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The role of business analysis, ai-enabled insights, and data analytics in enhancing the efficiency of digital transformation in Saudi Arabian organisations

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Abstract: The current research examines the pivotal role of business analysis, AI-powered insights, and data analytics in enhancing the effectiveness of digital transformation initiatives within Saudi Arabian organizations. The study provides context-specific information that is highly valuable to practitioners and policymakers, as it empirically substantiates the complex interactions among these factors. The findings highlight practical initiatives that organizations aiming to achieve successful outcomes from their digital investments and attain a long-term competitive advantage can implement. Although the cross-sectional design used in the quantitative analysis offers valuable insights, it limits the ability to draw definitive causal inferences. The results clearly demonstrate that business analysis, AI-enabled insights, and data analytics, individually, have a strong and positive impact on the successful delivery of digital transformation. Future academic research should consider incorporating longitudinal designs to capture the evolving dynamics of these relationships over time. Additionally, expanding the scope of investigation to include a broader range of nations and industries, as well as emerging technologies such as blockchain and generative AI, would significantly deepen the understanding of enablers of digital transformation.

Keywords: *AI-enabled insights, Business analysis, Data analytics, Digital transformation.*

1. Introduction

Digital transformation has become one of the fundamental blocks of the modern corporate strategy, necessary to adjust to the changes in technologies and remain competitive in the conditions of the digital economy. Organisations around the world are beginning to utilise artificial intelligence (AI), data analytics, and sound business analysis more to boost productivity, improve the decision-making process, and drive innovation. In accordance with the ambitious Vision 2030, Saudi Arabia has strategically placed digital transformation as the foundation of economic diversification and an essential measure to reduce the exposure to oil revenues [1].

The extensive digitisation of the Kingdom of Saudi Arabia has already been triggered by massive governmental efforts and investments in the main areas of digitisation, such as finance, healthcare, retail, and the public sector. Even though these are admirable steps, optimising digital transition is still a challenge facing a significant portion of organisations [2]. The potential of digital transformation is often limited by the inefficiencies introduced by poor data analytics, inadequate decision-making frameworks and AI insights that have not been coordinated to fit into the overall corporate strategy [3, 4].

This paper is an attempt to explore the exact role played by business analysis, AI-enabled insights, and data analytics in enhancing the effectiveness of digital transformation in Saudi Arabian organisations in a careful manner [5, 6]. It further specifically tries to examine how each of these

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strategic enablers, both in isolation and in combination, lead towards better decision-making, better operational results, and a stronger connection with higher-order organisational goals [7]. The study is especially relevant because it directly supports the Saudi Vision 2030 since it provides empirically based knowledge, which is valuable in realising sustainable digital innovation and economic diversification.

- In order to comprehensively cover its objectives, this research proposes to respond to the research questions below:
- What is the fundamental role of business analysis in the effectiveness of digital transformation of Saudi Arabian organisations?
- How can AI-enabled insights be used in discernibly better ways in decision-making in the course of digital transformation?
- What exactly is the role of data analytics in enhancing business and operational results remarkably?
- How can business analysis, AI-powered insights, and data analytics work together to affect the overall success of digital transformation projects?

In line with that, the aims of the research given are formulated in the following way:

- Strict evaluation of the role of business analysis in the efficiency of digital transformation.
- Sceptical assessment of the place of AI-enabled insight in enhancing strategic decision-making.
- Analytical examination of the value of data analytics to business performance and business operational efficiency.
- Quantitative determination of the correlation of business analysis, AI-enabled insights and data analytics with the ultimate success of digital transformation.
- Facilitation of strategic guidelines that Saudi organisations can adopt to equip them on the best routes to undergo digital transformation by applying these crucial enablers wisely.

2. Literature Review

The rise of digital transformation into the level of a strategic necessity among organisations worldwide has been driven by incessant technological improvements, changed customer desires, and an unmistakable urgency for operational effectiveness. With industries learning to manage and adjust to the challenging demands of the digital age, the smooth implementation of emerging technologies and data-driven decisions and approaches has ceased to be an optional practice and has become an unquestionable necessity [8, 9]. Nevertheless, the success of digital transformation does not in any way depend on the use of technology alone; instead, it is essentially linked to the sensible adjustment of these technologies to the fundamental business goals of an organisation, to its decision-making models, and to its overall performance indicators [10]. The strategic enablers that prove critical in enabling this alignment include business analysis, AI-enabled insights, and data analytics, among others, which are equally instrumental in designing and governing digital initiatives [11, 12].

Artificial intelligence (AI) has proved to transform the work of corporations, decision-making models, and value creation in a broad range of sectors. AI-powered insights assist organisations in careful analysis of massive amounts of data, identification of intricate patterns, and deep digitalisation, besides playing a pivotal role in spurring innovation, efficiency, and faster and more accurate decision-making [1, 13]. With the steady advance of digital transformation, AI implementation in organisational processes has moved beyond the stage of experimentation and has become a strategic necessity [14]. Machine learning, natural language processing, predictive analytics, and other automated insights can prepare firms to meet market trends proactively, have greater insights into customer behaviour and considerably speed up operational processes [15, 16]. In spite of these significant benefits, multiple complexities hamper the smooth incorporation of AI-powered insights into digital transformation endeavours, majorly due to the ubiquitous lack of qualified workers who can design, deploy, and explain sophisticated AI systems [17].

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Data analytics is becoming one of the most important factors in the digitalisation of contemporary organisations, improving their efficiency, decision-making process, and creativity. In a fast-evolving business world where digital technologies are at the core of achieving a competitive edge, the capability to derive business value out of massive data volumes has taken a central stage [18]. Data analytics enables businesses to support empirical evidence in their decisions, requiring organisations to use data wisely so that their processes, strategies, and structural make-ups are streamlined towards effective digitalization [19]. Descriptive, diagnostic, predictive, and prescriptive analytics allow a more profound level of efficiency and drive an organisation to its transformation goals due to a more in-depth understanding of internal operations, market forces, and customer behaviour [20].

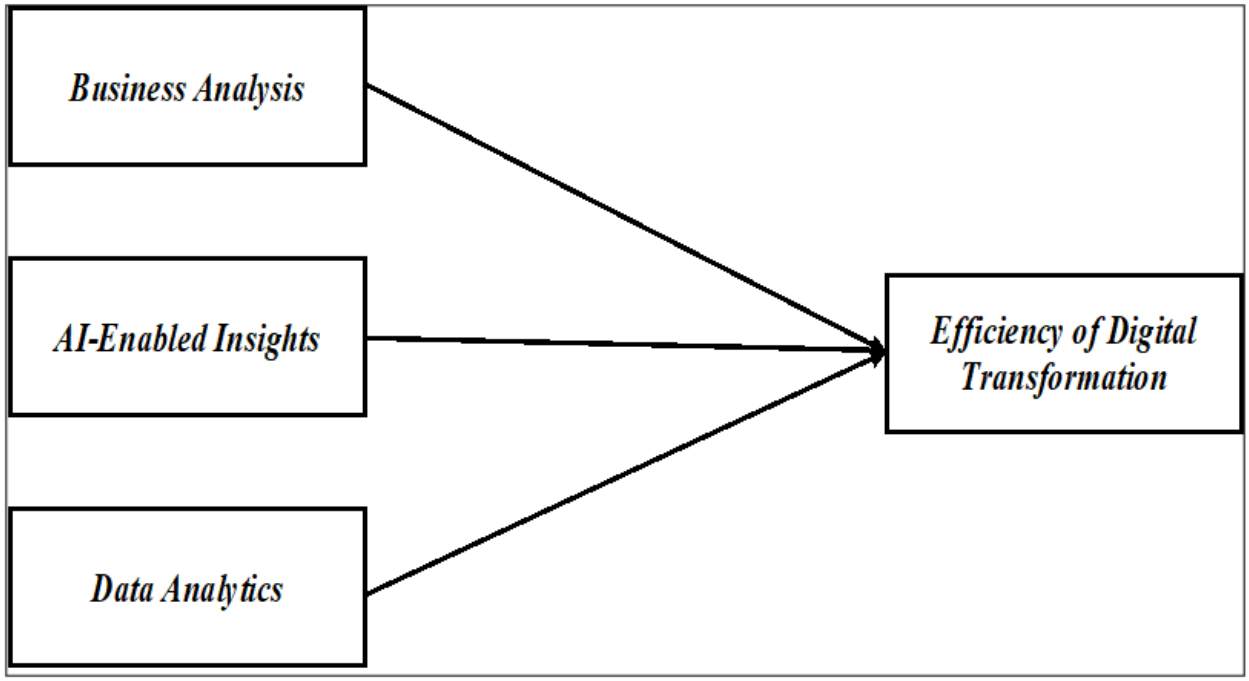

Figure 1.
Conceptual Framework of the Study.

The conceptual framework in Figure 1 forms the basis of the proposed study explains the complex yet interrelated nature of three central independent variables of the study: business analysis, AI-enabled insights, and data analytics and how they work together to influence the efficiency of digital transformation in Saudi Arabian organisations. The framework is strongly supported by the assumption that effective digital transformation is not about the adoption of technology alone; instead, the whole process depends on the strategic implementation of enablers that can improve the quality of decision-making, the optimisation of operational activities, and accurate alignment with organisational goals. All these three independent variables have their own contributions, which are, however, synergistic with the results of digital transformation.

2.1. Hypotheses

In accordance with the literature investigation and conceptual framework above, we suggest the following hypotheses:

H_1: Business analytics exert a positive and significant impact on the efficacy of digital transformation.
H_2: AI-enabled insights exert a positive and significant impact on the efficacy of digital transformation.
H_3: Data analytics exert a positive and significant impact on the efficacy of digital transformation.

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3. Methodology

The quantitative research design is conducted to strictly investigate the role of business analysis, AI-based insights, and data analytics in achieving better efficiency of digital transformation in Saudi Arabian companies [21]. The research approach implied that empirical data should be gathered to discover the existence of critical variables and determine their impact on the results of digital transformation in quantitative terms. The cross-sectional research approach was chosen, which allowed gathering information of a wide range of experts on digitally transforming industries at one time, thus giving a picture of the contemporary practice and perception [22].

The research design was a quantitative one, as the authors used a carefully designed questionnaire, which was distributed online among more than 750 experts working in different industries in Saudi Arabia. The response rate achieved was 36.8 percent, and the valid responses were 276. Descriptive statistics, correlation analysis, and structural equation modelling (SEM) were then employed to analyse the collected data to examine in detail the relations among the latent variables and to test the formulated research hypotheses rigorously.

This survey focused on a population of digital transformation experts based in Saudi organisations, including workers in key fields like banking, health, retail, e-commerce and government. These industries were selected because of their strategic significance to Vision 2030 and their effectiveness in embracing business analysis, AI, and data analytics for achieving higher levels of operational efficiency as well as better service delivery.

4. Results

The respondent profile for this research in Table 1 showcases a highly educated and professionally mature group of people actively spearheading digital transformation in Saudi Arabia. The dominant group comprised those aged 35–44 years (55.1%), followed by 25–34 years (23.2%) and 45–54 years (18.5%), with a clear dominance of mid- and senior-level professionals within the group. Academic achievements stood high, with 72.8% of the respondents having an undergraduate degree and 24.3% having higher degrees, reflecting the high level of education that is common in digital jobs. The private sector dominated as the driving force behind digital transformation, with 68.5% of the respondents, while 31.5% represented the public sector. Most of the respondents, with 89.1% in managerial posts, reflect that the data collected is heavily based on decision-makers with strategic roles.

Table 1.
Description of Participants (N=276).

Category	**Frequency**	**Percentage**	**Category**	**Frequency**	**Percentage**
Age			Education		
Below 25	6	2.2	High School	2	0.7
25 – 34	64	23.2	Diploma	6	2.2
35 – 44	152	55.1	Undergraduate	201	72.8
45 – 54	51	18.5	Graduate	67	24.3
55 and above	3	1.1	Total	276	100%
Total	276	100%	---	---	---
Gender			Sector		
Category	Frequency	Percentage	Category	Frequency	Percentage
Male	234	84.8	Public	87	31.5
Female	42	15.2	Private	189	68.5
Total	276	100%	Total	276	100%
Work Status			Experience in Digital Transformation		
Category	Frequency	Percentage	Category	Frequency	Percentage
Managerial	246	89.1	- 2 Years	6	2.2
Non-Managerial	30	10.9	2–5 Years	95	34.4
Total	276	100%	6–10 Years	134	48.6
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---	---	---	Total	276	100%

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Descriptive statistics, Table 2 facilitated information about the general patterns and perspectives of respondents on the primary concepts being studied. The item "Business Analysis in Digital Transformation" achieved the highest means of 4.01 with a standard deviation of 3.00, clearly showing that the respondents strongly believe that business analysis is an essential enabler of digital transformation efficiency. "AI-Enabled Insights in Decision-Making" in close collaboration with a mean of 3.83 and a standard deviation of 2.09 instilled a clear recognition among respondents of the significance of integrating AI-driven insights in strategic and operational decision-making. The "Role of Data Analytics in Digital Transformation" yielded a slightly lower mean score of 3.56 with a standard deviation of 2.74 but indicated a positive public sentiment towards the importance of analytics.

Table 2.
Descriptive Statistics of all the Latent Variables (N= 276).

Constructs	Mean (Likert 1-5)	Standard Deviation (Likert 1-5)
Business Analysis in Digital Transformation	4.01	3.00
AI-Enabled Insights into Decision-Making	3.83	2.09
Role of Data Analytics in Digital Transformation	3.56	2.74
Digital Transformation Success	3.78	2.10

The analysis of reliability and validity of the latent constructs in Table 3 demonstrated strong internal consistency and convergent validity in all the variables that were assessed. The values of Cronbach Alpha exceeded the suggested value of 0.70 for all constructs and ranged between 0.79 ("Role of Data Analytics") and 0.89 ("Digital Transformation Success"), which indicates the high reliability of the measurement items. On the same note, the Composite Reliability (rho_a and rho_c) values were also all above 0.8, which further enhanced the consistency of the constructs in measuring their intended dimensions. The values of Average Variance Extracted (AVE) surpassed 0.7 in all constructs, which indicated that the latent variables, but not the error, accounted for the majority of variance and, therefore, met the requirements of convergent validity. The values of the Collinearity Matrix were always less than 3.0, which meant that the multicollinearity was not a serious issue in the model.

Table 3.
Construct Reliability and Validity of all the Latent Variables.

Latent Factors	No. of Items	Cronbach's Alpha	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)	Collinearity Matrix
Business Analysis in Digital Transformation	10	0.80	0.91	0.79	0.78	1.09
AI-Enabled Insights into Decision-Making	8	0.89	0.82	0.81	0.83	2.31
Role of Data Analytics in Digital Transformation	8	0.79	0.81	0.89	0.86	1.69
Digital Transformation Success	8	0.89	0.89	0.90	0.87	2.57

Correlation analysis in Table 4 indicated that there were strong positive relationships among the important latent variables. Business Analysis in Digital Transformation was strongly and positively correlated with the Role of Data Analytics in Digital Transformation (r = 0.86), showing that organisations that focus on the practices of sound business analysis also tend to use data analytics effectively. Moreover, Business Analysis demonstrated a partial correlation with Digital Transformation Success (r = 0.78), which is quite significant and indicates the importance of the former in the success of transformation initiatives. Likewise, "AI-enabled insights in Decision-Making" showed a significant correlation with Digital Transformation Success (r = 0.81), implying a substantial positive influence of

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the involvement of AI-powered decision-making on digital transformation's success. Besides, the Role of Data Analytics also demonstrated a significant correlation with both AI-enabled insights (r = 0.78) and Digital Transformation Success (r = 0.77).

The values of R-squared defined the variance in the dependent variables explained by the independent variables included as part of the model. AI-Enabled Insights in Decision-Making had the highest R-Square (0.85) value, which means that about 85.4 percent of its variability is explained by the predictors, thus indicating an extremely good model fit to the AI-assisted decision-making processes.

Table 4.
Results of Correlation Analysis.

	Business Analysis in Digital Transformation	**AI-Enabled Insights into Decision-Making**	**Role of Data Analytics in Digital Transformation**	**Digital Transformation Success**
Business Analysis in Digital Transformation	1			
AI-Enabled Insights into Decision-Making	0.74**	1		
Role of Data Analytics in Digital Transformation	0.86**	0.78**	1	
Digital Transformation Success	0.78**	0.81**	0.77**	1

Note: *p < .05, **p < .01, Cronbach's alpha italicised along the diagonal.

Table 5 displayed the high R-Square value of 0.84, also emerged in "Digital Transformation Success", which implies that business analysis, AI-enabled insights, and data analytics jointly explain 84.3% of its variance. This clearly emphasises the collective roles these three enablers play in the success of digital transformation initiative implementations. Likewise, Business Analysis in Digital Transformation and Role of Data Analytics in Digital Transformation showed excellent R-Square values of 0.75 and 0.72, respectively, which means that more than 70 percent variability in these constructs is clarified in the model. The values of adjusted R-Square were slightly lower but still closely located near the R-Square values, which indicated that the number of predictors did not substantially reduce the explanatory power of the model.

BADT Business Analysis in Digital Transformation; AEDM* AI-Enabled Insights in Decision-Making; DADT* Role of Data Analytics in Digital Transformation; DTS* Digital Transformation Success.*

Table 5.
R-Square Values of all Latent Variables.

Variable	**R-Square**	**Adjusted R-Square**
Business Analysis in Digital Transformation	0.75	0.74
AI-Enabled Insights into Decision-Making	0.85	0.77
Role of Data Analytics in Digital Transformation	0.72	0.71
Digital Transformation Success	0.84	0.84

The results of hypothesis testing in Table 6 left no doubt that all three formulated hypotheses were supported statistically. The regression coefficient (β) of the relationship between Business Analysis in Digital Transformation (BADT) and Digital Transformation Success (DTS) was 0.46, with a t -t-statistic of 4.94 and a p -p-value of 0.05, meaning that the relationship was significant and positive. This leaves no doubt in the fact that proper business analysis can and will lead to improved results of digital transformation.

The association between AI-enabled insights in Decision-Making (AEDM) and Digital Transformation Success was even stronger, as the regression coefficient was high (0.75), the t-statistic was very high (7.84), and the p-value was 0.00. Interestingly, this finding shows that AI-enabled

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decision-making processes are the most significant influence among the three enablers, serving as a notable success factor in transformation.

Table 6.
Hypothesis Testing and Structural Equation Modeling.

	Regression Coefficient (β)	Standard Deviation (SD)	T-statistics (|O/SD|)	P-value	Remarks
H1 (BADT* → DTS*)	0.46	0.79	4.94	0.05	Accepted
H2 (AEDM* → DTS)	0.75	0.06	7.84	0.00	Accepted
H3 (DADT* → DTS)	0.45	0.79	5.84	0.05	Accepted

5. Discussion

The results of this study eloquently dictate that business analysis, AI-powered insights, and data analytics would play a significant role in encouraging digital transformation in Saudi Arabian companies [6]. Such findings strongly affirm the principles of the resource-based view (RBV) and digital transformation theory, according to which strategic analysis, intelligent insights, and data-driven decision-making are essential towards realising sustainable transformation [10, 23].

Previous studies (5) have revealed that several Saudi businesses did not utilise business analytical frameworks adequately, resulting in poor digital performance. The present research, nonetheless, indicates with particular clarity that digital transformation initiatives require careful coordination, technical viability, strategic consistency and operational effectiveness that can be ensured by utilising formal business analysis techniques, such as feasibility studies, stakeholder analysis and gap analysis [24].

The overwhelmingly large regression coefficient of AI-driven insights gives a vivid example of the increasing use of intelligent systems to operate in complex organisational environments, effectively anticipate market dynamics, and drastically improve consumer experiences [25].

Although skills shortages, data privacy concerns, and high implementation costs are some of the challenges associated with AI integration, SDAIA and the National Strategy for Data and AI efforts are in full swing to make Saudi enterprises adopt AI [8, 14]. The current study shows that despite technological hurdles, the strategic employment of AI can significantly add to the effectiveness of digital transformation, aiming at enhancing the competitiveness of organisations.

H3 confirms the positive and significant influence of data analytics on the success of digital transformation, thus supporting the literature findings on the role of data-driven decision-making in modern businesses [26].

Organisations use data analytics to perform thorough customer analysis, determine emerging trends, streamline operational processes, and customise product and service offerings [27]. Despite showing the lowest mean score among the three dimensions, the impact of data analytics is profound, indicating that although organisations are becoming more aware of their importance, their ability to realise its full potential is usually limited by the prevalence of data silos, issues of governance, and a huge gap in analytical talent [28]. Regardless of significant investments in building the analytics infrastructure, numerous organisations continuously fail to foster truly data-driven cultures and to operationalise insights in a meaningful way [21].

As a matter of fact, business analysis positionally and operationally coordinates change efforts, artificial intelligence-based insights scale predictive and real-time decision-making, and data analytics carefully finetunes performance on all fronts [29, 30]. The results of 21 correspond to the fact that privately held businesses are more agile and are more likely to be digitally transformed [31]. Nevertheless, the fact that the research participants included considerably many representatives of the public sector staff speaks in favour of the fact that the frameworks developed by SDAIA and the National Data Management Office are also stimulating changes in public organisations effectively [32].

The research study has strongly emphasised the great significance of proper digital transformation management. The fact that the vast majority of the respondents were of managerial level or above

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emphasizes that strategic leadership cannot be neglected while achieving successful transformation. It confirms the insights that effective technological integration and cultural adjustment require uncompromising senior management sponsorship, strong cross-functional cooperation, and advanced change management plans [33]. Managers are the key to influencing decisions and developing a data-driven culture, being the strongest advocates of applying AI and business analysis approaches [34].

With these promising results notwithstanding, the report also revealed some persistent barriers that organisations need to overcome in order to achieve greater efficiency in transition [35]. Data governance intricacies, the lack of AI and data analytics experts, the high cost of AI implementation, and the general cultural reluctance to change can be deemed as persistent challenges [5, 36].

6. Conclusion

The paper has discussed how business analysis, AI-powered insights, and data analytics have a leading role in digital transformation in Saudi Arabian organisations. Findings In accordance with the National Vision 2030 agenda, the findings highlight the necessity of organisations becoming more strategic and integrated in their approach to digital transformation, which should extend beyond the technological implementation phase and consider decision-making, operational efficiency and competitiveness in the long run.

The empirical support proves that business analysis has a significant contribution to the improvement of the transformation results because it helps to align the technical initiatives with the strategic goals and reduce the risks related to digital investment. These findings support other studies that propose well-planned and goal-oriented change initiatives [10, 37].

AI-enabled insights became apparently impactful, corroborating current research that frames machine learning and predictive analytics as revolutionary tools in business decision-making [1, 6]. However, accomplishing their full potential depends on confronting critical enablers such as organisational preparedness, skills development, and supportive infrastructure. National initiatives—such as those coordinated by the Saudi Data and AI Authority (SDAIA)—signal a strong policy commitment, while structural and human capital limits remain critical issues [8, 38].

Likewise, data analytics continues to play a crucial role in enhancing service delivery, operational operations, and consumer interaction across financial, healthcare and government sectors. Nonetheless, challenges pertaining to data repositories, governance limits, and lack of analytical experts hamper its effectiveness, highlighting the need for establishing a data-driven culture anchored by robust governance and persistent skill enhancement [24, 39]. Integrating market analysis, AI insights, and data analytics facilitate sustainable digital transformation, particularly in developing markets—surpassing prior, disintegrated tactics [40, 41].

Overall, the analysis warrants a comprehensive, ecosystem-oriented approach to digital transformation. Managers must advocate organised business research, govern the effective implementation of AI findings, and invest in versatile data infrastructure [28, 35]. By utilising these strategic enablers, Saudi organisations can drive real, sustained digital innovation—positioning themselves competitively in a fast-developing global market [7].

6.1. Limitations and Avenues for Future Research

Although the present research has indeed contributed to the current body of knowledge significantly, there are some limitations to its design that will provide ample opportunity for aspiring researchers. First, the study used a cross-sectional design, which obtained data at one time [42]. Although this design gives valuable glimpses of the current practice and attitude at a given moment in time, it intrinsically limits the possibility of making firm causal conclusions and understanding the dynamic processes of digital transformation as it develops over time. Future studies would, therefore, significantly be enhanced by embracing longitudinal patterns that would help to more effectively understand the contribution of business analysis, AI insights, and data analytics to transformation outcomes at various levels of maturity [27].

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Secondly, the study was confined exclusively to Saudi organisations. While this focused approach enhances contextual relevance and addresses a notable gap in emerging market research, it may limit the generalisability of the findings to other national or distinct cultural contexts. Future studies must expand the geographical scope to assess the applicability of these findings in diverse global settings [34].

Thirdly, the research examined the attitudes of employees at the managerial level without drawing clear differences among different industry sectors or the size of organisations. Digital transformation can imply exceptional challenges and opportunities in different fields, like healthcare, education, or heavy industry. To offer more customised information, future research might carry out sector analysis or comparative analysis between small and medium-sized enterprises (SMEs) and large companies.

Last but not least, this study has thoroughly addressed the aspects of business analysis, AI-enabled insights, and data analytics but failed to include other possibly impactful variables, including corporate culture, leadership types, organisational readiness to technology, or external environmental conditions, in general. The authors of future studies are welcome to include these other variables into their models to develop an even more all-rounded perception of the digital transformation success multifaceted determinants.

Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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