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# The Effect of Change Management on Organizational Innovation and Performance through the Mediating Role of Employee Innovative Behavior in the Digital Age

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## Abstract

**Purpose**: This study aimed to investigate the impact of change management on organizational innovation and performance, examining the mediating role of employees' innovative behavior in the context of the digital age.

**Method**: This research was applied in purpose and utilized a survey method for data collection. The statistical population consisted of managers and employees of Science and Technology Parks (STPs) across the country. The sample size (n=210) was determined using the standard technique for structural equation modeling (SEM), which recommends 10 to 15 observations per questionnaire item. After confirming the validity and

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reliability of the measurement tool, the data were analyzed using SmartPLS software.

**Findings**: The findings demonstrated that change management exerts a significant positive effect on organizational performance, organizational innovation, and employees' innovative behavior. Furthermore, employees' innovative behavior was found to significantly enhance both organizational innovation and performance, while organizational innovation itself had a positive impact on performance. Mediation analysis confirmed that the relationships between change management and organizational performance are partially mediated through two pathways: directly through employees' innovative behavior and indirectly via the sequential influence on organizational innovation.

**Conclusion**: The study concludes that in the digital age, implementing effective change management practices is crucial. Such practices foster innovative behaviors among employees, which subsequently promote organizational innovation and, ultimately, lead to improved overall organizational performance.

**Keywords**: Change Management, Organizational Performance, Organizational Innovation, Employees' Innovative Behavior, Digital Age

## Introduction

In the rapidly evolving business landscape of the Fourth Industrial Revolution (4IR), organizations confront unprecedented challenges and opportunities. The convergence of physical, digital, and biological systems has fundamentally altered competitive dynamics, rendering adaptability and innovation critical for survival (Kim, 2016; Wanner, 2013). Within this context, effective change management has emerged as a pivotal capability for organizations to navigate disruptions and sustain high performance. As Klaus Schwab, founder of the World Economic Forum, emphasized, 4IR represents an "unstoppable shift towards a highly complex form," marked by a fusion of technologies that distinguishes it from the purely digital focus of the previous industrial era (Kim, 2016). This new paradigm is best characterized as a VUCA environment—one defined by Volatility, Uncertainty, Complexity, and Ambiguity—demanding more profound and adaptive responses from organizations than ever before (Kim, 2018). Failure to adapt to these conditions risks obsolescence, prompting contemporary organizations to embrace innovation as a core strategic response.

Both private and public sector entities are leveraging technologies such as big data, artificial intelligence, the Internet of Things, and blockchain to drive innovation and enhance performance. However, organizational change initiatives often encounter resistance from employees due to factors such as distrust, fear of obsolescence, or perceived threats to established values and routines (Sung & Kim, 2021). Effective change management is therefore essential to overcome such barriers and foster a culture conducive to innovation. While rapid environmental change presents a crisis for ill-prepared organizations, it offers a strategic opportunity for those that can cultivate adaptive and innovative behaviors among their members (Chang et al., 2011).

Employee innovative behavior is widely recognized as a cornerstone of organizational adaptability. It encompasses the introduction and application of new ideas, processes, or improvements that enhance performance (West & Farr, 1990). Such behavior involves not only generating novel solutions but also implementing them effectively within the organizational context (Kanter, 1988; Amabile, 1998). In essence, it translates creative potential into tangible value, optimizing workflows and strengthening overall efficacy (Kim & Kang, 2019). This individual-level innovation is a critical precursor to broader organizational innovation, which entails a purposeful transformation toward a more effective state

through the adoption of new ideas, technologies, or processes (Lee & Lee, 2014).

Ultimately, the pursuit of innovation is directed toward improving organizational performance. Performance extends beyond financial metrics—such as profit and market share—to include the effective utilization of resources and the achievement of strategic objectives (Krishnan & Park, 2018). For organizations operating in knowledge-intensive sectors, such as Science and Technology Parks (STPs), the ability to manage change and stimulate innovation is particularly vital. STPs serve as crucial intermediaries in the technology-based economy, fostering entrepreneurship, supporting SMEs, and facilitating technology transfer. Inefficiencies in change management or a lack of innovative capacity can undermine their role and impair national economic development.

Despite global investments in digital transformation, many organizations struggle to convert change initiatives into sustained performance improvements (Van der Voet, 2016). This gap underscores the need to better understand the mechanisms through which change management influences outcomes—particularly through the mediating role of employee innovative behavior. Within the Iranian context, empirical research on this relationship remains limited. This study therefore addresses the following question: How does change management influence organizational innovation and performance through the mediating role of employees' innovative behavior in STPs during the digital age?

**Research main hypothesis:**

Change management affects organizational innovation and performance with the mediating role of employees' innovative behavior.

**Research sub-hypotheses:**

**H1:** Change management affects organizational performance.
**H2:** Change management affects organizational innovation.
**H3:** Change management affects employees' innovative behavior.
**H4:** Employee innovative behavior affects organizational innovation.
**H5:** Employee innovative behavior affects organizational performance.
**H6:** Organizational innovation affects organizational performance.
**H7:** Change management affects organizational performance through the mediating role of employees' innovative behavior.
**H8:** Change management affects organizational innovation through the

mediating role of employees' innovative behavior.
**H9:** Change management affects organizational performance through the mediating role of organizational innovation.

## Research Theoretical Framework

### Change Management

Organizational change entails a transition from a current state to a desired future state to enhance performance, impacting key assets including personnel, systems, processes, and structure. This transformation necessitates a structured change management plan to guide and monitor the process effectively (Van der Voet, 2016). Leadership commitment from board members, CEOs, and stakeholders is critical to steering this process (Reeves, 2019). Theoretical frameworks, such as Bullock and Batten's four-stage model (exploration, planning, action, and integration), provide a structured approach to implementation. Change initiatives are typically guided by one of two primary approaches: the rational-strategic approach, which involves deliberate planning and execution, or the evolutionary approach, which acknowledges inherent organizational resistance (Reeves, 2019). Leaders play a pivotal role by modeling desired behaviors, applying principles from social learning theory to guide employees from initial resistance—often characterized by negative emotional reactions—toward eventual acceptance. This transition requires consistent support and clear communication regarding the benefits of the change (Kranabetter & Niessen, 2017). Established models, such as Kotter's eight-step process, further emphasize creating a sense of urgency, building a guiding coalition, developing a clear vision, empowering broad-based action, and anchoring new approaches in the organizational culture (Coombs, 2018).

### Employee Innovative Behavior

The study of innovative work behavior (IWB) has gained prominence over the past four decades as organizations have transitioned from rigid, bureaucratic structures to more fluid and team-oriented models. IWB encompasses a multi-stage process involving the generation, promotion, and implementation of novel ideas beneficial to the organization (Scott & Bruce, 1994). This process begins with idea generation (creativity), advances to championing and seeking support for these ideas, and culminates in their practical application (Carnevale et al., 2017). As a proactive and often voluntary extra-role behavior, IWB is intrinsically

motivated and cannot be coerced. Several models delineate its stages. Drucker (1985), for instance, identified a sequence of problem identification, coalition building, prototyping, and standardization. Other scholarly traditions, such as the "Harvard School," treat creativity and innovation synonymously, outlining stages from problem comprehension to idea validation. The "Innovative Behavior Research School" emphasizes interaction with the organizational environment, including stages from opportunity recognition to the implementation of solutions (Carnevale et al., 2017). Research by Yuan and Woodman (2015) suggests that IWB is influenced by employees' expectations regarding potential performance and image outcomes, which are themselves shaped by individual and contextual factors. Ultimately, the adoption and application of new ideas by employees are vital for building the knowledge base necessary for organizational competitiveness and success, making it essential to identify facilitating factors such as supportive leadership and a climate open to change (Tseng et al., 2015).

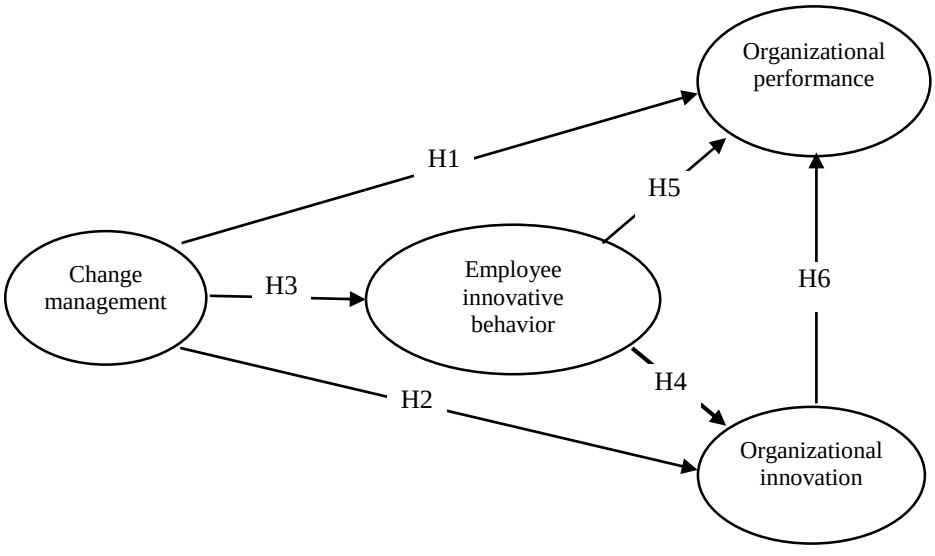
**Organizational Innovation**

Organizational innovation refers to the generation or adoption of novel ideas or behaviors at the firm level, distinguishing it from individual (micro) or industry-wide (macro) innovations. It is a critical mechanism for organizational adaptation and renewal (Brorström, 2015). A closely related concept is workplace innovation (WI), which involves the integrated implementation of new interventions in work organization, human resource practices, and supportive technologies. This broader view of non-technological innovation can include dynamic management practices, new marketing strategies, and external collaborations. WI effectively bridges strategic knowledge from leadership with the tacit knowledge of frontline employees, engaging stakeholders through both top-down and bottom-up processes. Its long-term success depends on fostering a self-sustaining cycle of development through continuous learning, hybrid models, and experimentation (Armbruster et al., 2017). In essence, organizational innovation reflects an entity's capacity and willingness to develop and successfully bring new or significantly improved offerings to market, enabling it to respond to competitive, technological, and market shifts (Adams, 2017).

**Organizational Performance**

Organizational performance originates from the voluntary combination of

productive assets—human, physical, and capital—to achieve common objectives. The core of this concept is value creation, as defined by the providers of these resources, which is indispensable for an organization's sustained existence (Adams, 2017). Performance is evaluated by comparing actual outcomes against intended goals, a process heavily reliant on employee efficiency, which is in turn influenced by leadership effectiveness (Mastrangelo et al., 2014). Leadership competence, often gauged by organizational outcomes, encompasses personal qualities such as values, ethics, and creativity, as well as practical skills in mentoring, motivation, and communication (Bryman, 2019). Given that employee performance is fundamental to organizational success, human resource leaders, with executive support, are crucial in developing the workforce. Traditional performance measurement has predominantly relied on financial metrics like return on assets and sales, alongside market-based indicators that incorporate investor perspectives and risk assessments. An effective performance management system should ultimately lead to improved financial results by creating a clear linkage between operational activities and strategic objectives (Chandrasekar, 2018). The research model proposed by Sung and Kim (2021) illustrates the hypothesized relationships between the independent, mediating, and dependent variables examined in this study.



## Literature Review

The interrelationships between change management, employees' innovative behavior, organizational innovation, and performance can be understood through several theoretical lenses, including organizational change theory, innovation diffusion theory, and the resource-based view. Organizational change theory underscores the necessity of a structured approach to transition an organization from its current state to a desired future state. Innovation diffusion theory elucidates the process by which new ideas are adopted and spread within an organization. Meanwhile, the resource-based view posits that employees' innovative behavior constitutes a valuable, strategic capability that can foster innovation and enhance performance.

Empirical research provides support for these theoretical connections. Pourkarimi et al. (2020) examined the mediating effect of organizational creativity on the relationship between transformational leadership and organizational innovation. Their analysis, conducted using SPSS and LISREL, revealed that the status of all three variables exceeded the hypothetical average. The findings demonstrated positive and significant correlations between transformational leadership, organizational creativity, and organizational innovation, and confirmed the mediating role of organizational creativity in this relationship.

In the context of Iranian sports federations, Alimoradian and Abbasi (2020) developed a model for employees' innovative behavior, identifying seven key components: organizational capacity for innovative behavior, strategy, limitations, participation in organizational innovation, individual needs, ideation, and benefits. The study suggested that by focusing on these dimensions, particularly organizational capacity, innovative behavior can become a practical foundation for success and effectiveness within these federations.

Further evidence comes from Dehghani Soltani et al. (2020), who investigated the effect of innovative behavior on organizational performance in Tehran's hotel industry, considering the roles of intellectual capital, opportunism, and competitive advantage. Using structural equation modeling (SEM) with PLS software, their results indicated that innovative behavior significantly affected various dimensions of intellectual capital (human, customer, organizational). The study also found that opportunism and competitive advantage influenced organizational performance, and confirmed the moderating role of organizational and customer capital on the relationship between innovative

behavior and human capital.

The critical role of change management itself is highlighted in several studies. Yousefirad (2019) argued that for organizations to thrive in a dynamic environment, they must adeptly manage change, which inherently affects knowledge, attitudes, and behaviors, thereby influencing overall performance. The study concluded that institutional, organization-wide change is indispensable for vitality in a competitive landscape.

Focusing on the mechanism of impact, Sung and Kim (2021) found that change management factors positively affected both innovative behavior and organizational innovation, with employees' innovative behavior serving as a significant mediator. Their research emphasized that participation and communication were particularly influential change management factors. Supporting this, Sujová and Simanová (2021) observed that wood processing companies implementing comprehensive transformational changes, especially in management systems and practices, achieved higher performance levels, often motivated by shifting customer needs and competitive pressures.

Finally, Osoro (2020) reinforced the importance of leadership and culture within change management, identifying a significant relationship between leadership style, organizational culture, and performance. The study concluded that effective leadership is vital for setting vision, clarifying goals, and coordinating activities to achieve efficient outcomes, while a strong organizational culture facilitates adaptation and internal integration.

## Method

This study is applied in purpose, aiming to investigate the effect of change management on organizational innovation and performance, mediated by employees' innovative behavior, within Iranian Science and Technology Parks (STPs).

The research population consisted of managers and employees from STPs across Iran. The sample size was determined using the standard guideline for Structural Equation Modeling (SEM), which recommends a size between 5 to 15 times the number of questionnaire items. A combination of stratified and convenience sampling methods was employed for participant selection. The final sample included 210 respondents, representing ten times the number of items in the measurement instrument.

Data were collected through a two-pronged approach: a library study

for the theoretical framework and a field study using a questionnaire as the primary data collection tool. The reliability of the questionnaire was confirmed using Cronbach's alpha. As presented in Table 2, all constructs demonstrated strong internal consistency, with alpha coefficients exceeding the accepted threshold of 0.7. For data analysis, the study utilized SPSS software for preliminary analyses and SmartPLS software to conduct the Structural Equation Modeling and test the research hypotheses.

## Findings

This section employed a Structural Equation Modeling (SEM) approach to test the research hypotheses. To assess the validity of the measurement model, Confirmatory Factor Analysis (CFA) was utilized, which is appropriate for variables composed of multiple dimensions. Prior to conducting the CFA, the suitability of the data for this analysis was evaluated using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's Test of Sphericity. Data are considered adequate for CFA when the KMO statistic exceeds 0.6 and Bartlett's test yields a significance level of less than 0.05.

As shown in Table 1, the results confirm the data's suitability: the KMO measure was 0.840, well above the acceptable threshold, indicating a sufficient sample size for the analysis. Furthermore, Bartlett's test was statistically significant ($p < 0.05$), confirming that the correlations between items are adequate for factor analysis. These results collectively justify proceeding with the CFA.

**Table 1. KMO and Bartlett's tests for the questionnaire items**

| | | |
|---|---|---|
| **KMO test** | | 0.840 |
| **$\chi 2$** | **Bartlett's test** | 469 |
| **Degree of freedom** | | 210 |
| **Sig.** | | 0.001 |

The CFA results of questionnaire items are presented in Table 2. This study used factor loadings, composite reliability (CR) test, average variance extracted (AVE), and the square root of AVE with the correlation of latent constructs test to measure the model. CR and AVE tests were evaluated to obtain convergent validity and correlation level. As shown in Table 2, the factor loading for each item is not less than 0.5. Therefore, no item is excluded from the analysis.

**Table 2. Values for factor loadings, significance statistic, Cronbach's alpha, CR, and AVE**

| Construct | Item | Factor loading | Sig. | Cronbach's alpha | CR | AVE |
|---|---|---|---|---|---|---|
| Change management | Q01 | 0.616 | 11.801 | 0.881 | 0.907 | 0.555 |
| | Q02 | 0.829 | 33.937 | | | |
| | Q03 | 0.843 | 25.080 | | | |
| | Q04 | 0.614 | 9.774 | | | |
| | Q05 | 0.654 | 15.628 | | | |
| | Q06 | 0.679 | 14.433 | | | |
| | Q07 | 0.897 | 60.687 | | | |
| | Q08 | 0.772 | 19.622 | | | |
| Employee innovative behavior | Q09 | 0.787 | 17.273 | 0.870 | 0.920 | 0.795 |
| | Q10 | 0.949 | 115.002 | | | |
| | Q11 | 0.929 | 87 | | | |
| Organizational innovation | Q12 | 0.823 | 23.735 | 0.875 | 0.924 | 0.802 |
| | Q13 | 0.950 | 148.115 | | | |
| | Q14 | 0.909 | 77.253 | | | |
| Organizational performance | Q15 | 0.747 | 24.438 | 0.906 | 0.927 | 0.650 |
| | Q16 | 0.800 | 22.851 | | | |
| | Q17 | 0.936 | 86.344 | | | |
| | Q18 | 0.908 | 57.354 | | | |
| | Q19 | 0.901 | 54.357 | | | |
| | Q20 | 0.722 | 17.914 | | | |
| | Q21 | 0.565 | 9.214 | | | |

As shown in Table 2, Cronbach's alpha for all constructs is above 0.7, which indicates high convergent validity. The constructs (latent variables) have high reliability for model fit. CR values for all constructs are higher than 0.7, indicating that the constructs have good CRs. In addition, according to Table 2, all the above three conditions are met. As a result, the questionnaire has convergent validity. If the square root of AVE for a construct is more significant than the correlation between that construct and other constructs, that construct has discriminant validity. As Table 3 shows, the numbers on the main diagonal represent the square roots of AVE. The square root of AVE for each construct is more significant than the correlation between that construct and other constructs. Therefore, the questionnaire's discriminant validity is approved.

**Table 3. AVE and correlation between constructs**

| Row | Construct | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1 | Employee innovative behavior | 0.891 | | | |
| 2 | Organizational performance | 0.527 | 0.806 | | |
| 3 | Change management | 0.252 | 0.440 | 0.745 | |
| 4 | Organizational innovation | 0.500 | 0.696 | 0.428 | 0.896 |

After testing the measurement model, it is time to conduct the SEM test. Fig. 2 illustrates the graphical output of the research model.

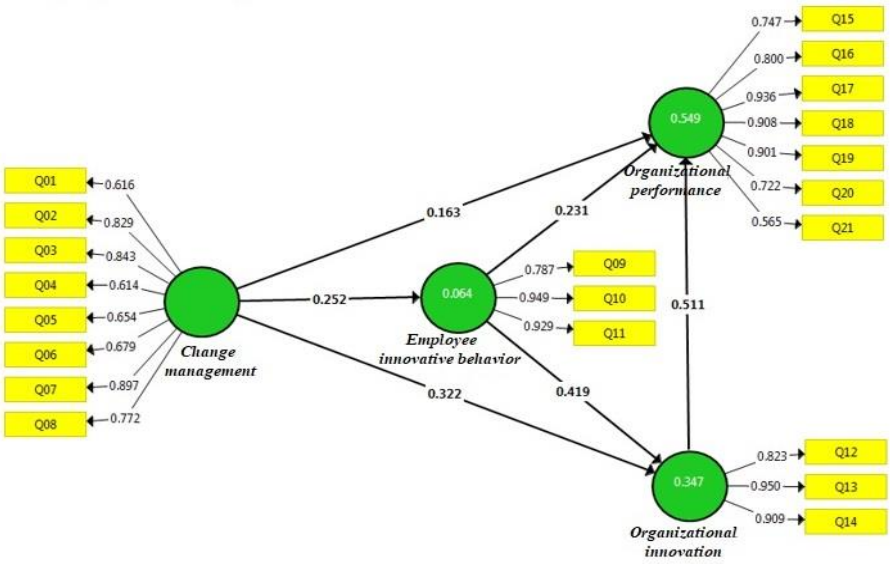



**Figure 2. Standard path coefficients of the conceptual research model**

The numbers written on the paths represent the path coefficients. Student's t-test values were calculated using the bootstrapping method to test the significance level of path coefficients. If the Student's t-test values are higher than 1.96, the path coefficient is significant at 0.05.

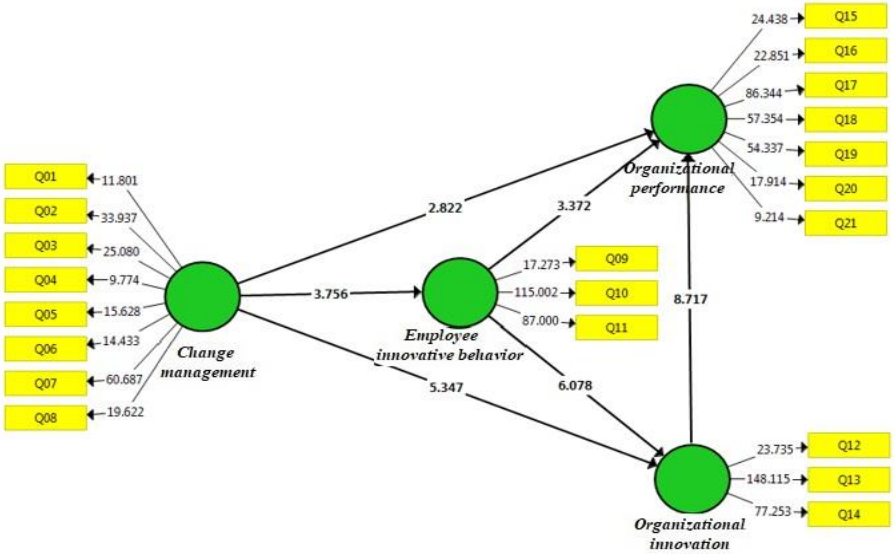



**Figure 3. Student's t-test results to verify the significance of path coefficients**

The coefficient of determination ($R^2$) is related to the model's endogenous latent (dependent) variables. $R^2$ is a measure that indicates the effect of an exogenous variable on an endogenous variable. 0.19, 0.33, and 0.67 are three criterion values for the weak, medium, and strong values of $R^2$. The $R^2$ values in Table 4 almost confirm that the SEM is a good fit.

**Table 4. $R^2$ values for research constructs**

| Row | Construct | R2 |
|---|---|---|
| 1 | Employee innovative behavior | 0.064 |
| 2 | Organizational performance | 0.549 |
| 3 | Organizational innovation | 0.347 |

$Q^2$ criterion determines the model's predictive power. If $Q^2$ for an endogenous construct has three values of 0.02, 0.15, and 0.35, indicating the weak, medium, and strong predictive power of the construct or related exogenous constructs, respectively. The $Q^2$ values listed in Table 5 show the good predictive power of the model regarding endogenous constructs and confirm that the SEM has a good fit.

**Table 5. $Q^2$ values for research constructs**

| Row | Construct | Q2 |
|---|---|---|
| 1 | Employee innovative behavior | 0.145 |
| 2 | Organizational performance | 0.331 |
| 3 | Organizational innovation | 0.265 |

The goodness of fit (GoF) is another index to measure the fit. GoF also works like LISREL model fit indices and is between 0 and 1, with values close to 1 indicating good model fit. It is noteworthy that GoF, like chi-square indices in LISREL models, does not assess the theoretical model's fit using the collected data but assesses the model's overall predictive ability and whether the tested model was successful in predicting endogenous latent constructs. Table 6 shows that the average of communalities is 0.504, and the average $R^2$ ($\overline{R^2}$) is 0.320. According to the formula, the GoF criterion equals 0.412, which is greater than the criterion value (0.3) and indicates the model's good predictive power in predicting the endogenous latent construct.

**Table 6. Results of overall model fit based on GOF criterion**

| $\overline{R^2}$ | $\overline{communalities}$ | $GoF = \sqrt{\overline{communalities} * \overline{R^2}}$ |
|---|---|---|
| 0.320 | 0.504 | 0.412 |

The software output was used to test the hypotheses and the significance of the path coefficients between the constructs. Table 7 shows the path coefficients and their significance level results.

**Table 7. SEM assessment results for testing the research hypotheses**

| Row | Path | Path coefficient (β) | Significance number (t-value) | Test result |
|---|---|---|---|---|
| 1 | Change management → Organizational performance | 0.163 | 2.822 | Supported |
| 2 | Change management → Organizational innovation | 0.322 | 5.347 | Supported |
| 3 | Change management → | 0.252 | 3.756 | Supported |

| | | | | |
|---|---|---|---|---|
| | Employee innovative behavior | | | |
| 4 | Employee innovative behavior → Organizational innovation | 0.419 | 6.078 | Supported |
| 5 | Employee innovative behavior → Organizational performance | 0.231 | 3.372 | Supported |
| 6 | Organizational innovation → Organizational performance | 0.511 | 8.717 | Supported |

Then, we explain and test the research hypotheses according to the output of the conceptual model.

**H1. Change management affects organizational performance**
The results support this hypothesis. As indicated in Table 7, the t-statistic for the path between change management and organizational performance is 2.822, which exceeds the critical value of 1.96 at a 95% confidence level. The path coefficient of 0.163 signifies a positive and direct effect, meaning that a one-unit increase in change management leads to a 0.163-unit increase in organizational performance. Therefore, H1 is supported.

**H2. Change management affects organizational innovation**
This hypothesis is confirmed. The t-statistic of 5.347 ($p < 0.05$) and the path coefficient of 0.322, as shown in Table 7, indicate a significant and positive relationship. Thus, an improvement in change management practices directly enhances organizational innovation. H2 is supported.

**H3. Change management affects employees' innovative behavior**
The analysis supports H3. The relationship is statistically significant ($t = 3.756$, $p < 0.05$) with a path coefficient of 0.252. This demonstrates that effective change management directly and positively influences employees' propensity for innovative behavior.

**H4. Employee innovative behavior affects organizational innovation**
A strong, significant relationship was found. With a t-statistic of 6.078 and a path coefficient of 0.419, the results confirm that employees' innovative behavior is a substantial driver of organizational innovation. H4 is therefore supported.

**H5. Employee innovative behavior affects organizational performance**

The hypothesis is supported. The path is significant ($t = 3.372$, $p < 0.05$) and the coefficient of 0.231 indicates a positive direct effect of employees' innovative behavior on organizational performance.

**H6. Organizational innovation affects organizational performance**

This hypothesis is strongly supported. The path coefficient is 0.511, which is the highest among the direct effects, and it is highly significant ($t = 8.717$, $p < 0.05$), underscoring the critical role of innovation in achieving performance outcomes.

**H7. Change management affects organizational performance through the mediating role of employees' innovative behavior**

The bootstrapping procedure was used to test this mediating effect. As presented in Table 8, the results show a significant indirect path. The p-value for the indirect effect is 0.008 ($p < 0.05$), and the confidence interval does not include zero. This confirms that employees' innovative behavior serves as a partial mediator in the relationship between change management and organizational performance. Thus, H7 is supported.

**Table 8. The bootstrap results to verify the significance of the indirect effect**

| Path | | | t-statistic | Sig. | Est. error | Est. error / Bootstrap value | | Indirect effect |
|---|---|---|---|---|---|---|---|---|
| Dependent variable | Mediating variable | Independent variable | | | | Lower limit | Upper bound | |
| Organizational performance | Innovative behavior | Change management | 2.643 | 0.008 | 0.022 | 0.022 | 0.104 | 0.058 |

**H8. Change management affects organizational innovation through the mediating role of employees' innovative behavior.**

The bootstrapping results confirm a significant mediating effect. As shown in Table 9, the significance level for the indirect path is 0.008 ($p < 0.05$), and the confidence interval does not include zero. Therefore, the hypothesis is supported, indicating that change management positively affects organizational innovation through the mediating role of employees' innovative behavior.

**Table 9. The bootstrap results to verify the significance of the indirect effect**

| Path | | | t-statistic | Sig. | Est. error | Est. error | Bootstrap value | Indirect effect |
|---|---|---|---|---|---|---|---|---|
| Dependent variable | Mediating variable | Independent variable | | | | Lower limit | Upper bound | |
| Organizational performance | Innovative behavior | Change management | 2.664 | 0.008 | 0.020 | 0.025 | 0.099 | 0.054 |

**H9. Change management affects organizational performance through the mediating role of organizational innovation**

The results of the mediation analysis, presented in Table 10, indicate a statistically significant indirect effect. The significance level of 0.001 ($p < 0.05$) and a confidence interval that excludes zero confirm that organizational innovation serves as a significant mediator. Therefore, the hypothesis is supported, demonstrating that change management enhances organizational performance through the mediating mechanism of organizational innovation.

**Table 10. The bootstrap results to verify the significance of the indirect effect**

| Path | | | t-statistic | Sig. | Est. error | Est. error | Bootstrap value | Indirect effect |
|---|---|---|---|---|---|---|---|---|
| Dependent variable | Mediating variable | Independent variable | | | | Lower limit | Upper bound | |
| Organizational performance | Innovative behavior | Change management | 4.713 | 0.001 | 0.035 | 0.096 | 0.235 | 0.165 |

## Conclusion

This study investigated the effect of change management on organizational innovation and performance through the mediating role of employees' innovative behavior in Iranian Science and Technology Parks (STPs). The results obtained from testing the research hypotheses are presented below.

Hypothesis 1. The analysis of data collected from the statistical sample indicated that change management has a direct and significant effect on the organizational performance of STPs. The statistical analysis demonstrated that for each unit of increase in change management, organizational performance increases by 16.3%. The findings suggest that STPs can assume a more influential role within the innovation and technology ecosystem and enhance their performance when employees are fully aware of organizational goals and understand their respective priorities. Given that changes are typically implemented according to a predetermined plan, it is recommended that STP management clearly communicate

organizational goals to employees and detail the methods for achieving them. Developing an organizational roadmap can effectively facilitate this process. Furthermore, after defining the primary goals, management should prioritize them and explain to employees that these priorities may shift according to varying circumstances to ensure mental preparedness.

Hypothesis 2. The path analysis model and t-statistic indicated that change management affects and strengthens organizational innovation, with a path coefficient of 32.2%. The results suggest that when management possesses a clear vision for the future and establishes transparent horizons for employees, the pace of employee adaptation and synchronization with ecosystem changes increases. Supporting this hypothesis leads to the argument that an organization's tolerance for the risks associated with innovation depends on management's attitude and preparatory actions toward change. Based on this finding, it is recommended that STP management reinforce employees' job security, for instance through long-term contracts, to enable the development of creative solutions and innovative ideas with greater intellectual freedom.

Hypothesis 3. Data analysis showed that change management can predict employees' innovative behavior in STPs by 25.2%. Supporting this hypothesis leads to the conclusion that if employees are consistently encouraged to enhance their capabilities, are involved in critical decision-making processes, and all necessary infrastructure for capability development is provided, novel approaches to both existing and new activities will emerge. This implies that the emergence of creative ideas and problem-solving can be a direct consequence of robust management during organizational change. Accordingly, it is recommended that STP management foster motivation to embrace change through fair performance evaluations and the provision of both material incentives (e.g., overtime pay) and immaterial incentives (e.g., job promotion). Utilizing systematic performance evaluation software could be beneficial. Management is also advised to solicit opinions from employees in relevant divisions during important decision-making processes and, through regular meetings, strive to incorporate employee interests into final decisions.

Hypothesis 4. Data analysis demonstrated that employees' innovative behavior significantly affects organizational innovation in the studied sample. When employees actively consider new methods for performing work, attempt to apply creative ideas, and adapt to their roles, they are more likely to perceive changes positively and exhibit higher risk

tolerance. This hypothesis underscores the necessity of focusing on human resources as the principal capital of the organization to boost organizational innovation, particularly in STPs. Based on this result, it is recommended that STP management intentionally present organizational challenges and offer rewards and privileges for the most creative and effective solutions. Furthermore, management should define work goals clearly but allow employees the autonomy to design work processes creatively within their departments, intervening only to correct deficiencies if they arise.

Hypothesis 5. The results from the statistical sample analysis showed that employees' innovative behavior has a direct and significant effect on the organizational performance of STPs, with a path coefficient of 23.1%. The findings indicate that when employees endeavor to find novel solutions to problems and continuously generate creative ideas to improve their areas of responsibility, they can enhance the services offered to clients and thereby improve STP performance. It is recommended that, when faced with problems, management consult with employees who have a history of constructive ideation, encourage them to share their solutions freely, and then implement the best options after thorough analysis and testing.

Hypothesis 6. The path analysis model and t-statistic indicated that organizational innovation positively affects organizational performance with a strong path coefficient of 51.1%. The results confirm that organizational performance improves when an STP's capacity for risk-taking is strengthened, and planned changes yield positive outcomes. Given the inherent nature of STPs, it is evident that higher innovativity correlates with better performance. Consequently, it is recommended that STP management continuously monitor political and economic changes and adapt decisions accordingly. For instance, conducting market analyses to identify new, cost-effective procurement methods at optimal times is advised.

Hypothesis 7. The statistical analysis using the bootstrapping technique supported this hypothesis, indicating that change management affects organizational performance through the mediating role of employees' innovative behavior ($\beta = 0.058$). This finding implies that when an organization incorporates employee opinions into its decisions, employees become more creative and dynamic, ultimately leading to enhanced STP performance.

Hypothesis 8. The bootstrapping analysis also supported this

hypothesis, confirming that change management affects organizational innovation through the mediating role of employees' innovative behavior ($\beta = 0.135$). This suggests that when managers implement changes and employees continuously update their skills and knowledge to adapt, they discover new methods for task execution and problem-solving, which in turn drives organizational innovation.

Hypothesis 9. The results from the bootstrapping technique indicated that this hypothesis is supported, demonstrating that change management affects organizational performance through the mediating role of organizational innovation ($\beta = 0.164$). This finding implies that by engaging in activities aimed at improving employee capabilities, an STP can enhance its tolerance for innovation-related risks and achieve superior performance after navigating the critical phases of change.

Based on the results of the final three hypotheses, it is recommended that STP management strengthen the foundational activities within the parks and enhance employee capabilities to increase risk tolerance. By doing so, they can initiate new processes and position their STPs as pioneers of innovation.

These findings align with existing literature, corroborating the work of Sung and Kim (2021), who identified a positive influence of change management on innovation, mediated by employees' innovative behaviors. Similarly, the results support Osoro's (2020) emphasis on the critical role of leadership and organizational culture in driving performance. This study, however, extends these established insights by providing empirical evidence from the unique context of Iranian Science and Technology Parks (STPs). It demonstrates that these relationships hold significant weight within an environment characterized by the specific challenges and opportunities of digital transformation, thereby contributing a valuable contextual nuance to the broader theoretical framework.

Managers in STPs should prioritize transparent communication, employee engagement in decision-making, and targeted training programs to strengthen innovative behaviors. Establishing long-term employment security and reward systems for creative contributions can further promote innovation and performance.

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