Managing digital transformation in a global environment: The role of national culture

إدارة التحول الرقمي في البيئات العالمية: دور الثقافة الوطنية

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Abstract

In today's fast-changing business environment, digital transformation has become an essential strategic imperative for companies seeking to maintain a competitive edge. However, research on the effect of national culture on digital transformation is lacking. This study seeks to address this gap by investigating the effect of national culture on digital transformation, with a focus on the mediating role of digital competencies and information system management practices, as well as the moderating effect of leadership. 250 managers and employees with digital transformation experience across various industries in Saudi Arabia were surveyed. Structural equation modeling (SEM) was employed to analyze and test the research hypotheses. The findings demonstrate that national culture significantly affects digital transformation, with digital competencies and information system management practices acting as mediators. Furthermore, the study discovered that leadership plays a moderating role in the relationship between national culture and digital transformation. The positive impact of national culture on digital transformation is amplified when there is a transformational leadership style in place. These insights hold significant implications for organizations embarking on digital transformation initiatives, emphasizing the importance of fostering a culture encourages digital innovation and risk-taking, investing in digital capabilities and effective information system management, and nurturing transformational leadership to drive successful digital transformation efforts.

Keywords: National Culture, Digital competencies, Information System Management Practices, Digital Transformation, Leadership.

المستخلص

في بيئة الأعمال سريعة التغير، أصبح التحول الرقمي ضرورة إستراتيجية أساسية للشركات التي تسعى إلى الحفاظ على ميزاتها التنافسية. ومع اهمية ذلك ، فإن هنالك نقص في البحوث حول تأثير الثقافة الوطنية على التحول الرقمي. تسعى هذه الدراسة إلى معالجة هذه الفجوة من خلال التحقيق في تأثير الثقافة الوطنية على التحول الرقمي ، مع التركيز على الدور الوسيط للكفاءات الرقمية وممارسات إدارة نظم المعلومات ، فضلاً عن التأثير لمتغير القيادة المُعدِل في النموذج. ولتحقيق هذا الهدف استخدمت الدراسة تصميم بحث كمي وجمعت بيانات مسح من 250 مديرًا وموظفًا في مختلف الصناعات في المملكة العربية السعودية ممن لديهم خبرة في التحول الرقمي. تم استخدام نمذجة المعادلات الهيكلية (SEM) لتحليل البيانات واختبار فرضيات البحث. تشير النتائج إلى أن الثقافة الوطنية لها تأثير كبير على التحول الرقمي ، ويتوسط هذا التأثير بشكل أساسي الكفاءات الرقمية وممارسات إدارة نظم المعلومات. تكشف الدراسة أن الثقافة التي تعطي الأولوية للابتكار والمخاطرة ترتبط بشكل إيجابي بالكفاءات الرقمية وممارسات إدارة نظام المعلومات ، مما يؤدي بدوره إلى التحول الرقمي. علاوة على ذلك ، اكتشفت الدراسة أن القيادة تلعب دورًا معتدلاً في العلاقة بين الثقافة الوطنية والتحول الرقمي. يتم تضخيم التأثير الإيجابي للثقافة الوطنية على التحول الرقمي عندما يكون هناك أسلوب قيادة تحويلية في المكان. الآثار المترتبة على الدراسة كبيرة بالنسبة للشركات التي تشرع في برامج التحول الرقمي. بناءً على النتائج ، يجب على الشركات إنشاء ثقافة تشجع الابتكار الرقمي والمخاطرة ، والاستثمار في القدرات الرقمية وتقنيات إدارة نظم المعلومات ، وتعزيز القيادة التحويلية. بالإضافة إلى ذلك ، يجب مراعاة الجوانب الثقافية الوطنية عند وضع خطط التحول الرقمي.

الكلمات المفتاحية: الثقافة الوطنية ، الكفاءات الرقمية ، ممارسات إدارة نظم المعلومات ، التحول الرقمي ، القيادة.

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Introduction

In recent years, Saudi Arabia has made significant strides in digital transformation. The country boasts a high internet penetration rate of 78%, with 27.1 million active internet users, despite a population of 34.8 million (Al-Kahtani et al., 2022). The Vision 2030 strategy of the government aims to reduce the country's reliance on oil earnings and invest in new areas such as technology, media, and telecommunications. To support this strategy, the government has developed projects such as the National Digital Transformation Program (NDTP) and the Saudi Cloud Computing Program (SCCP) to increase the use of digital technology across diverse sectors and promote cloud adoption in the public sector (Johri & Kumar, 2023). The Saudi ICT market is expected to reach $39.5 billion by 2023, growing at a 6.8% CAGR between 2018 and 2023.

The relationship between national culture and digital transformation takes on various forms, some complementary and others contradictory. One-way digital technologies contribute to the preservation of national culture is through the use of digital media to capture and document traditional practices, knowledge, and skills (Rowan et al., 2022). Digital transformation also contributes to solving environmental problems by encouraging sustainable practices such as renewable energy, waste reduction, and resource efficiency.

Despite the growing body of work investigating the impact of national culture on digital transformation, there is still a gap in understanding the mediating function of digital competencies and information system management practices, as well as the moderating role of leadership (Bemmami et al., 2022). Therefore, the aim of this study is to investigate the impact of national culture on digital transformation and the mediating role of digital competencies and information system management practices. Additionally, this study aims to explore the moderating role of leadership in this relationship.

Literature Review

Digital Transformation

D Digital transformation has emerged as a vital strategic imperative for businesses in today's technology-driven landscape. The integration of digital technologies across all aspects of an organization brings numerous benefits, including improved operational efficiency, enhanced customer experience, increased innovation and agility, and cost reduction (Hess et al., 2016). In recent years, the concept of digital transformation has garnered significant attention due to its profound impact on businesses and their ability to remain competitive in today's fast-paced and technology-driven world. Digital transformation entails the integration of digital technologies into all facets of an organization, leading to fundamental changes in its operations and value delivery to customers (Busulwa et al., 2022; Sebastian et al., 2020). This transformative process is driven by several key factors that have propelled its widespread adoption (Alshammari, 2023).

The benefits of digital transformation are multifaceted and hold great promise for organizations. One notable advantage is the improvement in operational efficiency (Hess et al., 2016; Vial, 2019). By leveraging digital tools and technologies, companies can streamline their processes, optimize resource allocation, and eliminate inefficiencies. This, in turn, leads to cost savings and enhanced productivity. Moreover, digital transformation enables organizations to deliver an elevated customer experience (Schuchmann & Seufert, 2015).

Additionally, organizations may encounter difficulties in integrating new technologies into their existing services and systems. Legacy systems and processes may not be compatible with emerging digital solutions, requiring careful planning and execution to ensure a smooth transition (Libert et al., 2016). Moreover, the process of upskilling or reskilling employees to effectively leverage digital technologies can present a significant challenge (Shahatha Al-Mashhadani et al., 2021).

National Culture in Information System Field

In the realm of Information Systems (IS) and Management research, one theory that has gained considerable prominence when exploring the influence of national culture is Hofstede's national cultures theory. This theory, introduced by Geert Hofstede, has been frequently cited and utilized in various studies examining the impact of national culture dimensions (Leidner & Kayworth, 2006). Researchers often turn to Hofstede's

theory as a framework for comprehending the role of national culture within organizations (Obeidat et al., 2012). Due to its comprehensiveness and widespread recognition, Hofstede's national cultures theory has been widely adopted in IS and Management research. Scholars have utilized this framework to investigate a broad range of topics, including cross-cultural IT adoption, technology acceptance, organizational behavior, knowledge sharing, and leadership styles across different national contexts (Leung et al., 2005).

Hypotheses Development

National Culture and Digital Competencies

The relationship between national culture and digital competencies has received growing attention in recent years. Numerous studies have explored the impact of cultural dimensions on individuals' abilities to effectively use technology. For instance, Hébert et al., (2022) found that certain cultures' members have a greater propensity to perform better than others in digital competencies. In another study, Robinson (2020) investigated the connection between national culture and digital literacy in the context of online learning. The author revealed that cultural factors such as collectivism and uncertainty avoidance significantly impacted digital skills in e-learning environments. Considering this, the following hypothesis is proposed:

H1: National culture has a significant and positive impact on digital competencies.

National Culture and information system management practices

Hofstede's cultural dimensions provide a significant framework for analyzing national culture, according to Xu & Hao (2021). Researchers have used Hofstede's framework to investigate the impact of national culture on Information Systems (IS) management practices. Therefore, the national culture plays a crucial role in shaping IS management practices.

Hofstede's cultural dimensions provide a useful framework for analyzing national culture's impact on IS management practices. Therefore, understanding the cultural values of employees and stakeholders is essential in managing IS effectively across different cultures. Considering this, the following hypothesis is proposed:

H2: National culture has a significant and positive impact on information system management practices.

National Culture and Digital Transformation

National culture is a critical factor that influences how organizations approach digital transformation initiatives. Cultural values, such as individualism and collectivism, have been shown to impact the adoption of digital transformation initiatives. A study conducted by Noguerón-Liu (2020) found that individualistic cultures are more receptive to digital transformation initiatives that emphasize innovation and efficiency, while collectivistic cultures are more receptive to initiatives that focus on collaboration and teamwork. This suggests that organizations operating in individualistic cultures need to prioritize the technical aspects of digital transformation, while organizations operating in collectivistic cultures should prioritize the social and cultural aspects of digital transformation.

Digital Competencies and Digital Transformation

Digital competencies are increasingly becoming crucial for organizations to stay competitive in today's digital age. These competencies refer to a set of skills and abilities that enable individuals and organizations to effectively use digital tools and technologies to achieve business objectives.

Gasco-Hernandez et al., (2022) identified four key digital competencies that organizations need to focus on: digital literacy, digital creativity, digital communication, and digital collaboration. Digital literacy involves the ability to use digital tools and technologies, while digital creativity involves the ability to generate innovative ideas and solutions using these tools. Digital communication and collaboration are also essential competencies that enable individuals and teams to communicate and work together effectively in a digital environment.

It's important to note that digital competencies are not only important for achieving success in the digital age but also for adapting to the changing technological landscape. Blanka, Krumay, & Rueckel (2022) found that digital competencies enabled organizations to adapt to changes brought about by digital transformation, such as changes in business processes and customer behavior. Considering this, the following hypothesis is proposed:

H3: Digital competencies have a significant and positive impact on digital transformation.

Information System Management Practices and Digital Transformation

Information system management practices are critical to the success of digital transformation as they help organizations to develop and manage the digital infrastructure needed to support new business models and operations. According to Bemmami et al., (2022), information system management practices are the collective set of policies, procedures, and practices used by an organization to manage its information systems. These practices provide a framework for managing the entire life cycle of an organization's information systems, from design and development to maintenance and retirement.

The impact of information system management on digital transformation can be seen in the way they enable organizations to transform their business models, processes, and operations. Information system management helps organizations to identify new digital business opportunities and align their information systems with these opportunities (Zeng et al., 2021). Considering this, the following hypothesis is proposed:

H4: Information system management practices have a significant and positive impact digital transformation.

Digital Competencies as Mediator

National culture has a significant impact on organizations' ability to undergo digital transformation. Research has shown that digital competencies play a mediating role in the relationship between national culture and digital transformation. Digital competencies refer to the ability to use digital tools and technologies effectively to achieve business goals (Gasco-Hernandez et al., 2022). In a study by Alos-Simo et al., (2017), digital competencies were found to mediate the relationship between national culture and digital transformation in South Korean organizations.

Thus, national culture is an essential factor that influences organizations' ability to undergo digital transformation. Considering this, the following hypothesis is proposed:

H5: Digital competencies significantly mediate the relationship between national culture and digital transformation.

Information System Management Practices as Mediator

Digital transformation is a complex process that involves the integration of digital technologies into all aspects of an organization's operations, including its products, services, processes, and culture. Information system management practices play a critical role in the success of digital transformation initiatives. Effective information system management practices enable organizations to develop and manage the digital infrastructure needed to support new business models and operations. The practices involve activities such as strategic planning, system design and development, IT infrastructure management, and IT service management. Toring et al., (2022) suggest that information system management practices are crucial in ensuring the success of digital transformation initiatives. Considering this, the following hypothesis is proposed:

H6: Information system management practices significantly mediate the relationship between national culture and digital transformation.

Leadership as Moderator

While having digital competencies is essential for successful digital transformation, how those competencies affect that transformation depends on the leadership position. Leaders play a critical role in

determining the success of digital transformation initiatives. According to Caldwell (2020), the relationship between digital competencies and digital transformation can be moderated by leadership. Leaders must possess leadership digital competencies, which refer to the capabilities needed to lead a digital transformation effectively. Anufrieva (2022) identifies several critical leadership digital abilities, including the capacity to comprehend and utilize digital technology, the capacity to effectively communicate through digital media, and the capacity to build a digital strategy. Considering this, the following hypothesis is proposed:

H7: Leadership significantly moderates the relationship between digital competencies and digital transformation.

While information systems (IS) management practices are critical enablers of digital transformation, their impact on digital transformation may be contingent upon the leadership of an organization. The relationship between IS management practices and digital transformation can be moderated by leadership. For instance, leadership can provide the necessary support, resources, and guidance to drive digital transformation initiatives, thereby moderating the relationship between IS management practices and digital transformation (Alkinani, 2021). Considering this, the following hypothesis is proposed:

H8: Leadership significantly moderates the relationship between information system management practices and digital transformation.

Methodology

Research Model

Figure 1 displays the conceptual framework that was developed to guide the study. The dependent variable of digital transformation is at the center of the framework, surrounded by the five national cultural dimensions. It is hypothesized that these dimensions impact digital transformation in different ways. The framework also considers the potential mediating role digital competencies and information system management practices, and the moderating role of leadership. It is hypothesized that digital competencies and information system management practices will have a significant mediating impact on digital transformation. Also, it is hypothesized that leadership will have a significant mediating impact on digital transformation.
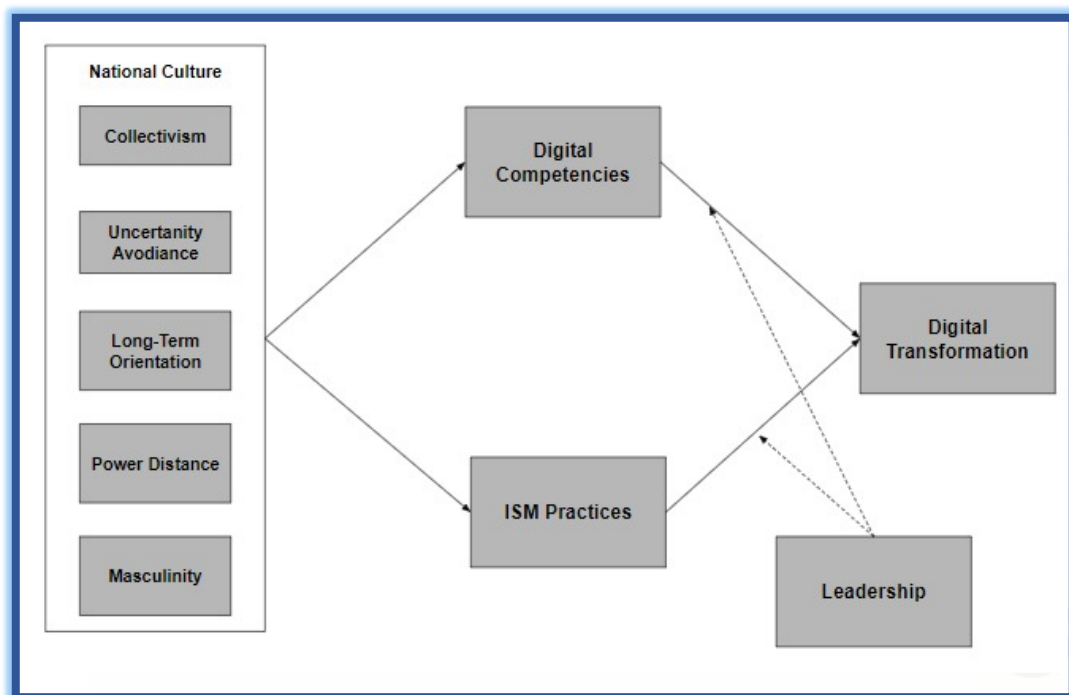

Figure 1. The study Model.

Research design

The research design selected for that study was a quantitative research approach, and the study aimed to explore the impact of national culture on digital transformation, while examining the mediating role of digital competencies and information system management practices, and the moderating role of leadership.

To address the research questions of this study, a rigorous and systematic research design was employed, utilizing a quantitative research approach and survey method. The survey questions were carefully developed based on previously validated instruments to ensure the reliability and validity of the data collected. By employing both structural equation modelling (SEM) and the SPSS statistical tool, the study was able to analyze the collected data and test the proposed conceptual framework.

Instrument Design and Measures

The study used validated scales to measure the constructs, and the measures for the constructs were as follows: 24 item scale adopted from (Hofstede, 2011) was used to measure national culture, while 5item scale was used to measure digital competencies adopted from (Sarango-Lapo et al., 2021). Additionally, 5 item scale adopted from (Kim, Yagi, & Kiminami, 2023) was used to measure information system management practices, and leadership was measured by using 5 item scale adopted from (Jedwab et al., 2023). Finally, Digital Transformation Assessment (DTA) was used to measure digital transformation adopted from (Nikmehr et al., 2021).

Findings

Demographic Profile

Table 1.
Demographic profile of the respondents

Demographic item		Frequency	Percentage
Gender			
	Male	162	65%
	Female	88	35%
Age			
	25-34 years old	36	14%
	35-44 years old	73	29%
	45-54 years old	82	33%
	55-64 years old	47	19%
	65+ years old	12	5%
Education			
	Bachelor's degree	93	37%
	Master's degree	125	50%
	Doctorate degree	32	13%
Digital Competencies			
	Low	27	11%
	Medium	134	53%
	High	89	36%

Testing measurement model (Stage 1)

The most recent and dependable PLS-SEM technique for second-order structures used in this study is reflective-formative modeling. Using recurrent indications, the method makes it easier to estimate hierarchical second-order constructs (Hair et al., 2019). The factor-based PLS method yielded outer loadings values that mirrored the measuring model of a multidimensional educational strategy for process-based instruction, direct instruction, hybrid instruction, and all other variables. Each item's outer loading value is greater than 0.4. Table 2 shows the outside loading of each item.

Table 2.
Outer Loading of Items

	Items	Outer Loading
Direct Instruction	C1	0.808
	C2	0.721
	C3	0.846
Hybrid Instruction	C4	0.868
	DC1	0.756
	DC2	0.569
Process Based Instruction	DC3	0.854
	DC4	0.905
	DC5	0.818
Syntactic Complexity in Argumentative Essays	DT1	0.452
	DT2	0.883
	DT3	0.761
TESOL's Attitude Towards Writing	DT4	0.873
	DT5	0.863
	ISMP1	0.777
Writing Task Complexity	ISMP2	0.804
	ISMP3	0.817
	ISMP4	0.906
	ISMP5	0.907
	L1	0.558
	L2	0.914
	L3	0.488
	L4	0.795
	L5	0.916
	LTO1	0.476
	LTO2	0.809
	LTO3	0.714
	LTO4	0.831
	M1	0.810
	M2	0.502
	M3	0.769
	M4	0.849
	PD1	0.806
	PD2	0.715
	PD3	0.804
	PD4	0.807
	UA1	0.813
	UA2	0.818
	UA3	0.907
	UA4	0.832

A high Cronbach's alpha value indicates a strong internal consistency and suggests that the items within the scale are measuring the same underlying construct (Hair et al., 2019).

Table 3.
Construct Reliability

Variables	Cronbach Alpha	CR	AVE
Collectivism	0.827	0.886	0.660
Digital Competencies	0.845	0.890	0.623
Digital Transformation	0.825	0.884	0.614
ISM Practices	0.898	0.925	0.712
Leadership	0.833	0.863	0.571

Long-term Orientation	0.700	0.807	0.520
Masculinity	0.719	0.828	0.555
Power Distance	0.792	0.864	0.615
Uncertainty Avoidance	0.875	0.908	0.711

By assessing discriminant validity, the study aimed to ensure that the correlations between reflective constructs and their indicators were higher than the correlations with other constructs and indicators (Hair et al., 2019). As a result, discriminant validity testing aids in the empirical differentiation of various notions. Table 4 displays the correlation coefficients between the model constructs.

Table 4.
Discriminant Validity (Fornell-Lacker)

|	C	DC	DT	ISMP	L	LTO	M	PD	UA
Collectivism	0.813								
Digital Competencies	0.262	0.789							
Digital Transformation	0.023	0.351	0.783						
ISM Practices	0.353	0.700	0.279	0.844					
Leadership	0.476	0.320	0.276	0.407	0.756				
Long-term Orientation	0.425	0.235	0.092	0.100	0.153	0.721			
Masculinity	0.375	0.196	0.031	0.282	0.283	0.549	0.745		
Power Distance	0.401	0.098	0.132	0.282	0.422	0.497	0.745	0.784	
Uncertainty Avoidance	0.659	0.053	0.181	0.214	0.322	0.268	0.377	0.389	0.843
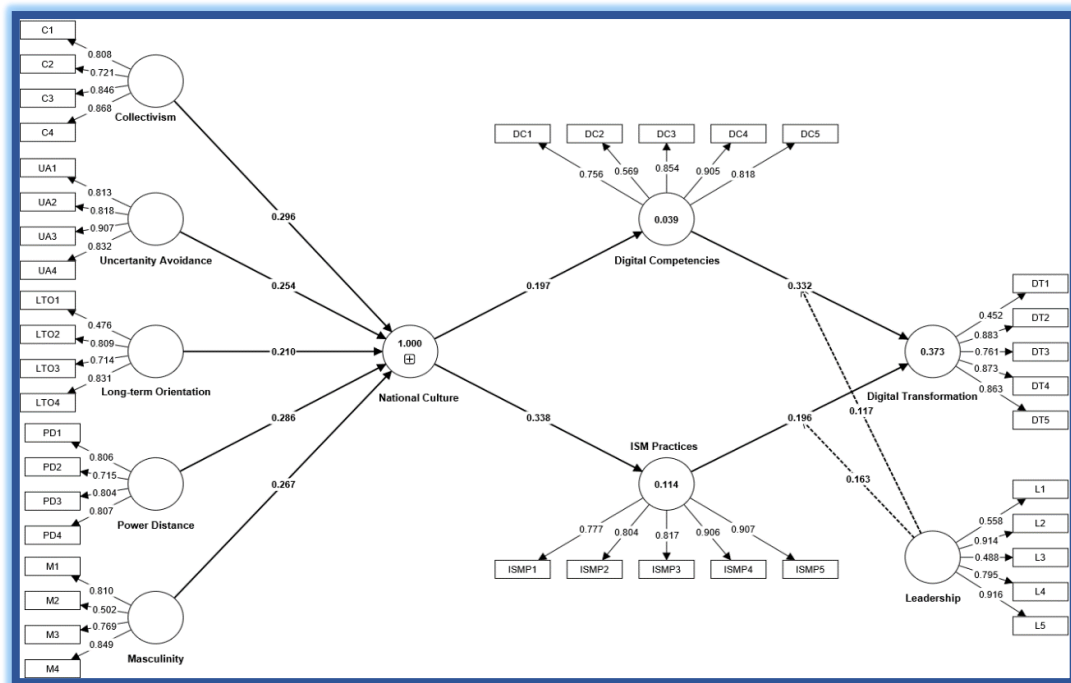
Figure 2. Measurement Model

Testing measurement model (Stage 2)

Reporting of the outer weights and p-values of the first-order (reflective) dimensions is necessary, as stipulated by the standards for evaluating formatively modeled HOC (Hair et al., 2019). Outer weights and p-values are used in Table 5 to determine the significance of national culture (second order reflective) and its dimensions (first order formative). In addition, the absence of multi-collinearity problems was

demonstrated by the collinearity statistics of the reflective construct indicators. This was accomplished by ensuring that all of the variance inflation factor values were less than 0.5, which is the suggested threshold (Hair et al., 2019).

Table 5.
Assessment of reflective dimensions of instructional approach

First order construct (Reflective)	Second order construct (Reflective)	Path Coefficient	t-value	VIF	p value
National Culture	Collectivism	0.296	21.399	2.017	0.000
	Long-term Orientation	0.210	11.010	1.602	0.000
	Masculinity	0.267	18.155	2.527	0.000
	Power Distance	0.286	18.925	2.384	0.000
	Uncertainty Avoidance	0.254	7.775	1.872	0.000

Significance of Structural Model

The structural model in this study examined the statistical significance of all path coefficients between the exogenous (independent) and endogenous (dependent) variables (Hair et al., 2019). To analyze the significance level of the structural correlations, the study employed the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach and utilized bootstrapping, a resampling procedure (Hair et al., 2019).

The PLS-SEM approach and bootstrapping were utilized to assess the significance of the path coefficients and determine the significance level of the study constructs. Path coefficients represent standardized regression coefficients, indicating the strength and direction of the relationships between variables (Hair et al., 2019). On the other hand, t-values were used to determine the significance level of the study constructs. In this analysis, the t-values were required to be greater than 1.64 to indicate statistical significance (Hair et al., 2019).

Table 6 presents the path coefficients, t-values, and significance levels for the research variables. This table provides a comprehensive overview of the relationships between the variables, indicating the strength and significance of each path coefficient (Hair et al., 2019).

Table 6.
Direct Path Analysis

Constructs	Path Coefficient	T value	P value	Q^2	R^2	SRMR
NC → DC	0.197	2.591	0.005	0.212	0.373	0.062
NC →ISM Practices	0.338	5.099	0.000			
DC →DT	0.332	2.474	0.007			
ISM Practices →DT	0.196	1.853	0.032			

Testing of hypotheses

For the statistical determination of the structural model path coefficients representing the hypothesized relationships, a PLS-SEM bootstrapping technique was utilized. The PLS-SEM assessment for national culture empirically confirmed that it is a significant predictor of digital competencies and ISM practices, as shown in Table 6, which depicts the path relationships (via beta and t-values) and hypothesis testing decisions. The first and second hypotheses were confirmed, namely that there is a significant positive relationship between national culture and digital competencies (t = 2.591, p = 0.005) and national culture and ISM practices (t = 5.099, p= 0.000). Similarly, digital competencies and ISM practices also have significant and positive impact on digital transformation (t = 2.474, p= 0.007) and (t= 1.853, p= 0.032) respectively.

Mediation Analysis

The mediation effect of digital competencies was investigated between the relationship of national culture and digital transformation. Digital competencies significantly mediate the relationship between national culture and digital transformation (t=1.731; p = 0.042). H6 is therefore accepted. The mediation effect of ISM practices was investigated between the relationship of national culture and digital transformation. ISM practices significantly mediate the relationship between national culture and digital transformation (t=1.659; p = 0.049). H7 is therefore accepted as shown in Table 7.

Table 7.
Mediation Analysis

Constructs	Path Coefficient	T value	P value
NC → DC → DT	0.065	1.731	0.042
NC→ ISMP → DT	0.066	1.659	0.049

Moderation Analysis

The moderating influence of leadership was explored on the relationship between digital competencies and digital transformation. The results of this investigation are shown below. Leadership (t=1.839; p = 0.033) establishes significantly positive moderations on the relationship between digital competencies and digital transformation. The moderating influence of leadership was explored on the relationship between ISM practices and digital transformation, as graphically displayed in Figures 3 and Table 8. The results of this investigation are shown below. Leadership (t=1.907; p = 0.028) establish significantly positive moderations on the relationship between ISM practices and digital transformation.

Table 8.
Moderation Analysis

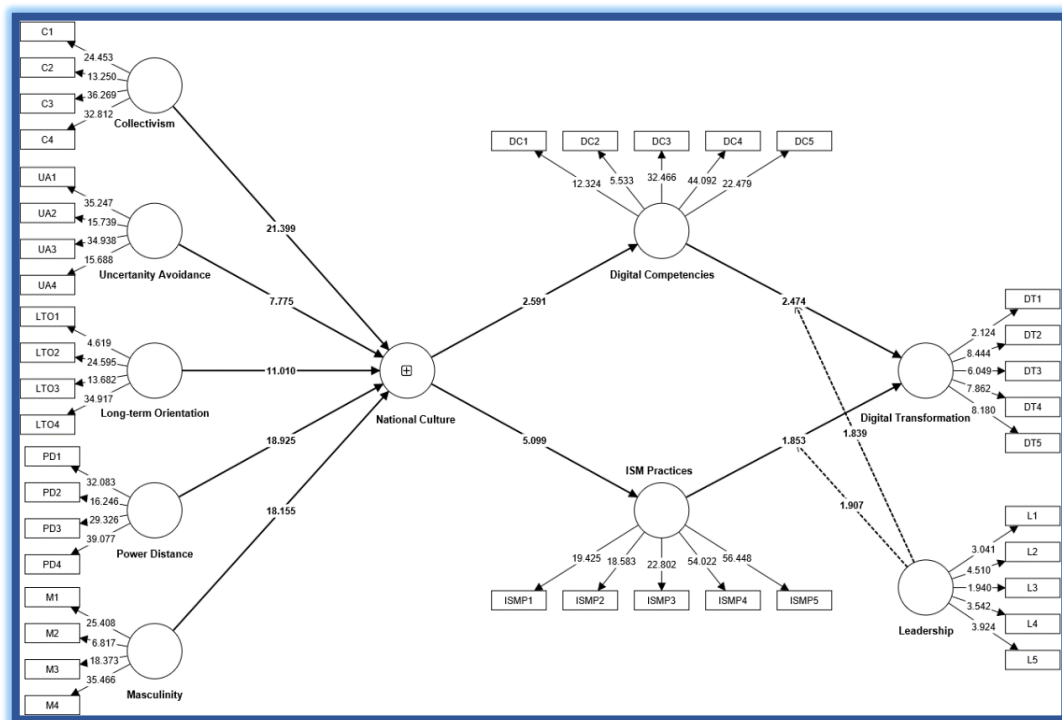| Constructs	Path Coefficient	T value	P value
Leadership x Digital Competencies → Digital Transformation	0.117	1.839	0.033
Leadership x ISM Practices → Digital Transformation	0.163	1.907	0.028

Figure 3. Structural Model

Discussion

The first hypothesis is to investigate national culture on digital competencies. National culture influences digital competencies. Cultural traits dictate individuals' perception and usage of digital technologies. Some cultures prioritize digital communication, resulting in higher digital literacy. Emphasis on education in certain cultures leads to increased digital competency (Hidalgo et al., 2020; Tatarinova et al., 2022).

The second hypothesis is to investigate national culture on information system management practices. National culture affects attitudes and practices towards information system adoption (Alghamdi, 2021). Trusting cultures favors systems promoting collaboration, also, individualistic cultures prioritize individual work support. Culture also influences system design: high uncertainty avoidance cultures desire robust systems, while low avoidance ones opt for flexibility (Alhosani, 2022).

The third hypothesis is to investigate digital competencies culture on digital transformation. Strong digital competencies culture positively impacts digital transformation, aiding organizations' success in this realm (Hämäläinen et al., 2021). Such a culture equips employees with necessary digital skills, fosters a continuous learning environment, and promotes a digital mindset of innovation and adaptability (Busulwa et al., 2022). This ensures effective adoption of digital technologies and smoother transitions during transformative changes. Emphasizing innovation, digital competencies culture prevents stagnation in fast-evolving tech landscapes (Gasco-Hernandez et al., 2022).

The fourth hypothesis is to investigate the information system management practices on digital transformation. In the digital age, information system management practices are pivotal for organizations adapting to technological shifts. Beyond technology, digital transformation involves organizational and cultural changes. Adopting these practices positively impacts transformation by aiding effective data management, decision-making, process streamlining, and cost reduction (Alkinani, 2021). These practices enhance collaboration, reduce silos, and promote innovation by leveraging digital tools (López-Sosa & García, 2022). They also enable organizations to stay updated with emerging technologies, ensuring adaptability and a competitive edge (Toring et al., 2022).

The fifth hypothesis examines the mediating effect of digital competencies between national culture and digital transformation. Digital competencies mediate national culture and digital transformation. In tech-trusting cultures, even low-competency organizations may adopt digital transformation. Conversely, in skeptical cultures, organizations with low digital competencies may be less likely to embrace digital transformation (Blanka et al., 2022).

The sixth hypothesis is to investigate mediating effect of information system management practices between national culture and digital transformation implies that a nation's ability to implement digital transformation initiatives are greatly influenced by the way its information systems are managed Cultural values influence a nation's digital tech acceptance, with efficient information system practices mitigating cultural barriers. While national culture affects digital transformation, company culture, leadership, and resources also play significant roles (Cao & AlKubaisy, 2022; Tummers et al., 2019).

The seventh hypothesis is to investigate the moderating effect of leadership between digital competencies and digital transformation. Leadership is vital in driving successful digital transformation. Its quality significantly influences the relationship between digital competencies and transformation. Committed leaders foster an innovative culture, provide essential resources, and navigate the digital landscape effectively (Liang & Law, 2023; AlNuaimi et al., 2022). However, leaders lacking digital competencies can hinder progress (Weber et al., 2022). The eighth hypothesis asserts leadership's moderating role between information system practices and digital transformation, emphasizing leadership's role in bolstering innovation and ensuring successful transformation (Savolainen, 2023; Pratsri et al., 2021).

Conclusions

National culture's influence on digital transformation is a complicated phenomenon that is influenced by many different things. For businesses looking to launch digital transformation efforts, especially those operating in a global setting, it has become clear that the analysis of this impact is essential. According to research findings, information system management practices and digital competencies play a crucial mediating role in the interaction between national culture and digital transformation. To lessen the

detrimental effects of national culture on digital transformation, firms should prioritize establishing digital competences and implementing efficient information system management procedures. Additionally, it has been shown that leadership has a moderating function in this relationship. By encouraging a digitally friendly culture within the organization, providing the necessary resources and support for digital transformation initiatives, and ensuring that the digital competencies and information system management practices are effectively implemented, effective leadership can assist in overcoming the detrimental effects of national culture on digital transformation.

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