Effects of Artificial Intelligence, Big Data Analytics, and Business Intelligence on Digital Transformation in UAE Telecommunication Firms

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Abstract

This research's primary objective is to investigate the impact of artificial intelligence, big data analytics, and business intelligence on digital transformation in UAE telecommunications companies. Following the completion of the sample checking procedure, 200 samples were collected. The Amos program was used to process all the collected data in the research study. The findings of the research demonstrate a set of relationships and linkages that can enhance digital transformation. Moreover, a summary of the findings revealed that all three hypotheses H1, H2, and H3 were found to be valid and significant. This study concluded that artificial intelligence, big data analytics, and business intelligence have a positive impact on developing and enhancing for digital transformation.

Keywords: Artificial Intelligence, Big Data Analytics, Business Intelligence, Digital Transformation, UAE Telecommunications Firms.

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1. Introduction

The term "digital transformation" has recently become a buzzword in the field of strategic information systems research (Piccinini et al., 2015). Digital transformation, according to the experts, is defined as the use of digital technology and its profound influence on society and industry (Agarwal et al., 2010; Majchrzak et al., 2016). At the organizational level, firms have attempted to develop a strategy capable of generating high-efficiency operational performance by using new solutions based on digital technology (Hess et al., 2016). Digital transformation is a new phenomenon with multiple levels and characteristics that necessitates several new studies capable of defining the capabilities and characteristics of digital transformation, as well as its ability to help organizations improve their work performance and compete in the digital market at the lowest costs and highest quality available to customers (Matt et al., 2015). The process of digital transformation is defined as the process of change, improvement, and development that occurs in the characteristics of an organization through the application of systems, tools, and technological methods of communication, which contribute to the discovery of new ideas and products, the development of innovative solutions, the management of operations through technological systems, and the improvement of the efficiency and effectiveness of an organization's performance in a general way (Wolfswinkel et al., 2013). We provide an inductive framework that analyzes the influence of artificial intelligence tools, big data analytics, and business intelligence systems in boosting businesses' capabilities throughout typical digital transformations, based on our investigations of the literature reviews and past research. The need for companies to better understand the phenomenon of digital transformation and identify the elements that aid or hinder the process led to the study of the influence of the preceding variables and their impact on the digital transformation process. The research examines the impact of artificial intelligence tools, big data analytics, and business intelligence systems as variables capable of enhancing organizations' transformation capabilities to achieve digital paradigm transformation, and it does so by assisting organizations in defining transformation metrics, scope, and speed. DuringThe methods of review will be discussed in the following parts, as well as the study results and recommendations for future research.

2. Literature review

2.1. *Artificial Intelligence (AI)*

Artificial intelligence is a branch of applied computer science that employs computer algorithms to assist organizations in performing tasks. It is often associated with the study of human intelligence (Jianxing et al., 2019), (Younus, A. M. 2021).. According to studies (Nambisan et al., 2017), customers' participation in product development and specification is important. As a result, using digital technologies as an effective means of connecting customers with businesses is critical in the process of creativity and innovation (Yoo, 2013; Wieland & Vargo, 2017; Jianxing et al., 2019). Most researchers agreed that using technological tools and systems to develop the administrative, operational, and industrial fields by developing strategic plans capable of developing specific product development maps is critical (Urbinati et al., 2018). Artificial intelligence tools are used as one of the technological techniques used to support managers and decision makers in reading, absorbing, and using all the information available within online repositories and accessing databases quickly and efficiently (Knippenberg et al., 2015). This allows businesses to use and implement new business models capable of transforming and developing businesses, producing innovative products capable of increasing customer loyalty, enhancing transformation and development capabilities, and gaining market share and competitive advantages (Nenonen & Stor-backa, 2018).
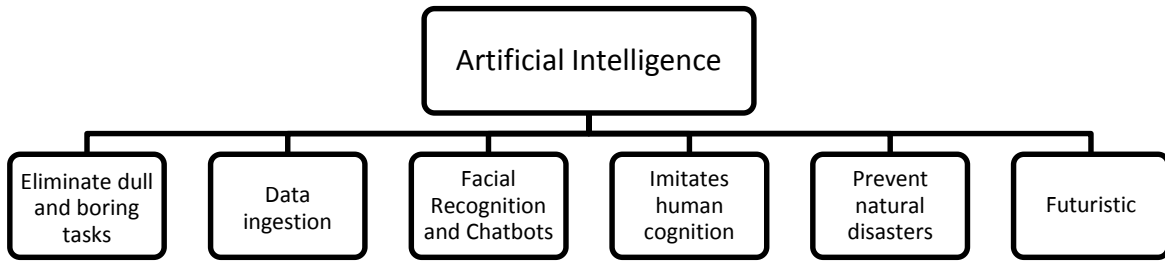
Figure 1. *Features of Artificial Intelligence*

2.2.   Big Data Analysis (BDA)

Big data is described as vast and complicated data sets that have been gathered from a variety of sources and combined. Among the sources of big data are information gleaned through data mining methods, artificial intelligence tools, learning systems, and social networking sites, among others (Chen, 2016; Lu, 2015). Big data has been shown to be an excellent tool for enterprises to employ to better understand customer behavior, minimize operational expenses, product prices, and running fees, among other things (Toole, 2015). When applied to social networking sites, big data technologies have proven to be effective in understanding consumer behavior by reducing the number of messages and comments posted on sites such as Facebook. This allows organizations to produce and supply products to end customers based on the requests made by those customers (Jiang, 2016).
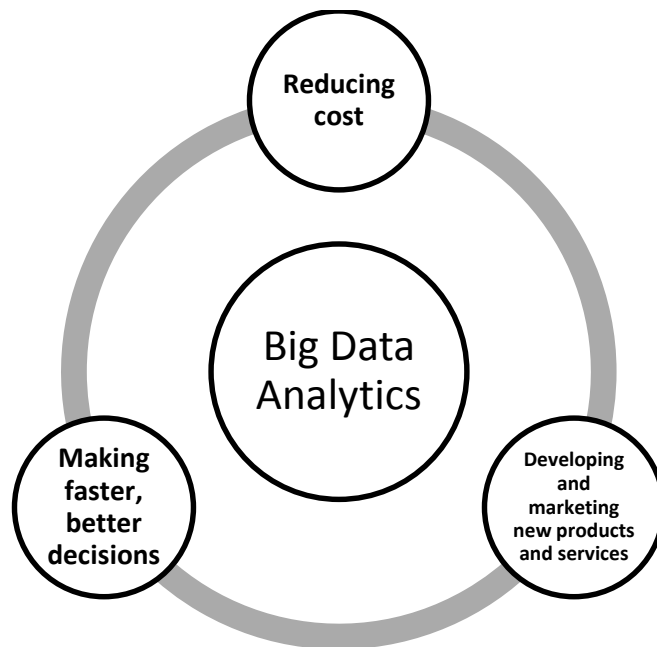

Figure 2. *importance OF big data analytics*

2.3.   Business Intelligence (BI)

Organizations were confronted with the challenges of owning and managing large amounts of

data, with the issues being summarized in terms of the size, quality, accuracy, and validity of the data. As a result, the business intelligence strategy has evolved as a very successful creative tool for extracting new values that may help firms differentiate themselves and become more distinctive (Wamba et al., 2015; Biswas & Sen, 2016; Fatorachian & Kazemi, 2018). Biz Intelligence Systems (BIS) are a collection of software applications that assist businesses in storing and managing their data, analyzing it, and weaving it together to create new knowledge and creative goods and services (Bordeleau F. et al., 2018). A complex but necessary process, the process of organizations achieving digital transformation is complicated but necessary due to the difficulty of working today without the extensive use of technological systems, the ability of organizations to deal with and analyze big data and try to extract new values, a complex process that has compelled organizations to use analytical business intelligence tools (Bordeleau et al., 2018; Raffoni et al. 2018). As a summary, data warehouses are used to store and organize information, which is then classified and checked for accuracy before being used to search for new relationships between data to create new knowledge that allows organizations to extract new ideas, support the decision-making process, solve complex and intractable problems, and finally provide new services and products to customers (Lamba & Singh 2017), Younus, A. M., & Abumandil, M. (2022).
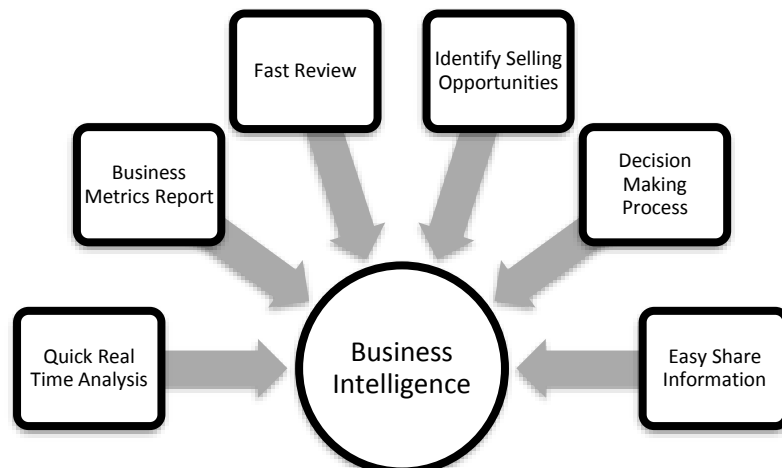

Figure 3 . *Business Intelligence - Offers Tools*

2.4.   *Digital Transformation (D TRF)*

The rise of the digital economy was seen by most businesses at the time as both a problem and an opportunity to be taken advantage of at the same time, according to the report. Some firms found the digital economy to be a barrier and a difficulty since they lacked the necessary technology infrastructure and competitive employees to compete effectively Younus, D., & Muayad, A. (2021).. On the other hand, the companies saw the digital economy as a chance to improve their own skills, infrastructure, and competitiveness, which would enable them to be more visible and dominant in the competitive market in the future (Hess et al., 2016; Sebastian et al., 2017; Lanzolla et al., 2018; Frank et al., 2019). The difficulty and the necessity of possessing diverse capabilities to reach customers and provide distinguished and innovative products ahead of competitors at an acceptable price have been recognized by organizations

seeking stability and remaining stable in their position in front of competitors (Dalenogare et al., 2018; Vial, 2019; Torto- rella et al., 2020). To achieve full digital transformation, most organizations have resorted to increasing their technological capabilities as one of the solutions to achieve various competitive advantages, such as lowering the costs of commercial and operational transactions, as well as transportation costs, and relying entirely on technological systems to deal with big data analytics and customer demands, among other things (Warner and Wager, 2019). Based on previous studies and reviews, the following research hypotheses are proposed:

2.5.   Conceptual Framework and Hypotheses

The following Research Framework and hypotheses are offered based on past studies and reviews:
H1: Artificial Intelligence has a positive effect on Digital Transformation.
H2: Big Data Analytics has a positive effect on Digital Transformation.
H3: Business Intelligence has a positive effect on Digital Transformation.
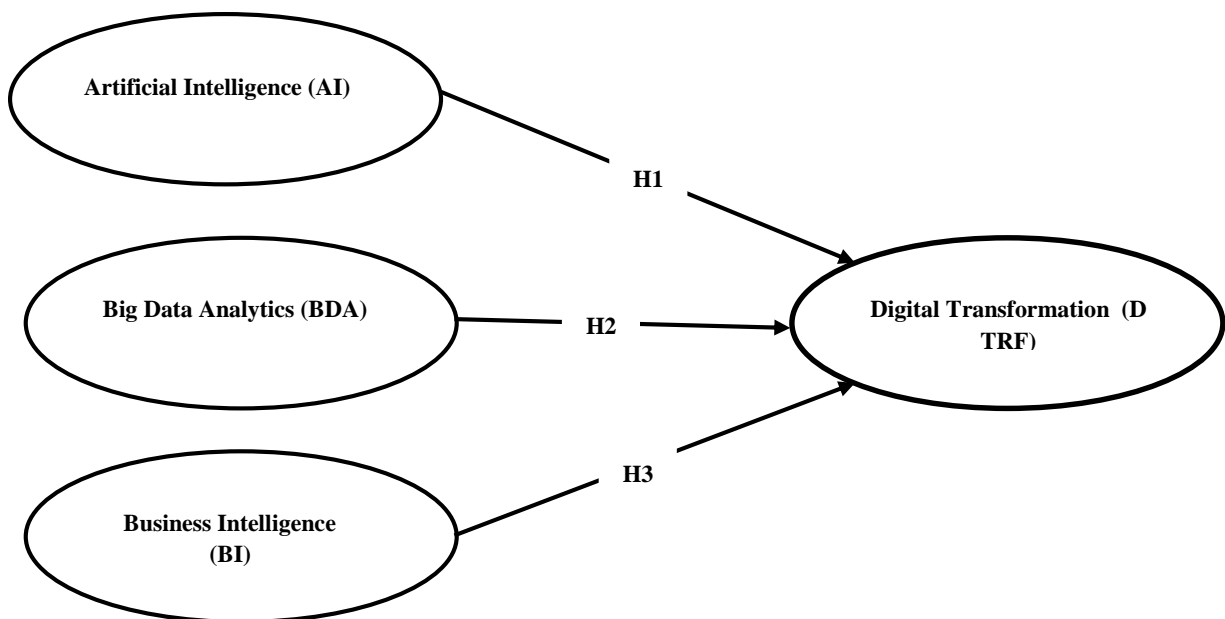

Figure 4. Conceptual Framework

3.   Research Methodology

Google Drive was used to design, create, and distribute an online research survey based on a five-point Likert scale (1 = Strongly Disagree; 2 = Disagree; 3 = neutral; 4 = Agree; and 5 = Strongly Agree) to gauge the research main constructs. In addition, the researcher uses the eth Amos approach to discuss research hypotheses statistically Younus, A. M., Tarazi, R., Younis, H., & Abumandil, M. (2022). After checking and filtering all the data received, 200 respondents' responses were accepted to be used in the analysis process to discuss the research hypotheses. Finally, the total number of samples collected was ten times that of the predictors (Gefen et al., 2011).

Structural equation modeling was used to investigate the impact of artificial intelligence, big data analytics, and business intelligence on digital transformation in UAE telecommunications companies. The model's reliability and validity have already been discussed. The model's goodness-of-fit indices are as follows: 2 = 146.724, df = 74, 2/df = 1.982 5.0, RMSEA = 0.055 0.80, GFI = 0.941, AGFI = 0.917, CFI = 0.972, NFI = 0.946, RFI = 0.934, and TLI = 0.966 using the Amos 24.0 software package. This indicates that the model's goodness-of-fit is satisfactory.

4.   Research Results and Discussion

Table 4. Participants Demographics Information

	Items	numbers		Items	numbers
Gender	Male	165	Current position	manager (C)	70
	Female	35		managers (B)	85
Age	More than 50	10		Director (A)	5
	40 – less than 50	55		Director (A4)	10
	30 – less than 40	140		Director (A3)	30
	Less than 30	5	Experience Years	More than 15 years	15
Academic qualification	Diploma B.Sc.	20 120		10 – less than 15 years	55
	Master	50		5 – less than 10 years	110
	Ph.D.	10		Less than 5 years	20

To understand the logic behind the respondents' questionnaire responses, the researcher looked at their demographic traits. Gender, age, degree of education, and duration of service with the organization were among the demographic data received from respondents. The parts that follow go through each of these in further depth. According to the study's findings, most respondents were under the age of thirty. Individuals in their twenties and thirties dominate UAE businesses, according to these statistics. As a result, it is possible to argue that SMEs can increase their perceived trustworthiness. Additionally, the over-40 age groups included economically engaged people who were obsessed with business success and Essential Telecommunications Firms (Albright, Winston, and Zappe, 2010). Furthermore, workers at Telecommunications Firms over the age of 40 are mature individuals, allowing us to make informed decisions concerning the influence on Telecommunications Firms.

4.1.   Structural Model Analysis

The intention towards telecommunications firms was measured using structural equation modeling. We've already talked about the model's dependability and validity. The model's goodness-of-fit indices, calculated using the Amos 24.0 software package, are as follows: 0.941, AGFI = 0.917, CFI = 0.972, NFI = 0.946, RFI = 0.934, and TLI = 0.966. 2 = 146.724, df = 74, 2/df = 1.982 5.0, RMSEA = 0.055 0.80, GFI = 0.941, AGFI = 0.917, CFI = 0.972, NFI = 0.946, RFI = 0.934, This indicates that the model's goodness-of-fit is satisfactory. Table 7 and Figure 3 present the findings.

The impact of Artificial Intelligence (AI) on Digital Transformation (D TRF) was direct and significant, with standardized path coefficients of 0.247 ** (p = 0.000). H1 was thus validated. Similarly, Big Data Analysis (BDA) had direct and significant effects on Digital Transformation (D TRF), with standardized path coefficients of 0.138 *** (p = 0.000). As a result, H2 was also endorsed. Finally, Business Intelligence (BI) had a direct and significant impact on Digital Transformation (D TRF), with a standardized path coefficient of 0.185 *** (p = 0.000), resulting in H3's acceptance. As a result, (AI), (BDA), and (BI) have a positive impact on developing and enhancing digital transformation (D TRF) in UAE telecommunications firms, according to the theory of planned behavior.

Table 1: Table description (TNR 10pt., italics)

Outcome Variable	TPB Aspect		Estimate	S.E.	C.R. p
(D TRF)	<—	(AI)	0.247	0.086	3.890 0.000 ***
(D TRF)	<—	(BDA)	0.138	0.088	2.277 0.030 **
(D TRF)	<—	(BI)	0.185	0.091	3.043 0.002 ***

Notes: S.E is the standard errors while C.R is composite reliability. <— means that there is a relationship with the outcome variable. *** p < 0.01, and ** p < 0.05.
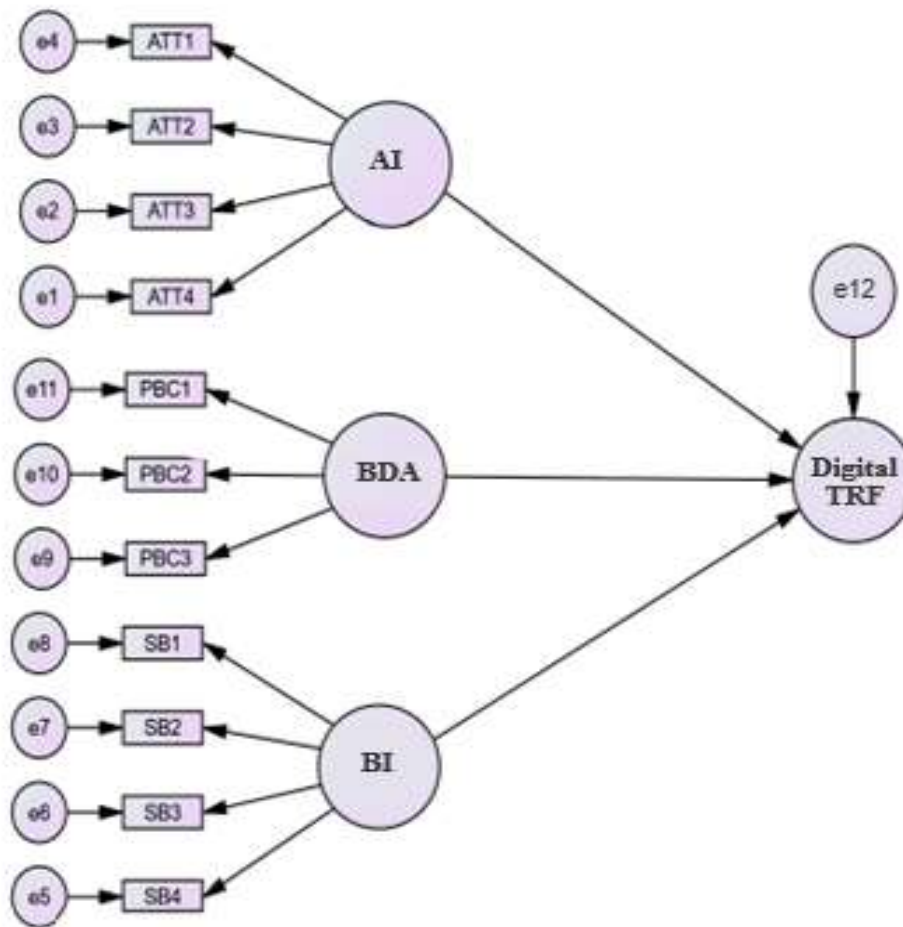
Figure 5 Result of Structural Model (AI), (BDA), And (BI) Have A Positive Impact on Digital Transformation (D TRF) In UAE Telecommunications Firms.

5.   Conclusion

The findings show that Artificial Intelligence has a direct positive impact on digital transformation in UAE telecommunications companies. The findings are consistent with those of prior investigations. Furthermore, this study reveals that big data analytics, which includes large data sources, hashing, indexing, and bloom filtering, as well as parallel computing, has a beneficial impact on digital transformation. This outcome is consistent with earlier research. Furthermore, the findings demonstrate that business intelligence, encompassing data warehouses, data mining, business process management, and competitive intelligence, has a direct and favorable impact on digital transformation. This outcome is consistent with the findings of earlier investigations. Finally, the research findings contradict prior studies that found no effect of the variables on changing capabilities or digital transformation. Finally, the findings of this study show that it is critical and urgent for organizations, firms, and companies to begin the process of digital transformation for all business transactional processes, documents, and orders, and to begin relying entirely on artificial intelligence tools and business intelligence systems to effectively deal with big data, keep up with development and competition, gain more competitive advantages and new knowledge, and support and develop new products and services.

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