Employee Engagement Mediate: the Impact of Digital Leadership and leadership diversity in shaping operational performance

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ARTICLE INFO	Abstract
	The hospitality business world's increased emphasis on diversity and employee engagement matches the growing importance of digital leadership in today's technological era. Nevertheless, further investigation is required to comprehend the moderating role of employee involvement in the hotel business regarding the significance of digital leadership and diversity on operational performance. The primary objective of this quantitative study is to identify and analyze the factors that influence operational performance, with a particular focus on the effects of digital leadership and leadership diversity. This study explores the influence of the mediating role that employee engagement plays between digital leadership, leadership diversity, and operational performance within the hospitality sector. Data collection involved a questionnaire distributed to managers and employees randomly at 38 five-star hotels in Sharm El-Sheikh, starting in August 2024 and continuing until the end of October. The statistical analysis utilized SPSS version 29, whereas Smart PLS 4.1.0.9 was used for modelling of structural equations. The findings indicate that digital leadership and employee engagement have significant effects on operational performance. Yet, the presence of leadership diversity did not demonstrate any effect on operational performance. The study identified that employee engagement acts as a mediator in the connection between digital leadership and operational performance. This contribution enhances the dynamic capabilities theory by highlighting the critical role of digital leadership and employee engagement in elevating operational performance within five-star hotels in Sharm El-Sheikh. The results indicate that diversity by itself may not lead to an immediate enhancement in performance; however, it should be strategically utilized to align various perspectives with shared operational objectives. The study indicates that hotels ought to allocate resources towards developing digital leadership skills, implementing training programs, fostering engagement activities, ensuring transparency, and utilizing digital platforms to improve communication and achieve operational goals.

1. Introduction

Digital leadership constitutes a contemporary dimension of leadership and is essential for enterprises seeking to maintain a competitive edge in the global marketplace (Avwokeni, 2024). The concepts of advanced digital technologies are founded on principles such as variety to

enhance efficiency, operational performance, and overall productivity (Dabić et al., 2023). Diversity represents a fundamental corporate obligation (Cole and Salimath, 2013).

Diversity agendas differ across global cultural and organizational contexts, requiring consideration (Farndale et al., 2015). Digital job tools enhance employee engagement and facilitate the advancement of their digital leadership competencies (Zia et al., 2024). Significant reflections will encompass adjustments at all levels (Lin, 2024).

The significance of the study arises from the rapid global spread of digitization, which has led to considerable worldwide changes. Consequently, digitalization is essential for enterprises in the hospitality industry to thrive in this technology era (Zia et al., 2024). Due to different points of view, diversity research often lacks metrics for effective diversity management (Holck et al., 2016). Additionally, the different definitions of employee engagement in the service industry make it even harder to understand the benefits and effects of participation (Jena and Nayak, 20224). The mediating function of employee involvement in the hospitality sector is inadequate, underscoring the need for additional research to comprehend its impact on operational performance and competitive advantages (Liu et al., 2022b).

This study enhances the literature on leadership, employee engagement, and operational performance from both practical and theoretical viewpoints. It focuses on identifying and understanding the factors influencing operational performance, specifically the impact of digital leadership and leadership diversity. It investigates the effect of these factors on employee engagement and examines the mediating role of employee engagement between digital leadership, leadership diversity, and operational performance in the hospitality industry. In theory, it offers an addition to the dynamic capabilities theory. The main aim of this study is to fill the current research gap and make substantial contributions by improving operational performance via the dynamic capability theory. The findings of this study will be of considerable importance for both local and international hotels operating globally.

2.   Literature review
2.1. Digital leadership (DL)

Digital leadership has garnered more spotlight lately (Khaw et al., 2022), with a significant gap in understanding the impact of digitalization on leadership concepts (Farhan et al., 2024). Digital leadership is crucial as organizations adapt to digital workplaces, combining tangible, cultural, and digital frameworks to work in complex, fluid, and often unstructured environments (Erhan et al., 2022). Jameson et al. (2022) declared digital leadership is an emerging multidisciplinary research domain that integrates e-leadership, technology management, and business. It encompasses social impact mechanisms facilitated by advanced information technology to alter attitudes, emotions, thoughts, actions, and achievement (Arham et al., 2024).

Philip et al. (2023) see digital leadership as a response to business strategy and declare that it competencies and leadership approaches of individuals and organizations to successfully execute a consumer-focused, digitally enabled business strategy, focusing on the implementation of appropriate actions for strategic success in digitalization (Bresciani et al., 2021). Gilli et al. (2024) define digital leadership as the ability of leaders to efficiently oversee

the process of digitalization, therefore influencing the attitudes and actions of employees that are shaped by digital technologies.

Malik et al. (2024) demonstrate that digital leadership involves leaders' technological expertise, effective implementation, and alignment of corporate strategy with digital innovation. It involves applying digital thinking to direct others, teams, or organizations, lacking consistency and universally accepted definition (Farhan et al., 2024). Digital leadership is crucial for tourism leaders to navigate decision-making, innovate, and optimize operations, but its impact on the tourism and hospitality value chain is under-explored in academic literature (Silva et al., 2023). Clarity on the skills, and methods of effective digital leadership for strategic success in the enterprise (El Sawy et al., 2020), specially on inner processes for executing a business's digital transformation strategy, as noted by (Yao et al., 2024).

Digital transformation necessitates dynamic capability, digital leadership, cutting-edge technology, data strategies, and a digital culture for competitive advantage (Hussein et al., 2024). Dynamic skills enable adaptability and renewal of expertise in changing environments (Teece et al., 1997). Dynamic capabilities theory solves limitations of resource-based view, extending resources and connecting them to performance outcomes (Wang et al., 2024a). Managers' capacity to create distinctive combinations is crucial for competitiveness (Teece, 2023).

2.2. Operational performance (OP)

In recent years, the notion of operational performance has received significant attention (Aslam and Jawaid, 2023) and is ongoing (Rompho, 2018). Operational performance measures a company's ability to convert various components into productive outputs that add value to product and service production (Culot et al., 2024). Operational performance is the method of strategy that a company uses to raise its level of competition by aligning with its strengths and weaknesses (Campo-Sierra et al., 2024), which represents the sum total of its results from operations (Liu et al., 2024a).

Improving operational performance might give an establishment an edge over others by raising its total performance (Purwanto, 2016). The competitiveness and efficiency of organizations are influenced by characteristics including longevity, job creation, revenue growth, business volume enlargement, organizational strength, client approval, satisfaction, and profitability (Agbeka et al., 2024). Operational performance can be evaluated based on various factors such as inventory reduction, quality enhancement, efficiency, on-time delivery, product diversity, quantity, waiting time, client requirements, errors, audit frequency, and production cost (Adem and Virdi, 2024). Thoumy et al., (2023) showed that key performance metrics include efficiency, productivity, waste minimization, quality, adaptability, creativity, manufacturing capacity (Masa'deh et al., 2017), and manufacturing cost (Campo-Sierra et al., 2024). Fiorello et al. (2023) provide key measures include process quality, price reduction, flexibility, effectiveness, resource use, quality enhancement, and stakeholder satisfaction. Um (2024) categorizes performance into daily monitoring, effectiveness and efficiency measurement, and non-financial indicators.

Dynamic capability theory, an extension of resource-based view (Kalali and Heidari, 2016), emphasizes the importance of organizational and managerial competences in sustaining a firm's competitive advantage over time (Teece et al., 1997), it helps figure out how operational performance is connected to changes in the work environment (Kovilage et al., 2024), which leads to better system matching and strategic implementation (Liu et al., 2024a).

2.2.1. Digital leadership and operational performance

Digital leadership significantly influences staff creativity and organizational performance, enhancing company advancement through effective leadership behaviors and knowledge management practices (Fatima and Masood, 2024). Digital leadership skills indirectly impact financial outcomes by influencing digital transformation, rather than directly enhancing financial performance (Senadjki et al., 2024). However, a few research efforts have examined how it affects improvements in performance in general (Chatterjee et al., 2023). In a while, the dynamic capabilities model enables enterprises to improve performance by enhancing digital capabilities, ensuring consumer satisfaction and market adaptability (Chen et al., 2024), and is crucial for strategic management research (Albannai et al., 2024).

H1: Digital leadership significantly and positively impacts operational performance.

2.3. Leadership diversity (LD)

Diversity literature frequently presupposes different views, resulting in a disjointed body of research (Holck et al., 2016), due to there not being enough metrics for thinking about and implementing diversity management (Jin et al., 2017). Diversity denotes a staff foundation that reflects the different viewpoints present in the wider society (Daya, 2014). Diversity encompasses demographic features that distinguish individuals from the majority group (Gip et al., 2024). Diversity serves as a catalyst for transforming an organizational culture from exclusive to inclusiveness (Sweet, 2023). Kim and Mason (2018) show a lack of leadership diversity literature, despite diversity encompassing attributes like race, sex, religious beliefs, impairments, socioeconomic status, and gender identities (Coleman, 2012). While Lee Cooke and Saini (2012) mentioned that diversity leadership is often unfamiliar in developing nations with developmental disparities and their impact on international organizations being less scrutinized (Mohan et al., 2024).

According to Kearse et al. (2022) diversity enhances representation, team effectiveness, and organizational cohesion by promoting inclusive language, enhancing communication dimensions, and facilitating identity-aligned relationships, as per Gauthier et al. (2024). Despite the increased calls to recognize the significance of diversity leaders in the leisure and hospitality industry (Gip et al., 2024). Implementing strategies aimed at enhancing diversity faces numerous obstacles (Morris-Wiseman et al., 2022), necessitating an increase in research on leadership diversity (Gip et al., 2024).

2.3.1. Leadership diversity and operational performance

Donnelly (2015) asserts that diversity improves organizational performance, profitability, creativity, adaptability, market responses, and overall growth for individuals and organizations (Downey et al., 2015). From another perspective, mixed results exist on the direct effect of diversity on operational and organizational performance, particularly for businesses aiming for financial gain (Cole and Salimath, 2013). Effective leadership practices can positively impact diversity (Jin et al., 2017).

H2: Leadership diversity significantly and positively impacts operational performance.

2.4. Employee engagement (EE)

Unfortunately, there is still no single agreed upon definition of "employee engagement" (Suan Choo et al., 2013). There are also many different and sometimes contradictory interpretations in the service industry (Jena and Nayak, 2024), which makes it challenging to understand the benefits and effects of engagement (Ly, 2024). Employee engagement, defined as a psychological condition characterized by a sense of obligation to excel and contribute to organizational objectives (Quansah et al., 2023), is a crucial aspect of work engagement, often associated with work, role, and job engagement, as defined by (Park et al., 2022). Employee engagement is a multifaceted concept involving physical, cognitive, emotional, and behavioral elements, categorized into personal resource creation, employment resource development, leadership training, and wellness promotion (Noor et al., 2023).

Employee engagement is crucial for organizational competitiveness (Obuobisa-Darko and Sokro, 2023), as committed employees demonstrate job fulfillment, completion, and pro-organizational behaviors (Lee, 2023), according to academics and practitioners. Employee engagement leads to improved financial performance (Suan Choo et al., 2013), profitability, competitive advantage, organizational objective fulfillment, and a keen interest in the firm's growth and success (Ghani et al., 2023).

The dynamic capacities theory highlights the link between resources, performance, employee adaptability and engagement in the digital age, emphasizing the importance of understanding these capabilities for organizational effectiveness (Wang et al., 2024a).

2.4.1. Digital leadership and employee engagement

In the digital age, leaders must encourage employee engagement and incorporate behavioral integration into their leadership approach, which will increase confidence and task-oriented conduct and the achievement of organizational goals (Farhan et al., 2024), with the necessity of creating a definitive goal and framework for organizational advancement within the digital landscape (Lin, 2024). Few studies have looked at how transformative leadership affects employee engagement and job performance. More research is necessary to understand the psychological factors that motivate employees (Park et al., 2022).

H3: Digital leadership significantly and positively impacts employee engagement.

2.4.2. Leadership diversity and employee engagement

Effective leaders empower their followers, promoting a two-way influence that maximizes their skills (Jin et al., 2017). Downey et al. (2015) revealed that diversity practices can alleviate discrimination and enhance workplace attitudes and performance. Global leaders improve employee engagement by fostering a happy work environment, refining onboarding processes, facilitating career advancement, and recognizing performance accomplishments (Lavigna, 2015). Understanding staff motivation, self-confidence, tenure, and age can guide efforts to improve skills (Grøn, 2024).

H4: Leadership diversity significantly and positively impacts employee engagement.

2.4.3. Employee engagement and operational performance

The literature on employee engagement in the hotel industry is inadequate (Agarwal et al., 2012), lacking extensive studies on outcomes and root causes, and lacking a theoretical framework to understand the correlations between performance and engagement (Ahmed et al., 2024). According to Bayona et al. (2020), actively involved employees play a crucial role in supporting companies' achievements by enhancing efficiency, dedication, and effectiveness. Enhanced work engagement has a beneficial effect on operational performance (Lorente et al., 2014). Leveraging the engagement of front-line personnel enhances employee well-being and fosters innovation in the hotel sector (Aly, 2024).

From another point of view, Kim and Koo (2017) saw that there is no significant direct effect found between job engagement and job performance. Which means that the task of enhancing employee engagement is intricate and demanding, due to the hotel's labour-intensive character (Masa'deh et al., 2017).

H5: Employee engagement significantly and positively impacts operational performance.

2.4.5. The mediation role of employee engagement between digital leadership and leadership diversity and operational performance.

Leadership has evolved to promote a collaborative work culture, involving location-agnostic partnerships, to enhance employee engagement (Divya et al., 2024), recognizing them as valuable assets for improved performance and productivity (Batmomolin et al., 2022). Digital leadership fosters an open-minded environment, promoting respect, autonomy, and staff engagement, leading to creative methods and improved organizational performance, with employee engagement playing a crucial role (Pratama and Amalia, 2024).

From another perspective, limited research on diversity management's impact on employee engagement is challenging (Batmomolin et al., 2022). However, Nawaz and Qayyum (2022) show that leaders who value diversity motivate employees, leading to increased productivity, profitability, and customer retention. Researchers have not sufficiently studied the role of employee involvement as a mediator in the hospitality industry. This highlights the need for more research to clarify how employees contribute to operational performance and competitive advantages (Liu et al., 2022b).

H6: Employee engagement mediates the relationship between digital leadership and operational performance.

H7. Employee engagement mediates the relationship between leadership diversity and operational performance. The initial figure outlines the study hypotheses to clarify the theoretical framework.
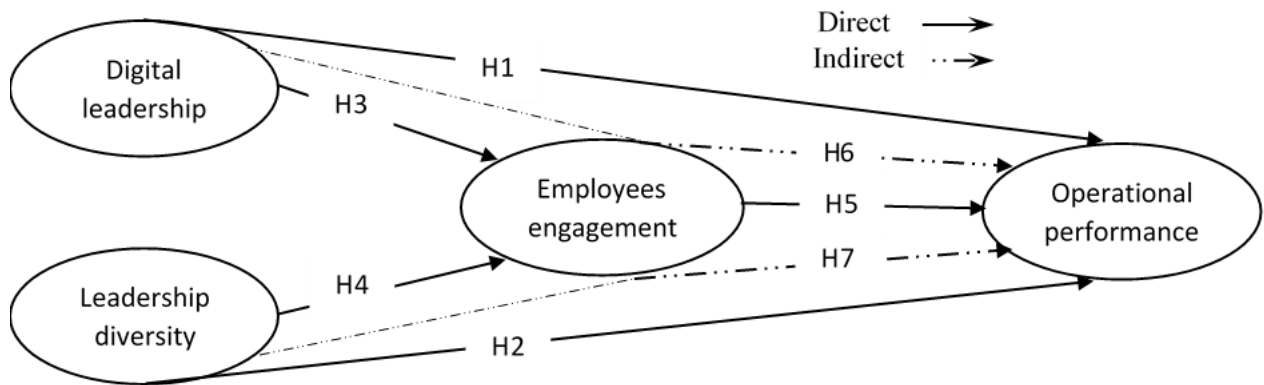
Figure1. Theoretical framework and hypotheses
Source: Author`s Work

3. Methodology

3.1 Research design

The study employed the use of quantitative methods to address the research problem, which is an accepted approach for facilitating the statistical analysis of the impact (Taleb et al., 2023). This technique enables statistical analysis to be performed and investigation of the connections between the different factors (Sharif et al., 2024).

3.2 Data collection and sample size

The researcher selects operational managers from front office, food and beverage, housekeeping, sales and marketing, and financial manager based on their influence on service supply, operational effectiveness, and direct supervision of team leadership (Madera et al., 2013). The researcher obtained permission for data collection from the head of each surveyed department. The study's objective was communicated to them, emphasizing that the information collected will be utilized solely for research purposes and that the answers they provide will remain hidden. The study also involves front-line employees in the room division and food and beverage departments, who play a crucial role in providing outstanding service and interacting with hotel guests daily, thereby meeting a variety of client needs (Mohamed, 2015).

A power analysis was conducted utilizing G*power 3.1.9.4 to ascertain the minimum necessary sample size. The power analysis results indicated that a minimum sample size of 111 is required to attain 95% statistical power for a medium effect size (0.30) at a significance level of 0.05 (Memon et al., 2023). The minimum sample size necessary for this study was 111.

According to Pirani (2024), if we apply Cochran's formula $n = \frac{z^2 (pq)}{e^2}$ know the population proportion with a 10% error margin, and know the total number of hotels in Sharm el-Sheikh, the final sample size will be 38 hotels, approximately 30% of the population randomly. For various reasons, eight hotels declined to participate in the study. Three of them were concerned that the polls might damage their reputation; another three hotels believed that the surveys could disrupt their regular operations or services; finally, two hotels believed that employees would perceive an increased workload if required to assist with survey logistics.

In the end managers and employees at 30 five-star hotels received a total of 450 forms. Sharm El-Sheikh was chosen because it is Egypt's most popular tourist destination (Egyptian Hotel Association, 2024), this makes them optimal for the examination of research-related variables, giving them a distinguished status in the competitive hospitality business (El Atiek, 2024). Five-star hotels were chosen due to their organizational environment that employs digitalization and automation to enhance business intelligence (Osei et al., 2022), along with proactive management that fosters innovation, outstanding client service, and effective performance (Salem et al., 2023). Of these, only 105 forms (70%) were valid from the 150 distributed to managers, while 228 forms (76%) had been valid from the 300 distributed to employees. The sample size employed in this study (N = 333) surpassed the required minimum number. Data were gathered from August 2024 to the end of October 2024.

3.3. Measurement scale

The researcher developed the instrument of collecting data using two surveys. The first survey was distributed to managers for measuring digital leadership, leadership diversity, and operational performance. The researcher distributes the second survey to employees to gauge their level of staff engagement. The second section of the two surveys comprises enquiries regarding the demographic attributes of the respondents. A six-item scale developed by Wang et al. (2024b) was employed to assess digital leadership. A 12-item scale developed by Gip et al. (2024) was utilized to assess leadership diversity. A 9-item scale, initially derived from Singh and Sihag (2024), is utilized to assess employee engagement. Finally, the researcher modified a five-item scale from Agbeka et al. (2024) to evaluate operational performance. Every single question was evaluated by employing a likert scale with a score of 5, with response options varying from 1 (strongly disagree) to 5 (strongly agree). Two professors reviewed the questionnaire in order to validate the survey responses concerning face and content truthfulness, ensuring their compatibility, simplicity, and logical structure. Validity of content evaluates relevance, representational accuracy, and completeness (Memon et al., 2023), in accordance with the investigation's aims.

3.4. Data analysis

Typically, most researchers employed SPSS to analyze demographic data (Sharif et al., 2024). The evaluation of study hypotheses through structural equation modelling was undertaken using Smart PLS 4.1.0.9, employing a methodologically rigorous methodology that included comprehensive analyses. The exceptional integration of SPSS with Smart PLS, facilitates a comprehensive analysis of the data's underlying structure and stringent hypothesis testing

(Ramayah et al., 2018). The PLS-SEM methodology is optimal for assessing employee engagement because it mitigates biases and enhances the creation of linkages through mediating roles (Di Prima et al., 2024).

4.   Results

4.1   Demographic information.

   Table 1 indicates that 44.1% of the sample falls within the age range of 21 to less than 32 years, with a considerable majority of 74.2% distinguishing as male and 25.8% as female. The participation of women in the workforce is minimal, largely due to parental opposition to females working in the hospitality sector and prevailing religious beliefs (Yasin et al., 2019). A remarkable 92.7% of those surveyed possess a bachelor's degree. The respondents' tenure at the same hotel exhibits a diverse distribution; 31.2% possess less than one-year experience, approximately 32.7% of respondents possess substantial expertise in hospitality, ranging from 10 years to less than 15 years. Furthermore, the food and beverage department made a notable contribution of 33.3%. The employees constitute 68.5%, while managers account for 31.5% of the total respondents.

Table1. Profile of respondents (N=333)

Variable	Category	Frequency	Percentage
Age	From 21 to less than 32	147	44.1
	From 32 to less than 43	86	25.8
	From 43 to less than 54	69	20.7
	ᵒ4 and older	31	9.3
Gender	Male	247	74.2
	Female	86	25.8
Educational Level	Bachelors	281	92.7
	Masters	14	4.6
	PhD	8	2.6
	Others		
Year of experience in the same hotel	Less than 1 year	104	31.2
	From 1 year to less than 5 years	84	25.2
	From 5 years to less than 10 years	92	27.6
	10 years and above	53	15.9
Total experience	Less than 5 years	65	19.5
	From 5 years to less than 10 years	83	24.9
	From 10 years to less than 15 years	109	32.7
	15 years and above	76	22.8
Job title	Front office manager	21	6.3
	Food and beverage manager	25	7.5
	Executive housekeeper	27	8.1
	Sales and marketing manager	17	5.1
	Financial manager	15	4.5
	Front office employee	69	20.7
	Food and beverage employee	86	25.8
	Housekeeping employee	73	21.9
Position	Manager	105	31.5
	Employee	228	68.5

source: author`s work.

4.2 Reliability and validity of scales

Utilizing measures of reliability, validity, and model fit, the PLS-SEM model evaluated the effectiveness of the proposed framework (Divya et al., 2024). The researcher evaluated the construct for convergent validity, composite reliability, internal consistency, and discriminant validity. According to the study by Cheung et al. (2024), convergent validity requires the mean, standard deviation, average variance extracted, cronbach's alpha, and composite reliability to all exceed 0.5. For both cronbach's alpha and composite reliability, they had to be higher than 0.7. The model's fitness, along with the reliability and validity metrics of the items, determined the efficacy of the scales. This is illustrated in Table 2.

Table. 2 Items means, standard deviation, AVE, CR and Cronbach alpha

Constructs	Items	Factors loading	Mean	Standard deviation	AVE	CR	Cronbach's alpha
Digital leadership	DL1	0.846	3.596	1.18		0.933	0.863
	DL2	0.879	3.626	1.203			
	DL3	0.885	3.707	1.166	0.699		
	DL4	0.792	3.788	1.085			
	DL5	0.906	3.646	1.157			
	DL6	0.69	3.616	1.237			
Leadership diversity	LD1	0.772	3.576	1.19		0.948	0.750
	LD2	0.908	3.808	0.929			
	LD3	0.846	3.919	0.939			
	LD4	0.855	3.808	0.971			
	LD5	0.751	3.929	0.913			
	LD6	0.789	4.01	0.759	0.604		
	LD7	0.647	3.848	0.936			
	LD8	0.733	3.848	0.925			
	LD9	0.843	3.899	0.859			
	LD10	0.726	3.98	0.816			
	LD11	0.697	4	0.791			
	LD12	0.718	3.97	0.717			
Employee engagement	EE1	0.84	3.96	0.724		0.955	0.786
	EE2	0.724	4.051	0.757			
	EE3	0.771	3.778	0.883			
	EE4	0.912	3.859	0.739			
	EE5	0.854	3.848	0.687	0.703		
	EE6	0.912	3.859	0.766			
	EE7	0.828	3.727	0.851			
	EE8	0.798	4.141	0.791			
	EE9	0.889	4.192	0.72			
Operational performance	OP1	0.826	3.97	0.893		0.911	0.796
	OP2	0.84	4.101	0.859			
	OP3	0.786	4.101	0.81	0.672		
	OP4	0.884	3.96	0.84			
	OP5	0.757	3.879	0.988			

Note(s): CR: composite reliability, AVE: Average variance extracted
Source: Author`s work

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4.4 Discriminant validity

Unlike convergent validity, discriminant validity assesses the distinctiveness and specificity of various constructs in empirical data, supported by the characteristics of the indicator (Henseler et al., 2015). If the heterotrait-monotrait (HTMT) ratio of correlations is less than 0.85 for separate components and less than 0.90 for related constructs, then the test is considered to be discriminant valid (Lim, 2021). Table 3 demonstrates that all calculated HTMT values from the data are less than 0.90. This indicates strong discriminant validity and sufficient differentiation between the constructs. Zia et al. (2024) also set the rule that the square root of the average variance extracted for a construct must be greater than the correlation coefficient for that construct. The study ultimately achieves discriminant validity.

Table 3. Discriminant validity

	DL	EE	LD	OP
Digital leadership	0.836			
Employee engagement	0.584	0.838		
Leadership diversity	0.534	0.673	0.777	
Operational performance	0.590	0.718	0.513	0.819

Note(s): DL: Digital leadership, LD: Leadership diversity, EE: Employee engagement, Op: Operational Performance
Source: Author`s work

1.5 Testing the hypotheses

4.5.1 Structural model (direct impact)

Table 4 and Figure 2 display the results of the hypothesis testing. The researcher posited that digital leadership has a significant and positive influence over operational performance. The results indicate that this link is significant, with a significance level below 0.05 (H1: β 0.262, p 0.008, t 2.640). Additionally, the researcher proposed that leadership diversity significantly and positively impacted operational performance. The results indicate that this association is inconsequential (H2: β -0.013, p 0.906, t 0.118). Our third hypothesis posited that digital leadership has an important and positive impact on employee engagement, which was confirmed (H3: β 0.314, p 0.00, t 3.768). Furthermore, it had been suggested that leadership diversity had a massive and positive effect on employee engagement, and the results corroborated this assertion (H4: β 0.505, p 0.00, t 6.223). The study posits that employee engagement has a significant and positive effect on operational performance, as seen by the data (H5: β 0.573, p 0.00, t 4.470).
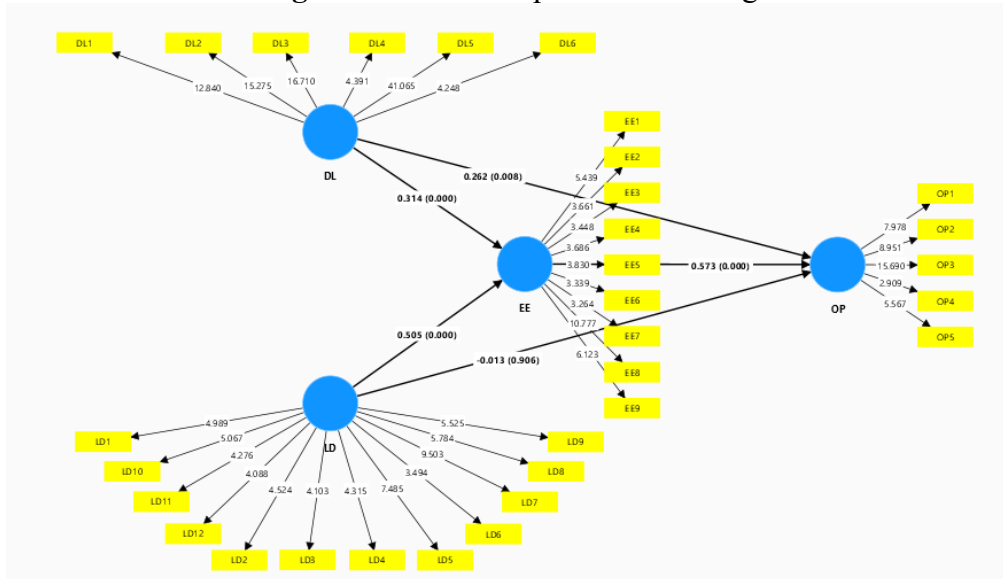
Table. 4 Hypothesized path coefficients

Hypotheses	Direct paths	B	P-values	T- values	Conclusion
H1	DL -> OP	0.262	0.008	2.640	Supported
H2	LD -> OP	-0.013	0.906	0.118	Not supported
H3	DL -> EE	0.314	0.000	3.768	Supported
H4	LD -> EE	0.505	0.000	6.223	Supported

| H5 | EE -> OP | 0.573 | 0.000 | 4.470 | Supported |

Source: Author`s work

Figure.2 Structure equation modelling

Source: Author`s work

4.5.2 Mediation hypothesis (indirect effect)

The researcher utilized the Zia et al. (2024) method for analyzing the mediation effect, which asserts that an indirect effect of zero signifies the absence of mediation. Table 5 illustrates the findings. It was hypothesized that employee engagement serves as a mediator in the relationship between digital leadership and operational performance. The results provide support for this hypothesis (H6: β = 0.180, p = 0.003, t = 3.023). It was hypothesized that employee engagement serves as a mediator in the relationship between leadership diversity and operational performance (H7). The findings further corroborate this hypothesis (H7: β 0.290, p 0.001, t 3.241). Support has been obtained at a statistically significant level of 5% ($p < 0.05$).

Table. 5 Results of specific indirect effects

Hypotheses	Indirect paths	B	P-values	T- values	Conclusion
H6	DL -> EE -> OP	0.180	0.003	3.023	Supported
H7	LD -> EE -> OP	0.290	0.001	3.241	supported

Source: Author`s work

4.6. Model Fit

The model includes R^2 values to account for the variance in the independent variables (digital leadership and leadership diversity) and the dependent variables (employee engagement and operational performance). Ozili (2023) indicates that an R-squared value between 0 and 0.09 is inadequate for models in social science research, whereas an R-squared value exceeding 0.10 up to 0.99 is considered statistically significant and acceptable.

Established boundaries classify the R^2 values for employee engagement (0.523) and operational performance (0.559) as moderate. This indicates that digital leadership and leadership diversity have a moderate explanatory effect on employee engagement and

operational performance. The adjusted R^2 values (0.513 for employee engagement and 0.545 for operational performance) closely align with the R^2 values, indicating the relevance of the indicators and the fitness of the model. This demonstrates the impact of digital leadership and leadership diversity on employee engagement, highlighting engagement as a crucial factor for enhancing operational performance within the hospitality industry.

5. Discussion

This study examines the effects of digital leadership, leadership diversity, and employee engagement on operational performance within five-star hotels in Egypt's hospitality sector. The research shows that digital leadership (H1) and employee engagement (H5) have a positive and significant effect on operational performance. When employees are engaged, they are more motivated, more efficient, and more dedicated to providing excellent service, which leads to better performance outcomes. This aligns with the previous findings of Hooi (2024), which indicated that employee engagement is a fundamental element of organisational and operational success.

However, the study found that leadership diversity (H2) did not have any significant impact on operational performance. Perhaps diversity in leadership alone won't naturally improve operations in five-star hotels; rather, adherence to established procedures and regulations is more significant than diversity in leadership. According to Mulqueen et al. (2012), this focus is different from what they found, they said that managers who are diverse and welcoming are better at bringing in new business, encouraging new ideas and solutions, and giving better customer experiences than managers who are less varied and welcoming, which hurts operational performance.

This study examines the impact of digital leadership and leadership diversity on employee engagement. The study's results demonstrate that both indicators (H3) and (H4) exert positive and significant effects on employee engagement within five-star hotels. Digital leaders that embrace technology enable employee possession of resources, enhance interaction between employees and management, and refine feedback systems, ultimately fostering a positive work culture. The direct impact of digital leadership on employee engagement aligns with previous research indicating a positive relationship between digital leadership and employee engagement (Grøn, 2024), and facilitates the development of future digitized leadership skills (Zia et al., 2024). Downey et al. (2015) assert that the relationship between diversity practices and employee engagement remains unexplored. The research indicates that leadership diversity at five-star hotels improves employees' sense of belonging and engagement by cultivating an atmosphere of understanding and respect, which contrasts with the declaration of Jin et al. (2017).

The research findings demonstrate that employee engagement serves as a mediator in the relationship between digital leadership and operational performance (H6), as well as between leadership diversity and operational performance (H7). This result is consistent with the current body of literature. The mediating role of employee engagement between digital leadership and operational performance aligns with the previous findings of Pratama and Amalia (2024), which indicate a positive correlation between digital leadership and the achievement of

organizational objectives, with employee engagement acting as a crucial mediator of this effect. Diversity in leadership cultivates an inclusive atmosphere, improving engagement and operational results. The prior findings align with Nawaz and Qayyum (2022), who asserted that leaders prioritizing diversity and inclusion inspire staff, resulting in enhanced efficiency, profits, and loyalty to clients.

6. Theoretical contribution

This study offers multiple creative improvements to the knowledge. At first, it looks at how employee engagement affects the relationship between digital leadership, leadership diversity, and operational effectiveness. The hospitality industry has not extensively explored this area in the past. This endeavour facilitates future study and elucidates the mechanisms that underlie these correlations.

This research adds to the dynamic capabilities theory by emphasizing the essential influence of digital leadership and staff engagement on improving operational performance in five-star hotels. Although dynamic capabilities usually focus on adaptability and flexibility, the researcher results show that diversity in leadership probably will not immediately improve operational performance. It may be necessary to modify the dynamic capacities theory to incorporate the notion that diversity alone cannot enhance performance. We must strategically utilise it to connect diverse perspectives to shared operational objectives. Employee engagement is a key link between digital leadership and leadership diversity, this is because digital leadership boosts engagement by providing resources, making communication easier, and strengthening feedback systems, which in turn gives important insights for further conceptual improvement.

7. practical Implication

The findings of this study have several ramifications for leaders, employees, and hotel management. Hotels ought to make an investment in cultivating digital leadership skills to optimize procedures, refine decision-making, and elevate communication. Training programs can enable managers to utilize digital tools proficiently. Emphasizing engagement activities, promoting transparent communication, and acknowledging employee accomplishments helps cultivate a motivated team. Diversity can bolster morale and collaboration, thereby indirectly facilitating operational objectives. Investment in digital platforms can enhance communication and optimize tasks. Employing mobile applications or virtual platforms helps connect employees and management, fostering a unified work culture. The outcomes of this study have numerous implications for practitioners seeking to promote innovative work behaviour in the work environment.

8. Limitations and future directions

The research examines the influence of digital leadership, leadership diversity, and employee engagement on operational performance in five-star hotels in Sharm El-Sheikh. The study's conclusions could not be appropriate to other industries or locations with distinct operational frameworks, standards of conduct, and expectations among staff. The study assumes a specific level of technological preparedness, similar to that of five-star hotels, suggesting that the

benefits of digital leadership may not apply universally. The study recognizes that participation levels may differ between institutions and circumstances.

The research possesses multiple limitations. First, the research demonstrates the impact of digital leadership and leadership diversity on operational performance in the hospitality industry, which may lead to different outcomes depending on the industry. Secondly, the results derive from responses to surveys, which might not prove appropriate for future theoretical development. Thirdly, while the research took place in August, September, and October, it might not fully assess the long-term impacts of hotels providing digital job tools. Longitudinal research may be more appropriate for tracking observable outcomes. Finally, we must carefully structure future studies to reduce measurement bias.

9. Conclusion

The research conducted at five-star hotels in Sharm el-Sheikh highlights the substantial influence of digital leadership and leadership diversity on enhancing employee engagement and, subsequently, operational effectiveness.

This study hypothesis test revealed a strong beneficial effect of digital leadership on operational performance but did not elucidate the effects of leadership diversity on operational performance. Digital leadership and leadership diversity greatly influence employee engagement, which mediates the relationship between the two. These findings provide significant insights into the development of leadership strategies and staff engagement initiatives within the hotel industry, with the aim of improving operational performance.

This study adds to the theory of dynamic capabilities by showing how important digital leadership and leadership diversity are. It also shows how hotels can rearrange their skills to adapt to environments that change quickly. Utilizing these tools to improve employee engagement, organizational agility, and operational performance.

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Appendix1: Questionnaires form

https://docs.google.com/document/d/1hW34p1yoLiw6xYokboKiCTvYD8ogKb9xQv-mJidHd7A/edit?tab=t.0

الملخص باللغه العربية

أثر تنوع القيادة والقيادة الرقمية على الأداء التشغيلى: الدور المعدل لمشاركة العاملين

يحــي زكريــا السيــد علــي

قسم ادارة الفنادق– المعهد المصري العالي للسياحة والفنادق– جمهورية مصر العربية

إن التركيز المتزايد في عالم الضيافة على التنوع ومشاركة الموظفين يتوافق مع أهمية القيادة الرقمية في العصر الحالي. ومع ذلك، هناك حاجة إلى مزيد من التحقيق لفهم الدور المعدل لمشاركة العاملين في مجال الفنادق. يتمثل الهدف الأساسي من هذه الدراسة هو تحديد وتحليل العوامل التي تؤثر على الأداء التشغيلي، مع التركيز بشكل خاص على تأثير القيادة الرقمية وتنوع القيادة. تستكشف هذه الدراسة تأثير الدور الوسيط الذي تلعبه مشاركة العاملين بين القيادة الرقمية وتنوع القيادة والأداء التشغيلي داخل قطاع الضيافة. وقد شملت عملية جمع البيانات استبيانًا تم توزيعه على المديرين والموظفين عشوائياً في 38 فندقًا من فئة الخمس نجوم في شرم الشيخ، بدءًا من شهرأغسطس ٢٠٢٤ وحتى نهاية شهر أكتوبر. تم استخدم برنامج SPSS لتحليل البيانات الديموغرافية بالإضافة إلى برنامج Smart PLS لنمذجة المعادلات الهيكلية. تشير النتائج إلى أن القيادة الرقمية ومشاركة العاملين لهما تأثير ذات دلالة إحصائية على الأداء التشغيلي. ومع ذلك، فإن وجود تنوع القيادة لم يثبت أي تأثير على الأداء التشغيلي. وحددت الدراسة أن مشاركة العاملين يعمل كوسيط في العلاقة بين القيادة الرقمية والأداء التشغيلي. وتعزز هذه المساهمة نظرية القدرات الديناميكية من خلال تسليط الضوء على الدور الحاسم للقيادة الرقمية ومشاركة العاملين في رفع الأداء التشغيلي داخل الفنادق ذات الخمس نجوم. وتشير النتائج إلى أن التنوع في حد ذاته قد لا يؤدي إلى تحسن فوري في الأداء؛ ومع ذلك، يجب استخدامه كاستراتيجية لمواءمة وجهات النظر المختلفة مع الأهداف التشغيلية، وتشير الدراسة إلى أنه يجب على الفنادق تخصيص مزيد من الموارد لتطوير مهارات القيادة الرقمية، وتنفيذ برامج التدريب، وتعزيز أنشطة المشاركة، والاستفادة من المنصات الرقمية لتحسين الاتصال وتحقيق الأهداف التشغيلية.

الكلمات المفتاحية: القيادة الرقمية؛ تنوع القيادة، مشاركة العاملين، الأداء التشغيلى.

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