Vol.2, Issue.2, (2024)
International Journal of Management Thinking
https://doi.org/10.56868/ijmt.v2i2.80

Examining the Influence of Digital Leadership, Organizational Culture and Strategic Approaches to Digitalization

Haipeng Wu[1] and Phanthida Laophuangsak[2*]

[1-2]Faculty of Educational Administration Southeast Asia University, Bangkok,10700, Thailand

Article Information

Article Type: Research Article

Dates:
Received: July 14, 2024
Revised: October 22, 2024
Accepted: November 28, 2024
Available online: December 15, 2024

Corresponding Author:
Phanthida Laophuangsak
Panthida_c@yahoo.com
https://orcid.org/0009-0001-9593-5508

ABSTRACT

The study aims to identify the key factors driving successful digital transformation through digital leadership and organizational culture. A quantitative study utilized multiple regression analysis to test the hypothesized relationships among digital leadership, organizational culture design thinking and knowledge sharing. Data was collected from 400 managerial-level employees in technologically advanced organizations in Beijing, China. The findings reveal that all four independent variables, digital leadership, organizational culture, design thinking, and knowledge sharing, positively and significantly influence digitalization, with organizational culture and design thinking having the most potent effects. These results emphasize the importance of leadership, culture, innovation and knowledge management in driving digital transformation. The study concludes that organizations should foster strong digital leadership, a supportive culture and innovative approaches to enhance their digital capabilities. Its practical implications highlight the importance of investing in these factors to navigate digital transformation successfully in today's business environment.

Keywords: Digitalization; Digital Leadership; Organizational Culture; Design Thinking, Knowledge Sharing

1. INTRODUCTION

Global enterprises are undergoing transformative operational shifts because of the increasing integration of digital technology in their operations (Cameron et al., 2006). Modern business's advanced digital transformation faces two critical tasks of technological progress combined with environmental sustainability preservation (Westerman et al., 2014). Green transformation has become important for sustainability and environmental stewardship throughout the digital world (Liu et al., 2023). The transformation calls for leaders to actively deal with adverse environmental effects, protect natural resources, and promote enduring business practices. The essential development for future organisations depends on digitalization, meeting sustainability needs (Wang et al., 2022). Digital leadership, organizational culture, and strategic approaches in digitalisation play pivotal roles in this transformation. Digital leadership entails leading organisations through technology adoption by maintaining employee intellectual involvement in building future-oriented digital plans that support sustainable development objectives (Iqbal & Piwowar-Sulej, 2023).

Digital modernisation needs fundamental technological changes with corporate principles and working frameworks. The leadership team must establish and develop strategic goals that unite digital

innovation and green transformation (Westerman et al., 2014). AlNuaimi et al. (2022) investigated the interrelations between leadership, cultural aspects, and strategic approaches to enable such transformations. However, integrating strategic leadership has increased interest in sustainable digital success. The core mechanism of this transformation depends on organisational culture since it affects both acceptance rates and execution methods of digitalisation projects. Organisations with adaptable cultures, an experimental mindset, and technological vision experience improved success with digital transformation efforts (Cameron et al., 2006). A culture resisting change will obstruct progress, so leaders must develop strategies to modify organisational cultures that allow digital evolution and innovation (Leal-Rodríguez et al., 2023). Designers may enable organisations to create digital solutions that match user requirements through their strategic approach, promoting customer-focused innovation and creative problem-solving. Shin et al. (2023) proposed that organisations can establish improved digital approaches that achieve broad acceptance due to designers' strategic framework while stimulating internal learning.

Companies struggle to successfully integrate leadership with culture and knowledge management systems, which results in low returns on investment in digital technology. In this way, organisations lose opportunities because they focus on technology rather than establishing the organisational resources and implementation skills necessary for successful adoption (Mollah et al., 2023). The complexity of digital leadership relationships with organisational culture creates confusion while building strategic approaches to digital transformation (Asif et al., 2024). Knowledge sharing blocks organisational progress because cultural and technical barriers impede the ability of organisations to maximise the potential of their digital investment (Fang, 2023). This paper aims to investigate the issues by exploring the interaction between digital leadership, organisational culture, design thinking, and knowledge sharing to obtain successful digital transformations through an integrated framework that enhances leadership and organisational culture while fostering effective knowledge-sharing and innovation. It also provides a roadmap for organisations to cover the complexities of digital transformation and maximise the benefits of digital technologies.

2. LITERATURE REVIEW

2.1 Digital Leadership and Digitalization

Digital leadership is a significant facilitator for shifting organisations and adopting the principles of the digital age. Also, digital leadership is about the stewardship of organisations when implementing digital transformation, which entails the coordination of managing digital technologies that can improve different business activities, goods, and services (de Araujo et al., 2021). According to Hensellek (2020), digital leadership is the capability of leaders to support and lead the change management of digital processes in an organisation. It comprises a spectrum of skills and knowledge from vision formulation to comprehensive strategic perspective with general managerial skills and the capacity to foster and implement changes within the organisation's culture. Leadership is also identified as a critical factor in digital transformation management as the leaders with high scores in these aspects will better initiate, manage and provide support to the digitalisation processes because these leaders can integrate technology into business strategies better and promote innovation (Kıyak & Bozkurt, 2020). Digital leadership also impacts organisational culture, as culture is another essential factor affecting an organisation's digitalisation level (Westerman et al., 2014).

With digital leadership, technology is emphasised to transform business processes and practices and thus change the organisational culture and dynamics by encouraging workers to accept an organisation's

new technology and change (Cahyadi & Magda, 2021). This cultural perspective is significant for digitalisation because it facilitates the ability to change culture and adopt new strategies effectively in response to market and technological changes. In addition, several companies have digital leaders at the helm who ensure that inventive projects become teamwork to enable the creation of digital solutions (Abbu et al., 2020).

H1: Digital Leadership positively influences digitalisation.

2.2 Organisational Culture and Digitalisation

Leso et al. (2023) proposed that organisational culture is the main driving factor that impacts digitalisation in organisations since digitalisation is becoming more significant to company success and identifies organisational culture patterns. Leal-Rodríguez et al. (2023) argue that organisational culture is the summation of the norms and practices that the employees of an organisation hold that guide their behaviour within a specific context. This study reviewed the existing literature on the context of organisational culture and outcomes of digitalisation while arguing about how culture can support or frustrate digitalisation processes.

Leso et al. (2023) specifically contended that assertiveness with positive values emphasises the necessity of a robust organisational culture and work environment to promote digitalisation, as corporate cultural attributes like taking risks, experimenting, and learning from mistakes improve the execution of the digital business strategy. Leadership is central to developing the organisational culture and cannot be overemphasised. Thus, Schein (2010) argued that change in organisational culture regarding digitalisation could be fostered through leadership that embraces and drives the culture through their behaviour.

H2: Organisational Culture positively influences digitalisation.

2.3 Design Thinking and Digitalization

Digitalization has emerged as one of the most critical focus areas in design thinking. Design thinking is an innovation process that involves considering the customers, technology use, and companies' economic benefits (Vendraminelli et al., 2023). This study aims to understand how and in what ways the concepts of design thinking and digitalisation are intertwined and how design thinking principles can shape the digitalisation process. Thus, Kamble et al. (2023) argued that design thinkers create an innovative culture, contributing to organisations' digitalisation. It fosters understanding of product users by seeking to put themselves in their shoes while making the process highly iterative to achieve positive outcomes through experimentation. Thus, more attention to the needs and expectations of the user as a key factor of the digital transformation process will result in the higher adoption of the initiatives and better execution of digital projects (Bustard et al., 2023).

Design thinking is also widely utilised to improve an organisation's level of cooperation, which is considered a critical element for implementing digitalisation. Such an approach uses cross-functional teams to avoid compartmentalisation and improve the coherence of the digital efforts undertaken at a company or an organisation (Mortati et al., 2023). In design thinking, the firm can better integrate digital business initiatives into organisation-wide strategic objectives to coordinate and orient the firm's digitisation efforts.

H3: Design Thinking positively influences digitalisation.

2.4 Knowledge Sharing and Digitalization

It is well understood that knowledge sharing is among the most important factors that positively impact organisational digitalisation (Cahyadi & Magda, 2021). Knowledge sharing occurs when individuals and teams willingly and freely transfer and share knowledge (Deng et al., 2023). They examine the link between knowledge-sharing and digitalisation and how sound knowledge-sharing practices may support the digital transformation agenda. Thus, knowledge sharing impacts digitalisation in disseminating crucial information and efficient practices within the company.

In addition, the flow of explicit knowledge empowers the idea of learning and change processes that digital business organisations require, especially when shifting towards the digital business model. Today's markets and technologies are characterised by continuous development; thus, an organisation must learn to embrace change and effectively manage new situations and opportunities (Eslami et al., 2023). They stipulate that knowledge sharing allows an organisation to adapt to the modern digital environment to ensure that every worker is informed with the necessary knowledge to address emerging trends and issues (Liu et al., 2023). The constant flow of information between these functions is a great way to strengthen the organisation's foundations and address the challenges of digitalisation more effectively.

H4: Knowledge sharing is positively influenced by Digitalization

2.5 Theoretical Background

The study combines three main theoretical frameworks to explicate relationships between the core theoretical constructs in the proposed research model: digital leadership, organisational culture, design thinking, knowledge sharing and digitalisation. A more comprehensive and targeted investigation of the factors that affect the success of digital transformation in businesses is made possible by this method of combining various elements into theoretical frameworks that are less coherent. These frameworks lay the necessary theoretical basis for understanding the dynamic relationship between the constructs and a shared vision of the combined effect of these other factors in achieving organisational success in the digital age.

2.5.1 Transformational Leadership and Organizational Culture

Shaping an organisation's efforts in digital transformation is essential for digital leadership and the digital organisational culture. Thus, Westerman et al. (2014) proposed that digital leadership helps direct and drive organisational technological adoption and digital initiatives. Thus, (Liu et al., 2023) espoused that good leaders inspire and motivate employees by engaging in change, innovation and technologically advanced environments. Such digital leadership is not just about managing technological changes; it also entails creating an environment of innovation and change in the organisation. Accordingly, Schein (2010) proposed that employees' acceptance and execution of digital efforts depend heavily on their shared values, attitudes, and behaviours. Successful digital solution integration requires a culture that supports experimentation, adaptability, and new technology, including humans. The key pillars of digital transformation are organisational culture and transformational leadership, which align the vision and cultural preparedness and, eventually, the organisation's capacity to utilise and implement technological advancements successfully.

2.5.2 Innovation and Knowledge Management

Nonaka et al. (1996) explained that innovation and knowledge management theory is how organisations create and share knowledge to innovate. It aligns with design thinking, a human-centric

approach to problem-solving by calling for empathy and ideation and then prototyping to solve problems and drive innovation. Organisations can ease the adoption and integration of digital solutions by integrating technology initiatives with consumer needs through design thinking in digital transformation (Hoe, 2006). In order to foster innovation and improve decision-making, knowledge management enshrines the knowledge-sharing approach of sharing data and insights across organisational boundaries (Nezafati et al., 2009). In the digital transition, understanding a culture of information sharing is essential for removing organisational silos and fostering employee collaboration, particularly in complicated scenarios. In order to achieve digital success, the combination of design thinking and information sharing ensures that digital strategies are not only creative but also user-centric and based on organisational knowledge.

2.5.3 Technology-Organisation-Environment (TOE) Framework

Technological-Organisation-Environment (TOE) provides a practical framework for understanding digitalisation since it deals with multifaceted processes (Baker, 2011). Such a framework demonstrates how technology features, organisational design, and external pressures affect digital technologies implemented in organisations. Digitalisation represents using digital technology to transform business processes, organisational structures, and value propositions. The TOE framework demonstrates how digitalisation efforts rely on successfully integrating technology with organisational features and external environmental forces, including leadership and cultural aspects, market requirements, and regulatory needs. Through its TOE framework, organisations receive complete knowledge about the difficulties and potential gains they experience when implementing new technologies (Oliveira & Martins, 2010). Organisations that analyse their technological readiness, organisational capabilities, and environmental factors gain better control of digitalisation complexities. The TOE framework is completed when it incorporates digital leadership alongside organisational culture design thinking and knowledge sharing to strategically allow organisations to manage their digitalisation process for sustainable success, as illustrated in Figure 1.

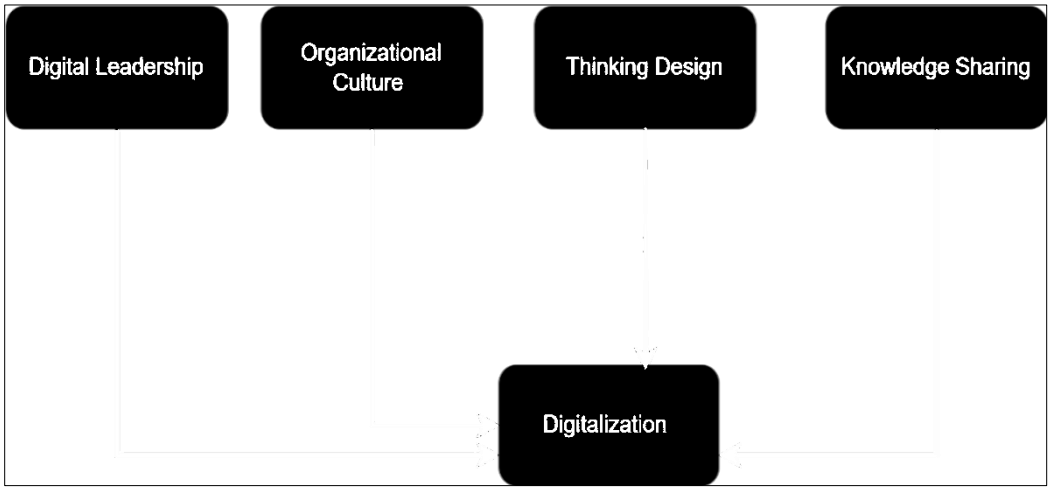

Figure 1: Research Model

3. METHODOLOGY

This study employs a quantitative research design for exploring the influence of digital leadership and design thinking on organisational culture.

The study's goal is to quantify the correlations between these factors and evaluate their influence within the organisational environment, and this design is likely appropriate for that purpose. The study facilitates the collection and analysis of numerical data. Its statistical inference through a quantitative approach is particularly valuable for empirically validating hypothesised relationships. It offers a robust framework to understand the contribution of digital leadership and design thinking to enhance organisational outcomes. The statistical analysis of the study aims to provide actionable insights into the role of these factors in promoting organisational effectiveness in the face of digital transformation.

3.1 Sample Size and Sampling Technique

The study collected data from 400 participants of managerial-level employees across various organisations in Beijing to ensure sufficient statistical power to detect significant effects and interactions among the key variables. It is a city renowned for its technological advancement and high concentration of businesses undergoing digital transformation initiatives. The sample size exceeds the minimum requirement for strengthening the reliability and generalizability of the findings; due to the city's prominence in innovation and business development, it is an ideal context for this research. The study adopted a stratified random sampling technique to ensure a representative sample, enabling the capture of diverse perspectives from different regional sectors and business environments.

3.2 Data Collection

Data collection for the study was carried out through structured surveys distributed to selected participants in Beijing. We designed the survey to assess key constructs like design thinking, digital leadership, knowledge sharing, organisational culture, and the degree of digitalisation within various organisations. We utilised the design thinking scale from Vignoli et al. (2023) to capture innovative and organisational problem-solving abilities. The study employed a scale developed by Büyükbeşe et al. (2022) for digital leadership. It helps evaluate leaders' proficiency in digital skills, attitudes toward digital technologies, and behaviours promoting a digital-first culture. To measure knowledge sharing, we used a scale adapted from Yi (2009) that looks at employee knowledge exchange frequency, quality, and efficiency. The organisational culture is measured using Van Muijen's (1999) scale, which examines the prevailing attitudes, values, and practices that influence organisational operations and responses to digital challenges. Lastly, we measured the extent of digitalisation using a scale from Garg et al. (2024), focusing on how well digital technologies are integrated and utilised.

3.3 Analysis Techniques

The study utilised two advanced statistical analysis techniques, SPSS (Statistical Package for the Social Sciences) and multiple regression analysis, to handle the complex data sets and rigorously test the variables' relationships. SPSS was chosen for its robust capabilities in managing large datasets and performing various statistical tests that are crucial for the initial stages of our analysis. It included descriptive statistics, which enabled an understanding of the data descriptions and gave initial impressions and trends, while inferential statistics were carried out to determine relationships.

3.4 Ethical Considerations

The study strictly adhered to ethical principles for ensuring the protection and respect of all participants. Participants were given comprehensive information about the study's goals, methods, data use, rights, and the freedom to discontinue participation without repercussions.

Participants' confidentiality and anonymity were preserved by anonymising survey replies and safely preserving demographic data, which will be erased at the end of the study. The study only addressed professional inquiries about organisational innovation and digital leadership without interfering with participants' personal lives. The participants' dignity and rights were fully respected throughout the study, with additional precautions taken to prevent harm.

4. RESULTS AND DISCUSSION

4.1 Demographic Information

Table 1 shows a diverse representation of 400 participants, with male participants accounting for 60% of the total while female participants comprise 40%. Most employees who completed the survey belonged to the younger and middle-aged segments, where the most significant demographic segment consisted of workers who were 36 to 45 years old. The majority of participants in this study completed university studies at the master's level, and before them, there were participants with undergraduate degrees at 37.5%. A sample composed mainly of professionals with six to ten years of work experience exists according to the results (35%). The data shows that technology-driven industries comprise a significant portion of the company as both Information Technology (25%) and Manufacturing (22.5%) represent most of the organisations in this participant sample. Senior-level and executive-level managers form 37.5% of the study subjects, while the rest (50%) fill entries in middle management categories.

Table 1: Demographic Information of Participants

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	240	60.0
	Female	160	40.0
Age Group	18-25 years	50	12.50
	26-35 years	120	30.0
	36-45 years	140	35.0
	46-55 years	70	17.5
	56 years and above	20	5.0
Education Level	High School	10	2.50
	Undergraduate Degree	150	37.50
	Master’s Degree	180	45.0
	Doctorate	60	15.0
Work Experience	1-5 years	80	20.0
	6-10 years	140	35.0
	11-15 years	120	30.0
	16+ years	60	15.0
Industry Sector	Information Technology	100	25.0
	Manufacturing	90	22.50
	Finance/Banking	80	20.0
	Consulting	50	12.50
	Healthcare	30	7.50
	Other	50	12.50
Managerial Level	Mid-Level	200	50.0
	Senior-Level	150	37.50

Executive-Level	50	12.50

4.2 Socioeconomic Features

Table 2 shows the socioeconomic features of key variables involved in the study, providing insight into their central tendencies, variability, and distribution characteristics. The mean values indicate that participants generally rated Digital Leadership (4.15), Organizational Culture (3.95), Design Thinking (4.05), knowledge Sharing (3.85), and Digitalization (4.1) positively, with scores above 3.5, suggesting a generally favourable perception of these factors. The standard deviation values, ranging from 0.58 to 0.68, show moderate variability in participants' responses, indicating some diversity in opinions but relatively consistent views overall. The skewness values are all negative, suggesting that the distributions of responses are slightly skewed to the right, indicating a tendency towards higher scores (positive perceptions) for all variables. The kurtosis values are close to zero, indicating that the distributions are relatively normal, with no significant outliers or heavy tails.

Table 2: Socioeconomic Features of Key Variables

Variable	Mean	Median	Standard Deviation	Skewness	Kurtosis
Digital Leadership	4.15	4.2	0.68	-0.25	-0.1
Organisational Culture	3.95	4	0.6	-0.2	0
Design Thinking	4.05	4.1	0.62	-0.15	-0.05
Knowledge Sharing	3.85	3.9	0.58	-0.1	0.2
Digitalisation	4.1	4.15	0.65	-0.18	0.05

4.3 Correlation Matrix Analysis

Table 3 shows a positive interdependence between the key variables, as the correlation matrix indicates. It established a significant positive relationship between digital leadership and digitalisation, 0. 75, suggesting that efficient digital leadership positively relates to a greater degree of digitalisation. There are moderate positive associations with Organizational Culture, with a correlation coefficient of 0. 7; Design thinking, with a coefficient of 0. 65; and Knowledge sharing, with a coefficient of 0. 6, which indicates a strong positive relationship with digital leadership. The results show that Organizational Culture has a higher correlation with Knowledge Sharing (0. 8); it also has a positive correlation with digitalisation to the extent of 0. 7. This testifies that a positive organisational culture is key to knowledge-sharing and digitalisation. Design Thinking correlates more significantly with digitalisation than Knowledge Sharing, suggesting its importance in enabling innovation and digitisation. Sharing of knowledge has the highest correlation coefficient with digitisation with a score of 0. 85, implying that proper management of knowledge-sharing practices is critical to achieving the organisation's digitisation goals. It indicates the interdependency between digital leadership, organisational culture, design thinking and knowledge sharing regarding digitalisation.

Table 3: Correlation Matrix for Key Variables

	Digital Leadership	Organisational Culture	Design Thinking	Knowledge Sharing	Digitalisation
Digital Leadership	1.00	0.7	0.65	0.6	0.75
Organisational Culture	0.7	1.00	0.6	0.8	0.7
Design Thinking	0.65	0.6	1.00	0.75	0.8
Knowledge Sharing	0.6	0.8	0.75	1.00	0.85
Digitalisation	0.75	0.7	0.8	0.85	1.00

4.4 Multiple Regression Analysis

The statistical method of multiple regression analysis enables researchers to connect a dependent variable with multiple independent variables throughout an analytical assessment. The current research relies on multiple regression analysis to determine the combined effect of Digital Leadership with Organizational Culture, Design Thinking, and knowledge Sharing upon Digitalization within organisations. The study focuses on determining how several variables affect digital transformation processes in technologically advanced organisations because digital change manifests in various ways. The analysis fully understands variable significance by evaluating each component beyond other contributing factors. This study investigates relationships between key system elements to determine which ones positively affect organisations' digitalisation initiatives within technologically advanced organisations. Multiple regression establishes a valid testing system and theoretical model assessment by incorporating the independent variable contribution to digitalisation variance. The results produced through these analyses contribute to digitalisation theory while simultaneously providing actionable help for organisational leaders who want to create digital transformation environments and policymakers seeking organisational growth. The multiple regression analysis results show variable relationships in subsequent tables, contributing statistical evidence to validate the study's findings.

4.4.1 Model Fit Analysis

Table 4 shows the model fit summary, determining the model's reliability and fitting performance. The strong direct relation between digitalisation and independent variables emerges through the R-value of 0.915. Digitalisation has 83.8% of its explanatory power from the variables used in the model, as shown through the R^2 value of 0.838. The adjusted R^2 value of 0.834 excludes predictors while maintaining a high level of model explanation power. The standard error of the estimate at 0.477 indicates the average measurement distance between actual Digitalization values and their predictions, which indicates a moderate prediction accuracy.

Table 4: Model Fit Summary

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate
1	0.915	0.838	0.834	0.477

4.4.2 ANOVA Analysis

Table 5 shows that the F-statistic of 131.68 is highly significant, with a p-value of 0.000, indicating that the model significantly explains the variance in the dependent variable, digitalisation. The Sum of Squares for Regression (118.59) represents the variability in digitalisation explained by the independent variables (Digital Leadership, Organizational Culture, Design Thinking, and Knowledge Sharing). In contrast, the Residual Sum of Squares (22.67) represents the unexplained variability. The Mean Square for Regression (29.645) is calculated by dividing the sum of squares for regression by the degrees of freedom (df = 4), and the Mean Square for Residual (0.057) is the residual sum divided by the degrees of freedom for the residuals (df = 395). The large F-value, along with the p-value of 0.000, confirms that the independent variables in the model have a statistically significant combined effect on digitalisation, making the regression model a good fit for the data.

Table 5: ANOVA Results

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	118.59	4	29.645	131.68	0
Residual	22.67	395	0.057		
Total	141.26	399			

4.4.3 Coefficient

Table 6 provides insights into the individual impact of each independent variable on digitalisation. The unstandardised coefficients (B) indicate the raw effect of each predictor, where Digital Leadership has a coefficient of 0.424, meaning that for each one-unit increase in digital leadership, digitalisation increases by 0.424 units, holding other variables constant. Similarly, organisational culture, design thinking, and knowledge sharing have coefficients of 0.361, 0.371, and 0.389, respectively, showing that each factor positively influences digitalisation. The standardised coefficients (β) reveal the relative strength of each predictor, with Organizational Culture (β = 0.714) having the most decisive influence, followed by Design Thinking (β = 0.701) and Knowledge Sharing (β = 0.692), indicating their substantial roles in driving digital transformation. The high t-values (ranging from 10.51 to 12.62) and the p-values of 0.00 for all variables suggest that all predictors are statistically significant, affirming that they each have a meaningful and positive impact on digitalisation.

Table 6: Coefficients

Variable	Unstandardised Coefficients (B)	Standardised Coefficients (β)	t	Sig.
(Constant)	0.648		5.612	0.00
Digital Leadership	0.424	0.684	12.62	0.00
Organisational Culture	0.361	0.714	10.51	0.00
Design Thinking	0.371	0.701	11.87	0.00
Knowledge Sharing	0.389	0.692	12.23	0.00

4.5 Discussion

The multiple regression analysis yields essential information about key elements driving organisational digitalisation. Digital Leadership, Organizational Culture, and Design Thinking Knowledge Sharing positively affect digital transformation protocols. Research conducted by Zhang and Wu (2023) and Schein (2010) confirms that leadership and organisational culture are crucial for digital change development. The study findings show Digital Leadership as the most influential variable in predicting digitalisation since it has a standardised coefficient 0.684. Previous studies demonstrate that leaders guide digital initiatives by creating strategic directions and constructing environments that encourage technology adoption (Zhang et al., 2023; Rösch et al., 2023). Digitalisation shows a strong dependence on Organizational Culture based on the result of a standardised coefficient of 0.714, according to Yi (2009), since cultural alignment with digital strategies leads to successful transformations. Modern digitalisation initiatives succeed when organisations encourage flexibility while promoting collaboration and innovation because these values build favourable conditions for new technological adoption. According to this research, organisations require a supportive cultural context that develops digital capabilities at every organisational level.

The statistical analysis indicates design thinking and knowledge sharing as key factors ($\beta = 0.701$ and $\beta = 0.692$, respectively) that influence digitalisation. Organisations applying design thinking methods to user-focused innovation and problem resolution have made it their essential method to fulfil digital requirements (Yao et al., 2024; Proksch et al., 2024; Tagscherer & Carbon, 2023; Santhose & Lawrence, 2023). Organisations demonstrating positive knowledge-sharing results have better opportunities to adapt transformational technologies and extract maximum value from digital platforms. The research findings show that digital transformation includes multiple dimensions that need exceptional leadership, organisational support, innovative strategies, and precise knowledge management. District authorities benefit from the practical application of these research results. Digital transformation requires organisations to invest in establishing digital leadership skills, innovative cultural development, and knowledge exchange between teams. A strategic integration of such elements will help organisations enhance their digital capabilities to transform smoothly into the digital era. The research enhances digital transformation literature through quantitative evidence, which identifies digital leadership, organisational culture, design thinking, and knowledge sharing as significant factors that drive digitalisation. Future studies should analyse these relations across different sectors and organisational situations to establish their general

validity and understand any extra elements that might affect digitalisation processes in distinct environments.

5. CONCLUSION AND RECOMMENDATIONS

The research investigates essential organisational elements for digital transformation by evaluating digital leadership, organisational culture, design thinking, and knowledge-sharing practices. Digital transformation advances rapidly because all variables support it effectively in a direct relationship, which proves that decisive leadership leads to positive cultures through innovative execution and knowledge-sharing methods. Strategic investments in digital leadership, organisational culture, design thinking, and knowledge sharing are imperative because they create favourable digital transformation ecosystems that enable organisations to embrace technological progress while staying competitive. This research provides beneficial recommendations to managers and policymakers for enhancing organisational digital capabilities. Additional research with expanded organisational perspectives and across various industrial landscapes will refine present knowledge about the driving factors of digitalisation.

6. LIMITATIONS AND FUTURE STUDIES

The study delivers a beneficial understanding of digitalisation drivers, yet it must be recognised that it contains several restrictions. The research delimits generalisation because it focuses on the Beijing region, potentially reducing applicability to other locations and organisations at different stages of digital operational evolution. The research depends on managerial-level employee self-reported data for its findings, but this approach might produce bias through human perception and limit observations of organisational interactions. Future investigations should increase the range of their subject sample by adding employees at diverse hierarchical positions and across different industries to research digital transformation better. The investigation calls for time-based research to study Digital Leadership with Organizational Culture and Design Thinking and Knowledge Sharing's lasting impacts on digital transformation across different periods. Further research should analyse how these elements function together with external market influences and processes of technological disruption to understand digitalisation's complex attributes better.

Author contributions: Haipeng Wuconceptualized the study, provided resources, performed formal analysis, and contributed to the methodology. Zhiqiang Jiang contributed to writing, reviewing, and editing. All authors have read and agreed to the published version of the manuscript.

Ethical Statement: The author(s)has obtained permission from the faculty of Educational Administration Southeast Asia University. The researcher explained the study’s objectives before interviewing the respondents. The respondents

were assured that the information would only be used for research purposes. They were also told they could withdraw from the interview at any stage if they felt uneasy or did not want to continue.

Competing Interests: The author declares that this work has no competing interests.
Grant/Funding information: The author declared that no grants supported this work.
Data Availability Statement: The associated data is available upon request from the corresponding author.
Declaration Statement of Generative AI: The author(s) of this work declared that they did not use any AI tools except Grammarly to improve the language of the study.

REFERENCES

Abbu, H., Mugge, P., Gudergan, G., & Kwiatkowski, A. (2020, June). Digital leadership character and competency differentiate digitally mature organisations. In *2020 IEEE international conference on engineering, technology and innovation (ICE/ITMC)* (pp. 1-9). IEEE. https://doi.org/10.1109/ICE/ITMC49519.2020.9198576

AlNuaimi, B. K., Singh, S. K., Ren, S., Budhwar, P., & Vorobyev, D. (2022). Mastering digital transformation: The nexus between leadership, agility, and digital strategy. *Journal of Business Research*, *145(1)*, 636-648. https://doi.org/10.1016/j.jbusres.2022.03.038

Asif, M., Yang, L., & Hashim, M. (2024). The Role of Digital Transformation, corporate culture, and Leadership in Enhancing Corporate Sustainable Performance in China's Manufacturing sector. *Sustainability*, *16*(7), 2651. https://doi.org/10.3390/su16072651

Baker, J. (2011). The technology–organisation–environment framework. *Information Systems Theory: Explaining and Predicting Our Digital Society, Vol. 1*, 231-245. https://doi.org/10.1007/978-1-4419-6108-2_12

Bustard, J. R., Hsu, D. H., & Fergie, R. (2023). Design thinking innovation within the quadruple helix approach: A proposed framework to enhance student engagement through active learning in digital marketing pedagogy. *Journal of the Knowledge Economy*, *14*(3), 2463-2478. https://doi.org/10.1007/s13132-022-00984-1

Büyükbeşe, T., Dikbaş, T., Klein, M., & Ünlü, S. B. (2022). A study on digital leadership scale (DLS) development. *Kahramanmaraş Sütçü İmam Üniversitesi Sosyal Bilimler Dergisi*, *19*(2), 740-760. https://doi.org/10.33437/ksusbd.1135540.

Cahyadi, A., & Magda, R. (2021). Digital leadership in the economies of the G20 countries: Secondary research. *Economies, 9 (1), 32*. https:// doi.org/doi:10.3390/economies9010032

Cameron, K. S., Quinn, R. E., DeGraff, J., & Thakor, A. V. (2006). Competing values leadership: Creating value in organisations. In *Competing Values Leadership*. Edward Elgar Publishing. https://doi.org/10.4337/9781847201560

de Araujo, L. M., Priadana, S., Paramarta, V., & Sunarsi, D. (2021). Digital leadership in business organisations. *International Journal of Educational Administration, Management, and Leadership*, 45-56. https://doi.org/10.51629/ijeamal.v2i1.18

Deng, H., Duan, S. X., & Wibowo, S. (2023). Digital technology-driven knowledge sharing for job performance. *Journal of Knowledge Management*, *27*(2), 404-425. https://doi.org/10.1108/JKM-08-2021-0637

Eslami, M. H., Achtenhagen, L., Bertsch, C. T., & Lehmann, A. (2023). Knowledge-sharing across supply chain actors in adopting Industry 4.0 technologies: An exploratory case study within the automotive industry. *Technological Forecasting and Social Change*, *186*, 122118. https://doi.org/10.1016/j.techfore.2022.122118

Fang, L. (2023). Examining the effects of digital leadership strategies on enhancing organisational innovation performance. *Journal of Logistics, Informatics and Service Science*, *10*(4), 318-335. https://doi.org/10.33168/JLISS.2023.0422

Garg, P., Gupta, B., Sar, A., Graham, G., & Shore, A. P. (2024). Development and validation of an instrument to measure the perceived benefits of digitalisation in manufacturing. *IEEE Transactions on Engineering Management, 71*, 8288–8306. https://doi.org/10.1109/TEM.2024.3390434

Hensellek, S. (2020). Digital leadership: A framework for successful leadership in the digital age. *Journal of Media Management and Entrepreneurship (JMME)*, *2*(1), 1-15. https://doi.org/10.4018/JMME.2020010104

Hoe, S. L. (2006). Tacit knowledge, Nonaka and Takeuchi SECI model and informal knowledge processes. *International Journal of Organization Theory & Behavior*, *9*(4), 490-502. https://doi.org/10.1108/IJOTB-09-04-2006-B002

Iqbal, Q., & Piwowar-Sulej, K. (2023). Sustainable leadership and heterogeneous knowledge sharing: the model for frugal innovation. *European Journal of Innovation Management*, *26*(7), 655-673. https://doi.org/10.1108/EJIM-03-2022-0144

Kamble, S., Rana, N. P., Gupta, S., Belhadi, A., Sharma, R., & Kulkarni, P. (2023). An effectuation and causation perspective on the role of design thinking practices and digital capabilities in platform-based ventures. *Technological Forecasting and Social Change*, *193*, 122646. https://doi.org/10.1016/j.techfore.2023.122646

Kıyak, A., & Bozkurt, G. (2020). A general overview of the digital leadership concept. *Uluslararası Sosyal ve Ekonomik Çalışmalar Dergisi*, *1*(1), 84-95. https://dergipark.org.tr/tr/pub/gsijses/issue/72093/1160298

Leal-Rodríguez, A. L., Sanchís-Pedregosa, C., Moreno-Moreno, A. M., & Leal-Millán, A. G. (2023). Digitalisation beyond technology: Proposing an explanatory and predictive model for digital culture in organisations. *Journal of Innovation & Knowledge*, *8*(3), 100409. https://doi.org/10.1016/j.jik.2023.100409

Leso, B. H., Cortimiglia, M. N., & Ghezzi, A. (2023). The contribution of organisational culture, structure, and leadership factors in the digital transformation of SMEs: a mixed-methods approach. *Cognition, Technology & Work*, *25*(1), 151-179. https://doi.org/10.1007/s10111-022-00714-2

Liu, H., Zhu, Q., Khoso, W. M., & Khoso, A. K. (2023). Spatial pattern and the development of green finance trends in China. *Renewable Energy*, *211*, 370-378. https://doi.org/10.1016/j.renene.2023.05.014

Mollah, M. A., Choi, J. H., Hwang, S. J., & Shin, J. K. (2023). Exploring a pathway to sustainable organisational performance of South Korea in the digital age: The effect of digital leadership on IT capabilities and organisational learning. *Sustainability*, *15*(10), 7875. https://doi.org/10.3390/su15107875

Mortati, M., Magistretti, S., Cautela, C., & Dell'Era, C. (2023). Data in design: How big and thick data inform design thinking projects. *Technovation*, *122*, 102688. https://doi.org/10.1016/j.technovation.2022.102688

Nezafati, N., Afrazeh, A., Jalali, S. M. J., & Mohammad, J. (2009). A dynamic model for measuring the knowledge level of organisations based on the Nonaka and Takeuchi Model (SECI). *Scientific Research and Essays*, *4*(5), 531-542.

Nonaka, L., Takeuchi, H., & Umemoto, K. (1996). A theory of organisational knowledge creation. *International journal of technology Management*, *11*(7-8), 833-845. https://doi.org/10.1504/IJTM.1996.025472

Oliveira, T., & Martins, M. F. (2010, September). Information technology adoption models at the firm level: a literature review. In *The European conference on information systems management* (p. 312). Academic Conferences International Limited.

Proksch, D., Rosin, A. F., Stubner, S., & Pinkwart, A. (2024). The influence of a digital strategy on the digitalisation of new ventures: The mediating effect of digital capabilities and digital culture. *Journal of small business management*, *62*(1), 1-29. https://doi.org/10.1080/00472778.2021.1883036

Rösch, N., Tiberius, V., & Kraus, S. (2023). Design thinking for innovation: context factors, process, and outcomes. *European Journal of Innovation Management*, *26*(7), 160-176. https://doi.org/10.1108/EJIM-03-2022-0164

Santhose, S. S., & Lawrence, L. N. (2023). Understanding the implementations and limitations in knowledge management and sharing using a systematic literature review. *Current Psychology*, *42*(36), 32427-32442. https://doi.org/10.1007/s12144-022-04115-6

Schein, E. H. (2010). *Organisational culture and leadership* (Vol. 2). John Wiley & Sons.

Shin, J., Mollah, M. A., & Choi, J. (2023). Sustainability and organisational performance in South Korea: The effect of digital leadership on digital culture and employees' digital capabilities. *Sustainability*, *15*(3), 2027. https://doi.org/10.3390/su15032027

Tagscherer, F., & Carbon, C. C. (2023). Leadership for successful digitalisation: A literature review on companies' internal and external aspects of digitalisation. *Sustainable Technology and Entrepreneurship*, *2*(2), 100039. https://doi.org/10.1016/j.stae.2023.100039

Van Muijen, J. J. (1999). Organisational culture: The focus questionnaire. *European Journal of work and organisational psychology*, *8*(4), 551-568.

Vendraminelli, L., Macchion, L., Nosella, A., & Vinelli, A. (2023). Design thinking: a strategy for digital transformation. *Journal of Business Strategy*, *44*(4), 200-210. https://doi.org/10.1108/JBS-01-2022-0009

Vignoli, M., Dosi, C., & Balboni, B. (2023). Design thinking mindset: scale development and validation. *Studies in Higher Education*, *48*(6), 926-940. https://doi.org/10.1080/03075079.2023.2172566.

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

Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Press.

Yao, Q., Tang, H., Liu, Y., & Boadu, F. (2024). The penetration effect of digital leadership on digital transformation: the role of digital strategy consensus and diversity types. *Journal of Enterprise Information Management*, *37*(3), 903-927. https://doi.org/10.1108/JEIM-09-2022-0350

Yi, J. (2009). A measure of knowledge sharing behaviour: scale development and validation. *Knowledge Management Research & Practice*, *7*(1), 65-81. https://doi.org/10.1057/kmrp.2008.36

Zhang, C., Zhou, G., Li, J., Chang, F., Ding, K., & Ma, D. (2023). A multi-access edge computing enabled framework for constructing a knowledge-sharing intelligent machine tool swarm in Industry 4.0. *Journal of Manufacturing Systems*, *66*, 56-70. https://doi.org/10.1016/j.jmsy.2022.11.015