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THE ROLE OF DIGITAL TRANSFORMATION STRATEGY CAPABILITIES IN KNOWLEDGE LEADERSHIP AT IRAQI UNIVERSITIES

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Abstract:

This study aims to identify the role of Digital Transformation Strategy (DTS) capabilities (i.e., administrative and operational) in Knowledge Leadership (KL) with its dimensions (i.e., leadership skills, collaboration and trust, knowledge integration, and creativity) at Iraqi universities. The researchers resorted to this study to check the extent of the presence of digital transformation strategy and knowledge leadership in the Middle East, especially in developing countries including Iraq. This study adopted a descriptive-analytical approach in data collection. It demonstrates a survey based on the Likert scale; data analysis was performed using SPSS software. The survey was distributed to a random sample of 285 teaching staff to represent the original population of teaching staff at the Northern Technical University (NTU). Results showed that digital transformation strategy has a significant impact on knowledge leadership practices at the Northern Technical University. It also revealed that operational capabilities have the most influence on knowledge leadership practices, and it provides a framework for understanding how digital transformation strategy is adopted, especially at the Northern Technical University and generally in Iraqi universities. Therefore, this study is considered unique and important in the Iraqi educational environment, and its results can be generalized to other Iraqi universities, as they are culturally, technologically, and administratively similar.

Keywords: Digital Transformation Strategy DTS, higher education, Iraq, knowledge leadership KL, Northern Technical University

INTRODUCTION

The rapid pace of digital technology advancement has led to an increased significance of knowledge leadership (henceforth KL) as a vital source for gaining competitive advantage (Onn et al., 2019; Sadeghi et al., 2018; Sadeghi Crupi et al., 2020; Zahur et al., 2022). Knowledge is considered a fundamental element in organizations, yet it still faces some administrative challenges. Some leaders fail to recognize the importance of digital transformation in knowledge management processes within organizations, and they believe that undergoing a transformation in knowledge management processes is not important (Castagna et al., 2020; Lin, 2023).

Therefore, organizations should support KL practices through digital technologies, as they can facilitate the transfer, enhancement, analysis, and development of knowledge (Alvarenga et al., 2020; Buntak et al., 2020; Deng et al., 2023; Gupta et al., 2023; Kadarsah et al., 2023; Shen et al., 2022; Tiwari et al., 2022). Organizations can acquire knowledge by leveraging digital technology, which improves their operational efficiency (Aripin et al., 2023; Gupta et al., 2023; Deng et al., 2023; Tiwari et al., 2022).

As a result, the success of KL primarily depends on an organization's possession of advanced digital technologies that facilitate knowledge discovery, analysis, and transfer (Mukti et al., 2023; Shen et al., 2022; Siddiqui et al., 2023; Stachová et al., 2020; Urbinati et al., 2020). Digitization increases the potential to leverage heterogeneous knowledge sources outside the organization (Hund et al., 2019). KL plays a crucial role in engaging information systems leaders

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and business leaders in digital transformation within organizations (Porfírio et al., 2021). Therefore, the emergence of digital technologies in organizations has opened new horizons in how KL is conducted (Erceg & Zoranović, 2022; Vaio et al., 2021).

Finally, our current research aims to study the relationship between DTS and KL. Therefore, this study focuses on providing a survey and analysis of the literature related to DTS and KL in higher education and scientific research. Overall, this paper draws the reader's attention to the following research questions:

1. To what extent does the digital transformation strategy and its dimensions impact knowledge leadership, and to what extent are they available at the Northern Technical University?
2. How important are the dimensions of knowledge leadership at the Northern Technical University?

Many previous studies have explored the connection between DTS and KM practices, as evidenced (Arantes et al., 2021; Pereira et al., 2022; Petana & Rosa, 2020; Silva et al., 2022; Zanuzzi et al., 2020). However, there is a scarcity of research focusing on the correlation between DTS and KL. Consequently, the anticipated outcomes of this study will hold scientific significance. This research stands out for its unique examination of this relationship and its provision of a framework for Iraqi universities to implement digital transformation strategy. Moreover, it presents a model that can be adopted by the Ministry of Higher Education and Scientific Research. As a result, its findings can be applied to other Iraqi universities. It is important to highlight that our current study makes a substantial theoretical and scientific contribution, addressing a gap in the existing literature.

Finally, the paper will be structured as follows: Section two presents a review of the literature related to digital transformation strategy and knowledge leadership and the correlation and derivation of hypotheses. Section three discusses the study's methodology, including the sample, data collection procedures, variables and measurement. The results of exploratory and confirmatory factor analysis will be discussed in part four. Section five encompasses the discussion, including conclusions, implications, limitations, and future research

1. LITERATURE REVIEW

Digital Transformation Strategy

The digitization of business models and their transformation provides new opportunities for revenue and value, necessitating the adoption of new strategies based on digital technologies (Fernández et al., 2023; Korachi & Bounabat, 2020). The term digitization is used to describe the increasing use of digital technologies (Danuso et al., 2021; Rodríguez-Abitia & Bribiesca-Correa, 2021; Trischler & Li-Ying, 2023; Uribe-Linares et al., 2023). DTS is a process aimed at improving the organization's entity through a blend of information, computing, communication, and communication technologies, leading to significant changes in the organization's characteristics. This has been mentioned by Hamdani et al. (2021), Plekhanov et al. (2022), Fernández et al. (2023), Feliciano-Cestero et al. (2023), Cao et al. (2023), Feliciano-Cestero et al. (2023), Wang et al. (2023), Stoumpos et al. (2023), and Jafari-Sadeghi et al. (2023).

There are several advantages to adopting a DTS in an organization, such as: improving physical and digital resources, gaining a competitive advantage, creating value for customers, and reducing costs (Firmananda et al., 2023; Reis & Melão, 2023; Nurmatovich, 2023; Oubrahim et al., 2023; Pascucci et al., 2023; Putritamara et al., 2023). There are several factors for the success of a digital transformation strategy that can be categorized into three main categories, i.e., cultural, organizational, and leadership (Leso et al., 2023). Strategic alignment, governance, ensuring flexibility, collaboration, and digital expertise are essential enabling factors for the success of a digital transformation strategy (AlNuaimi et al., 2022).

Despite the advantages of digital transformation, it is accompanied by numerous challenges and difficulties. It is likely that a DTS presents many economic and social challenges, such as changes in labor demand and wage opportunities, as well as potential social disruptions (Cho et al., 2023). Insufficient information technology infrastructure, lack of technical skills, inadequate business processes, high risks and implementation costs, and cultural barriers are all challenges associated with digital transformation (Ubiparipović et al., 2023). One of the biggest challenges at the heart of digital transformation lies in how to make deep-seated structural and operational changes within the organization (Graf et al., 2023:4224).

Based on prior research, the stages of digital transformation encompass digital awareness, digital requirements, initial digitization, digitization, and digital collaboration (Abd Hamid, 2023). However, the consensus among most researchers is that the stages of DTS can be categorized into three distinct phases: initial digitization, which involves encoding information into a digital format for processing by computer systems or electronic devices; digitalization, which focuses on leveraging digital technology to transform current business operations; and digital transformation, which pertains to organizational-level change leading to the development of new organizational business models (Cao et al., 2023; Mahboub & Sadok, 2023; Nita & Gutu, 2023; Pascucci et al., 2023; Sikki & Batmetan, 2022; Yikilmaz & Kör, 2023).

World Economics & Finance Bulletin (WEFB)
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Vol. 33, April, 2024
ISSN: 2749-3628,

Some of the most important advanced digital technologies used in business include artificial intelligence, cloud computing, big data analytics, blockchain technology, and the Internet of Things (Chin et al., 2023; Han et al., 2023; Li et al., 2023; Saeed et al., 2023; Tan & Saraniemi, 2023; Zhang & Chen, 2023;).

Knowledge leadership

Until recently, researchers have only begun to recognize the role of leaders in knowledge management practices and processes within organizations (Lakshman, 2009). Leadership is described as a means to inspire others to diligently accomplish important tasks (Movaghar et al., 2021; Odeh et al., 2023). Consequently, leadership style is the most critical factor in the success or failure of knowledge sharing within the organizational context (Chaudhary et al., 2023; Mehmood et al., 2023). The support of leaders is crucial in fostering a culture of knowledge sharing among employees in the organization, and the actions of leaders significantly impact knowledge and information sharing (Andrei et al., 2022; Karani & Roda, 2023; Rafique et al., 2022; Saeed et al., 2022).

Knowledge leadership is defined as the role of leaders and their capacity to improve the generation, dissemination, and utilization of new information and knowledge in a manner that results in transformative collective outcomes (Al Hawamdeh, 2022; Putra et al., 2022; Zahur et al., 2022). It involves knowledge-embracing leaders motivating and nurturing employees and subordinates, and fostering a culture of knowledge adoption and sharing to instigate changes in thinking among individuals and groups (Mubarak et al., 2023; Putra et al., 2023).

Leaders who adopt a knowledge-oriented approach are known for their support and recognition of employees' new ideas through incentives, enhancement of learning experiences, and facilitation of knowledge flow from external sources by establishing channels for external influences (Khin Khin Oo & Rakthin, 2022). The primary role of a knowledge leader is to serve as a guide, motivator, and facilitator, inspiring followers to participate in the creation, transformation, and application of knowledge to generate ideas for new products and services (Chughtai & Khan, 2023). Knowledge leadership promotes the acquisition, retention, utilization, and sharing of knowledge (Zorlu & Uçan Dağ, 2023). It encompasses a series of processes including knowledge development, knowledge transfer, knowledge storage, and knowledge application (Putra et al., 2022).

Despite the many attributes of knowledge leadership, its emphasis centers on four key elements: motivation and communication, social relationships, technologies utilized in knowledge management, and leadership style (Arunga & Kilika, 2023). In the end, the effectiveness of knowledge leadership practices relies on the leadership style and its influence on employees within the organization (Saputra & Mahaputra, 2022). Two significant styles of knowledge leadership are transformational leadership and transactional leadership (Siddiqui et al., 2023).

Correlations and Derivation of Hypotheses

DTS contributes to the sustainability of higher education and scientific research organizations through the use of clean technologies in their activities to develop their environment and enhance the curriculum (Abad-Segura et al., 2020; Filho et al., 2023; Martínez-Peláez et al., 2023; Shenkoya & Kim, 2023; Trevisan et al., 2024). Accordingly, digital investment in universities primarily aims to improve student engagement, enhance relationships and operational efficiency, harness data, and reduce information access time (Firmananda et al., 2023; Gurcan et al., 2023; Hasan, 2023; Nebati et al., 2023; Oubrahim et al., 2023; Pascucci et al., 2023). Based on the above, the primary hypothesis of the study can be formulated as follows:

H1: The digital transformation strategy model is available at Northern Technical University.

Furthermore, a number of studies (Al-Sabaawi & Alshaher, 2021; Alzghoul et al., 2023; Manzoor et al., 2023; Sahibzada et al., 2021) have examined knowledge leadership in higher education institutions and its impact on employees, specifically in enhancing creativity and fostering a culture of knowledge and information sharing among staff. Therefore, the leadership style is deemed the most critical factor in determining the success or failure of knowledge sharing within organizational contexts (Chaudhary et al., 2023; Mehmood et al., 2023; Saeed et al., 2022). Yet, the second main hypothesis can be derived as follows:

H2: The knowledge leadership model is available at Northern Technical University.

Furthermore, organizations that adopt digital transformation strategy are likely to support knowledge leadership, as digital technologies support social relationships and knowledge management processes (Alvarenga et al., 2020; Gupta et al., 2023; Shen et al., 2022). Emerging technologies encompass a set of technological tools and resources that enable individuals to research, discover, create, store, modify, and exchange knowledge in various ways (Tiwari et al., 2022; Deng et al., 2023).

Accordingly, the third main hypothesis of the study can be formulated as follows:

H3: Digital transformation strategy impacts knowledge leadership.

World Economics & Finance Bulletin (WEFB)
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ISSN: 2749-3628,

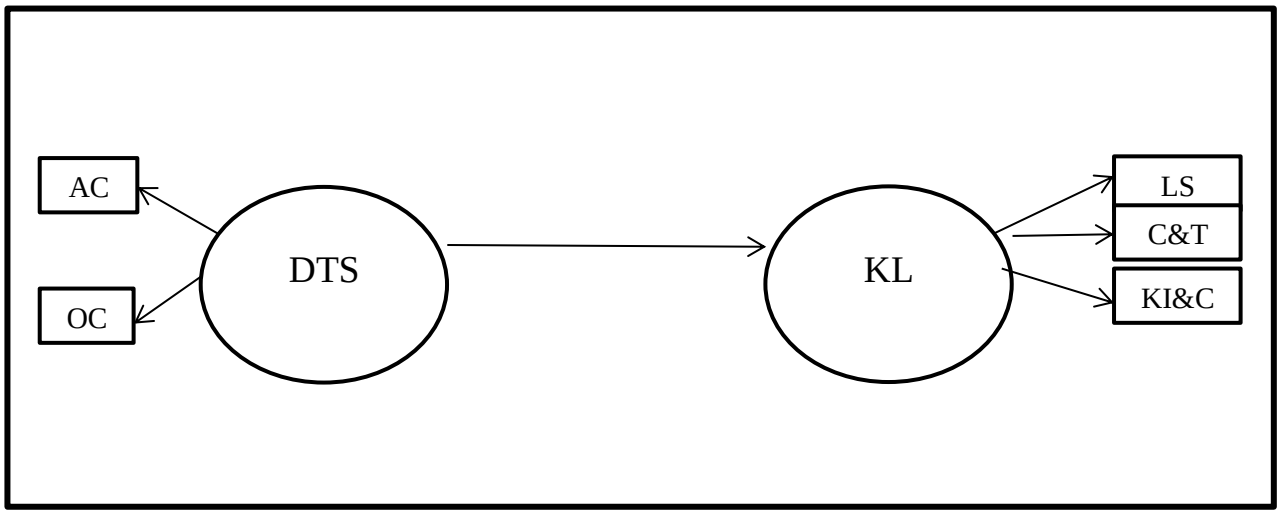

Figure 1. *Conceptual framework*

Notes: AC=Administrative capabilities; OC=Operational capabilities; LS=Leadership skills; C&T=Cooperation and Trust; KI&C=Integration of knowledge and creativity

Furthermore, managers' capabilities function as social assets that bolster knowledge leadership, as they can foster a culture of knowledge sharing among employees within the organization (Swanson et al., 2020). Moreover, senior leaders promote digital technologies to support knowledge leadership processes by fostering a collaborative organizational culture that encourages employees to share knowledge and new ideas through digital platforms (Pereira et al., 2022). Additionally, a digital strategy aligned with operational processes enables organizations to acquire necessary knowledge and facilitates its sharing. This strategy fosters interaction, communication, and dynamic collaboration between business units (Petana & Rosa, 2020). Accordingly, the hypothesis can be drawn here:

H3. 1. Managerial and operational capabilities influence knowledge leadership.

3. METHODS

Sample and data collection procedures

Data were collected through primary sources by surveying a sample of lecturers at Northern Technical University using a questionnaire, as indicated by Ha (2022). Secondary data, on the other hand, were obtained from international books, journals, and other sources. The population size was 1100, with a sample size of 285 lecturers. Out of the 285 distributed questionnaires, 275 responses were received. Five incomplete questionnaires were disregarded, leaving 270 valid responses for analysis. The response rate was 96%, in line with the recommendation by Krejcie and Morgan (1970). To ensure ethical standards, participants were informed that their questionnaire responses would remain confidential and would only be used for research purposes. To guarantee freedom in responding, the questionnaire was designed without requiring participants to provide their names, as it was intended for scientific research purposes and was conducted in a manner that respects the rights and dignity of all study participants. There are several reasons for selecting lecturers as the sample for this study. Firstly, they play a crucial role in the evaluation process. Secondly, their responses are characterized by neutrality and objectivity because they do not have administrative duties. Additionally, they possess a comprehensive understanding of university operations and are well-equipped to adapt to digital changes or facilitate digital education. They are considered an exceptional elite within both society and the university, as they are dedicated to improving the quality of technical education. Moreover, they have a strong interest in scientific research. Finally, the service sector in Iraq, including universities, is well-suited for such research endeavors (Hussein et al., 2023), as highlighted in previous studies (Hashim et al., 2022; Martínez-Navarro et al., 2021; Moreno-Ger & Burgos, 2021; Téllez & Villela, 2021). Northern Technical University is an Iraqi government institution operating under the Ministry of Higher Education and Scientific Research. It is renowned as one of Iraq's leading technical universities; it consists of 14 colleges and institutes. They include eight colleges and six institutes specializing in various fields. The university offers diplomas, bachelor's degrees, and master's degrees in diverse fields such as medical, engineering, administrative, and agricultural sciences, among others, to meet the demands of the job market and community for scientific expertise. Geographically,

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 33, April, 2024
ISSN: 2749-3628,

Northern Technical University spans three provinces: Nineveh, Kirkuk, and Salah al-Din, with its main campus situated in Nineveh province. Therefore, the questionnaire was distributed across these provinces (https://ntu.edu.iq/ar/home-page-ar/).

2 .Variables and Measurement

This research adopted a descriptive-analytical approach and used a survey as a data collection tool. The survey consists of two main sections. Section A includes demographic information about the respondents, such as gender, age, educational level, and years of service, Table 1. Section B includes the DTS and KL scales.

Table 1. *Demographic composition of the sample*

Variable	Category	Percentage	Mean score	Standard deviation
Sex	Male	57%	1.43	0.496
	Female	43%		
Age	26 _ 34	24%	3.05	0.733
	34_42	46%		
	More than 42	30%		
Academic achievement	Master	25%	1.75	0.978
	PhD	75%		
Years of experience	1-5	18%	2.50	0.435
	6-11	31%		
	12-16	33%		
	17-21	18%		

The DTS variable was assessed through two dimensions: managerial capabilities (MC) and operational capabilities (OC), based on Ukko et al.'s (2019). It comprised 10 items divided into two dimensions labeled (AC, OC). Knowledge leadership was evaluated across three dimensions: leadership skills, collaboration and trust, and knowledge integration and innovation, drawing from the works of Yang et al. (2013), Al-Sabaawi and Alshaher (2021), and Mubarak et al. (2023). The scale underwent review by a panel of experts in business management sciences and was adjusted to ensure its suitability for measuring the digital transformation strategy within the researched university. Confirmatory factor analysis using SPSS AMOS 24 validated the scale, following the recommendations of Sekaran & Bougie (2016), Saunders et al. (2009), Hair et al. (2010, 2014), and Adams et al. (2014) in scale design. Responses were rated on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The overall Cronbach's alpha coefficient was 0.919, indicating high reliability, with a value above 0.60 suggesting excellent internal consistency.

4. RESULTS

We will use exploratory and confirmatory factor analysis to identify the available factor model for the digital transformation strategy and knowledge leadership. Additionally, descriptive analysis will be conducted.

4.1 Exploratory and confirmatory factor

In this section, our aim is to determine the external loadings for each item and to understand the overall variance explained by the DTS and KL variables and dimensions. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test were used to assess the sample adequacy, following the guidelines of Hair et al. (2010). A KMO value of 80% or higher indicates excellent sample adequacy, as recommended by Abdulmohsen (2021). The KMO value for both DTS and KL was 92%. Additionally, Bartlett's test statistic for DTS was 2191.499, and for KL was 3059.119, indicating significant correlations between the scale dimensions, with p-values less than 0.000. This value is lower than the recommended threshold of 0.50 suggested by Hair et al. (2010, 2014) and Kline (2023).

We evaluated the hypothesized model using SPSS AMOS V.24, employing both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to ensure its validity. In Table 2, we observed the external loadings (communality). An external loading exceeding 0.40 for each item and each factor is considered acceptable, while anything lower than that is deemed unacceptable. The total variance explained was found to be greater than 60%, indicating that the scale is capable of collecting data from the study sample. Administrative capabilities (AC) were interpreted with a mean of 66.245, whereas operational capabilities (OC) were interpreted with a mean of 8.540. Therefore, AC serves as the focal point for the DTS. However, the role of OC should not be overlooked, as it provides evidence for strategic implementation processes and is responsible for the tactical aspect of organizing the DTS.

Table 2. *External loadings for DTS*

Items	AC	OC

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 33, April, 2024
ISSN: 2749-3628,

X1	0.800		
X2	0.859		
X3	0.847		
X4	0.723		
X5	0.713		
X6			0.861
X7			0.842
X8			0.819
X9			0.827
X10			0.833
Explained variance	66.245		8.540
Total variance		74.785	

Regarding KL, the external loading for each item and each factor was acceptable. The total variance explained was found to be greater than 60%, indicating that the scale is capable of collecting data from the study sample. Leadership Skills (LS) were interpreted with a mean of 67.812, while Collaboration & Trust (C&T) were interpreted with a mean of 7.114, and Knowledge Integration & Innovation (KI & C) were interpreted with a mean of 5.043. Therefore, LS is the most significant in terms of its importance in knowledge leadership. However, the roles of C&T and KI & C should not be overlooked.

Table 3. *External loadings for KL*

Items	LS	C&T	KI&C
Z1	0.862		
Z2	0.809		
Z3	0.827		
Z4	0.685		
Z5		0.846	
Z6		0.874	
Z7		0.843	
Z8		0.867	
Z9			0.826
Z10			0.895
Z11			0.737
Z12			0.786
Explained variance	67.812	7.114	5.043
Total variance		79.968	

4.2 Confirmatory factor analysis

To confirm the results obtained from the exploratory factor analysis as shown in Tables 2 & 3 above, we will use confirmatory factor analysis. Following the suggestions of Anderson and Gerbing (1988) and Shin et al. (2023), the analysis should surpass the goodness-of-fit indices, as shown in Table 4.

Table 4. *Goodness-of-Fit Indices*

Indicator	Accepted value
x2	>0.05
x2/df	<2.50
GFI	>0.80
AGFI	>0.80
RMR	<0.08
RMSEA	<0.08
NFI	>0.90
CFI	>0.90

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 33, April, 2024
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TLI	>0.90

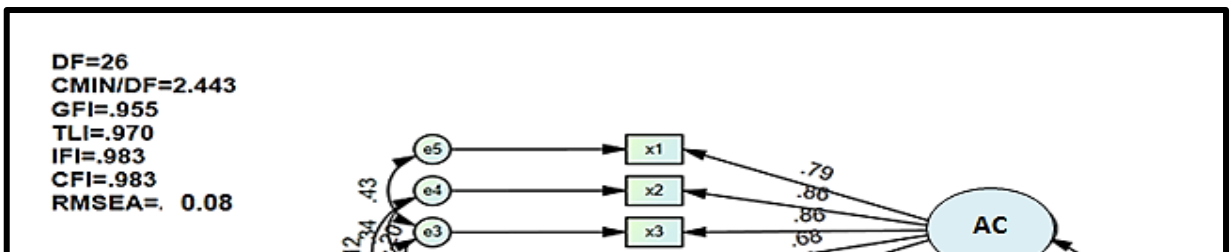
The value of CMIN/DF for the DTS model, representing the ratio of chi-square to degrees of freedom, is 2.443. As for the KL model, the CMIN/DF value is 2.549. These values are acceptable as they are less than 5, indicating a close fit between the model and the data. The following values for both models: GFI, CFI, TLI, IFI are greater than 0.90, which is acceptable. Additionally, the RMSEA value is 0.08, indicating an acceptable fit for this index, as suggested by Afthanorhan (2013) and Narang (2023). The estimates were significant at p = 0.000, indicating the model's quality. In conclusion, these indicators confirm the quality of both models and affirm that the data extracted from the sample match the DTS and KL models.

The results of confirmatory factor analysis, as shown in Table 5, demonstrated excellent convergent validity results (external loading, composite reliability (CR), and average variance extracted (AVE).

Table 5. *Results of Confirmatory Factor Analysis Model*

Variables	Measurement items	Outer loading	CR	AVE	Square (AVE)	Mean	Std. dev
threshold value		< 0.70	< 0.70	< 0.50			
AC	X1	0.812	0.867	0.540	0.735	3.290	0.785
	X2	0.775					
	X3	0.704					
	X4	0.789					
	X5	0.865					
OC	X6	0.754	0.873	0.631	0.794	3.150	0.781
	X7	0.780					
	X8	0.841					
	X9	0.819					
	X10	0.761					
LS	Z1	0.823	0.867	0.601	0.775	3.132	0.830
	Z2	0.767					
	Z3	0.822					
	Z4	0.734					
C&T	Z5	0.811	0.865	0.624	0.790	3.238	0.888
	Z6	0.804					
	Z7	0.798					
	Z8	0.725					
KI&C	Z9	0.747	0.881	0.750	0.866	3.410	0.832
	Z10	0.807					
	Z11	0.798					
	Z12	0.866					

As shown in Tables 4 & 5 the fit indices in the SEM analysis were superior to the globally recommended cutoff values (Hair et al., 2010). This suggests that the data observed in the study sample were appropriately consistent with those of the original population, indicating an effective representation of the population by the study sample. Furthermore, the causal relationships in the study model were highly accurate, reflecting the perspective of the experimental field under investigation, (Figs 2. & 3).



World Economics & Finance Bulletin (WEFB)
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Vol. 33, April, 2024
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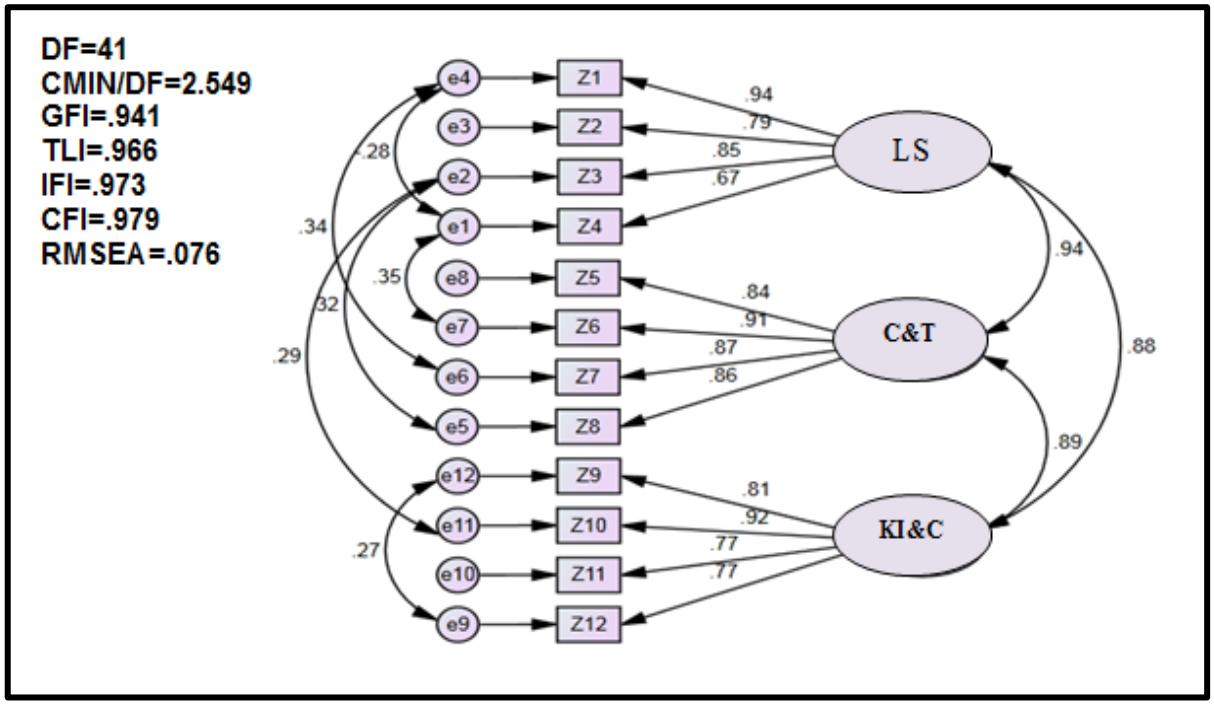

Figure 3. *Confirmatory factor analysis of KL*

The results for DTS KL showed external loading factors that exceeded the maximum of 60%, as recommended by Hair et al. (2014) Kline,(2023).The correlation coefficient between the factors depicted in Figures 2 and 3 exceeds 85%, indicating a high level of agreement and consistency between the scale items and the trends observed in the study sample. This suggests that the study scale can be relied upon in future research in the field of higher education and in developing countries. Based on these findings, the proposed scale can be accepted since all variables' items loaded according to both exploratory and confirmatory factor analyses. Therefore, both the first and second sub-hypotheses of the study were accepted, consequently confirming the main study hypothesis. Therefore, after reviewing the analyses and the results mentioned above

- The main study hypothesis H1 (DTS model is available at NTU) was accepted.
- The main study hypothesis H2 (KL model is available at NTU) was accepted.

Table 6. *Impact results*

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 33, April, 2024
ISSN: 2749-3628,

Hypotheses testing	Variables	R^2	F test	β coefficients	T test
H3	DTS>KL	0.72	702.184	0.873	26.499
H3-1	AC>KL	0.74	377.917	0.195	3.073
	OC>KL			0.663	11.107

Significant at the level of .05

Table 6 shows that 72% of the variations in KL are explained by DTS, according to R2. The β coefficient indicates that if DTS increases by one unit, KL will increase by 0.873 units. This positive and significant effect was confirmed by the t-test, supporting the acceptance of hypothesis H3, which suggests a significant impact of DTS on KL .Similarly, 74% of the variance in knowledge leadership is primarily explained by AC and OC. The β coefficient indicates that a one-unit increase in AC results in a 0.195-unit increase in KL, which is a positive and statistically significant effect as confirmed by the t-test. Moreover, the β coefficient for OC suggests that a one-unit increase in OC leads to a 0.663-unit increase in KL. In terms of which dimension has a greater impact on KL, it is noteworthy that OC has the strongest impact at Northern Technical University. This supports the acceptance of hypothesis H3. 1, indicating a significant impact of both AC and OC on KL.

5. DISCUSSION AND CONCLUSION

The findings indicate that NTU recognizes the importance of the digital transformation strategy in achieving knowledge leadership. As highlighted by Sadeghi et al. (2018), Crupi et al. (2020), Zahur et al. (2022), and Onn et al. (2019), the rapid pace of new technologies and digital communications has increased the importance of knowledge leadership as a vital source for gaining competitive advantage. Therefore, knowledge leadership is of paramount importance for the success of organizations. Consequently, our study aligns with other global studies mentioned earlier, such as those by Hannan (2023), Rodríguez-Abitia and Bribiesca-Correa (2021), Yangüez and Zapata-Jaramillo (2021), Yabar-Vega and Diaz-Zelada (2021), and Martínez-Navarro et al. (2021). This confirms the significance of the DTS model for institutions of higher education and scientific research, which can be applied in various educational environments, including developing countries. Additionally, there should be an emphasis on AC, as the failure of organizations to undergo digital transformation is primarily attributed to inadequate leadership practices in supporting digital transformation strategy (Magesa & Jonathan, 2022; Lorentzen, 2022; Nit,ă & Gut,u, 2023; Porfírio et al., 2021; Ruloff & Petko, 2022; Tigre et al., 2023; Weber et al., 2022). Moreover, the importance of operational capabilities is crucial, as they involve restructuring organizational structures, meeting the needs of students, and enhancing university resources (Bhatti et al., 2021; Fukawa et al., 2021; Andrade & Gonçalo, 2021; Iman et al., 2022).

IMPLICATIONS

Our study contributes significantly to the fields of strategic management and knowledge management. It offers both theoretical and empirical insights that are valuable for future research in digital strategic management, particularly in the Middle East region, including Iraq as a developing country. Moreover, our research addresses a significant academic gap by focusing on digital transformation strategies within the region, with a specific emphasis on Iraq. The findings of our study provide valuable insights for organizations and researchers regarding how businesses can adapt their models to digital strategies to remain competitive in digitally advanced industries. Additionally, it sheds light on the generation and sharing of knowledge among employees through knowledge-oriented leadership practices. By successfully achieving its main objective, which was to understand the role of DTS in achieving KL, and by assessing the availability of AC and OC models in Iraqi universities, particularly at NTU, our study's results can be generalized at the national level. The technological convergence, administrative procedures, and unified culture shared among Iraqi universities justify this generalization.

LIMITATIONS AND FUTURE STUDIES

The study faced several challenges and obstacles related to the distribution and collection of data because the sample was distributed across geographically distant departments and colleges. Additionally, there were difficulties in surveying all employees at the University of Science and Technology, so the study was limited to faculty members only. Furthermore, there were challenges in obtaining approval from the senior administration in some colleges and institutes of the university. In future research, we recommend using the scale in other studies, such as investigating the role of

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 33, April, 2024
ISSN: 2749-3628,

DTS in achieving strategic innovation, knowledge management, enhancing customer experience, or its impact on business models. Additionally, we suggest studying it in other sectors such as the telecommunications sector, the financial sector, and the security sector.

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