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# Development of Digital Transformation in Raising the Efficiency of Workers in Medical Devices: is Digital Transformation More Effective? – Cross-Sectional Study Medical Equipment Technology Department, Majmaah University, Saudi Arabia

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Fawaz Mohammed Almutair<sup>1\*</sup>, Meshal Mohammed Al Harbi<sup>2</sup>, Mohammed Ali Alanazi<sup>3</sup>

<sup>1,2</sup>Bachelor of Medical Equipment Technology department, Majmaah University, Saudi Arabia

<sup>3</sup>Diploma of Medical Equipment Technology department, Majmaah University, Saudi Arabia

Email: <sup>2</sup>mm.mm.l@hotmail.com, <sup>3</sup>mm-nn-122@hotmail.com

Corresponding Email: <sup>1</sup>\*fawaz-2@outlook.com

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**Abstract: Background:** Digital transformation is a process that aims to improve an entity by causing material changes to its properties through combinations of information, computing, communication, and connectivity technologies. DT has an impact on a variety of companies, including the purchase of digital assets, the creation of digital growth strategies, and the modification of internal organizational structures.

**Aim of study:** This cross-sectional study navigates in the research that evaluate the level of raising in efficiency of performance of workers in medical devices.

**Methodology:** This cross-sectional study collected data in the form of digital and paper questionnaires and then analyze these data to know if the hypothesis of research accepted or rejected via this descriptive analysis. The target number of questionnaires are 300 digital questionnaire, and 100 paper questionnaire and target participants are those work with medical device to answer the questions.

**Result:** the results showed that Most had bachelor, 24% diploma, and 8% master degree, and most had experience years less than 5 years. Virtual Reality for Patient Treatment was ranked 7.5%, with Big Data analysis ranked 3.8%, followed by Medical Records (1.9%). The most agreement items were (We have a record of patient visits to follow up on their visits to hospital) and (We use digital analysis tool to make better operational decisions). Results showed the efficiency of workers level was high with mean = 4.17.

**Conclusion:** This study demonstrates that types of digital transformation have an impact on the healthcare business and predict how they will improve the productivity of medical device professionals.



***Keywords: Digital Transformation, Medical Device, Workers.***

## **1. INTRODUCTION**

"A process that aims to improve an entity by causing material changes to its properties through combinations of information, computing, communication, and connectivity technologies," according to the definition of digital transformation (DT) (Vial, 2019, p. 118). DT has an impact on a variety of companies, including the purchase of digital assets, the creation of digital growth strategies, the modification of internal organizational structures, and the definition of appropriate metrics and goals (Verhoef et al., 2019).

The business sector as a whole is being revolutionized by this phenomenon, which has grown to be a very popular research topic in a number of business research areas (such as information systems, strategy, and marketing). Healthcare (HC), which includes all services provided by medical professionals to maintain patients' physical and mental wellbeing, has long been one of the major industries which DT has occurred (Agarwal, Guodong, DesRoches, & Jha, 2010; Marques & Ferreira, 2020) According to Elton and O'Riordan (2016), the digital revolution in healthcare has given rise to new business opportunities and business models that address issues with medical practice, value creation, and other issues like the ageing population. Both academics and practitioners realized the growing importance of DT in this sector (Reis, Amorim, Melo ao, & Matos, 2018).

The amount of research on this subject has increased over the past 20 years, as shown by a recent systematic literature review about DT in HC (Marques & Ferreira, 2020), which also highlights the most prevalent technology-related research themes in this field. The strict focus on technology, however, prevents it from adequately highlighting the various management applications and business impacts of DT on the numerous industry stakeholders (Nudurupati, Bhattacharya, Lascelles, & Caton, 2015).

The process of improving business processes through their digitization is known as digital transformation. Due to changes in the organizational environment, the competition's digital transformation, and the increasing demands of stakeholders from the outside environment, it appears to be essential. The researchers' perspectives on the digital transformation process vary. Some of them are focusing on digital transformation from the perspective of enhancing the organization's social media presence and by implementing new technologies that will enable enhancing stakeholder satisfaction while also enhancing the caliber of goods and services (Reis, et al., 2018). The business model and paradigm of the organization are altered by digital transformation, which permeates the entire organization. It primarily entails a functional strategy and an operational strategy (which includes goods, services, and other activities) (which relates to functions in an organization such as human resources, finance and accounting, etc.). Additionally, the addition of value to products and services is altered using new technologies. Despite the significance and necessity of the digital transformation of business, there are not enough case studies and literary references that discuss the digital transformation, indicating that it is still in its early stages. Another challenge is



determining the organization's level of digital maturity, which is a problem that is not well defined enough. It is important to emphasize how the quality management system and the entire organization have been affected by the digital transformation. The concept of Quality 4.0, which is based on innovations emerging from the development of Industry 4.0, is particularly important for the digital transformation of the quality management system.

Understanding how, in practice, the different players of the HC ecosystem (patients, pharmaceutical companies, hospitals, public agencies, and many more) exploit DT technologies and means to quality of care, value creation, and many other managerial issues requires a multi-stakeholder perspective. The stakeholder perspective is rarely examined in mainstream DT literature, which generally reports that the organization of value creation, growth, digitalization, and DT depends on a heterogeneous set of network stakeholders (Verhoef et al., 2019; Vial, 2019).

Health organizations, along with all other service organizations, were also impacted by digitization, in addition to production organizations. The development and implementation of the information system in the healthcare industry was once thought to be one of the fundamental steps in the digital transformation, but it turned out to be one of the more minor aspects of system digitization. The implementation of the information system, however, allows for much more effective communication and boosts the flow of information resources within the system, which can lead to a more cost-effective use of the capacities that are already available. However, an organization that undergoes digital transformation adopts new knowledge that boosts its competence in addition to adapting to the rapidly changing market conditions. The opportunities provided by web 2.0, which have the effect of improving internal communication as well as communication with customers and service users, are frequently used to illuminate the problem of digital transformation in practice (Jahankhani, Kendzierskyj, 2019). Identification of the current situation and the organizational context is the first step in the digital transformation process. Organizations cannot differentiate between the current level of health care and the level of health service requested by users without defining the context and requirements of stakeholders (Lapo, 2019). The adoption of technological innovations must be viewed, though, from the perspective of enhancing the process and maximizing its potential.

The quality is also impacted by digital transformation, in addition to the industry. The potential of new technology has raised quality as a result, as well as its potential. A shift in the quality management paradigm is taking place as a result of increased demand from interested parties for the ability to customize products and improve the effectiveness and efficiency of organizational business processes. Business transparency is made possible by digitization, which also speeds up process cycles, incorporates artificial intelligence into quality control, uses sensors to track process performance in real time, and does many other things. Due to these technological advancements, businesses can provide customers with higher-quality goods and services (Rodrguez-Salvador, Garcia-Garcia, 2018). Applying new technology, however, does not imply doing away with the current quality control models; rather, it calls for combining the old approaches and philosophies with a fresh one that is based on the use of new technology (Santos et.al., 2018). The monitoring of process performance and the performance



of the requirements that the management system norms place on the organization are both greatly facilitated by the use of sensors. However, sensory and automation reduce process costs by streamlining and eliminating process waste like movements, queues, etc. as well as by maximizing the utilization of the organization's currently available capacities.

### **Health Care Quality Management Problems:**

Given that stakeholder demands are rising as a result of a decline in quality of life, ensuring quality in healthcare is a challenge. A rise in environmental turbulence and the effects of stress on the human body are the causes of the decline in quality of life (Duggal, 2009). As a consequence, it is crucial to constantly improve the procedure, which is controlled by law and standards like ISO 9001. (Ebert, Duarte, 2018). Organizations can continuously improve the process using a variety of tools. It should be highlighted that agencies can identify a point in the process where digital transformation can be conducted out while also improving their processes. Poor life quality and the appearance of high costs as a result of poor quality are two possible outcomes of inconsistent health care processes. Reduced resource flows and ineptly optimization health care processes can also lead to significant financial waste, the development of waiting lists, a decline in customer satisfaction, and other issues (Ebert, Duarte, 2018). It is also important to mention the large financial debts that were created as a result of insufficiently effective and efficient resource use, which negatively affected the health organization's ability to conduct business and produced insufficiently positive outcomes.

The delivery of health services in cities with a high proportion of hospitalized users is a particularly difficult task. In addition to them, urban hospital organizations draw a lot of patients from the city (Garmann-Johnsen, 2018). The application of the solutions provided by Industry 4.0, which include the application of some innovations like big data, IoT, e-health, m-health, etc., can be used to address such problems. The implementation of such technology does, however, present a problem with regard to the safety of data transmission between medical equipment. However, the difficulties arise not only from the use of secure communication between devices but also from the development of large data and related activities (Ha, Hong, 2016)

An integrated management system made up of a quality management system, worker health and safety management systems, environmental management systems, risk management systems, and employee health and safety management systems must be implemented for the organization to maintain this issue. Organizations can respond to rising environmental demands and use technological advancements and digitization to improve the quality of services by integrating management systems.

### **The Health System Digitalization:**

Health organizations, like all other service organizations, were also impacted by digitization, in addition to production organizations. The development and implementation of the computer system in the healthcare industry was once thought to be one of the fundamental steps in the digital transformation, but it turned out to be one of the more minor aspects of system digitization. The implementation of the information system, however, allows for much more effective communication and boosts the flow of information resources within the system, which



can lead to a more expensive use of the capacities that are already available (Househ et.al., 2016). However, an agency that undergoes digital transformation adopts new knowledge that increases its competence in addition to adapting to the rapidly changing market conditions. The opportunities provided by web 2.0, which have the effect of improving internal communication as well as communication with customers and service users, are frequently used to illuminate the problem of digital transformation in practice (Jahankhani, Kendzierskyj, 2019). Identification of the current situation and the organizational context is the first step in the digital transformation process. Organizations cannot differentiate between the current level of health care and the level of health service requested by users without defining the context and requirements of stakeholders (Lapo, 2019). The adoption of technological innovations, however, must be viewed from the perspective of enhancing the process and maximizing its potential.

### **The Effect of Digital Transformation on Health Care Service Quality:**

Based on quality indicators, which can change depending on the health system in which quality is being examined, the quality of the health service can be determined. The Manual on Quality Standards of Health Care has defined a set of quality indicators for the Republic of Croatia and details how to use them. Digitalization can enhance some clinical indicators, such as early cancer detection, the percentage of hypertension treated, and the timely arrival of health care users via organized transportation through emergency medical care. IoMT specifically allows for the monitoring of patients' health status and prompt notification of any changes to vital signs like heartbeat, sudden increase or decrease in blood pressure ,etc. Additionally, the use of expansive reality can make surgical procedures easier to perform and lower the risk of prospective medical errors during such a procedure. Since the results of the diagnostic procedure can be quickly transferred to a specialist in each health area, the development and implementation of technology like e-health and m-health, as well as the general development of an information system that enables communication and sharing of information, makes it possible to obtain a diagnosis much more quickly. Additionally, the need for a physician's visit to the doctor declines thanks to the potential of communicating with medical professionals remotely, which affects the reduction of waiting times and, as a result, the slightly faster availability of necessary medical care. As a result, fewer health risks arise that require treatment more quickly (Rodrguez-Salvador, Garcia-Garcia, 2018).

Robotization and the options offered by the use of automated systems can, as a result, lower the cost of providing qualified medical staff as well as address the general staffing shortage. Machine learning can be used to perform tasks that require high levels of precision from medical personnel much more reliably, and expert systems can be used to diagnose patients more quickly and effectively.

The use of high-quality medical assistance in sites where such medical assistance is not readily available is made possible by the digitalization of healthcare processes. It is now possible to read diagnostic results and specify the necessary medical interventions to get relieved of or lessen symptoms thanks to innovations like machine learning. Similar to this, people who use health services can answer basic questions they would otherwise have to consult a doctor by themselves. This causes waiting lines, which may lower the quality of life for other people who



also use health care services. However, in order to reap benefits of digitization and the use of digital technology in health, the current infrastructure must be upgraded, and sufficient education for both patients and the medical staff employed by the health service must be provided. Infrastructure security often implies high costs as well as the conversion of a health organization's current business model to the digital environment, which necessitates hiring qualified staff to keep up the installed systems and inform and inform health service users about the potential benefits of using digital technology.

The hypothesis shall prove that the digital transformation in healthcare industry increase the efficiency of medical devices' workers performance.

- 1- What type of digital transformation applied in healthcare?
- 2- How digital transformation effect on efficiency of medical devices' workers performance?

### **Aim \ Hypothesis:**

This cross-sectional study navigates in the research that evaluate the level of raising in efficiency of performance of workers in medical devices. The literature research reflected that it's clear and noticed that digital transformation and new industries technologies that would be found play a role in efficiency in performance of worker and show it may increase the efficiency of them but thus efficiency depend on type of digital transformation applied.

My hypothesis is: the development of digital transformation will increase the performance efficiency of medical devices' workers.

The research questions to help explore this hypothesis are:

- 1- What are types of digital transformation applied in healthcare?
- 2- If digital transformation will affect the role of human being?
- 3- How will the development of digital transformation raise the efficiency of medical devices' workers performance?

## **2. METHODOLOGY**

This cross-sectional study collected data in the form of digital and paper questionnaires and then analyze these data to know if the hypothesis of research accepted or rejected via this descriptive analysis. The target number of questionnaires are 300 digital questionnaire, and 100 paper questionnaire and target participants are those work with medical device to answer the questions.

## **3. DATA ANALYSIS AND RESULTS**

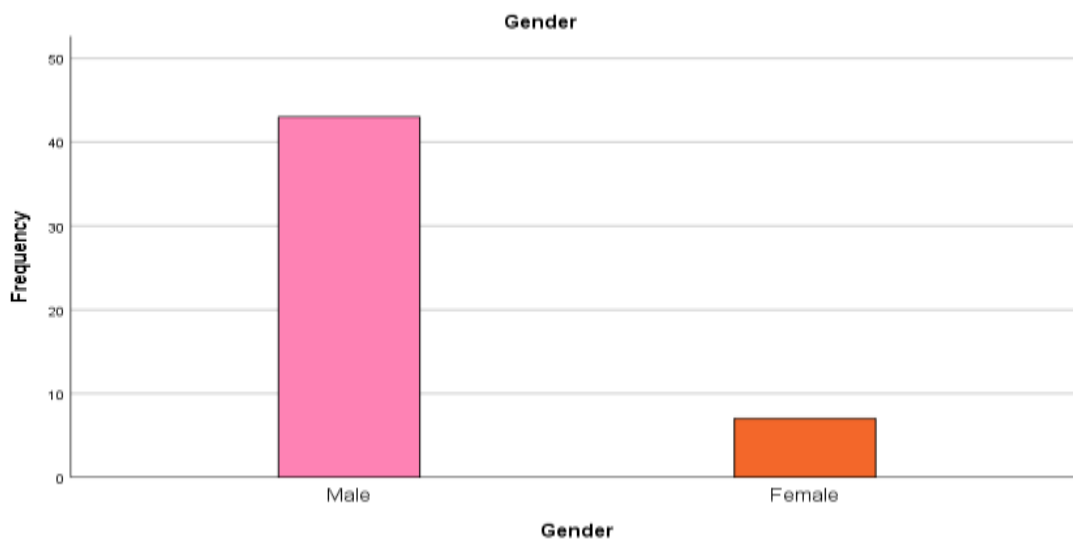
After the process of data collection, data should be analyzed via SPSS. Unpaired t-tests or ANOVA for continuous variables were used for statistical analysis. And chi square will be used for categorial variables with P-value < 0.05 significant.

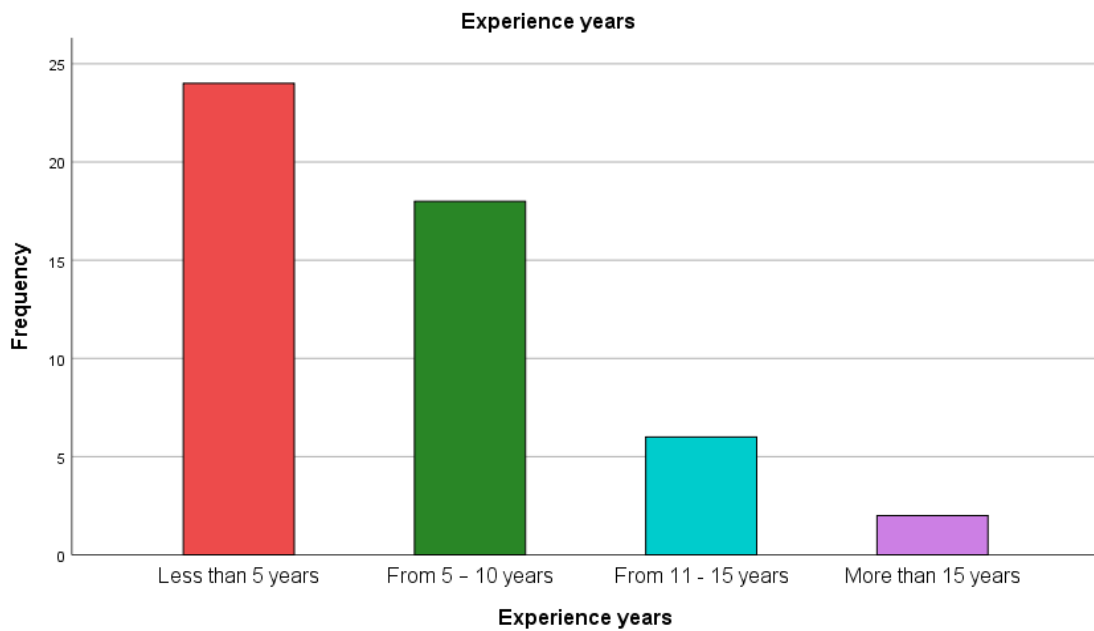
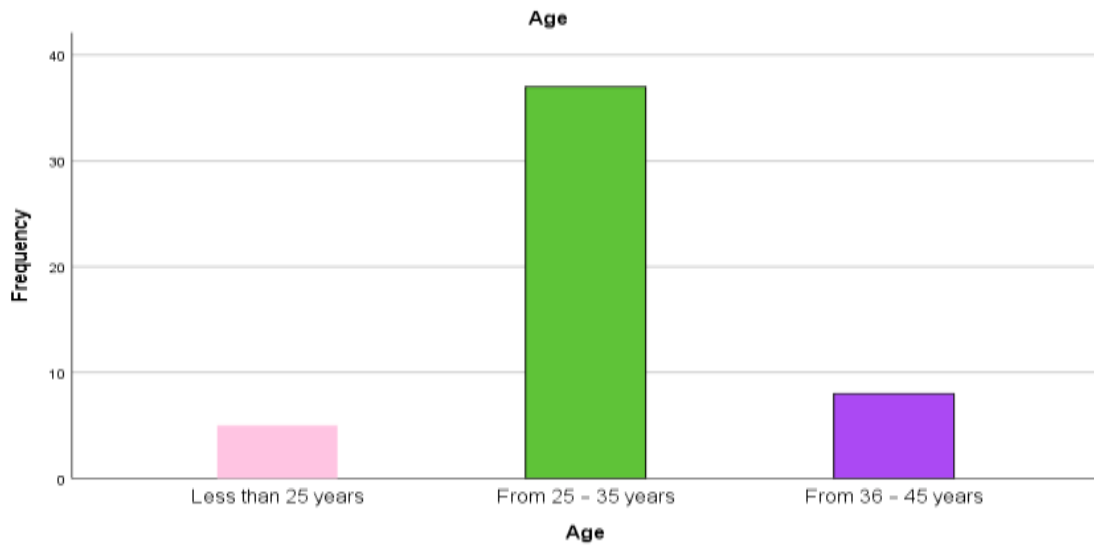
Development of digital transformation in raising the efficiency of workers in medical devices



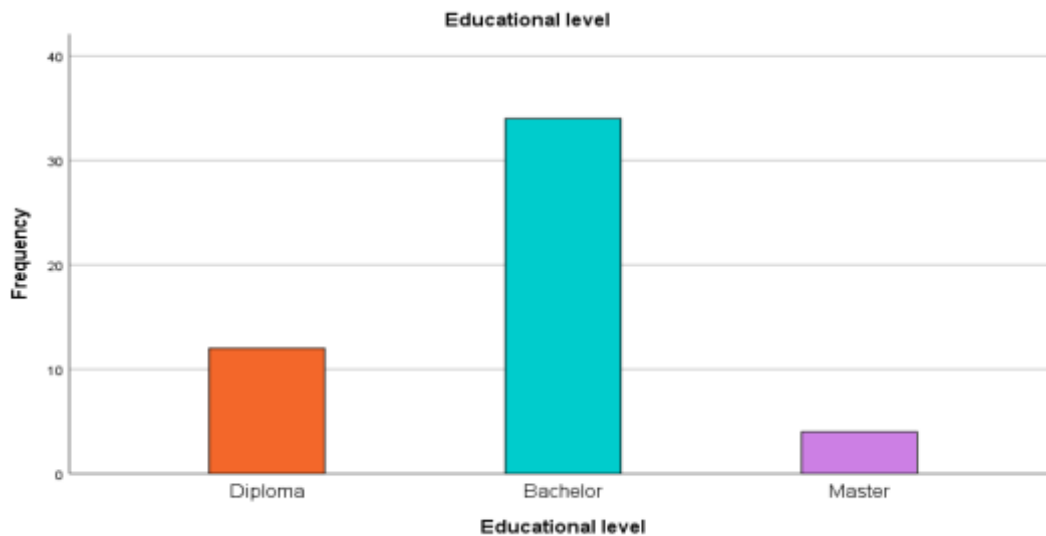
**Table 1: Demographic Data (N=50)**

Variables	Categories	N	%
Gender	Male	43	86
	Female	7	14
Age	Less than 25 years	5	10
	From 25 – 35 years	37	74
	From 36 – 45 years	8	16
Experience years	Less than 5 years	24	48
	From 5 – 10 years	18	36
	From 11 - 15 years	6	12
	More than 15 years	2	4
Educational level	Diploma	12	24
	Bachelor	34	68
	Master	4	8





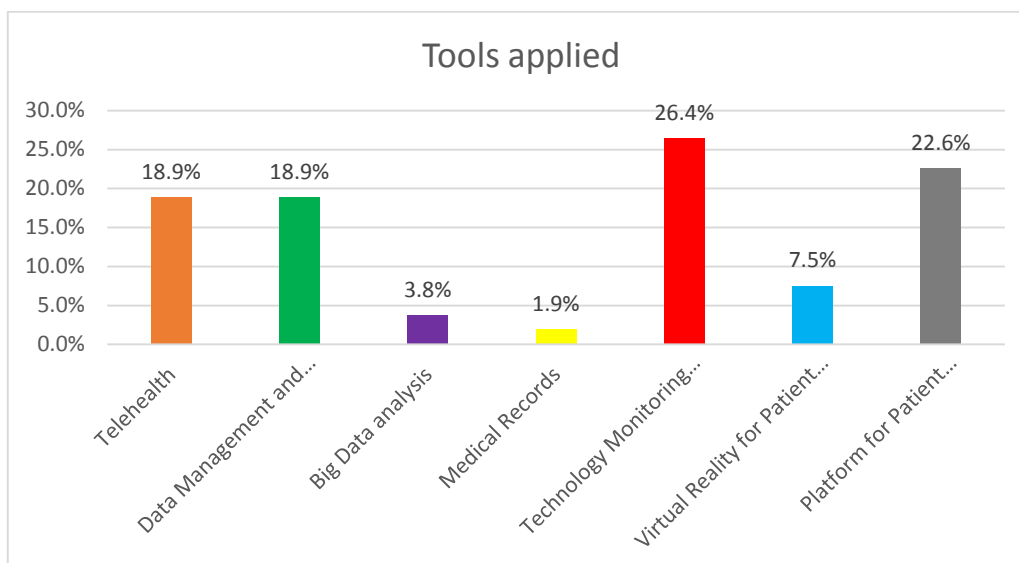




The results showed the participants were 50, most of them 86% male, and 14% female, most of them 74% aged from 25 – 35 years, 10% less than 25 years, and 16% from 36 – 45 years, most of them 48% their experience years less than 5 years, 36% from 5 – 10 years, 12% from 11 – 15 years, and 4% more than 15 years, and most of them 68% had bachelor, 24% diploma, and 8% master

**Table 2: Digital Transformation Tools Applied In Workplace**

No	Tools applied	N	%
1	Telehealth	20	18.9%
2	Data Management and Patient Analytics	20	18.9%
3	Big Data analysis	4	3.8%
4	Medical Records	2	1.9%
5	Technology Monitoring Health	28	26.4%
6	Virtual Reality for Patient Treatment	8	7.5%
7	Platform for Patient Interaction	24	22.6%



The results showed the digital transformation tools applied in workplace was (Technology Monitoring Health) (26.4%), followed by (Platform for Patient Interaction) (22.6%), followed by (Telehealth) and (Data Management and Patient Analytics) (18.9%), followed by (Virtual Reality for Patient Treatment) (7.5%), followed by (Big Data analysis) (3.8%), followed by (Medical Records) (1.9%)

**Table 3: Reliability**

No	Domains	No. items	Cronbach's Alpha
1	Digital transformation	10	0.913
2	Efficiency of workers	10	0.973
3	The questionnaire	20	0.968

The results showed the Cronbach's Alpha between 0.913 and 0.973, and the general reliability for the questionnaire 0.968, which mean that the tool of the study (questionnaire) have high reliability

**Table4: Mean range of Likert scale**

Mean range	Scale	Interpretation
1 – 1.8	1	Very low
1.81 – 2.60	2	Low
2.61 – 3.40	3	Moderate
3.41 – 4.20	4	High
4.21 - 5	5	Very high

**Table 5: Distributions of Reponses of Digital Transformation**

No	items	Srongly agree	Agree	Neutral	Disagree	Strongly disagree	mean	SD



1	we can do data analytics on population health and integrate it into budgeting, forecasting and capital needs	21	19	10	0	0	4.22	0.76
		42%	38%	20%	0%	0%		
2	We have a platform where people can reach us	19	25	3	2	1	4.18	0.87
		38%	50%	6%	4%	2%		
3	We train most of our staff through short video excerpts or modern digital applications	11	29	5	4	1	3.90	0.91
		22%	58%	10%	8%	2%		
4	we have Virtual waiting rooms with educational or revenue-generating advertising content	12	28	4	4	2	3.88	1.00
		24%	56%	8%	8%	4%		
5	We have a record of patient visits to follow up on their visits to the hospital	22	23	3	2	0	4.30	0.76
		44%	46%	6%	4%	0%		
6	there are electronic Payment portals	16	10	10	14	0	3.56	1.21
		32%	20%	20%	28%	0%		
7	we have Integration with electronic medical record systems	15	26	5	4	0	4.04	0.86
		30%	52%	10%	8%	0%		
8	the system has Data security and privacy compliance	21	21	6	2	0	4.22	0.82
		42%	42%	12%	4%	0%		
9	We use digital technology to improve the performance and value of our existing products and services	19	21	6	4	0	4.10	0.91
		38%	42%	12%	8%	0%		
10	We use digital analysis tool to make better operational decisions	18	23	7	2	0	4.14	0.81
		36%	46%	14%	4%	0%		
Total mean							4.05	0.68



The results showed the digital transformation level was high with mean = 4.05, about the items the most agreement item was (We have a record of patient visits to follow up on their visits to the hospital) with very high agreement and mean 4.30, followed by (the system has Data security and privacy compliance) and (we can do data analytics on population health and integrate it into budgeting, forecasting and capital needs ) with very high agreement and mean 4.22, followed by (We have a platform where people can reach us) with high agreement and mean 4.18, followed by (We use digital analysis tool to make better operational decisions) with high agreement and mean 4.14, followed by (We use digital technology to improve the performance and value of our existing products and services) with high agreement and mean 4.10, followed by (we have Integration with electronic medical record systems) with high agreement and mean 4.04, followed by (We train most of our staff through short video excerpts or modern digital applications) with high agreement and mean 3.90, followed by (we have Virtual waiting rooms with educational or revenue-generating advertising content) with high agreement and mean 3.88, followed by (there are electronic Payment portals) with high agreement and mean 3.56

**Table 6: Distributions of Reponses of Efficiency of Workers**

No	items	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	mean	SD
1	The employees complete the work according to the required instructions easily and smoothly	23	18	9	0	0	4.28	0.76
		46%	36%	18%	0%	0%		
2	Employees complete work in a timely manner while maintaining quality	22	21	7	0	0	4.30	0.71
		44%	42%	14%	0%	0%		
3	The staff is quick to solve customer problems	24	18	6	2	0	4.28	0.83
		48%	36%	12%	4%	0%		
4	Employees are keen on increasing their level of performance today for business	21	18	4	6	1	4.04	1.09
		42%	36%	8%	12%	2%		
5	Employees initiate suggestions and solve problems	20	19	4	6	1	4.02	1.08
		40%	38%	8%	12%	2%		
6	Employees use all the resources available to them without wasting those resources	20	13	12	5	0	3.96	1.03
		40%	26%	24%	10%	0%		
7	The employees have knowledge and	20	21	8	0	1	4.18	0.85
		40%	42%	16%	0%	2%		



	familiarity with the nature of their work							
8	Employees have the ability to take action	22	15	10	2	1	4.10	0.99
		44%	30%	20%	4%	2%		
9	Important decisions and take responsibility for them	24	17	9	0	0	4.30	0.76
		48%	34%	18%	0%	0%		
10	Employees succeed in team work	22	20	6	2	0	4.24	0.82
	Total mean						4.17	0.81

The results showed the efficiency of workers level was high with mean = 4.17, about the items the most agreement item was (Employees complete work in a timely manner while maintaining quality) and (Important decisions and take responsibility for them) with very high agreement and mean 4.30, followed by (The employees complete the work according to the required instructions easily and smoothly) and (The staff is quick to solve customer problems ) with very high agreement and mean 4.28, followed by (Employees succeed in team work) with very high agreement and mean 4.24 followed by (The employees have knowledge and familiarity with the nature of their work) with high agreement and mean 4.18, followed by (Employees have the ability to take action) with high agreement and mean 4.10, followed by (Employees are keen on increasing their level of performance today for business) with high agreement and mean 4.04, followed by (Employees initiate suggestions and solve problems) with high agreement and mean 4.02, followed by (Employees use all the resources available to them without wasting those resources) with high agreement and mean 3.96.

Table 7: The Effect of Development of Digital Transformation on Raising the Efficiency of Workers (Regression Analysis)

R	0.837		
R <sup>2</sup>	0.695		
F	112.479		
p-value	0.000		
Independent	β	t	p-value
Digital transformation	1.005	10.606	0.00

The results showed that the model of regression between efficiency of workers as dependent variable and digital transformation as independent variable was fit where F = 112.479, and p-value < 0.001, and there is strong positive relationship between digital transformation and the efficiency of workers( r= 0.837), and the change occurred in the efficiency of workers explained by 69.5% due to digital transformation(R<sup>2</sup> = 0.695), and the effect is significant (t= 10.606, p-value < 0.001), and when digital transformation increase by 1 unit the efficiency of workers increase by 1.005( β = 1.005)



The results showed the digital transformation tools applied in workplace was (Technology Monitoring Health) , followed by (Platform for Patient Interaction), followed by (Telehealth) and (Data Management and Patient Analytics), followed by (Virtual Reality for Patient Treatment) , followed by (Big Data analysis), followed by (Medical Records), the digital transformation level was high, the efficiency of workers level was high, there is strong positive relationship between digital transformation and the efficiency of workers, and the change occurred in the efficiency of workers explained by 69.5% due to digital transformation, and the effect is significant, and when digital transformation increase by 1 unit the efficiency of workers increase by 1.005

### **Ethical issues**

No primary study will be included in this review. There fore no ethical considerations should be taken. Although it will be passed the university ethics sub-group.

## **4. DISCUSSION**

Rajnish Latoria and Prateek Pandey [2020] to assess the social and technical issues that large-scale, comprehensive health care delivery faces and to suggest a technological solution that will benefit society as a whole. The National Health Policy of India is examined in this study (2017). Arogya Chain, a technology based Blockchain solution to remove roadblocks in the implementation of health policies, is being proposed after the social and technological barriers are discussed. Scalability is the primary issue with the implementation of blockchain health services on such a large scale.

We tested a blockchain and discovered that system throughput depends on the number of special nodes called ordering nodes. A compromise is needed to balance system tolerance and time-to-commit tolerance. The digital landscape is constantly evolving for manufacturers. Rapidly evolving consumer expectations, networked devices, and technological advancements in neighbouring industries all cause change to spread throughout the supply chain (Ghobakhloo, 2018). Organizations, their suppliers, customers, and other third parties are already feeling the effects of the digital transformation in manufacturing.

Businesses could undergo a total transformation thanks to digital transformation. For instance, real-time insights can help with the monitoring, resolving, and even foretelling of issues to optimise machinery lifecycles (Paschou et al., 2017). This guarantees uninterrupted operations and zero disruptions. A digital transformation plan lays the foundation for a thorough optimization strategy because innovation breeds innovation. The term "industry 4.0" describes a trend in which industrial factories and traditional manufacturing are combined with digital technology. Industry 4.0, also referred to as "the fourth industrial revolution," has as its main objective the automation of manufacturing processes to the point where all operations are automated and controlled in real-time (Xing et al., 2021). IoT is one of the primary technologies of Industry 4.0. An interconnected system of physical objects known as the Internet of Things (IoT) uses both internally generated data and data obtained from external sources to communicate. It may result in more features, advantages, and benefits for manufacturers. The



most prevalent IoT use cases are in operations, asset management, and personnel management (West et al., 2021).

For instance, manufacturers can implement preventative maintenance plans with real-time monitoring, improve energy efficiency and working conditions using smart air management, risk management, worker productivity, and other techniques (Xia et al., 2020). Several stages of the manufacturing process can make use of a digital twin technology. Starting off, a digital twin makes it possible to monitor a manufacturing component, asset, system, or process in real-time (Bao et al., 2019). A deeper understanding of what's happening on your production lines and throughout the manufacturing process is made possible by these improved monitoring capabilities (Abdulmotaleb, 2018).

At the component level, one specific, essential manufacturing component is the focus. creating a digital twin at the asset level of a single piece of machinery within a production line. A digital twin can be used to track and improve an entire production line at the system level. Everything from product and process design to development to manufacturing and production is examined at the process level (He & Bai, 2021). However, the success of these new corporate operating models depends on effective cybersecurity and data privacy. A quick and long-lasting strategy for addressing the cyber hygiene principles is needed to secure core business (Corallo et al., 2020). Failure to do so will fundamentally impair future trading capabilities and market position, as well as negatively affect consumer and institutional confidence.

## 5. CONCLUSION

This review demonstrates that digital transformation will increase the efficiency of performance of medical devices' workers and show the type of digital transformation that affect on healthcare industry. Therefore, the study provides information about:

- Types of digital transformation and which type is effective in health care industry.
- The role of digital transformation development in raising workers performance.

### Schedule

The proposal, ethical review, and execution of the project take almost seven months. The electronic database search take up the majority of the time. The following GANTT chart shows the significant turning points. The Harvard referencing style was be used for all references.

Task/ Timeline	Nov-22	DEC-22	Jan-23	Feb-23	March-23	April-23	May-23
Starting proposal							
Making questions for digital and paper questionnaires							



Research Strategy							
Ethical approval							
Submitting project proposal							
Conducting questionnaires and methodology							
Data Collection							
Data analysis and finding							
First draft submission							
Tutor comments and feed back							
Adjustment and enhancement							
Final submission							

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**Development of Digital Transformation in Raising the Efficiency of Workers in Medical Devices:**

Gender:

	Male
	Female

Age:

	Less than 25 years
	From 25 – 35 years
	From 36 – 45 years
	More than 45 years

Educational level:

	Diploma
	Bachelor
	Master
	PhD

Experience years:

	Less than 5 years
	From 5 – 10 years
	From 11 - 15
	More than 15 years

What are types of digital transformation applied in your workplace? (You select more than one):

	Telehealth
	Data Management and Patient Analytics
	Big Data analysis
	Medical Records
	Technology Monitoring Health
	Virtual Reality for Patient Treatment
	Platform for Patient Interaction

		Srongly agree	agree	Neutral	disagree	Strongly disagree
N	<b>digital transformation</b>					
1	we can do data analytics on population health and integrate it into					



	budgeting, forecasting and capital needs					
2	We have a platform where people can reach us					
3	We train most of our staff through short video excerpts or modern digital applications					
4	we have Virtual waiting rooms with educational or revenue-generating advertising content					
5	We have a record of patient visits to follow up on their visits to the hospital					
6	there are electronic Payment portals					
7	we have Integration with electronic medical record systems					
8	the system has Data security and privacy compliance					
9	We use digital technology to improve the performance and value of our existing products and services					
10	We use digital analysis tool to make better operational decisions					
	<b>the efficiency of workers</b>					
1	The employees complete the work according to the required instructions easily and smoothly					
2	Employees complete work in a timely manner while maintaining quality					
3	The staff is quick to solve customer problems					
4	Employees are keen on increasing their level of performance today for business					
5	Employees initiate suggestions and solve problems					
6	Employees use all the resources available to them without wasting those resources					
7	The employees have knowledge and familiarity with the nature of their work					
8	Employees have the ability to take action					



	Important decisions and take responsibility for them					
9	Employees succeed in team work					
10	Employees are keen on public goals					