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Article

Digital leadership moderating effect in improving the organisational performance of telecom companies through the organisational knowledge capabilities pillars

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Abstract: The main goal of this study is to assess the moderating role of digital leadership capabilities (DLC) in improving the overall performance of telecom companies through their organisational knowledge capabilities. The author builds a conceptual model with six hypotheses and tests them with data collected through an electronic questionnaire. The data is analysed using WarpPLS 8.0 software as an application of the structural equation modelling technique. The sample size included 528 participants. The study revealed that individual knowledge capability (IKC) does not significantly affect organisational performance (PR). Also, the results reveal that managerial knowledge capability (MKC) and organisational collaborative capability (OCC) have a positive but weak impact on the performance of telecom companies (PR). However, it was clear that individual knowledge capability (IKC) and organisational collaborative capability (OCC) do not affect organisational performance (PR) through the moderator, digital leadership capabilities (DLC). On the other hand, it was also evident that managerial knowledge capabilities (MKC) significantly negatively affect the performance of telecom companies (PR) through the moderator role of digital leadership capabilities (DLC). The author recommends that telecom companies adopt knowledge-based practices to ensure enduring high performance. He also suggests creating a knowledge management department to foster a culture of creativity and cooperation across departments, which is essential to establishing a work environment that promotes continuous learning and development. Findings may help telecom sector CEOs boost the company's performance value. The research highlights the importance of fostering appropriate knowledge pillars and building digital leaders to shift telecom companies to a new successful stage. These findings offer tangible benefits that can be directly applied in the telecom industry, making the research highly relevant and valuable.

Keywords: organisational knowledge capabilities; digital leadership; telecommunications; performance

1. Introduction

In a globalised and highly competitive environment, business performance is strongly influenced by proper knowledge management. This perspective has been consistently supported by some authors who say that knowledge becomes the primary resource for the organisation from which other resources can be acquired, maintained, and strengthened.

The advent of information technology (IT) has triggered a profound revolution in business operations, particularly in digital management. This shift, driven by the preference for digital management for capital and human resources, underscores the crucial role of digital leadership capabilities in the modern business landscape. Many scholars have examined knowledge management and its impact on organisational

performance (Fotopoulos and Psomas, 2010). Still, few have discussed the concept of digital leadership capabilities and their effects on organisational performance in telecom companies. Digital leadership capabilities and its effect on organisational performance. This study aims to establish the influence of the digital leadership capabilities (DLC) continuum from the organisational performance perspective (Heeseok and Byounggu, 2003).

Knowledge management becomes a critical resource for the organisation's strength, so it must manage its resources effectively to take advantage of this intellectual and knowledge-based asset (Fernandez et al., 2004) by making the knowledge available and organised wherever and whenever needed. In general, the leading role of knowledge management is to enhance organisational productivity and performance and create added value through acquiring, storing and using knowledge (Armistead and Meakins, 2002; Heeseok and Byounggu, 2003; Newman and Conrad, 1999).

The objective of this study is to enhance the company's performance by employing knowledge capabilities to improve the performance considering the digital leadership capabilities in the Syrian telecom companies to overcome the challenges they are facing, such as the country's economic challenges, increasing complexity of the telecommunication domain, the rapid change in the telecommunication market requirements, In addition to the entrance of the more GSM operators to Syrian market. The research will help build awareness of how to create a strategic competitive advantage and face the rapid advancement of technology and market requirements. This leads to recognising knowledge as an asset and focusing on the value of knowledge to improve performance and productivity.

2. Telecommunications industry in Syria

Despite the significant challenges posed by the ongoing economic instability, the telecommunications sector in Syria has demonstrated remarkable resilience. It continues to provide essential services to the total population of Syria, which was approximately 22.1 million in December 2022, according to the World Bank.

In an officially published report, the Ministry of Communications and Technology (2022) said that different key players exist in the telecom industry, such as the Syrian Telecommunications Establishment (STE), the state-owned operator responsible for fixed-line communications and internet services. It is a good point to state here that several internet service providers (ISPs) are available in the country, but none of them has a market share above 5%. STE is also the only voice service provider at a fixed location, holding 87% of the leased lines market share. Furthermore, it mentioned that the second major player is Syriatel, which holds 63.0% of the mobile subscriber market share; Syriatel is a major mobile operator that provides a range of mobile services, including 3G and 4G. The third provider is MTN Syria, which holds 37.0% of the mobile subscriber market share. It is good to mention here that the government gave the third mobile subscription to a company called "WAFA", which will start operating soon (Reuters, 2022).

According to the same reference, the total revenue of fixed and mobile retail services of the telecom sector reached (993,739 thousand million SYP, which equals

approximately $395,600 million). Moreover, the number of internet users from their mobile devices reached 11.1 million in 2022.

The recovery and development of the telecommunications sector in Syria remain uncertain due to the ongoing economic situation. Several challenges face the telecom sector, such as developing the infrastructure and building the required staff, but the Ministry of Communications and Technology is trying to develop the required laws, regulations, and policies to overcome the challenges and attract new investments to the sector.

3. Literature review and hypotheses development

Much of the knowledge management literature aims to identify strategies and mechanisms enabling organisations to exploit their knowledge resources successfully. Existing research shows that knowledge is central to the competitiveness of the modern organisation, and its vital role is reflected in the fact that it is considered a strategic asset (Azeem et al., 2021). As a result, knowledge has become the centrepiece of the strategic management approach to managing organisational assets. Knowledge is critical to the organisation's long-term success and essential for improvement and development. (Pereira and Bamel, 2021).

In the current information age and highly turbulent working environments, especially during crises and wars like the Syrian one, knowledge is widely recognised as a critical resource for rapid response to changes. So, organisations need to continuously learn and innovate to remain competitive or at least keep working (Shahzad et al., 2020). However, knowledge cannot occur without the organisation's systems, policies, and mechanisms that enable knowledge creation, distribution, and application (Hammami and Alkhaldi, 2021; Li et al., 2020).

3.1. Competence-based theories

The resource-based view of strategy considers the firm a portfolio of resources and capabilities. (Bruce and Zaiyong, 2006) It provides the primary basis for a firm's strategy and profitability; if these resources are valuable, rare, hard to imitable and well organised, they may be used as capabilities to create a sustainable competitive advantage. It assumed that there are four categories of resources: Financial (cash, retained earnings), Physical (plant and equipment, geographic location), Human (skills and abilities of individuals), and Organizational (reporting structures, relationships), which is inadequate to realise a firm in today's economy. Nonaka et al. (2000) mentioned that knowledge is a vital and strategically important resource for survival and competitive advantage.

Accordingly, knowledge has become a critical resource of strength, and the performance capacity of any organisation is increasingly dependent on two factors: the quality of knowledge and its productivity. Knowledge takes two forms: tacit and explicit knowledge. Implicit knowledge is highly personal, hard to formalise, and challenging to communicate with others. In contrast, explicit knowledge is collected from inside or outside the organisation, such as simple software code and market data (Becerra et al., 2024).

Nonaka and Takeuchi (1998) See knowledge management as a vital element of success aimed at organisation CEOs. It is a conventional process that seeks to change the organisation's present shape of knowledge handling to improve its outcomes (Firestone and McElroy, 2005). Hence, it is a management action to provide employees with objective information to respond to environmental changes and make the right decisions to achieve the organisation's objectives (Kanagasabapathy et al., 1997).

3.2. Individual (employee) knowledge capabilities and organisational performance

Individual knowledge and its proper utilisation in various business activities have become critical in achieving competitive advantage and superior organisational performance in different aspects, such as revenue growth, process efficiency, financial performance, service innovation, market share, reduced complaints, and customer loyalty, as mentioned by Migdadi (2022); Obeso et al. (2020); Soomro et al. (2021).

Knowledge capabilities are seen as the highest efficient level of knowledge management processes as they refer to the combining, leveraging, and integrating these other knowledge processes to unlock the potential of individual and organisational knowledge (Singh et al., 2021).

Human capital is one of the main components of the organisation and consists of the know-how, abilities, skills and expertise of human members of an organisation (Kucza, 2001; Vinekar et al., 2009); these capabilities are crucial to aligning employees' abilities with the overall business strategy, which allows the organisation to grow and change in response to the market and technology, making employees more flexible and adaptable (Becerra et al., 2024; Choi, 2003; Schehar et al., 2010; Yang, 2007) Sharing what they have learned makes other employees more experienced and knowledgeable. In addition, through gained knowledge and experience, the employees earn a good reputation, according to (Yingda et al., 2010). Moreover, Drucker's (1999) study, which renownedly states that knowledge is a vital organisational resource, argues that applying knowledge is crucial for success and survival. The research paper uses human capital, skills and competencies as an initial proxy of knowledge capabilities for three reasons. First, the concept covers human resources knowledge, skills, and competencies. Second, it is one of the most critical factors for success and work performance, and it can also lead to significant superiority for the organisation.

Accordingly, the author built the following hypothesis:

H_1: The performance of a telecom organisation is influenced by the individual's knowledge capabilities.

3.3. Managerial knowledge capabilities and organisational performance

In today's fast-paced work environment, effective management of knowledge assets is crucial for gaining a competitive edge and creating market value to communicate the business objectives to address long-term strategy (Nonaka and Takeuchi, 1998). In general, companies will get negative results when leaders act as if performance comes from the sum of individual actions rather than co-dependent behaviours like cooperation and knowledge sharing (Pfeffer and Sutton, 2000).

Moreover, as per (Hsu, 2006), Managers are encouraged to consider the organisational experience, including management values, organisational culture, processes and structure, to facilitate the implementation of knowledge management practices (Hammami and Alkhaldi, 2021).

Exploring the relationship between managerial knowledge capabilities and corporate performance within the context of the theoretically grounded RBV of the firm tones of discussions provided in previous research. The RBV further hypothesises that firms must understand how to manage and build their portfolio of capabilities to deliver superior returns. This RBV has been widely applied in empirical research to understand how resources influence corporate financial performance in researching other managerial perspectives in line with resources as strategic capability constraints (Beamish and Chakravarty, 2021; Chahal et al., 2020; Gerhart and Feng, 2021; Lubis, 2022).

The knowledge-based view of the firm posits that knowledge resources are the firm's most important resources and should be managed strategically. The firm's resource-based view (RBV) suggests that the competitive advantage lies in its unique resources and capabilities. It emphasises the importance of organisational resources, specifically valuable and inimitable, as strategic determinants of organisational performance. (Rezaei et al., 2021; Shahzad et al., 2021; Tajpour et al., 2022; Wang and Wu, 2021).

Based on the prior literature, the author has formulated the following hypotheses:

H_2: The performance of a telecom organisation is influenced by the managerial's knowledge capabilities.

3.4. Organisational knowledge capabilities and organisational performance

Having a clear knowledge management plan is essential. It usually starts with an emphasis on sharpening the knowledge focus within the operational divisions, supported by the efforts of the knowledge capturing and sharing process (Brewster et al., 1999).

In addition, organisation management considers knowledge management an essential factor and work practice to achieve innovation and, as a result, to gain a competitive advantage (Bayraktar et al., 2017). To deal with knowledge as a capability, the knowledge management perspective centred on building core competencies, understanding the strategic advantage of know-how, and creating intellectual capital (Alavi and Leidner, 2001).

According to Armistead and Meakins (2002), the concern is not only about employees' ability to interact with technology but also about their ability to encourage sharing and knowledge creation through social behaviour. At the same time, and as per Yang and Wan (2004), it is essential to have a cultural shift within the organisation for any knowledge management program to succeed.

The perfect corporate culture for Knowledge Management is where people constantly and continuously pursue sharing, learning and knowing to enhance their job performance and spread what they know throughout the organisation, so the prerequisite of effective knowledge interflow is to develop an organisational culture

where knowledge-sharing is included in the job description of each position; as well, an influential organisational culture is one of the critical components influencing the organisational ability to survive and succeed in the long-term. (Yang and Wan, 2004).

Regarding the organisation Structure, it was noted that the flexible structure and design positively affect knowledge transfer strategies. (AL-Hakim and Shahizan, 2011). From the other point of view, building a shared vision, especially for the desired goals in the future, creates tension that leads the company's employees to understand the importance of their work in achieving the organisation's mission. (Goh and Gregory, 1997).

So, knowledge management aims to enhance organisational performance by designing and implementing tools, processes, and systems to improve the creation and sharing of knowledge critical for business performance. According to the resource-based theory, performance differences across firms are caused by variances in the firm's resources and capabilities.

Resources that are valuable, unique, and challenging to imitate can provide the basis for firms' competitive advantages. It is noticeable that the performance level will be reflected through the organisation's process, service, reputation, market share, and competitive advantage. Therefore, knowledge Management can drive continued performance improvement in resource use, environmental impact, and financial performance. However, it must be closely linked with performance management, metrics benchmarking, and target-setting (AL-Hakim and Shahizan, 2011).

So, Organizational flexibility and the active and effective implementation of new organisational strategies and practices enhance productivity and enable firms to match their asset base to the requirements of a changing business environment. (Becerra et al., 2024). Reconfiguring activities such as re-engineering processes and promoting new organisational practices should enhance the firm's performance. This supports seizing opportunities through new resource combinations and well-organized processes and structures. This is proposed to be reflected in innovation performance and profitability.

It has been noticed that the enhancement of customer loyalty comes through detecting and recording their unique interests and requests and providing personalised attention (Yang and Wan, 2004), which could be accessible as a result of good performance and help the organisation offer new or improved products or services (Becerra et al., 2024; Hammami et al., 2021). Value-added services also benefit from Knowledge management due to the effect the latter has on organisational process innovation. "For example, innovative processes resulting from knowledge management at Buckman Laboratories enable sales and support staff to feed customer problems into their computer network, access relevant expertise throughout the company, and develop innovative solutions for customers. Similarly, companies such as SUN have enhanced customer service by placing solutions to customer problems in a shared knowledge base. Moreover, customers can download software patches from the Internet based on their answers to an automated system that prompts customers with questions to diagnose their needs (Becerra et al., 2024; Hammami et al., 2022).

The literature has generally discussed that knowledge management can impact overall organisational performance directly or indirectly. The direct impact of knowledge management on organisational performance happens when knowledge is

used to create innovative products or services that generate revenue and profit or when the KM strategy is aligned with the business strategy. The indirect impacts on organisational performance are the results of activities not directly linked to the organisation's vision, revenues, or cost (Fotopoulos and Psomas, 2010). Such effects occur, for example, through knowledge management to demonstrate intellectual leadership within the company, which in turn might enhance customer loyalty. (Becerra et al., 2024).

Organisational performance will be more effective when creating knowledge that enables a corporate strategic competitive advantage (Kanagasabapathy et al., 1997), positively affecting the company's profit rate and market share. Improving the company's reputation is strongly linked with intellectual capital, which is used here to refer to the intangible creations of the human intellect, including technical expertise, problem-solving capability, creativity and managerial skill (Judith and Penelope, 1997). It is also noticeable that Knowledge management provides a sustainable competitive advantage by enabling the organisation to develop and use tangible and intangible resources better than the competitor can, even though the resources might not be unique. (Becerra et al., 2024).

According to the previous literature, the author builds the following hypotheses:

H_3: The performance of a telecom organisation is influenced by organisational knowledge capabilities.

3.5. Digital leadership

Digital leadership refers to the ability to use an organisation's digital assets to attain its strategic objectives (Araujo et al., 2021). It refers to the ability of leaders to effectively guide organisations through the complexities and opportunities presented by digital transformation; the digital leader should be able to create an innovative vision for the organisations that rely on technology to achieve their strategic objectives (Hung et al., 2023). He can also build and coordinate teams quickly and has up-to-date knowledge and skills in digital technologies and digital transformation; he also can act proactively and positively and balance new and existing business areas, modern trends and traditions, and innovation and integration (Büyükbeşe, 2022). He can also find ways to attract new digital talent to the organisation and encourage employees when encountering difficulties in digital transformation (Huynh et al., 2023). The digital leader can act as a guide and role model for those who work in the digital transformation process and focuses on employees' well-being during the application of new technologies (Tigre et al., 2023).

The telecommunications industry has been a powerful force in digital transformation for a long time. It can be considered among the few industries directly affected by the widespread adoption of the Internet and the introduction of innovative digital services. (Chen et al., 2021; Greenstein, 2020; Zunino et al., 2020). The telecommunications industry is undergoing profound changes triggered by the change in usage patterns, which are moving towards over-the-top models. Incumbent telcos are facing the challenge of extracting more value from their infrastructure and customer base. (Al-Mashraie et al., 2020; Kim et al., 2020).

Digitalisation involves organisations making better use of digital technologies to find, create, and release value by incorporating digital technologies, data, and knowledge into their networks and organisations, allowing for value creation through entirely new types of enhancements. (Agostini et al., 2020; Kohtamäki et al., 2020; Martínez-Caro et al., 2020; Ribeiro-Navarrete et al., 2021) This enablement of value creation is the main object of discussions with digitalisation. The discussion about digital technologies and products is a subset of this comprehensive view. Information and communication technologies (ICT) can help increase productivity growth rates during adoption. However, they also change the course of business operations so that it is more critical concerning competitiveness to know how to integrate technologies into business. (Andriushchenko et al., 2020; Blichfeldt and Faullant, 2021; Martínez-Caro et al., 2020).

The primary skill for a digital leader is to work within cross-functional teams; this goes against the traditional views which had leaders work on 'individual-focused teams'. The digital leader needs to work closely with IT professionals and other teams to bring excellent results, which is one of the leadership qualities (Claassen et al., 2021; Cantillo, 2020; Engelsberger et al., 2024).

3.6. The moderating role of digital leadership capabilities in improving organisational performance

Planning can help enterprises achieve more significant results within the digital era, especially in economic crises. In the Syrian context of telecommunications and international enterprises, the emphasis is on fulfilling the demanding sustainable development strategies by looking at digital technologies and highlighting the need for open and effective digital leadership capabilities (DLC). Due to its specific nature, the winning perspectives of high-speed telecommunications providers, aimed at investment in infrastructure that rely on significant economic incentives for property value and digital presence, should also be unique to this industry. The leader's orientation plays a crucial role in shaping the firm's results, particularly regarding the impact of engaged digital capabilities and organisational attributes (Li et al., 2016). As digital transformation becomes increasingly imperative, leadership outcomes and capabilities must align with the characteristics of the organisations. This strategy should share the understanding of how digital affects performance metrics (Huynh et al., 2023; Oktaysoy et al., 2022).

This study covers and addresses the simultaneous moderating role of digital leadership capabilities (DLC) in improving the organisational performance of telecom companies. However, based on the literature, only some comprehensive models include the relationship between digitised leadership skills and organisational performance variables (Hung et al., 2023).

The relationship between digital leadership capabilities and organisational performance is a common theme; moreover, the simultaneous relationship between digitised leadership skills and performance variables is rare in the literature. This model is also relatively unique as the leadership model includes digitised leadership skills. Individually, studies in the literature have investigated the effects of technological leadership on organisational performance.

Recognising these nuanced dynamics, the author proposes:

H_4: Digital leadership capabilities moderate the relationship between individual knowledge capabilities and organisational performance.

H_5: Digital leadership capabilities moderate the relationship between managerial knowledge capabilities and organisational performance.

H_6: Digital leadership capabilities moderate the relationship between organisational collaborative capabilities and organisational performance.

4. Research model

The research model incorporates three latent variables: individual knowledge capabilities (IKC), which has five items; managerial knowledge capabilities (MKC), which has eight items; and organisational collaborative capabilities (OCC), which has five items.

In addition, it includes one latent dependent variable, organisation performance (OP), which consists of seven items and was derived from (Huynh et al., 2023; Hammami, 2021; King et al., 2010; Singh et al., 2016). The digital leadership capabilities (DLC) dimension comprises nine items, and it was derived from (Büyükbeşe, 2022); see **Figures 1** and **2**.

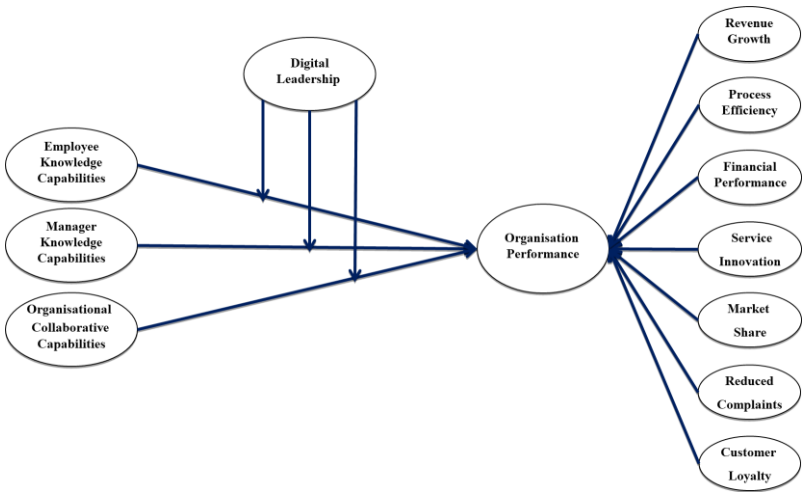

Figure 1. Conceptual research model.

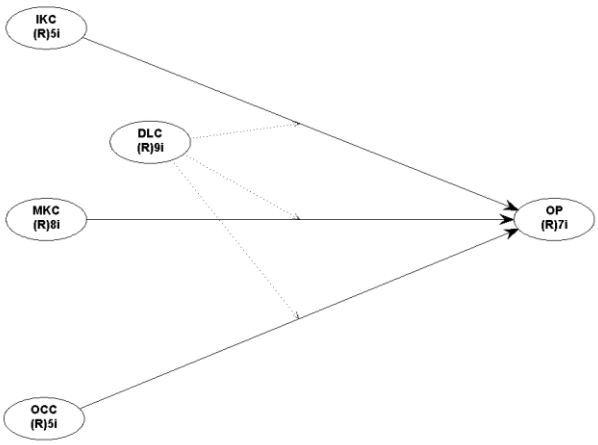

Figure 2. Conceptual research model (WarpPLS 8.0 Output).

5. Research methodology

The current research is exploratory and confirmatory, and the author builds a complex conceptual framework, which needs the adoption of the PLS-SEM technique to check and handle the complex relations and effects within it. PLS-SEM has several strengths, including flexibility and robustness to data issues like non-normal data distributions and multicollinearity; in addition, this technique is often employed in applied research where practical implications.

This research aimed to investigate the moderation impact of digital leadership capabilities on the effect of organisational knowledge capabilities on telecom organisational performance. This study used statistical analysis methods like exploratory factor analysis, confirmatory factor analysis, and structural equation modelling. These analyses evaluated the relationship that occurred between the independent and dependent variables. This study built and tested a research model with five latent variables critical to the telecom industry and provided the recommended strategies to develop practices for industry practitioners. It was reasonable to use SEM as the number of items used for the dimensions was sufficient enough to use this analysis, and it allowed the researcher to investigate further the impact of digital leadership capabilities that were readily available.

The questionnaire was designed based on the research neediness; it had two parts. The first part was about demographic information, and the second included 34 statements in five sections. The author sent the questionnaire to three experts in the field to check its validation. Based on their feedback, the author adjusted the questionnaire. Then, he conducted a pilot study by sending the questionnaire to 27 participants to ensure the readability and understandability of the survey instrument before embarking on the leading research; some modifications were made according to the results of the pilot study.

The author used a rigorous methodology for collecting survey data from telecom sector organisations, utilising the attached questionnaire in Appendix One. The target population was well-delineated by specifying the telecom service industry in Syria. The author stratifies the population into sub-groups based on relevant criteria (e.g., company, department).

The questionnaire was built in English according to the literature, translated into Arabic by an Arabic/English language expert, and distributed in Arabic. Thus, the study's primary data collection tool was clear and concise and directly addressed the research objectives. The time required to complete the questionnaire was short to ensure the survey was manageable for respondents.

Then, the author employs convenient sampling as a probability sampling technique to guarantee the representativeness of the target population. The author adheres to data privacy regulations and avoids unreliable contact lists. The author approached some directors working in telecom companies in Syria to receive their consent to distribute the questionnaire to employees; the author sent the link to the questionnaire, which was built using Google Forms.

6. Control variables

The study's control variables included gender, age, education level, work experience, and career level. According to Hammami et al. (2022), gender, age, education level, and career level did not significantly contribute to variance in organisational performance. Similarly, the study of Hammami et al. (2021) revealed that work experience also did not significantly affect organisational performance.

7. Data analysis and findings

The researcher has presented the results of the data analysis as follows.

7.1. Descriptive results

The descriptive analysis results indicated that 27.3% of the sample are female. Also, 45.4% of the sample is less than 30 years, 26.3% is between (31–40) years, 15.3% is between (41–50) years, and 13% is over 50 years. In addition, 77.9% of the sample have a bachelor's degree, and 22.1% have a postgraduate degree. Moreover, 44.5% of the sample have five years of experience or less, 42.1% have (6–10) years of experience, and the remainder have more than ten years of experience. Regarding the career level, 1.5% were directors, 2% were director's assistants, 10.1 % were heads of sections, and the remainder of the sample were employees. The respondents' distribution is given in **Table 1**.

Table 1. Respondents' distribution.

Department	Number of Responses
Revenue Assurance	21
Organization Development	27
Consumer Segment	18
Customer Care Support	102
Treasury	18
Contact Center	24
Distributors	60
Direct and Corporate Sales	9
Operations	27
POS	60
Maintenance	45
Market Research	9
HR	9
Back Office and Large Accounts	3
Infrastructure	27
Procurement	12
Billing	6
IT Management	9
Credit Management	9
Accounting	6

Table 1. (*Continued*).

Department	Number of Responses
Intelligent Network	15
Legal Affairs	12
Total	528

7.2. Data techniques

The PLS-SEM technique contains the external measurement model and the internal structural model. The external measurement model is used to estimate the validity and reliability of the measures; on the other hand, the internal structural model is used to evaluate the strength of the assumed relationships and moderation effects between constructs and was used to analyse the data using WarpPLS 8.0 Software.

7.3. Measurement model

The author calculated the indicator reliability, internal consistency reliability, convergent validity, and discriminant validity to evaluate the measurement model (Hair et al., 2011). Initially, all factors with loadings less than the threshold of 0.7 were eliminated for one of the following reasons: either the VIF is more than 5, the factor loading is less than 0.7, or there is a cross-loading to other factors (refer to Appendix 1 to discover the eliminated factors) (Manley et al., 2021). Consequently, the analysis was a rerun, and all indicator loadings exceeded the suggested cutoff point of 0.7. (**Table 1**), these results confirmed the indicator reliability (Hair et al., 2011). All composite reliability (CR) and Cronbach's Alpha values exceed the threshold of 0.7. Also, convergent validity (AVE) values exceeded the recommended cutoff point of 0.50, and all VIF values are below 5 (Manley et al., 2021), as given in **Table 2**.

Table 2. Reliability and convergent validity.

Construct/ Items	Loading	CR	Cronbach's Alpha	AVE	VIF
Individual Knowledge Capability (IKC)		0.894	0.821	0.737	1.602
IKC2	(0.817)				1.688
IKC3	(0.909)				2.447
IKC4	(0.847)				1.923
Managerial Knowledge Capability (MKC)		0.876	0.822	0.587	1.081
MKC1	(0.707)				1.702
MKC2	(0.770)				1.909
MKC3	(0.806)				1.890
MKC4	(0.830)				2.385
MKC5	(0.709)				1.775
Organisational Collaborative Capability OCC)		0.873	0.782	0.697	1.182
OCC3	(0.808)				1.577
OCC4	(0.885)				1.985
OCC5	(0.809)				1.583

Table 2. (*Continued*).

Construct/ Items	Loading	CR	Cronbach's Alpha	AVE	VIF
Digital Leadership Capabilities (DLC)		0.900	0.804	0.602	1.091
DLC4	(0.704)				2.068
DLC5	(0.741)				2.474
DLC6	(0.837)				2.445
DLC7	(0.821)				2.204
DLC8	(0.806)				3.075
DLC9	(0.737)				2.298
Organisational Performance (OP)		0.885	0.818	0.719	1.202
OP2	(0.810)				1.606
OP3	(0.896)				2.178
OP4	(0.836)				1.772

Note: CR = composite reliability; AVE = average variance extracted.

The author also evaluated the discriminant validity; **Table 3** presents the square root of each construct's AVE value, greater than its correlation with other latent constructs. Moreover, all HTMT1 and HTMT2 ratios were less than 0.90; all *p* values were <0.001, which were accepted as the threshold for the good if $p < 0.05$ according to (Fornell and Larcker, 1981; Henseler, 2017; Van Riel et al., 2017).

Table 3. Discriminant validity.

AVEs values					
Construct	**IKC**	**MKC**	**OCC**	**DLC**	**OP**
IKC	(0.859)				
MKC	0.213	(0.766)			
OCC	0.101	0.069	(0.835)		
OP	0.044	0.166	0.355	(0.848)	
DLC	0.093	0.058	0.193	0.172	(0.776)
HTMT 1 Ratios (good if <0.90, best if <0.85), all *p* values are <0.001					
Construct	IKC	MKC	OCC	OP	DLC
IKC					
MKC	0.265				
OCC	0.124	0.107			
OP	0.072	0.212	0.452		
DLC	0.115	0.082	0.232	0.208	
HTMT2 Ratios (good if <0.90, best if <0.85), all *p* values are <0.001					
Construct	IKC	MKC	OCC	OP	DLC
IKC					
MKC	0.237				
OCC	0.099	0.079			
OP	0.034	0.162	0.410		
DLC	0.067	0.049	0.225	0.173	

The author also calculated the goodness-of-fit indices values. All values were acceptable, Average path coefficient (APC = 0.111, p = 0.001), Average R-squared (ARS = 0.158, $p < 0.001$), Average adjusted R-squared (AARS = 0.148, $p < 0.001$), Average block VIF (AVIF = 1.045, the ideal value should be ≤3.3), Average full collinearity VIF (AFVIF = 1.100, the ideal value should be ≤3.3), the Tenenhaus GoF (GoF ≈ 0.360), Sympson's paradox ratio (SPR = 0.833, acceptable if ≥0.7) which is acceptable, R-squared contribution ratio (RSCR = 0.995, acceptable if ≥0.9), and the statistical suppression ratio (SSR = 1.000, the ideal value should be >0.7 which is acceptable. The standardised root mean squared residual (SRMR) = 0.088, and its value is acceptable as it is ≤0.1.

The predictive validity of the endogenous variables in the research model was evaluated using the Stone-Geisser Q-squared coefficients, as presented in **Table 4**. According to Fornell and Cha (1994), a research model possesses predictive ability if the Q-squared coefficient exceeds zero, so the research model satisfies this criterion, as the coefficient is measured at 0.161. Additionally, the model's goodness of fit (GoF) was calculated to be 0.354, which is almost the minimum value of 0.36. Thus, the model is deemed suitable for evaluating its viability. Furthermore, the R-squared coefficients were measured at 0.158, which indicates a weak ability to interpret the results.

Table 4. The predictive validity of endogenous variables.

***Q*-squared coefficients**	**R-squared coefficients**	**Goodness of Fit (GoF)**
0.161	0.158	≈ 0.360

7.4. Structural model assessment

The author used the values of structural model path coefficients (β), p-value of β, effect size (f^2) for β, and R^2 to evaluate (Hair et al., 2011). The results indicated that individual knowledge capability significantly and positively influences organisational performance ($\beta = -0.019$, $p = 0.318$). Accordingly, H_1 is rejected. Also, managerial knowledge capability significantly and positively influences organisational performance ($\beta = 0.148$, $p \leq 0.001$), so H_2 is confirmed. Organisational collaborative capability positively and significantly influences organisational performance ($\beta = 0.336$, $p \leq 0.001$). Therefore, H_3 is supported. Also, the results showed that the R^2 value for organisational performance is 0.158. See **Table 5**.

Table 5. Structural model and hypotheses testing.

Hypotheses	**Path coefficient (β)**	**Effect size (f^2)**	***p*-value**	**Result**
H1: IKC → OP	−0.019	0.001	0.318	Rejected
H2: MKC → OP	0.148	0.024	< 0.001	Supporte
H3: OCC → OP	0.336	0.119	< 0.001	Supported

R^2 value: OP = 0.158

This statement highlights that the research model typically has sufficient explanatory power (Cohen, 2013). Regarding the effect size (f^2), (Cohen, 2013) stated that the impacts of β may be categorised as small, medium, or high depending on

values of −0.0.19, 0.148, and 0.336, respectively (Fassott et al., 2016). **Table 6** also reveals the effect size values between the studied constructs. See **Tables 5** and **6** and **Figure 3**.

Table 6. Moderating effect analysis.

Hypotheses	*β*	*p-value*	Effect size (f^2)	Result
H_4: IKC × DLC → OP	−0.005	0.457	0.000	Rejected
H_5: MKC × DLC → OP	−0.090	0.026	0.009	Supported (with a negative impact)
H_6: OCC × DLC → OP	0.066	0.078	0.005	Rejected

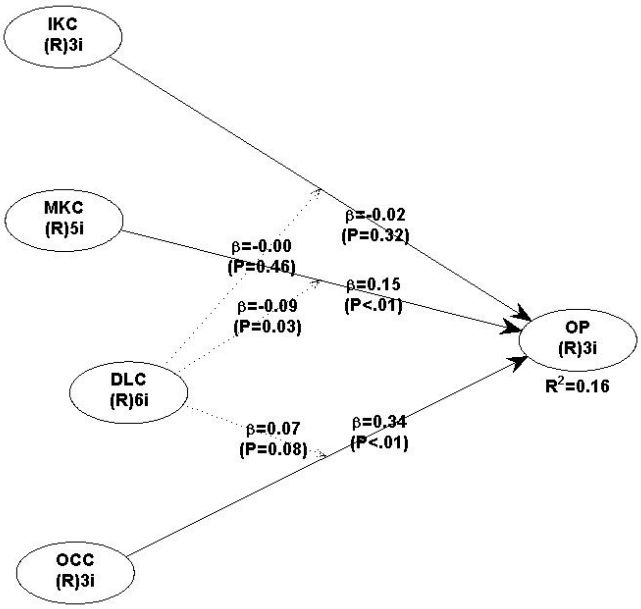

Figure 3. Structural model research model (WarpPLS 8.0 Output).

7.5. Moderation analysis

The author assesses the role of digital leadership capabilities (DLC) in moderating the relationships between three independent variables, individual knowledge capability (IKC), managerial knowledge capability (MKC), and organisational collaborative capabilities (OCC), and one dependent variable, which is organisational performance (OP). Please refer to **Figure 4** for the moderating effect of DLC between IKC and OP. In addition, **Figure 5** shows the moderating impact of DLC between MKC and OP. Furthermore, **Figure 6** shows the moderating influence of DLC between OCC and OP.

Table 6 also reveals the effect size values of the moderating effect of DLC between the studied constructs and OP with the existence of the DLC as a moderator. The results show that the DLC does not significantly moderate the path IKC → OP (β = −0.005; p = 0.457). Therefore, H_4 is rejected. Conversely, it is revealed that DLC significantly moderates the direct path between MKC and OP (β = −0.090; p = 0.026) but negatively. Similarly, DLC does not significantly moderate the direct path between OCC and OP (β = 0.066; p = 0.078). Consequently, H_5 is supported, but H_6 is rejected. The moderation graphs are presented in sequence as follows.

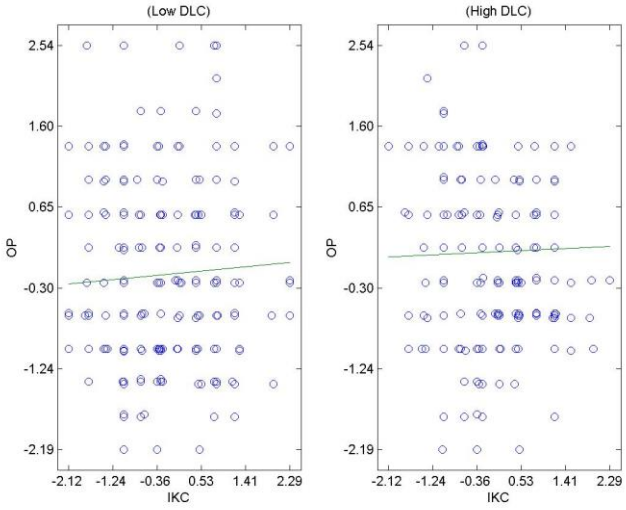

Figure 4. The moderating effect of DLC between IKC and OP.

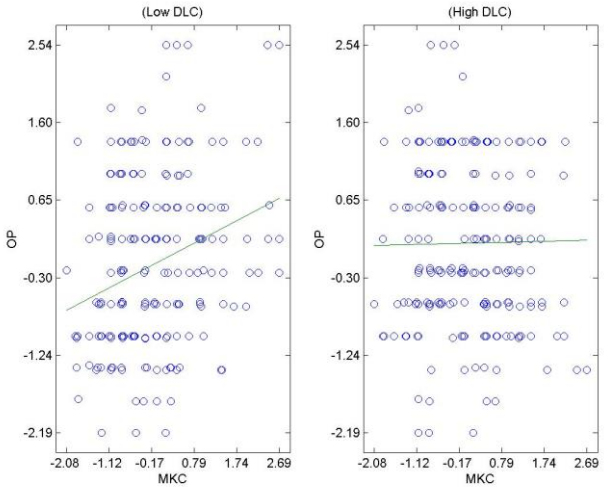

Figure 5. The moderating effect of DLC between MKC and OP.

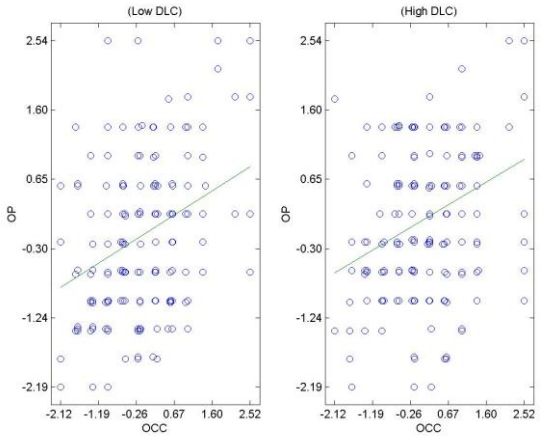

Figure 6. The moderating effect of DLC between OCC and OP.

8. Discussion of findings

Hypothesis one was rejected, which indicates that the knowledge possessed by individual employees has a significant and positive impact on the organisation's overall performance. This result highlights the importance of investing in knowledge management initiatives to facilitate the knowledge acquisition and sharing of employees, as it can lead to an improved workplace environment and better performance, as in the study by Hammami and Alkhaldi (2017) and Hammami et al. (2021).

The findings of hypothesis two indicate the positive and significant impact of managerial knowledge capability on overall organisational performance. This finding suggests that enhancing managers' leadership abilities may lead to many benefits for the firm. Developing the knowledge and skills of managers will likely lead to improved organisational performance and, hence, better success. The results of the study agree with four recent studies (Daradkeh, 2023; Hammami et al., 2022; Hammami et al., 2021) that suggested organisations need a different set of multiple roles and tasks for their manager to initiate knowledge. They argue that managers should use all resources and instruments the members need to participate in knowledge initiatives. They must also act as innovators for the company's environment and as a learning organisation. Furthermore, managers as leaders must focus on the knowledge heading and the knowledge worker's understanding of preparing the heading of knowledge initiatives and making the team identify knowledge objectives, who does what best, who captures what best, and the skills needed. The findings of hypothesis three indicate the positive and significant impact of collaborative knowledge capability on overall organisational performance in telecom companies. The influence value has a higher value, which means that fostering a culture and systems that support teamwork and knowledge exchange leads to better performance for the organisation, so telecom companies are advised to increase the efficiency of internal collaboration and related fruitful practices that can be a key driver of success.

In relation to moderation analysis, the findings suggest that digital leadership capabilities (DLC) significantly moderate the relationship between staff's knowledge capability and organisational performance. This indicates that the opportunity to enhance digital leadership for managers encourages a more positive effect of each employee's knowledge capacity on organisational performance. Through digital leadership, a good working climate can be created in the workplace where all staff with personal knowledge integrate with organisational knowledge using a dedicated knowledge-sharing system, increasing performance and effectiveness. The results support the findings of an earlier study (Hammami et al., 2021) that suggested a positive link between leadership style and organisational performance. However, DLC does not moderate the relationship between managerial knowledge capability and organisational performance. Similarly, DLC has no significant moderation relationship between organisational knowledge capability and performance. The results show that the efficiency of digital leadership and its impact on a firm's performance is crucial and critically needs top management attention. Also, the model should be expanded to include other factors to enhance its interpretation.

9. Theoretical implications

The theoretical implications of the current research could be extensive and multidimensional as not so many papers were published about linking the research variables within telecom companies in challenging contexts.

The research, with its unique focus on the intersection and interaction of digital leadership, knowledge management, and organisational performance, contributes to theoretical integration in a novel way. It provides empirical evidence to support theoretical theories and offers fresh insights into the complex relationships between such variables in digital organisational research. Previous research by Hammami et al. (2021) linked just two variables, knowledge management and organisational performance, without any moderating effect, and it was conducted in a different context.

Moreover, the study not only delves into digital leadership capabilities that may considerably enhance organisational performance in today's digital era but also provides practical insights on driving digital transformation and enhancing organisational performance. It highlights how digital leadership skills may be needed beyond traditional managerial competencies to include a deep understanding and proper employment of digital technologies to achieve the strategic goals of telecom companies. The study underscores the significance of knowledge management within organisations. It suggests that telecom companies need to develop the capabilities to harness and leverage this knowledge to drive performance effectively.

The research findings align with the dynamic capability, knowledge-based, and resource-based views of the organisation, emphasising an organisation's ability to sense, seize, and reconfigure resources in response to changing environments. Digital leadership and organisational knowledge capabilities can be viewed as dynamic capabilities that enable organisations to adapt and thrive in the face of technological disruptions, business contexts, and market changes.

10. Practical and management implications

The author establishes different implications that all should consider in strategic alignment with the company's objectives and vision.

The author understands that the first implication for Syrian telecom companies is establishing a well-structured knowledge management department and internal mentorship and knowledge-sharing programs specifically focusing on digital leadership competencies.

Moreover, prioritise digital leadership development by investing in comprehensive leadership programs fostering digital fluency, strategic understanding of emerging technologies, and the ability to champion digital transformation initiatives. Also, top management may conduct periodical skills assessments to identify digital leadership development needs across all company levels. That action will help emphasise the data-driven decision-making process by implementing robust data collection and analysis systems across all relevant aspects of organisational operations. Also, training leaders and decision-makers in data literacy and using analytical insights to drive strategic action will help establish and enforce clear data governance protocols to ensure accuracy, accessibility, and ethical usage.

The second implication is to build a knowledge-centric organisational culture, which could be achieved on different levels, including individual, managerial, and organisational. On the individual level, the telecom companies may provide targeted training in relevant digital technologies and incentivise continuous learning through professional development opportunities. On the managerial level, telecom companies may emphasise knowledge management best practices, including identifying experts, facilitating information sharing, and supporting cross-functional collaboration. On the organisational level, telecom companies might invest in knowledge management systems and platforms, collaborative workspaces, and communication tools that promote seamless information exchange and idea generation.

The third implication is creating an environment conducive to innovation by developing transparent mechanisms for employees to propose new ideas and solutions with a clear path for implementation and allocate dedicated resources (financial and human) to support the exploration and testing of innovative digital initiatives.

The fourth implication is to centre digital initiatives on customer experience by utilising customer journey mapping and design thinking methodologies to prioritise digital solutions that enhance personalisation, self-service capabilities, and overall ease of interaction, which will help foster collaborative processes to generate customer-focused innovation, actively soliciting input across various organisational levels.

The fifth implication is that top management is expected to highlight the need to build the right culture that keeps looking at knowledge management as an asset of the organisation; since Syrian telecom companies are using many in-house development services and applications, a best practices database should be created; this will help such companies in case of employee turnover and even help develop or create new services and support the new employee's faster engagement in the work environment.

11. Recommendations

The researcher recommends that managers in telecommunications institutions build a solid digital culture that encourages employees to acquire new digital skills, instilling a culture of creative thinking and cooperation between individuals and teams and creating a work environment that stimulates continuous learning and development. It also concludes that it is vital to make informed strategic decisions and develop a clear vision for the digital transformation strategy, in addition to defining goals and priorities accurately and allocating the necessary resources to support the implementation of the strategy.

Also, CEOs are urged to consider digital leadership a compass that guides telecom companies towards broad horizons of growth and development in a rapidly changing and competitive market. By adopting a practical digital leadership approach, these companies can strengthen their position in the market and achieve their goals by improving their performance.

As competitive advantage is implied to be influenced by capabilities, it is essential to understand the capabilities and their link with knowledge processes. Individual knowledge capabilities are vital for building an organisation's knowledge

capabilities. Also, Syrian telecom companies are urged to initiate and foster individual knowledge creation, which is believed to be an essential source of knowledge.

Telecom companies aiming at enduring high performance are better off adopting elements relating to knowledge-based practice to ensure agile learning across their organisational boundaries and provide challenging and retaining roadmaps for their employees.

The author also recommends several actions to identify appropriate knowledge management solutions for Syrian telecom companies. That will be achieved by adopting knowledge management initiatives by upper management, and the author recommends establishing a knowledge management department. This action will prioritise knowledge culture distribution and establish a knowledge vision. This action will help create knowledge-capture processes and systems using different mechanisms and technologies.

12. Limitations and future research direction

The research's scope was limited to the Syrian telecom sector. Also, it is limited to the employee perception. The distribution of the questionnaire was limited to employees working in the telecom sector in a few cities in Syria, and the questionnaire was also distributed within a short period to obtain responses from respondents. The researcher faced several challenges and obstacles when conducting the research, including the difficulty of securing employee approval to participate, as some may hesitate to participate in such applied research for reasons related to fear of losing privacy.

Researchers are encouraged to apply the concepts introduced in the study to other sectors and contexts worldwide. Further research is necessary to determine whether these findings apply to telecom companies or other contexts. They are also urged to include other factors that influence the performance of the telecom company.

13. Conclusions

The current research may significantly develop the understanding of how digital leadership can shape and improve the relationship between organisational knowledge capabilities and its performance; it offers valuable insights for academic researchers and industry practitioners. The research's focus on Syrian telecom companies is insightful and applicable to various organisational contexts. This underscores the universality of its findings, making it relevant and valuable beyond its current scope.

The research presents novel findings. It provides theoretical and statistical outcomes that offer practical implications for enhancing the performance of telecom companies.

The implications and recommendations derived from this research aim to raise awareness about the role of digital leadership in telecom companies, adding a new perspective to the existing body of knowledge.

The study is expected to contribute to management information systems research by providing ground for future work on formalising the dynamics of a leader's influence on digital business transformation and digital innovation contexts. It will also support telecom companies in getting the needed practices through which to

overcome the challenges faced in a rapidly changing telecommunication market requirement to achieve sustainable success in the local context by developing effective knowledge management strategies.

Conflict of interest: The author declares no conflict of interest.

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