The Impact of Digital Transformation on Enhancing the Performance of Health Practitioners Working at King Faisal Medical Complex in Taif

Muhaysin Alnefaie[1], Akram Abdulsamad Ali[2]

[1]PhD Candidate in Management , Lincoln University College,
alnefaie.phdscholar@lincoln.edu.my
[2]Assistant Professor Lincoln University College, akramak@lincoln.edu.my

ABSTRACT
The study aims to identify the Impact of digital transformation in terms of (vision and strategic planning- human resources- infrastructure-information security), also to identify the digital transformation improving job performance at King Faisal medical complex in Taif. the quantitative method is used, and the study used a descriptive-analytical methodology. the questionnaire was applied to collect data; the research used the social statistical package program (SPSS). the study utilized a random sample drawn from a target population of 250 medical and support staff members at the emergency department of King Faisal medical complex in Taif. a random sample of 150 individuals was selected to receive the study instrument. consequently, 122 valid responses were retrieved from the medical, technical, and support staff working in the department, the results showing that human resources dimension is the most stable outcome, which indicates that employees have a very positive and consistent view of this area. the results also showed that information security requires immediate managerial attention. the presence of vision and strategic planning suggests that, despite the strong performance of tools (infrastructure) and human resources, the long-term roadmap may not be clear enough to employees or may not be fully perceived by them. the findings also indicated that when practitioners feel data is secure, their job performance improves significantly. Moreover, the study revealed a gap between the hospital's higher-level goals and the daily reality experienced by healthcare practitioners, the research recommends that to create and communicate a clear digital transformation roadmap with measurable goals and timelines, and review and optimize digital infrastructure to ensure system integration, usability, and reduced complexity, and also strengthen human resources involvement through continuous training, incentives, and participatory system design.
Keyword: Digital Transformation - Performance - Health Practitioners - King Faisal Medical Complex in Taif

INTRODUCTION

The world is witnessing a huge revolution in the field of modern information and communications technology, which has led to the emergence of a different world in terms of data and tools, creating a new world that has made the current era characterized by amazing developments in the field of information and communications technology, information technology and internet networks, which have contributed to the emergence of new features.
In this context, "the use of technology in administrative institutions is no longer a path of luxury as was common before, but rather the achievement of the administrative process of its goals in light of the new requirements of the current era is done by converting traditional processes into digital processes, and this process is called digital transformation, as digital transformation is defined as accelerating various businesses and activities to fully benefit from the opportunities of digital technologies and their impact in a strategic manner", (Al-Mutraf, 2020: 160).

The Kingdom of Saudi Arabia has worked through its vision (2030) to implement digital transformation in all fields, including various public and private health institutions, and where digital transformation has proven its effectiveness over the past years in various activities, which has proven its importance and effective role, and the revolution of digital transformation and technology is almost an endless revolution, as there are always technological innovations being created that facilitate the work of these institutions.

These developments have contributed to improving the image of digital institutions through their daily work. Berghaus (2018:12) indicated that "the term digital transformation has become very popular in recent years among managers, experts and relevant consultants due to its great importance in organizational changes resulting from technological developments. It refers to the use of digital technologies to create value and change the style and model of work, as it works to change the basic and fundamental business within the institution, such as creating new products and its strategy".

The healthcare sector was no exception with healthcare organizations increasingly incorporating digital technologies in their operations. digital transformation (DT) in healthcare institutions was the cornerstone of a patient-centered streamlining of their operations, understanding what the patient needs, establishing loyalty and confidence, and providing a better user experience and outlines. the incorporation of digital technologies in the healthcare setting offers new opportunities for the assessment of healthcare needs and delivery of health services (Ricciardi, 2019). therefore, the current study attempts to measure the impact of digital transformation in the health sector on the performance of health practitioners.

Statement of the problem:

The greatest concern for health institutions in the kingdom has become how to transform their services and digitize their work mechanisms by taking advantage of the communications revolution in order to implement the requirements of the kingdom's vision 2030 regarding digital transformation. In this context, many studies have addressed the topic of digital transformation strategies and their impact on improving performance from multiple aspects. the results of the study (Bress and Jabr, 2021) showed that digital transformation technology has worked to develop and increase expertise in the areas of strategic performance in order to innovate new products and their strategies and then provide services better. meanwhile, the study (Teichert, 2019) provided a systematic review of the literature on digital transformation maturity, and revealed that most current models give an incomplete picture of digital maturity, and that models specific to the service sector are not clearly represented.

In this regard, (Al-Sawat and Al-Harbi, 2022: 648) indicated that digital transformation "constitutes a significant way out of the deliverables of contemporary technology, and means to boost and achieve quality services. as these companies and institutions seek to reduce time, effort, and money, digital transformation provides facilities that help them to do so. such companies use digital transformation to convert their customer services from a traditional image to an electronic image, ensuring service provision for a longer period of time, with less effort, and for a larger segment of beneficiaries, and digital transformation "works on a radical change within the company and has an extraordinary impact on its organizational strategies and structures" (Berghaus and Back, 2016: 3). now this research aims to measure the role of digital transformation in improving performance at dental university hospital at King Faisal medical complex in Taif, by answering the main study question, which is the question: What is the impact of digital transformation on enhancing the performance of health practitioners working at King Faisal medical complex in Taif?

Research objectives:
The study aims to identify the Impact of digital transformation on Enhancing the performance of health practitioners working at King Faisal medical complex in Taif, it also aims:
1. To identify the reality of digital transformation in terms of (vision and strategic planning) at King Faisal medical complex in Taif.
2. To identify the reality of digital transformation in terms of (Human Resources) at King Faisal Medical Complex in Taif.
3. To identify the reality of digital transformation in terms of (Infrastructure) at King Faisal medical complex in Taif.
4. To identify the reality of digital transformation in terms of (Information Security) at King Faisal medical complex in Taif.
5. To identify the digital transformation improving job performance at King Faisal medical complex in Taif.
6. To clarify the opinions of the study sample on the impact of digital transformation on enhancing the performance of health practitioners working at King Faisal medical complex in Taif, according to demographic variables: gender - nationality - years of experience - educational qualification.

Significance of the study:
The significance of the current investigation is demonstrated as (scientific and practical) aspects, according to the following:
1. Practical importance: this research aids in the identification and diagnosis of reality and Impact of the application of digital transformation on enhancing the performance of health practitioners.
2. Academic importance: it is anticipated that the study's findings will help those interested and involved in providing a number of the findings and recommendations that may enrich their desires and help them in making scientific and academic decisions.

Study questions:
The study attempts to answer the following question:
1. What is the reality of digital transformation in terms of (vision and strategic planning) at the at King Faisal Medical Complex in Taif?
2. What is the reality of digital transformation in terms of (human resources) at King Faisal Medical Complex in Taif?
3. What is the reality of digital transformation in terms of (infrastructure) at King Faisal Medical Complex in Taif?
4. What is the reality of digital transformation in terms of (information security) at King Faisal Medical Complex in Taif?
5. How is digital transformation improving job performance at King Faisal Medical Complex in Taif?
6. What are the opinions of the study sample regarding the impact of digital transformation on improving the performance of healthcare practitioners working at King Faisal Medical Complex in Taif, according to demographic variables: gender, nationality, years of experience, and academic qualifications?

Terminologies of the study:
- Digital transformation: digital transformation is a process that aims to improve organizations by launching major changes in their characteristics using groups of information, computing and communication technologies (Vial,2019).
- Performance: (Celine, 2018) defined job performance as the product of work based on the quality and quantity achieved by the employee when performing his work in the organization or

institution in which he works, regardless of the affiliation of this organization, whether it is affiliated with the government sector or affiliated with the private sector.

- Telemedicine Technology: Distribution of health-related information as well as services through telecommunication and electronic information technologies. (Galea, 2019).

Study Hypothesis:

- **H1** There is a statistically significant effect at the significance level ($\alpha \leq 0.05$) of the combined dimensions of digital transformation (Vision and Strategic Planning, Human Resources, Infrastructure, and Information Security) on improving the job performance of healthcare practitioners at King Faisal Medical Complex in Taif."
- **H1.1** There is a statistically significant effect of (Vision and Strategic Planning) on improving the job performance of healthcare practitioners at King Faisal Medical Complex in Taif." (Logical Justification: The existence of a clear vision and strategic plan directs employees' efforts and unifies goals, which positively reflects on performance efficiency) .
- **H1.2** There is a statistically significant effect of (Human Resources) on improving the job performance of healthcare practitioners at King Faisal Medical Complex in Taif." (Logical Justification: The availability of digitally trained competencies and appropriate development programs enhances practitioners' ability to use modern tools effectively.)
- **H1.3** There is a statistically significant effect of (Infrastructure) on improving the job performance of healthcare practitioners at King Faisal Medical Complex in Taif." (Logical Justification: The provision of advanced devices, networks, and technical systems reduces operational obstacles and accelerates task completion.)
- **H1.4** There is a statistically significant effect of (Information Security) on improving the job performance of healthcare practitioners at King Faisal Medical Complex in Taif." (Logical Justification: Ensuring data confidentiality and integrity builds practitioners' trust in digital systems and encourages them to rely on these systems for making clinical and administrative decisions without concern.)
- **H2** The demographic variables (gender, nationality, years of experience, and educational qualification) moderate the relationship between the dimensions of digital transformation (Vision, Human Resources, Infrastructure, and Information Security) and the performance of healthcare practitioners at King Faisal Medical Complex in Taif.

LITERATURE REVIEW

Concept of digital transformation:

The term "digital age" refers to the era that followed the industrial age, during which information governs politics, economics, and social life. It is also the era in which all types of information have gone digital and are communicated via intermediate electronic devices across the global information network (Shams, 2017: 21). "Digital age," is characterized by "the rapid change in information technology, the growth of digital technology, and its impact on knowledge in contemporary society, which affected the business system in all sectors of society.

The digital age also provided the potential of realizing the current information networks for communications, during which a tremendous amount of digital information can be stored and distributed, which furthermore means that "all forms of information can become in the digital image, whether texts, graphics, static or moving images, and that information is transmitted through the international information network by means of intermediate electronic devices" (Shams, 2017: 36-37).

Digital transformation goals:
According to (Al-Sawat and Al-Harbi, 2022: 654), digital transformation strives to simplifying administrative procedures helps reduce reliance on paperwork thanks to the availability of information in digital form, eliminating the need for hard copies that were previously accessible online. by leveraging technology based on information networks and developing better methods for citizen participation in the executive process, productivity can be enhanced while performance costs are reduced. moreover, storing information in hard copy while enabling its electronic reuse ensures that human energy is directed toward more productive fields. In addition, performance-related goals include the ability to transfer information accurately and seamlessly across different departments, as well as improving data accuracy to strengthen confidence in the exchanged information and minimize errors caused by manual entry.

Challenges of digital transformation:
The implementation of e-government faces several obstacles that vary according to the administrative, economic, political, and cultural contexts of each society. key challenges include limited understanding among government executives regarding the concept of e-government and the need for extensive organizational restructuring, insufficient material resources to keep pace with rapid technological advancements, and serious security risks such as electronic piracy that threaten national information security while increasing institutional dependence on digital data (Al-Khalidi, 2007: 90-91).

Telemedicine:
Telemedicine was initially defined as remote treatment, but this definition was limited as it implied use only by doctors. Later, it was redefined as "the transmission of medical data from one place to another… using wired and wireless communication technologies to provide medical services and information such as images, live video, audio recordings, and electronic patient records" (Murad, 2011: 7). similarly, the world health Organization defined it as "the use of remote communication to transfer medical information to obtain remote diagnosis" (Marion, 2011: p.11). overall, telemedicine refers to the use of information and communication technologies to support healthcare services, education, and research, and as "the use of information technology and electronic communications to support virtual health care practice" (Health Insurance Council, 2021: p. 3).

The use of telemedicine has expanded due to recent health crises, highlighting the importance of understanding its concept for proper application. Studies such as Faisal and Abdul Qader (2015) demonstrated practical applications, including websites enabling remote diagnosis via video conferencing, allowing patients to book and consult without visiting hospitals. other studies, such as Abd-al-Aziz and Abu Shar (2015), confirmed that telemedicine enhances healthcare services and supports developing countries. Additionally, Al-Sudairi (2014) found that hospitals in Saudi Arabia have a strong infrastructure for adopting electronic health systems. telemedicine contributes to improving healthcare quality and achieving competitive advantage. For example, Asia (2019) confirmed the significant impact of remote medical consultations in enhancing the competitiveness of healthcare institutions. it also aims to improve communication between remote and urban healthcare centers, provide access to specialists and medical resources, and support effective healthcare delivery. according to Malika and Fatima (2011:8), telemedicine enhances healthcare services, supports inexperienced doctors in diagnosis, and provides training opportunities for medical teams in remote areas. it also reduces costs by limiting patient transfers, promotes collaboration among hospitals, and encourages knowledge exchange. furthermore, it offers training programs for medical and technical staff and supports continuous medical education.

E-health shares similar objectives, including using digital technologies to improve healthcare performance, efficiency, and service delivery while reducing costs and administrative procedures (Dunnebeil et al., 2012; Mcalearney et al., 2014). Additionally, electronic medical record systems help reduce costs of medications and tests, minimize medical errors, and create comprehensive databases to support research (Minichiello et al., 2013).

Telemedicine challenges:

To clarify the concept, the telemedicine system is subject to civil liability, and a study has indicated this study of Abdul Jabbar (2021) on the doctor's civil liability in telemedicine. the study showed that the basic civil liability that results from breach of the contract (telemedicine) is a contractual liability whenever there is a valid contract between the doctor and the patient, but the exception is liability for damage. if the obligation is stipulated in the telemedicine contract. the telemedicine system also faces challenges in application in some health institutions. as a study of Durah et al., (2017) aimed to diagnose the reality of e-health and determine the requirements, means and tools that must be followed to implement the e-health system. the study concluded that the level of application of the e-health system in the hospital is rather low, and that there is a discrepancy in the dimensions of e-health, as it was found that the most applied dimensions are the health services development system dimension, followed by the medical records system, and finally the telemedicine system. although telemedicine provides important benefits, its adoption in developing countries is still limited. key challenges include the lack of legislative frameworks to protect providers and patient data, high costs of equipment and data management, absence of insurance coverage, unresolved privacy concerns, and doubts about diagnostic accuracy. moreover, the inability to deliver immediate interventions and broader social issues such as poverty and illiteracy further restrict its effective use (Al-Shawi, 2022:55)

Electronic health records (EHRs):

Electronic Health Records (EHR) play a crucial role in improving hospital workflow efficiency by using modern technology to collect, store, and retrieve patient data. they enable fast and secure access to information, support quicker clinical decision-making, reduce medical errors, and enhance communication and coordination among medical teams. this leads to more accurate documentation and improved follow-up processes, ultimately enhancing healthcare quality and operational efficiency (Ratwani, 2017). EHR systems also improve hospital operations by organizing workflows, reducing time spent searching for patient data, and facilitating better communication between healthcare teams. Additionally, they provide detailed data that support performance evaluation and help improve healthcare policies and procedures (Upadhyay and Fen Hu, 2022).The increasing reliance on EHR systems highlights their role in optimizing patient data management and workflow efficiency. However, their effectiveness depends on mediating factors such as user training and readiness for change, which are essential for successful adoption and improved performance.

EHR systems offer multiple functionalities, including accessing health information, scheduling, billing, and order entry. they help reduce healthcare costs, minimize medical errors, improve continuity of care, and overcome limitations of paper-based records such as storage issues, errors, and data loss (Yanam et al., 2016; Jin et al., 2020). despite these benefits, EHR adoption may have unintended negative consequences, including workflow disruptions, temporary productivity loss, privacy and security concerns, user dissatisfaction, overdependence on technology, and financial burdens (Menachemi and Collum, 2023; Sittig et al., 2016). Increased documentation time may also negatively affect patient-provider communication and act as a barrier to effective implementation (Menachemi and Collum, 2023; Sittig et al., 2016). in preventive health, EHR systems can support physical activity tracking, improve adherence to exercise programs, and

enhance patient outcomes (Lobelo et al., 2018). For example, integrating physical activity data into EHR systems has shown promising results in improving treatment quality, as demonstrated in the Kaiser performance study in Southern California (Stoltenberg et al., 2017).

Artificial intelligence (AI):

Today, artificial intelligence (AI) is one of the most important masterminds of some human functions and tasks in many of the tasks they perform, and this has become evident in recent times. Since recent decades have witnessed a tremendous revolution in scientific and technological progress, particularly in the fields of communications and the use of computer models to study human, animal, and biological behavior in general, the term "globalization" has become increasingly prominent, enabling access to any location in the vast world with minimal time and effort. It is defined as "systems or devices that simulate human intelligence to perform tasks and can improve themselves based on the data they collect, recognize, explain, and predict patterns" (Moaz, 2020). defined artificial intelligence as "a branch of computer science that is concerned with the study and creation of computer systems that exhibit some form of intelligence.

Belham and Warzi, (2017: 66) defined artificial intelligence as "a part of computer science that aims to simulate cognitive ability to replace humans in performing appropriate functions in a given context that require intelligence. he also defined artificial intelligence as the simulation of human intelligence and understanding. his nature is achieved by creating computer programs capable of simulating intelligent human behavior (Majid, 2018:11-13). Artificial intelligence is also defined as "the study of how to direct a computer to perform things that humans do better." (Al-Azzam, 2020: 476), also artificial intelligence is also defined as "the branch of computer science through which computer programs can be created and designed that mimic human intelligence, enabling the computer to perform certain tasks instead of humans, which require thinking, understanding, hearing, speaking, and movement in a logical and systematic manner" (Mahmoud, 2020: 182).

Objectives of artificial intelligence:

The objectives of artificial intelligence, according to (Najari, 2019: 203), are the process of knowledge management involves storing and analyzing information while preserving methodological rules that guide its proper use and lead to accurate insights. it also requires acquiring, updating, and investing in accumulated human knowledge to effectively address problems. by optimizing the application of scientific and practical expertise, organizations can overcome challenges of loss, deficiency, and forgetfulness. furthermore, generating and developing new knowledge, alongside activating computerized systems, ensures that information is effectively utilized in decision-making and contributes to continuous advancement.

Job performance:

Many developed countries have relied on their human resources in their scientific and practical renaissance, directing most of their investments towards developing and empowering this human capital. they provided tools and means for theoretical knowledge and advanced practical application, and worked diligently towards identifying all obstacles and barriers that prevent these workers from fully performing their duties, whether these obstacles are material or moral. the aim behind this was to raise the level of job performance among all employees, with the goal of increasing efficiency and improving productivity rates, as job performance is the only method that helps organizations achieve their goals, (Shoukry, 2016), so (Celine, 2018) defined job performance as the work output based on the quality and quantity achieved by the employee while performing their duties in the organization or institution they work for, regardless of whether the organization belongs to the public or private sector.

The relationship between artificial intelligence and job performance:
The study attempts to link artificial intelligence (independent variable) with job performance (dependent variable). there are undoubtedly a strong relationship and connection between the use of artificial intelligence technologies, which represent one of the outcomes of modern digitalization, and their positive relationship with job performance. workers, employees, and healthcare practitioners in general will be impacted by the use of artificial intelligence technology, improving their performance, which in turn impacts overall hospital performance. this strong relationship and connection were highlighted in the results of their study by that the Artificial intelligence, in all its dimensions, plays a role in terms of its significant positive impact in improving the job performance of workers in sports institutions (Reda, and Mohamed,2024).

The relationship between electronic health records (EHRs) and employee performance:
A study by Al-Ruwaili and Mabrouk (2024) showed a positive impact between the EHRs and employee performance across its dimensions (speed of performance, knowledge of job requirements, and quality of performance.

The relationship between telemedicine and job performance:
Telemedicine is an innovative medical technology that encompasses various specialties, including remote diagnosis, remote monitoring (remote patient follow-up), remote assistance (remote medical reports), and medical advice. information and communication technology (ICT) has facilitated access to medical services through telemedicine, and telemedicine has contributed significantly during health crises and pandemics in hospitals around the world. It also positively contributes to the development and enhancement of the capabilities of healthcare practitioners and staff. (Schreierand Hamidoush2017).

Previous studies:
The study by **(Alzahrani & Moglad, 2024)** was limited to only two hospitals in Jeddah, which restricts the generalizability of its findings to other hospitals across the Kingdom. It focused on infrastructure, legislation and policies, organizational culture, and human resources, while neglecting aspects such as information security and strategic vision. in contrast, the study by **(Bohazawi and Algahami, 2024)** has the strength of examining a private institution (the telecommunications company in Benghazi), which adds a different dimension compared to the healthcare sector. however, its weakness lies in the small sample size (65), which reduces the robustness of the results. the dimensions addressed included vision and strategic planning, human resources, infrastructure, and information security. yet, one of its shortcomings is that it did not cover organizational culture or legislation, despite their importance in the telecommunications environment. as for the study by **(Bin Areema and Abukhelwa,2024),** the sample size was very limited (41), making the findings less generalizable. the dimensions were not clearly defined, except for digital transformation level and job performance, without detailing their components. moreover, the results showed that performance was moderate despite the high level of digital transformation, which is a contradiction that requires deeper explanation. across the three studies, it is noticeable that there is a lack of integration among the dimensions used. furthermore, the studies relied on questionnaires and did not employ objective performance indicators (such as productivity, service speed, or customer satisfaction).
Among its strengths, studies **(Abu-Salim, 2023; Al-Azab, 2023; Zayed and Mohamed, 2023)** all confirmed a statistically significant relationship between digital transformation and human resource performance or empowerment. the dimensions used varied, and reliable scientific tools, such as questionnaires, were employed, enhancing the credibility of the results. However, some dimensions were identified as shortcomings. Zayed & Mohamed's study showed that legislation,

policies, and funding did not have a clear impact on performance, while Al-Azab's study did not adequately address external factors like funding or the regulatory environment. Abu-Salim's study focused on management but did not delve deeply into legislation and policies. Furthermore, some research gaps were identified, such as the lack of in-depth analysis of how digital policies are formulated or implemented and their impact on performance, and the absence of cross-sectoral comparisons: no comparative studies were conducted between different sectors (e.g., health versus oil versus education).

Studies **(Rahib and Shabbi, 2023; Al-Zoubi, 2023; Ibtesam and Ameera, 2023)**, among its advantages is that it addressed different dimensions of digital transformation (technology, employees, customers), and showed that digitization for employees and customers has a direct positive impact on job performance. It also proved the existence of a correlation between digital transformation and job performance. among its disadvantages is that it did not find an effect of the use of digital technology itself on performance, which raises questions about the measurement tools or the nature of the technology used. it was also limited to one bank (El Tarf), which limits the possibility of generalization. these studies revealed some research gaps, as each study focused on one sector (banking, telecommunications, aviation), and did not conduct comparisons between different sectors to determine the differences in the impact of digital transformation. it also did not find an effect of the technology itself, which opens a gap to examine the type of technology or the level of its use. this limitation reduces the possibility of international generalization. there was also a lack of focus on individual factors, such as personal digital skills, resistance to change, or level of training, which may directly affect performance. therefore, the three studies confirm the existence of a positive relationship between digital transformation functional performance is also a factor, but there are gaps in generalization, sectoral comparisons, and time-based analysis. these gaps represent opportunities for more comprehensive future studies that combine different sectors and examine the long-term impact of technology while considering individual and organizational factors.

The studies of **(Dabnoon & Alhidi, 2023; Khamees 2021; Alfaris & Bin Khalid,2022)** all revolve around the impact of digital transformation or digital leadership on performance (whether organizational or job performance). their limitations lie in relying solely on questionnaires, without using other tools such as interviews or actual performance data, which may reduce the accuracy of the results. they also focus on a single sector, which limits the generalizability of the findings to other sectors. each study is confined to one country (Libya, Egypt, Kuwait), with differing economic and political conditions that may influence the outcomes. as for the research gaps, these studies revealed the absence of comparisons across sectors and countries, as no study connects banks with hospitals or compares different Arab countries despite the similarity of digital challenges. moreover, there is little focus on negative impacts, as most studies emphasized the positive effects except for a brief mention in **(Khamees, 2021)** of "digital confusion" and its negative influence on job performance. additionally, mediating factors such as job satisfaction, organizational commitment, or psychological stress, which may intervene in the relationship between digital transformation and performance, were not examined. in terms of the relationship among the studies, it is clear that they all confirm that digital transformation or digital leadership has a positive effect on performance.

Study by **(Al-Ghobairi 2020; Hammad, 2020)** Both studies agreed on digital transformation as a fundamental phenomenon in development, but both also revealed some shortcomings. **(Al-Ghobairi's,2020**) study focused on macroeconomic indicators and did not delve into the direct impact on institutions or individuals, nor did it provide a practical framework or clear application recommendations. **(Hammad's,2020)** study, on the other hand, pointed to deficiencies in the dimensions of digital transformation (strategic planning, leadership development, organizational structure, and skills acquisition) but did not test practical solutions to these gaps. these studies also revealed some gaps, such as the lack of a study linking digital transformation at the national

level (as in Saudi Arabia) to its impact on the performance of institutions and individuals (as in Egypt, where the applied study environments were Saudi Arabia and Egypt, respectively). in **(Al-Ghobairi's,2020)** study, there was a gap in examining the direct socioeconomic impact of digital transformation on institutions and human resources, and a lack of analysis of the challenges facing practical implementation. **(Hammad's,2020)** study, however, lacked a broader scope to include different sectors or a comparison between multiple companies. the weak link between the institution's results and the national or regional environment for digital transformation.

Areas of benefit from previous studies:
The researcher relied extensively on previous studies in preparing the theoretical framework, designing the questionnaire, and addressing the procedural aspects of the current study. this research also shares similarities with earlier work, as it reflects contemporary trends and models concerning the role and impact of digital transformation on the performance of healthcare practitioners, trends that can be effectively applied in the healthcare sector to drive continuous improvement. moreover, prior studies informed the methodology, tools, sample selection, statistical methods, and even the findings and recommendations, thereby shaping the study's foundation. the diversity and richness of these studies played a crucial role in reinforcing and supporting the current research, offering the researcher broad insights into digital transformation strategies within the Saudi healthcare sector and their significance in enhancing practitioner performance.

Gap in literature:
Most studies have demonstrated the significant role of digital transformation in improving the job performance of healthcare practitioners working in the healthcare sector and some other sectors. however, the current study focuses on the Saudi healthcare sector at King Faisal Medical Complex in Taif. the Saudi healthcare sector is witnessing numerous transformations, including the Kingdom's vision 2030 strategy for digital transformation and the digitization of healthcare services, along with the associated challenges facing healthcare institutions, in addition to the health transformation program. based on the previous topic, digital transformation is a broad field, and there are many potential research gaps that can be explored, such as the government's move toward privatizing public hospitals, the actual launch of this program, and the impact of these steps on healthcare practitioners' performance.

Study population and sample:
The study utilized a random sample drawn from a target population of 250 medical and support staff members at the emergency department of King Faisal medical complex in Taif. a random sample of 150 individuals was selected to receive the study instrument. consequently, 122 valid responses were retrieved from the medical, technical, and support staff working in the department.

Statistical analysis of the study instrument:
This section presents the statistical analysis of the study instrument, which was designed in alignment with the research objectives outlined previously. the instrument comprises two main parts:
the first part covers demographic data, including the following variables: gender, nationality, educational qualification, and years of experience. the second part addresses the study constructs, divided into two main axes:
1. Digital transformation, consisting of four dimensions: vision and strategic planning, human Resources, Infrastructure, and Information Security.

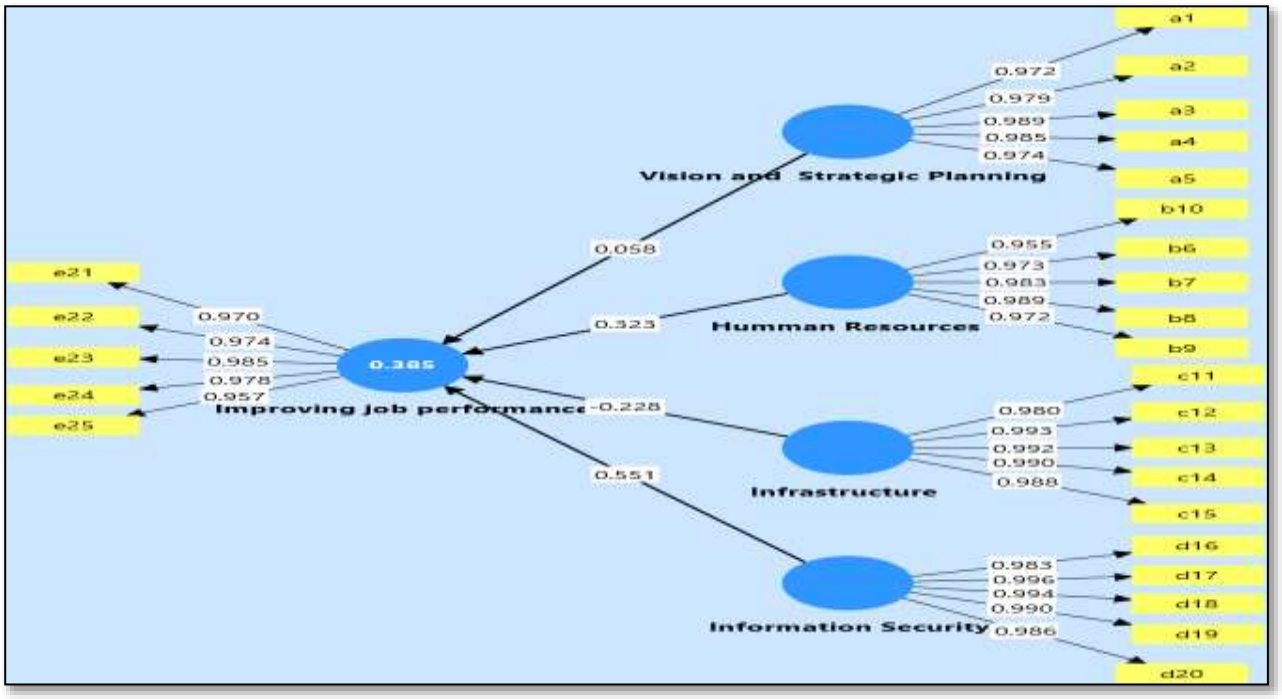
2. Improving job performance.

The instrument was distributed electronically via google drive to the targeted study sample.

Data analysis:

The study employed a range of appropriate statistical methods to address the research questions and test the hypotheses, encompassing both descriptive and inferential statistics. the analyses were conducted using SmartPLS (Version 4).

Figure (1): structural Model: Strategic Vision, HR, Infrastructure, Information Security & Job Performance



Construct reliability and validity:

To verify the properties of the measurement model, the PLS algorithm was used in SmartPLS 4 to assess the reliability (Cronbach's Alpha, Rho-A, Rho-c) and convergent validity (AVE) of the study's dimensions. the results revealed that the instrument conforms to international standards. the bellow illustrated these measurements:

Table (1) Construct reliability and validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)	Evaluation
Human Resources	0.987	0.988	0.989	0.95	Excellent
Improving job performance	0.986	0.986	0.989	0.946	Excellent
Information Security	0.995	0.995	0.996	0.98	Excellent
Infrastructure	0.994	0.994	0.995	0.978	Excellent
Vision and Strategic Planning	0.99	0.996	0.992	0.96	Excellent

The statistical analysis conducted using SmartPLS 4 revealed exceptional psychometric precision for the study instrument, with all reliability and internal consistency indicators significantly exceeding standard acceptable thresholds. Specifically, Cronbach's Alpha values ranged from 0.986 for the dimension of "Improving Job Performance" to 0.995 for "Information Security."

similarly, composite reliability (Rho-A) values showed a comparable range, spanning from 0.986 to 0.996 (for "Vision and Strategic Planning"), while Composite Reliability (Rho-c) peaked at 0.996, also for the "Information Security" dimension. These remarkably high values all substantially surpassing the minimum required threshold of 0.70 strongly confirm the high internal consistency and reliability of the instrument's items in measuring the dimensions of digital transformation and job performance.

Furthermore, the results affirmed strong convergent validity, as evidenced by the average Variance Extracted (AVE) values, which ranged from 0.946 for "Improving Job Performance" to 0.980 for "Information Security." These figures far exceed the accepted benchmark of 0.50, indicating that each construct explains more than 94% of the variance in its respective indicators, with a negligible margin of measurement error.

consequently, it can be conclusively stated that the study's measurement model demonstrates an exceptionally high degree of reliability and validity, providing a robust foundation for hypothesis testing and the analysis of relationships among the study variables.

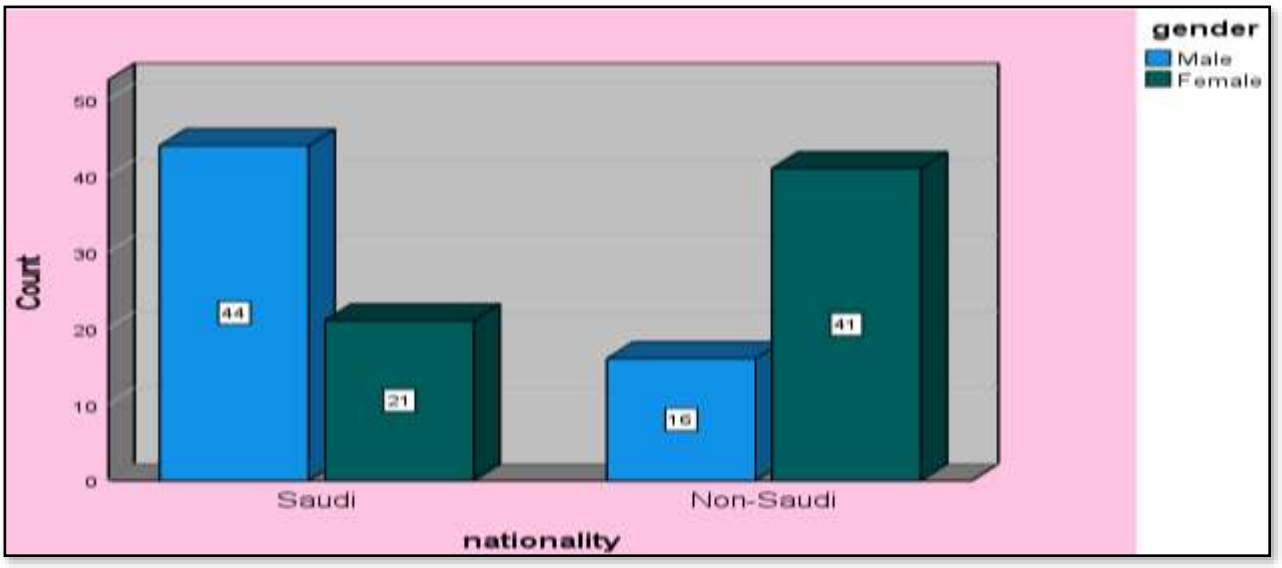
demographic variables (Primary data):

Table (2): Descriptive statistics (percentages, frequencies) of demographic variables

Demographic variable		**Gender**	
		Male (F/%)	**Female (F/%)**
Nationality	Saudi	44(67.7%)	21(32.3%)
	Non-Saudi	16(28.1%)	41(71.9%)
Highest level of education	High school	1(50.0%)	1(50.0%)
	A diploma before university	19(61.3%)	12(38.7%)
	Bachelor	16(31.4%)	35(68.6%)
	postgraduate diploma	3(42.9%)	4(57.1%)
	Master	6(46.2%)	7(53.8%)
	Ph.D.	15(83.3%)	3(16.7%)
Job experience	Less than (3) years	7(43.8%)	9(56.3%)
	(3) - less than (6) years	5(27.8%)	13(72.2%)
	(6) less than (9) years	7(53.8%)	6(46.2%)
	(9) less than (12) years	6(33.3%)	12(66.7%)
	(12) less than (15) Years	6(50.0%)	6(50.0%)
	More than (15) years.	29(64.4%)	16(35.6%)

The above Table (2) illustrates the distribution of the sample according to nationality and gender. the results indicate that Saudi participants totaled 65, comprising 44 males (67.7%) and 21 females (32.3%), reflecting a clear male predominance within this category. In contrast, non-Saudi participants totaled 57, consisting of 16 males (28.1%) and 41 females (71.9%), demonstrating a notable female predominance in this group. The accompanying bar chart visually depicts this variation through contrasting bars that highlight the relative gender differences across each nationality category.

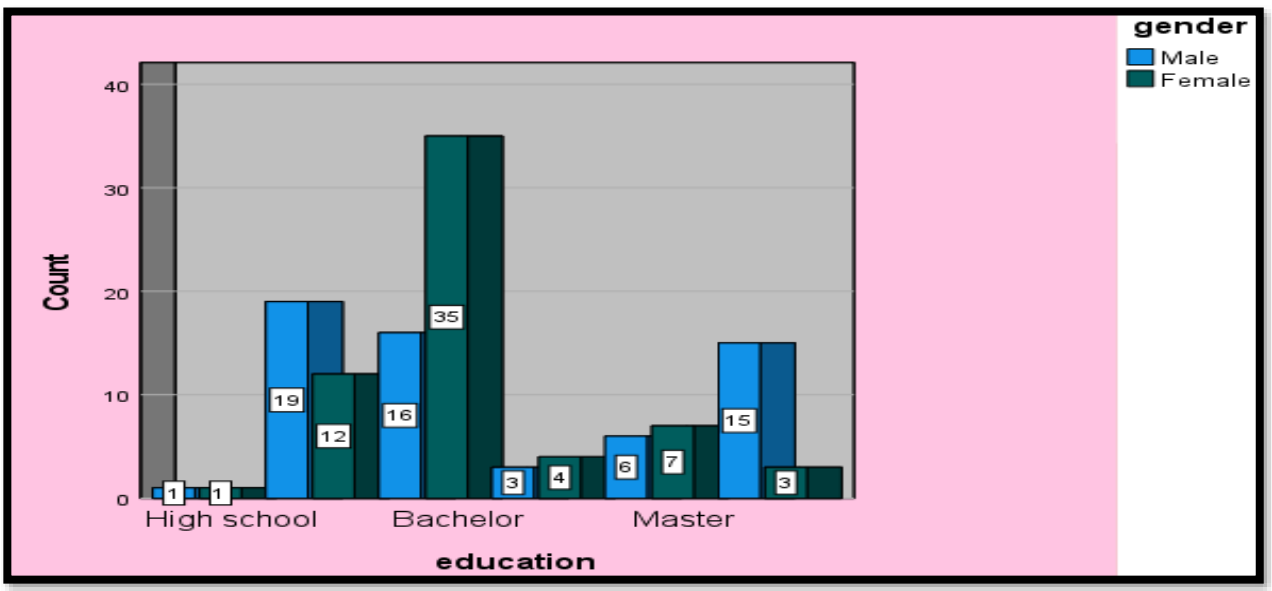
Figure (2): Sample Distribution by Nationality and Gender



Similarly, Table (2) illustrates the distribution of participants across different educational levels. at the high school level, the distribution was equal between males and females (50.0% each). At the pre-university diploma level, males predominated, accounting for 61.3% (19 participants) compared to 38.7% for females (12 participants). at the bachelor's degree level, a clear female predominance was observed, with females representing 68.6% (35 participants) versus 31.4% for males (16 participants). At the postgraduate diploma level, females constituted 57.1% (4 participants) compared to 42.9% for males (3 participants). At the master's degree level, the distribution was relatively balanced, with 53.8% for females (7 participants) and 46.2% for males (6 participants). Finally, at the doctoral degree (Ph.D.) level, a marked male predominance was evident, with males representing 83.3% (15 participants) compared to only 16.7% for females (3 participants). the accompanying bar chart visually highlights these distributions in a clear and illustrative manner.

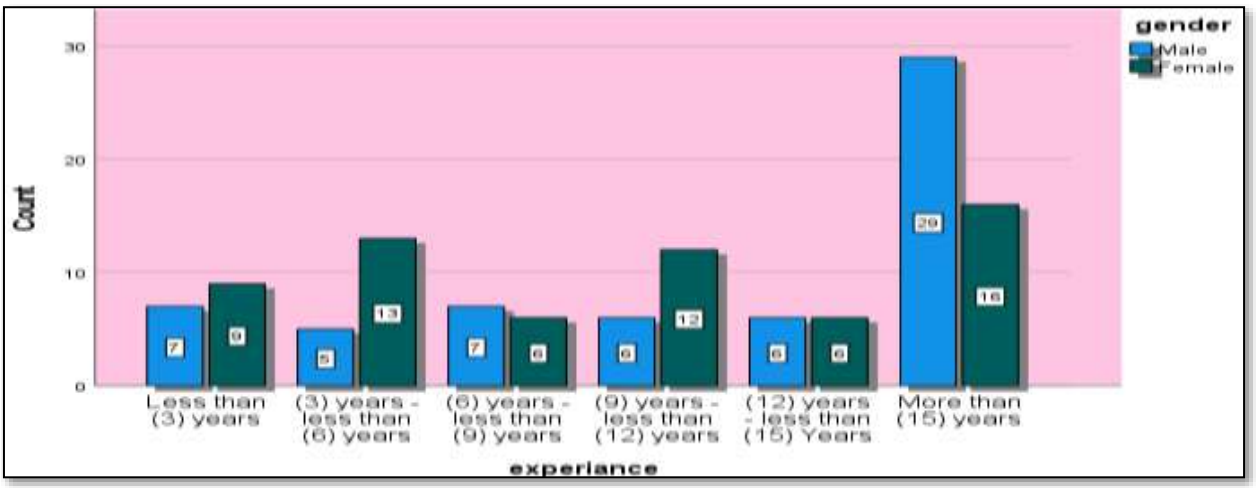
Table (2) also illustrates the distribution of participants according to years of job experience. In the category of less than 3 years, females constituted the majority at 56.3% (9 participants) compared to 43.8% for males

Figure (3) Sample Distribution by Education and Gender



(7participants). In the category of 3 to less than 6 years, females demonstrated a clear predominance at 72.2% (13 participants) versus only 27.8% for males (5 participants). In the category of 6 to less than 9 years, males showed a slight predominance at 53.8% (7 participants) compared to 46.2% for females (6 participants). In the category of 9 to less than 12 years, females exhibited a notable predominance at 66.7% (12 participants) versus 33.3% for males (6 participants). In the category of 12 to less than 15 years, the distribution was perfectly equal (50.0% for each gender). Finally, in the category of more than 15 years, males demonstrated a substantial predominance at 64.4% (29 participants) compared to 35.6% for females (16 participants). the accompanying bar chart visually depicts these distributional patterns across the different experience categories.

Figure (4) Sample Distribution by Experience and Gender



Axis one - Digital Transformation at King Faisal Medical Complex in Taif:

Table (3) Means, standard deviations, and Chi-square coefficient values for the sample respondents' answers regarding the first dimension (Vision and Strategic Planning)

Statement	Mean	±St. Deviation	The weight is closer to		Chi-square P-value
			Weight	Degree	
The hospital has been keen to modify its vision through a strategic plan that includes digital transformation and is in line with its objectives.	3.94	0.89	5	Agree	62.721
Through digital transformation, the administration seeks to achieve the hospital's business model development strategy.	3.93	0.89	4	Agree	65.082
The hospital is continuously developing implementation plans for the strategic plan for digital transformation, in line with technical and organizational developments within the hospital.	3.98	0.85	3	Agree	69.672
The hospital has a clear strategic plan for digital transformation.	4.00	0.81	1	Agree	68.492

There is financial and moral support from the hospital's senior management for the digital transformation.	4.00	0.83	2	Agree	58.918
	3.97	**0.85**		**Agree**	

Table (3) presents the arithmetic means, standard deviations, and Chi-square values for sample respondents' answers regarding the first dimension (vision & strategic planning) of digital transformation at King Faisal Medical Complex in Taif. the results reveal that all items obtained high arithmetic means ranging from (3.94-4.00) with standard deviations ranging from (0.81-0.89), indicating a high degree of agreement among participants. the fourth item "the hospital has a clear strategic plan for digital transformation" ranked first with an arithmetic mean of (4.00) and a standard deviation of (0.81), followed by the fifth item "there is financial and moral support from the hospital's senior management for digital transformation" with a mean of (4.00) and a standard deviation of (0.83). meanwhile, the second item "through digital transformation, management seeks to achieve a strategy for developing the hospital's business model" ranked last with a mean of (3.93) and a standard deviation of (0.89). the overall arithmetic mean for the dimension reached (3.97) with a standard deviation of (0.85), reflecting participants' agreement on the existence of a vision and strategic planning for digital transformation. As for the Chi-square values, all were statistically significant at the significance level of ($p<0.05$), ranging from (58.918-69.672), indicating the presence of statistically significant differences in participants' responses.

Table (4) Means, standard deviations, and Chi-square coefficient values for the sample respondents' answers regarding the second dimension (Human Resources)

Statement	**Mean**	**±St. Deviation**	**The weight is closer to**		**Chi-square P-value**
			Weight	**Degree**	
The hospital is focused on human resources planning in line with digital transformation processes.	4.07	0.81	3	Agree	87.246
The hospital has developed an approved plan to attract digital talent with the aim of enhancing the capabilities needed to achieve digital transformation.	4.08	0.83	2	Agree	84.885
The hospital has worked to attract skills and competencies in digital transformation.	4.07	0.82	4	Agree	87.246
The hospital has innovative mechanisms and methods to attract and retain talent for the digital transformation process.	4.09	0.84	1	Agree	77.016
Hospital healthcare practitioners are motivated to perform their work efficiently and accurately and are interested in participating in the digital transformation.	4.06	0.87	5	Agree	80.623
	4.07	**0.84**		**Agree**	

Table (4) presents the arithmetic means, standard deviations, and Chi-square values for respondents' answers regarding the second dimension (Human Resources). the results show that all items obtained very high arithmetic means ranging from (4.06-4.09) with standard deviations

ranging from (0.81-0.87), indicating a very high degree of agreement among participants. the fourth item "the hospital has innovative mechanisms and methods to attract and retain talents for the digital transformation process" ranked first with an arithmetic mean of (4.09) and a standard deviation of (0.84), followed by the second item "the hospital has established an approved plan to attract digital talents with the aim of enhancing the necessary capabilities to achieve digital transformation" with a mean of (4.08) and a standard deviation of (0.83). meanwhile, the fifth item "Healthcare practitioners at the hospital are motivated to perform their work efficiently and accurately and are interested in participating in digital transformation" ranked last with a mean of (4.06) and a standard deviation of (0.87). the overall arithmetic mean for the dimension reached (4.07) with a standard deviation of (0.84), which is the highest among all dimensions, reflecting the hospital's attention to human resources in digital transformation. Chi-square values ranged from (77.016-87.246), all of which were statistically significant, indicating the presence of variability in participants' responses.

Table (5) Means, standard deviations, and Chi-square coefficient values for the sample respondents' answers regarding the third dimension (Infrastructure)

Statement	Mean	±St. Deviation	The weight is closer to		Chi-square P-value
			Weight	Degree	
The hospital provides a separate budget for the purchase of modern technical equipment and devices.	3.99	0.90	5	Agree	82.393
The hospital administration is keen to use the latest equipment and technologies to speed up the pace of work.	4.02	0.91	2	Agree	81.082
The specifications of the equipment used must be compatible with the nature of the work.	4.00	0.90	4	Agree	77.41
The hospital administration is keen to carry out periodic maintenance to avoid malfunctions.	4.03	0.93	1	Agree	77.41
The hospital is working to accommodate the tremendous advances in communication means.	4.01	0.90	3	Agree	83.574
	4.01	**0.91**		**Agree**	

Table (5) presents the arithmetic means, standard deviations, and Chi-square values for the sample responses regarding the third dimension (Infrastructure). the results reveal that all items obtained high arithmetic means ranging from (3.99-4.03) with standard deviations ranging from (0.90-0.93), indicating a high degree of agreement. the fourth item "hospital management is keen to conduct periodic maintenance to avoid breakdowns" ranked first with an arithmetic mean of (4.03) and a standard deviation of (0.93), followed by the second item "hospital management is keen to use the latest equipment and technologies to accelerate workflow" with a mean of (4.02) and a standard deviation of (0.91). meanwhile, the first item "the hospital provides a separate budget for purchasing modern technical equipment and devices" ranked last with a mean of (3.99) and a standard deviation of (0.90). the overall arithmetic mean for the dimension reached (4.01) with a standard deviation of (0.91), reflecting participants' satisfaction with the hospital's technical infrastructure. Chi-square values ranged from (77.41-83.574), all of which were

statistically significant at the ($p<0.05$) level, indicating the presence of statistically significant differences in the responses.

Table (6) Means, standard deviations, and Chi-square coefficient values for the sample respondents' answers regarding the fourth dimension (Information Security)

Statement	Mean	±St. Deviation	The weight is closer to		Chi-square P-value
			Weight	Degree	
The hospital has an independent department specialized in information security.	3.92	0.96	5	Agree	68.754
The hospital administration is keen to maintain all information and data related to healthcare practitioners.	3.98	0.95	1	Agree	75.705
The hospital is keen to employ the best specialists in the field of information security.	3.97	0.96	2	Agree	75.705
The specifications of the available equipment must be compatible with the nature of the work.	3.95	0.96	3	Agree	68.754
Responsibility for security, confidentiality and information is a priority for hospital management.	3.94	0.96	4	Agree	71.115
	3.97	**0.96**		**Agree**	

Table (6) presents the arithmetic means, standard deviations, and Chi-square values for participants' responses regarding the fourth dimension (Information Security). the results show that all items obtained relatively high arithmetic means ranging from (3.92-3.98) with standard deviations ranging from (0.95-0.96), which are the highest among all dimensions, indicating a high degree of agreement alongside greater variability in responses. the second item "Hospital management is keen to preserve all information and data related to healthcare practitioners" ranked first with an arithmetic mean of (3.98) and a standard deviation of (0.95), followed by the third item "the hospital is keen to employ the best specialists in the field of information security" with a mean of (3.97) and a standard deviation of (0.96). meanwhile, the first item "the hospital has an independent department specialized in information security" ranked last with a mean of (3.92) and a standard deviation of (0.96). the overall arithmetic mean for the dimension reached (3.97) with a standard deviation of (0.96), which shares the ranking with the first dimension. Chi-square values ranged from (68.754-75.705), all of which were statistically significant, indicating the presence of variability in the responses.

Axis tow: Improving job performance at King Faisal Medical Complex in Taif:

Table (7) Means, standard deviations, and Chi-square coefficient values for the sample respondents' answers regarding the fifth dimension (improving job performance)

Statement	Mean	±St. Deviation	The weight is closer to		Chi-square P-value
			Weight	Degree	
Healthcare practitioners are adapting appropriately to the digital	3.99	0.96	5	Agree	62.066

transformation processes required by a hospital.					
Digital technologies help create a flexible work environment for healthcare practitioners.	4.10	0.91	1	Agree	59.18
Digital transformation helps solve problems facing healthcare practitioners, prevent them from recurring.	4.09	0.92	2	Agree	56.033
Digital technologies enable healthcare practitioners to make and take decisions based on real-time data.	4.07	1.00	4	Agree	58.918
Healthcare practitioners are highly satisfied with the hospital's digital transformation policies.	4.08	0.99	3	Agree	57.738
	4.07	**0.96**		**Agree**	

Table (7) presents the arithmetic means, standard deviations, and Chi-square values for the sample responses regarding the fifth dimension (Improving Job Performance). The results reveal that all items obtained high arithmetic means ranging from (3.99-4.10) with standard deviations ranging from (0.91-1.00), indicating a high degree of agreement among participants on the role of digital transformation in improving performance. The second item "Digital technologies help create a flexible work environment for healthcare practitioners" ranked first with an arithmetic mean of (4.10) and a standard deviation of (0.91), followed by the third item "Digital transformation helps solve problems facing healthcare practitioners and prevents their recurrence" with a mean of (4.09) and a standard deviation of (0.92). Meanwhile, the first item "Healthcare practitioners adapt appropriately to the digital transformation processes required by the hospital" ranked last with a mean of (3.99) and a standard deviation of (0.96). The overall arithmetic mean for the dimension reached (4.07) with a standard deviation of (0.96), which shares the ranking with the second dimension. Chi-square values ranged from (56.033-62.066), all of which were statistically significant, indicating the presence of statistically significant differences in the responses.

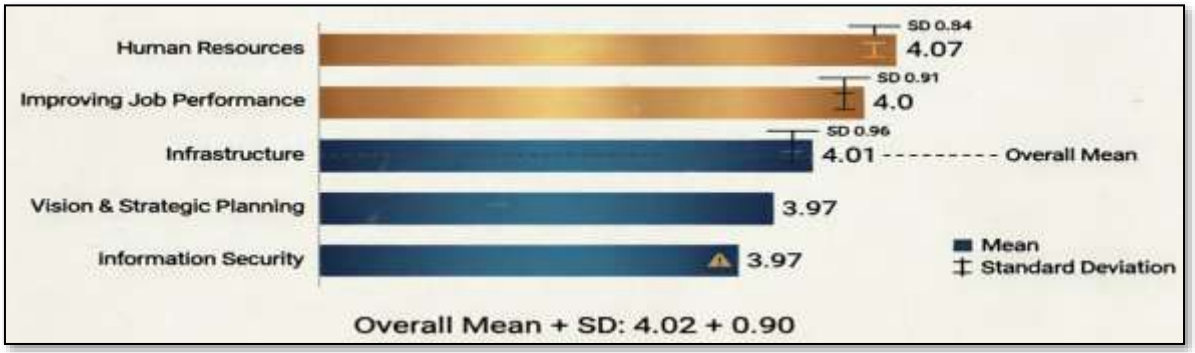
Table (8) Comparison of Study Dimensions Based on Their Arithmetic Means and Standard Deviations

Statement	**Mean**	**±St. Deviation**	**The weight is closer to**	
			Weight	**Degree**
Vision and Strategic Planning	3.97	0.85	4	Agree
Human Resources	4.07	0.84	1	Agree
Infrastructure	4.01	0.91	3	Agree
Information Security	3.97	0.96	5	Agree
Improving job performance	4.07	0.96	2	Agree
	4.02	**0.90**		**Agree**

Table (8) presents a comprehensive comparison of the five study dimensions based on arithmetic means, standard deviations, and ranking. the results reveal that the second dimension (Human Resources) and the fifth dimension (Improving Job Performance) shared the first rank, each with an arithmetic mean of (4.07). However, the second dimension recorded a lower standard deviation (0.84) compared to the fifth dimension (0.96), indicating greater homogeneity in participants' responses regarding human resources. the third dimension (Infrastructure) ranked

third with an arithmetic mean of (4.01) and a standard deviation of (0.91). meanwhile, the first dimension (Vision & Strategic Planning) and the fourth dimension (Information Security) shared the last rank, each with an arithmetic mean of (3.97). Notably, the fourth dimension recorded the highest standard deviation (0.96) among all dimensions, reflecting greater variability in participants' opinions regarding information security. the overall arithmetic mean for all dimensions was (4.02) with a standard deviation of (0.90), indicating that participants generally agree with the digital transformation practices at King Faisal Medical Complex in Taif across all dimensions. these results confirm that the hospital is achieving notable progress in digital transformation, with particular emphasis on human resources and job performance improvement. the following conceptual model illustrates the arrangement of dimensions according to their arithmetic means:

Figure (5) Digital Transformation Analysis-King Fisal Complex in Taif.



Study Hypotheses:

The study hypotheses were formulated as follows:

Hypothesis one (H_1): there is a statistically significant positive effect of information security on job performance improvement among healthcare practitioners at King Faisal medical complex in Taif.

Hypothesis two (H_2): there is a statistically significant positive effect of human resources on job performance improvement among healthcare practitioners at King Faisal medical complex in Taif.

Hypothesis three (H_3): there is a statistically significant positive effect of infrastructure on job performance improvement among healthcare practitioners at King Faisal medical complex in Taif.

Hypothesis four (H_4): the demographic characteristics of healthcare practitioners (education level and job experience) moderate the relationship between digital transformation dimensions and job performance improvement.

To test hypotheses one, two, and three, the following relationship was employed using SmartPLS 4 software:

Figure (6): PLS-SEM Path Model: Predictors of Job Performance

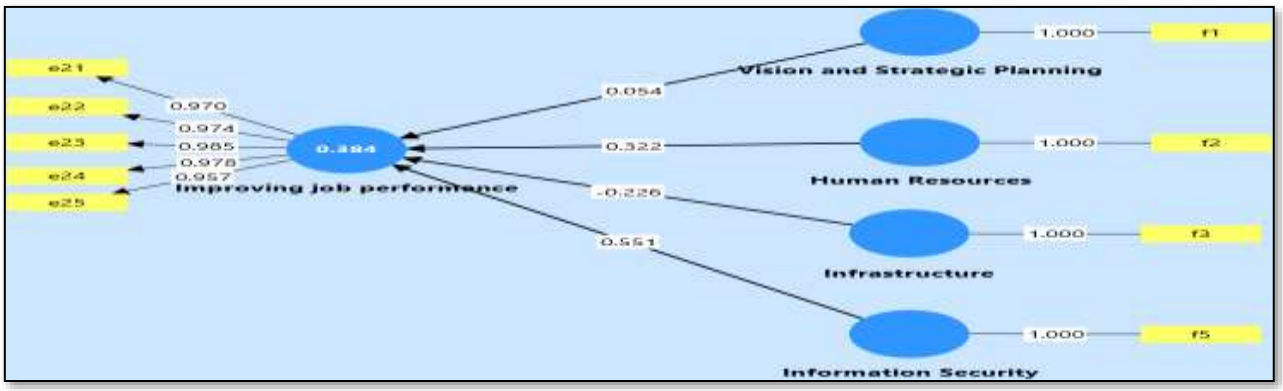


Table (9): Path Coefficients and Effect Sizes (f^2) of Independent Variables on the Dependent Variable

	Path coefficients	f-square
Human Resources -> Improving job performance	0.322	0.098
Information Security -> Improving job performance	0.551	0.267
Infrastructure -> Improving job performance	-0.226	0.032
Vision and Strategic Planning -> Improving job performance	0.054	0.004

Table (9) presents the values of Path Coefficients and Effect Sizes (f-square) for the relationships between the four dimensions of digital transformation (Human Resources, Information Security, Infrastructure, and Vision & Strategic Planning) and the variable of Job Performance Improvement.

The results reveal that Information Security achieved the strongest positive impact on job performance improvement with a path coefficient of (0.551), the highest among all dimensions, with a medium-to-large effect size according to the f-square value of (0.267). this indicates that enhancing information security is the most influential factor in improving the performance of healthcare practitioners, thereby supporting the first hypothesis (there is a statistically significant positive effect of information security on job performance improvement among healthcare practitioners at King Faisal Medical Complex in Taif).

the second dimension (Human Resources) ranked second with a positive path coefficient of (0.322) and a small-to-medium effect size ($f^2 = 0.098$), reflecting the important role of qualified human resources in supporting digital transformation and improving performance, thereby supporting the second hypothesis (there is a statistically significant positive effect of human resources on job performance improvement among healthcare practitioners at King Faisal Medical Complex in Taif).

with a negative path coefficient of (-0.226) and a very small effect size ($f^2 = 0.032$), which may indicate that providing infrastructure alone without effective utilization may not improve performance, or that there are challenges in the optimal use of available technologies, thereby rejecting the third hypothesis (There is a statistically significant positive effect of infrastructure on job performance improvement among healthcare practitioners at King Faisal Medical Complex in Taif).

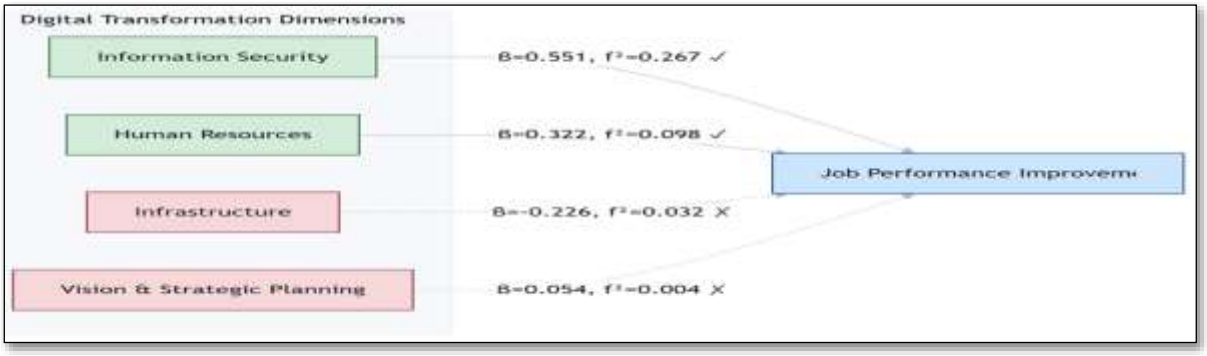
Finally, the fourth dimension (Vision & Strategic Planning) ranked last with a very weak path coefficient of (0.054) and a negligible effect size ($f^2 = 0.004$), indicating that having a vision and strategic planning for digital transformation, despite its importance, does not translate directly and tangibly into immediate improvement in job performance unless implemented practically and effectively, thereby rejecting the fourth hypothesis (there is a statistically significant positive effect of vision and strategic planning on job performance improvement among healthcare practitioners at King Faisal medical complex in Taif).

these results confirm that information security and human resources are the decisive factors in the success of digital transformation and job performance improvement at King Faisal medical complex in Taif, while Infrastructure and Strategic Vision require further development and practical integration with daily practices.

In summary, the results demonstrate that information security (0.551; 0.267) and human resources (0.322; 0.098) are the most influential factors in improving job performance, while Infrastructure showed a weak negative relationship (-0.226), and strategic vision had a negligible and non-significant effect (0.054). this confirms that the success of digital transformation in the hospital fundamentally depends on data protection and qualified competencies rather than relying solely on technical resources or theoretical planning. the following conceptual model depicts the

statistically supported and rejected hypotheses regarding the relationships between digital transformation dimensions and job performance improvement:

Figure (7): Conceptual model: Digital transformation and job performance



Hypothesis Four (H_4):

Demographic characteristics of healthcare practitioners (education level and job experience) moderate the relationship between digital transformation dimensions and job performance improvement.

Data were analyzed and hypotheses were tested in this study using SmartPLS 4, following the methodology of Path Analysis with Interaction Terms, based on the following model:

Figure (8): Structural Model with Education and Experience Moderators

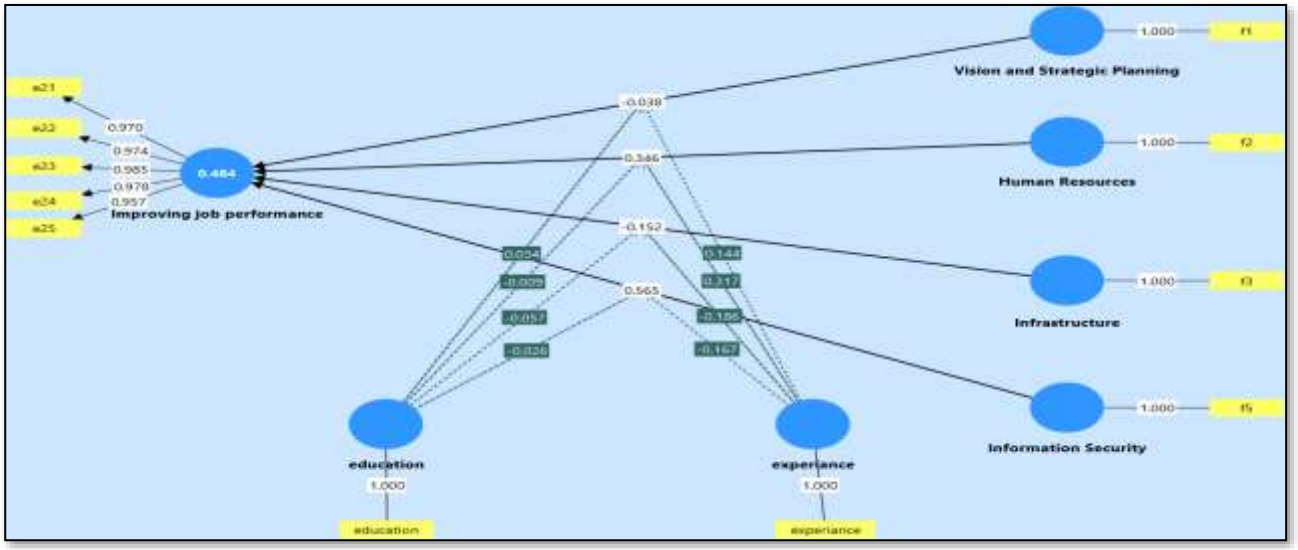


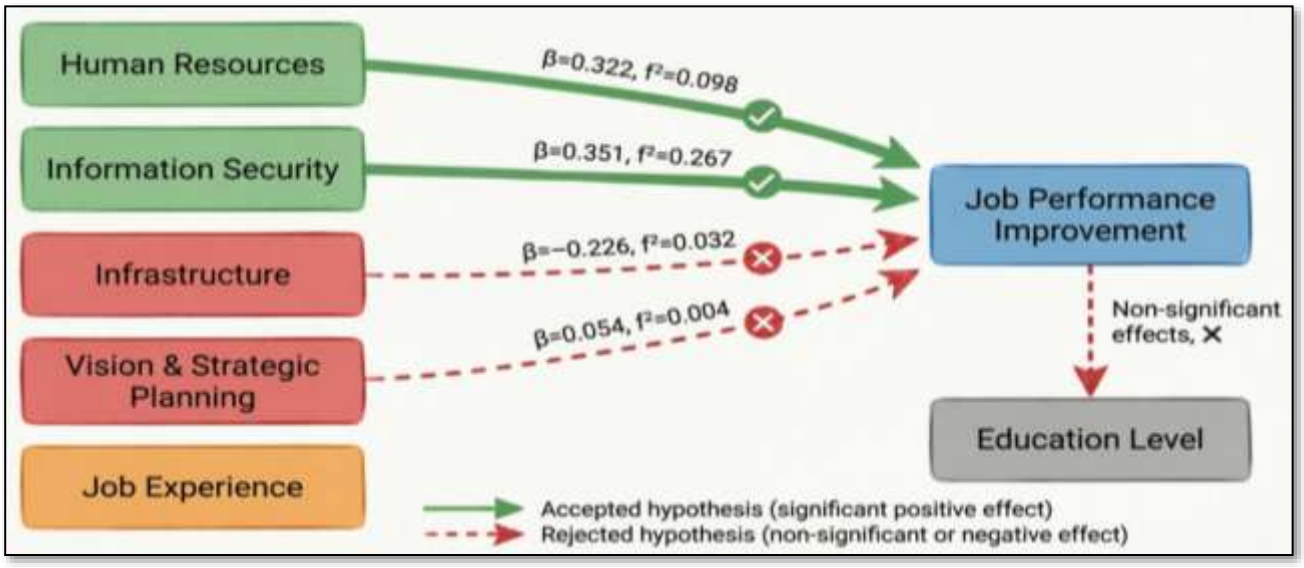
Table (10): Moderating Effects of Education and Experience on the Digital Transformation–Job Performance Relationship: Path Coefficients and f² Values

	Path. coefficients	f-square
education -> Improving job performance.	-0.004	0.000
education x Human Resources -> Improving job perf.	-0.009	0.000
education x Information Security -> Improving job performance	-0.026	0.001
education x Infrastructure -> Improving job performance.	-0.057	0.002
education x Vision and Strategic Planning -> Improving job perf.	0.034	0.002
experience -> Improving job performance	-0.096	0.016
experience x Human Resources -> Improving job perf.	0.317	0.079
experience x Information Security -> Improving job performance	-0.167	0.020
experience x Infrastructure -> Improving job performance.	-0.186	0.022

experience x Vision and Strategic Planning -> Improving job perf.	0.144	0.026
Human Resources -> Improving job performance.	0.346	0.127
Information Security -> Improving job performance.	0.565	0.262
Infrastructure -> Improving job performance.	-0.152	0.014
Vision and Strategic Planning -> Improving job performance.	-0.038	0.002

Table (10) presents the results of path analysis with moderation testing for the variables of education level and job experience on the relationship between digital transformation dimensions and job performance improvement. The results reveal that education level did not demonstrate any statistically significant moderating effect on any of the four dimensions (all interaction coefficients $\leq |0.057|$ and f^2 values $\approx 0.000–0.002$), indicating that the impact of digital transformation on performance does not vary according to practitioners' educational qualifications. In contrast, job experience emerged as a significant moderating variable, particularly in its interaction with human resources (interaction coefficient: 0.317; $f^2 = 0.079$), which represents the only moderating effect of small-to-medium magnitude. This suggests that more experienced practitioners benefit more effectively from digital human resources policies in enhancing their job performance. However, the interactions of experience with the other dimensions (information security, infrastructure, and strategic vision) were weak and statistically non-significant ($|\beta| \leq 0.186$; $f^2 \leq 0.026$). Regarding direct effects, information security (0.565; 0.262) and human resources (0.346; 0.127) remained the most influential factors on performance, while the effects of infrastructure and strategic vision remained weak or negative. Based on these results, the hypothesis is partially supported: job experience (but not education level) moderates the relationship between digital transformation dimensions and job performance improvement, whereby greater experience enhances the positive effect of human resources on performance ($\beta = 0.317$; $f^2 = 0.079$), while information security and human resources remain the most directly influential dimensions on performance improvement, regardless of demographic characteristics. The conceptual model illustrates the accepted and rejected relationships based on path analysis results:

Figure (9): Digital Transformation Dimensions and Job Performance Improvement: Conceptual Model



Finding:

First: Demographic results of the sample:

The final study sample consisted of (122) healthcare practitioners working at King Faisal Medical Complex in Taif. Participants were distributed according to demographic variables in a manner that reflects notable diversity in characteristics. Regarding nationality and gender, Saudi participants totaled (65), comprising (44) males (67.7%) and (21) females (32.3%), while non-Saudi participants totaled (57), comprising (16) males (28.1%) and (41) females (71.9%), indicating male predominance among Saudis and female predominance among non-Saudis. Regarding educational qualifications, distributions varied: males dominated at the doctoral level (83.3%), while females dominated at the bachelor's level (68.6%), whereas other levels (diploma, postgraduate diploma, master's) were distributed in relatively balanced proportions between genders. Concerning years of experience, results showed that the "more than 15 years" category was most representative of males (64.4%), while females were concentrated in mid-level experience categories (3-6 years and 9-12 years) at proportions exceeding (66%), reflecting differing experience patterns between genders within the studied sample.

Results of study dimensions:

Descriptive results for the digital transformation dimensions revealed a high degree of participant agreement regarding digital transformation practices at the hospital, with an overall arithmetic mean of (4.02) and a standard deviation of (0.90) across all dimensions. the dimensions of "Human Resources" and "Improving Job Performance" led the results with a shared arithmetic mean of (4.07); however, the Human Resources dimension recorded a lower standard deviation (0.84) compared to Improving Job Performance (0.96), indicating greater homogeneity in participants' responses regarding digital human resources policies. The "Infrastructure" dimension ranked third with a mean of (4.01) and a standard deviation of (0.91), reflecting participant satisfaction with technical equipment while indicating room for improvement. In the lowest rank, the dimensions of "Vision & Strategic Planning" and "Information Security" shared the lowest arithmetic mean (3.97); however, the Information security dimension recorded the highest standard deviation among all dimensions (0.96), indicating clear variability in participants' perspectives regarding the effectiveness of data and information protection policies at the hospital a finding that warrants managerial attention to address this variability and enhance confidence in digital systems.

Results of hypotheses testing:

Inferential analysis using SmartPLS 4 yielded varied results regarding support for the study hypotheses. The first hypothesis (the effect of Information Security on performance improvement) demonstrated the strongest statistically significant positive impact, with a path coefficient of (0.551) and a medium-to-large effect size ($f^2 = 0.267$), confirming that enhancing information security is the decisive factor in improving healthcare practitioners' performance. Results also supported the second hypothesis (the effect of Human Resources on performance) with a path coefficient of (0.322) and a small-to-medium effect size (0.098), reflecting the important role of qualified competencies in supporting digital transformation. In contrast, results did not support the third hypothesis concerning Infrastructure, which showed an inverse relationship with a negative path coefficient (-0.226) and a negligible effect size (0.032), suggesting that the mere availability of infrastructure without effective utilization may be insufficient to improve performance. Regarding the hypothesis on Vision & Strategic Planning, no statistically significant effect was observed (path coefficient: 0.054), indicating that the existence of a strategic plan does not automatically translate into immediate performance improvement unless implemented practically and effectively. concerning the fourth hypothesis on the moderating effect of demographic variables, results revealed that only "years of experience" played a statistically significant moderating role in the relationship between Human Resources and performance improvement (interaction coefficient: 0.317), while "educational qualification"

showed no significant moderating effect. This implies that more experienced practitioners benefit more effectively from digital human resources policies in enhancing their performance, regardless of their academic qualifications.

Final results:

1. High general consensus: there is a high overall degree of agreement among participants regarding digital transformation practices, with a general arithmetic mean of 4.02 and a standard deviation of 0.90.
2. Top Performing Areas: human resources" and "Improving Job Performance" tied for the highest rank (Mean: 4.07).
3. Area of concern: information security and vision & strategic planning" ranked lowest (mean: 3.97).
4. The homogeneity factor: the human resources dimension is the most "stable" result because it has the lowest standard deviation (0.84). this means employees have a very similar, positive view of this area.
5. The variability gap: Information security warrants immediate managerial attention. the high standard deviation (0.96) alongside the low mean suggests that while some staff may feel secure, a significant portion likely has doubts or differing experiences regarding data protection.
6. Strategic alignment: the fact that vision & strategic planning sits at the bottom suggests that while the "tools" (Infrastructure) and "people" (HR) are performing well, the long-term "roadmap" may not be as clearly communicated or felt by the staff.
7. The power of Security: Information Security isn't just a technical requirement it is the primary catalyst for performance improvement in this model. Its medium-to-large effect size ($f^2 = 0.267$) suggests that when practitioners feel the data is secure, their functional performance increases significantly.
8. The infrastructure paradox: the negative path coefficient (-0.226) for Infrastructure is a critical finding. It suggests that simply adding more hardware or software without proper integration or "buy-in" might actually hinder performance or create friction.
9. Strategy vs. execution: the lack of significance for vision & strategic planning (0.054) indicates a gap between high-level hospital goals and the daily reality of healthcare practitioners

DISCUSSION

The results of this study, which demonstrate a highly significant positive impact of digital transformation on the performance of health practitioners, largely converge with the broad consensus of previous empirical literature including Bress and Jabr (2021), Al-Sawat and Al-Harbi (2022), Berghaus and Back (2016), Abu-Salim (2023), Al-Azab (2023), Zayed and Mohamed (2023), Rahib and Shabbi (2023), Al-Zoubi (2023), Ibtesam and Ameera (2023), Dabnoon & Alhidi (2023), Khamees (2021), Alfaris & Bin Khalid (2022), Mabrouk and Al-Ruwaili (2024), and Reda and Mohamed (2024), all of whom established positive correlations between digital transformation and performance metrics. Specifically, the paramount influence of Information Security and Human Resources identified in this research resonates with the comprehensive dimensional approach of Bohazawi and Algahami (2024) and the training-focused findings of Basboos (2023), while contrasting with Alzahrani & Moglad (2024) who neglected security and vision, and further validating the human-centric conclusions of Abu-Salim (2023) and Al-Azab (2023). Conversely, the negative path coefficient observed for Infrastructure challenges the conventional wisdom of technical determinism but finds resonance with the ambiguities noted by Rahib and Shabbi (2023) and Al-Zoubi (2023) regarding technology's direct effect, as well as Khamees (2021) who documented negative outcomes like digital confusion, and supports

Teichert (2019) critique of incomplete maturity models, while also aligning with the unintended consequences and usability issues highlighted by Menachemi and Collum (2023) and Sittig et al. (2016). Furthermore, the negligible impact of Vision and Strategic Planning validates the concerns raised by Al-Ghobairi (2020) and Hammad (2020) regarding the disconnect between national strategies and institutional execution, alongside Zayed and Mohamed (2023) findings on policy ineffectiveness. The specific technology impacts noted in prior literature, such as the performance enhancements from telemedicine and EHRs reported by Ricciardi (2019), Faisal and Abdul Qader (2015), Abd-al-Aziz and Abu Shar (2015), Al-Sudairi (2014), Asia (2019), Dunnebeil et al. (2012), Mcalearney et al. (2014), Minichiello et al. (2013), Ratwani (2017), Upadhyay and fen Hu (2022), Lobelo et al. (2018), Stoltenberg et al. (2017), Adeniyi et al. (2024), Yanam et al. (2016), and Jin et al. (2020), collectively underscore the potential of digital tools which, in this study, are realized primarily through security and human capital rather than infrastructure alone, distinguishing the current high performance outcomes from the moderate results of Bin Areema and Abukhelwa (2024) and the low application levels noted by Durah et al. (2017), while the moderating role of experience rather than education further nuances the human resource discourse, ultimately suggesting that successful digital transformation in healthcare depends critically on data security and experienced human capital rather than mere infrastructure or strategic documentation, thereby addressing the implementation gaps and sectoral limitations highlighted across these prior studies.

Research Recommendations:

1.Strengthen information security practices, as this dimension shows the lowest mean and highest variability.
2.Improve the communication and clarity of the digital transformation vision and strategic planning across all staff levels.
3.Investigate the reasons behind the negative impact of digital infrastructure on job performance.
4.Build on the strong and consistent performance of the human resources dimension and apply its successful practices to other areas.
5.Develop a comprehensive information security awareness and training program for all employees.
6.Create and communicate a clear digital transformation roadmap with measurable goals and timelines.
7.Review and optimize digital infrastructure to ensure system integration, usability, and reduced complexity.
8.Strengthen human resources involvement through continuous training, incentives, and participatory system design.

REFERENCES

- Abd-Aziz, Hassan and Abou-Shar, Hiba. (2015). Telemedicine in Clinical laboratory Science. *American Society Journal for Medical Technology*, October.
- Abduljabbar, Firas Meshal and Alnajmawi, Raida Mohamed Mahmood. (2021). Physician Civil Liability in Telemedicine: a comparative Study. *Middle East Journal of Legal and Jurisprudence Studies (MESR), Valume (2), no. (3),* p.124-149.
- Abu-Salim, Dareen Abdullah. (2023), Dimensions of Digital Transformation and Its Impact on Career Development: Evaluating the Mediating Role of Technological Infrastructure in the General Administration of Education in Tabuk City. *Scientific Journal for Publishing Research*, Riyadh.
- Al-Azzam, Noura Muhammad Abdullah. (2020). The Role of Artificial Intelligence in Improving the Efficiency of Administrative Systems for Human Resources Management at Tabuk University. *Educational Journal, Faculty of Education*, Sohag University.

- Al-Mutraf, Abdul Rahman bin Fahd. (2020 AD). The Digital Transformation of University Education in light of Crises Between Public and Private Universities from the Point of View of Faculty Members, a Published Study. *the Scientific Journal of the Faculty of Education, Benha University, Volume (36), Issue (7).*
- Al-Sawat Talq Awad Allah and Al-Harbi, Yasser Sayer (2022). The impact of digital Transformation on the Efficiency of Academic Performance (A Case Study of Faculty Members at King Abdul-Aziz University in Jeddah. *The Arab Journal for Scientific Publishing (AJSP), Issue (43).*
- Al-Ruwaili, Rad and Matrouk, Amna. (2024). The Impact of the EHR System on Employee Performance in the Healthcare Sector. *Scientific Journal of Business Research and Studies, Volume (38), Issue (4),* 1361-1404.
- Al-Khalidi, Muhammad. (2007). Electronic technology. Amman: Kunoz Al Marifa House for Publication and Distribution
- Al-Azab, Abdel-Magsood Mohamed. (2023). The Impact of Applying the Impact of Digital Transformation on Empowering Human Resources: An Applied Study on Workers in the General Office of the Egyptian Ministry of Health and Population. *Scientific Journal of Business and Environmental Studies, Volume (14). Issue (1),*101-120.
- Al-Faris, Mobarak Mohsin and Bin Khalid, Marei Hasan Hamad. (2022). Impact of digital leadership on Kuwaiti hospitals 'Employees' Performance. *Journal of Economic, Administrative and Legal Sciences, Volume (6), Issue (19)*, 132 – 142.
- Al-Ghabeeri, Muhammad Abd al-Rahman Hassan. (2020). The Reality of Digital Transformation in the Kingdom of Saudi Arabia: An Analytical Study, Journal of Administrative and Financial Sciences, *University of Martyr Hama Lakhdar al-Wadi, Faculty of Economics, Commerce and Management Sciences, Volume (3), Issue (4),* 8-31.
- Al-Sidairy, Muhammad Ahmed bin Turki, (2014). The Extent of the use of Electronic Systems in the Saudi hospitals; Analytical Study of Hospitals in the cities of Jeddah and Riyadh in the Kingdom of Saudi Arabia, *Journal of King Abdul-Aziz University*: *Economics and Administration, Volume (28), Issue (1)*, pp. 177-260.
- Al-Shawi, Abdul-Mughith (2022). Telemedicine in Morocco; Reality and Challenges. *Moroccan Health Journal, Issue (32).*
- Al-Zahrani, Omar Khamees Saeed and Moglad, Osama Abdulrahman. (2024). The impact of Digital Transformation on the Job Performance: Afield Study in the Jeddah Specialist Hospitals Employees. *Arab Journal of Management, Vol. (44), Issue (6),*171-190.
- Al-Zoubi, Maryam Mohamed. (2023), The Impact of Digital Transformation on The Performance of Workers in Telecommunications Companies. *Journal of Human Resource for Studies and Research, Issue (19*),53-73.
- Asia, Khadim, (2019*). Telemedicine as a Tool to Achieve Competitive Advantage; field Study of a Sample of Public and Private Health Institutions in the State of Wargella*. Master's Degree in Service Marketing, Faculty of Economic, Commercial and Management Sciences, Kasdi Merbah University, Wargella, Algeria.
- Bin Areema, Nawal and Abukhelwa, Badees. (2024). The Impact of Digital Transformation on job Performance an Applied Study at Mobilis in Ouargla. the Study Aims to Know the Impact of Digital Transformation on the Job Performance of Employees in Mobilis in Ouargla. *Research Journal, Volume (24), Issue (1),*283-295.
- Belham, Fatima Zahra and Warzi, Fathi. (2017). The Contribution of Expert Systems to Improving Decision-Making in the Algerian Institution: A Case Study of SPA - ABRAS in the City of Said, *Abu Bakr Belkaid University Journal, Volume (2), Issue (1),* Abu Bakr Belkaid University, Tlemcen, Algeria.

- Bohazawi, Halima, S. and Algahami, Nesrin, F. (2024), the Role 0f Digital Transformation on Employee the Optimization Performance of Workers at Al-Madar al Jaded Company. *Economic Studies Journal (ESJ), Faculty of Economics, Sirte University, Vol (7), Issue (2),*143-168.
- Berghaus, S, (2018). *The Fuzzy Froht End of Digital Transformation: Activities and Approaches for Initiating Organizational Change Strategies*. Dissertation of the University of ST, Germany.
- Berghaus, Sabine and Back, Andrea. (2016). *Stages in Digital Business Transformation: Results of an Empirical Maturity Study*. MCIS 2016 Proceedings.
- Celine, F. (2018). *Effects of Job Stress on Employee Performance in an Enterprise: A Microfinance institution in Cameroon*. Master Thesis. Centria university of Applied Science.
- Dabnoon, Mohamed, S. and Aljadi, Zamzam. (2023). Impact of Digital Transformation on Organizational Performance of Commercial Banks Operating in the City of Sirte-Libya. *Bayan Journal Scientific, Issue (16),*122-150.
- Dunnebeil, Sebastian, and others. (2012). Determinants of Physician Technology Acceptance for E-Health in Ambulatory Care, *International Journal of Medical Informatics, Volume (8)*.
- Durah, Omar Mohammed and Nasser, Saif and Khaddour, Nasser (2017). Diagnosing the Reality of the Electronic Health System in the Founding King Abdullah University Hospital, a Case Study. *The Arabic Journal of Management*, *Volume (37), Issue (2),* Amman, pp. 3-23.
- Hammad, Mohamed Mahmood. (2020). The Role of Digital Transformation in Developing Employee Performance: A Field Study on Egyptian Company for Pharmaceutical. *Scientific Journal of Financial and Administrative Studies and Research, Faculty of Commerce, Sadat City University, Volume (7), Issue (2),* 1-23.
- Health Insurance Council. (2021). Telehealth Policies and Procedures (Telemedicine). Saudi Council of Health Insurance, p. 3.
- Khamees, Assir Ahmed. (2021). The Impact of Digital Transformation on job Performance of the Employees of Egyptian Commercial Banks. *Scientific Journal of Financial and Commercial Studies and Research, Faculty of Commerce, Damietta University, Volume (2), Issue (2)*, 999-1044.
- Lobelo, F. Rohm Young D. Sallis R. et al. (2018). Routine assessment and promotion of physical activity in healthcare settings. *a scientific statement from the American Heart Association. Circulation. 137(18)*: 495–522.
- Ibtesam, Gazal and Ameera, Margani. (2023). *Digital Transformation and its Impact on Improving Job Performance, A Aield Study of the Regional Directorate of Air Algérie, Ouargla*. Faculty of Economics, Business and Management Sciences Department of Management Sciences, University of Kasdi Merbah, Ouargla, Algeria.
- Faisal, Afnan Faisal and Abdul Qadir, Ikram Saif Al-Din Muhammad (2011). Telemedicine. A Project Submitted as one of the Requirements for Obtaining a Bachelor's degree in Computer Science, Faculty of Computer Science and Information Culture, the Sudan University of Technology Science.
- Galea, M. D. (2019). Telemedicine in Rehabilitation. *Physical Medicine and Rehabilitation Clinics, 30(2)*, 473-483.
- Malika, Tayeb Suleiman and Fatima, Bin Abdul Aziz (2011). Analytical study on Telemedicine, Innovation in Medical Services. The International Forum on Organizational Change as an Introduction to a Changing Environment Adaptation, Saad Dahlab University, Blida, Algeria.
- Mahmoud, Abdel-Razzaq Mukhtar. (2020). Artificial Intelligence Applications: An Introduction to Developing Education Amid the Challenges of the COVID-19 Pandemic. *International Journal of Research in Educational Sciences, Vol. (1), No. (4).*
- Marion Albouy, llaty. (2011). *Telemedicine Staff SP*, p11.
- Majid, Ahmed. (2018). *Artificial Intelligence in the United Arab Emirates*. Abu Dhabi: Department of Economic Studies and Policies, Ministry of Economy.

- Mcalearney, Ann, and others. (2014). Evidence-Based, Management of Ambulatory Electronic Health Record System Implementation. An Assignment of Conceptual Support and Qualitative Evidence, *International Journal of Medical Informatics, Volume (83), issue (7)*.
- Menachemi, N. and Collum TH. (2023). Benefits and drawbacks of electronic health record systems. Risk Manag Health Policy. *Journal of Multidisciplinary Healthcare:16*.
- Minichiello, Victor, and Others. (2013). E-Health Potential Benefits and Challenges in Providing and Accessing Sexual Health Services, *BMC Public Health, Volume (13)*.
- Murad, Lina Mustafa, (2011). Telehealth Software Applications Using Smart Mobile phones. Master's Thesis in Informatics, Faculty of Science, Al-Baath University, Syria.
- Moaz, Mohammed. (2020). Artificial Intelligence in the Face of SARS-CoV-2: Opportunities and Challenges. Retrieved from: https://arsco.org/Ebooks/_ShowDocument/?filename=
- Najari, Fatima Zahra. (2019). *Artificial Intelligence and its Role in Enhancing the Competitiveness of Economic Institutions*. A Theoretical Approach. Berlin: Arab Democratic Center.
- Schreier, Souad, and Hamidoush, Ali. (2017). Information and communication technology and its role in improving the level of healthcare services. *Journal of New Economics, Al-Zaer, Vol. (1), No. (16)*, 291-304.
- Shams, Nada Ali Hasan. (2017). *Citizenship in the Digital Age - The Model of the Kingdom of Bahrain*. Studies Series of Bahrain Institute for Political Development.
- Shukri, Marah. (2016). *Administrative Control and its Relationship to Job Performance Among Principals of Basic Government Schools in the Northern Governorates of the West Bank from the Perspectives of the Principals Themselves*. (Master's thesis), College of Graduate Studies, An-Najah National University, Gaza.
- Stoltenberg M, Shaya GE, Feldman DI, Carroll JK. (2017). *Practical strategies for assessing patient physical activity levels in primary care*. Mayo Clin Proc Innova Qual Outcomes. 1:8–15.
- Rahib, Sanna and Shabbi, Haleema. (2023). The Impact of Digital Transformation on the Job Performance of Workers in Algerian Commercial Banks: A Case Study of the Commercial Bank of the State of El Tarf. *Industrial Economics Journal –Khezzartech, Volume (13), Issue (1),*689-710.
- Ratwani, Raj. (2017). *Electronic Health Records and Improved Patient Care: Opportunities for Applied Psychology*. Scientific Director, National Center for Human Factors in Healthcare, MedStar Institute for Innovation, MedStar Health Research Institute.
- Ricciardi, W. (2019). Assessing the Impact of DT of health services: Opinion by the Expert Panel on Effective Ways of Investing in Health (EXPH). *European Journal of Public Health*, *29* (Supplement_4), ckz, p:185-769.
- Reda, Hunaish Mohamed and Al-Mahdi, Sheikh. (2024). The impact of artificial intelligence dimensions on improving job performance- A field study in sports institutions in the state of El Oued. *Journal of Sports Performance Science, Vol. (6), No. (2),* 31-51.
- Press, Ahmed Kazem and Jabr, Warda Qasim. (2021). Digital Transformation Technology and its Impact on Improving the Strategic Performance of the Bank. An Analytical Study of the Opinions of a Sample of Managers Working in the Private Commercial Banking Sector in Karbala. *Iraqi Journal of Administrative Sciences, Volume (16), Issue (65)*, Baghdad.
- Vial, G. (2019). Understanding digital transformation: a Review and a Research Agenda. *The Journal of Strategic Information Systems*.
- Zayed, Hala Salahaldin Abdulsalam Hussain and Mohamed, Mohamed Saad. (2023). The Impact of Digital Transformation on the Job Performance of Human Resources for Employees of the Petroleum Commercial Services Company (Petrotrade). *Scientific Journal of Scientific and Environmental Studies, Volume (14), Issue (1),*522-548.
- Yanam Dala S. Morrison D. Curtin C. McDonald K. Hernandez-Bossard T. (2016). Electronic health records and quality of care: an observational study modeling impact on mortality. *readmissions, and complications. Medicine. 95(19):* e3332.

▪ Upadhyay, Somya and fen Hu, Hen. (2022). A Qualitative Analysis of the Impact of Electronic Health Records (EHR) on Healthcare Quality and Safety: Clinicians' Lived Experiences. *Health Services Insights Volume 15:* 1–7.