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Article

Unlocking sustainable competitive advantage: The catalytic role of digital talent and knowledge workers in digital leadership in tourism and hospitality industry

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Abstract: The study aims to investigate the impact of digital leadership on sustainable competitive advantage, digital talent, and knowledge workers. Additionally, it explores the mediating role of digital talent (DT) and knowledge workers (KW) in the relationship between digital leadership (DL) and sustainable competitive advantage (SC), using the Technology Acceptance Model (TAM) as its theoretical foundation. The researchers employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine survey data from 784 employees working in Egyptian travel agencies and tour operators. The results demonstrate that DL significantly enhances SC, DT, and KW. Moreover, DT and KW were shown to positively contribute to SC and serve as partial mediators in the relationship between DL and SC. The findings highlight the crucial role of developing DT and creating an environment that embraces technological acceptance and innovation. This approach amplifies the strategic effectiveness of DL, ultimately contributing to long-term organizational success.

Keywords: digital leadership; sustainable competitive advantage; digital talent; knowledge worker; travel agency; tour operator

1. Introduction

Digital leadership has become vital in the tourism and hospitality sector to address rapid technological changes and shifting consumer expectations. It drives innovation, fosters continuous improvement, and leverages digital tools to enhance operational efficiency and customer experiences. Digital leaders play a key role in guiding organizations through digital transformation, integrating AI and other technologies into operations, and aligning digital strategies with sustainability goals. By adopting digital leadership, businesses in this sector can adapt to market changes, improve their competitive advantage, and ensure sustainable long-term growth (Hussein et al., 2024; Jasim et al., 2024).

Organizations in the digital tourism sector face the challenge of attaining a sustainable competitive advantage by adeptly utilizing technology, encouraging innovation, and staying adaptable in a swiftly evolving market (Alsheref et al., 2024). Digital leadership plays a critical role in achieving a sustainable competitive advantage by spearheading the adoption and effective utilization of digital technologies, promoting innovation, and aligning technological efforts with strategic business objectives (Sheninger, 2019). It steers organizations through digital transformations, boosts operational efficiency, and facilitates tailored customer experiences. Digital leadership fosters a culture of continuous learning and adaptability, essential for

maintaining competitiveness in the fast-paced digital environment. By harnessing data analytics, AI, and other digital tools, digital leadership uncovers new opportunities, optimizes processes, and enhances decision-making, thereby driving long-term success and sustainability for the organization (Niu et al., 2022; Yansen and Yujie, 2023).

Digital leadership plays a pivotal role in attracting, developing, and retaining digital talent and knowledge workers. Leaders who foster innovation, collaboration, and continuous learning create an environment that appeals to skilled, tech-savvy professionals (Hussein et al., 2024; Sheninger, 2019). By encouraging experimentation with emerging technologies, informed risk-taking, and leveraging individual expertise, digital leadership enhances employee purpose and autonomy. Additionally, a focus on upskilling, cross-training, and knowledge-sharing ensures teams stay ahead of technological advancements and continuously improve their digital capabilities. This strengthens the organization's digital talent pipeline, knowledge base, and overall market competitiveness (Bonesso et al., 2019; Dobrin, 2024; Ismail et al., 2023).

A strong pool of digital talent and a knowledgeable workforce is crucial for achieving sustainable competitive advantage in the digital era. Skilled professionals contribute technical expertise and innovative approaches to develop advanced solutions, optimize operations, and enhance customer experiences. Organizations that effectively attract, develop, and retain such talent gain a competitive edge (Al-Nagar, 2024; Chauhan and Thangavelu, 2024). Continuous upskilling, collaboration, and knowledge-sharing among knowledge workers further enhance adaptability and responsiveness to market dynamics. These workers identify emerging trends, anticipate disruptions, and drive transformative strategies, ensuring long-term competitiveness and resilience (Patalas-Maliszewska, 2013; Saleh and Saad, 2023).

The Technology Acceptance Model (TAM) asserts that the perceived usefulness and ease of use of technology are crucial in influencing user acceptance and adoption (Marangunić and Granić, 2015). Leaders who effectively articulate the benefits of digital transformation and empower their teams to adopt new technologies are more likely to foster a digitally-savvy workforce (Verma et al., 2022). These digital talent and knowledge workers have the skills necessary to create innovative digital solutions, streamline operations, and improve the customer experience—key factors in securing a sustainable competitive advantage (Sen, 2020). Utilizing insights from TAM, organizations in the tourism and hospitality sector can gain a deeper understanding of how digital leadership can enhance digital skills and knowledge-sharing practices, thereby fostering long-term competitiveness in an ever-evolving digital environment.

While existing research on digital leadership, digital talent, knowledge workers, and sustainable competitive advantage has predominantly concentrated on industries such as IT, manufacturing, and retail (Kianto et al., 2019; Mihardjo et al., 2019), there is a notable gap in studies specifically targeting the tourism and hospitality sector. This industry faces unique challenges and opportunities in digital transformation, including rapid technological advancements and shifting market demands (Ratna et al., 2024). Understanding how digital leadership can effectively harness digital talent and knowledge workers is crucial for maintaining competitiveness in this dynamic environment.

Although the Technology Acceptance Model (TAM) has been extensively employed to analyze technology adoption, its use in exploring the role of digital talent and knowledge workers within the context of digital leadership and competitive advantage remains underdeveloped. Investigating how TAM's concepts of perceived usefulness and perceived ease of use impact the acceptance and effective utilization of new technologies by digital talent can offer valuable insights into improving organizational performance and ensuring sustainability.

The role of digital talent and knowledge workers as mediators between digital leadership and sustainable competitive advantage has not been extensively examined. Existing research often emphasizes direct relationships without delving into these essential mediating factors. Exploring these mediating effects could illuminate how digital leadership impacts competitive advantage indirectly by enhancing the capabilities and motivations of digital talent and knowledge workers.

In light of these research gaps, this study aims to assess the influence of digital leadership on sustainable competitive advantage, digital talent, and knowledge workers within tourism and hospitality organizations. It will evaluate how digital talent and knowledge workers contribute to achieving a sustainable competitive edge. Importantly, the study will also investigate whether digital talent and knowledge workers mediate the relationship between digital leadership and sustainable competitive advantage.

Addressing these research gaps and objectives will offer valuable insights into the intersection of digital leadership and competitive advantage within the tourism and hospitality industry. By examining the mediating role of digital talent and knowledge workers through the Technology Acceptance Model (TAM), this study aims to enhance our understanding of how digital leadership can foster sustainable competitive advantage in this dynamic sector. This research contributes to the literature by elucidating the mechanisms through which digital leadership influences organizational success in the face of technological advancements and shifting market conditions.

2. Literature review and hypotheses development

2.1. The effect of digital leadership on sustainable competitive advantage

Digital leadership is the capacity of an organization's leaders to effectively drive and manage digital transformation. This involves steering the adoption and integration of digital technologies, cultivating a culture of innovation, and aligning digital strategies with the organization's overarching objectives (Hussein et al., 2024). On the other hand, sustainable competitive advantage refers to the enduring edge an organization maintains over its competitors, achieved through unique resources, capabilities, or strategies that provide exceptional value to customers and are difficult for competitors to replicate, thus ensuring ongoing success and market leadership (Al-Romeedy and Abdelfattah, 2023; Alsheref et al., 2024). In the swiftly changing digital environment, the importance of digital leadership for organizations striving to secure and sustain a competitive edge is growing exponentially (Vaz, 2021). Digital leadership involves crafting a clear strategic vision that embraces digital transformation, setting ambitious goals, and developing a strategic roadmap to harness

digital technologies for competitive advantage. By ensuring that digital transformation efforts are closely aligned with the organization's fundamental objectives, effective digital leadership facilitates the seamless integration of digital solutions into business processes, enhancing overall efficiency and effectiveness (Sheninger, 2019). Digital leadership fosters innovation by motivating teams to experiment with new technologies, take informed risks, and create innovative digital solutions. This entrepreneurial mindset allows organizations to distinguish themselves and develop unique, difficult-to-imitate digital capabilities. Furthermore, digital leaders cultivate dynamic work environments that attract and retain top tech talent by providing opportunities for career advancement, autonomy, and a sense of purpose, ultimately building a skilled workforce that enhances long-term competitiveness (Jasim et al., 2024; Marr, 2020). So, the following hypothesis is suggested:

H1: Digital leadership positively affects sustainable competitive advantage.

2.2. The effect of digital leadership on digital talent

Digital talent includes individuals skilled in leveraging digital technologies, data analytics, and innovative practices to drive organizational success in the digital age (Al-Nagar et al., 2023). Digital leadership promotes ongoing learning and professional development to keep teams abreast of the latest digital tools, methods, and industry standards (Ismail et al., 2023). This includes facilitating access to training programs, industry certifications, and cross-functional projects that enhance employees' digital skills. By prioritizing the growth and upskilling of digital talent, digital leadership ensures a workforce that is equipped to foster innovation and adaptability, preparing the organization for future challenges (Sheninger, 2019). Digital leadership creates a dynamic and collaborative work environment that attracts and retains digital professionals. By fostering a culture of autonomy, innovation, and risk-taking, it encourages employees to experiment, take ownership, and share creative ideas. Providing meaningful work, growth opportunities, and a sense of purpose helps reduce turnover and maintain a stable, high-performing team (Chauhan and Thangavelu, 2024; Hussein et al., 2024). Strategically, digital leadership aligns the organization's digital talent with its priorities by assessing workforce capabilities and deploying cross-functional teams to address complex, impactful projects. This ensures the effective utilization of talent to achieve significant organizational outcomes (Phakamach et al., 2023; Plesner and Husted, 2019). Moreover, digital leaders empower teams by providing tools, autonomy, and decision-making authority to tackle digital challenges. They foster an environment where calculated risks and learning from setbacks are encouraged, promoting creativity and entrepreneurship. This approach enhances employee engagement, motivation, and dedication, driving the organization towards its goals (Jasim et al., 2024). Hence, the following hypothesis is adopted:

H2: Digital leadership positively affects digital talent.

2.3. The effect of digital talent on sustainable competitive advantage

Digital talent possesses a profound grasp of cutting-edge technologies, evolving digital trends, and shifting customer behaviors. They utilize this expertise to conceive and create groundbreaking digital products, services, and business models that can

transform conventional industry norms. Through relentless innovation and a willingness to challenge established practices, digital talent enables organizations to remain competitive and sustain a unique position in the marketplace (Al-Romeedy, 2024; Bonesso et al., 2019). Digital talent harnesses their expertise in data analytics, automation, and digital tools to refine and enhance the organization's operational workflows. They excel in pinpointing and deploying solutions that improve inventory management, streamline supply chain operations, optimize labor scheduling, and address other essential functions. These enhancements in operational efficiency led to increased productivity, reduced costs, and greater pricing agility, ultimately reinforcing the organization's sustainable competitive edge (Al-Nagar, 2024). Digital talent exemplifies a commitment to ongoing learning, experimentation, and adaptability. They embed these principles into the organization, fostering a culture that embraces innovation, tolerates calculated risks, and swiftly adapts to changing market dynamics. This agility equips the tourism and hospitality sector to maintain a competitive edge by anticipating disruptions, responding effectively to emerging trends, and seizing new opportunities (Jules, 2022; Kueng, 2020). Digital talent plays a crucial role in building a repository of expertise, skills, and institutional knowledge that becomes deeply embedded in an organization's processes and systems. Over time, this unique digital capability evolves into a distinctive, hard-to-replicate asset, providing a sustainable competitive advantage (Al-Romeedy, 2024). Therefore, the following hypothesis is postulated:

H3: Digital talent positively affects sustainable competitive advantage.

2.4. The meditating role digital talent in the link between digital leadership and sustainable competitive advantage

Digital leadership emphasizes the recruitment and development of digital talent, fostering an organization that is both agile and resilient (Jasim et al., 2024). Digital talent harnesses data analytics, scenario planning, and agile methodologies to foresee and adapt to industry disruptions and evolving customer needs. This proactive adaptability enhances the organization's capacity to navigate economic downturns, technological advancements, and other challenges more effectively than its competitors (Al-Nagar, 2024). Digital leaders who support their digital talent can utilize their skills in data analytics and performance management to enhance resource allocation and operational efficiency (Ismail et al., 2023). These skilled professionals offer data-driven insights that guide strategic decisions, uncover cost-saving opportunities, and ensure optimal use of resources. By refining operations and simplifying processes, the organization can boost profitability and strategically reallocate resources to initiatives that reinforce its competitive edge (Al-Nagar et al., 2023; Sen, 2020). Digital leadership nurtures an environment of innovation, leveraging the expertise and mindset of digital talent to drive ongoing organizational transformation (Sheninger, 2019). Digital talent plays a crucial role in pinpointing automation opportunities, adopting cutting-edge technologies, and integrating novel digital solutions into organizational practices. This capacity for continuous digital evolution ensures that the tourism and hospitality industry remain competitive and relevant in an ever-changing market landscape (Al-Romeedy, 2024). Besides, digital

leaders who actively invest in and cultivate digital talent enable their organizations to develop unique digital capabilities that are challenging for competitors to duplicate (Vaz, 2021). Accordingly, the following hypothesis is formulated:

H4: Digital talent mediates the link between digital leadership and sustainable competitive advantage.

2.5. The effect of digital leadership on knowledge worker

A knowledge worker is a professional whose main responsibilities revolve around managing and interpreting information. Those workers use their specialized expertise, analytical prowess, and knowledge to address tasks such as problem-solving, making decisions, and fostering innovation. They are vital in roles that demand critical thinking, creativity, and the efficient use of information to boost organizational success. Their contributions are significant in domains like research, development, strategic planning, and continuous improvement (Muzam, 2023; Sokół and Figurska, 2021). Furthermore, digital leadership values collaboration and knowledge sharing among knowledge workers. It integrates digital tools and platforms that promote efficient communication, information exchange, and cross-functional teamwork. This collaborative setting allows knowledge workers to share their expertise, learn from each other, and jointly solve problems, thereby enriching the organization's collective knowledge and boosting its innovative capabilities (Ismail et al., 2023; Pasolong and Setini, 2021). Also, it acknowledges the necessity of providing consistent feedback and opportunities for growth to knowledge workers. It also implements transparent performance management systems that align individual goals with the organization's strategic objectives and offers customized training and development programs to enhance the digital skills of knowledge workers. By prioritizing the professional development of knowledge workers, digital leaders guarantee that their skills and expertise continue to be pertinent and beneficial to the organization (Hussein et al., 2024; Sheninger, 2019). Consequently, the following hypothesis is assumed:

H5: Digital leadership positively affects knowledge worker.

2.6. The effect of knowledge worker on sustainable competitive advantage

Knowledge workers bring a wealth of expertise, creativity, and problem-solving abilities, which empower them to spot new opportunities and devise innovative solutions. By tapping into their knowledge and insights, organizations can remain at the forefront of their industries, swiftly respond to market shifts, and launch unique products, services, or processes that distinguish them from competitors. This capacity for innovation and adaptability is essential for sustaining a competitive edge in today's fast-paced, digital-centric business landscape (Muzam, 2023; Tidd and Bessant, 2020). They excel at managing uncertainty and welcoming change. Their knack for swiftly evaluating situations, responding effectively, and adjusting to shifting customer demands, technological innovations, and competitive challenges enhances the organization's agility and responsiveness. An agile organization, capable of quickly adapting to market dynamics, is better poised to seize new opportunities and outpace competitors, thereby achieving a sustainable competitive advantage (Holbeche, 2023).

In addition, knowledge workers flourish in settings that promote knowledge sharing, cross-functional teamwork, and the exchange of best practices. By enabling the seamless transfer of knowledge and expertise throughout the organization, they help dismantle silos, foster organizational learning, and support the creation of comprehensive, integrated solutions. This collaborative method of problem-solving and decision-making results in more informed, innovative, and effective strategies, thereby enhancing the organization's competitive edge (Hislop et al., 2018; Lindblom and Martins, 2022;). Thus, the following hypothesis is developed:

H6: Knowledge worker positively affects sustainable competitive advantage.

2.7. The meditating role knowledge worker in the link between digital leadership and sustainable competitive advantage

Digital leadership provides the strategic direction and essential resources needed to drive digital transformation initiatives (Sheninger, 2019). Knowledge workers, leveraging their specialized expertise and creativity, can use these digital tools to develop innovative products, services, or business models that differentiate the organization from its competitors. The collaboration between the strategic vision of digital leadership and the hands-on implementation by knowledge workers leads to the creation of unique, hard-to-replicate digital capabilities, thereby strengthening the organization's sustainable competitive advantage (Hassan, 2012). Digital leaders, with their visionary and strategic guidance, enable knowledge workers to implement agile methodologies, foster a culture of experimentation, and swiftly react to market dynamics (Ismail et al., 2023). Knowledge workers, leveraging their profound understanding of digital tools and processes, assist the organization in quickly adapting to changing customer demands, technological innovations, and competitive challenges. This collaboration between digital leadership and knowledge workers boosts the organization's overall agility and adaptability, ensuring it remains ahead of competitors (Alsheref et al., 2024; Zhang and Chen, 2024). Digital leadership fosters and supports cross-functional collaboration among knowledge workers, dismantling silos and encouraging the exchange of insights and expertise (Jasim et al., 2024). When knowledge workers from diverse departments and disciplines collaborate on digital projects, they can discover fresh perspectives, synergies, and innovative strategies (Hislop et al., 2018). This cross-functional teamwork, nurtured by digital leaders, results in the creation of unique, integrated solutions that are challenging for competitors to replicate, thereby bolstering the organization's sustainable competitive advantage (Vaz, 2021). Moreover, digital leadership aligns the organization's digital strategies with its overarching strategic objectives (Hussein et al., 2024; Ismail et al., 2023). So, the following hypothesis is highlighted:

H7: Knowledge worker mediates the link between digital leadership and sustainable competitive advantage.

3. Materials and methods

3.1. Sample and data collection

The research focused on a group of employees at all managerial levels from travel agencies and tour operators in Egypt. Questionnaires were distributed electronically, with the researchers contacting the sample via industry-related groups on social media platforms like Facebook, Twitter, and LinkedIn. Survey links were sent directly to the private accounts of chosen participants who belonged to these groups. Participants were guaranteed confidentiality with the assurance that no personal identifiers, such as names, would be collected. Based on the recommendations by Hair et al. (2021), the ideal sample size for research should be between 10 and 20 times the number of items in the latent constructs. With this study incorporating four latent constructs and a total of 34 items, the researchers established that a sample size ranging from 340 to 680 would be appropriate. Opting for a larger sample size is typically advised to reduce the risk of sampling bias (Hair et al., 2021). The researchers shared the questionnaire with 1443 individuals via social networking sites. Between October 2023 and June 2024, they collected 986 responses, resulting in a response rate of 68.3%. Out of these, only 784 responses were considered valid for further analysis.

3.2. Measures

The research investigates four variables: digital leadership, sustainable competitive advantage, digital talent, and knowledge worker, using a series of questions scored on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). To guarantee content validity, the questionnaire items for each variable were adapted from earlier studies. Digital leadership was evaluated through a 7-item scale, modified from Claassen et al. (2021). Examples of these items include, “I am involved in decisions that affect my work and my digital work environment”. Sustainable competitive advantage was measured using a 4-item scale developed by Hossain et al. (2021). Examples of these items include, “This hotel/travel agency offers comparatively lower prices than competitors”. Digital talent was evaluated using a 16-item scale adapted from Nair (2019) and Thuda et al. (2023). For example, “The company has high-performing employees who can complete routine tasks”. The knowledge worker variable was assessed using a 7-item scale derived from Hassan (2012). For instance, the scale included items such as “Frequency of knowledge sharing and collaboration with colleagues”.

4. Results and discussion

4.1. Respondents profile

As shown in **Table 1**, the sample was predominantly male (60.6%), with females representing 39.4%. In terms of age distribution, 41.6% of respondents were between 30 and 39 years old, 26.9% were between 40 and 49 years old, 18.5% were 50 years or older, and 13% were under 30 years old. Most respondents held a bachelor’s degree (74.5%). Regarding work experience, 36.9% had 10 to 14 years of experience, 34% had 15 years or more, 21.6% had 5 to 9 years, and 7.5% had less than 5 years of experience.

Table 1. Respondents' profile.

Profile	**Freq.**	**%**
Gender		
Male	475	60.6%
Female	309	39.4%
Age		
Less than 30 years	102	13%
From 30 to less than 40 years	326	41.6%
From 40 to less than 50 years	211	26.9%
50 years and above	145	18.5%
Educational level		
Less than bachelor	123	15.7%
Bachelor	584	74.5%
Postgraduate	77	9.8%
Work experience		
Less than 5 years	59	7.5%
From 5 to less than 10 years	169	21.6%
From 10 to less than 15 years	289	36.9%
15 years and above	267	34%
Total	784	100%

4.2. Measurement model

The fit and validity of each construct within the measurement model were assessed prior to evaluating the full measurement model with the entire sample. The goodness-of-fit indices, including CMIN/DF = 2.117, GFI = 0.930, CFI = 0.945, IFI = 0.943, NFI = 0.927, TLI = 0.951, and RMSEA = 0.026, demonstrated a strong alignment between the model and the data. **Table 2** shows that the loadings of all items in the final measurement model were above 0.50, reflecting internal consistency (Hair et al., 2021). Additionally, the Cronbach's alpha values for each variable exceeded the recommended threshold of 0.70, satisfying Nunnally's minimum reliability standard (1978). Regarding convergent validity, all composite reliability (CR) values surpassed the 0.80 threshold. Additionally, the average variance extracted (AVE) for each construct was above 0.60, meeting the minimum criteria for convergent validity. Additionally, the square roots of the AVE for all variables were higher than the maximum correlations with any other variables, as shown in **Table 3**. This indicates that both convergent and discriminant validity were achieved, adhering to the guidelines set forth by Hair et al. (2021).

Table 2. Measurement model.

Construct	**Factor loading**	***A***	***CR***	***AVE***
Digital leadership (DL)		0.777	0.936	0.678
DL1	0.841			
DL2	0.799			
DL3	0.835			
DL4	0.813			
DL5	0.778			
DL6	0.822			
DL7	0.873			
Sustainable competitive advantage (SC)		0.791	0.904	0.704
SC1	0.888			
SC2	0.845			
SC3	0.834			
SC4	0.787			
Digital talent (DT)		0.856	0.967	0.651
DT1	0.777			
DT2	0.802			
DT3	0.837			
DT4	0.792			
DT5	0.785			
DT6	0.795			
DT7	0.832			
DT8	0.812			
DT9	0.807			
DT10	0.783			
DT11	0.806			
DT12	0.841			
DT13	0.822			
DT14	0.856			
DT15	0.783			
DT16	0.779			
Knowledge worker (KW)		0.788	0.932	0.664
KW1	0.815			
KW2	0.809			
KW3	0.867			
KW4	0.802			
KW5	0.798			
KW6	0.828			
KW7	0.785			

Table 3. Discriminant validity.

Construct	DL	SC	DT	KW
DL	(0.823)			
SC	0.691	(0.839)		
DT	0.447	0.523	(0.807)	
KW	0.481	0.640	0.587	(0.815)

4.3. Structural model

As depicted in **Table 4**, Path coefficient analysis (β), standard error (S.E.), critical ratio (C.R.), and *p*-values were employed to examine the influence of DL on SC, DT, and KW. they also employed to explore how DT and KW affect SC and investigate the mediating role of DT and KW in the relationship between DL and SC. The results indicated that DL has a significant and positive impact on SC (β = 0.486, *p*-value = 0.000) and DT (β = 0.411, *p*-value = 0.000), thereby supporting hypotheses H1 and H2. Moreover, the findings demonstrated that DT significantly and positively influences SC (β = 0.502, *p*-value = 0.000), thus confirming H3. Additionally, the results revealed a significant and positive impact of DL on KW (β = 0.399, *p*-value = 0.000), supporting H5. Hypothesis 6 was confirmed as the results showed a significant positive effect of KW on SC (β = 0.421, *p*-value = 0.000). To explore the mediating roles of DT and KW, a mediation analysis was performed, as detailed in **Table 4**. The findings revealed that DT partially mediates the relationship between DL and SC (β = 0.233, *p*-value = 0.000), supporting H4. Finally, the analysis indicated that KW partially mediate the relationship between DL and SC (β = 0.187, *p*-value = 0.000), supporting H7.

Table 4. Direct and indirect effects.

Path	Estimate	S.E.	C.R	*P* Value	Result
H1: DL → SC	0.486	0.061	7.967	0.000	Accepted
H2: DL → DT	0.411	0.059	6.966	0.000	Accepted
H3: DT → SC	0.503	0.066	7.621	0.000	Accepted
H5: DL → KW	0.399	0.065	6.138	0.000	Accepted
H6: KW → SC	0.421	0.070	6.014	0.000	Accepted
Mediation effect					
H4: DL → DT → SC	0.233	0.059	3.949	0.000	Accepted
H7: DL → KW → SC	0.187	0.052	3.596	0.000	Accepted

5. Discussion

This study aims to examine the mediating role of DT and KW in the relationship between DL and SC. The results underscored the positive impact of DL on SC. According to Hargitai and Bencsik (2023) and Yansen and Yujie (2023), digital leadership nurtures an environment where continuous learning and knowledge exchange thrive. It inspires teams to explore new technologies, exchange best practices, and collaborate on solving intricate challenges. This leads to the creation of digital skills that are intricately woven into the organization's operations and knowledge

framework. Perkin and Abraham (2021) observed that as the organization builds its digital proficiency and experience, it becomes more proficient at foreseeing and adapting to technological changes, thereby securing a durable competitive advantage.

The findings also revealed that DL significantly enhances DT. Leaders in this domain play a crucial role in nurturing the ongoing advancement of digital skills within the organization. They facilitate various learning opportunities, including online courses, workshops, and certifications, to keep employees abreast of the latest technological advancements and trends (Phakamach et al., 2023; Sheninger, 2019).

Similarly, the findings showed that DT positively influences SC. Al-Nagar (2024) noted that DT is critical for driving ongoing digital transformation, shaping strategies, experimenting with technologies, and adapting business models to maintain relevance and competitiveness in a dynamic industry. Al-Romeedy (2024) and Winsor and Paik (2024) added that acting as catalysts for innovation, they inspire peers to challenge traditional methods, adopt an experimental mindset, and embrace strategic risk-taking. By fostering cross-functional collaboration and idea exchange, digital talent nurtures an innovative culture that enables organizations to create unique, hard-to-replicate offerings, ensuring a sustained competitive edge.

Additionally, the findings demonstrated the positive impact of DL on KW. Jasim et al. (2024) observed that digital leaders who empower knowledge workers can unlock their creative potential and nurture a culture of innovation. Holford (2019) and Vuori et al. (2019) noted that by equipping KW with essential digital tools, resources, and autonomy, digital leaders enable them to experiment with new concepts, challenge established practices, and explore innovative solutions. Kohli and Melville (2019) and North and Kumta (2018) highlighted that such a creative and experimental environment allows KW to expand the limits of their expertise, resulting in the development of unique products, services, or processes that set the organization apart from its competitors.

The findings as well indicated that KW play a crucial role in SC. Those workers, with their specialized skills, expertise, and innovative abilities, are key to an organization's long-term success and resilience (Bahrami and Evans, 2014). Investing in the development and retention of knowledge workers is vital for organizations striving to maintain a competitive edge and excel in a dynamic market. By harnessing the skills and capabilities of KW, organizations can effectively navigate challenges, seize opportunities, and achieve sustainable growth (Hassan, 2012).

Finally, the findings revealed that DT and KW act as partial mediators in the relationship between DL and SC. This indicates that while robust DL directly boosts an organization's SC, the presence of DT and KW enhances this impact. However, the notion of partial mediation suggests that other factors also play a role in achieving SC. This underscores the need not only to foster strong DL but also to continuously invest in the development of DT and WE to fully capitalize on the advantages of effective DL.

6. Theoretical implications

The study provides significant contributions to the Technology Acceptance Model (TAM) by incorporating perspectives on DL, DT, and KW. The finding that

DL positively impacts SC, DT, and KW expands the scope of TAM. Traditionally, TAM focuses on individual perceptions of technology acceptance but does not extensively consider the role of leadership. By integrating DL into TAM, the study reveals how leadership influences technology acceptance indirectly through its effects on human resources. Leadership plays a critical role in shaping organizational culture, setting strategic priorities, and fostering an environment that supports technology adoption, which in turn affects employees' perceptions and engagement with technology. As well, DL is demonstrated to impact both the development and application of DT and KW. By integrating this element into TAM, the model recognizes that leadership is fundamental in shaping the perceived ease of use and usefulness of technology.

The positive impact of DL on SC indicates that leaders align technology with organizational objectives, enhancing its perceived usefulness. This addition enriches TAM by demonstrating how leadership decisions regarding technology strategy and alignment influence both the acceptance and effectiveness of technology in securing a competitive edge. Besides, the finding that DTt and KW positively influence SC enhances the TAM construct of perceived usefulness. While TAM typically evaluates perceived usefulness from a technology-centric viewpoint, this finding highlight that the abilities of users—specifically digital talent and KW—play a significant role in shaping their perception of a technology's usefulness. Skilled employees can utilize technology more effectively, thereby showcasing its value in achieving organizational goals.

Digital talent and knowledge workers are crucial in leveraging technology to drive competitive advantage. This perspective broadens TAM by acknowledging that the effectiveness of technology is mediated by users' skills and expertise. The model now includes how employee competencies influence the practical application and benefits of technology. Additionally, the finding that DT and KW workers partially mediate the connection between DL and SC introduces intermediary elements into TAM. Traditionally, TAM does not include mediating factors in its model. This modification reveals that technology acceptance is shaped not just by direct perceptions of the technology itself, but also by the intermediary roles that human resources play in either enabling or obstructing technology adoption.

7. Practical implications

The study highlights the essential role of DL in establishing a SC by adeptly managing DT and KW. For organizations in the tourism and hospitality sectors, this implies that leaders must foster a culture centered on digital innovation. They should articulate a clear vision for digital transformation and ensure that technology initiatives are aligned with overarching business goals. This alignment includes investing in advanced technologies that boost operational efficiency and improve customer experiences. By emphasizing digital leadership, organizations can spur innovation and adjust to swiftly evolving market conditions, thereby securing a lasting competitive edge.

Importantly, the study emphasizes the beneficial role of digital talent in securing a sustainable competitive advantage, suggesting that ongoing investment in employee

training and development is crucial. Organizations should prioritize enhancing their workforce's digital skills, including data analytics, digital marketing, and AI applications. Such investments not only boost employees' capability to effectively use technology but also strengthen their contribution to the organization's strategic objectives. Moreover, creating a culture of continuous learning and offering career growth opportunities can help attract and retain top digital talent, which is essential for sustaining a competitive edge in the industry.

Likewise, knowledge workers are crucial in leveraging technology to gain a competitive edge. In the tourism and hospitality industry, organizations should capitalize on the expertise of these workers to drive innovation and enhance service delivery. This means fostering a culture of knowledge sharing and collaboration across departments to maximize technology use. Organizations should establish knowledge management systems to capture and share best practices and innovative ideas. By utilizing the skills and insights of knowledge workers, companies can boost operational efficiency, tailor customer experiences, and create new service offerings that distinguish them from competitors.

Meanwhile, the mediating role of digital talent and knowledge workers in linking digital leadership to competitive advantage indicates that these elements should be incorporated into strategic planning. Organizations should include digital talent and knowledge workers in the decision-making and strategy development processes to ensure that technology investments meet practical needs and capabilities. Involving these employees in strategic conversations helps align leadership vision with operational execution, ensuring that digital initiatives are effectively carried out and achieve the intended competitive benefits.

Given the pivotal role of digital leadership and talent in securing a competitive advantage, robust change management strategies are essential for successful technology adoption. Organizations should create detailed change management plans that consider employees' needs and concerns during digital transitions. This involves clearly communicating the advantages and effects of new technologies, providing support and training throughout the implementation phase, and engaging employees in the change process to secure their commitment. Effective change management facilitates smooth transitions and enhances the success of digital initiatives.

8. Limitations and future research

The study acknowledges certain limitations and suggests directions for future research. One notable limitation is the focus on a specific cultural context, namely Egypt. The results are affected by the unique features of the tourism and hospitality sector in this region, including the state of digital infrastructure, prevailing business practices, and local workforce dynamics. Future research could broaden the study's geographic scope to explore whether the mediating role of digital talent and knowledge workers is consistent across different cultural and regional contexts. This would help determine the broader relevance and generalizability of the findings.

The study also provided a snapshot of the relationships between key variables at a specific moment. However, the dynamics of digital transformation and the growth of digital talent and leadership skills can change over time. Future research could take

a longitudinal approach, monitoring these variables over an extended period to gain a deeper understanding of how these relationships develop and adjust to evolving industry conditions. Longitudinal studies could also reveal insights into the long-term sustainability of competitive advantages gained from digital leadership and talent.

Further, the study concentrated on how digital talent and knowledge workers mediate the connection between digital leadership and sustainable competitive advantage. Future research could investigate the impact of other relevant factors, such as organizational well-being, digital support systems, or external industry influences, on this relationship. Expanding the range of variables considered could provide a more detailed model and offer further insights into the factors driving sustainable competitive advantage in the tourism and hospitality sector.

Finally, the sample size and diversity in the study present limitations. A small or uniform sample may hinder the ability to generalize the findings. Future studies should aim to involve a larger and more diverse group, capturing a broader range of viewpoints and experiences. This could be achieved by conducting research across various locations, regions, and organizational scales. A more varied sample would provide deeper insights into the interactions between digital leadership, digital talent, and knowledge workers in different environments.

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