The Reality of Digital Transformation in Jordanian Universities from the Administrators Perspective.

ABSTRACT

The study aimed to identify the Reality of Digital Transformation in Jordanian Universities from the Administrators Perspectives. The study sample were chosen by the stratified random method, The questionnaire was distributed to 410, of whom 255 responded. The study followed the descriptive survey method, and the questionnaire were developed, consisting of four axes: digital culture, institutional support, infrastructure, insight and vision.

The results of the study showed that the estimates of members of the administrative board for the degree of digital transformation in Jordanian Universities came to a medium degree, and the field of institutional support ranked first. The results also showed that there are statistically significant differences in the estimates of the members of the administrative board of the degree of digital transformation in Jordanian universities according to the variable of experience and in favor of the members of the administrative board with experience (less than 5 years), and to the variable of the administrative department and in favor of the members of the administrative board working in (the presidency), and to the variable of the type of university (official, private), and for the benefit of private universities.

The study recommended interest in institutional support for digital transformation in universities through an interest in continuous development and creativity.

Keywords: Digital Transformation, Administrative staff, Jordanian Universities

Introduction

Technology plays a significant role in modern society, transforming the way we work, learn, and communicate. This has led to countless innovations that have deeply impacted the economy and the job market. Digital transformation is considered one of the most important of these innovations, serving as a key driver of growth for companies and governments striving to stay ahead. By developing innovative solutions, digital transformation not only ensures their survival but also enables them to compete (OECD, 2017).

According to Norton et al. (2020), digital transformation is a process of changing the way operations are conducted by utilizing digital technology and innovative practices. It may seem like a mere implementation of technological solutions, but in reality, it is the convergence of digital technology and human factors.

Given this rapid development, education cannot remain stagnant. Digital tools have become widespread and their use has increased in various educational environments (Parlak, 2017).

According to Mahlow and Hediger (2019), the adoption of technology by universities is associated with a qualitative leap. Technology represents a complex and interconnected environment that enables and enhances digital learning.

Traditional teaching methods have been replaced by alternative approaches that provide more effective outcomes, relying on inference, logic, simulation, virtual reality, interactive learning, and programmed instruction. These methods cannot be achieved through conventional educational approaches but require the utilization of modern technology and a transition to digital education. This shift aims to cultivate generations equipped with the necessary skills to thrive in the new knowledge era (Shalan, 2016).

In light of the global COVID-19 pandemic, which has imposed a formidable challenge on governments worldwide, digital transformation has become inevitable in all sectors, particularly in education. Badran (2019) argues that higher education institutions serve as incubators for science and technology, which can be transformed into creative inventions that can alleviate the social and economic crises faced by nations.

From this perspective, universities today are compelled to undergo comprehensive strategic

transformations in all their policies. This is necessary for them to break free from their isolation from the societal environment and transition from being mere consumers of knowledge to producers of knowledge. By actively contributing, universities can play a crucial role in building a knowledge society.

Study Problem

The COVID-19 pandemic has brought about significant changes in various sectors and systems, particularly in the education sector, not only in Jordan but globally. This prompted the Higher Council for Science and Technology in Jordan to launch the "Experimental University E-Learning Initiative." The initiative aims to assist students in both public and private universities for the academic year 2019-2020 and to become an integral part of higher education in all Jordanian universities. This strategic

direction positions Jordan on the path of digital transformation and the implementation of the long awaited "Digital Learning" project (Higher Council for Science and Technology, 2020).

Despite the progress made by Jordan in this sector, the Global Knowledge Index 2021 report, as revealed by the United Nations Development Programme in the Arab region, highlighted a decline in Jordan's overall ranking by eight percentage points, placing it at 103 out of 154 countries. The decline was attributed to sub-indicators related to higher education, technical and vocational training, and pre university education, with a total of 59 points. There was also a decline in the research and development innovation index by four points, and a three-point decline in the information and communication technology index (UNDP, 2021).

Based on this, the Information and Communications Technology Companies Association issued a warning regarding the decline in the digital transformation project in Jordan. Additionally, the Ministry of Digital Economy and Entrepreneurship has developed the Jordanian Government Vision 2025 strategy to further stimulate digital transformation (Ministry of Digital Economy and Entrepreneurship, 2021).

In line with this, the Jordanian Strategies Forum, in collaboration with the Ministry of Higher Education, presented a research paper that includes a set of recommendations for Jordanian universities. These recommendations urge universities to consider implementing best international practices and embrace recent changes that have occurred in prestigious universities worldwide (Jordanian Strategies Forum, 2021).

Several studies in the field of digital transformation in educational institutions have confirmed that traditional education is no longer sufficient to achieve educational goals, especially in the era of technology. Studies such as Al-Safiani (2018), Mediani and Talhaoui (2018), and Marques et al. (2019) have emphasized this point. Additionally, Al-Muqaiti's study (2021), which investigated the utilization of artificial intelligence in Jordanian universities, recommended that Jordanian universities adopt plans to increase the utilization of artificial intelligence in both administrative and academic domains.

Therefore, digital transformation, along with its associated challenges, particularly in light of the

processes of acceleration and regression mentioned, as well as the commitment to progress in the digital transformation project in Jordan, and the scarcity of studies - within the knowledge of the researcher - that discuss digital transformation in Jordanian universities, have led the researcher to wonder, "To what extent have higher education institutions achieved the required digital transformation?"

Purpose of the Study

Firstly, understanding the reality of digital transformation in Jordanian universities from the perspective of the administrative members.

Secondly, it is important to uncover the differences in the perspectives of administrative members regarding the reality of digital transformation in Jordanian universities, based on variables such as experience, administrative unit, and university.

The problem of the study arises from addressing the following questions:

1. What is the degree of digital transformation in Jordanian universities from the perspective of administrative members?
2. Are there statistically significant differences at the significance level ($\alpha \leq 0.05$) in the estimates of administrative members regarding the degree of digital transformation in Jordanian universities attributed to variables such as experience, administrative unit, and university?

Importance of The Study

First: Theoretical Importance

The significance of this study arises from its focus on a subject that aligns with the technological revolution and its developments in the field of education, namely the digital transformation in educational institutions. It provides a theoretical framework for the current status of digital transformation in Jordanian universities, opening the door for researchers and interested individuals to conduct further studies. Additionally, the scarcity of studies - within the scope of the researcher's knowledge - related to the study's topic will contribute to understanding the mechanisms and realities of digital transformation in the higher education sector (universities) in the Hashemite Kingdom of Jordan.

Second: Practical Importance

With the dominance of information and communication technology, a set of challenges has emerged for digital transformation, which has affected the new roles of administrative body members. Hence, the importance lies in understanding its application in higher education institutions. Therefore, it is hoped that this study will assist decision-makers in various sectors in making appropriate decisions to facilitate deep and coordinated transformations in workforce, culture, and technology, aiming to establish a model of digital transformation that can be emulated.

Study Terms and Definitions

Digital Transformation: Ibrahim and Al-Haddad (2018) define digital transformation as "the use of

technology within both governmental and private institutions and organizations. It helps improve operational efficiency and enhance services provided to employees and the public. It involves the utilization of technology to facilitate workflow within the organization's departments, aiming to enhance services and facilitate their accessibility, ensuring the simultaneous saving of time and effort" (p. 2).

Operationally, it is defined as the actual utilization of modern digital technologies, such as computers, artificial intelligence, and cloud computing, interactively within Jordanian universities. Its implementation was assessed by measuring the overall degree of response from the study sample regarding questionnaire items in the following domains: digital culture, institutional support, infrastructure, vision, and insight.

Jordanian universities: Universities are generally defined as educational institutions dedicated to higher education and research in specific fields. They serve as the foundation that shapes students' knowledge and skills in various areas, and they represent the intellectual hub of society as they are entrusted with the primary responsibility of shaping students' cultural identity (Al-Ghouriya, 2013).

Operationally, they are defined as the official and private universities in the Hashemite Kingdom of Jordan (the study's location), which are affiliated with the Ministry of Higher Education and Scientific Research and share the common goal of achieving specific educational and learning objectives.

Administrative staff members: They are defined as an elected body of academics and educators who possess a strategic and creative vision. They are characterized by their ability to employ innovative methods in executing tasks, thereby achieving desired objectives. In their work, they represent a specific educational institution through which they strive to fulfil a particular vision and mission (Al-Ghouriya, 2013).

Operationally, they are defined as employees who hold administrative positions in both private and official Jordanian universities. They possess academic degrees in various scientific fields and work within different administrative units.

Study Limitations

Human Limitations: This study was limited to administrative staff members in Jordanian universities (both public and private).

Spatial Limitations: The study was conducted in the following public Jordanian universities: Jordan University, Yarmouk University, Mutah University, and Hashemite University. Additionally, it was implemented in the following private universities: Middle East University, Princess Sumaya University for Technology, Al-Ahliyya Amman University, and Philadelphia University.

Temporal Limitations: This study was conducted during the second semester of the academic year 2021/2022.

Subject Limitations: The study focused on the perceptions of administrative staff members in both public and private Jordanian universities regarding the reality of digital transformation.

The limitations of the study were represented by the degree of accuracy of the responses provided by the study participants to the questionnaire items. Given the nature of the research tools and variables, it is possible to generalize the results of the current study to similar communities, taking into account the validity and reliability indicators of the research instrument.

Theoretical Literature

The concept of digital transformation or digitization:

The concept of digital transformation is a broad concept with many dimensions and implications that carry scientific and technological progress. It encompasses not only business activities but also penetrates into the personal lives of all members of society from different social strata. This reflects people's interaction in all aspects of life, from work to education, and extends to knowledge and information.

Digital transformation is closely linked to what is known as the Fourth Industrial Revolution, a process in which digital technologies shape future social and economic development in a similar manner to the steam-powered evolution of the first industrial revolution (Schwab, 2016).

Norton et al. (2020) view digital transformation as the change in organizational work driven by emerging digital technologies and innovative business models. It is not just about implementing technological solutions but also about aligning digital technologies with human and organizational factors.

Connecting all sectors of the economy in society through a complete network is another meaning of digital transformation or digitization, in addition to the ability to gather relevant information, analyze it, and convert it into actions. This change brings benefits and opportunities, but it also brings entirely new challenges (Lahtinen et al., 2015).

According to Al-Jubeir (2021), digital transformation is a shift in the way institutions operate, leading to a reduction in mundane work tasks while increasing the time spent on thinking about developments. This accelerates daily workflows, harnessing significant technological advancements to better and faster serve customers, improve efficiency, reduce errors, and increase productivity.

Based on the previous definitions, the researcher concludes that digital transformation, at its core, is a transformation of human thinking, culture, and mindset before being a transformation of processes and strategies, relying on information and communication technology. It is a philosophy that involves changing the way people think, which, in turn, affects numerous decisions and actions, ultimately improving the quality and effectiveness of services and adding value to work by acquiring new skills that align with the current progress and development.

Characteristics of Digital Transformation in Universities:

Digital transformation brings forth numerous advantages and features that help educational institutions excel, as outlined by Al-Mutraf (2020) as follows:

● Digital transformation can help universities keep up with the constantly changing business world.

● Digital transformation provides higher education institutions with the ability to quickly adapt to changing conditions, allowing them to maintain a level of excellence that is essential for global competition.

● The nature of work within and outside the university campus, at both the local and global levels, allows these institutions to have an interconnected organizational structure.

● Digital transformation assists higher education institutions in achieving the requirements of integrity and transparency through the meticulous distribution of roles and responsibilities and making appropriate decisions, free from bureaucracy.

● Digital transformation equips universities with a globally recognized level of information and communication technology.

● Through the utilization of information and communication technology, universities can establish highly advanced technological infrastructure, enabling them to remain competitive in the global arena.

Goals of Digital Transformation in Universities

The digital transformation of higher education is heavily influenced by government policies and institutional development strategies (Walker et al., 2016).

According to Sandkuhl & Lehmann (2017), the goal of digital transformation in higher education is to redefine educational services and redevelop operational processes.

Jackson (2019) also suggests that the concept of digital transformation goes beyond the adoption of advanced digital technology alone. In the case of higher education institutions, changing current teaching and learning models is necessary to sustain competitiveness in the long run. There are four main and consistent objectives of digital transformation, including improving the learning environment for students, enhancing operational efficiency, increasing computing power, and fostering innovation in education.

From Al-Jawadi's perspective (2021), the key objectives of digital transformation for universities include sharing databases among different universities and research centers, enhancing digital collaboration, establishing collaboration links among researchers, ensuring transparency and accountability in academic work, facilitating the updating of information and topics on websites, developing anti-plagiarism software, data security, and providing students and staff with updated information and ensuring their data security. Furthermore, universities can utilize modern administrative methods in the digital space.

Digital Transformation Requirements

In light of the constantly changing digital world, it is important for universities to have a clear

understanding of their digital transformation goals and the necessary steps to achieve a smooth and effective digital transformation. This includes considering the strategies to be followed, monitoring budgets in terms of expected profits, clarifying the vision and mission for the coming years, identifying the type and scale of information technology and infrastructure used within the university, and the degree of change that will occur in the activities, trends, and prevailing values among the various university staff.

This is confirmed by a study by Lahtinen and Weaver (2015), which emphasizes that the digital transformation taking place in universities should be based on several important factors. These factors include institutional and governmental support to assist in developing the infrastructure of information technology and communications, as well as modern training programs for students to fill jobs in the technology field. Finally, changes in the university culture need to occur in order for digital transformation efforts to succeed, including acceptance of digital technology by university members, and their awareness of the benefits and opportunities it offers.

The sudden shift to remote teaching and learning during the pandemic highlighted the importance of having a strong digital infrastructure. Institutions that had already invested in digital infrastructure were in a better position to adapt to the sudden changes.

According to Porter (2021), a strong digital infrastructure can provide greater flexibility in teaching and learning, allowing for both synchronous and asynchronous teaching methods. It also enables access

for all students, including those with disabilities, through the provision of tools and technologies that support their learning needs. Additionally, it plays a crucial role in enabling communication and collaboration between students and faculty members, whether through synchronous communication tools like video conferencing or asynchronous collaboration tools like discussion forums and group work.

On the other hand, there is a strong need for a clear vision and strategy for digital transformation supported by institutional leadership and stakeholders. This includes investing in technology and data security, developing digital skills, and providing institutional support to develop faculty members' understanding of digital pedagogy and the integration of technology in teaching and learning. It also involves creating a supportive environment for students, including digital literacy training and access to digital resources, and the need for continuous evaluation of digital transformation initiatives to ensure their effectiveness and impact.

"Embedding digital transformation in higher education requires leadership, culture, and change management, but it also requires institutional support for digital infrastructure, faculty development, and student success. Institutions must invest in the necessary resources and policies to foster a culture of digital innovation and lifelong learning" (Bates, 2020, p. 16).

In addition to the importance of insight and vision, a clear digital strategy that aligns with the institution's mission and overall goals ensures that digital investments are targeted and effective. It also helps build a shared understanding and vision for digital transformation across the institution.

This includes the importance of using data and analytics related to student and faculty behaviors for continuous improvement in digital transformation efforts, as well as a deep understanding of their needs and preferences in designing digital tools and technologies. The crucial role of leadership and culture in driving successful digital transformation efforts is also included, which involves having strong leadership support for digital initiatives, as well as creating a culture of innovation and experimentation that encourages risk-taking and continuous improvement.

In addition, the importance of collaboration and partnerships with industry partners and technology providers is emphasized to leverage best practices and experiences.

Insight and vision are manifested in the importance of adopting a strategic and comprehensive approach to digital transformation in higher education, building a shared vision, and committing to digital innovation across the institution (Deloitte, 2020).

As for digital culture, technology has an emotional impact on individuals and society, shaping how we feel and interact with each other. It is not neutral and has its own policies and power dynamics that affect our emotions and experiences. It can be used to promote positive social change as well as reinforce existing power structures and inequalities. "Digital cultures are more than just a set of tools or technological platforms; they embody social relationships, values, and emotions that have consequences in the real world. By exploring the emotional impact of technological change, we can develop a more accurate understanding of how digital culture shapes our lives and how we can use technology to promote positive social change" (Karatzogianni, 2012, p. 5).

Meanwhile, a study by Al-Dhahshan and Al-Sayyid (2020) concluded that the requirements for transforming universities digitally into smart universities include: building a digital vision, smart infrastructure, smart human elements, smart learning environment, and smart management.

One of the prominent factors contributing to the delay in the digital transformation of universities into smart universities, as described by Al-Jawadi (2021) and perhaps notably absent, is the weak information and communication infrastructure, as well as the lack of a clear vision for smart digital processes, resulting in limited support from leadership, scarcity of digital investments, and increasing financial requirements.

Challenges of Digital Transformation in Universities

The digital transformation often faces a range of challenges, which are not prioritized or linked to a specific industry. These challenges include changing customer expectations, resistance to change, technology resistance, lack of leadership support, inadequate digital transformation skills and competencies, lack of clear vision, and digital illiteracy among stakeholders (Petkovics et al., 2014).

Xiao (2019) indicates that if these challenges are properly addressed, modern technological means such as artificial intelligence, Internet of Things, big data, blockchain, social analytics, and cloud services can enhance and transform educational practices for the better, especially at a time when students are actively and continuously engaging with technology in all aspects of their lives. Digital

transformation provides them with opportunities that are not always available in the traditional classroom environment.

Rodríguez and Bribiesca (2021) summarize the key challenges facing digital transformation in universities as follows:

Firstly, human resistance to change: Higher education institutions face numerous challenges in adapting to digital transformation, such as adopting modern teaching methods and instructional models. This resistance can be a major obstacle to implementing transformative change. Successful institutions should inspire their staff to embrace a digital maturity vision, develop the professional and educational orientations regarding the positive aspects of technology, and thereby reduce the sense of job insecurity.

Secondly, setting priorities: Universities tend to delay important investments in capacity building, which can be time-consuming. It has been emphasized that a well-planned digitization process is not carried out in a particularly novel way or with the necessary financial means to implement the plan. However, it can be addressed by prioritizing digital investments and creating a roadmap that guides the institution's systematic transformation in a sequential manner.

According to Trifonov and Shorokhova (2019), the challenges of digital transformation lie in the low level of digital technological skills among faculty members, as well as the generation gap between digital natives and faculty members and administrators in institutes and universities who need to adapt and learn to use digital technologies.

Furthermore, Smith and Beretta (2021) add another dimension to the challenges that digital transformation in universities may face, including:

Firstly, the decentralized decision-making process, which can lead to delays in implementing decisions and large-scale projects. On the other hand, information technology systems characterized by centralized control and decision-making tend to be more efficient.

Secondly, the narrow view of investment and return on investment by universities. It is important to consider the specific cases of core digital skills and the measures that evolve slowly or are difficult to measure. This includes providing faculty members with time savings and cost savings through more efficient operational processes and automation, as well as delivering improved experiences.

Previous Studies

The study by Rodriguez and Bribiesca (2021) conducted in Mexico focused on the application of an integrated digital transformation model proposed by the study to assess the level of maturity possessed by higher education institutions in their digital transformation processes and compare them with other industries. The study applied the model specifically to a sample of universities. A quantitative methodology was employed to verify the validity of the relationships between the model components and provide a general framework to aid in the qualitative interpretation of the results. The study concluded that there is a strong emphasis on providing infrastructure but a lack of intention to

implement information and communication technology to enable new educational models and teaching methods. Additionally, universities lag behind other sectors, possibly due to a lack of effective leadership, resistance to change, insufficient innovation, and financial support.

On the other hand, the study by Teixeira et al. (2021) aimed to determine the impact of higher education institutions on the digital development of Portugal, specifically the impact of public polytechnic institutes on the development of the capital city, Porto. Both quantitative and qualitative approaches were used, and data was collected through semi-structured interviews and questionnaires. The study revealed the positive impact of higher education institutions on the digital development of the Porto region. It identified key challenges for digital transformation, including cultural and behavioral resistance, a lack of change-oriented mindset, and the influence of higher education on regional development, labor market, and quality of work life. Furthermore, the study highlighted that digital transformation and Industry 4.0 make significant contributions to the development of companies in various sectors, particularly in financial and accounting domains. These areas require relatively lower investments to implement new innovative systems, which in turn bring numerous benefits to companies, especially in the realm of data communications and artificial intelligence systems for generating and informing decision makers of information.

The study by Hervás-Gómez et al. (2021) aimed to identify the perceptions of university students in Spain towards teaching and learning processes during the COVID-19 pandemic. It explored resources such as devices and software, professional collaboration, digital pedagogy, and student empowerment in relation to digital education and recent changes in university teaching due to the pandemic. This study employed a descriptive methodology based on opinion surveys and exploratory studies. Non-probability sampling was used, consisting of 486 students from the University School of Osuna affiliated with the University of Seville. The results showed a positive correlation between digital teaching assets, student motivation, and digital environments. The study provided recommendations to encourage the scientific

community to continue exploring experiences and self-learning and to enhance initiatives that promote competency development among future teachers. Additionally, the study emphasized the importance of pursuing integrated designs and continuous assessment as they are essential for digital transformation in universities.

The study by Mohammed and Al-Ghubairy (2020) aimed to analyze the reality of digital transformation in the Kingdom of Saudi Arabia towards adopting its use in achieving development, updating, and continuous improvement for the progress of the country, and then determine the extent of its progress in dealing with "digitalization" and assimilating its contents. This study used a descriptive analytical methodology. Through the study and analysis, it was revealed that digital transformation in the Kingdom is progressing at an annual rate of 5% since 2011 until 2017, which represents the time series of study variables. The study also showed that the Kingdom is among the top three countries in the region and is part of the group of countries supporting technology on the Global Communications Index for 2017. These countries seek to support the infrastructure of information and communication technology and provide all the innovative technological requirements to facilitate the digital

transformation process. One of the most important recommendations of the study was that policymakers should design policies that suit the implementation of digital transformation, support its progress, and provide support and endorsement by the highest political leadership to achieve digital transformation. In addition, it is necessary to promote the culture of electronic work and the use of technology.

The study by Maadi and Abu Hijair (2020) aimed to determine the readiness of private Palestinian universities for digital transformation. The study followed a descriptive-analytical methodology, and a questionnaire was used as a data collection tool. The study population consisted of employees working in private Palestinian universities in the southern governorates. The stratified random sampling method was used based on the university. The study reached several results, the most important of which were that there is a high approval for the support of top management for digital transformation, and a lower percentage for the suitability of strategic orientations for digital transformation. It was also found that there are statistically significant differences between the mean ratings of the study sample individuals' assessments attributed to age and occupation. On the other hand, there were no statistically significant differences between the mean ratings of the study sample individuals' assessments attributed to gender, academic qualification, and university experience. One of the most important recommendations of the study was to work on providing all the supporting factors for the readiness of Palestinian universities for digital transformation, with a focus on providing the necessary administrative and financial environment, as well as qualifying the human and organizational resources necessary for the success of the transformation process.

The study by Al-Balushi et al. (2020) aimed to explore the reality of digital transformation in the Sultanate of Oman. The study employed a descriptive qualitative methodology, with semi-structured interviews as the main data collection tool. It was conducted in four government institutions: The Ministry of Technology and Communications, the Ministry of Education, the Ministry of Health, and the Royal Oman Police, as well as one private institution, Bank Muscat. Among the key findings of the study was the clear efforts and roles undertaken by these institutions in digital transformation, including

awareness, education, training, integration, readiness, and more. Although the level of transformation varied among the sampled institutions, all of them contributed to the progress of the Sultanate's digital transformation, as reported by the United Nations in 2018. The study recommended the need to promote and raise awareness about available electronic services through various media channels and social networks. It also emphasized the importance of institutions intensifying their utilization of Fourth Industrial Revolution technologies, by implementing technological projects that effectively serve their digital transformation, resulting in a clear impact on their work and delivery mechanisms.

The study by Al-Mutref (2020) in Saudi Arabia aimed to investigate the possibility of digital transformation in government and private universities in the Kingdom. It also aimed to monitor the reality of digital transformation between the two types of universities amidst global crises and disasters. The study utilized a descriptive-analytical methodology and designed a scale to measure the readiness of government and private universities for digital transformation. The study sample consisted of faculty members in universities. The study found statistically significant differences between government and

private universities in terms of the availability of necessary physical resources for digital transformation, the digital competencies of faculty members favoring those in the private sector, and the possibility of digital transformation in education during crises favoring private universities. The study concluded that there is a significant impact of the education sector on the possibility of digital transformation in education during the current crises.

On the other hand, the study by Marks et al. (2020) aimed to explore the digital transformation maturity and challenges in higher education institutions in the United Arab Emirates. The study employed a novel framework based on Petkovic's 2014 comprehensive and core process mapping framework and a maturity assessment framework. The research utilized a mixed-methods approach, including surveys, interviews, case studies, and direct observation. The survey targeted information technology directors, senior information officers, and senior academics interested in digital transformation from both public and private sectors of higher education institutions. The questionnaire consisted of 15 closed-ended questions. Additionally, six in-depth and semi-structured interviews were conducted with IT directors, and four interviews were conducted with senior academic officials. Direct observation was used to verify actual practices rather than relying solely on self-reported information. Finally, a case study was conducted in a public university to validate and triangulate the survey results. The research findings revealed significant variations in the respondents' perceptions of digital transformation maturity levels and the basic requirements for digital transformation maturity. The results also highlighted the lack of comprehensive vision, digital transformation efficiency, and data structure and processing as major challenges for digital transformation.

The study conducted by Santos et al. (2019) aimed to analyze students' perspectives on the use of digital technologies to communicate with their teachers and investigate the objectives and functions for which students use these technologies, as well as understanding their expectations. The study employed a descriptive methodology, and the study sample consisted of 570 students who were primarily bachelor's and master's degree holders in biological and health sciences departments. The results of the study indicated that students choose digital means such as email, instant messaging systems, publishing, and

collaboration technologies to communicate with their teachers, but it was unclear whether these specific selected technologies were institutionally supported. The study also revealed a low expectation regarding the use of social networks, video conferencing, and audio systems for communication, despite the widespread daily use of these systems for other purposes. The study recommended addressing the findings from the perspective of teachers or institutional communication and evaluating the perception of communication overload in the higher education context.

Lastly, the study by Bond et al. (2018) aimed to propose different policies and strategies in Germany that address educational technology innovations in higher education. The study presented the University of Oldenburg as an example and aimed to understand what is being proposed and what actually happens in teaching and learning in German university classrooms. The study employed a descriptive methodology and utilized questionnaires as a tool. The results of this study provided an initial insightful

view of how teachers and students use digital tools for teaching and learning, indicating the need for increased professional development for teachers to address academic digital illiteracy. The study also highlighted that students have access to a range of digital media for academic learning, which depends on teachers implementing digital media and university adoption policies for this purpose.

The study by Amin (2018) aimed to identify digital transformation in Egyptian universities and its role in meeting the knowledge society's requirements. The study employed a descriptive methodology, and a questionnaire was designed and administered to faculty members (67) from various Egyptian universities (Damanhur, Alexandria, Tanta, and Mansoura) to determine their perspectives on the requirements of digital transformation for achieving a knowledge society. The results of the field study showed high significance, confirming the response of faculty members to requirements related to developing a digital transformation strategy, designing digital educational programs, managing and financing digital transformation, and addressing human, technological, security, and legislative requirements. However, faculty members' responses showed moderate significance regarding the requirement of promoting digital culture. The study also proposed a conceptual framework to identify the requirements of digital transformation in universities for achieving the study's knowledge society.

The study by Mediani and Talaawi (2018) addressed higher education in the Arab world, attempting to evaluate its current status and diagnose the weaknesses that hinder its role. This was done through an analysis of education indicators and classifications based on the World Economic Forum's Global Competitiveness Index for 2016-2017. The study concluded that the competitiveness of the higher education sector in Arab countries is weak, necessitating the reform of education in general and higher education and scientific research in particular. The study highlighted the low quality of educational outcomes, high unemployment rates among learners due to a mismatch between their scientific specialties and labor market needs, and the persistence of high illiteracy rates in several Arab countries. These factors collectively represent a waste of human resources that could contribute to progress and development in the Arab world if education and training were improved and learners were adequately prepared in their respective fields.

Finally, the study by Al-Sufiani (2018) aimed to develop a proposed model for digital transformation based on an analysis of the challenges faced by educational institutions. It examined the key features of

digital education and identified the main obstacles preventing the implementation of digital transformation in international schools following the British curriculum in Saudi Arabia. The study employed a descriptive methodology and included the school owner, teachers, and parents as the study sample. Three tools were utilized: interviews, a focus group interview guide, and observation cards. The research identified several problems faced by schools, such as inadequate curriculum coverage, and provided recommendations, including the use of an electronic model for distributing the curriculum on a semester basis and the activation of electronic formative assessment.

Commenting on previous studies and the position of the current study: This study aligns with some studies in addressing the variable of digital transformation in universities, such as the study by Amin (2018), the study by Madi and Abu Hajer (2020), and the study by Bond et al. (2018). It

differs from other studies that focused on the topic of digital transformation in certain schools, like the study by Al-Soufiyani (2018).

Regarding the objective, this study agrees with some studies that aimed to investigate the reality of digital transformation in higher education in different countries, such as the study by Amin (2018) and the study by Marks et al. (2020). However, it differs from studies that aimed to study the reality of digital transformation in all government institutions, like the study by Mohammed and Al-Ghubairy (2020) in Saudi Arabia and the study by Al-Balushi et al. (2020) in Oman.

In terms of the methodology used, this study aligns with the study by Rodrigues and Bribiesca (2021) in utilizing a quantitative approach.

In terms of research instruments, this study shares similarities with previous studies in using closed ended questionnaires, such as the study by Madi and Abu Hajer (2020) and the study by Amin (2018). However, it differs from some studies, like the study by Marks et al. (2020), which employed a mixed methods approach including surveys, interviews, case studies, and direct observation. It also differs from the study by Al-Balushi et al. (2020) and the study by Teixeira et al. (2021).

Regarding the sample, it differs from the study by Al-Balushi et al. (2020) and the study by Al Soufiyani (2018). It also distinguishes itself from the study by Gomez et al. (2021).

This study stands out from previous studies in terms of the study population, both in terms of location (Jordan) and topic, as it is the first study - to the best of the researcher's knowledge - to address digital transformation in Jordanian government and private universities from the perspective of administrative staff.

The Study Methodology:

The researcher employed a descriptive survey methodology to achieve the objectives of this study. A survey was conducted to gather the opinions and assessments of a sufficient sample of administrators regarding the current status of digital transformation in Jordanian universities.

Study Population

The study population consisted of all administrative staff members in both public and private Jordanian universities, totalling 19,870 individuals according to the statistical report of the Ministry of Higher Education and Scientific Research (2019-2020). (Ministry of Higher Education and Scientific Research, 2021-2022), as shown in Table (1).

Table (1)
Components of the study population for all Jordanian universities

Total	Number	University Type	Function
19870	15118	Public	**Administrators**
	4752	Private	

Sample of the Study:

The study sample was selected using stratified random sampling by choosing eight Jordanian universities based on their geographical distribution across the Hashemite Kingdom of Jordan. Four of them were public universities, namely, the University of Jordan, Yarmouk University, Mutah University, and Hashemite University. The other four were private universities, namely, Middle East University, Princess Sumaya University, Al-Ahliyya Amman University, and Philadelphia University.

Then, a sample of administrative staff members was determined from a total of 19,870 individuals, following the table by Krejcie and Morgan (1970) to determine the sample size. The study instrument was distributed to 410 administrative staff members, and 255 administrators responded to it. The following presents the demographic characteristics of the study participants according to the study variables.

Table (2)
Characteristics of the study sample of administrators in Jordanian universities according to the variables of the study

Percentage %	Frequency	Dimensions of the variable	Variable
34.1%	87	Less than 5 years	**Years of Experience**
31.8%	81	Less than10 years – 5 years	
24.3%	62	Years 10 – less than 15 years	
9.8%	25	15 years and above	
54.9%	140	Private	**The university**
45.1%	115	Public	
12.9%	33	Presidency Department	**The unit**
22.7%	58	Registration department	
27.5%	70	Information Technology Department	
10.6%	27	The library	
11.8%	30	Human resources department	
7.5%	19	Department of finance	
7.1%	18	Otherwise	

%100.0	255	Total	**Total**

Study Instrument

The questionnaire was developed by referring to the theoretical literature related to digital transformation and previous studies, such as Al-Mutref's study (2020) and Amin's study (2018). Additionally, global models for measuring digital transformation maturity in institutions were consulted, including Gill and VanBoskirk (2016) and Anderson and Ellerby (2018). The questionnaire, in its initial form, consisted of two parts. The first part included participants' demographic data, which were answered using multiple-choice options. The second part consisted of four main dimensions, namely, digital culture, institutional support, infrastructure, and insight and vision. Responses to the statements were measured using a four-point Likert scale: (strongly agree, agree somewhat, disagree somewhat, strongly disagree).

The questionnaire was designed to assess the current status of digital transformation in Jordanian universities from the perspective of administrators. It comprised 40 items, in addition to personal data that included years of experience, administrative unit, and university.

Validity of the Study Instrument

The initial version of the questionnaire was presented to 10 experts from Middle East University and other Jordanian universities specializing in education and information technology. They were asked to assess the suitability of the questionnaire items, their relevance to measuring the reality of digital transformation in Jordanian universities from the perspective of administrators, the alignment of the items with the provided dimensions (digital culture, institutional support, infrastructure, insight and vision), the clarity and linguistic accuracy of the items, and to suggest any necessary modifications or deletions of irrelevant items. Based on the recommendations of 80% of the experts, the proposed modifications were implemented. Consequently, the questionnaire was revised and consisted of 37 items.

Reliability of the Study Instrument

The reliability of the study instrument was ensured through two methods:

Test-Retest Method:

The questionnaire was administered to a pilot sample of 30 participants, including administrative staff members from within and outside the study sample. After a two-week interval, the same questionnaire was re-administered to the pilot sample. The Pearson correlation coefficient was calculated to determine the correlation between the two administrations. The results are presented in Table 3.

Table (3)
(Pearson correlation coefficient) between the first and second applications of the study tool

between the first and second applications of the study tool		**The field**	**Number of field**
significance level	**Pearson correlation coefficient**		

0.000	**0.854	digital culture	1
0.000	**0.779	Institutional support	2
0.000	**0.779	Infrastructure	3
0.000	**0.865	Insight and vision	4
0.000	**0.842	The questionnaire as a whole	

The table shows that the correlation coefficients between the first and second administrations are high, indicating that the study instrument has an acceptable level of reliability and is suitable for the purposes of this study.

Secondly, the internal consistency method was employed using Cronbach's alpha coefficient. After administering the instrument to the survey sample, the reliability was calculated using Cronbach's alpha equation. Table 4 presents the reliability coefficients for the four domains of the questionnaire and the overall domain.

Table (4)
Reliability coefficients for the study tool according to the method of internal consistency (Cronbach alpha)

Questionnaire directed to members of the administrative members		**The field**	**The number of field**
The number of paragraphs	**persistence value - Alfa**		
8	.0.836	Digital culture	1
10	0.846	Institutional support	2
9	0.811	Infrastructure	3
10	0.856	Insight and vision	4
37	0.934	The questionnaire as a whole	

The table indicates that the reliability coefficients, according to Cronbach's alpha, for the domains of the questionnaire ranged from 0.811 to 0.856, while the overall reliability coefficient (alpha) for the questionnaire as a whole was 0.934. These values are considered high and suitable for the purposes of this study.

The response scale of the questionnaire was designed according to the four-point Likert scale model, as follows: "Strongly Agree" with four levels, "Agree to Some Extent" with three levels, "Disagree to Some Extent" with two levels, and "Strongly Disagree" with only one level. The length of the scale was calculated by dividing the difference between the upper limit of the alternatives (4) and the lower limit of the alternatives (1) by 3 levels: (High, Moderate, Low), as shown in the equation: (4-3)÷3=1.

Thus, the weights of the items are as follows:

From 1 to less than 2: Low degree.

From 2 to less than 3: Moderate degree.

From 3 to 4: High degree.

Study Variables

Independent Variables of the Administrative Staff Members:

- Years of Experience (Less than 5 years, 5 to less than 10 years, 10 to less than 15 years, 15 years or more)
- Administrative Unit (Presidency Department, Registration Department, Information Technology Department, Library, Human Resources Department, Financial Department, and others) − University (Governmental, Private)

Dependent Variables: The state of digital transformation in the following domains:

- Digital Culture
- Institutional Support
- Infrastructure
- Insight and Vision
- Statistical Analysis:

To answer the research questions, the following statistical methods were used:

- Pearson correlation coefficient to measure the correlation and Cronbach's alpha equation to calculate the reliability and internal consistency of the study instruments.
- Means, standard deviations, and ranks were used to detect the degree of digital transformation in Jordanian universities from the perspective of administrative staff members.
- Independent Samples T-test to examine the differences in the perceptions of administrative staff members regarding the degree of digital transformation in Jordanian universities based on the variable of "university."
- One-Way ANOVA to identify the differences in the perceptions of administrative staff members regarding the degree of digital transformation in Jordanian universities based on the variables of "experience," "rank," "administrative unit," and "university." In case the results indicate significant differences attributed to the study variables, post hoc comparisons were conducted using Scheffe's method.

Results Related to the First Research Question:

"What is the degree of digital transformation in Jordanian universities from the perspective of administrative staff members?"

To answer this question, the mean, standard deviation, and ranking were calculated for the perceptions of administrative staff members regarding the areas of the questionnaire that measure the degree of digital transformation in Jordanian universities. The results are presented in Table 5.

Table (5)
Arithmetic means and standard deviations of the estimates of the members of the administrative staff on the areas of the questionnaire for the degree of digital transformation in Jordanian universities, arranged in descending order according to their fields

The rating	arrangement	standard deviation	SMA	The field	Number of field
Average	1	0.39	2.97	Institutional support	2
Average	2	0.44	2.96	Infrastructure	3
Average	3	0.46	2.88	Insight and visio	4
Average	4	0.39	2.79	Digital culture	1
Average	-	0.32	2.90	The degree of digital transformation in Jordanian universities	

The results indicate that the perceptions of administrative staff members regarding the degree of digital transformation in Jordanian universities were within the moderate range. The mean score for their perceptions was 2.90 with a standard deviation of 0.32. Similarly, the perceptions of administrative staff members across all areas were also within the moderate range.

These results align with the findings of a previous study by Madi and Abu Hajer (2020), which indicated a high agreement of 81.52% in support of top management for digital transformation. They also align with the results of a study by Mohammed and Al-Ghubairi (2020), which highlighted the need to support information and communication technology infrastructure and provide innovative technological requirements to facilitate the digital transformation process.

The researcher interprets these results by emphasizing the importance of organizational leadership understanding the opportunities and benefits that digital technologies can offer to improve the quality of education and research. Support can be provided through funding, policies, or guidelines. In addition, universities need to ensure strong technological infrastructure and develop necessary digital platforms and tools, guided by a clear mission and vision for digital transformation. This includes identifying areas where digital technologies can enhance the educational experience and exploring new and innovative ways to integrate them. The researcher also highlights the recent awareness among universities of the need to create a digital culture within the institution that facilitates a shared understanding of the benefits and opportunities provided by digital technologies. Without these crucial elements in the digital transformation process, universities risk lagging behind in the rapidly changing digital landscape and missing out on the opportunities digital technologies can provide to enhance the educational experience.

Results related to the second research question: "Are there statistically significant differences at the

significance level ($\alpha \leq 0.05$) in the perceptions of administrative staff members regarding the degree of digital transformation in Jordanian universities attributed to the variables (experience, administrative unit, university)?"

This question was answered based on its variables as follows:

A. Experience variable (less than 5 years, 5 to less than 10 years, 10 to less than 15 years, 15 years or more):

The mean scores and standard deviations were calculated for the perceptions of administrative staff members on the study questionnaire, considering the experience variable. The results are presented in Table (6).

Table (6)
Arithmetic means and standard deviations of the estimates of members of the administrative staff for the degree of digital transformation in Jordanian universities, according to the variable of experience.

15 and above n=25		**15 less than 10 - n=62**		**-less than 5 10 years n=81**		**Less than 5 years n=87**	
standard deviation	SMA	standard deviation	SMA	standard deviation	SMA	standard deviation	SMA
0.38	2.74	0.24	2.90	0.31	2.87	0.34	2.98

The means indicate the presence of apparent differences in the mean scores of administrative staff members' perceptions regarding the degree of digital transformation in Jordanian universities based on the experience variable. To determine the statistical significance level of these differences in the means, One-Way ANOVA analysis was used. The results are shown in Table (7).

Table (7)
The results of a one-way analysis of variance to reveal the significance of differences in the estimates of members of the administrative staff for the degree of digital transformation in Jordanian universities, according to the experience variable.

significance level	**The calculated "F" value**	**Average of squares**	**degrees of freedom**	**sum of squares**	**source of contrast**	**variable**
0.006*	4.304	0.423	3	1.269	Between groups	The years of experience
		0.098	251	24.657	Inside groups	
			254	25.926	Total	

* statistical function

Statistically function

The results indicate statistically significant differences in the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities based on the experience variable. The "F" value was (4.304), and this value was statistically significant at the significance level ($\alpha \leq 0.05$).

To identify the source of these differences in the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities based on the experience variable, post-hoc comparisons were conducted using the Scheffe method, as illustrated in Table (8).

Table (8)
The results of post-comparisons using Scheffe's method to reveal the source of differences in the estimates of the members of the administrative staff of the degree of digital transformation in Jordanian universities according to the experience variable.

15 years and above	Less than 10- 15 years	5 – less than 10 years	Less than 5 years		The years of experience
2.74	2.90	2.87	2.98	-	
0.24*	0.08	0.11	-	2.98	Less than 5 years
0.13	0.03	-	-	2.87	5-10 years
0.16	-	-	-	2.90	11-15 years

* Statistically significant at ($\alpha \leq 0.05$) level x - = the arithmetic mean

The results demonstrate that the source of statistically significant differences among the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities lies in the experience variable. These differences were observed between the administrative staff members with less than 5 years of experience and those with 15 or more years of experience, favoring the administrative staff members with less than 5 years of experience. It can be concluded that the estimations of the administrative staff members with less experience in digital transformation in Jordanian universities are higher than those of their more experienced counterparts. This result can be explained by the computer skills possessed by the new generation, especially as they have grown up with

digital transformations and are accustomed to using computers and mobile devices, which have become an integral part of their daily lives.

B) The administrative department variable (presidency, registration, information technology, library, human resources, finance, others).

The arithmetic means and standard deviations were calculated for the estimations of the administrative staff members on the study questionnaire, considering the administrative department variable. The results are presented in Table (9).

Table (9)
Arithmetic means and standard deviations of the estimates of members of the administrative staff for the degree of digital transformation in Jordanian universities, according to the variable of the administrative department

Otherwise n=18		Financial n=19		Human Resources n=30		The Library n=27		Information Technology n=70		Registration n=58		Presidency n=33	
standard deviation	SMA	standard deviation	SMA	standard deviation	SMA	standard deviation	SMA	standard deviation	SMA	standard deviation	SMA	standard deviation	SMA
0.12	2.97	0.32	3.07	0.28	2.85	0.33	2.86	0.26	2.88	0.36	2.79	0.35	3.08

The arithmetic means in the table indicate the presence of apparent differences in the arithmetic means of the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities, according to the administrative department variable. To determine the level of statistical significance of the differences in the arithmetic means, One-Way ANOVA analysis was conducted, and the results are shown in Table (10).

Table (10)
The results of a one-way analysis of variance to reveal the significance of differences in the estimates of members of the administrative staff for the degree of digital transformation in Jordanian universities, according to the variable of the administrative department

significance leve	The calculated "F" value	Average of squares	degrees of freedom	sum of squares	source of contrast	variable
0.000*	4.592	0.432	6	2.592	Between groups	Administrative department
		0.094	248	23.334	Inside groups	
			254	25.926	Total	

Statistically function

The results indicate the presence of statistically significant differences in the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities, according to the administrative department variable. The value of "F" was found to be (4.592), and this value is statistically significant at the significance level ($\alpha \leq 0.05$).

To identify the source of differences in the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities, post-hoc comparisons were conducted using the Scheffe method, as shown in Table (11).

Table (11)
The results of post-comparisons using the "Scheffe" method to reveal the source of differences in the estimates of the members of the administrative staff of the degree of digital transformation in Jordanian universities according to the variable of the administrative department.

Otherwise	Financial	Human Resources	Library	Information Technology	Registration	Presidency		Administrative department
					3.08 2.79 2 2.85 3		س -	
0.10	0.01	0.23	0.22	0.20	0.29*	-	3.08	Presidency
0.19	0.28	0.06	0.07	0.09	-	-	2.79	Registration
0.10	0.19	0.03	0.02	-	-	-	2.88	Information Technology
0.12	0.21	0.01	-	-	-	-	2.86	Library
0.13	0.22	-	-	-	-	-	2.85	Human Resources
0.09	-	-	-	-	-	-	3.07	Financial

* Statistically significant at ($\alpha \leq 0.05$) level x - = the arithmetic mean

The results reveal that the source of statistically significant differences in the estimations of the administrative staff members regarding the degree of digital transformation in Jordanian universities lies between the administrative departments of "Presidency" and "Registration," in favor of the administrative staff members working in the "Presidency" department. It can be concluded that the estimations of the administrative staff members working in the "Presidency" department regarding the degree of digital transformation in Jordanian universities are higher than those of their counterparts in the "Registration" department. This result can be attributed to the pressures placed on administrators in the "Presidency" department to acquire the latest technologies and devices and integrate them into university operations in order to keep up with the advancements in digital transformation, which consequently leads to the development of services provided by the university.

University Type Variable (Public, Private)

The arithmetic means and standard deviations were calculated for the estimations of the administrative staff members based on the study questionnaire. The Independent Samples t-test was used, and the results are presented in Table (12).

Table (12)
The results of the "T" test to reveal the significance of differences in the estimates of the members of the administrative staff for the degree of digital transformation in Jordanian universities according to the university variable

significance level	The calculated T value	standard deviation	SMA	Number	Gender
0.014*	2.472-	0.32	2.86	140	Public
		0.31	2.96	115	Private

Statistically function

The arithmetic means in the table indicate the presence of significant differences in the arithmetic means of estimations by the administrative staff members regarding the degree of digital transformation in Jordanian universities according to the university type variable (public, private). The Independent Samples t-test was conducted to determine the statistical significance of the differences between the estimations of the administrative staff members based on the university type variable (public, private).

The results revealed statistically significant differences in the arithmetic means of estimations by the administrative staff members regarding the degree of digital transformation in Jordanian universities according to the university type variable (public, private), with a value of "t" (-2.472) and this value is statistically significant at a significance level of ($\alpha \leq 0.05$). This means that the administrative staff members working in private universities perceive a higher degree of digital transformation compared to their counterparts in public universities. This result can be interpreted by the greater emphasis on administrative aspects in private universities, especially since their primary goal is to attract larger numbers of students, which drives private universities to provide their administrative units with the best modern resources to address any possible challenges, particularly in the intense competition between private universities to accommodate a larger number of students. Additionally, these units strive to recruit specialized administrative competencies with a high degree of experience and knowledge in various digital means that can be utilized to achieve the university's goals, as private universities consider them a fundamental element of human and intellectual capital.

Recommendations

Based on the study results, the researcher recommends the following:

- Emphasizing institutional support for digital transformation in universities by focusing on continuous development and innovation.
- Promoting digital culture through the dissemination of an ethical code for dealing with digital

transformation in administration.

- Utilizing international experiences in the field of digital transformation in educational institutions and transferring their expertise to our communities.
- Conducting scientific research in the field of digital transformation in the education sector in Jordan.

The proposed suggestions are:

- Keeping up with emerging developments in digital transformation by participating in international conferences and exhibitions.
- Building more flexible organizational structures and providing highly specialized human resources in information technology and communication.

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