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# Innovative work behaviors in the digital age: The influence of organizational structures and processes

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**Abstract**

This research aims to examine the relationship between digital infrastructure, digital integration, and digital management and employees' innovative work behavior. Moreover, this research employed knowledge hiding and organizational innovative atmosphere as moderating variables in the direct relationships between digital integration, digital infrastructure, digital management, and the creative work behavior of employees. This research collected data from 239 workers across various small-business electronic companies in Pakistan. To achieve the aim of this research, this study has employed the structural equation modeling. This research has demonstrated a significant association between direct relationships among digital management, digital infrastructure, digital integration, and innovative work behavior among employees. Moreover, the findings confirmed that the relationship between these variables is moderated by knowledge hiding and an organizational climate of innovation. This study examines the impact of digital characteristics, knowledge concealment, and organizational climate on employee creativity in small electronic firms. The findings underscore the importance of digital capabilities, information exchange, and innovative culture in fueling organizational innovation. Leadership and managers can utilize digital technologies and organizational dynamics to enhance innovation and competitiveness in the digital age with these tips.

**Keywords:** lean digital factors, knowledge hiding behaviors, organizational innovative atmosphere, employee innovation, small sector electronic firms, sustainable organizations.

## 1. Introduction

Innovation is becoming a key agenda among firms in order to remain competitive and relevant in the age of fast-growing technology. The introduction of digital technology into the operations of organizations has resulted in a major change in the organizations. It is, thus, essential to understand the determinants of employee innovation (Nguyen et al., 2024). Innovation can be the invention of ideas, solving problems and other processes that render an organization more agile and creative (Gao et al., 2024). Researchers (Chen et al., 2022; Yao et al., 2024) and business

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consultants, in turn, have brought out the need to develop a creative corporate culture. A number of research studies have investigated the effect of digital infrastructure, integration and management on the behaviour of employees and the innovation within the enterprise (Liu et al., 2024).

The focus of research on innovation and organizational behavior has been to explore the relationship between the digital traits among the workers and their creativity capacity (Hock-Doepgen et al., 2024). Previous studies have shown that the two have a correlation; Xu et al. (2024) found that digital infrastructure affects employee creativity and innovativeness to a large extent. Their study supports the fact that there is a high dependence between the work style development and up-to-date digital infrastructure. Recently performed a study that sought to establish the extent to which digital resources and tools influence workers to be intentionally tested and innovative. The study of Wang et al. (2024) has revealed that employees in the companies with properly developed digital systems are more likely to be more creative. Schildt et al. (2023) researched the effects of the use of digital technology on the innovation of the business. The study by Chin, Shi, et al. (2023) talks about a direct relationship between the creative and inventive work of the employees and the success of the processes of digital integration. A recent survey by Zamrudi (2023) states that the integration of digital technology into virtual teams is beneficial since it compels individuals to act more creatively at work. According to their results, it can be concluded, that more successful organizations in the use of digital technologies are more likely to employ more creative virtual teams. One of them is that digital technology also makes communication, collaboration, and sharing of knowledge among the team members easier than in the case of older methods (Chin, Zhang, et al., 2023). According to one of the latest studies (Arias-Perez et al., 2023), the integration of digital management practices can enhance the productivity of the employees and the efficiency of the whole firm. Conducted an experiment that was meant to research the effects of technology-savvy supervisors on the innovative effort of employees. It was also shown that innovative working environments can be created by managers who have a high level of knowledge of digital technology (Zhai et al., 2023). Explored the effectiveness of the innovativeness of the employees in terms of digital management. The findings of their research show the advantages of adopting digital management practice, including the definition of clear goals and objectives, in establishing the culture of innovation among organizational workers.

Although the connection between digital components and creative work practices has been more clearly understood, there are still gaps in the literature (Xu et al., 2023). Empirical studies examining the potential consequences of the strategies that employees adopt to cover information gaps on the connections between digital components and creative work practices are deficient (Chen et al., 2022). Previous research indicates that information concealment is harmful to the performance of both individuals and organizations (Donate et al., 2022). Nevertheless, it is yet to be seen how the effect of information masking on the relationship between digital elements and creative activities affects it. Companies should be taught how to address specific behaviors, including the concealment of information, effectively,

which can diminish the performance of online interventions in boosting the creativity of the employees (Ur Rehman et al., 2024). Organizations need to embrace digital technology to enhance the ability of information and communication technology to promote innovation (Shaikh et al., 2023). A second study is needed to determine the effects of dynamic work environment on employee innovation during digital transformation (Arsawan et al., 2022). Despite its crucial role in the process of promoting innovation, the organizational inventive climate is still under-researched in the context of the relationship between the digital elements and the innovative working behavior (Qamar et al., 2023). Employee innovation promotion success in digital transformation companies relies on the environment and culture of a company as they promote the development of innovation (Firk et al., 2022). Through addressing the issue of employee innovation in the information age, we will be able to further understand the issue and offer valuable information to companies that wish to promote innovation. Our aim is to address the gaps of research that exist.

This research investigates the relationship between knowledge hiding and organizational innovative climate as moderators of the relationship between digital drivers (digital infrastructure, digital integration, and digital management) and innovative work behavior among employees. It achieves this with support from the social exchange theory (Arias-Pérez & Cepeda-Cardona, 2022) and social learning theory (Arias-Pérez & Vélez-Jaramillo, 2022). This research focuses particularly on the relationship between the three parameters. The purpose of this research is to develop knowledge about digital employee innovation processes and provide valuable insights to companies undergoing digital transformation. This study aims to (1) evaluate the direct impacts of digital components on innovative work behavior, (2) explore the moderating effect of knowledge concealing, and (3) explore the moderating effect of an innovative work environment within the company.

## 2. Literature review

Innovative work behaviors (IWBs) are the most challenging elements for companies in today's rapidly changing, technologically developing, modern digital world (Mubarak et al., 2022). Organizational designs are also constantly evolving (Wang et al., 2022); as firms increasingly utilize digital technology, they need to become more creative and resilient to thrive in highly competitive markets (Bai, 2021). Academics emphasize the need for a skilled workforce to navigate the digital age and drive innovation in digital environments (Pokrovskaia et al., 2021). The development of new ideas, solving existing problems, and implementing state-of-the-art solutions are examples of innovative ways of working (Wen et al., 2021). Digital platforms and technologies reflect these tendencies, facilitating global collaboration, innovation, and knowledge sharing (Roblek et al., 2021; Wen & Ma, 2021). Digitalization has transformed the way humans interact with tasks, processes, and organizations, revolutionizing the way work is done. Virtual teams, remote work, and digital platforms have transformed the way employees work together and communicate, presenting new opportunities (Ahmad et al., 2020). Staff can enhance processes,

experiment with new approaches, and respond quickly through digital technology. This combines new ways of working with technical digital skills (Satalkina et al., 2020). Companies ought to foster a spirit of risk-taking, innovation, creativity, and learning from mistakes. The evolving condition requires that companies adapt to workers' habits (Mendling et al., 2020). Having this information enables organizations to maximize their workers' capabilities and remain competitive in the digital world.

A company's digital infrastructure encompasses networks, platforms, equipment, and software that enable workers to communicate, collaborate on projects, and share information (Gafurov et al., 2020). "Innovative work behavior" encompasses a broad range of behaviors and activities used to generate new ideas, discover novel solutions, and implement them within an enterprise (Tidd et al., 2020). This includes trial and error, thinking outside the box, sharing Knowledge, and finding solutions to problems. The digital infrastructure provides workers with easy access to tools, resources, and platforms for digital exploration and imagination (Nguyen & Sharma, 2024). Literature links digital infrastructure with creative work habits. Several studies have examined the impact of technology and digital tools on worker behavior and organizational creativity (Hock-Doepgen et al., 2024). A study found that companies with advanced digital infrastructures have more imaginative and inventive employees (Wang et al., 2024). New studies have found that digital technologies and resources facilitate experimentation and innovation among employees (Chin, Shi, et al., 2023). A robust digital infrastructure is essential for supporting creativity and innovation within a company. The digital infrastructure supports employee innovation, as evidenced by new studies. Digital infrastructure is linked to workers' creativity in research (Chin, Zhang, et al., 2023). Creative workers prefer working for organizations with strong digital infrastructures (Ahmed et al., 2022). A modern digital infrastructure provides employees with access to numerous facilities, tools, and resources that facilitate creativity, cooperation, and clear communication (Zhai et al., 2023). Investing in digital infrastructure can enhance the company's creativity, innovation, and problem-solving capabilities.

H1: Digital infrastructure has a significant impact on the innovative work behavior of employees.

Several studies have demonstrated that incorporating digital technology into organizational activities can significantly increase creative output (Chen et al., 2022). According to Arsawan et al. (2022), workers who utilize digital technology tend to be more innovative. Workers' creative productivity is positively related to the use of digital technology (Arias-Pérez & Cepeda-Cardona, 2022). The scope of interest for this study is the importance of digital technology in empowering people with the resources, support, and surroundings they need to innovate within their professions (Mubarak et al., 2022). Employees are more innovative when they utilize digital technologies, as demonstrated by Bai (2021). Digital integration and creative work practices are interlinked, as shown by empirical research. Previous studies indicate that companies that adopt digital technologies in their businesses establish an environment that fosters employee creativity and innovation (Wen & Ma, 2021). Digitization facilitates seamless information exchange, intensifying collaboration and

communication, which in turn enhances problem-solving and innovation (Ahmad et al., 2020). Digital integration with strategic investment has the potential to enhance workers' satisfaction, engagement, and creativity (Mendling et al., 2020; Ahmed et al., 2020). This study utilizes empirical evidence to demonstrate the impact of digital integration on employee behavior and creativity in digital organizations.

H2: Digital integration has a significant impact on the innovative work behavior of employees.

An empirical study has emphasized the connection between digital management and employee innovation (Tidd & Bessant, 2020). To efficiently control their operations and employees, organizations employ digital tools and technologies, utilizing digital leadership methods, techniques, and management (Gafurov et al., 2020). Several empirical studies have investigated the role of digital management in driving organizational innovation. Satalkina and Steiner (2020) suggest that technologically adept leaders are associated with enhanced creativity and innovation among their workers. Roblek et al. (2021) have identified a positive relationship between digital management practices and innovative work behavior. The above practices involved establishing well-defined goals and timelines, promoting experimentation, and providing opportunities for skill development (Pokrovskaia et al., 2021). According to the studies above, digital management has a transformative impact on employee behavior, triggering innovation (Wang et al., 2022). Studies indicate that digital management enhances employee creativity and fosters innovation. The presumption that firms with effective digital management practices foster an innovation culture among their employees is supported by empirical evidence that establishes a relationship between employees' creativity and digital management practices (Arias-Pérez & Vélez-Jaramillo, 2022). Employees can effectively utilize digital technology and tools in problem-solving and innovation by implementing digital management practices that focus on collaboration, communication, and knowledge sharing (Firk et al., 2022). Additionally, developing digital management skills has the potential to enhance staff enthusiasm, participation, and creativity (Donate et al., 2022). This hypothesis presents empirical proof of how digital management aids creativity in digital organizations.

H3: Digital management has a significant influence on the innovative work behavior of employees.

The complex relationship between worker imagination, digital infrastructure, and concealment of Knowledge has been the subject of empirical investigation (Xu et al., 2023). "Knowledge hiding" refers to employees who conceal information, which can suppress innovation, collaboration, and knowledge sharing (Arias-Pérez & Huynh, 2023). There is evidence from various studies that concealing information is detrimental to both employees and organizations. Following Zamrudi (2023) and Schildt et al. (2023, information hiding by staff can hinder team performance and firm innovation. The creativity and innovativeness of employees are reduced when information is hidden. This paper emphasizes the importance of cultivating a culture that fosters truthfulness, openness, and Knowledge sharing to promote growth and innovation. An examination reveals that dishonesty may undermine the relationship

between digital infrastructure and creative activities (Xu et al., 2024). Past research has shown that digital infrastructure and employee creativity could be negatively affected by corporate information concealing (Liu et al., 2024). Advanced digital infrastructures can struggle to promote creativity when employees conceal facts. ROI for digital infrastructure is maximized through knowledge sharing, transparency, and trust, which also minimize information hiding (Liu et al., 2024; Nguyen & Sharma, 2024). Within this theoretical framework, empirical evidence elucidates the complex interplay between employees' creativity, information hiding, and digital infrastructure. Thus, knowledge management is required for corporate innovation.

H4: Knowledge hiding significantly moderates the relationship between digital infrastructure and employees' innovative work behavior.

Information hiding affects employee creativity and the use of digital technology, according to various empirical studies (Arias-Pérez & Cepeda-Cardona, 2022). Knowledge suppression obstructs collaboration, sharing of ideas, and creativity. Organizational knowledge hiding is referred to as "hiding knowledge." Several studies have demonstrated that withholding information from employees reduces their ability to solve innovative problems and negatively impacts the company's profitability (Firk et al., 2022). Arsawan et al. (2022) argue that hiding Knowledge from employees discourages collaboration and innovation. Discovered that hiding Knowledge discourages employee creativity and innovation. Consistent with the research by Donate et al. (2022), information management problems, such as intentionally withholding information, must be addressed if innovation is to thrive in an open setting. Information concealment, digital integration, and creative work behavior studies indicate that knowledge concealment weakens the relationship between digital integration and innovation (Chen et al., 2022). Based on Xu et al.'s (2023) research, the extent to which information is withheld within an organization impacts employee innovation, which is influenced by digital integration. To clarify, even completely integrated digital organizations can fail to support creative endeavors when Knowledge is concealed (Zhai et al., 2023). Companies can minimize information hoarding and optimize the benefits of digital technology by fostering openness, trust, and knowledge sharing (Arias-Pérez & Huynh, 2023). This theory examines the intricate relationship between employee innovation, knowledge hiding, and the integration of digital technology, grounded in empirical evidence. Issues of knowledge management for organizational innovation are also addressed.

H5: Knowledge hiding significantly moderates the relationship between digital integration and innovative work behavior of employees.

Existing studies reveal an intricate relationship between information hiding, digital management, and innovative work behavior. Information hiding impedes innovation, collaboration, and sharing (Chin, Zhang, et al., 2023). Concealment of organizational Knowledge is the willful withholding of information. Suppression of information diminishes organizational and productivity effectiveness, as indicated by numerous studies. Zamrudi (2023) analyzed how withholding leads to stunted workplace innovation and collaboration. Employees' creativity is lower when Knowledge is withheld, as noted by Chin, Shi, et al. (2023). Innovation and long-term

success demand an open, transparent, and knowledge-sharing organizational culture (Schildt et al., 2023). Evidence drawn from information hiding, digital management, and creative work behavior indicates that Knowledge concealing significantly mediates the relationship between digital management and employees' imaginative work behavior (Ur Rehman et al., 2024). Past studies suggest that corporate information hiding influences employees' innovation through digital management. Therefore, even companies with excellent digital management systems might not be able to promote innovation if employees conceal information (Ahmad et al., 2020). Transparency, trust, and knowledge dissemination activities aimed at counteracting information hiding can enable organizations to enhance their digital management (Roblek et al., 2021). This hypothesis utilizes empirical data to elucidate the complex relationship between digital management, information concealment, and employee innovation. It also highlights knowledge management problems in organizational innovation.

H6: Knowledge hiding significantly moderates the relationship between digital management and innovative work behavior of employees.

Numerous research papers have explored the link between digital infrastructure and staff creativity, as well as a creative organizational climate (Shaikh et al., 2023). An "organizational innovative atmosphere" refers to the environment that fosters innovation. This culture promotes risk-taking, creativity, and leadership support (Wen & Ma, 2021). Numerous studies have demonstrated the benefits of an innovative and dynamic workplace. Qamar et al. (2023) found, for instance, that creativity and innovation among employees were boosted when they were supported for innovation by the organization. Pokrovskaia et al. (2021) found that a positive corporate culture promotes innovation. Employee behavior and the creation of a creative culture within companies are considerably shaped by the organizational environment, according to research findings (Bai, 2021). The hypothesis is that an imaginative organizational climate affects the relationship between workers' imaginative working behavior and digital infrastructure, as noted in empirical research. The theory, based on previous research, suggests that worker innovation can be influenced by digital infrastructure only in imaginative working cultures (Liu et al., 2024). In other words, firms with advanced digital infrastructures might struggle to create a spirit of innovation if they do not instill and reinforce creative attitudes in their employees (Hock-Doepgen et al., 2024). However, firms that nurture innovation through risk-taking spreading new ideas, and supporting them at the top might be able to reap greater benefits from digital infrastructure investments (Xu et al., 2024). This hypothesis explains the complex relationship between employee creativity, corporate creative environment, and digital infrastructure, supported by empirical evidence. This will illustrate the importance of creating an innovative working environment.

H7: An innovative organizational atmosphere significantly moderates the relationship between digital infrastructure and employees' innovative work behavior.

Earlier empirical research has investigated how an innovative organizational environment influences the integration of technology and creative work behavior

among employees (Zaman et al., 2021). Several factors drive business innovation. These consist of leadership support, fostering innovation, and embracing uncertainty (Xu et al., 2024). An organizational climate and culture that is inclined towards innovation is part of this environment. Research has shown that a positive corporate culture fosters creativity and employee motivation. Wang et al. (2024) established that employees working in innovation-oriented companies are more innovative and creative. Schildt et al. (2023) established that a positive organizational culture enhances innovation. These studies indicate that organizational culture has a profound effect on employee behavior and innovation (Tidd & Bessant, 2020). Empirical findings of innovative work behavior, digital integration, and organizational innovative environment support the hypothesis that an organizational innovative climate has a substantial effect on the relationship between digital integration and employees' innovative work behavior (Gafurov et al., 2020). Based on previous studies, this hypothesis posits that digital integration would only influence employee innovation in the context of an innovative organization (Mendling et al., 2020). To put it simply, it posits that high-digital-integration companies may struggle to establish an innovative culture if they do not actively encourage and reward innovative behavior among their staff (Mendling et al., 2020). However, organizations that foster a culture of innovation, characterized by leadership support, encouragement of new ideas, and risk-taking, are likely to reap greater benefits from digital technology (Zhai et al., 2023). This hypothesis applies empirical data to describe the intricate connection among digital integration, organizational innovative climate, and employees' invention. This will demonstrate why businesses require a technical advancement-conducive environment.

H8: An innovative organizational atmosphere significantly moderates the relationship between digital integration and innovative work behavior among employees.

The correlation between digital management and the creative work behavior of employees, as well as the development of an innovative corporate culture, has been the focus of numerous studies (Ahmad et al., 2020). Several key factors drive innovation within a corporation. These include embracing uncertainty, fostering innovation, and enjoying leadership support (Pokrovskaia et al., 2021). A good work environment promotes innovation and enhances staff engagement, as provided by many studies (Mubarak et al., 2022). Firk et al. (2022) found that employees in innovative companies tend to be more creative and intelligent. Optimistic corporate cultures promote innovation, as explained by Chen et al. (2022). The above findings show the considerable impact of company culture on employee behavior and creativity (Arias-Pérez & Huynh, 2023). The hypothesis predicts a strong relationship between employee creativity and digital management in organizations with an innovative environment based on prior empirical research. Previous research suggests that the impact of digital management on employee creativity may be contingent upon a creative organizational climate (Chin, Shi, et al., 2023). In other words, firms with excellent digital management systems might struggle to implement

an innovation culture if they do not nurture and reinforce employee innovation (Xu et al., 2024).

In contrast, firms that support innovation through risk-taking, innovation-driven leadership, and innovation-supportive cultures could benefit more from digital management (Liu et al., 2024). This theory explains the complex relationship between organizational creativity, employees' invention, and electronic management using empirical evidence. The need for a creative business culture is also highlighted.

H9: An innovative organizational atmosphere significantly moderates the relationship between digital management and employees' creative work behavior.

The considerations above are summarized in Fig. 1. Specifically, it is hypothesized that digital infrastructure, digital integration, and digital management determine the IWB. These links are moderated by knowledge hiding and organizational innovative atmosphere.

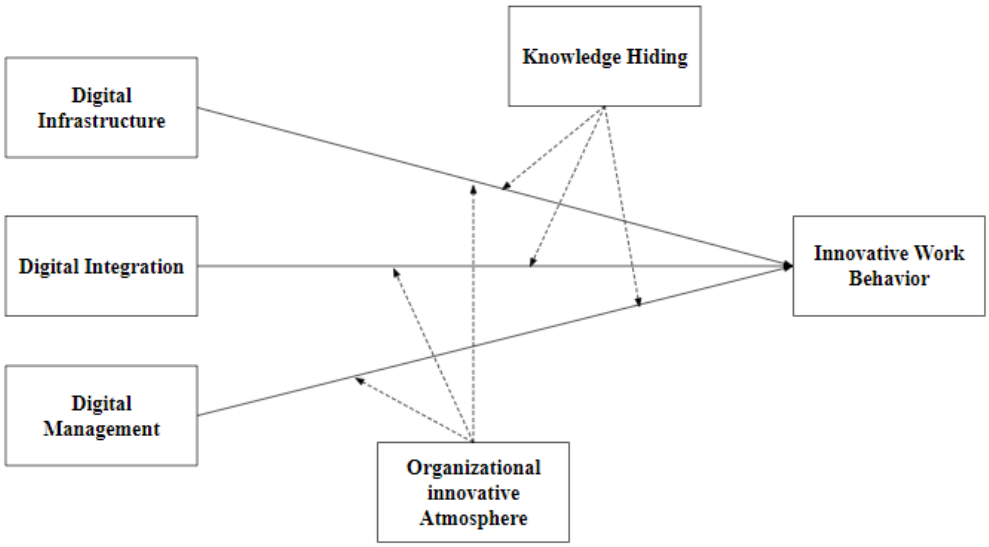


Fig. 1. Theoretical model

## 3. Methods

The study was carried out in Pakistan, aiming at the aspects of staff innovation, innovative corporate climate, information concealment tendencies, and digital pointers. Pakistan was chosen as a research setting as it is a fast-growing economy, in which the digital transformation and innovation are becoming decisive to organizational survival and competitiveness. Over the past few years, Pakistani small and medium size enterprises (SMEs), especially those in the electronic industry, have been facing tight competition, rapid penetration of technologies, and changing digital infrastructures. These circumstances offer a theoretically significant and empirically

rich environment to test the role that organizational climate and information-related behaviors play in establishing innovation at the employee level. Further, the scarcity of empirical evidence about South Asian emerging economies have provided a gap in the literature of innovation which has been mainly dominated by the studies of developed nations; the present research therefore answers the gap directly by providing a sense of context in Pakistan. The sample size comprised of 239 persons who were selected out of different small electronic companies in operation in Pakistan. The selection of small-scale electronic business was based on the fact that it operates in very dynamic and innovative environments where the creativity of employees, the digital engagement process, and the information sharing behavior are especially applicable. A convenience sampling technique was used to select participants representing different organizational roles and levels of the organization, which guaranteed the heterogeneity of the views. The standardized questionnaires were used to collect data and all the key constructs were assessed using reliable and well-tested scales applied in previous studies (Table 1 and Annex A). Such measurement tools were grounded on validated indicators that are common in research of organizational innovation and digital transformation, which makes the empirical results strong and credible.

Table 1
Scales information

| Variable | # of items | Reference |
|---|---|---|
| Knowledge Hiding | 4 | Connelly et al., 2012 |
| Digital Infrastructure | 5 | Carvalho et al., 2023 |
| Digital Integration | 5 | Redecker, 2017 |
| Innovative Work Behavior | 5 | Dahiya et al., 2022 |
| Organizational Innovative Atmosphere | 6 | Ramdan et al., 2022 |
| Digital Management | 5 | Carvalho et al., 2023 |

Source: designed by the authors.

Data was collected and then analyzed using Stata SEM. Structural equation modeling (SEM) is advantageous for investigating complex interactions that involve multiple variables. This study employed SEM to examine the moderating, direct, and indirect impacts of company culture, knowledge concealment tactics, and digital factors on employee innovation. The data analysis encompassed various stages, namely model construction, estimation, screening, and fit evaluation. Descriptive statistics and correlation analysis were employed to describe the sample and study the factors of interest. Theories were used to build the structural model, whereas routes were used to represent flexible connections. In addition to the maximum likelihood model estimate, the assessment of model fit was conducted using CFI, RMSEA, and Standardized Root Mean Square Residual. The present study aims to examine the relationship between the organizational, creative atmosphere, personnel creativity, digital qualities, and knowledge concealment tactics within small electronic enterprises in Pakistan. The validity and reliability were ensured by the utilization of known scales derived from a previous study conducted using Stata SEM.

## 4. Results

The reliability of the study's component assessment measures is displayed in Table 2. Scale internal consistency was evaluated using Cronbach's alpha coefficients. According to the survey, the Knowledge Hiding construct has a high level of internal consistency among its items, as seen by its Cronbach's alpha coefficient of 0.841. Evidence suggests that knowledge concealment measures represent a fundamental concept, and responses to these measures are significantly correlated with one another. The Cronbach's alpha coefficient for the Digital Infrastructure construct was 0.893, suggesting that the elements used to evaluate the digital infrastructure of organizations had good internal consistency. This demonstrates how digital infrastructure assessment tools can provide a reliable assessment of this idea by efficiently assessing the vast array and complexity of digital resources and technologies in businesses.

Table 2
Cronbach's alpha

| Variable | Cronbach's Alpha |
|---|---|
| Knowledge Hiding | 0.841 |
| Digital Infrastructure | 0.893 |
| Digital Integration | 0.823 |
| Innovative Work Behavior | 0.789 |
| Organizational Innovative Atmosphere | 0.828 |
| Digital Management | 0.852 |

Source: designed by the authors.

Digital Integration's Cronbach's alpha was 0.823, indicating strong internal consistency among items assessing the integration of digital technology into organizational processes and functions. The digital integration items properly reflect the extent to which digital technologies are applied across corporate operations. Cronbach's alpha was 0.789, indicating good internal consistency in employee innovation assessments. This means creative work behavior questions effectively assess employee creativity, problem-solving, and ideation. Finally, Business Innovative Atmosphere's Cronbach's alpha value was 0.828, indicating strong internal consistency among innovation-friendly company climate and culture metrics. This shows that organizational innovative atmosphere items accurately measure crucial characteristics of a creative organizational environment. High Cronbach's alpha coefficients across all variables support the study's conclusions via measurement reliability and internal consistency.

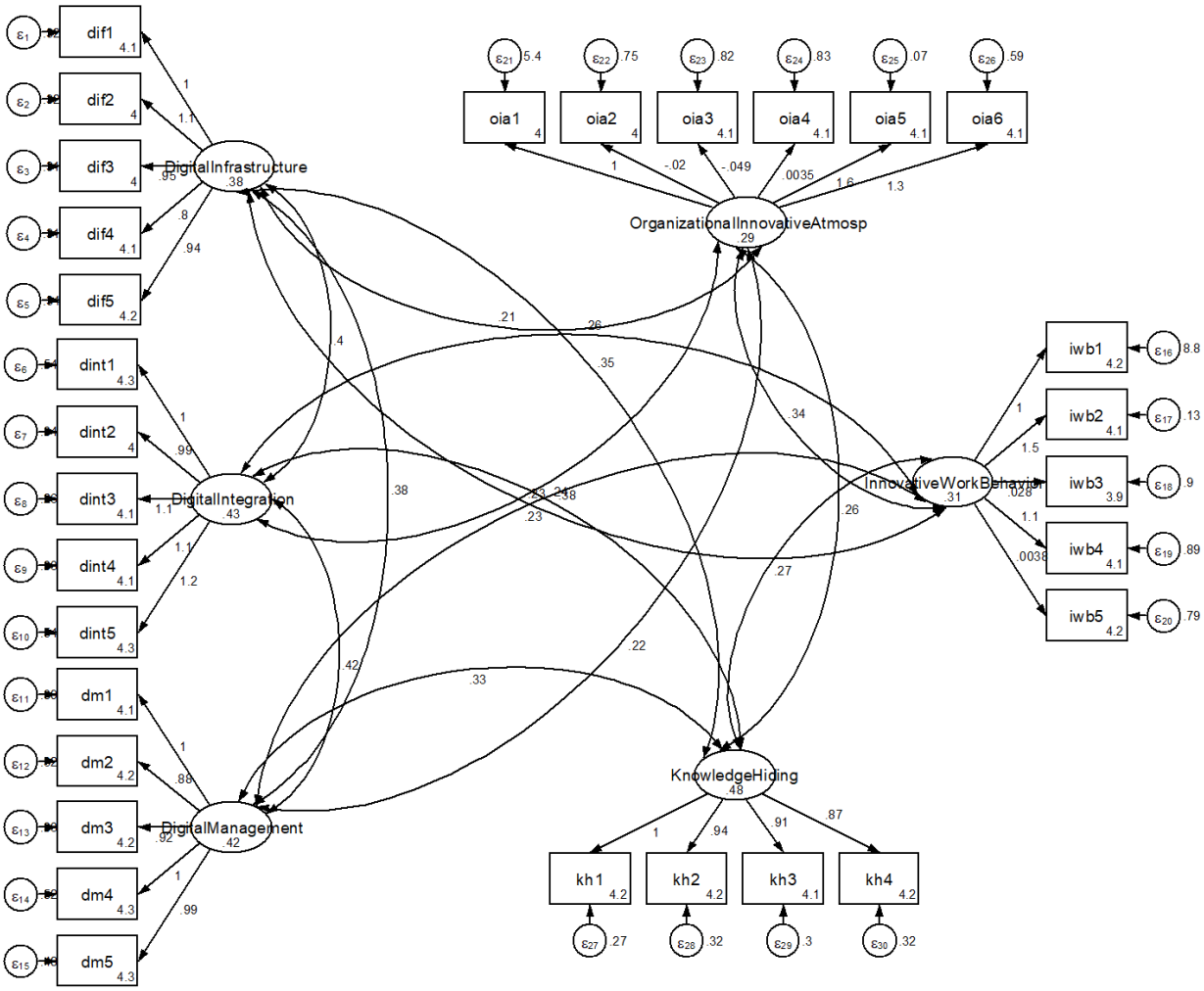


Fig. 2. Estimated model
Source: designed by the authors.

Table 3 presents the results confirming the validity and reliability of the research variables. Average variance extracted (AVE) values measure convergent validity, while composite reliability values measure the internal consistency and dependability of the constructs. Knowledge-hiding items had a composite reliability of 0.922, above the threshold of 0.7, suggesting excellent internal consistency. Convergent validity is confirmed by the AVE value of 0.566, which is above the acceptable threshold of 0.5. Digital Infrastructure's composite reliability was 0.852, and AVE was 0.586, both over the thresholds, suggesting good internal consistency and convergent validity. Digital Integration also exceeded the standards for composite reliability (0.881) and AVE (0.541), demonstrating good reliability and convergent validity. Innovative Work Behavior exceeded the thresholds with a composite reliability of 0.912 and an AVE of 0.560, demonstrating good reliability and convergent validity. The Organizational Innovative Atmosphere has a composite reliability of 0.823 and an AVE of 0.545, exceeding the thresholds, which suggests good reliability and convergent validity. Finally, Digital Management exceeded the thresholds with a composite reliability of

0.942 and an AVE of 0.558, showing good reliability and convergent validity. These findings strengthen the conclusions and support the hypotheses by confirming the validity and reliability of the assessment measures for the variables in question.

Table 3
Validity and reliability Confirmation

| Variable | Composite reliability | Average Variance Extracted (AVE) |
|---|---|---|
| Knowledge Hiding | 0.922 | 0.566 |
| Digital Infrastructure | 0.852 | 0.586 |
| Digital Integration | 0.881 | 0.541 |
| Innovative Work Behavior | 0.912 | 0.560 |
| Organizational Innovative Atmosphere | 0.823 | 0.545 |
| Digital Management | 0.942 | 0.558 |

Source: designed by the authors.

Table 4 shows the measurement model's data fit confirmation factor analysis (CFA) results. Standardized factor loadings, standard errors, z-values, p-values, and confidence ranges are given for each item. All items show substantial factor loadings ($p < 0.001$), confirming the measurement model. The Comparative Fit Index, Tucker-Lewis Index, and Root Mean Square Error of Approximation indicate that the measurement model provides a good fit to the data. This study supports the conclusions by demonstrating the reliability and validity of the evaluation methods used to evaluate the components under inquiry.

Table 4
Confirmatory factor analysis

| Measurement | OIM Coef. | Std. Err. | Z | P>\|z\| | 95% Conf. Interval | |
|---|---|---|---|---|---|---|
| KH1 | 1 | (constrained) | | | | |
| KH2 | 0.747 | 0.069 | 10.641 | 0.000 | 0.612 | 0.882 |
| KH3 | 0.549 | 0.061 | 8.776 | 0.000 | 0.429 | 0.670 |
| KH4 | 0.598 | 0.063 | 9.247 | 0.000 | 0.473 | 0.722 |
| DInf1 | 1 | (constrained) | | | | |
| DInf2 | 0.641 | 0.067 | 9.443 | 0.000 | 0.510 | 0.771 |
| DInf3 | 0.320 | 0.064 | 4.928 | 0.000 | 0.195 | 0.445 |
| DInf4 | 0.601 | 0.070 | 10.013 | 0.005 | 0.501 | 0.825 |
| DInf5 | 0.851 | 0.080 | 12.015 | 0.002 | 0.701 | 0.864 |
| DINT1 | 1 | (constrained) | | | | |
| DINT2 | 0.688 | 0.069 | 9.757 | 0.000 | 0.552 | 0.823 |
| DINT3 | 0.792 | 0.064 | 12.104 | 0.000 | 0.666 | 0.918 |
| DINT4 | 0.894 | 0.070 | 12.545 | 0.000 | 0.757 | 0.835 |

Table 4 continued

| Measurement | OIM Coef. | Std. Err. | Z | P>\|z\| | 95% Conf. Interval | |
|---|---|---|---|---|---|---|
| DINT5 | 0.877 | 0.057 | 15.078 | 0.000 | 0.765 | 0.792 |
| DM1 | 1 | (constrained) | | | | |
| DM2 | 0.810 | 0.064 | 11.993 | 0.000 | 0.685 | 0.934 |
| DM3 | 0.759 | 0.062 | 11.607 | 0.000 | 0.639 | 0.880 |
| DM4 | 0.832 | 0.059 | 13.339 | 0.000 | 0.717 | 0.759 |
| DM5 | 0.736 | 0.070 | 13.838 | 0.000 | 0.692 | 0.890 |
| IWB1 | 1 | (constrained) | | | | |
| IWB2 | 0.781 | 0.064 | 11.456 | 0.000 | 0.655 | 0.906 |
| IWB3 | 0.757 | 0.065 | 11.004 | 0.000 | 0.630 | 0.884 |
| IWB4 | 0.857 | 0.067 | 12.030 | 0.000 | 0.726 | 0.801 |
| IWB5 | 0.719 | 0.065 | 10.355 | 0.000 | 0.591 | 0.848 |
| OIA1 | 1 | (constrained) | | | | |
| OIA2 | 0.790 | 0.065 | 11.418 | 0.000 | 0.662 | 0.917 |
| OIA3 | 0.826 | 0.063 | 12.232 | 0.000 | 0.702 | 0.763 |
| OIA4 | 0.678 | 0.058 | 10.925 | 0.000 | 0.565 | 0.792 |
| OIA5 | 0.692 | 0.059 | 10.860 | 0.000 | 0.575 | 0.809 |
| OIA6 | 0.866 | 0.064 | 12.709 | 0.000 | 0.741 | 0.804 |

Source: designed by the authors.

Table 5 presents the measurement items' fitness statistics, including the average variance extracted (AVE) for each indicator within its respective variable. AVE values indicate how much variance the items capture compared to measurement error, indicating their construct measurement fitness. Knowledge Hiding, Digital Infrastructure, Integration, Management, Work Behavior, and Organizational Innovative Atmosphere had AVEs of 0.561 to 0.902. These results show that each variable's items capture construct-related variance, suggesting measurement fitness. High AVE values validate the study's concept assessment techniques and research conclusions.

Table 6 presents the model's chi-square fit statistics, which reveal its fit to the data. Compared to a saturated model, the likelihood ratio chi-square value is 13791.839. Additionally, the baseline model’s chi-square value compared to the saturated model is 11003.552. Both chi-square values have p-values of 0.000, suggesting that the observed data deviate significantly from the proposed and baseline models. The chi-square test is sensitive to sample size; however, the substantial p-values indicate that the proposed model does not provide a good fit to the data. These fit indices go beyond the chi-square test to assess the model's data fit.

Table 5
Measurement Items Fitness Statistics

| Variable | Indicator | Original Sample |
|---|---|---|
| Knowledge Hiding | KH1 | 0.777 |
| | KH2 | 0.768 |
| | KH3 | 0.684 |
| | KH4 | 0.739 |
| Digital Infrastructure | DInf1 | 0.795 |
| | DInf2 | 0.820 |
| | DInf3 | 0.844 |
| | DInf4 | 0.759 |
| | DInf5 | 0.902 |
| Digital Integration | DINT1 | 0.834 |
| | DINT2 | 0.561 |
| | DINT3 | 0.684 |
| | DINT4 | 0.883 |
| | DINT5 | 0.831 |
| Digital Management | DM1 | 0.864 |
| | DM2 | 0.817 |
| | DM3 | 0.785 |
| | DM4 | 0.649 |
| | DM5 | 0.592 |
| Innovative Work Behavior | IWB1 | 0.705 |
| | IWB2 | 0.746 |
| | IWB3 | 0.740 |
| | IWB4 | 0.771 |
| | IWB5 | 0.787 |
| Organizational Innovative Atmosphere | OIA1 | 0.641 |
| | OIA2 | 0.619 |
| | OIA3 | 0.820 |
| | OIA4 | 0.844 |
| | OIA5 | 0.759 |
| | OIA6 | 0.846 |

Source: designed by the authors.

Table 6
Chi-square fit statistics

| Fit statistic | Value | Description |
|---|---|---|
| Likelihood ratio | 13791.839 | model vs. saturated |
| p > chi2 | 0.000 | |
| chi2_bs(2356) | 11003.552 | baseline vs. saturated |
| p > chi2 | 0.000 | |

Source: designed by the authors.

Table 7 presents the goodness-of-fit statistics for the saturated and estimated models. The SRMR values for both models are presented. The saturated model has an SRMR of 0.051, while the estimated model has an SRMR of 0.073. The SRMR measures the model's mismatch between observed and anticipated correlations. Lower values indicate better model fit. The saturated model has a lower SRMR than the estimated model, suggesting a better data fit. Even yet, the estimated model's SRMR value remains within a reasonable range, indicating a good model fit. The saturated model fits best, although the estimated model's SRMR value suggests that it accurately depicts the connections between the observed variables. These data reveal the goodness of fit of the suggested model and suggest areas for improvement.

Table 7
Model goodness of fit statistics

| Measure | Saturated Model | Estimated Model |
|---|---|---|
| SRMR | 0.051 | 0.073 |

Source: designed by the authors.

Table 8 presents the R-squared statistics for the model variables, indicating the proportion of variance each exogenous variable explains. The digital infrastructure has an R-squared value of 0.331, indicating that external variables account for 33.1% of its variance. Digital Integration has an R-squared score of 0.212, indicating that exogenous variables explain 21.2% of its variance. Finally, Digital Management has an R-squared value of 0.435, indicating that exogenous variables explain 43.5% of the variation in its outcomes. These R-squared statistics show how much external variables explain endogenous variable variability. The R-squared values indicate that exogenous variables have a significant impact on the variability of Digital Infrastructure, Digital Integration, and Digital Management, underscoring their importance in shaping organizational digital capabilities.

Table 8
R-squared statistics

| Variable | R Square |
|---|---|
| Digital Infrastructure | 0.331 |
| Digital Integration | 0.212 |
| Digital Management | 0.435 |

Source: designed by the authors.

Path analysis results in Table 9 show the linkages between digital elements, knowledge concealment practices, organizational innovative atmosphere, and employee innovation. The analysis reveals that digital infrastructure has a significant impact on employee innovation ($\beta = 0.810$, $p < 0.001$). This illustrates the importance of digital infrastructure in fostering innovation within enterprises. Advanced digital tools and resources that encourage idea development, collaboration, and testing encourage innovative behavior among employees. Second, digital integration has a significant influence on employee innovation ($\beta = 0.065$, $p < 0.05$). To foster creativity, digital technology must be smoothly integrated into organizational processes and operations. Incorporating digital tools and platforms into operations enables employees to utilize technology for creative problem-solving and idea generation, thereby fostering innovation throughout the firm.

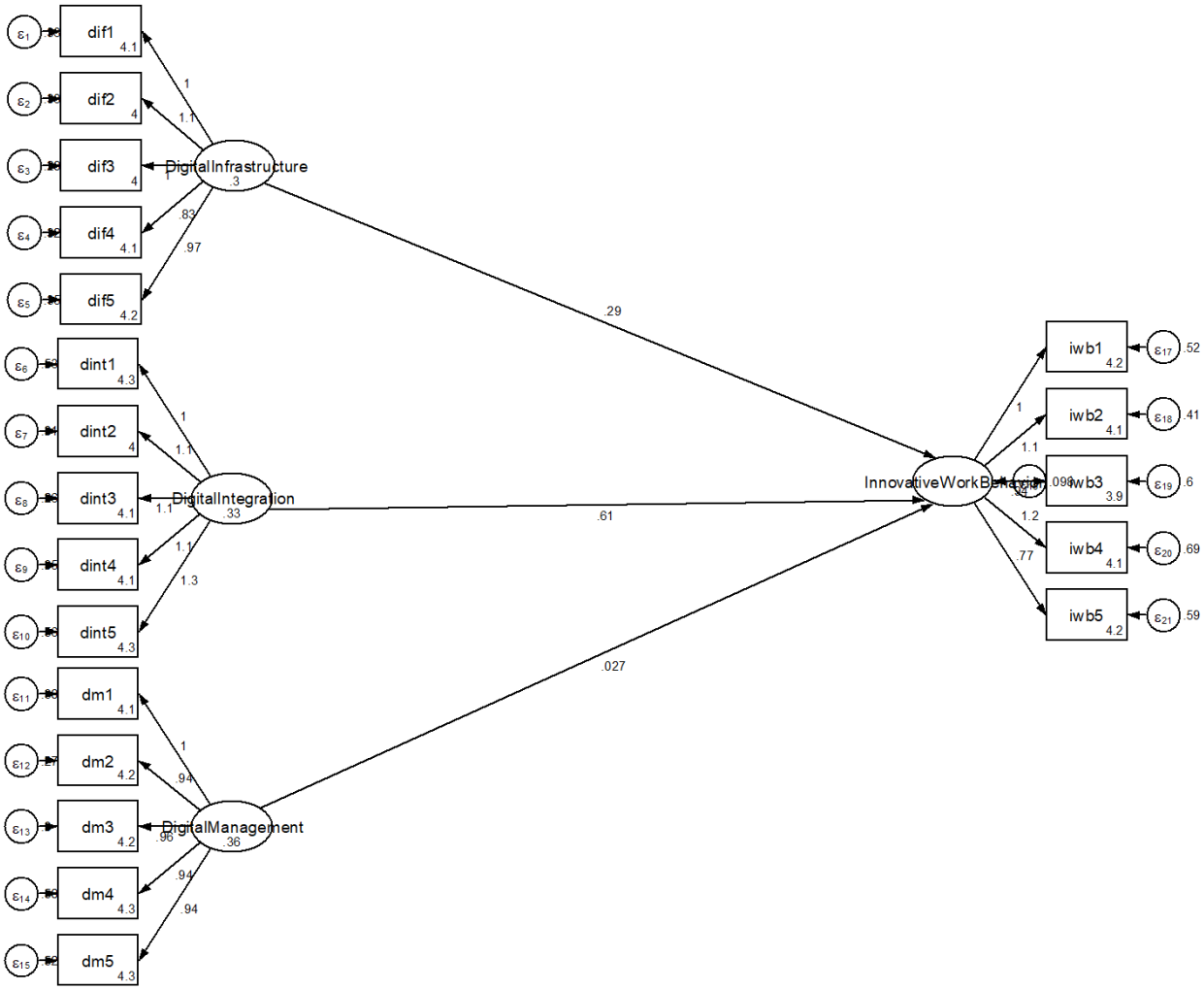


Fig. 3. Structural model for direct and mediated path analysis
Source: designed by the authors.

Thirdly, creative work behavior is highly influenced by digital management (β = 0.191, p < 0.05). Digital management techniques, including goal setting, experimentation, and support for employee innovation, facilitate innovation. Successful management and leaders who are aware of digital trends encourage employees to experiment, take calculated chances, and be creative.

Table 9
Path analysis

| Hypothesis | OIM Coef. | Std. Err. | Z | P>\|z\| | 95% Conf. Interval | |
|---|---|---|---|---|---|---|
| Digital infrastructure has a significant impact on the innovative work behavior of employees. | 0.810 | 0.451 | 1.628 | 0.000 | 0.620 | 0.784 |
| Digital integration has a significant impact on the innovative work behavior of employees. | 0.065 | 0.346 | 2.195 | 0.009 | 0.536 | 0.612 |
| Digital management has a significant influence on the innovative work behavior of employees. | 0.191 | 0.092 | 1.882 | 0.014 | 0.372 | 0.286 |
| Knowledge hiding significantly moderates the relationship between digital infrastructure and employees' innovative work behavior. | 0.853 | 0.062 | 2.711 | 0.000 | 0.731 | 0.788 |
| Knowledge hiding significantly moderates the relationship between digital integration and employees' innovative work behavior. | 0.818 | 0.065 | 1.817 | 0.000 | 0.691 | 0.756 |
| Knowledge hiding significantly moderates the relationship between digital management and employees' innovative work behavior. | 0.832 | 0.076 | 5.151 | 0.000 | 0.683 | 0.795 |
| An innovative organizational atmosphere significantly moderates the relationship between digital infrastructure and innovative work behavior among employees. | 0.609 | 0.063 | 8.983 | 0.000 | 0.485 | 0.733 |
| An innovative organizational atmosphere significantly moderates the relationship between digital integration and innovative work behavior among employees. | 0.305 | 0.061 | 4.688 | 0.000 | 0.186 | 0.424 |
| An innovative organizational atmosphere significantly moderates the relationship between digital management and employees' innovative work behavior. | 0.748 | 0.061 | 2.349 | 0.000 | 0.628 | 0.867 |

Source: designed by the authors.

Additionally, the data demonstrates how information-hiding practices significantly alter the relationships between digital components and employee innovation. The relationship between innovative work behavior and digital infrastructure, integration, and management is moderated by knowledge concealment (β = 0.853, p < 0.001). Enhancing staff innovation requires addressing knowledge management issues. For enterprises to effectively leverage their investments in digital technology for innovation, they need to promote openness, transparency, and information exchange.

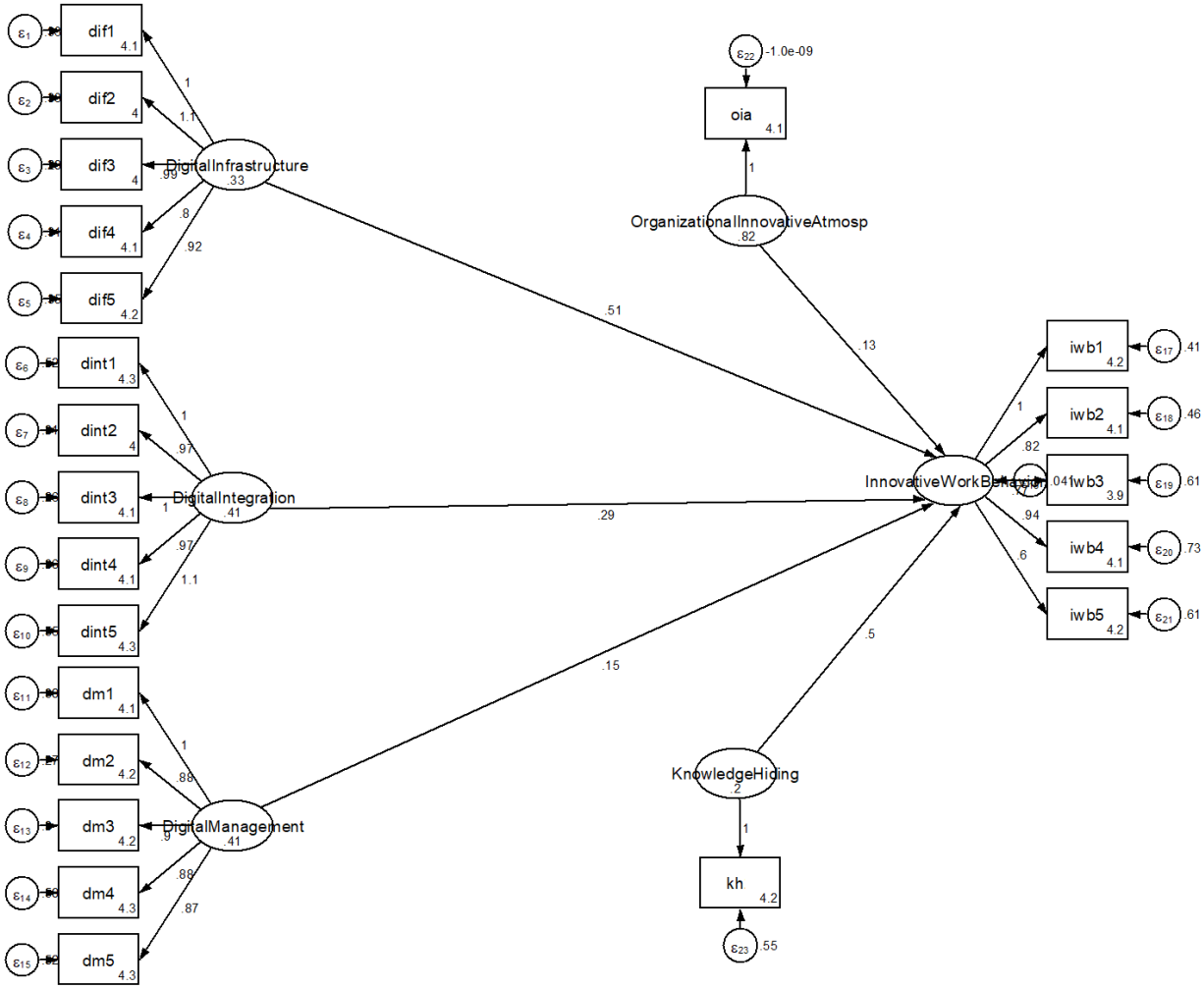


Fig. 4. Structural model for moderating path analysis
Source: designed by the authors.

## 5. Discussion

This research analyses the impact of digital infrastructure on staff creativity. Research has proven that improved digital infrastructure increases employee creativity. Resilient digital infrastructure providers should offer a wide range of

resources, tools, and platforms that foster innovation, collaboration, and communication. Cloud computing, data analysis, and cooperation empower employees to explore and evaluate new ideas. This idea illustrates how contemporary technology infrastructure encourages innovation and development. We established a relationship between employee creativity and their use of digital technology. As indicated by recent research conducted by Mubarak et al. (2022) and Satalkina & Steiner (2020), it has been found that digital technology significantly contributes to the development of innovative organizational cultures. Digital technology enables workers to collaborate in real time, share Knowledge, and engage in creative brainstorming. Technology allows employees in digitally integrated companies to continue innovating and learning throughout their careers. The support for this strategy demonstrates how digital technology enables organizational innovation and flexibility. Our research shows a strong relationship between staff innovation and digital management. Several scholarly articles, including the one published by Firk et al. (2022), have demonstrated the beneficial effect of electronic management practices on stimulating innovative and creative thinking among workers. The results of this article are consistent with their findings. Innovative thinking is encouraged by intelligent, competent, and efficient electronic managers. Electronic management systems empower workers to harness their creative abilities and drive innovation. This framework eases the provision of promoting progress, inquiry, and goal setting. The effective use of digital technologies to foster employee innovation and drive business success relies on skilled management and leadership.

The findings of our research demonstrate a powerful relationship between the concealment of Knowledge and its negative impact on employee creativity and digital infrastructure. The proper understanding and management of Knowledge are crucial for fostering creativity within a firm. Adequate use of digital infrastructure is needed to foster creativity, collaboration, and the exchange of information. Our ignorance is a critical concern. Companies need to cease concealing information and become as transparent as possible to achieve the highest returns from their digital technology investments (Arias-Pérez & Vélez-Jaramillo, 2022). When companies prioritize open communication and collaboration, employees can be innovative, pursue new opportunities, and exchange Knowledge more freely. According to this research, employees who do not exchange Knowledge may be less creative or less likely to fully utilize digital technology. Digital integration needs new concepts and a solid data infrastructure.

Digital technology facilitates collaboration, communication, and the sharing of information. Deception mechanisms can complicate these objectives. To harness the full creative potential of digital integration, organizations must ensure that their employees prioritize transparency, cooperation, and trust (Wang et al., 2022). Foster education and open communication. Digital technologies should be leveraged to foster creativity and adaptability in an evolving profession. The research established that concealing information restricts employees' creativity and their ability to manage resources effectively. This highlights the importance of effective management and leadership in information management, as well as the role of employee creativity.

Digital management involves the intentional application of digital tools to generate novel ideas. Concealing Knowledge, though, can hamper employee creativity and collaboration. At every level, organizations need to emphasize openness, transparency, and knowledge sharing. Build an open environment that respects, acknowledges, and invites free expression to foster innovation.

This study also indicates that an innovative work environment mediates the relationship between digital infrastructure and employee creativity. The above research suggests that organizational climate and culture influence employee behavior and innovation. Digital infrastructure, technology, and a robust corporate culture enhance the effectiveness of innovation projects. Individuals can develop and contribute to the organization's goals within a space facilitated by organizations that support openness, self-confidence, and creative thinking. Companies can maximize their investments in digital infrastructure and build an innovative culture that drives long-term growth and a competitive edge by creating a conducive work environment. Second, this study also reveals that employee creativity and digital integration have an interaction where a creative work environment moderates their relationship. The declaration highlights the importance of the corporate environment and culture in promoting innovation through digital integration (Arias-Pérez & Vélez-Jaramillo, 2022). Knowledge sharing, collaboration, and employee communication are all made easier with digital integration. The efficacy of these efforts is amplified in an encouraging work environment. Individuals who work in a creative environment are more open to experimenting with new things, taking calculated risks, and driving innovation throughout the entire company. In a competitive setting, the potential of digital integration for adaptation and innovation can be maximized through an organizational culture that fosters enabling. This study proves that an innovative workplace culture moderates the link between digital management and staff creativity (Manthar et al., 2025). Corporate culture is shaped and creativity is enhanced by sound management and leadership practices. By providing the setting and guidelines for harnessing digital technologies for innovation, a supportive corporate culture is crucial to the success of digital management practices. Companies that emphasize innovation create a culture in which employees feel valued and are encouraged to share their ideas. By fostering a favorable organizational climate, companies can promote innovation and long-term success in the digital economy (Parmar & Ahmed, 2013).

Considering all the assumptions, organizational innovation can be stated to be determined by digital factors, an innovative organizational culture, and challenges in managing Knowledge. Organizations can innovate and compete by investing in sophisticated digital infrastructure, facilitating digital integration programs, employing effective digital management practices, and having a good organizational culture. This research extends our Knowledge of the dynamics of digital employee creativity. This paper presents ideas that managers and leaders can appreciate when encountering the challenges of digital change.

## 5.1. Implications of the study

This study addressed the complex interaction between digital aspects, organizational dynamics, and employee behavior in building an innovative culture. This study demonstrates how digital infrastructure, integration, and management impact employee innovation, contributing to the digital transformation literature. Experimentally, these digital qualities positively affect inventive work behavior, supporting the hypothesis that digital technologies fuel organizational innovation. The findings also highlight the moderating role of an innovative organizational atmosphere in shaping the relationships between digital factors and employee innovation, underscoring that a supportive organizational climate and culture are essential to maximizing the impact of digital investments on innovation outcomes. Knowledge-hiding behaviors as moderators underscore the importance of addressing knowledge management challenges in driving employee innovation and the need for organizations to cultivate a culture of openness, transparency, and Knowledge sharing to harness digital technologies for innovation fully. The theoretical implications of this research help us understand digital employee creativity and lay the groundwork for future research on digital transformation and organizational innovation.

This research has various implications for leaders, managers, and policymakers who aim to innovate and enhance performance through digital technologies. The findings emphasize the importance of investing in robust digital infrastructure, integrating digital technology into organizational processes and functions, and employing effective digital management strategies to drive innovation within the company (Ahmed et al., 2019). Prioritizing digital capabilities and providing tools, resources, and support for innovation can encourage creativity, experimentation, and ideation. Moderated knowledge-concealing practices underscore the need to address knowledge management issues to enhance innovation. Organizations must incentivize knowledge sharing, provide training in communication and collaboration, and foster trust and openness to promote information sharing, cooperation, and transparency. They also emphasize the role of organizational climate and culture in shaping employee creativity, highlighting the need for supportive and innovative workplaces that foster risk-taking, experimentation, and learning. A culture of innovation, support, and tools can help organizations maximize employee potential and succeed in the digital era. This report gives managers and leaders practical ideas for digital transformation and innovation.

## 5.2. Limitations and potential areas of future research

This study examines digital aspects, knowledge concealment techniques, organizational inventiveness, and staff invention; however, it has limitations. The study employs cross-sectional data, making causal association inferences problematic. Digital aspects, knowledge concealment practices, company climate, and employee innovation may be linked in longitudinal or experimental studies. The study uses self-reported data, which may be technique and social desirability-biased.

Multiple data sources, such as objective performance measurements or supervisor ratings, can help eliminate biases and enhance the validity of research. Leadership styles, organizational structures, and industry factors that may influence employee innovation are often overlooked in favor of a limited range of digital components and organizational characteristics. Future research could examine how these characteristics affect employee innovation and interact with digital aspects and knowledge concealment. This study also explores how knowledge-hiding behaviors and organizational inventive atmosphere moderate the association between digital elements and employee innovation. Still, it does not examine boundary conditions or alternative mechanisms. This study's links may be affected by organizational culture, industry dynamics, and national culture in future research. Digital literacy, technical skills, and organizational learning processes are also expected to impact employee innovation in future studies. The study's constrained environment and sample limit its applicability to other organizational or cultural contexts. Further research could duplicate the study in different industries, nationalities, or organizational contexts to test the findings and assess cross-cultural relationships. This research sheds light on the complex dynamics of employee creativity in the digital age; however, further research is needed to address its limitations and enhance our theoretical and practical understanding of organizational innovation processes.

## 6. Conclusions

This study sheds light on the complex interactions that exist between staff innovation, organizational inventive culture, information-hiding practices, and digital components in small-scale electronic firms in Pakistan. The study revealed strong positive relationships between employee innovation, management, integration, and digital infrastructure. The results highlight the importance of digital skills in fostering an innovative environment. Moreover, the relationship between employee innovation and digital attributes is moderated by information concealment. This study emphasizes that to increase innovation, knowledge management issues must be addressed. The study also found that the organization's innovative environment mitigated the effects of digital components on employee innovation. The results underscore the importance of fostering experimentation, creativity, and Knowledge sharing in the workplace to promote innovation. This research sheds light on employee creativity in the digital era (Qadeer et al., 2014). Additionally, this study provides managers and leaders with strategies for enhancing innovation and achieving a long-term competitive advantage by leveraging organizational dynamics and digital technologies.

## References

Ahmad, F., Widén, G., & Huvila, I. (2020). The impact of workplace information literacy on organizational innovation: An empirical study. *International Journal of Information Management, 51*, 102041. https://doi.org/10.1016/j.ijinfomgt.2019.102041

Ahmed, R. R., Romeika, G., Kauliene, R., Streimikis, J., & Dapkus, R. (2020). ES-QUAL Model and Customer Satisfaction in Online Banking: Evidence from Multivariate Analysis Techniques". *Oeconomia Copernicana, 11* (1), 55-89. http://dx.doi.org/10.24136/oc.2020.003

Ahmed, R. R., Hussain, S., Pahi, M. H., Usas, A., & Jasinskas, E. (2019). Social Media Handling and Extended Technology Acceptance Model (ETAM): Evidence from SEM-based Multivariate Approach. *Transformations in Business & Economics, 18*(3), 246-271.

Ahmed, R. R., Štreimikienė, D., & Streimikis, J. (2022). The Extended UTAUT Model and Learning Management System during COVID-19: Evidence from PLS-SEM and Conditional Process Modeling. *Journal of Business Economics and Management, 23*(1), 82–104. https://doi.org/10.3846/jbem.2021.15664

Arias-Pérez, J., & Cepeda-Cardona, J. (2022). Knowledge management strategies and organizational improvisation: What changed after the emergence of technological turbulence caused by artificial intelligence? *Baltic Journal of Management, 17*(2), 250-265. http://dx.doi.org/10.1108/BJM-01-2021-0027

Arias-Pérez, J., & Huynh, T. (2023). Flipping the odds of AI-driven open innovation: The effectiveness of partner trustworthiness in counteracting inter-organizational knowledge hiding. *Industrial Marketing Management, 111*, 30-40. https://doi.org/10.1016/j.indmarman.2023.03.005

Arias-Pérez, J., & Vélez-Jaramillo, J. (2022). Ignoring the three-way interaction of digital orientation, Not-invented-here syndrome and employee's artificial intelligence awareness in digital innovation performance: A recipe for failure. *Technological Forecasting and Social Change, 174*, 121305. https://doi.org/10.1016/j.techfore.2021.121305

Arsawan, I., Kariati, N. M., Shchokina, Y., Prayustika, P. A., Rustiarini, N. W., & Koval, V. (2022). Invigorating employee's innovative work behavior: Exploring the sequential mediating role of organizational commitment and knowledge sharing. *Business Theory & Practice, 23*(1), 117-130. http://dx.doi.org/10.3846/btp.2022.15684

Bai, H. (2021). Role of digital technology in transforming organizational competencies influencing green economy: moderating role of product knowledge hiding. *Frontiers in Psychology, 12*, 792550. https://doi.org/10.3389/fpsyg.2021.792550

Carvalho, L. P. D., Poleto, T., Ramos, C. C., Rodrigues, F. D. A., de Carvalho, V. D. H., & Nepomuceno, T. C. C. (2023). Predictors of digital competence of public university employees and the impact on innovative work behavior. *Administrative Sciences, 13*(5), 131.

Chen, Y., Luo, H., Chen, J., & Guo, Y. (2022). Building data-driven dynamic capabilities to arrest knowledge hiding: A knowledge management perspective. *Journal of Business Research, 139*(2), 1138-1154. http://dx.doi.org/10.1016/j.jbusres.2021.10.050

Chin, T., Shi, Y., Del Giudice, M., Meng, J., & Xing, Z. (2023). Working from anywhere: yin–yang cognition paradoxes of knowledge sharing and hiding for developing careers in China. *Humanities and Social Sciences Communications, 10*(1), 1-10. https://doi.org/10.1057/s41599-023-01744-5

Chin, T., Zhang, W., & Jawahar, I. M. (2023). Intellectual capital and employee innovative behavior in cross-border e-commerce enterprises: the moderating role of career sustainability. *Journal of Intellectual Capital, 24*(6), 1532-1549. https://doi.org/10.1108/JIC-10-2022-0193

Connelly, C. E., Zweig, D., Webster, J., & Trougakos, J. P. (2012). Knowledge hiding in organizations. *Journal of Organizational Behavior, 33*(1), 64–88. https://doi.org/10.1002/JOB.737

Dahiya, R., & Raghuvanshi, J. (2022). Validation of innovative work behaviour scale: Indian apparel manufacturing sector. *Asia Pacific Management Review*, *27*(2), 120-136.

Donate, M. J., González-Mohíno, M., Appio, F. P., & Bernhard, F. (2022). Dealing with knowledge hiding to improve innovation capabilities in the hotel industry: The unconventional role of knowledge-oriented leadership. *Journal of Business Research, 144*, 572-586. https://doi.org/10.1016/j.jbusres.2022.02.001

Firk, S., Gehrke, Y., Hanelt, A., & Wolff, M. (2022). Top management team characteristics and digital innovation: Exploring digital Knowledge and TMT interfaces. Long Range Planning, 55(3), 102166. https://doi.org/10.1016/j.lrp.2021.102166

Gafurov, I. R., Safiullin, M. R., Akhmetshin, E. M., Gapsalamov, A. R., & Vasilev, V. L. (2020). Change of the Higher Education Paradigm in the Context of Digital Transformation: From Resource Management to Access Control. *International Journal of Higher Education, 9*(3), 71-85. http://dx.doi.org/10.5430/ijhe.v9n3p71

Gao, S., & Zhao, X. (2024). Social media overload and proactive–reactive innovation behaviour: A TTSC framework perspective. *International Journal of Information Management, 75*, 102735. https://doi.org/10.1016/j.ijinfomgt.2023.102735

Hock-Doepgen, M., Montasser, J. S., Klein, S., Clauss, T., & Maalaoui, A. (2024). The role of innovative work behavior and organizational support for business model innovation. *R&D Management, 55*(1), 7-26. https://doi.org/10.1111/radm.12671

Liu, G., Liu, J., Gao, P., Yu, J., & Pu, Z. (2024). Understanding mechanisms of digital transformation in state-owned enterprises in China: An institutional perspective. *Technological Forecasting and Social Change*, 202, 123288. https://doi.org/10.1016/j.techfore.2024.123288

Manthar, S., Muhammad, G., Zahid, M., & Ahmed, R. R. (2025). Beyond Diversity Management: A Constructive Perspective on Inclusive Workplaces. *Transformations in Business and Economics, 24*(2), 501-523.

Mendling, J., Pentland, B. T., & Recker, J. (2020). Building a complementary agenda for business process management and digital innovation. *European Journal of Information Systems, 29*(3), 208–219. https://doi.org/10.1080/0960085X.2020.1755207

Mubarak, N., Khan, J., & Osmadi, A. (2022). How does leader's knowledge hiding kill innovative work behavior. Interna*tional Journal of Managing Projects in Business, 15*(7), 1048-1063. https://doi.org/10.1108/IJMPB-01-2022-0014

Nguyen, M., & Sharma, P. (2024). Interactive impact of transformational leadership and organizational innovation on online knowledge sharing: a knowledge management perspective. *Journal of Knowledge Management, 28*(4), 1164-1182. https://doi.org/10.1108/JKM-09-2022-0758

Parmar, V., & Ahmed, R. R. (2013). Factors Influencing Impulse Buying Behavior. European *Journal of Scientific Research, 100*(3), 67-79.

Pokrovskaia, N. N., Korableva, O. N., Cappelli, L., & Fedorov, D. A. (2021). Digital regulation of intellectual capital for open innovation: Industries' expert assessments of tacit Knowledge for controlling and networking outcome. *Future Internet, 13*(2), 44. https://doi.org/10.3390/fi13020044

Qadeer, S., Aqil, M., Qureshi, M. A., & Ahmed, R. R. (2014). Determinants of Unemployment in Pakistan. *International Journal of Physical and Social Sciences, 4*(4), 676-682.

Qamar, F., Afshan, G., & Rana, S. A. (2023). Sustainable HRM and well-being: systematic review and future research agenda. *Management Review Quarterly, 73*(3), 1-51. http://dx.doi.org/10.1007/s11301-023-00360-6

Ramdan, M. R., Abd Aziz, N. A., Abdullah, N. L., Samsudin, N., Singh, G. S. V., Zakaria, T., ... & Ong, S. Y. Y. (2022). SMEs performance in Malaysia: The role of contextual ambidexterity in innovation culture and performance. *Sustainability, 14*(3), 1679.

Redecker, C. (2017). European framework for the digital competence of educators: DigCompEdu (No. JRC107466). Joint Research Centre (Seville site).

Roblek, V., Meško, M., Pušavec, F., & Likar, B. (2021). The role and meaning of the digital transformation as a disruptive innovation on small and medium manufacturing enterprises. *Frontiers in Psychology, 12*, 592528. https://doi.org/10.3389/fpsyg.2021.592528

Satalkina, L., & Steiner, G. (2020). Digital entrepreneurship and its role in innovation systems: A systematic literature review as a basis for future research avenues for sustainable transitions. *Sustainability, 12*(7), 2764. https://doi.org/10.3390/su12072764

Schildt, H., Lahdenranta, K., Demir, R., & Turunen, T. (2023). Waking up to digital innovation: how organisational secrecy hampers top management focus on strategic renewal. *Innovation, 26*(4), 532-558. https://doi.org/10.1080/14479338.2022.2162530

Shaikh, F., Afshan, G., Anwar, R. S., Abbas, Z., & Chana, K. A. (2023). Analyzing the impact of artificial intelligence on employee productivity: the mediating effect of knowledge sharing and well-being. *Asia Pacific Journal of Human Resources, 61*(4). 794-820. https://doi.org/10.1111/1744-7941.12385

Tidd, J., & Bessant, J. R. (2020). *Managing innovation: integrating technological, market, and organizational change (7th Edition)*. New Jersey: John Wiley & Sons.

Ur Rehman, K., Anwar, R. S., Antohi, V. M., Ali, U., Fortea, C., & Laura Zlati, M. (2024). Driving Frugal Innovation in SMEs: How Sustainable Leadership, Knowledge Sources, and Information Credibility Make a Difference. *Frontiers in Sociology, 9*, 1344704. https://doi.org/10.3389/fsoc.2024.1344704

Wang, K., Chen, B., & Li, Y. (2024). Technological, process or managerial innovation? How does digital transformation affect green innovation in industrial enterprises? *Economic Change and Restructuring, 57*(1), 1-32. https://doi.org/10.1007/s10644-024-09598-w

Wang, T., Lin, X., & Sheng, F. (2022). Digital leadership and exploratory innovation: From the dual perspectives of strategic orientation and organizational culture. *Frontiers in Psychology, 13*, 902693. https://doi.org/10.3389/fpsyg.2022.902693

Wen, J., & Ma, R. (2021). Antecedents of knowledge hiding and their impact on organizational performance. *Frontiers in Psychology, 12*, 796976. https://doi.org/10.3389/fpsyg.2021.796976

Xu, C., Zhu, S., Yang, B., Miao, B., & Duan, Y. (2023). A review of policy framework research on promoting sustainable transformation of digital innovation. *Sustainability, 15*(9), 7169. https://doi.org/10.3390/su15097169

Xu, J., Shi, P. H., & Chen, X. (2024). Exploring digital innovation in smart tourism destinations: insights from 31 premier tourist cities in digital China. *Tourism Review, 80*(3), 681-709. http://dx.doi.org/10.1108/TR-07-2023-0468

Yao, A., Wu, J., & Cai, Z. (2024). An Empirical Study on the Influence Factors of Digital Human Resource Management on Deviant Innovation. In Proceedings of the 3rd International Conference on New Media Development and Modernized Education,

NMDME 2023, October 13–15, Xi'an, China. http://dx.doi.org/10.4108/eai.13-10-2023.2341271

Zaman, U., Nawaz, S., Anjam, M., Anwar, R. S., & Siddique, M. S. (2021). Human Resource Diversity Management (HRDM) practices as a coping mechanism for xenophobia in the transnational workplace: A case study of a multi-billion-dollar economic corridor. *Cogent Business & Management, 8*(1), 1883828. http://dx.doi.org/10.1080/23311975.2021.1883828

Zamrudi, Z. (2023). A Pathway to Counterproductive Knowledge Behaviour: Integrating Knowledge Hoarding, Knowledge Withholding, and Knowledge Hiding. *Journal of Scientometric Research, 12*(1), 211-228. http://dx.doi.org/10.5530/jscires.12.1.019

Zhai, X., Wang, M., Chen, N.-S., Ghani, U., & Cacciolatti, L. (2023). The Secret Thoughts of Social Network Site Users: A Scale for Measuring Online Knowledge-Hiding in a Knowledge Exchange (KE) Context. *Interactive Learning Environments, 31*(5), 2899-2913. http://dx.doi.org/10.1080/10494820.2021.1913608

## Annex A. Scales used

Knowledge Hiding

1. In this specific situation, I explained that I would like to tell him/her, but was not supposed to
2. In this specific situation, I explained that the information is confidential and accessible only to individuals involved in a particular project.
3. In this specific situation, I told him/her that my boss would not let anyone share this Knowledge.
4. In this specific situation, I stated that I would not answer his or her questions.

Digital Infrastructure

1. You use different digital technologies (emails, applications such as WhatsApp, Telegram, Instagram, Facebook, website, and information systems of the institution to improve communication with the community university.
2. You use digital technologies (emails, messaging apps such as WhatsApp and Telegram, videoconferencing platforms, such as Google Meet, Zoom, and Teams, cloud file storage platforms, such as Google Drive and OneDrive, management information systems to work with colleagues inside and outside your institution.
3. You carefully consider how, when, and why to use digital technologies in your unit's work processes to ensure they add value.
4. In your perception, the digital infrastructure of your institution's information systems can meet the needs of work processes in your unit.
5. You possess the necessary digital Knowledge and skills to utilize your institution's digital infrastructure.

Digital Integration

1. In your perception, the Unit's Development Plan (UDP) is integrated with the institution's digital strategy to consider the use of digital technologies.
2. In your perception, your work unit integrates digital technologies in all its subunits, using the institution's information systems platforms.

3. In your opinion, your institution's information systems facilitate the integration of data across different subunits.
4. You can freely share and use data from other subunits through the institution's information systems.
5. You consider and address potential practical or technical difficulties in making digital services available to the university community.

Digital Management

1. You actively develop your skills in digital technologies.
2. You participate in online training when you have the opportunity. (For example: online courses, webinars, virtual conferences).
3. From the digital training offered by the institution, you apply the skills and Knowledge of digital systems.
4. You use the institution's digital systems to solve internal and external demands related to your work processes.
5. You plan, document, and monitor your work processes using digital technologies. For example, use of videoconferencing platforms (Google Meet, Zoom, Teams), cloud file storage platforms (Google Drive, OneDrive), and management information systems.

Innovative Work Behavior

1. You look for opportunities to improve processes or services provided to the university community.
2. You generate ideas or solutions to improve services provided to the university community.
3. You participate in debates and meetings to contribute new ideas to your Unit Development Plan (PDU).
4. You encourage coworkers in the implementation of new ideas that support improving service to the university community.
5. You adopt the institution's digital systems in your work processes to improve the fulfillment of demands from the university community.

Organizational Innovative Atmosphere

1. Our organization's atmosphere behaviors that relate to creativity and innovation.
2. Our organization's atmosphere encourages informal meetings and interactions.
3. Our organization's atmosphere encourages employees to monitor their performance.
4. Employees take risks by continuously experimenting with new ways of doing things.
5. Our organization's atmosphere encourages employees to share Knowledge.
6. Our organization's atmosphere focuses on long-term performance and teamwork.