innovation, representing the real performance of the Chinese IT industry (Hafeez et al., 2020). The main types of Chinese IT companies are basic service companies, business application companies, communication entertainment companies, and internet media companies (Wang & Yue, 2020). The respondents in this study cover all these main types of Chinese IT SMEs. In this research, both the basic technological personnel and engineers in the Chinese IT SMEs are targeted.

Figure 1. Research framework



## Research Design

Based on the proposed research framework, the quantitative research method is adopted. The structural questionnaire is regarded as the research instrument for primary data collection. The questionnaire consists of two sections: Section 1 aims to capture the demographic profile of the respondents, covering gender, age, education, and job experience; Section 2 contains the items measuring the constructs in this research framework. Judgment sampling is regarded as non-probability, which could avoid the knowledge of probability and increase the precision of estimation among the defined population. Some criteria are usually defined as bias control (Perla & Provost, 2012). Two criteria are utilized for choosing the participants in this study. Firstly, the respondents in the current study focused on the technology employees in various job positions, such as engineers, maintenance personnel, software programmers, technology developers, and analysts in Chinese IT SMEs. Secondly, only full-time technology employees are included. According to Darban et al. (2022), part-time employees do not feel they belong in the organization with less work passion. Therefore, only full-time technology employees are concentrated. A multi-level sampling procedure has been adopted in this research. Initially, the respondents were selected based on judgment sampling. In the second stage, snowball sampling, called *chain-referral sampling*, was applied (Heckathorn, 2011). At the end of the online questionnaire, a sentence has been added to invite the respondents to share the linkage to suitable acquaintances. Finally, existing participants utilized their networks and invited others they knew for additional data source generation (Berndt, 2020). In this way, the sample size has been increased.

The original questionnaire is the English version. Hereby, the back-to-back translation method was adopted. *Back translation* is the process of translating a specific language version questionnaire into a second language, then translating it back to the original language to make a comparison (Beins, 2013). To achieve this translation, two independent expert translators were invited to ensure clarity between the original questionnaires and the translated ones. Although the majority of the targeted respondents in the current study grasp English, it is argued that the native language would ease the difficulty of dealing with emotional content varying caused by the different languages (Matsumoto et al., 2008).

Furthermore, back translation's main advantage is making the questionnaire items easy to access across different cultures and linguistic contexts (Beins, 2013). Therefore, respondents were asked to rate the questions on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). To ensure the understanding and conciseness of the translated questionnaire version, a pre-test was conducted before the formal questionnaire distribution among 12 respondents, to examine whether the questionnaire structure was clear.

After years of development, the Chinese IT market has initially formed a certain industrial base and pattern. After identifying the targeted population and calculating the minimum sample size in this study, the authors began to browse Chinese IT SME websites, the Chinese IT Summit Forum, and the Chinese IT technology online community. The list of the targeted IT companies was finalized. Among these thirty-two companies on the list, only fifteen IT companies permitted the researchers to conduct the survey. Additionally, five companies in Shanghai, seven companies in Beijing, and three companies in Shenzhen were reached. Among them, 12 companies had fewer than 500 employees, and three had 500–2,000 employees. Further, five basic service companies, four business application companies, three communication entertainment companies, and three Internet media companies constitute the 15 IT companies as research participants.

The cover letter states the research purpose, anonymity and confidentiality of companies and respondents, and the importance of real answers. It is also stated that there are no right or wrong answers as long as from an honest perspective. The cover letters were sent to 15 companies' HR managers for checking purposes. Then, the online questionnaire and consent form were sent to the HR managers after getting permission. Further, HR managers helped distribute this online questionnaire linkage through internal communication channels, such as an intranet, employee portal, and WeChat working group to collect data.

The questionnaire linkage was generated by the Chinese online platform WJX.cn, which can host the questions, track them, and collect responses. Before filling up the questionnaire, the consent form needs to be ticked first by each respondent. Hereby, the survey conducted in the present research is based on respondent willingness. The questionnaire was distributed in two batches. It is said that if the self-report questionnaires are collected simultaneously, *common method variance* (CMV) may occur (Chang et al., 2020). CMV usually results in a false internal consistency and correlation among variables by unsuitable measurement methods. One of the remedies is the information for the dependent variable, and independent variables construction comes from different sources. The other one is to collect data at different points in time (Podsakoff et al., 2003). To reduce biases in the response rating and consistency motivation, the time lag between the first-time questionnaire distribution (procedural justice, ethical leadership, organizational trust, and work engagement) and the second-time distribution (proactive personality and organizational innovation) is three weeks. The time interval can reduce the cognitive creation of the correlations by the respondents based on the statement of Chang et al. (2020). Finally, 839 valid questionnaires were collected from the technology employees in these 15 IT SMEs.

## Sample Size

Basic sampling theory guidelines must be considered to gain reliable results with minimal sampling errors (Sarstedt et al., 2018). The model structure, the anticipated significance level, and the expected effect sizes under the power analyses are the factors that need to be considered for the sample size calculation (Marcoulides & Chin, 2013). According to Hair et al. (2019), the inverse square root method proposed by Kock and Hadaya (2018) is a new approach for minimum sample size calculation in PLS-SEM. By the inverse square root method, if the value of the path coefficient with the minimum absolute magnitude is unknown, the suggested minimum sample size should be 160.

## Measurement of Variables

The purpose of this research framework is to investigate and identify the antecedents of organizational innovation in Chinese IT SMEs. The four procedural justice items were adopted from Ha and Lee (2022) with a Cronbach's  $\alpha$  value of .881. Ethical leadership was measured using 10 items from Brown et al. (2005) with Cronbach's  $\alpha$  value of .83. Organizational trust was assessed by four items (Cronbach's  $\alpha$  = 0.83) derived from Malla and Malla (2021). Work engagement was captured by the nine-item scale used by Schaufeli et al. (2006; Cronbach's  $\alpha$  = .933). In addition, a proactive personality was assessed by 10 items, which were adapted from Bateman and Crant (1993). Some



sentences were paraphrased and adjusted after the pre-test to make them specific, targeted, and easy to understand in the Chinese cultural context and research scope by closely attaching the main concepts in the previous questions. For example, the question “I excel at identifying opportunities” changed to “I am always seeking new opportunities for career development.” Organizational innovation is measured by a six-item scale, which is adapted from Jia et al. (2022) with a Cronbach’s  $\alpha$  value of 0.899. To align better with the research aims, previously tested questionnaires were adapted by the researchers, by rewording, adding, or supplying. If there is no difference in the answers between the original items and the adapted ones, the adaption is perceived as feasible (Sousa et al., 2017). The pre-test usually ensures the successful adaption of the questionnaire items. As this study focuses on organizational innovation from the individual level, the *film activities* in the original items replaced *job activities*, and *managing the human resources* replaced *managing the job* to conform to the current research purpose and scope.

## Data Analysis

SPSS v29 software was utilized to understand the demographic profiles of the respondents, common method bias examination, and descriptive statistics. Smart PLS 4.0.9.5 software is adopted to apply structural equation modeling (SEM) with partial least squares (PLS) to assess the hypotheses results. PLS-SEM is divided into two stages, which are measurement model analysis and structural model analysis. Measurement model analysis is the first stage, which focuses on the insurance of the reliability, convergent validity, and discriminate validity of the research framework. The second stage mainly emphasizes estimating the structural model for hypothesis testing.

## RESULTS

In this section, the results after data analysis are presented. Both the demographic profile of the respondents and the hypotheses are assessed.

### Demographic Profiles of the Respondents

Demographic information represents the distinct characteristics of respondents to gain a broader understanding of the population (Lee & Schuele, 2010). Table 1 shows that 56% ( $n = 470$ ) of the respondents were male, and the rest were female. About 60% ( $n = 504$ ) of respondents were under 40. However, 26% ( $n = 218$ ) of respondents were between 41 and 50 years old, while only 14% ( $n = 117$ ) were over 50 years old. On the other hand, around 35% ( $n = 294$ ) of respondents had 10 to 14 years of job experience in the same company; 58% ( $n = 487$ ) held bachelor’s degrees. Table 1 shows the detailed characteristics.

### Common Method Bias

A multipronged approach was used to minimize CMB at both the beginning and post-hoc stages of data collection (Podsakoff et al., 2003). At the beginning, item ambiguity was eliminated by pre-test, a logical flow of general to specific questions, cover letter attachment, and unfamiliar terms definition. Additionally, Harman’s single-factor test, and full collinearity test were employed at post-hoc stage. Harman’s single factor test was conducted to examine if the common method bias exists, which follows the guidelines of Podsakoff et al. (2003). It was found that no single variable accounts for more than 50% of the variance and the first factor explains 37% of the variance in this study. Furthermore, the full collinearity results reveal that all values of variance inflation factor (VIF) are below three. Thus, CMB does not exist in the current research.

Table 1. Demographic characteristics

Demographic	Frequency ( <i>n</i> = 839)	Percentage
Gender		
Male	470	56.0
Female	369	44.0
Age		
30 years old and below	185	22.1
31–40 years old	319	38.0
41–50 years old	218	26.0
51 years old and above	117	13.9
Job experience (at this company)		
4 years and below	109	13.0
5–9 years	201	24.0
10–14 years	294	35.0
15 years and above	235	28.0
Education		
Junior college	34	4.1
Bachelor's degree	487	58.0
Master's degree	268	31.9
PhD	50	6.0

## Descriptive Statistics

The descriptive statistics allow the researchers to observe the response pattern. The mean and standard deviation demonstrate the central tendency and inconsistency in responses respectively. The findings of descriptive statistics are presented in Table 2. The mean statistics show that most of the research participants agreed with the given statements in the questionnaire. The values of standard deviation range from 0.90 to 1.17, which indicates a medium level of inconsistency in the responses.

## Measurement Model Analysis

Measurement model assessment examines how well the measurement items represent the latent variables, as demonstrated in Figure 2. Hair et al. (2022) recommended the assessments of convergent

Table 2. Descriptive statistics of study variables

Construct	Mean	Standard Deviation
Ethical leadership	3.37	0.90
Procedural justice	3.95	1.12
Organizational trust	3.62	1.17
Work engagement	3.61	1.01
Proactive personality	2.38	1.03
Organizational innovation	3.71	1.15

validity, internal consistency reliability, and discriminant validity. Convergent validity was assessed by factor loading and average variance extracted (AVE). Additionally, internal consistency reliability was evaluated by the values of Cronbach's  $\alpha$  and composite reliability. Discriminant validity was estimated using heterotrait-monotrait (HTMT) correlation method.

The findings of convergent validity and internal consistency reliability are in Table 3. In Figure 2, all factor loadings are above .70 except EL6, EL9, WE4, PP2. These four items were deleted to improve the AVE values of relevant constructs with less than .50. The AVE values of all the constructs are likewise above .50, indicating the presence of convergent validity. Similarly, both the values of composite reliability and Cronbach's  $\alpha$  exceed the .70 threshold. Thus, internal consistency reliability was confirmed. Lastly, the HTMT values of each construct were found below .85, as shown in Table 4, suggesting that discriminant validity also exists.

## Structural Model Analysis

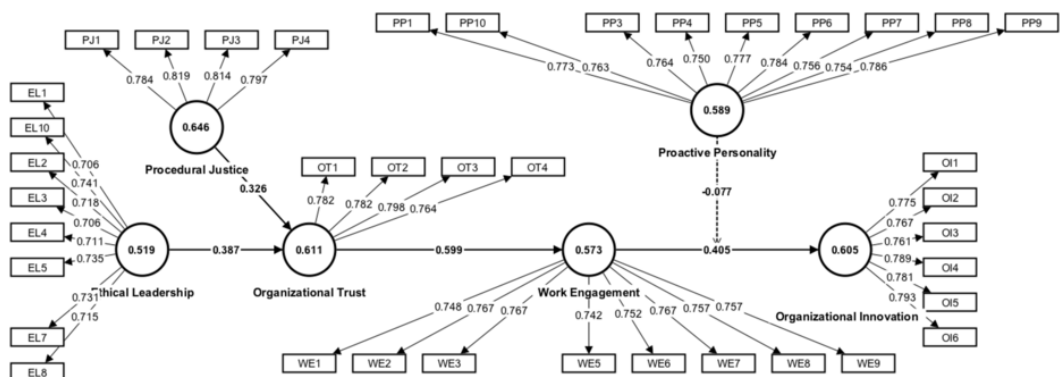
After the measurement model analysis, the structural model analysis should be further conducted to examine the hypotheses and multiple relationships among the latent variables through the bootstrapping process (Hair et al., 2019).

## Hypotheses Testing

The PLS-SEM approach was undertaken with a sub-sample of 5,000 in the bootstrapping process for evaluating hypotheses (Becker et al., 2022; Hair et al., 2022). Figure 3 in the appendix shows the results of the direct relationships. According to the findings in Table 5, procedural justice ( $\beta = .326$ ,  $t = 9.055$ ,  $p < .001$ ) and ethical leadership ( $\beta = .387$ ,  $t = 10.613$ ,  $p < .001$ ) are positively associated with organizational trust. Similarly, organizational trust ( $\beta = .599$ ,  $t = 24.686$ ,  $p < .001$ ) positively relates to work engagement. Finally, work engagement ( $\beta = .683$ ,  $t = 34.134$ ,  $p < .001$ ) has a positive effect on organizational innovation. In addition, the bias-corrected confidence intervals presented in Table 5 validate the statistical significance of all direct hypotheses, as zero is not straddling between lower and upper bounds. Thus, all four hypotheses of direct relationships are confirmed. Moreover, the effect size was measured using the guidelines of Cohen (2013). It evaluates the relative impacts of a particular exogenous construct on an endogenous construct by analyzing the changes in the  $R^2$  coefficient. As a rule of thumb, Cohen (2013) recommended the thresholds of small (.02), moderate (.15), and substantial (.35) levels of effect size. The results indicated that procedural justice and ethical leadership had a small and moderate effect size on organizational trust, respectively, while work engagement had a substantial effect size on organizational innovation.

Likewise, mediation analysis was conducted to test the indirect effects. Table 6 demonstrates that organizational trust positively mediates the relationships of both procedural justice – work engagement

Figure 2. Measurement model assessment



**Table 3. Measurement model assessment: Convergent validity and internal consistency reliability**

Construct	Item	Loading	VIF	Cronbach's Alpha	CR	AVE
Procedural justice	PJ1	0.784	1.624	0.817	0.879	0.646
	PJ2	0.819	1.789			
	PJ3	0.814	1.784			
	PJ4	0.797	1.610			
Ethical leadership	EL1	0.706	1.590	0.868	0.896	0.519
	EL2	0.718	1.609			
	EL3	0.706	1.582			
	EL4	0.711	1.609			
	EL5	0.735	1.719			
	EL7	0.731	1.684			
	EL8	0.715	1.606			
	EL10	0.741	1.693			
Organizational trust	OT1	0.782	1.549	0.787	0.862	0.611
	OT2	0.782	1.580			
	OT3	0.798	1.601			
	OT4	0.764	1.494			
Work engagement	WE1	0.748	1.797	0.894	0.915	0.573
	WE2	0.767	1.902			
	WE3	0.767	1.863			
	WE5	0.742	1.805			
	WE6	0.752	1.831			
	WE7	0.767	1.907			
	WE8	0.757	1.833			
	WE9	0.757	1.840			
Proactive personality	PP1	0.773	2.008	0.913	0.928	0.589
	PP3	0.764	1.960			
	PP4	0.750	1.897			
	PP5	0.777	2.037			
	PP6	0.784	2.052			
	PP7	0.756	1.913			
	PP8	0.754	1.892			
	PP9	0.786	2.100			
	PP10	0.763	1.925			
Organizational innovation	OI1	0.775	1.806	0.869	0.902	0.605
	OI2	0.767	1.760			
	OI3	0.761	1.735			
	OI4	0.789	1.858			
	OI5	0.781	1.831			
	OI6	0.793	1.890			

*Note.* FL = factor loading; VIF = variance inflation factor; CR = composite reliability; AVE = average variance extracted

Table 4. Discriminant validity (HTMT ratio)

Construct	1	2	3	4	5	6
1. Ethical leadership	—					
2. Organizational innovation	0.742	—				
3. Organizational trust	0.700	0.702	—			
4. Proactive personality	0.739	0.771	0.700	—		
5. Procedural justice	0.702	0.726	0.689	0.740	—	
6. Work engagement	0.741	0.773	0.713	0.764	0.753	—

Figure 3. Structural model assessment without interaction effect (Direct relationships)

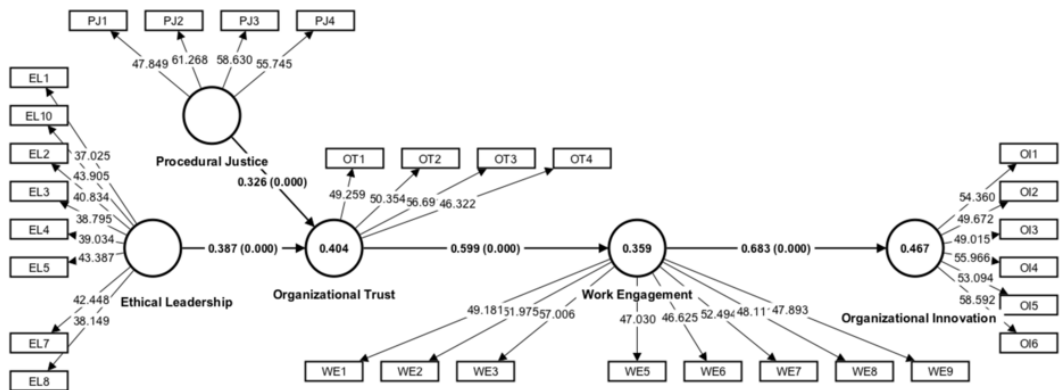


Table 5. Structural model assessment: Hypotheses testing (direct relationships)

Relationships	$\beta$	SE	<i>t</i> -value	95% CI [LL, UL]	$f^2$
Procedural justice → Organizational trust	0.326	0.036	9.055***	[0.264, 0.382]	0.116
Ethical leadership → Organizational trust	0.387	0.036	10.613***	[0.326, 0.443]	0.163
Organizational trust → Work engagement	0.599	0.024	24.686***	[0.558, 0.638]	0.560
Work engagement → Organizational innovation	0.683	0.020	34.134***	[0.649, 0.715]	0.875

Note. \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$  (one-tailed test);  $\beta$  = path coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit.

( $\beta = .195$ ,  $t = 8.170$ ,  $p < .001$ ) and ethical leadership – work engagement ( $\beta = .232$ ,  $t = 9.104$ ,  $p < .001$ ) relationships. Similarly, work engagement acts as a mediator between organizational trust and organizational innovation ( $\beta = .409$ ,  $t = 17.964$ ,  $p < .001$ ). Besides, a casual-chain mediation of organizational trust and work engagement between antecedent variables (procedural justice and ethical leadership) and the outcome variable (organizational innovation) was also proved. The findings reveal that organizational trust and work engagement play positive sequential mediation roles between both the relationships of procedural justice – organizational innovation ( $\beta = .133$ ,  $t = 7.743$ ,  $p < .001$ ) and ethical leadership–organizational innovation ( $\beta = .158$ ,  $t = 8.474$ ,  $p < .001$ ) relationships. Furthermore, the confidence intervals in Table 6 do not contain zero between lower and upper limits, suggesting that all indirect effects are statistically significant.

Table 6. Structural model assessment: hypotheses testing (indirect relationships)

Relationships	$\beta$	SE	<i>t</i> -value	95% CI [LL,UL]	$f^2$
Procedural justice → Organizational trust	0.326	0.036	9.055***	[0.264, 0.382]	0.116
Ethical leadership → Organizational trust	0.387	0.036	10.613***	[0.326, 0.443]	0.163
Organizational trust → Work engagement	0.599	0.024	24.686***	[0.558, 0.638]	0.560
Work engagement → Organizational innovation	0.683	0.020	34.134***	[0.649, 0.715]	0.875

Note. \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$  (one-tailed test);  $\beta$  = Path Coefficient; SE = Standard Error; CI = Confidence Interval; LL = Lower Limit; UL = Upper Limit.

Last, the moderating effect of proactive personality on the relationship between work engagement and organizational innovation was analyzed by a default two-stage approach (Hair et al., 2022). Hair et al. (2022) argued that this approach performs better in revealing the significance of moderating effects. The results of the moderating relationship can be seen in Figure 4 in the Appendix. The results in Table 7 show that proactive personality has a negatively moderating effect on the relationship between work engagement and organizational innovation. The interaction effect was also examined by applying a simple slope analysis. Figure 5 depicts the increasing trend of work engagement – organizational innovation relationships in the presence of proactive personality levels. The dotted line is below the sold line when proactive personality is high, which reflects a negative impact of proactive personality on the relationship between work engagement and organizational innovation. It supports the hypothesized statement of the moderator. A proactive personality weakens the relationship between work engagement and organizational innovation.

### Coefficient of Determination and Predictive Performance

The coefficient of determination ( $R^2$ ) is the most common way to predict the model's explanatory power. The  $R^2$  values of .75, .50, and .25, represent substantial, moderate, and weak explanatory power, respectively (Hair et al., 2019). The  $R^2$  values of organizational innovation (without moderator), work engagement, and organizational trust are .467, .359, and .404, respectively. It suggested that 46.7% of the variance is in organizational innovation. However, the  $R^2$  value of organizational innovation is increased by 10% with a moderator (proactive personality), which achieves a moderate explanatory power. Explanatory power for both organizational trust and work engagement remained unchanged. Apart from that, the predictive performance of the model was tested through a PLS-Predict procedure with the number of ten folds and repetitions' settings

Figure 4. Structural model assessment with interaction effect (moderating relationships)

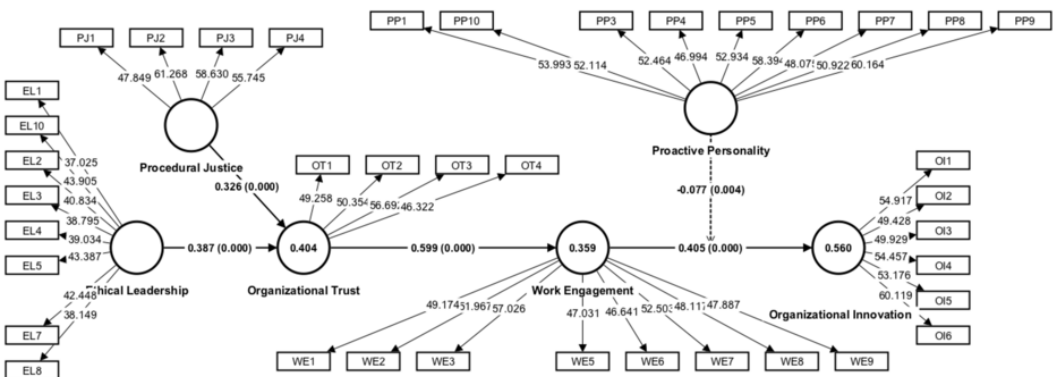
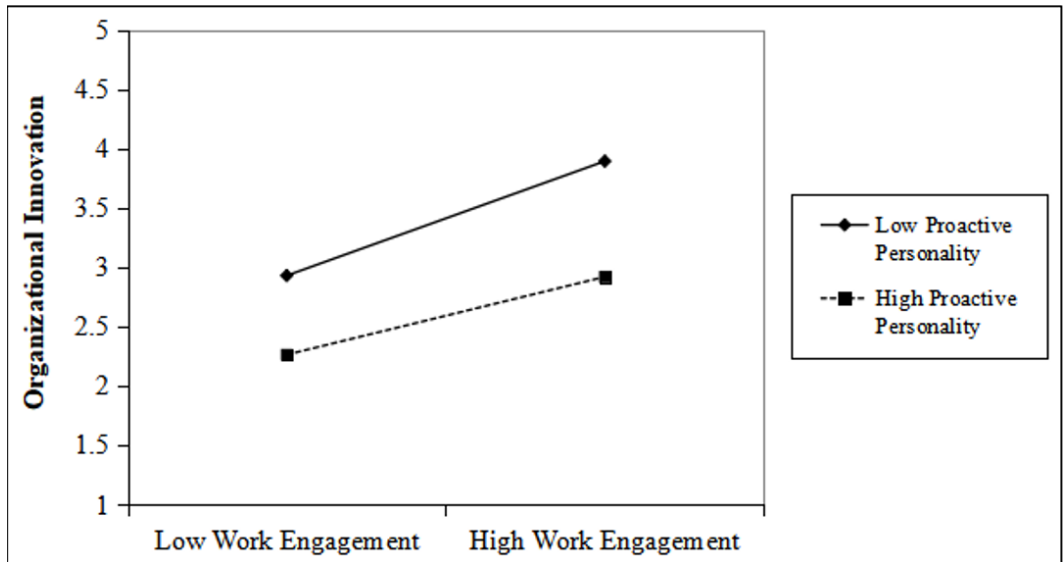


Table 7. Structural model assessment: Hypotheses testing (moderating relationships)

Relationships	$\beta$	SE	t-value	95% CI [LL, UL]
PP * WE $\rightarrow$ Organizational innovation	-0.077	0.029	2.647**	[-0.128, -0.032]

Note. \*\*\*  $p < 0.001$ ; \*\*  $p < 0.01$ ; \*  $p < 0.05$  (one-tailed test);  $\beta$  = path coefficient; SE = standard error; CI = confidence interval; LL = lower limit; UL = upper limit; PP = proactive personality; WE = work engagement.

Figure 5. Moderating effects



(Shmueli et al., 2019). Based on their guidelines, a majority of the errors of the PLS model (RMSE) were lower than the errors given by the linear model (LM). As such, the conclusion is that our model has a medium predictive power, as shown in Table 8.

## DISCUSSION AND CONCLUSION

This section discusses the findings, theoretical, methodological, and practical implications, limitations, and future research. In this study, all seven hypotheses were supported. Procedural justice ( $\beta = .326$ ,  $p < .001$ ,  $f^2 = .116$ ), and ethical leadership ( $\beta = .387$ ,  $p < .001$ ,  $f^2 = .163$ ) have positive impacts

Table 8. PLS-predict

MV	Q <sup>2</sup> predict	PLS-SEM_RMSE	LM_RMSE	PLS-LM_RMSE
OI1	0.287	1.210	1.230	-0.020
OI2	0.284	1.242	1.255	-0.013
OI3	0.288	1.263	1.271	-0.008
OI4	0.312	1.226	1.210	0.016
OI5	0.301	1.246	1.236	0.010
OI6	0.319	1.058	0.959	0.099

on organizational trust, which are consistent with the previous studies by Jiang et al. (2017) and Xu et al. (2016). However, in this study, ethical leadership has more impact on organizational trust. Organizational trust ( $\beta = .599, p < .001, f^2 = .560$ ) is found to be positively related to work engagement at a significant level of .001, which is consistent with the findings of Eluwole et al. (2022). Organizational trust has a mediating effect on the relationship between procedural justice and work engagement at a significant level of .001, which has the same finding as Agarwal (2014) and Sharma and Yadav (2018). The new finding in this study is that organizational trust also has a mediation impact on the relationship between ethical leadership and work engagement. Furthermore, work engagement ( $\beta = .683, p < .001, f^2 = .875$ ) is positively associated with organizational innovation, which is consistent with the previous study by Lin (2010). Procedural justice has a positive influence on organizational innovation through casual-chain mediators (organizational trust and work engagement) in this study ( $\beta = .133, p < .001$ ). Additionally, ethical leadership also has a positive influence on organizational innovation through casual-chain mediators (organizational trust and work engagement) in this study ( $\beta = .158, p < .001$ ). These findings have a novel meaning in ethical leadership and organizational innovation, as this indirect relationship has not been considered and discovered by previous scholars. Last, a proactive personality weakens the relationship between work engagement and organizational innovation ( $\beta = -.121, p < .001$ ). This finding is interesting and demonstrates the positive power of a proactive personality. That indicates when employees have a high level of proactive personality, the external just and ethical environments have less effect on proactive employee participation in organizational innovation.

### Theoretical Implications

Based on the results of the data analysis in this study, both ethical leadership and procedural justice could foster the organizational trust of the employees in Chinese IT companies. Moreover, procedural justice and ethical leadership could predict employees' organizational innovation through the casual-chain mediators (organizational trust and work engagement). These findings provide more careful and dedicated considerations of the organizational innovation promotion process from ethical and fair perspectives. The role of ethical leadership has been extended through indirect relationships and causal-chain mediator integration in this research framework. The interesting findings in this study demonstrate that ethical leadership has more impact on organizational trust and organizational innovation through casual-chain mediators with the higher values of  $\beta$ , which indicates the necessary exploration of ethical leadership in the field of employee organizational innovation promotion.

In addition, a proactive personality weakens the relationship between work engagement and organizational innovation of the technological employees in Chinese IT companies. This finding reacts to the positive effects of a proactive personality, such as actively seeking opportunities, exploring improvement, and being persistent for meaningful changes (Crant, 2000). As employees with proactive personalities are usually less constrained by the external environment or convictions, more dynamic and innovative work behavior could come out automatically (Zhang et al., 2012). Therefore, a proactive personality weakens the effect of employee work engagement on organizational innovation in this research framework. SET, SDT, and RAT provide solid theoretical backgrounds for this research model. Through SET, the roles of organizational fair and ethical commitments in increasing employee organizational trust and work engagement as reciprocity could be well understood and supported. SET has been extended for organizational trust and work engagement generation as implicit employee obligations and repayment under the high exchange with the organizational and supervisory commitments. Reformulation of attitude theory is identified as the underpinning theory in the current research, which depicts a comprehensive process of desired employee behavior generation and achievement (organizational innovation) in a sequence. Last, SDT offers the theoretical implications that the proactive personality as a stable characteristic could lead to intrinsic motivation, which external working situations would have less influence.



However, most scholars choose to explain the relationship between organizational factors and desired employee behavior by a specific theory and neglect the integrated analysis of individual, group, and organizational factors together. SDT, SET, and RAT theories identified in this research framework provide an entry point for probing the iterations of organizational, group, and individual motivational factors with positive individual work behavior achievement (organizational innovation participation). Additionally, less research has been done on combining and integrating these theories into a specific population and context (technical personnel in the Chinese IT industry). In this study, SET, SDT, and RAT are recognized together to explain that when employees feel that their organizations and supervisors have made commitments, they generate intrinsic motivation and positive emotional responses for further expected work behavior.

### **Methodological Implications**

To minimize the errors of common method variance (CMV), this study strictly adheres to the procedural remedy of collecting data at two points in time, as suggested by Podsakoff et al. (2003). The responses of independent variables, and mediators were collected in the first stage, while the answers for the moderator and dependent variable were collected at the second point. Therefore, the nature of relationships between the constructs and indicators is reflective. With this, this research paper strictly follows the rules of the reflective constructs and the first-order data analysis procedures proposed by Hair et al. (2019) and Hair et al. (2022). Moreover, judgment sampling, back-to-back translation, pre-test, and some item adjustments after the pre-test are customized in the research design process. This paper gains methodological contributions from the suitable data collection method, data analysis procedures, and research design.

### **Practical Implications**

Innovation capability significantly affects long-term organizational development (Tripathi & Dhir, 2022). According to Hu (2022), talent retention has become vital for IT companies to deal with the rapid changes and globalization in the world. It is said that the success of IT companies relies heavily on the talented and skilled workforce (Sanyal & Biswas, 2014). Hereby, human capital is an important asset for IT companies. Sanyal and Biswas (2014) showed that performance-related pay is one of the most unsatisfactory elements for employees in the Chinese IT industry compared with other industries between 2013 and 2016. This indicates the important correlation between the fairness of the salary system and employee work attitude. Organizations should ensure procedural justice to stimulate employees to gain fair and ethical perceptions. Procedural justice must be addressed to prompt the employees to gain organizational trust and high work engagement.

Furthermore, it is stated that ethical leadership involves the ethical example set and two-way communication, which offers the employees more opportunities to speak up the new ideas (Martin et al., 2021). This research has explored the necessity of ethical leadership in inducing the organizational trust and work engagement of technology employees in the IT industry. It is argued that the important reason for employee self-development lies in the organizational cultures of involvement, empowerment, and participation as a sustainable competitive advantage. Hence, a proactive personality is a positive trait and characteristic of employees. It motivates employees to put more effort into organizational innovation commitments with fewer external environmental constraints (Jiang & Gu, 2015). It demonstrates that organizational trust as a positive emotion plays an important role in employee creativity cultivation (Jo & Lee, 2012). By increasing organizational trust, employee work engagement could be strengthened, leading to more employee organizational innovation. Work engagement as a positive job status reflects employee vigor and dedication to the work even when the workload is intense (Schaufeli et al., 2006). This study gives practical implications for employee participation in organizational innovation through high work engagement prompts. Predictive factors for individual innovative behavior have been proved in this research after data analysis, procedural justice and ethical leadership adoptions from organizational and group levels. Therefore, Chinese IT companies

should pay special attention to the crucial links between these two predictive factors and employee organizational trust cultivation.

### **Limitations and Future Research**

The study has a few limitations that may inevitably impact the generalization and reliability of the research findings. The first limitation is that the study uses a cross-sectional approach, which means that the data was collected at a single point in time. This can make it difficult to track changes in variables over time. Therefore, future research could benefit from longitudinal research design to examine how organizational innovation facilitation changes over time. In China, the population and national territorial area are enormous. Hereby, it is only possible to reach some IT SMEs because of time constraints, financial constraints, and uncontrollable factors. However, through a suitable research design, the research bias has been minimized. The bias still inevitably exists during the data collection and in respondents' answers. In addition, the generalization of the study could be extended by exploring other types of IT companies, industries, and job positions in the future. This study may overlook the unique operational realities of individual SMEs. Individual Chinese SMEs must integrate their operational realities into the current research implications.

### **DECLARATION OF CONFLICTING INTERESTS**

The authors declare that they have no known conflicting financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## APPENDIX

### QUESTIONNAIRE

Please tick (✓) the Appropriate Answer

1. Gender
  - a. Male
  - b. Female
2. Age
  - a. 30 years old and below
  - b. 31–40 years old
  - c. 41–50 years old
  - d. 51 years old and above
3. Job experience (at this company)
  - a. 4 years and below
  - b. 5–9 years
  - c. 10–14 years
  - d. 15 years and above
4. Education
  - a. Junior college
  - b. Bachelor's degree
  - c. Master's degree
  - d. PhD

### Constructs (Please Rate Based on a Five-Point Likert Scale)

#### Ethical Leadership

1. My leader listens to what employees have to say.
2. My leader disciplines employees who violate ethical standards.
3. My leader conducts his/her personal life in an ethical manner.
4. My leader has the best interests of employees in mind.
5. My leader makes fair and balanced decisions.
6. My leader can be trusted.
7. My leader discusses business ethics or values with employees.
8. My leader sets an example of how to do things the right way in terms of ethics.
9. My leader judges success not just by results but also the way that they are obtained
10. When making decisions, my leader asks, "What is the right thing to do?"

#### Procedural Justice

1. Procedures applied for my evaluation are fair and consistent.
2. Procedures applied for my promotion are fair and consistent.
3. My company's work evaluation is conducted according to accurate information.
4. Procedures applied for my personnel reshuffle and allocation are fair and consistent.

### Organizational Trust

1. My employer is open and upfront with me.
2. I believe my employer has high integrity.
3. In general, I believe my employer's motivations and intentions are good.
4. I can expect my employer to treat me in a consistent and predictable fashion.

### Work Engagement

1. At my work, I feel as though I have a lot of energy.
2. At my job, I feel strong and vigorous.
3. I am enthusiastic about my job.
4. My job inspires me.
5. When I get up in the morning, I feel like going to work.
6. I feel happy when I am working intensely.
7. I am proud of the work that I do.
8. I am immersed in my work.
9. I get carried away when I'm working.

### Proactive Personality

1. I am constantly looking for new ways to improve my life.
2. If I see something I don't like it, I fix it.
3. I hope to solve problems that will cause other troubles.
4. I am constantly looking for new methods for work improvement.
5. I am constantly learning new knowledge to improve my work.
6. I am always seeking for new opportunity for career development.
7. I am not afraid of challenges at work.
8. I have a high level of work initiatives.
9. I am not afraid of changes at work.
10. I persist to take actions for meaningful changes.

### Organizational Innovation

1. We renew the organization structure to facilitate the job activities.
2. We renew the communication structures to facilitate coordination between different functions.
3. We renew the processes used to execute job activities.
4. We implement improvements in managing the job.
5. We renew practices used to improve job.
6. We implement new practices to make sure effective completion of job activities.

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