ADVANCE SOCIAL SCIENCE ARCHIVE JOURNAL
Available Online: https://assajournal.com
Vol. 05 No. 01. Jan-March 2026.Page# 1678-1697
Print ISSN: 3006-2497 Online ISSN: 3006-2500
Platform & Workflow by: Open Journal Systems

Digital Leadership and Employee Service Innovative A Perspective of Cognitive-Affective Processing System

Ayesha Sadaf
Ph.D. scholar, Department of Management Sciences, institute of Business Management and Administrative Sciences, The Islamia University of Bahawalpur, Pakistan
ayeshaspledu7@gmail.com
Ghazanfar Ali
Lecturer, Department of Management Sciences, institute of Business Management and Administrative Sciences, The Islamia University of Bahawalpur, Pakistan
Ghazanfar.ali@gmail.com.edu.pk

ABSTRACT
Employee's service innovative behavior is essential for any organizations to involve innovative initiatives and achieve competitive advantages during digital transformation. Although numerous researches have examined the nexus of leadership with innovative behavior, the influence of digital leadership and the factors that cultivate innovative behavior remain ambiguous. The study employed the cognitive and affective processing system model to examine the dual mediating roles of creative self-efficacy and sense of belonging in the nexus of digital leadership with service innovative behavior. We measured the theoretical model hospitality sector of Pakistan. The design of the study was cross-sectional and quantitative with 5-point Likert Scale. The findings show that dual mediating paths are significant. The study has significant implications for comprehending the effect of digital leadership on significant workers' outcomes. The limitations with direction for future research are discussed.

Keywords: *Sense of Belonging, Creative Self-Efficacy, Digital Leadership, Service Innovative Behavior*

Introduction

A leader who selects, trains, equips, and impacts his followers with numerous contributions such as skills and knowledge upsurge the followers' inclination to exercise willingly mystical, emotional, and physical in attaining the organizational goals (Winston & Patterson, 2006). Moreover, when the leaders appreciate and value their followers, they are more driven to work devotedly rather than forced submission (Li et al., 2022; Webb, 2007). Since, such kind of leadership styles are the conventional based upon governing, and controlling them to get work effectively done (Erhan et al., 2022). Conventional leadership is the one who only contemplates the behavioral style of his followers and shows their performance in an organization.

However, in the new high-tech epoch, the leaders have been following technological expansions and gaining knowledge concerning the topical vicissitudes in administrative structures. Leaders in this epoch obtain digitization skills to stimulate workforces to be innovative to perform higher since the leaders with digital competences can get work done. So, in this technological epoch, a new-fangled leadership competence is required for the organization to upkeep its competitive advantage by altering the employees' behavior (Hensellek, 2020; Tigre et al., 2023). The leadership considers technology breakthroughs to prompt organizational vicissitudes to form workplace digital (Erhan et al., 2022). The leadership style in new digital epoch inclined towards

the practice of technological transformation that develops on a huge scale. The energetic and unceasing nature of this digital epoch, organization wants a newfangled leadership style, that is digital leadership who effectively lead employees towards accomplishing their goals (Muniroh et al., 2022). It indicates that, this leadership style refers to assimilate leadership values with the usage of digital technology, abilities and skills (Zeike et al., 2019). More precisely, digital leaders accomplish the process of digital transformation in a steady way, by applying digital strategies and acclimatizing manifold leadership styles (transformational and transactional.) to achieve competitive advantages by making constructive strategy.

Digital leaders contribute effective digital transformations in the followers by stimulating them to adapt new techniques (Artüz & Bayraktar, 2021; Skopak & Hadzaihmetovic, 2022). DL accentuates vital competencies in communication, information, and usage of technology by fostering a learning-oriented culture that develops employees' abilities and skills (Ahmed et al., 2024). Digital leadership leverages new technology to develop processes and operation that uplift innovative behavior, and cultivate an atmosphere that inspires employees to examine and use digital tools (Borah et al., 2022). Several studies found positive outcomes of digital leadership like employee engagement (Zhan et al., 2024), job performance (Turyadi et al., 2023), creativity and job crafting (Zhu et al., 2022), employee motivation (Öztirak & Bayram, 2023). Numerous studies have juxtaposed the relationship between various leadership styles, such as ethical, empowering, authentic, transformational, and servant leadership, with workers' IWB (Haque & Yamoah, 2021). However, it is elicited that the traditional leadership styles fail to address the unique challenges and opportunities presented by digital environments. First, they do not effectively address the rapid pace of technological change and digital disruption (Gilli et al., 2024). Second, they lack clear strategies for supporting innovation in virtual teams, where personal interaction is limited (Abbas et al., 2024). Third, they often fail to use data and digital tools to identify and support innovation opportunities (Tigre et al., 2023). Digital leadership (DL) helps overcome these challenges by incorporating technology into leadership practices, encouraging a digital mindset among employees, and enabling expeditious knowledge sharing through online platforms (Abbu et al., 2022). DL refers to the ability of a leader to effectively utilize digital technologies, tools, and strategies to drive innovation, manage organizational change, and improve performance in a digitally driven environment (Tigre et al., 2023). Even though previous studies have found positive outcomes of digital leadership. Yet, there are negligible studies that examine the nexus and role of digital leadership to augment behavior especially in service innovation (Gao & Gao, 2024; Sagbas et al., 2023). So, we need more studies that examine how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation exclusively.

Service innovative behavior (SIB) refers to the employees' behavior taking initiative to nurture newfangled products, service, processes and bring up-to-date in existing ones for attaining competitive advantages (Kim & Lee, 2013). The expansion of newfangled ideas for creating product and service is a multifaceted transformational process that encompasses the creation, promotion as well as execution (Janssen, 2003). Though, this transformational procedure requires to necessitates digital technologies and assimilate them into their networks. Thus, its success necessitates digital leadership, that is usually accompanying with fostering an innovative culture, navigating digital transformation, and forming innovative business models (Brunner et al., 2023). Upper Echelons Theory (UET) also validates that leader with an innovative mind set and digital literacy, make strategic decision to boost innovative behavior to determine performance in service sector (Erhan et al., 2022; Mihardjo et al., 2019). Although, some researchers examined the nexus and role of digital leadership to augment behavior particularly

in-service innovation (Abbas et al., 2024; Ahmed et al., 2024; Erhan et al., 2022). Yet, there is a gap exist at the mediating level of the significant nexus how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation and the boundary conditions between sense of belonging (SOB), creative self-efficacy (CSE) and behavior in service innovation. This gap makes boundary conditions of when and how the leader transform technology in their followers to uplift behavior regarding service innovation. Here, we postulate our 1st research question: how does digital leader magnify innovative behavior in the hospitality industry?

For the answer of above question, we contemplate that employee sense of belonging and employee creative self-efficacy as two momentous mental and emotional factors that can elucidate the significant nexus and role of digital leadership to augment behavior especially in-service innovation. SOB refers to the sense of valued and sense of attachment with the atmosphere or place (Cheng & Kuo, 2015). It might be understood as a general psychological attachment, where individuals build a strong interpersonal bond with an environment or a place (Seamon, 2015). Digital leadership promotes the feeling of belonging in a working community by nurturing new opportunities for participation, articulating of affection and sharing information (Lampinen et al., 2018). So, this outcome turns employees into strong positive innovative behavior (Liu et al., 2019).

Other factor to answer that question, CSE as a significant emotional and mental factor that may elucidate the vital association and bridge between digital leadership and behavior regarding invention. CSE refers to the individual's belief or trust in his skill to harvest creative consequences (Tierney & Farmer, 2002). CSE promotes employees' discernment that he might attain creative results (Newman et al., 2018; Tierney & Farmer, 2002). Further, self-efficacy theory (Bandura, 1986) also validated that individuals' belief normally originates from their competences and skills that foster a specific behavior to augment creativity.

This study employs the cognitive and affective processing system (CAPS) model to investigate the dual mediating mechanism linking digital leadership and innovative behavior in responding to originate further research. The CAPS model basically posits that individual behavior arises from the interplay of contextual and cognitive-emotional elements (Mischel & Shoda, 1995). An external circumstance elicits cognitive and emotional responses, which subsequently trigger certain behaviors. This study explores creative self-efficacy and sense of belonging as cognitive and affective mechanisms respectively, just like prior research has theoretically established and empirically explained the mediation affective commitment and psychological empowerment in the nexus how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation (Gao & Gao, 2024). Consequently, we assert that these two mediating constructs may be employed to examine how digital leadership transforms the technology and motivation to boost the employee's behavior especially in-service innovation from both the perspective of cognitive and affective process.

If these two mediating constructs elucidate the positive association of how digital leadership transforms the technology and stimulate employee's behavior especially in-service innovation, the following question is: under what situations does this association cultivate? This association is cultivated, when employees are fully aware of their competence to equip their behavior with creativity (Mulligan et al., 2021). Literature in the area of organizational behavior designates that worker's mindfulness is a significant factor in the service sector since that foster creativity, inquisitiveness and problem-solving technique (Reb et al., 2020; Van Gelderen et al., 2019). Previous literature proposes that mindfulness as an influential moderator to enhance innovative behavior (Martín-Hernández et al., 2020). We also contend that mindfulness is a significant

employee's psychological source Zivnuska et al. (2016) that turns into innovative behavior (Reb et al., 2014). While previous studies disclosed a fruitful discussion concerning the outcomes of mindfulness, since, empirical findings are still scarce and uncover this gap especially in the hospitality industry. In specific, we slightly known concerning the association between mindfulness and individual behaviors at workplace with the boundary conditions within mindfulness produces positive outcomes in hospitality industry (Wang et al., 2021). Therefore, we suppose that workers' low mindfulness may deteriorate the positive associations between employees' creativity-centered sense of efficacy, sense of belonging, and innovative behavior in service sector.

We form considerable contributions to the current literature by assessing the model of the Study 1. First, the researches on digital leadership and innovative behavior in service sector leftovers in its infancy, with rare empirical analysis of this significant nexus– mostly conducted cross-sectional design. So, we contribute by testing this significant nexus via an inclusive moderated mediation model using a three-wave time-lagged design (Study 2). Second, the study contributes majorly through cognitive-emotional mediating mechanisms how digital leadership transforms the technology and drives the employee's behavior especially in-service innovation. These endeavors, too, update the concept of digital leadership that boost the innovative behavior. Third, we examine an indispensable yet unnoticed zone of the literature in the hospitality sector, where service innovative behavior is the valuable consequences in the context of performance of the employees. So, this study embodies a novel and exclusive contribution, mainly concerning how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation. Customers would appreciate such a behavior of frontline employees.

Digital Leadership and Service Innovative Behavior

Digital leadership (DL) possesses the ability to foster the organizations towards digitalization in an effective way (Dewi & Sjabadhymi, 2021). DL deliver good empirical skills and digital knowledge to their employees for resolving problems and enhance innovation (Benitez et al., 2022). DL encompasses employees to expand the use of technology to magnify performance (Brunner et al., 2023). Fleetingly, DL incorporates individual for assuming and executing the usage of technological expansions to enlarge productivity (AlAjmi, 2022). Upper-echelon theory (UET) narrates when leader's knowledges turn into skills that insert a substantial influence on the business as well as employees (Wang et al., 2022). So, this outcome would affect the organization as achieve its goals through digital transformation (Wasono & Furinto, 2018). Thus, such kind of suppositions of digital leadership are elucidated by UET (Erhan et al., 2022; Hambrick & Mason, 1984; Mihardjo et al., 2019). According to this theory, the characteristics of leadership affect the strategic decision of management and followers, which influence organizational behavior (Hambrick & Mason, 1984; Neely Jr et al., 2020). The theory states that leaders are the important factor that affect and implement the strategic decisions, and their influence has been regarded to regulate the performance (Erhan et al., 2022). In addition, the theory has supposed that the effect of leaders' characteristics such as diversity and are more probable to adoptive an innovative culture and experimentation that driving them to boost behavior particularly service innovation. So, it is specified that the digital capabilities of the leader effect on employees as well as the organization.

Digital leadership can effortlessly equip employees at the workplace with effective, transparent, and available digital technologies (Oberer & Erkollar, 2018). When leaders practice digital apparatuses in cooperating with their teams, they possess easier access to followers and make the way for more appeasing atmosphere among stakeholders (Erhan et al., 2022). - Digital Leadership and SIB are inter-reliant, as innovative services need leadership support and its

competencies. The UET delivers a framework for comprehending how digital leader transforms the technology to boost the employee's behavior especially in-service innovation exclusively through their decision and characteristics (Erhan et al., 2022; Hambrick & Mason, 1984; Sagbas et al., 2023).

H1: Digital leadership is positively related to service innovative behavior.

The Dual Mediating Role of Creative Self-efficacy and Sense of Belonging

Cognitive Path: The Mediating Role of Creative Self-efficacy

Creative self-efficacy (CSE) refers to the self-confidence which supports an individual to perform creative tasks under a diverse circumstance (Tierney & Farmer, 2002). When creative belief is high that becomes indispensable component for employees to carry creative work (Gong et al., 2009). Further, Bandura (1986) suggests some components of self-efficacy, such as vicarious learning (observing others), enactive mastery (work experience), social persuasion (influenced by others), and mental and emotional state. Remarkably, literatures on leadership highlight the importance of creative beliefs to promote innovative culture (Huang et al., 2016; Wang et al., 2014).

Digital leaders support their employees in numerous ways in this innovative culture. For instance, digital leaders inspire employees to apply knowledge on innovative activities, they share and combine knowledge into the team to foster reflective understanding, and also bring knowledge outside from the organization (Anwar & Saraih, 2024). Digital leaders are accountable for upholding productive communication among employees, team, and also managing across these groups to comprehend digitalization or usage of digital tools (Petry, 2018).

Tierney and Farmer (2002) argue that creative activities are thought-provoking, risky and develop inner nurturing in employees that is vital for completing creative tasks. Individuals who have a high level of CSE contemplate that they may perform innovative tasks. We argue that when individuals possess high level of innovative behavior, they perceive low uncertainty at workplace, they anticipate risk and engage in creativity. Such employees are motivated to determine innovative behavior in service sector (Gong et al., 2020; Tu et al., 2019).

Digital leader is a visionary individual with the ability to effectively lead an organization by applying digital information and communication technologies to lead the organization at the digital age (Bresciani et al., 2021). According to Miller (2018), digital leaders can advance the life expectancy with digital technologies, well-being, and innovative culture in an organization. Here, we contend that digital leaders deliver digital vision, digital skill and knowledge to the employees in their strategic decision making. This argument undertakes that digital leadership boosts the level of employee's experimentation and learns from failures by providing support and resources for creative tasks, which lead to uplift behavior especially in-service innovation. The CAPS model elucidates that employee behavior develops from contextual situation to produce cognitive factors (creative self-efficacy) that drive them to be innovative (Gao & Gao, 2024; Mischel & Shoda, 1995). So, digital leader stimulates them to fortify self-concept, overwhelm hindrances and boost them to involve in innovative behavior on which they may take pride (Gao & Gao, 2024; Susanti & Ardi, 2022). Thus, we contend that creative self-efficacy serves as the mechanism via which digital leadership transforms the technology to boost the employee's behavior especially in-service innovation. We, thus, undertake that employees' creativity-centered sense of efficacy is one of the significant paths through which digital leadership encourages their behavior particularly in-service innovation. Now, we subsequently hypothesize as follows:

H2: Digital leadership is positively related to creative self-efficacy.

H3: Creative self-efficacy is positively related to service innovative behavior.

H4: Creative self-efficacy mediates the association of digital leadership with service innovation behavior.

Affective Path: The Mediating Role of Sense of Belonging

The terms sense of belonging (SOB) in the literature of tourism refers to place belonging (Hammitt et al., 2004; Jones et al., 2000) and destination belonging that have frequently been defined the relational bond with the destination or place perceived by tourists (Kumar & Nayak, 2019). Cheng and Kuo (2015) further defined that sense of belonging in the context of destination refers to a sense of attachment with or a sense of affiliation with the environment of that destination. It may be understood as a general psychological attachment, where people foster a robust association with the place or the environment (Seamon, 2015). So, employees who perceive more psychological association to their jobs, dedicate their more energy and provide exertion toward their creativity and innovation (Mayhew et al., 2007).

Previous literatures have revealed numerous positive consequences of sense of belonging, such as employee wellbeing (Waller, 2020), job performance (Waller, 2021), engagement (Kennedy, 2021). Other literatures have revealed the predictors of sense of belonging like feedback quality, perceived organization support (Liu et al., 2022), innovation (Haddow & Brodie, 2023), support and encouragement (Lampinen et al., 2018). A comparatively previous literature of psychological ownership displays the effect of leadership in prompting employee's sense of belonging (Slamti, 2020). This review proposes that leadership styles indorse high level of sense of belonging, whereas passive leadership styles diminution the level of belonging. However, researcher did not yet find any association from previous studies that digital leadership may transform the sense of attachment and motivational level to boost the employee's behavior especially in-service innovation exclusively. The researchers argue that sense of belonging endorses to cultivate behavior regarding in-service innovation (Berisha et al., 2024; Kousina & Voudouris, 2023). Digital leaders create an environment where employees engage in making strong nexus that cultivate innovative behavior. We find no clue the association of digital leadership and sense of belonging in previous studies.

We therefore contend that digital leadership make available frontline employees with an atmosphere in which they possess sense belonging and engross innovative behavior to make contribution to the organization. Moreover, Tammelin et al. (2022) propose the usage of digital technologies enhance the feelings of belonging by establishing the nexus, providing psychological support, and re-empowering the social nexus with workers. The CAPS model validates that employee behavior develops from contextual situation to cultivate the sense of emotion (belonging) that drive them to be innovative (Gao & Gao, 2024; Mischel & Shoda, 1995). So, digital leader stimulates them to fortify the sense of belonging and encourage them to engage in innovative behavior on which they may take pride (Gao & Gao, 2024; Susanti & Ardi, 2022). Thus, we contend that sense of belonging serves as the mechanism via which digital leadership transforms the sense of motivation and commitment to boost the employee's behavior especially in-service innovation. According to the aforementioned explanation, we argue that sense of belonging delivers the technique through which digital leadership stimuli employee innovative behavior: Now, we propose the following hypothesis:

H5: The positive effect of digital leadership on the sense of belonging.

H6: The positive effect of sense of belonging on service innovation behavior.

H7: The mediating effect of sense of belonging between the association of digital leadership and service innovation behavior.

Methodology

Study

For measuring mediated model empirically. The researchers conducted online survey using Data Prolific Service to collect the data from workforces in the hospitality industry of Pakistan. This online survey was collected four weeks.

We employed the participants' Prolific IDs with unique codes to match the received data from these 3 waves. Of the 370 participants, 47% were male. Further, 37% of employees were between the range of 20 and 30 years of age, and 36% were between the range of 31 and 41 years of age. Moreover, 12% had a diploma degree and 36% had graduate degree, and 39% had 6 to 11 years of experience in the hospitality industry.

Measurement Study

To measure the digital leadership (DL) regarding employee's perception, Informatics Leadership Scale developed by Ulutaş and Arslan (2017) is applied in in both studies. Furthermore, numerous studies have applied this scale to measure digital leadership (Artüz & Bayraktar, 2021; Batur et al., 2024). This scale has total eighteen items of three dimensions with 6 items of each dimension. These three dimensions such as information, communication and orientation. Followers' perceptions of their supervisor's digital behavior are the most reliable with theory and hypothesized of this research model. In the current study, 6 items of orientation are adapted to measure digital leadership. In the current study, the purpose for measuring this dimension, specified and represent the digital leadership (Ulutaş & Arslan, 2017). For reliability and validity of this scale, Alpha is calculated as 0.97. CSE was measured through the scale developed by the researchers Tierney and Farmer (2002) with three items in both studies. Sense of belonging was measured by adapted a 4-item scale developed by the researchers (Zhao et al., 2012) in both studies. We then adapted a 6-item scale to measure SIB developed by (Hu et al., 2009) in both studies. The whole scale adapted in both studies based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

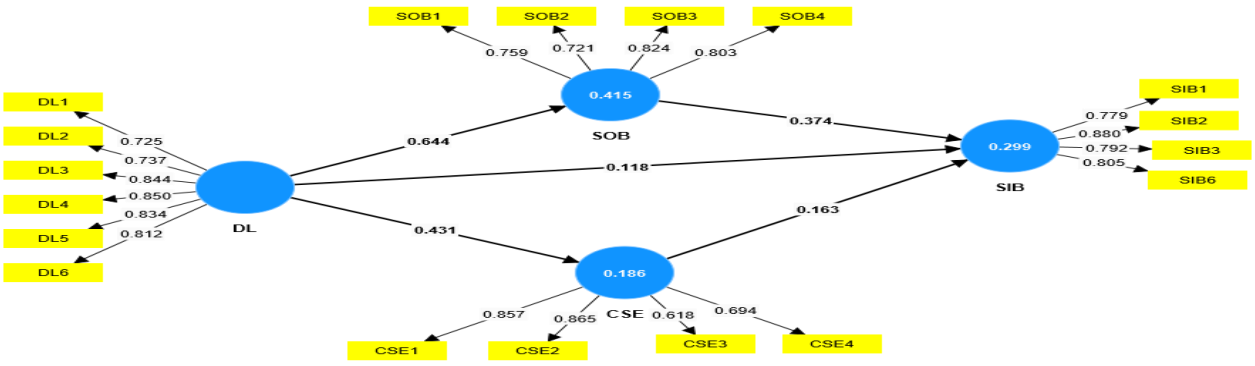
The questionnaire was used in the form of 5-point Likert scale (e.g. 1 is strongly disagree and 5 is strongly agree). We also controlled demographic variables like gender, age, education and tenure (a significant personality trait) in the hospitality industry.

Analyses and Results

We applied numerous approaches to investigate the data and measure the hypotheses. We analyze the descriptive results, missing values, data normality, multivariate outlier, and correlation. In specific, we selected full time employees with more than a year of experience. We applied the same standards and process in both studies. Data was evaluated applying partial least squares and structural equation modeling (PLS-SEM). Since, PLS-SEM validates the internal consistency in the measurement model and measure the path analysis in the structural equation model. PLS-SEM emphasizes on prediction and estimation, which valuable the best use of independent variables and dependent variable (Fong & Law, 2013).

Data Analysis

Measurement Model



In the first part of both studies, Table 1 displays the reliability of the data, validity of the data, composite reliability (CR), convergent validity (CV). The value of factor loading of each item is greater than 0.50. Cronbach's alpha (α) values in Study ranged from 0.774 to 0.881, CR values in Study ranged from 0.848 to 0.915 demonstrate that the scale is reliable. Second, the value of factor loading of each item is greater than 0.50, which shows that each construct is reliable (Hair et al., 2014). Moreover, convergent validity (CV) that measures whether two dissimilar measurement approaches produce similar results for the similar construct (Hair et al., 2017). The valuation of CV draws from the average variance extracted (AVE) test. The value of AVE for each construct is greater than 0.50, so, the CV of all constructs is acceptable.

Table 1: Internal Consistency

Constructs	Cronbach's alpha	Composite reliability	AVE
CSE	0.774	0.848	0.587
DL	0.888	0.915	0.643
SIB	0.831	0.888	0.664
SOB	0.781	0.859	0.605

Further, for validity assessment, discriminant validity (DV) was developed to test the assessment of one variable which should not correlate with others. Henseler et al. (2015) suggest Heterotrait–monotrait (HTMTs) ratio of correlations, a more accurate new criterion.

Table 2: Discriminant Validity (HTMT)

Constructs	CSE	DL	SIB	SOB
CSE				
DL	0.491			
SIB	0.412	0.486		
SOB	0.445	0.765	0.629	

The current study used this new technique for creating DV between variables. By means of a more traditional method (as the robust criterion), All values of each constructs are <0.90 in Table 2 (Gold et al., 2001). This test shows each construct is discriminant with each other. Thus, discriminant validity developed in the model.

Structural Model

Structural model measures the effect of exogenous constructs on endogenous construct directly or indirectly in the model. In Figure 2, it shows measuring a path model with both direct and indirect effects. The researchers propose that a mediation model. For measuring the mediated hypothesized model, the study measured the mediation hypotheses through SEM in PLS 4.10.

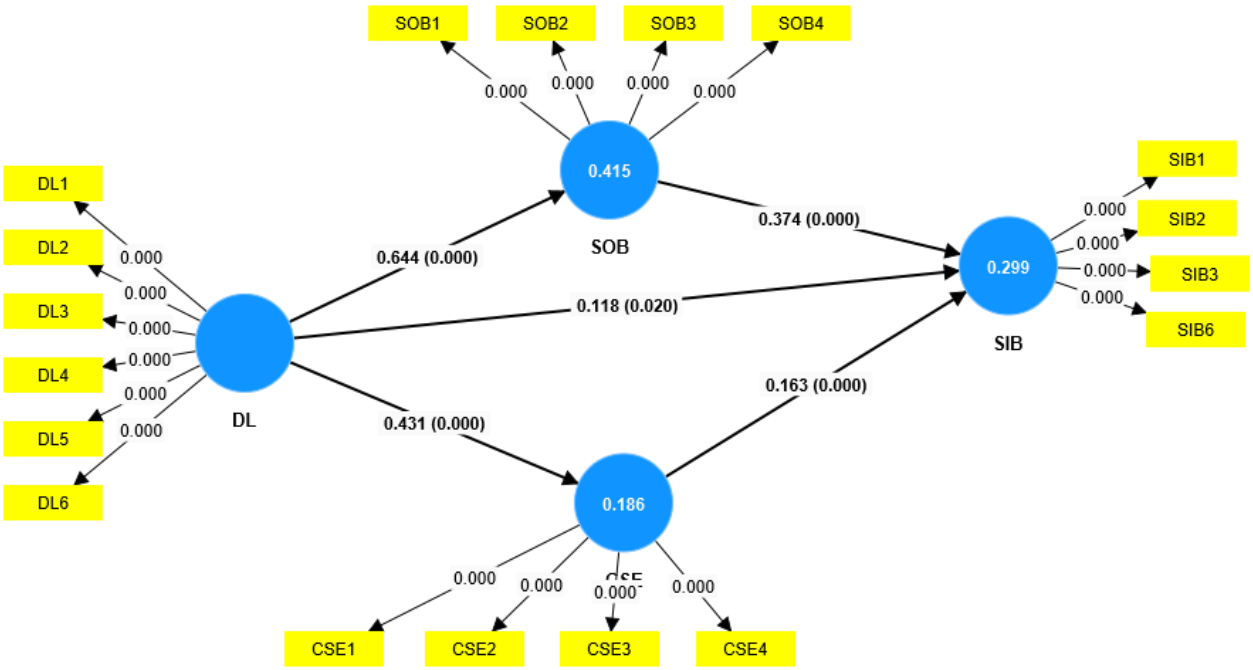


Figure 2. Path Coefficients

Table 3. Path Coefficients

Relationships	β	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
CSE -> SIB	0.163	0.044	3.671	0	Supported
DL -> CSE	0.431	0.041	10.461	0	Supported
DL -> SIB	0.118	0.057	2.058	0.02	Supported
DL -> SOB	0.644	0.029	21.922	0	Supported
SOB -> SIB	0.374	0.055	6.851	0	Supported
DL -> CSE -> SIB	0.070	0.020	3.469	0	Supported
DL -> SOB -> SIB	0.241	0.037	6.451	0	Supported

The direct effect of Creative self-efficacy on service innovative behavior is positive and significant (β=0.163, p<0.05). so, the hypothesis is positive. The direct effect of digital leadership on Creative self-efficacy is positive and significant (β=0.431, p<0.05). so, the hypothesis is positive. The direct effect of digital leadership on service innovative behavior is positive and significant (β=0.118, p<0.05). so, the hypothesis is positive. The direct effect of digital leadership on sense of belonging is positive and significant (β=0.644, p<0.05). The direct effect of sense of belonging on service innovative behavior is positive and significant (β=0.374, p<0.05). The mediating effect of creative self-efficacy on the relationship of digital leadership and service innovative behavior is significant (β=0.070, p<0.05). So, the mediating hypothesis is significant. The mediating effect of sense of belonging on the relationship of digital leadership and service innovative behavior is significant (β=0.241, p<0.05). So, the mediating hypothesis is significant.

Discussion

Drawing on the cognitive and affective processing model, this study examines the dual path mediation that clarify why and under what conditions digital leadership cultivates service innovative behavior. So, the main findings are discussed below.

We conducted this study to examine when and how digital leadership develops service innovative behavior. Drawing on UET (Erhan et al., 2022; Hambrick & Mason, 1984; Sagbas et al.,

2023). Consistent with the current study, the findings support for the direct association between digital leadership and service innovative behavior is significant (Cai et al., 2024; Sagbas et al., 2023). However, mostly previous studies, the association of digital leadership with service innovative behavior used cross-sectional design. Dissimilar to previous studies, this study inferred more precise results by using a three-wave time lagged design. Hence, this study discusses the question of rare time lagged research how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation exclusively (You et al., 2022).

Moreover, to clear comprehend how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation. We examined further to explore creative self-efficacy and sense of belonging elucidate underlying mediating mechanisms of digital leadership and innovative behavior in hospitality sector are significant and partially mediated. The CAPS model elucidates that employee behavior develops from contextual situation to produce cognitive factors (creative self-efficacy) that drive them to be innovative (Gao & Gao, 2024; Mischel & Shoda, 1995). So, digital leader stimulates them to fortify self-concept, overwhelm hindrances and drive them to involve in innovative behavior on which they may take pride (Gao & Gao, 2024; Susanti & Ardi, 2022). Thus, we contend that creative self-efficacy serves as the mechanism via which digital leadership transforms the technology to boost the employee's behavior especially in-service innovation. We, thus, undertake that employees' creativity-centered sense of efficacy is one of the significant paths through which digital leadership encourages their behavior particularly in-service innovation. Similarly, the CAPS model also validates that employee behavior develops from contextual situation to cultivate the sense of emotion (belonging) that drive them to be innovative (Gao & Gao, 2024; Mischel & Shoda, 1995). So, digital leader stimulates them to fortify the sense of belonging and encourage them to engage in innovative behavior on which they may take pride (Gao & Gao, 2024; Susanti & Ardi, 2022). Thus, we contend that sense of belonging serves as the mechanism via which digital leadership transforms the sense of motivation and commitment to boost the employee's behavior especially in-service innovation.

The results of two studies show that the direct effect of digital leadership on sense of belonging and creative self-efficacy is positive that leads to develop positive association with innovative behavior in service sector. These results make the ways how digital leadership transforms digital technology and sense of motivation and attachment with environment to boost the employee's behavior especially in-service innovation exclusively. Since, the frontline employees react differently since they possess dissimilar service innovative behaviors in the hospitality industry. They provide novel and digital quality service and present more effective techniques of packaging food, making inimitable and prompt solutions for setting the table, room management as well as housekeeping. Consistent with the current study, the findings support for the direct association between digital leadership and service innovative behavior (Cai et al., 2024; Sagbas et al., 2023). However, the mostly previous studies, the association of digital leadership with service innovative behavior used cross-sectional design to analyze. Dissimilar to previous studies, this study inferred more precise results by using a three-wave time lagged design. Hence, this study discusses the issue of rare time lagged research how digital leadership transforms the technology to boost the employee's behavior especially in-service innovation exclusively (You et al., 2022).

Further, the control variables, gender and age are insignificant and also has negative effect on innovative behavior (Caniëls et al., 2022; Ng & Feldman, 2013). Other control variables show the significant effect of both education and tenure on innovative behavior in service sector (Gong et

al., 2009; Tierney & Farmer, 2002). Since, educational level is associated to both leader and workers' professional knowledge and skills (Amabile, 1988), whereas tenure is associated to the degree of leader and employees' participation in innovative activities at workplace (Ibarra, 1993). So, we decided to control both variables, employee's education as well as tenure in this study. Drawing on UET, leadership's characteristics, education and tenure intensive effect on innovative behavior (Erhan et al., 2022; Hambrick & Mason, 1984; Sagbas et al., 2023).

Theoretical Contribution

The findings of the study can enhance the current research on digital leadership and service innovative behavior in multiple ways.

Initially, our research enhances UET by expanding the discourse on the ramifications of digital leadership (Erhan et al., 2022; Sagbas et al., 2023). Prior studies have shown that various leadership styles influence employee innovative behavior (Braojos et al., 2024; Mohamed, 2022; Munawar et al., 2024; Philip, 2021). Nonetheless, despite being a significant leadership style (AlNuaimi et al., 2022; Engesmo & Panteli, 2021), the ramifications of digital leadership remain unexamined. Our research offers empirical data about the positive impact of digital leadership on individual outcomes. particularly innovative behavior. Furthermore, we empirically address the demand for investigating the impact of digital leadership on several results (Banks et al., 2022; Tigre et al., 2023).

Secondly, our research examines the intricate cognitive and emotional processes by which digital leadership effects innovative behavior, mediated by both creative self-efficacy and sense of belonging. Prior research has examined the correlation between leadership style and employee innovative behavior through the lens of digital leadership theory (Gao & Gao, 2024), social learning theories (Iqbal et al., 2022), and self-determination theory (Guo et al., 2023), all of which originate from just one cognitive or affective pathway. The CAPS posit that individual behavior results from a synthesis of cognitive and emotional processes, and concentrating solely on one aspect is insufficient to elucidate the intricate mechanisms underlying employee innovative behavior. Consequently, employing the CAPS, our research offers a novel perspective through a dual mechanism regarding digital leadership and employee innovative behavior. This approach to analysis aligns with prior studies employing the CAPS framework to examine the correlation between leadership style and individual outcomes (Yuan et al., 2019). Additionally, we have empirically addressed the demand for further investigation into the effect of mechanisms of digital leadership (AlEssa & Durugbo, 2022).

Thirdly, our research seeks to integrate CAPS theory with UET. In the current study, UET applied to rectify the deficiencies of CAPS to examine how digital leadership influence on worker's cognitive and affective components to boost behavior especially in-service innovation. Previous research indicate that the effect of proactive personality on the direct effect of digital leadership on affective commitment and psychological empowerment (PE) is not significant, nor the indirect nexus of digital leadership and innovative behavior (Gao & Gao, 2024). Consequently, the current study offers a contingency perspective on the novel ramifications of DL and addresses the research demand for further examinations of the effectiveness of digital leadership (Erhan et al., 2022; Zhu et al., 2022).

Practical Implications

The current study has significant empirical implications for personnel, supervisors, and organizations. First, the direct and positive associations we examine between digital leadership, sense of belonging, creative self-efficacy and SIB. This framework should stimulate supervisors to properly value their digital behavior that cultivates behavior especially in-service innovation. For organizations, employee's innovative behavior is an appreciated and precious outcome.

Rendering to our findings, supervisors' digital behavior improves this outcome based on sense of belonging and employees' creativity-centered sense of efficacy that play pivotal role in mounting the employees' behavior especially in-service innovation. Therefore, organizations should promote and value leaders' digital behavior to augment behavior in service innovation. Supervisors themselves may magnify digital behavior by encouraging open communication, facilitating them with digital apparatuses and upholding vigorous interpersonal associations with employees.

They reluctant to face any kind of changes and new adaptation. Leadership should extremely contemplate this issue and formulate actual solutions to tackle this issue. For example, supervisors should communicate their employees about how to tackle uncertainty and unstructured issues. Training programs may also guide employees to magnify employee 's cognitive and affective process to foster innovative behavior.

Limitations and Future Research Directions

We analyzed an inclusive moderated mediation model applying a three-wave time-lagged research design in examining the nexus of workplace ethics to worker's service innovative behavior, the current work contains few limitations. 1st, we analyzed current model in Malaysia (collectivism Culture), where those people possess high value and intensify the level of phycological attachment with others and focuses on internal rather than external awareness and avoid self-reflection (Leary, 2017). Future studies in individualistic cultures may provide deviating findings. 2nd based on the cognitive and affective processing model, this study examined the effects of two dual path mediating mechanisms between workplace ethics and service innovative behavior. This research method is closely related to previous research (Gao & Gao, 2024), which helps to comprehensively reveal the impact of workplace ethics from multiple perspectives. Thus, future research can consider other mechanisms from various theoretical perspectives, such as social exchange theory, social learning theory, and social identity theory. Secondly, while the study employed a **longitudinal design**, capturing changes over time and strengthening causal interpretations, it still relied on **self-reported measures using a 5-point Likert scale**. This method is susceptible to **common method variance (CMV)** and **social desirability bias**, particularly on sensitive constructs such as ethical perceptions, personality traits, and innovative behavior. Although statistical remedies such as Harman's single-factor test may reduce CMV concerns, future research would benefit from **multi-source or behavioral data** (e.g., supervisor evaluations of innovation or actual service performance metrics) to triangulate findings and improve objectivity. Another limitation is the **singular use of obsessive-compulsive personality traits (OCP traits) as the moderating variable**, and its interpretation solely through **Personality Trait Theory**. While the study demonstrates that OCP traits positively moderate the relationship between creative self-efficacy and innovation, and show non-significant or negative moderation between belonging and innovation, this analysis does not consider **interactions between multiple traits** or **alternative psychological mechanisms** such as anxiety sensitivity, tolerance of ambiguity, or emotional intelligence, which may also shape how employees respond to ethical cues and internal states.

Lastly, the measurements of the main variables were self-reported by employees, which may lead them being overestimated or underestimated. 6th, incorporating **team and organizational variables**, such as innovation leadership, ethical climate strength, or group cohesion into multi-level models would allow researchers to understand how **contextual moderators amplify or buffer individual psychological responses** to ethical environments. These insights would be especially beneficial in high-turnover, high-stress service industries like hospitality. 7th, we managed the survey through online to collect the data (Prolific Academic).

Conclusion

Employee's service innovative behavior is the most valued and precious outcome in the hospitality industry. Theorizing on CAPS, this study found a positive nexus between workplace ethics and service innovative behavior in both studies. the dual path mediation, creative self-efficacy and sense of belonging between workplace ethics and service innovative behavior were significant.

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