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RESEARCH ARTICLE

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The Impact of Big Data Analytics and Digital Transformation on Organizational Performance in the Saudi Telecom Sector: An Empirical Study

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Abstract: Based on dynamic capabilities theory, this paper examines how digital transformation and big data analytics affect the performance of organizations within the Saudi telecommunications industry. The quantitative research design was used with a structured online questionnaire that was conducted with the employees in digital, analytics, IT, and operational positions in large telecom centers in Riyadh, Jeddah, and Dammam. The descriptive statistics, correlation analysis, and multiple regression were used to analyze 124 valid responses using SPSS. The results show that digital transformation and big data analytics positively and statistically influence the performance of organizations. Nonetheless, big data analytics proved more predictive, indicating that data-driven decision-making is more significant for improving performance outcomes. Digital transformation is positive but appears conditional on organizational preparedness, employee abilities, and its successful implementation within current processes. The regression model has been able to explain 44 percent of the variance in organizational performance, which indicates the significant combined effect of the two capabilities. The research is a contribution to the theory in that it empirically confirms the dynamic capabilities theory in a non-Western, technology-driven setting and incorporates digital transformation and analytics into one conceptual model. In practice, the results can be used to offer practical suggestions to telecom managers and policymakers who want to align digital efforts with performance and Vision 2030 goals. Future studies should adopt a cross-sectional design using interviews and surveys to understand challenges faced, evaluate the effectiveness of adopted practices, and highlight prospects to achieve desired outcomes in other Gulf Cooperation Council states.

Keywords: Digital Transformation, Big Data Analytics, Organizational Performance, Telecommunications Sector, Dynamic Capabilities Theory

JEL Codes: L96, O33, M15, C83, D83

Introduction

The use of digital technologies has emerged as the core of the functioning of modern organizations, the way they compete and provide value, and this process has gained momentum in the past decade in all industries worldwide as firms have become reliant on digital platforms, automation tools and data-driven systems to simplify operations, enhance customer experience, and make faster and more informed decisions (Bai, 2021; Schilirò, 2024). The reason behind this change, according to Orero-Blat et al. (2025), is the swift change in customer expectations, the growing complexity of its operations, and the rising accessibility of sophisticated digital tools, which allow organizations to work more precisely and responsively. More specifically, with the uncertain market environment and increased competition, digital transformation is no longer an option but a strategic necessity for the firm (Chouaibi et al., 2022). Meanwhile, the capacity to gather, examine, and process large amounts of data has become a fundamental competence; thus, big data analytics enables the

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business to recognize trends, streamline activities, and generate insights that can be used in innovation and improvement of performance (Bogdan & Borza, 2019). This is mainly because the scholars are raising more and more arguments that organizations that can incorporate digital transformation and data analytics into their fundamental procedures are more likely to perform better than those that use traditional methods (Aljumah et al., 2021; Pappas et al., 2018).

What is particularly noticeable is the significance of such developments in industries that require a high level of infrastructure and constant technological advancements, including telecommunications. The telecommunications industry in Saudi Arabia has developed at a fast pace and can be of great importance in the digitalization process of the country, being a foundation of digital services nationwide, which facilitates e-government services, mobile banking, e-commerce, cloud services, and digital payment systems (Aldiab et al., 2022; Singh & Sharma, 2020). Through Saudi Vision 2030, the government has put a heavy focus on the creation of a knowledge-based digital economy, which has prompted telecom companies to upgrade their networks, implement new high-tech platforms, and re-architect their service delivery models (Abn_hammad et al., 2025). Large operators like STC, Mobily, and Zain have invested in 5G implementation, artificial intelligence, and cloud-based solutions and automation technologies meant to enhance the capacity of the network, minimize operational interruptions, and offer customers dependable and individualized services (Albreem et al., 2023; Mukhtar, 2024). The industry is also witnessing the rising customer demands, the rise in the use of data, and the need to seek more advanced digital solutions, which leads the telecommunication firms to invest in the continuous development of their technological capabilities to be competitive and stay at a high level of performance. Although these developments have been made, little is known academically about the impact of these digital initiatives on organizational performance in the Saudi environment, where culture, economy, and regulations are not similar to those in Western markets.

An extensive available literature available emphasizes the possible advantages of digital transformation and analytics, but the reality is that it can be successful based on the organizational preparedness, the quality of data, the capabilities of the employees, and the extent to which the digital systems are integrated into the daily activities (Bai, 2021; Bogdan & Borza, 2019; Pappas et al., 2018; Schilirò, 2024). The Saudi telecommunication industry is technologically advanced, but it is not similar to the global markets because of its regulatory framework, national interests, customer preferences, and the speed of the digital service adoption, which leaves a gap in the knowledge about how digital capabilities can be converted into better organizational performance in this particular scenario. Past research has been inclined to look at sweeping trends of digital transformation or analyze analytics capabilities in isolation, considering different sectors other than telecommunication. For example, role of digital transformation has been studied in SMEs (Wang & Zhang, 2025), manufacturing sector (Asif et al., 2024) and retail (Zhang et al., 2025) while the role of big data analytics have been observed in the case of banking sector (Al-Dmour et al., 2023), fashion (Hossain et al., 2024) and pharmaceutical sector (Soliman et al., 2025) focusing on Asian countries or Western countries other than Saudi Arabia. Thus, it can be affirmed that the cited studies have not incorporated both constructs in a single model and examined their impacts using a primary quantitative survey in the Saudi telecom industry. This research fills that gap by offering empirical evidence that relates to the realities of the local industry and adds to the global knowledge of digital performance drivers.

Research Objectives

Aligned with this, this study seeks to investigate the impacts of digital transformation and big data analytics on the performance of organizations operating in the telecommunications industry in Saudi Arabia, with the following specific research objectives.

- 1) To assess the effect of digital transformation adoption on the performance of telecom companies in Saudi Arabia.
- 2) To investigate the effect of big data analytics on the organizational performance of telecom companies in Saudi Arabia.

- 3) To determine whether these capabilities jointly enhance the performance outcomes of telecom companies in Saudi Arabia.

Achieving these objectives, this research has a number of significant contributions to make. First, it offers evidence regarding an area where empirical studies on digitalization are already under development, filling a contextual and conceptual research gap focusing on Saudi Arabia, which is one of the most developed telecom markets in the Middle East, where the governmental initiatives and investments made by corporations are transforming the digital landscape (Alayed, 2023). Second, it can guide the telecom managers to more clearly comprehend the kinds of digital efforts and analytics practices that can result in serious changes in performance, so they can make better decisions and resource allocation. Third, the study will be practical to the national policymakers and regulators since they would have access to the analysis that aligns with the aims of the Saudi Vision 2030, particularly in relation to digital infrastructure, innovation, and diversification of the economy. Fourth, it is academically contributing that the research synthesized digital transformation and big data analytics into a single model and evaluated the overall effects of the latter two on the performance of organizations, thereby further enhancing the theoretical development of the fields of digital strategy, analytics capability, and performance measurement. Finally, findings provide the foundation of a future study of the subject of digital capabilities in other sectors in the Gulf or make comparisons between findings in other regions.

The next section contains a critical review of the literature sources available regarding the topic of digital transformation, big data analytics, and organizational performance, with the emphasis on the theoretical backgrounds and previously tested empirical evidence, preceded by the methodology section describing the way the research will be conducted in terms of the research design, population, sampling, data collection instrument, and statistical methods used. Next, the data analysis section shows descriptive statistics, reliability tests, and SEM analysis, which are discussed in the context of the current research and provide insights into the implications of the findings for the theory and practice. The paper ends by providing a conclusion on the main contributions, recommendations to telecom companies and policymakers, and directions of future research.

Literature review

The recent literature has widely accepted that digital transformation is transforming the way organisations are run and how they compete and adapt to the changing environment, depending on the dynamics in the sector, the digital maturity, and the ability of organisations to cope with new systems. For example, Bai (2021) discovered that Chinese telecom companies with developed digital strategies enhanced operational efficiency and financial performance in a way that adoption of digital tools in the workflows enabled these firms to make decisions more quickly, minimize redundancies, and react to changes in the market more efficiently. According to the study, digital maturity and strategic alignment are essential in transforming the adoption of technology into real performance enhancements, as affirmed by Schilirò (2024), who argued that digital transformation allows automating processes and allocating resources more efficiently, which cuts costs and enhances the reliability of operations. In a similar way, Wang and Zhang (2025) studied the significance of digital transformation tools in SMEs and found that the digital initiatives should be aligned with organisational objectives to ensure the attainment of quantifiable benefits, which reinforces the notion that technology is not a panacea that should be used to improve performance. Furthermore, the studies by Orero-Blat et al. (2025) and Mubarak et al. (2019) reported that product development and innovation in the financial services industry were expedited by the use of cloud-based platforms and collaborative digital tools. Both studies concluded that those companies that strategically use digital transformation can enhance internal and external competitiveness, which are the key determinants of organizational performance as noted by Teng et al. (2022), who found that integrated digital systems improve customer experiences, which boost their loyalty and organizational profitability in the long term noting that the performance gains of transformation are increased when digital initiatives are associated with customer-centric strategies. Although these positive results are reported in the literature, some studies, such as Guo et al. (2023) and

Jardak and Ben Hamad (2022), argued that digital transformation did not always lead to the improvement of performance in cases when employees were not equipped with the required skills or processes were not adjusted appropriately. These studies emphasize the role of human capability and organisational preparedness and demonstrate that inefficiencies may arise when the technologies are implemented without the appropriate support. In a similar way, Zhao and Liu (2024) discovered that the hasty or unplanned adoption of digital technologies raised operational expenses and disturbed work processes, which highlights the fact that the ill-thought-out initiatives may lead to an immediate decrease in efficiency, implying that digital initiatives without proper planning, skills, and alignment cannot deliver higher performance. In summary, the literature suggests that digital transformation and data analytics can significantly improve the performance of organisations when they are applied in a strategic manner, organisations that are unprepared, unable, or disintegrated can have fewer gains or even temporary losses, which points out the fact that technology is not enough to have sustainable gains in performance. Based on this, the study has established the following research hypothesis to be tested in the case of the Saudi Arabian telecommunications sector.

H1: Digital transformation has a positive effect on organizational performance in the Saudi Arabian telecommunications sector

The concept of data analytics has become one of the most important capabilities to improve organisational performance in any industry, allowing companies to make data-driven decisions. Carrying out a meta-analysis, Bogdan & Borza (2019) discovered that organisations that successfully exploited analytics were more productive and profitable, highlighting that strategic and operational decisions based on large datasets enabled firms to predict market trends, resource allocation, and inefficiency. It underscores the fact that the ability to analyze data is an important facilitator of performance enhancement and not merely a technological supplement. In a similar manner, Fosso Wamba et al. (2018) in the supply chain and logistics industry showed that big data analytics enhanced the demand forecasting, minimized operational errors, and increased supply chain responsiveness in a way that analytics has a direct impact on operational efficiency and reliability, which contributes to the long-term organisational competitiveness and performance. Furthermore, Pappas et al. (2018) and Aljumah et al. (2021) discovered that analytics helped the companies to identify patterns in collected data, which enhanced patient outcomes and service quality, offering essential insights that can be used to promote operational and service-level improvements, especially in knowledge-intensive industries. These findings are supported by Gupta et al. (2020), who found that analytics enable the delivery of personalized services and increase customer satisfaction, indicating that data-driven decision-making can lead to customer-centric performance results, making companies better in the accuracy of their decisions and fewer operational uncertainties, which supports the notion that well-established analytics capabilities enhance organisational strategic and operational results (Al-Dmour et al., 2023). Nevertheless, literature also states a negative relationship between data analytics and organizational performance, asserting that data analytics do not always lead to better performance when staff members do not have the competencies to process complex data (Akhtar et al., 2019; Ghasemaghahi, 2019). According to their findings, analytics require human capability and training to achieve performance benefits, as supported by Ghasemaghahi (2020), who noted that companies that implemented analytics without proper infrastructure incurred greater expenses, data overload, and uneven improvements, which suggests that organisational readiness is a mediating factor in the success of analytics. In general, the mentioned studies indicate that the application of analytics is not the only tool that can be effective, but it should be integrated with the development of skills, the alignment of processes, and the strategic placement in order to achieve measurable performance changes. Based on this, the study has established the following research hypothesis to be tested in the case of the Saudi Arabian telecommunications sector.

H2: Data Analytics has a positive effect on organizational performance in the Saudi Arabian telecommunications sector

Theoretical Framework – Dynamic Capabilities Theory

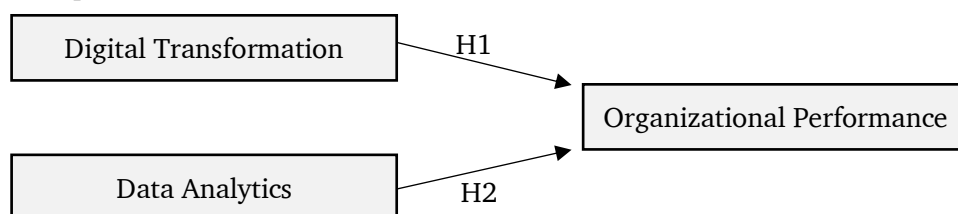
The dynamic capabilities theory (DCT) forms the theoretical framework of this study, noting the argument of Teece et al. (1997) that dynamic capabilities are the capacity of a firm to combine, create, and reorganize both internal and external resources in order to effectively react to the fast-changing environments. According to this theory, the high performance is not only due to the ownership of resources or adoption of technology but the ability of an organisation to sense the opportunities, capture them strategically, and realign resources to sustain competitive advantage (Gupta et al., 2020; Kang & Moon, 2016). When it comes to digital transformation, DCT states that the implementation of digital technologies is not enough to improve performance noting that organisations should build the ability to see opportunities brought about by digital tools (sensing), adopt technologies successfully (seizing), and redesign processes, workflows, and knowledge management systems (reconfiguring) to gain operational, financial and strategic advantages (Andrade et al., 2022; Ferri & Takahashi, 2025). As an example, companies that are well digitally prepared and have adaptable cultures can match digital efforts with organisational aims, enhance the pace of decision-making, and become more customer-sensitive, which is in line with the DCT view (Yu et al., 2022). Likewise, the use of data analytics is consistent with DCT in allowing firms to feel the trends in big and complicated data, capture insights to drive strategic or operational decisions, and realign their resources, including workforce or supply chain operations or service delivery systems (Gupta et al., 2020; Singh & Del Giudice, 2019). These arguments are supported by existing literature where it is argued that companies that effectively utilize analytics potentials may enhance forecasting, operational inefficiency, and customer-focused decision-making (Bogdan & Borza, 2019; Fosso Wamba et al., 2018; Pappas et al., 2018) while organisations with inadequate analytical capabilities or those that do not incorporate the insights into the decision making process might not have any performance improvement (Akhtar et al., 2019; Ghasemaghaei, 2020), which underlines the moderating effects of dynamic capabilities in converting analytics adoption into performance. Based on this, it can be argued that through the incorporation of digital transformation and data analytics within the context of DCT, the current study acknowledges the fact that the performance outcomes of an organisation are determined by the capacity of the firm to constantly adapt, learn, and restructure resources in relation to the changes in the technological and market environment. Thus, DCT offers a logical theoretical perspective to understand why certain organisations attain high performance gains, and others incur inefficiencies, opposition, or minimal gains, studying the role of digital transformation and data analytics in improving organisational performance in the Saudi Arabian telecommunications sector.

Conceptual Model

The study's conceptual model focuses on investigating how digital transformation and data analytics (both are independent variables) affect the organisational performance (dependent variable) of companies in the telecommunication sector in Saudi Arabia. In the existing literature, digital transformation has been defined as the level of digitization of organisations to use and embrace digital technologies in order to enhance processes, customer experiences, and strategic decision-making (Andrade et al., 2022; Bai, 2021), data analytics assesses the capacity of an organisation to gather, process, and analyze data in making decisions (Bogdan & Borza, 2019; Fosso Wamba et al., 2018) while organizational performance is the measurement of the actual output or results of an organisation against the goals or objectives set according to Aljumah et al. (2021) and Gupta et al. (2020).

Figure 1

Conceptual Model



Testing the conceptual framework as shown in Figure 1, the study will present a clear picture of how the adoption of technologies and analytical capabilities contributes to organisational performance in unison, which will be of practical use to managers who want to optimize performance by using digital and data-driven approaches.

Research Methodology

The research was based on a positivist philosophy and deductive reasoning, which presupposes that reality is measurable objectively and that the correlation between variables may be examined with the help of the statistical methods grounded in the existing theories and literature (Saunders et al., 2019). Following this methodological framework, the research relied on a quantitative design to circulate an online Google Form survey link to 160 employees working as IT, operational, digital, and analytics officers in the telecom hubs in Riyadh, Jeddah, and Dammam because these cities are the locations of the main activities and digital transformation of major companies (Alayed, 2023; Bahreldin et al., 2025). More specifically, the online social media platforms were used to circulate the questionnaire link, such as LinkedIn, WhatsApp, Instagram, and X (formerly known as Twitter), to have access to a large number of respondents within the time and budget constraints, following the endorsement of Ball (2019) and Braun et al. (2021). The social media distribution also made it more accessible and promoted participation among the employees, asking them to participate in their free time to avoid any wrong responses because of work pressure. The chosen sample size number of 150 was informed by the study by Memon et al. (2020), who systematically compared the sample size rule of thumbs provided by different scholars at different times and proposed that at least 150 is required to have reliable statistical results. 124 completed responses were received, showing a response rate of 82.67%.

As it was not possible to access all the employees randomly, purposive sampling was employed to access respondents directly exposed to digital tools, platforms, and data analytics processes, ensuring the credibility of the information collected since the respondents chosen are those who are knowledgeable about the digital transformation efforts in their companies (Campbell et al., 2020; Rai & Thapa, 2015). In order to have the most related individuals, the questionnaire had a screening statement that *"Fill out this questionnaire only if you are working as an IT, operational, digital, and analytics officers in the telecom hubs in Riyadh, Jeddah, and Dammam."* During the course of data collection, different ethical considerations were followed, such as respondents were told the aim of the study, and they were assured that they were participating in the study voluntarily. No personal identifiers were gathered, the participants were reminded that the answers would be confidential, the collected data was kept safely in a personal OneDrive account, and was used solely for research purposes.

The research instruments were adopted from existing studies to ensure the construct reliability, content validity, and overall measurement accuracy. For example, four items for big data analytics and ten items for organizational performance were adopted from Imran et al. (2018), and Nawanir (2016) was also used by Mubarak et al. (2019) on a five-point Likert scale. While digital transformation was operationalized using a seven-item scale adopted from Bley et al. (2016), it was also used by Teng et al. (2022) on a seven-point Likert scale. Adopted scales do not require lengthy pilot testing, but the instruments were checked to ensure that they made sense and were applicable to the target context through industry experts. The analysis of data was done in a systematic order with the help of SPSS, starting with data screening in terms of missing values, descriptive statistics, and frequency analysis of demographic questions asked to participants. After these tests, correlation and multiple regression analysis were conducted to determine the direct impact of the digital transformation and big data analytics on the organizational performance. These results were then compared with existing literature and theoretical frameworks to establish the acceptance or rejection of developed research hypotheses and make evidence-based recommendations.

Findings and Discussion

This section reports and interprets the results obtained by employing both descriptive and inferential tests, which are later discussed in relation to existing literature and dynamic capabilities theory.

Participants' Information

Table 1 reports the summary of frequency analysis of demographic characteristics of respondents, indicating that there were 71 (57.30%) and 53 (42.70%) female and male respondents, respectively, which suggests that the female population in the sampled telecommunications organizations was greater. This nearly equal gender representation suggests that the results indicate the views of a workforce of both genders, which minimizes the impact of gender bias on the evaluation of the results of digital transformation and big data analytics. Regarding age, 34 respondents were aged between 40 and 49 years (27.4%), 31 respondents were aged above 50 years (25.0%), followed by respondents aged between 20 and 29 years (30), representing 24.2 percent of the total, and the respondents between 30 and 39 years (29) constituted 23.4 percent of the total sampled employees. Such a balanced age distribution implies that the opinions about digital transformation and the use of analytics as the driver of performance changes are informed by both younger, digitally flexible workers and older, more seasoned employees with strategic understanding.

Table 1

Participants' Characteristics

Demographic characteristics	Categories	Frequency	Percent
Gender of respondent	Male	53.00	42.70
	Female	71.00	57.30
Age of respondent	20-29 years	30.00	24.20
	30-39 years	29.00	23.40
	40-49 years	34.00	27.40
	50 years and above	31.00	25.00
	Job role of the respondent	Operational staff	25.00
	Technical / IT staff	25.00	20.20
	Digital transformation or analytics role	20.00	16.10
	Supervisory/middle management	27.00	21.80
	Senior management	27.00	21.80
Work experience of the respondent	Less than 2 years	38.00	30.60
	2-5 years	28.00	22.60
	6-10 years	23.00	18.50
	More than 10 years	35.00	28.20

In terms of job roles, there were 25 respondents (20.20%) serving as the operational staff, 25 respondents (20.20%) in technical or IT staff, while respondents in the digital transformation or analytics role were 20 (16.1%), 27 respondents (21.80%) held supervisory or middle management roles, and 27 respondents (21.8%) held senior management positions. This representation will ensure both the operational execution and strategy decision-making views will be represented in the result that is necessary in the evaluation of the total effects of organizational performance. With regards to work experience, the highest number of respondents were within the less than two-year bracket with 38 (30.60%), and those who had over ten years' experience with 35 (28.2%), followed by 28 respondents (22.6%) having 2-5 years of experience and the number of employees who have 6-10 years of experience was 23 (18.5%). This distribution means that the research represents the knowledge of the employees of various career levels, which enhances the applicability of the findings to the general population of the digital transformation and big data analytics in the Saudi telecommunications industry.

Descriptive and Reliability Statistics

Descriptive statistics (Table 2) show that there is a high degree of agreement in all the constructs among respondents. Starting with, the mean score of 4.07 and standard deviation of 0.55 are recorded for data analytics, with the lowest and highest responses of 1.75 and 5.00, respectively, which indicates that the majority of the respondents view the data analytics capabilities as well-developed, with rather low dispersion in the opinions. Next, the mean score of organizational performance is slightly greater (4.13) with a lower standard deviation (0.45), and the data range is 3.00 to 5.00, making it clear that the respondents have always had positive perceptions of the performance outcomes. Finally, the mean value of digital transformation is highest at 4.63, with the responses being within the range of 3.71 to 6.57, and a standard deviation of 0.45, indicating a high level of consensus among respondents that digital transformation efforts are effectively being undertaken in Saudi telecom companies. Overall, average scores of above 4.00 for all variables suggest that the respondents are generally not in agreement with the fact that the data analytics and digital transformation practices are properly implemented and are significantly related to positive organizational performance. The standard deviations are also relatively low, which also suggests the agreement of the participants, which can be regarded as a strong argument in favor of the stability of the responses and their representativeness.

Table 2

Descriptive and Reliability Statistics

	Minimum	Maximum	Mean	Std. Deviation	Cronbach alpha
Data analytics	1.75	5.00	4.07	0.55	0.824
Organizational performance	3.00	5.00	4.13	0.45	0.835
Digital transformation	3.71	6.57	4.63	0.45	0.668

Next, the reliability statistics based on Cronbach's alpha Table 2 show that there is an acceptable to a strong internal consistency of the study constructs: data analytics and organizational performance have a Cronbach's alpha of 0.824 and 0.835, respectively greater than 0.70, which means that there is good reliability affirming that the items used to measure this construct are very consistent (Saunders et al., 2019). Notably, digital transformation has a Cronbach's alpha of 0.668, which is a little lower than the traditional 0.70 benchmark, but is still deemed to be acceptable in exploratory and survey research, as argued by Daud et al. (2018). Overall, these reliability values suggest that the measurement tools are reliable enough and can be used in further inferential analysis that will explore the connections between digital transformation, data analytics, and organizational performance.

Correlation Statistics

The correlation analysis (Table 3) shows that there is a positive relationship between data analytics and organizational performance, with a correlation coefficient of 0.640, which is statistically significant at the 0.01 level. This implies that the organizations utilizing data analytics effectively are destined to achieve higher performance rates in a manner that data analytics is able to translate the findings into actions in terms of enhanced decision-making, operational efficiency, and customer service in reality.

Table 3

Correlation Statistics

	Data analytics	Digital transformation	Organizational performance
Data analytics	1.00		
Digital transformation	0.02	1.00	
Organizational performance	.640**	.187*	1.00

On the other hand, digital transformation implies a lesser positive correlation with organizational performance, with an insignificant coefficient of 0.187. This is a positive correlation, but quite low, which can be an indicator that digital transformation initiatives do not have a direct negative-immediate effect on improving performance, perhaps due to implementation, adaptation of employees, or the preparedness of organizations. Overall, these results suggest that the impact of data analytics on organizational performance is more significant and immediate when compared to the impact of the digital transformation, which is also positive but not as significant, underscoring that Saudi telecom companies should focus on data analytics strategies and, at the same time, have the digital transformation efforts well-managed to realize a tangible performance change.

Regression Statistics (Hypothesis Testing)

The regression analysis results (Table 4) on the impact of data analytics and digital transformation on organizational performance within the Saudi telecommunications industry. indicates a R value of 0.664, and the R2 is 0.44, representing that both independent variables can explain the variance of organizational performance by about 44 percent. The results of the ANOVA show that the regression model is statistically significant with an F-value = 47.68 and a P-value =0.000 (less than 0.05), affirming that both data analytics and digital transformation have a significant effect on organizational performance.

Table 4
Regression Estimates (Hypotheses Testing)

Model Summary						
Model	R	R Square	Adjusted Square	R-Std. Error of the Estimate		
1.00	.664	0.44	0.43	0.34		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1.00	Regression	10.83	2.00	5.41	47.68	.000
	Residual	13.74	121.00	0.11		
	Total	24.56	123.00			
Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1.00	(Constant)	1.22	0.38		3.21	0.00
	Data analytics	0.52	0.06	0.64	9.37	0.00
	Digital transformation	0.17	0.07	0.18	2.59	0.01

Dependent Variable: Organizational performance

Concentrating on the standardized beta coefficients, it is evident that data analytics has a significant positive impact on the organizational performance with the beta of 0.64, which is highly significant (t = 9.37, p = 0.00), implying that, other things being equal, a one unit increase in data analytics will be associated with a 0.64 unit increase in organizational performance. Practically, this underscores that efficient use of data analytics tools, processes, and insights is important in improving performance outcomes in terms of operational efficiency, customer satisfaction, and strategic decision-making in Saudi telecom companies. Next, the low positive and significant effect of digital transformation with a standardized beta of 0.18 (P = 0.01 < 0.05) indicates that the advantages of digital transformation can be conditional on other organizational aspects, including adaptation of the employees, technological preparedness, or compatibility with the existing systems.

Overall, the comparative analysis underlines that data analytics is a more significant driver of organizational performance, whereas digital transformation has a positive but minor impact, which calls for companies to focus on improving their data analytics abilities and a well-managed digital transformation plan to achieve the highest performance results.

Discussion on Results

The findings of the current study provide a clear indication that digital transformation and big data analytics have positive effects on the performance of Saudi telecommunications companies, but the impact differs.

To begin with, for the first objective intended to assess the effect of digital transformation adoption on performance of telecom companies in Saudi Arabia, the regression results indicate a standardized beta of 0.18 ($T = 2.59$, $P = 0.01$), which implies that digital transformation has a positive and significant effect on organizational performance in a way that one unit increase in the digital transformation initiatives leads to a 0.18 units increase in the organizational performance also supported by correlation analysis, which indicates positive and moderate correlation ($r = 0.187$, $p < 0.05$). This result suggests that digital transformation adoption improves performance, but the effect is less significant than data analytics, which has a beta coefficient of 0.64. In practical terms, the positive result highlights that digital transformation programs such as automation, cloud computing, digital service platforms, and improved IT infrastructure lead to a higher level of operational efficiency, customer satisfaction, and strategic responsiveness. The result aligns with the findings of Bai (2021) and Schilirò (2024), who noted that companies with developed digital strategies enhanced operational efficiency and financial performance in a way that adoption of digital tools in the workflows enabled these firms to make decisions more quickly, minimize redundancies, and react to changes in the market more efficiently arguing that digital transformation allows automating processes and allocating resources more efficiently, which cuts costs and enhances the reliability of operations. Furthermore, the studies by Orero-Blat et al. (2025) and Mubarak et al. (2019) reported that those companies that strategically use digital transformation can enhance internal and external competitiveness, which are the key determinants of organizational performance as noted by Teng et al. (2022). Nevertheless, the moderate beta value shows that these advantages can be conditional upon the organizational readiness, skills of employees, and the successful implementation of technologies into the current procedures. This finding is consistent with the previous studies that highlighted that adoption of technology does not necessarily lead to higher performance, and contextual factors, including culture, change management, and workforce adaptation, are key to achieving the potential benefits (Guo et al., 2023; Jardak & Ben Hamad, 2022). The obtained result also aligns with the dynamic capabilities theory (Teece et al., 1997), which argues that firms gain a competitive advantage by sensing opportunities, capturing them, and changing their internal resources and processes to fit the dynamic environments. In this case, digital transformation is a dynamic capability that enables telecom companies to reorganize organizational routines, effectively utilize technological resources, and adapt to market and customer demands (Yu et al., 2022). The high positive beta is an indication that the firms investing in digital technologies acquire the power to feel the new technological opportunities and mold operations to enhance performance. In this way, the adoption of digital transformation can be theorized not only as a technical improvement but as a strategic tool that empowers organizational flexibility and sustainability in a competitive environment.

In the context of big data analytics, the regression outcome shows that the standardized beta is 0.64 ($T = 9.37$, $P = 0.00$), which means that it has a strong positive impact on organizational performance, also confirmed by the correlation coefficient of 0.640 ($p < 0.01$). The high obtained beta coefficient indicates that data analytics capabilities are a vital driver of performance, which implies the significant capacity of telecom companies to derive actionable insights out of big data and to make evidence-based decisions, affirming that analytics enables organizations to anticipate customer behavior, optimize network operations, improve service quality, and create focused marketing strategies, which directly reflect on operational and strategic

performance results. The result aligns with the existing literature where Bogdan & Borza (2019) discovered that organisations that successfully exploited analytics were more productive and profitable, highlighting that strategic and operational decisions based on large datasets enabled firms to predict the market trends, resource allocation, and inefficiency. In a similar manner, Pappas et al. (2018) and Aljumah et al. (2021) discovered that analytics helped the companies to identify patterns in collected data, which enhanced patient outcomes and service quality, offering essential insights that can be used to promote operational and service-level improvements, especially in knowledge-intensive industries, supporting the notion that well-established analytics capabilities enhanced organisational strategic and operational results (Al-Dmour et al., 2023). Nevertheless, literature also states a negative relationship between data analytics and organizational performance, asserting that data analytics do not always lead to better performance when staff members do not have the competencies to process complex data (Akhtar et al., 2019; Ghasemaghaei, 2019). In the light of the dynamic capabilities theory, big data analytics is a strategic capability that would allow firms to feel the market trends, capture opportunities, and change internal operations based on the changing conditions (Gupta et al., 2020; Singh & Del Giudice, 2019). The high positive and significant beta indicates that the companies that make use of analytics are in a better position to re-allocate resources, improve operational efficiency, and make data-driven strategic decisions.

Overall, the two hypotheses are accepted, asserting that digital transformation and big data analytics have a positive influence on organizational performance, and data analytics have a more significant influence. These results indicate that Saudi telecom firms need to focus on the establishment of a powerful analytics infrastructure, human resources, and combined digital approaches to improve performance indicators. Although digital transformation is a positive factor, its average impact indicates that there should be appropriate strategies of implementation, training employees, and integrating processes to ensure maximum returns. Strategic planning should focus on big data analytics with its more powerful influence, which will allow companies to make timely and data-driven decisions to enhance efficiency, customer satisfaction, and competitive positioning, reinforcing the sector's ability to remain agile, innovative, and customer-centric in an increasingly competitive environment.

Conclusion

Conclusion

This paper aimed to examine the effects of digital transformation and big data analytics on the organizational performance of the firms within the telecommunication industry of Saudi Arabia. Following the positivist philosophy and deductive research design, the study adopted a quantitative methodology and collected data through an online questionnaire from employees working as IT, operational, digital, and analytics officers in the telecom hubs in Riyadh, Jeddah, and Dammam, adopting a purposive sampling technique. More specifically, the online social media platforms were used to circulate the questionnaire link, such as LinkedIn, WhatsApp, Instagram, and X (formerly known as Twitter), to have access to a large number of respondents within the time and budget constraints following a cross-sectional time horizon. During the data collection, no personal identifiers were gathered, the participants were reminded that the answers would be confidential, the collected data was kept safely in a personal OneDrive account, and was used solely for research purposes. 124 obtained valid responses were tested through SPSS, performing descriptive analysis, frequency analysis of demographic questions asked to participants, correlation, and multiple regression analysis was conducted to determine the direct impact of the digital transformation and big data analytics on the organizational performance.

The results validate the positive and statistically significant impact of digital transformation and big data analytics on organizational performance, leading to acceptance of both developed research hypotheses grounded in existing literature and dynamic capabilities theory. The comparative analysis underlines that data analytics is a more significant driver of organizational performance, whereas digital transformation has a positive but minor impact, which calls for companies to focus on improving their data analytics abilities

and a well-managed digital transformation plan to achieve the highest performance results aligned with Vision 2030. Overall, the study provides strong empirical data in the non-Western, highly controlled, and technologically developed setting, affirming the fact that as long as digital transformation provides the basis of modernization, big data analytics is the key driver through which the performance gains are achieved. The conclusion highlights the significance of strategic integration, capability building, and ongoing organizational adaptation towards attaining sustainable performance gains.

Theoretical and Practical Implications

Theoretically, this research is valuable as it empirically confirms the dynamic capabilities theory in the framework of digital transformation and big data analytics, focusing on the Saudi telecommunication industry. The analysis of the two constructs into one analytical framework leads the research to fill a significant research gap available in the current Middle East-focused literature that tends to look at the capabilities separately in other settings. More specifically, the results affirm that digital technologies are not enough to ensure performance improvement, unless the organizations can reorganize the processes, align human resources, and integrate analytics into the strategic decision-making, reinforcing the claim that dynamic capabilities are an important process by which digital investments are translated into actual performance results. Although previous studies often presuppose the existence of a direct and strong relationship, the weaker effect of digital transformation in the present study indicates the existence of contextual and organizational contingencies. This theoretical implication urges future research to go beyond this linear assumption and look at mediating and moderating variables like organizational culture, leadership support, employee competencies, and change management practices.

In practice, the results provide a clear guideline to the telecom managers and decision-makers in Saudi Arabia. To begin with, the organizations are supposed to focus on building strong big data analytics, considering the fact that analytics infrastructure, data governance, and analytical skills are some of the investments that can result in performance improvements that can be measured immediately. Second, digital transformation projects must be strategic, but not technological, for which managers should make sure that digital tools are consistent with organizational goals and are integrated into the workflow. To avoid resistance and inefficiencies, employee training, cross-functional cooperation, and slow integration of the system are necessary. The study also offers evidence on which policymakers and regulators can rely in relation to Saudi Vision 2030, urging them to consider that increasing the national analytics capacity, promoting the development of digital skills, and promoting innovation based on data within telecommunication companies will improve the performance and competitiveness of the sector as a whole. Regulatory frameworks, which encourage the exchange of data, readiness for cybersecurity, and investment in digital infrastructure, will also contribute to sustainable development. Altogether, the practical implication is that telecom companies must consider big data analytics as a strategic asset and digital transformation as an organizational capacity instead of a technological upgrade that should be implemented once.

Limitations and Future Research Directions

To begin with, the study utilized a cross-sectional design that does not enable the researcher to observe how digital capabilities and performance change with time. Digital transformation is dynamic by nature, and longitudinal studies would give more information on the changes in performance effects as organizations grow digital. Second, the research was based on self-reported survey information, which is prone to bias in response or perception among the participants. Despite obtaining informed participants through purposive sampling, future studies might be useful to supplement the survey data with objective performance indicators or secondary data to increase robustness. For this purpose, interviews should be carried out along with surveys to have an idea about the challenges faced, evaluating the effectiveness of adopted practices, and highlighting possible prospects to achieve desired outcomes. Third, the sample was limited to the key telecom centers in Saudi Arabia. Although this is suitable in the context of the study, it restricts the ability to generalize

to smaller telecom companies or other service industries. Future research should involve comparative studies across industries or an extension of the model to other Gulf Cooperation Council states. The mediating and moderating variables that should be studied in future research include the organizational culture, leadership support, employee digital skills, and innovation capacity to have a more subtle insight into the effect of digital transformation and analytics in its collaboration on performance.

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