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Title: Digital Alchemy: Unraveling the Moderating Roles of Digital Literacy and Employee Engagement

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Conflict of Interest

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Digital Alchemy: Unraveling the Moderating Roles of Digital Literacy and Employee Engagement

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Abstract

Investment in technology enhances firms' efficiency. As a result, they become more competitive and achieve sustainable growth. Factors that directly and indirectly affect digital transformation are human capital, social capital, organizational culture, leadership vision, digital literacy, and employee engagement. We examined the effect of these variables on digital transformation. The study collected data from firms investing in technology. It found that human and social capital, organizational culture, and leadership vision positively affect digital transformation. The study also validates that digital literacy moderates the relationship between human capital and digital transformation. We also found that employee engagement moderates the relationship between leadership vision and digital transformation. Thus, we suggest that firms create a conducive culture where employees are willing to participate and share knowledge. Furthermore, we believe the leadership vision is also important for digital transformation. However, just developing a vision is insufficient; leaders must share their vision with all the firms' stakeholders.

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Keywords: *Human capital, social capital, structural capital, digital transformation, organizational culture, leadership vision, digital literacy, and employee engagement.*

Introduction

In the prevailing technology-driven business environment, organizations' reliance on digital transformation has increased significantly (Cijan et al., 2019). Firms that invest in technologies and innovative processes have significant advantages (Behie et al., 2023). The organizational performance of such firms increases significantly, and their customers are highly satisfied. As a result, they have a competitive advantage (Guo et al., 2023). Moreover, digital transformation improves efficiency by streamlining processes and automating tasks (Nambisan et al., 2019). It also reduces operating costs and increases efficiency, leading to sustainable growth (Joel & Oguanobi, 2024). Furthermore, it enables organizations to understand customer needs, preferences, and behaviors. Consequently, the organization develops a value proposition based on customers' needs (Ismail et al., 2023). Additionally, digital transformation fosters a culture of innovation and expansion through new products, services, and business models (Kraus et al., 2022). Nosratabadi et al. (2024) assert that it allows organizations to respond quickly to changing market conditions, customer needs, and technological advancements (Nosratabadi et al., 2024). Moreover, digital transformation enables organizations to make informed, data-driven decisions (Lyu et al., 2022). Furthermore, it empowers employees to work more efficiently, make better decisions, and develop new skills, increasing job satisfaction and engagement (Nosratabadi et al., 2024). Thus, we argue that digital transformation is critical for achieving business objectives, growth, and long-term success (Guo et al., 2023). Given the above discussions, the study has examined:

1. The impact of the "human capital, social capital, organizational culture, and leadership vision on digital transformation."
2. The moderating role of digital literacy on "the relationship between human capital and digital transformation."
3. The moderating role of employee engagement on "the relationship between leadership vision and digital transformation."

Literature Review

Digital Transformation

In the prevailing technological era, digital transformation is crucial for a firm's growth

and sustainability (Kraus et al., 2022). Digital transformation refers to integrating digital technology into all areas of a business. It includes changing how the business operates and delivers customer value (Cijan et al., 2019). It has numerous benefits, including delivering personalized and seamless customer experiences and developing new business models, products, and services (Joel & Oguanobi, 2024). Moreover, it allows organizations to stay ahead of competitors in the digital age and reduce costs through automation and efficiency (Nambisan et al., 2019). Despite its advantages, digital transformation presents several challenges (Nambisan et al., 2019). It includes resistance to change, lack of digital skills, cybersecurity risks, data management, and integration complexity (Kraus et al., 2022). However, researchers believe a strategic approach and cultural transformation can help organizations overcome these hurdles and achieve sustainable business growth (Cijan et al., 2019).

Human Capital

Human capital refers to the “skills, knowledge, experience, and abilities” of an organization's workforce, encompassing the collective value of its human resources (Birkbeck & Rowe 2024). Besides other factors, it includes employees' education, training, expertise, and competencies (Lee & Zhao, 2023). Deming (2022) asserts that firms with skilled and knowledgeable employees are better equipped to adapt to changing market conditions and deliver excellent customer service (Lee & Zhao, 2023). Researchers suggest that firms invest in employee development (Abbas et al., 2024). Moreover, firms must monitor and evaluate human capital development (Serenko, 2024). Google, Amazon, and IBM have successfully implemented human capital strategies in their companies. As a result, they have improved productivity and achieved business success (Prabhakar et al., 2023).

Social Capital

Social capital refers to the “networks, relationships, and norms of trust” within organizations and societies. It allows individuals and groups to work together effectively (Annamalah et al., 2023). Moreover, social capital facilitates access to information and opportunities and reduces social isolation and inequality (Sabet & Khaksar, 2024). However, researchers assert that social capital can be eroded by social isolation, inequality, and cultural and language barriers (Mishchuk et al., 2022). To address these challenges, organizations must prioritize social capital development and invest in initiatives that promote community engagement, volunteerism, and social connections (Dias et al., 2024). Moreover, by adopting a comprehensive approach to social capital development, organizations can build stronger, more resilient relationships (Mishchuk et al., 2023).

Organizational Culture

Organizational culture refers to an organization's "shared values, beliefs, and norms" (Orienson et al., 2024). It also includes unwritten rules, customs, and traditions (Palumbo & Douglas2024). Thus, an organizational culture guides employees in interacting and behaving with each other and external stakeholders (Siswadi et al., 2023). Researchers believe a strong organizational culture promotes collaboration, and drives business success (Pratiwi & Amini, 2023). Moreover, a clear sense of purpose, shared values, and open communication characterize a positive organizational culture (Nabella et al., 2022). Furthermore, a positive organizational culture also promotes a sense of ownership and accountability, empowering employees to take initiative and make decisions (Orienson et al., 2024). Conversely, a toxic culture can lead to low morale, high turnover, and decreased productivity (Palumbo & Douglas2024). It can also hinder innovation and creativity and damage the organization's reputation (Siswadi et al., 2023).

Leadership Vision

Leadership vision is the capability of leaders to share their visions with the employees and all the company's stakeholders (Pedaste et al., 2024). A well-articulated vision provides a sense of direction to the employees (AlKayid et al., 2023). As a result, employees' motivation and inspiration increased, and they worked together toward a common goal (Vinh et al., 2022). Kim et al. (2023) assert that leaders possess unique skills (Zhou & Reynaldo, 2024). It includes the ability to anticipate future trends and challenges, communicate effectively, and foster a culture of teamwork and collaboration (Bashori et al., 2022). Researchers believe organizational success significantly depends on a clear and compelling vision (Kim et al., 2023). Furthermore, a strong leadership vision fosters a culture of accountability, empowerment, and continuous improvement, driving employees to take ownership of their work (Pedaste et al., 2024). Additionally, researchers believe visionary leaders are genuinely passionate about their organization's mission and values, inspiring others to share their enthusiasm (Vinh et al., 2022).

Digital Literacy

Digital literacy is the effective use of digital technologies to access, evaluate, and create information (Nguyen & Habók,2024). It includes technical proficiency, critical thinking, and online safety awareness (López et al., 2023). Researchers assert that digital literacy is essential for individuals to access information and take advantage of economic opportunities in the prevailing digital era (Diseiye et al., 2024). Moreover, it allows individuals to navigate the internet, use digital tools, and communicate effectively online (Tinmaz et al., 2022). Furthermore, researchers assert that digital literacy involves more than just basic computer skills; it requires a deep understanding of how to use technology to achieve specific goals (Veronika et al., 2023). Additionally, digital literacy

is critical for employability, as most jobs require digital proficiency (Farias-Gaytan et al., 2023). Researchers believe there is a huge disparity in individuals in terms of digital literacy. Some individuals are highly comfortable using digital technologies (Nguyen & Habók, 2024). Others lack the skills and confidence to use digital technologies (López et al., 2023).

Employee Engagement

Employee engagement is necessary for job satisfaction, productivity, and organizational performance (Susanto et al., 2023). A highly engaged employee tends to have emotional and cognitive attitudes and behavior (Pincus, 2023). Consequently, it increases productivity, job satisfaction, and organizational success (Susanto & Sawitri, 2022). Kwon et al. (2024) believe it involves an emotional connection to the organization and its mission, feeling valued and supported. Moreover, extending the above arguments, we argue that engaged employees are more productive, satisfied, and likely to stay with the organization (Al Zeer et al., 2023). Consequently, this improves customer satisfaction (Saks et al., 2023). By focusing on employee engagement, we argue that firms promote a conducive working environment to enhance organizational performance (Kwon et al., 2024).

Hypotheses Development

Human Capital and Digital Transformation

Winarsih et al. (2024) assert that effective human capital management is necessary for successful digital transformation. Many past studies have noted that digital transformation includes developing a “digital transformation strategy” that aligns with business objectives (Qureshi, 2023). Moreover, investing in digital skills training and fostering a culture of innovation is necessary for digital transformation (Nwankpa et al., 2022). Researchers believe the impact of human capital on digital transformation is multifaceted (Winarsih et al., 2024). It allows firms to develop innovative digital products and services, improve operational efficiency, and enhance customer satisfaction (Winarsih et al., 2024). Moreover, it facilitates the adoption of digital technologies, ensuring successful implementation and integration (Qureshi, 2023). Nwankpa et al. (2022) assert that human capital helps manage organizational change, minimizing resistance and ensuring a smooth transition (Qureshi, 2023). Researchers believe organizations can achieve sustainable business growth by prioritizing human capital development (Nwankpa et al., 2022).

H1: Human capital “positively affects digital transformation.”

Social Capital and Digital Transformation

Social capital is a crucial precursor of digital transformation, allowing firms to leverage relationships and networks and achieve business outcomes (Nguyen et al., 2023). The value derived from social relationships is crucial in facilitating collaboration, innovation, and knowledge sharing (Nosratabadi et al., 2024). Moreover, strong social capital in firms promotes the knowledge and expertise of their stakeholders to drive digital transformation (Lyu et al., 2022). As a result, it enables organizations to access new ideas, technologies, and markets, leading to sustainable business growth (Gallardo-Vázquez et al., 2019).

Malike et al. (2024) assert that effective social capital management is critical for successful digital transformation. Therefore, firms must develop a social capital strategy that aligns with their digital transformation objectives (Nguyen et al., 2023). It includes investing in network development, building trust through stakeholder engagement, and fostering a collaborative culture (Nosratabadi et al., 2024). Moreover, leadership plays a crucial role in championing social capital and digital transformation, ensuring that stakeholders are empowered to collaborate and innovate (Lyu et al., 2022).

H2: Social capital “positively affects digital transformation.”

Organizational Culture and Digital Transformation

Extant literature asserts that organizational culture is pivotal in digital transformation (Dąbrowska et al., 2024). It either facilitates or hinders the adoption and implementation of digital technologies (Martínez-Peláez et al., 2023). Moreover, a culture that supports innovation, experimentation, and collaboration is essential for successful digital transformation (Lyu et al., 2024). Additionally, when an organization's culture prioritizes innovation, it fosters creativity and innovation, developing new digital products and services (Guo et al., 2023). Adama et al. (2023) assert that a collaborative culture enables effective teamwork and communication. As a result, it ensures that all stakeholders are aligned and working towards a common goal (Adama et al., 2023). Furthermore, a culture that values adaptability enables organizations to respond quickly to changing market conditions, staying ahead of the competitors (Martínez-Peláez et al., 2023). Organizational culture often resists change, which can hinder the adoption and implementation of digital technologies (He et al., 2023). To mitigate this resistance, organizations must address resistance to change through effective communication and stakeholders' engagement (Guo et al., 2023). Furthermore, by prioritizing organizational culture, organizations can unlock the full potential of digital transformation, drive innovation, and achieve sustainable business growth (Adama et al., 2023).

H3: Organizational culture “positively affects digital transformation.”

Leadership Vision and Digital Transformation

Extant literature highlights that leadership vision plays a pivotal role in digital transformation, setting the direction and tone for the organization's digital journey (McCarthy et al., 2022). Moreover, leadership vision inspires and motivates employees and stakeholders, ensuring everyone is aligned and working towards a common goal (Türk et al., 2023). Researchers believe that leadership vision provides direction and purpose, fostering a sense of unity and coordination across the organization (Müller et al., 2024). Moreover, a leader's clear and concise vision empowers employees to take ownership of the digital transformation journey, driving innovation and experimentation (AlNuaimi et al., 2022). Furthermore, a well-articulated vision facilitates change management, helping employees navigate the transition to new digital technologies and ensuring a smooth adoption process (Yansen et al., 2023). However, a rigid vision may not promote digital transformation (Reuter et al., 2024).

H4: Leadership vision “positively affects digital transformation.”

Human Capital, Digital Literacy, and Digital Transformation

Extant literature documents that digital literacy positively moderates the relationship between human capital and digital transformation (Mykhailovska et al., 2024). Qaribilla et al. (2024) assert that the effectiveness of human capital in promoting digital transformation significantly depends on digital literacy (Perdana et al., 2024). Moreover, employees with high levels of digital literacy can effectively utilize digital technologies, making their skills and knowledge more relevant and valuable in the digital economy (Sofyan et al., 2024). Furthermore, digital literacy enhances employee productivity, facilitates data-driven decision-making, drives innovation, and enables employees to adapt quickly to changing market conditions. Additionally, digital literacy facilitates adopting and implementing digital technologies, ensuring a smoother transition and accelerating digital transformation (Mykhailovska et al., 2024). Conversely, low digital literacy impedes the adoption and implementation of digital technologies and hinders digital transformation (Qaribilla et al., 2024).

H5: Digital literacy “moderates the relationship between human capital and digital transformation.”

Leadership Vision Employee Engagement and Digital Transformation

Employee engagement plays a crucial moderating role in the relationship between leadership vision and digital transformation (Shwedeh et al., 2023). Leadership vision

is essential for driving digital transformation, as it sets the direction and tone for the organization's digital journey (Mutha & Srivastava, 2023). However, the effectiveness of leadership vision in driving digital transformation is significantly influenced by the level of employee engagement (Ulrich et al., 2023). Highly engaged employees are likelier to take ownership of the digital transformation journey, driving motivation, commitment, and involvement (Mutha & Srivastava, 2023). Moreover, employee engagement amplifies the impact of leadership vision, facilitating the adoption and implementation of digital technologies and accelerating digital transformation (Turyadi et al., 2023). Furthermore, employee engagement fosters collaboration and teamwork, driving innovation and enabling employees to adapt quickly to changing market conditions (Shwedeh et al., 2023).

H6: Employee engagement “moderates the relationship between leadership vision and digital transformation.”

Conceptual Framework

The developed conceptual framework depicted in Figure 1 shows the articulated. Hypotheses. It has “four direct and two moderating relationships.”

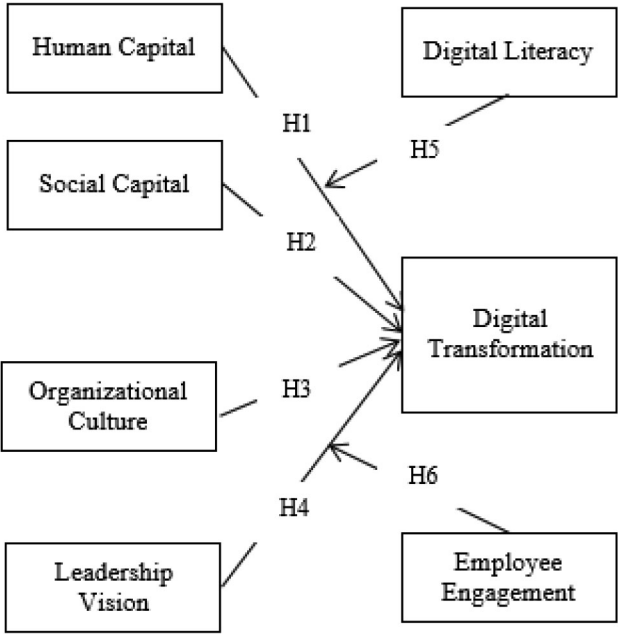


Figure 1: Conceptual Framework

Methods

Research Approach and Sampling

The study used quantitative research, which involves collecting data through questionnaires (May & Perry, 2022). Researchers believe quantitative research offers objectivity, reliability, generalizability, precision, and scalability (Lilien et al., 2022). However, limitations include lack of depth, assumption of linearity, measurement errors, and dependence on statistical assumptions (Zikmund et al., 2020). Moreover, the study used a deductive approach. It calls for developing relationships based on theory and numerically testing the articulated hypotheses (Hair et al., 2017).

A research population is the entire group of individuals, organizations, or entities a researcher aims to study (Sekaran & Bougie, 2020). It includes all potential participants sharing common characteristics relevant to the research questions. On the other hand, a target population is a subset of the research population (Zikmund et al., 2020). It is the specific group the researcher intends to study. The target population for this was the firms that employ digital transformation.

Researchers suggest drawing a sample from a large target population as it is not time-consuming and efficient. The study calculated that a “sample size” of 410 would be appropriate (Indicator variables 41 X 10 samples per case) (Creswell, 2019). The study used purposeful sampling, a non-probability sample technique.

Statistical Analysis

The study used Smart PLS for statistical analysis. We prepared the data set initially to ensure it aligned with the software's requirements (Ringle & Sarstedt, 2022). Subsequently, we specified the research model defining the relationships between variables and the hypotheses to be tested. Then, we run the PLS algorithm to estimate the model parameters. Finally, we interpreted the results and drew a conclusion based on the findings (Hair et al., 2022).

Scale and Measures

A 5-rater Likert scale was employed to measure responses. “One indicates a high degree of disagreement, and five shows a high degree of agreement.” The study has “seven latent and 41 indicator variables,” detailed in Table 1.

Table 1: Scale and Measures

Variables	Sources	Items
Human Capital	Lee and Zhao(2023	6
Organizational Culture	Palumbo and Douglas(2024)	6
Leadership Vision	Kim et al (2023)	5
Digital Literacy	Nguyen and Habók (2024)	6
Employee Engagement	Susanto et al, (2023)	7
Digital Transformation	Cijan et al. (2019)	5
Social Capital	Annamalah et al., (2023)	6

Results

Respondent Profile

The research sample consists of 410 observations. The results show that 22.18% of respondents are from software houses, 24.81 % are from insurance firms, 30.83% are from the education sector, and 22.18% are from healthcare. Regarding gender, we found that 59% are males, and 51% are females. Educational profile suggests 52% of respondents have Master's degrees, 39% have a bachelor's degree, and 9% have an intermediate level of education.

Measurement Model

Extant literature suggests a two-phase approach for PLS Models: One generates a measurement model to assess the relationship between the observed variables and their corresponding latent variables. Second, a structural model, which shows the relationship between latent variables.

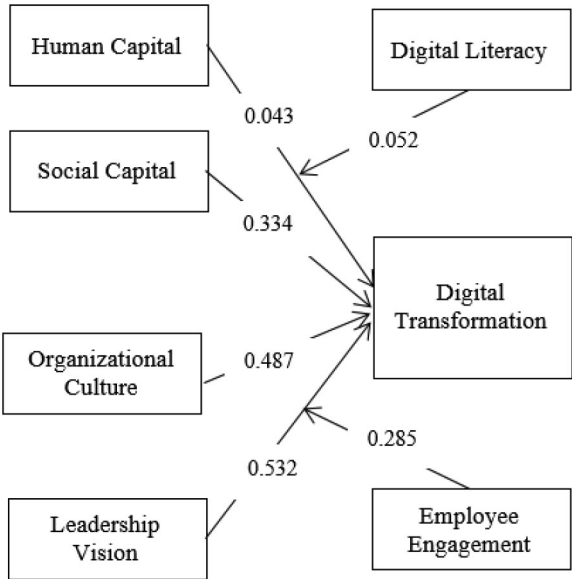


Figure 2: Measurement Model

Reliability and Validity

Table 2 shows the factor loading of the constructs' indicators. It also shows the Cronbach Alpha, composite reliability, and AVE values of all the latent variables.

Table 2. Measurement Items

Variables	Items	Loadings	Cronbach's Alpha values	Compost Reliability	Average Variance Extracted
Human Capital	HC1	0.834	0.814	0.945	0.646
	HC2	0.716			
	HC3	0.896			
	HC6	0.757			
Social Capital	SC1	0.840	0.856	0.903	0.653
	SC2	0.753			
	SC4	0.778			
	SC6	0.812			
Organizational Culture	OC1	0.881	0.856	0.903	0.699
	OC2	0.862			
	OC3	0.822			
	OC4	0.776			

OC5	0.779				
Leadership Vision	LV1	0.834	0.814	0.945	0.646
	LV2	0.716			
	LV3	0.896			
	LV4	0.837			
	LV5	0.786			
Digital Literacy	DL1	0.800	0.883	0.915	0.683
	DL2	0.840			
	DL3	0.809			
	DL4	0.773			
	DL5	0.815			
Employee Engagement	EE1	0.789			0.712
	EE2	0.815			
	EE3	0.833			
	EE4	0.725			
	EE7	8.793			
Digital Transformation	DT1	0.769			0.695
	DT2	0.778			
	DT3	0.777			
	DT4	0.784			
	DT6	0.814			

All values for composite reliability are above the specified minimum threshold of 0.700. The Cronbach's Alpha values exceeded the minimum required values of 0.700. All constructs' average variance extracted (AVE) values surpassed the minimum threshold of 0.500 (Hair et al., 2017). Thus, the "constructs used in the study are within the prescribed limits of convergent validity."

Discriminant Validity (Fornel & Larcker, 1981)

The study used Fornell and Larcker's (1981) criteria for assessing discriminant validity. Table 3 shows that the "square roots of AVE values are greater than correlation values, suggesting the constructs used in the study are unique and distinct."

Table 3. Fornell – Larcker Criterion

Variables	HC	OC	LV	DL	EE	DT	SC
Human Capital	0.902						
Organizational Culture	0.630	0.836					
Leadership Vision	0.438	0.540	0.804				
Digital Literacy	0.535	0.320	0.431	0.828			
Employee Engagement	0.478	0.517	0.523	0.593	0.844		
Digital Transformation	0.534	0.531	0.436	0.678	0.758	0.834	
Social Capital	0.537	0.613	0.621	0.150	0.569	0.666	0.808

Hypothesis Results

The study articulated four direct and two moderating hypotheses, which our results supported. Table 4 summarizes the results, and Figure 3 shows the structural model.

Table 4: Discriminant Validity

Relationships	B	t-value	p-value	Results
Human Cap -> Digital Transformation (H1)	0.043	2.372	0.011	Validated
Social Cap ->Digital Transformation (H2)	0.334	4.416	0.000	Validated
Org. Culture ->Digital Transformation (H3)	0.478	6.533	0.000	Validated
Leader. Vision->Digital Transformation (H4)	0.532	11.193	0.000	Validated
Dig. Literacy X Human. Cap-> Digital Trans. (H5)	0.052	2.374	0.017	Validated
E. Engagement X L. Vison > Dig. Trans. (H6)	0.285	4.712	0.000	Validated

We found support for all the articulated hypotheses. The strongest effect is in Hypothesis 4 ($\beta=0.532$, $t= 11.193$, <0.05), followed by Hypothesis 3 ($\beta=0.478$, $t=6.533<0.05$), Hypothesis 2 ($\beta=0.344$, $t=4.416<0.05$), Hypothesis 6 ($\beta=0.285$, $t=4.712<0.05$), Hypothesis 5 ($\beta=0.052$, $t=2.374<0.05$), and Hypothesis 1($\beta=0.043$, $t=2.372<0.05$).

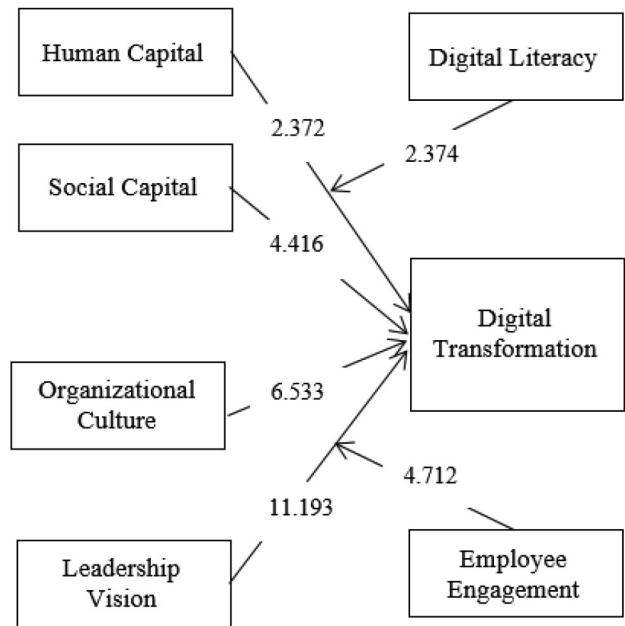


Figure 3: Structural Model

Discussion and Conclusion

Discussion

The study “validates human capital positively affects digital transformation.” Winarsih et al. (2024) assert that effective human capital management is necessary for successful digital transformation. Many past studies have noted that digital transformation strategy includes developing a “digital transformation strategy” that aligns with business objectives (Qureshi, 2023). Moreover, investing in digital skills training and fostering a culture of innovation is necessary for digital transformation (Nwankpa et al., 2022). Researchers believe the impact of human capital on digital transformation is multifaceted (Winarsih et al., 2024). It allows firms to develop innovative digital products and services, improve operational efficiency, and enhance customer satisfaction (Winarsih et al., 2024). Moreover, it facilitates the adoption of digital technologies, ensuring successful implementation and integration (Qureshi, 2023).

We “found that social capital positively affects digital transformation.” Social capital is a crucial precursor of digital transformation, allowing firms to leverage relationships and networks and achieve business outcomes (Nguyen et al., 2023). The value derived from social relationships is crucial in facilitating collaboration, innovation, and knowledge

sharing (Nosratabadi et al., 2024). Moreover, strong social capital in firms promotes the knowledge and expertise of their stakeholders to drive digital transformation (Lyu et al., 2022). As a result, it enables organizations to access new ideas, technologies, and markets, leading to sustainable business growth (Gallardo-Vázquez et al., 2019).

The “study documents that organizational culture promotes digital transformation.” Extant literature asserts that organizational culture is pivotal in digital transformation (Dąbrowska et al., 2024). It either facilitates or hinders the adoption and implementation of digital technologies (Martínez-Peláez et al., 2023). Moreover, a culture that supports innovation, experimentation, and collaboration is essential for successful digital transformation (Lyu et al., 2024). Additionally, when an organization's culture prioritizes innovation, it fosters creativity and innovation, developing new digital products and services (Guo et al., 2023). Lyu et al. (2022) asserts that a collaborative culture enables effective teamwork and communication. As a result, it ensures that all stakeholders are aligned and working towards a common goal (Adama et al., 2023). Furthermore, a culture that values adaptability enables organizations to respond quickly to changing market conditions, staying ahead of the competitors (Martínez-Peláez et al., 2023).

The “study documents that leadership vision promotes digital transformation. Extant literature highlights that leadership vision plays a pivotal role in digital transformation, setting the direction and tone for the organization's digital journey (McCarthy et al., 2022). Moreover, leadership vision inspires and motivates employees and customers, ensuring everyone is aligned and working towards a common goal (Türk et al., 2023). Researchers believe that leadership vision provides direction and purpose, fostering a sense of unity and coordination across the organization (Müller et al., 2024). Moreover, a leader's clear and concise vision empowers employees to take ownership of the digital transformation journey, driving innovation and experimentation (AlNuaimi et al., 2022). Furthermore, a well-articulated vision facilitates change management, helping employees navigate the transition to new digital technologies and ensuring a smooth adoption process (Yansen et al., 2023).

We found “that digital literacy moderates the relationship between human capital and digital transformation.” Extant literature documents that digital literacy positively moderates the relationship between human capital and digital transformation (Mykhailovska et al., 2024). Qaribilla et al. (2024) assert that the effectiveness of human capital in promoting digital transformation significantly depends on digital literacy (Perdana et al., 2024). Moreover, employees with high levels of digital literacy can effectively utilize digital technologies, making their skills and knowledge more relevant and valuable in the digital economy (Sofyan et al., 2024). Furthermore, digital literacy

enhances employee productivity, facilitates data-driven decision-making, drives innovation, and enables employees to adapt quickly to changing market conditions.

The study “validates that employee engagement moderates the relationship leadership vision digital transformation.” Employee engagement plays a crucial moderating role in the relationship between leadership vision and digital transformation (Shwedeh et al.,2023). Leadership vision is essential for driving digital transformation, as it sets the direction and tone for the organization's digital journey (Mutha & Srivastava,2023). However, the effectiveness of leadership vision in driving digital transformation is significantly influenced by the level of employee engagement (Ulrich et al., 2023). Highly engaged employees are likelier to take ownership of the digital transformation journey, driving motivation, commitment, and involvement (Mutha & Srivastava,2023). Moreover, employee engagement amplifies the impact of leadership vision, facilitating the adoption and implementation of digital technologies and accelerating digital transformation (Turyadi et al., 2023).

Conclusion

In the prevailing technological era, digital transformation has become more significant. Firms that invest in digital technology are more competitive than firms that do not. Given its importance, the study examined the effect of four antecedents and two moderators on digital transformation. The study collected data from firms investing in technology. Results show that “human capital, social capital, organizational culture, and leadership vision positively affect digital transformation.” The study also validates that “digital literacy moderates the relationship between human capital and digital transformation.” We also found that “employee engagement moderates the relationship between leadership vision and digital transformation.”

Implications

Human capital is a key driver of digital transformation. We advise firms to invest in human capital development, which catalyzes innovation, productivity, and competitiveness. This investment minimizes the risks associated with digital transformation and empowers firms to harness its power and achieve sustainable business growth.

Social capital plays a crucial role in digital transformation, with far-reaching implications. By recognizing its positive and negative effects, organizations can create targeted strategies to leverage it, foster innovation, and enhance social inclusion. As the digital landscape continues to evolve, the significance of social capital will grow even more, making it vital for organizations to focus on developing it to remain

competitive. By prioritizing social capital, organizations can harness the potential of digital transformation and achieve sustainable business growth.

Organizational culture significantly impacts digital transformation, and its implications are far-reaching. We recommend that firms understand its positive and negative implications. This will help firms develop targeted strategies to create a culture that supports digital transformation and drives business growth. By following the right strategies, organizations can harness the power of digital transformation and achieve sustainable business growth.

Limitations and Future Research

The study collected data from the employees of the organizations investing in technology. All the selected business entities are Karachi-based. We advise others to extend our developed conceptual framework to other cities in Pakistan. We have examined the impact of human capital, social capital, organizational culture, and leadership vision on digital transformation. Other studies may also expand the conceptual framework by adding more antecedents, such as attitudes and behavior toward technology and change management. We have used two moderators, including leadership vision and employee engagement, with no mediating variables. Thus, we suggest that future researchers add more moderators and include mediating variables.

Annexure 1

The Constructs and Items Used in the Questionnaires

Digital Transformation

DT1. Digital transformation enables organizations to stay ahead of the competition by adopting new technologies, innovating processes, and improving customer experiences.

DT2. Digital transformation streamlines processes, automates tasks, and enhances productivity, leading to cost savings and increased efficiency.

DT3. Digital transformation enables organizations to better understand customer needs, preferences, and behaviors, leading to personalized experiences and improved customer satisfaction.

DT4. Digital transformation fosters a culture of innovation, enabling organizations to develop new products, services, and business models and driving growth and expansion.

DT5. Digital transformation enables organizations to respond quickly to changing market conditions, customer needs, and technological advancements.

Human Capital

HC1. My organization encourages continuous learning and improvement.

HC2. My organization recognizes and values my work.

HC3. My organization has a strong leadership team.

HC4. My organization encourages collaboration and knowledge sharing.

HC5. My organization trusts employees to make decisions.

HC6. My organization supports my career goals and aspirations.

Social Capital

SC1. We share knowledge and resources within the team.

SC2. We work together to achieve common goals.

SC3. We share best practices and lessons learned.

SC4. We show empathy and understanding towards each other.

SC5. We work towards shared goals and objectives.

SC6. Our team is involved in community service activities.

Organizational Culture

OC1. Our organization encourages innovation and experimentation.

OC2. Our organization prioritizes customer satisfaction and needs.

OC3. Our organization values and celebrates diversity.

OC4. Leaders and managers are approachable and supportive.

OC5. Our organization is agile and responsive to change.

OC6. We take ownership and accountability for our actions.

Leadership Vision

LV1. Our leader has a clear and compelling vision for the organization. LV

LV2. Our leader inspires and motivates me to work towards the vision.

LV3. Our leader has a deep understanding of the industry and market trends.

LV4. Our leader communicates effectively with all stakeholders.

LV5. Our leader sets clear goals and expectations.

Digital Literacy

DL1. I am comfortable using a computer and basic software applications.

DL2. I know how to protect my personal information online.

DL3. I can effectively search for and evaluate online information.

DL4. I am comfortable using email and instant messaging.

DL5. I am comfortable experimenting with new digital technologies.

DL6. I understand my rights and responsibilities online.

Employee Engagement

EE1. I am satisfied with my job overall.

EE2. I am committed to the organization's mission and values.

EE3. I feel comfortable approaching my manager with questions or concerns.

EE4. We work together effectively as a team.

EE5. I have opportunities for growth and development.

EE6. I have a good balance between work and personal life.

EE7. I receive regular communication from leadership.

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