

DETERMINANTS OF DIGITAL HEALTHCARE INFORMATION TECHNOLOGY ADOPTION IN ACCREDITED TERTIARY HOSPITALS

A thesis submitted in February 2024 to the University of Hyderabad in partial
fulfillment for the award of the

Doctor of Philosophy

Degree in

School of Management Studies

by

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CERTIFICATE

This is to certify that the thesis entitled **Determinants of Digital Healthcare Information Technology Adoption in Accredited Tertiary Hospitals** submitted by **NEERAGATTI SURYA NARAYANA** bearing registration number **19MBPH14** in partial fulfilment of the requirements for the award of Doctor of Philosophy in the School of Management Studies is a bonafide work carried out by him under my supervision and guidance.

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- Asia Pacific Journal of Health Management (ISSN 2204-3136 (online); ISSN 1833-3818 (print))
- Asia Pacific Journal of Information Systems (ISSN 228-6818 (online); ISSN 2288-5404 (print))

and

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- Software Product Management Summit India 2023 IIM Bangalore
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- The 2nd International Healthcare Management Conference 2022”

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DECLARATION

I, **Neeragatti Surya Narayana**, hereby declare that the thesis entitled **“Determinants of Digital Healthcare Information Technology Adoption in Accredited Tertiary Hospitals”** submitted by me under the supervision of Dr. Ranjit Kumar Dehury is a bonafide research work for the award of a Doctor of Philosophy degree in School of Management Studies, University of Hyderabad. I also declare that this work is original and free from plagiarism and has not been submitted in part or full for the award of any degree or diploma to this University or any other university or Institution.

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STATEMENT OF GRATITUDE

I would like to express my deepest gratitude and thanks at this juncture to all the people who extended their support and encouragement for the accomplishment of this research work for my Ph.D. degree. Here, I utilize the opportunity to thank each one of them.

First, thanks to my research supervisor Dr. Ranjit Kumar Dehury, who extended tireless support and guidance for my research work's smooth learning and completion. His expertise always inspired me to pursue innovative learning and teaching. His generous evaluation and feedback for writing research dissertations and papers are commendable and made me produce this research work. Apart from his profession, he is a very kind personality who is always ready to assist and help.

I would like to express my thanks to the Doctoral Research Committee –Prof. G. V. R. K. Acharyulu, Dr. P. Murugan and Dr. Punam Singh for the assessment of my research work.

Special thanks to Prof. G. V. R. K. Acharyulu, a great source of motivation and knowledge. I would also like to thank all other faculty members of the school of Management Studies (SMS-UoH).

I would like to thank the non-teaching staff of the school.

I would like to thank ICSSR for granting me the Doctorial Fellowship (File no: RFD/2021-22/SC/MGT/12) for carrying out my research work. This fellowship is really helping financially the downtrodden communities like Schedule Caste people to pursue Higher Education.

I would like to thank fellow scholars and friends for their great support in my PhD life. I would like to thank my family. First, my parents (Late) Smt. Duggemma Neeragatti and Shri Veeraswamy Neeragatti know the value of education without having it. They encouraged, motivated, and supported me without sharing their struggle to pursue my education.

Surya Neeragatti

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ACRONYMS AND ABBREVIATIONS

DHIT	Digital Healthcare Information Technology
EHR	Electronic Health Records
CDSS	Clinical Decision Support Systems
RPM	Remote Patient Monitoring
HIE	Health Information Exchange
PHR	Personal Health Record
NABH	National Accreditation Board for Hospitals and Healthcare Providers
ABDHM	Ayushman Bharat Digital Health Mission
NDHE	National Digital Health Ecosystem
IMS	Information Management System
ABHA	Ayushman Bharat Health Account
HPR	Healthcare Professionals Registry
HFR	Health Facility Registry
UHI	Unified Health Interface
ICT	Information and Communication Technology
UTAUT	Unified Theory of Acceptance and Use of Technology
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
MM	Motivational Model
TPB	Theory of Planned Behavior
C-TAM-TPB	Combined TAM-TPB
MPCU	Model of PC Utilization
IDT	Innovation Diffusion Theory
SCT	Social Cognitive Theory
EMR	Electronic Medical Records
TJP	Type of Job Position
S-CI	Sensor-Cloud Infrastructure
CPOE	Computerized Physician Order Entry
PACS	Picture Archiving and Communication Systems
HIT	Health Information Technology
IoT	Internet of Things

Notations

%	Percentage
H	Hypothesis
α	Cronbach's Alpha
β	Standardized Beta Coefficient
P-Value	Probability value of significant level
T-Value	t-statistic
F ²	Effect Size
Q ²	Predictive Relevance
R ²	Coefficient of Determination

CHAPTER - 1

INTRODUCTION

1. Introduction

This chapter introduces the impact of technology on healthcare, flow of patient health information within hospital systems, flow of data in digital healthcare information technology (DHIT), digital health technologies in India, and importance of National Accreditation Board for Hospitals and Healthcare Providers (NABH) in patient data maintenance. At last, this chapter through light on the existing challenges in implementation of DHIT. The chapter also justify the need of the study for further inquiry about the utilization of digital technology for agile healthcare system.

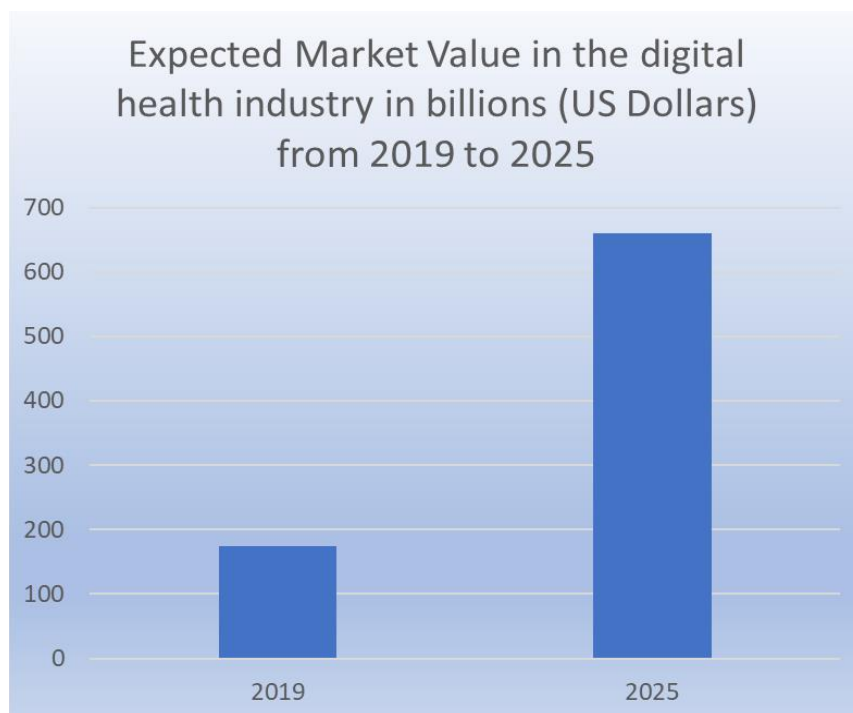
1.1 Technology and Healthcare

Integration of technology and healthcare has been increased in the new era of healthcare services delivery, which is characterized by increased accessibility, improved quality, and patient-centred care. These digital technologies in healthcare industry experienced significant transformations, resulting in streamlining processes, increasing efficiency, and improving patient outcomes (Enaizan et al., 2020). The integration has not only addressed long-standing challenges within healthcare systems but has also paved the way for innovative solutions that optimize the delivery of care (Abdekhoda et al., 2016). These technologies have revolutionized the patient care flow, resulting in a smoother and more efficient healthcare experience (Hassan et al., 2019). According to a research (Statista Research Department (2022), the global digital health market was valued

at \$175B in 2019 and is expected to reach \$660B by 2025 (see Figure.1). Investment in the industry has grown significantly, with over \$21B invested in 2020 compared to \$1B in 2010(2022). Due to COVID-19 pandemic use of telemedicine has accelerated, and the use of patient-owned health data is seen as a major trend.

Figure 1

Expected growth of Global Digital Health Market (created by author)



Technology interventions have enhanced the effectiveness of patient care, leading to improved outcome and better overall healthcare delivery. Konduri et al., (2018) emphasized the role of digital health technologies in promoting access to medicines and essential pharmaceutical services, which are key to realizing SDG3. They emphasized that as we march towards the target year for achievement of SDG 2030, the ability to gather and analyze data effectively using digital health technologies will be pivotal in achieving the UN's SDG3. Refaee & Fayed, (2000) underscores the significance of a multidisciplinary approach to

healthcare technology, encompassing disease management, information technology, and medical engineering, to achieve the goal of "health for all." Revolutionary changes has occurred in various aspects human life due to technology, and healthcare is one of the area that has gained tremendously. In recent years, numerous studies explored the impact of technology on healthcare delivery, quality, and patient outcomes.

1.1.1 Enhancing Healthcare Quality

Various studies indicate that the integration of technology in healthcare has huge advantageous impacts on the quality of medical services. Evidences found that health information technology (HIT) and electronic health records (EHR), has a positive influence on hospitals and healthcare processes (Lopo et al., 2020). The adoption of technology resulted in increased healthcare quality, particularly in the fields of diagnosis and patient monitoring (Okpala, 2018). Utilization of computerized physician order entry and electronic health records help in a significant way in the improvement in quality measures (Mccullough et al., 2010). Pertile's (2006) comprehensive literature review examined the underlying mechanisms of the diffusion of new healthcare technologies and their implications, which suggest that specific characteristics of diseases and technologies play a crucial role. There is also a need for health care practitioners to adjust workflows and adapt different documentation methods post-implementation. These findings emphasize that the adoption of technology in healthcare is having positive effects on the quality of care, which necessitates the development of strategies to manage costs associated with technological implementation while ensuring the effectiveness.

1.1.2 Accessible and Efficient Healthcare Delivery

Previous studies suggest that technology adoption has a significant impact on healthcare delivery. There are benefits of digital technologies in healthcare, including improved delivery of health services, better quality control, and lower costs (Osipov & Skryl, 2021). A study proposes a framework for managing the importance of medical decision-making in familiarizing new technology in the workplace (Wong et al., 2021). Geisler (2007) investigates healthcare delivery reorganization due to recent changes in the medical technology. He looked into managed-care, integration, and strategic alliances as major components of technology induced changes in healthcare delivery. According to Ashrafi et al., (2014) business intelligence is playing an important role in healthcare delivery in the United States. It helps in decision-support capabilities particularly collecting and analyzing data from multiple sources of effective care delivery. The technology adoption has led to significant changes in healthcare delivery, with digital technologies and decision-support capabilities playing a key role in improving quality of care and reducing costs. One of the main advantages of technology in healthcare is its capacity to offer services to patients at any time, from anywhere. Negash et al., (2018) discuss how healthcare information technology enables the potential provision of services beyond geographical limitations, which create accessibility of healthcare for masses. This is particularly valuable in remote or underserved areas. Additionally, the use of mobile technology is highlighted by Drayton & Robinson, (2014) on streamlining healthcare delivery. These technologies allow for efficient communication and information exchange between healthcare professionals and patients.

1.1.3 Patient Engagement and Empowerment

Digital technology significantly influences the dynamics of patient-provider interactions. A systematic review demonstrated that technology has the capacity to enhance access to healthcare and augment patient satisfaction (ElKefi & Asan, 2021). Conversely, another research revealed that technology can yield both positive and negative impacts on patient compliance (Planel-Ratna & Juwaheer, 2021). A study reported that technology can foster improved rapport and communication between patients and healthcare providers (Parish et al., 2017). Further, the findings suggest that technology can empower patients and enhance knowledge on health (Boucher, 2010). Also, these studies explore the role of digital technologies in fostering patient engagement and facilitating shared decision-making (Weinhold & Gastaldi, 2015). This evidence suggests that healthcare providers can draw lessons from other industries to enhance patient engagement through the utilization of digital technology. Harahap et al., (2022) underscores the significance of patient engagement in the digital transformation of healthcare, while also acknowledging that limited health literacy and the presence of unreliable online medical information can impede patient engagement. Technology is having potential to enhance patient-provider interactions, provided that its implementation is well-structured and purposefully targeted to achieve effectiveness. Technology plays a pivotal role in engaging patients and empowering them in their healthcare journey. These studies emphasize that technology-based interventions enable consumer engagement in care management, integration of physical and mental healthcare, and real-time access to personalized health information. Patients can actively participate in decision-making, access to educational resources, and manage their health behaviors

through self-directed tools. This fosters a sense of empowerment, improves patient satisfaction, and promotes better health outcomes.

1.1.4 Improved Clinical Decision-Making:

Integration of digital technology has diverse impact on clinical decision-making process. Briggs et al., (2022) underscore the beneficial impact of digital healthcare technologies (DHT), including chatbots, artificial intelligence, virtual reality, videoconferencing, wearables with network capabilities, smartphone applications, and web-based communication platforms, on improving the quality and accessibility of healthcare. The applications like Clinical decision-support in the healthcare industry have more potential due to the growing importance of smartphone apps which are helping in data-driven clinical decision-making, as reported by Halilaj et al., (2021). The effects of digitalization and technology on patient compliance in healthcare services reveals positive and negative influences on patient compliance (Planel-Ratna & Juwaheer, 2021). Vallo Hult et al., (2020) find that there is correlation between physicians' actual utilization of information and communication technology (ICT), and perceived performance, social influence, and organizational context, which highlight the need for effective integration of ICT into continuous professional development (CPD) and clinical work. The clinical decision support (CDS) systems, often embedded within EHRs, which could enhance clinical decision-making by providing specific actionable recommendations, reducing medication errors, and improving the accuracy and ensuring comprehensive documentation (Sharma & Aggarwal, 2016). The significance of evidence-based CDS models help in guiding patient care, which is evident from studies showing CDS interventions implemented in EHRs can effectively alter physician practices in terms of process outcomes like adherence

to guidelines (Rosenzweig et al., 2023). Overall, the researchers suggest that digital technology has the potential to enhance clinical decision-making; however, it is crucial to address the accompanying challenges and pitfalls. The integration of technology into healthcare systems has the potential to enhance clinical decision-making processes. It is critical that healthcare practitioners have access to evidence-based guidelines, real-time patient data, and alerts for possible hazards or interactions when integrating technology and established behaviour modification strategies for decision assistance in clinical practice. Healthcare personnel can improve patient care and safety by using technology to help them make better decisions.

Collectively, It has been demonstrated the importance of technology in healthcare. Technology has a significant impact on how healthcare would develop in the future, helping to improve clinical decision-making, empower patients, and increase accessibility and quality of care. In order to optimise healthcare delivery, improve patient outcomes, and establish a patient-centered, technologically advanced healthcare system, it is vital that healthcare organisations and policymakers embrace and harness the potential of technology.

1.2 Flow of Digital Health Information in Hospitals

Research suggests that the improvement of patient health information flow inside hospital systems can be accomplished by implementing workflow information management, information exchange, patient flow exploration, and integrated health information systems. Fidia Ardiani et al., (2022) underscores the significance of providing medical officers with digital access to patient data, enabling efficient tracking of information over time. Sanner & Øvreliid, (2020)

emphasizes the necessity of information transparency, the collaborative efforts of dedicated coordinators, and regular coordinative meetings to establish legitimacy of workflow information in practice. Domova & Sander-Tavallaey, (2019) discusses the development of a web-based portal that facilitates interactive analysis of patient flow data, assisting hospital authorities in optimizing service quality and timeliness. The importance of electronic recording, managing, governing, regulating, linking through a master index, and making information available to users through interconnected software applications to ensure successful information flow is to be recognised (Meaker et al., 2018). We can state that the use of integrated health information systems, workflow information management, patient flow exploration, and information exchange are necessary to improve the flow of patient health information inside hospital systems.

1.3 Integration of Patient Journey and Digital Healthcare Information Technology

In digital healthcare, the integration of the patient journey with digital healthcare information technology (DHIT) is becoming increasingly important. This integration aims to streamline patient care, improve health outcomes, and enhance patient experiences.

The journey of patients starts from interaction with the healthcare system, followed by registration, discharge, and follow-up. Every stage of this journey involves collection, storage, and use of a significant amount of data.

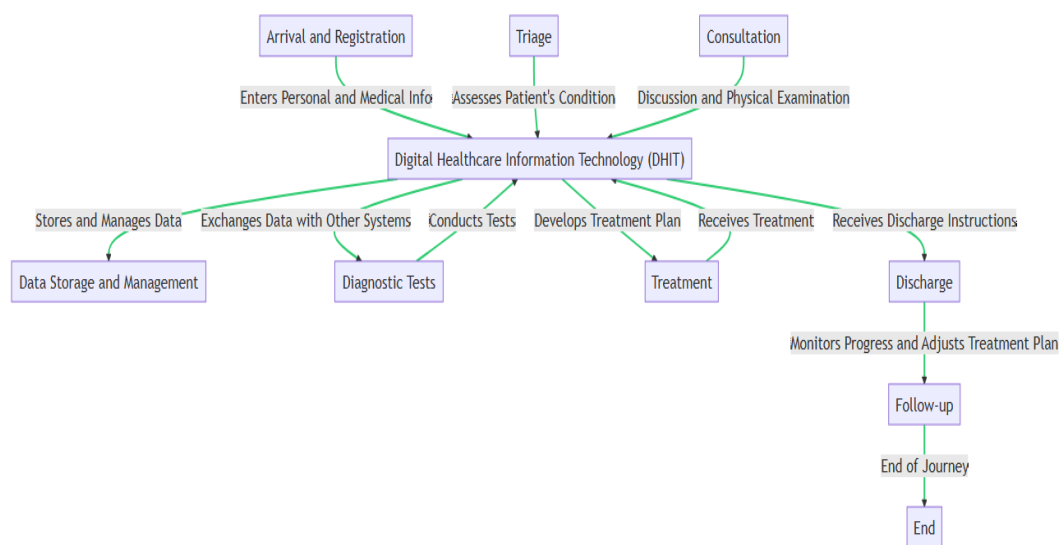
DHIT refers to the systems or technologies and tools used to create and manage this data. These technologies facilitate the collection of patient information and support decision-making for healthcare providers by enabling communication

between different departments or healthcare facilities, and allow patients to access their own health information.

The combination of patient's journey with DHIT means that at each stage of the patient's interaction with the healthcare system, digital technologies are used to enhance care (see Figure.2). For example, during registration, digital systems are used to collect and store patient information for provision of quality services. In the stage of consultation and treatment, these systems support healthcare providers in taking informed decisions. After discharge the digital technologies enable efficient follow-up care to a great extent.

Figure 2

The Flow of Patient in hospital



- *Arrival and Registration:* In this patient arrives at the hospital and registers, providing their personal information and reason for visit. This information is entered into the Digital Healthcare Information Technology (DHIT) system.

- *Triage:* It is an important stage where nurse assesses the patient's condition to determine the urgency of their need for care. This information is also entered into the DHIT.
- *Consultation:* In this stage the patient is seen by a healthcare provider by discussing symptoms, medical history, and possibly a physical examination. This information is recorded in the DHIT.
- *Diagnostic Tests:* In the process of diagnosis of a disease the provider orders diagnostic tests, and the patient is sent to appropriate department for these tests. The test results are returned electronically and stored in the DHIT.
- *Treatment:* In this stage the patient receives the prescribed treatment. The details of the treatment are recorded in the DHIT by doctors.
- *Discharge:* The patient is discharged from the hospital. Their discharge instructions, including the prescribed medications and follow-up appointments are recorded in the DHIT and provided to the patient electronically.
- *Follow-up:* After the discharge the patient has to be available for follow-up appointments, either in person or via telemedicine. The details of these appointments are recorded in the DHIT.

This combination of patient journey and digital health information flow has several benefits. It can help in the process of accurate diagnoses, effective treatments, and improved health outcomes. It can also enhance the patient experience, by making interactions with the healthcare system more efficiently and devoid of stress for the workforce. Finally it would usher operational efficiencies for healthcare providers by reducing paperwork and facilitating communication.

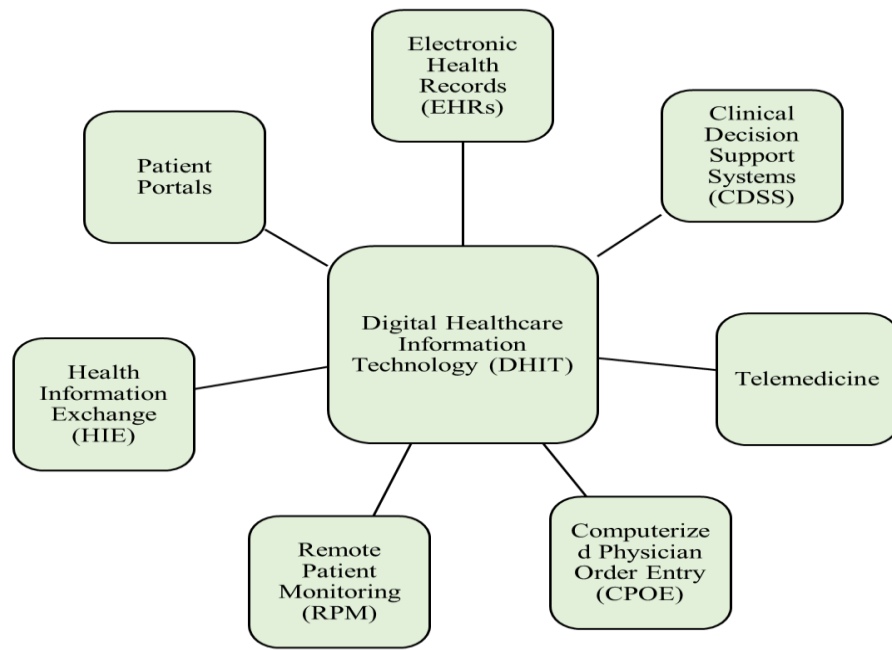
However, the integration of patient journey with DHIT also presents challenges. These include ensuring the security and privacy of patient data, managing the cost of implementing and maintaining digital systems, and training healthcare providers to use these systems effectively. Despite these challenges, the integration of the patient journey with DHIT is a key trend in the healthcare industry, and is likely to continue to shape the future of healthcare.

1.4 Different Digital Healthcare Technologies

Digital health technologies constituted with a wide array of tools that enhance healthcare outcomes, such as telemedicine, remote patient monitoring, mobile health apps, data analytics, and social networking (Lowery, 2020). These technologies have revolutionized the communication and accessibility of health information for both patients and providers, overcoming the traditional barriers of distance, location, and time. However, lack of a clear definition for digital health poses challenges for research, policy, and practice in this domain. Nonetheless, the potential of digital health tools to monitor and promote healthy behaviors at scale, in a cost-effective manner, continues to expand, and improved evaluation methods will likely bolster clinician confidence in utilization (Pelly et al., 2023). Digital health technologies present novel opportunities to address critical challenges, enhance the connection between patients and healthcare providers, and integrate patient input throughout the entire patient flow.

Figure 3

Different types of Digital Healthcare Information Technologies



The diagram (see Figure.3) provides a bird's eye view of various digital health technologies that contribute to the broader ecosystem of Digital Healthcare Information Technology (DHIT). At the centre of this ecosystem is DHIT, serving as the nucleus around which the other technologies revolve, signifying their integral role in contemporary healthcare settings.

- *Electronic Health Records (EHRs)*: EHRs serve as digital versions of patients' paper charts, storing critical health information over time. They provide real-time access to patient histories, treatment plans, and test results, making them an invaluable tool for decision-making and continuity of care.

- *Clinical Decision Support Systems (CDSS)*: These systems are designed to aid healthcare providers in decision-making tasks, offering patient-specific assessments or recommendations to enhance patient care.
- *Telemedicine*: This technology enables remote patient care, consultation, and treatment via digital communication platforms. It is a critical component of healthcare delivery, particularly in reaching remote or underserved communities.
- *Computerized Physician Order Entry (CPOE)*: A system that enables physicians to electronically prescribe medications, tests, and procedures, eliminating errors due to handwriting or transcription and improving efficiency.
- *Remote Patient Monitoring (RPM)*: By enabling medical personnel to keep an eye on patients outside of traditional clinical settings, such as at home, this technology improves access to care while lowering the cost of providing it.
- *Health Information Exchange (HIE)*: HIEs allow health information to be electronically shared between various healthcare facilities. They can greatly increase patient care's efficiency, security, and calibre.
- *Patient Portals*: These platforms provide patients with access to their personal health data, appointment scheduling, communication with healthcare providers, and more, promoting patient engagement and ownership over their health.

Each of these technologies is interconnected through DHIT, collectively contributing to improved patient care, efficient healthcare delivery, and better health outcomes. This digital transformation is rapidly reshaping the

landscape of the healthcare sector, placing information technology at the heart of patient care.

1.5 Digital Healthcare Information Technologies in India

In the Indian context, e-health encompasses various aspects, such as the interaction between patients and healthcare service providers, data transmission between institutions, and peer-to-peer communication among patients and medical professionals. Al Dahdah & Mishra, (2023) explored the incorporation of digital technologies in India's universal health coverage initiative, *Rashtriya Swasthya Bima Yojana*, and raises inquiries regarding the influence of digital health policies on private health markets. According to Cheung et al., (2019), performance expectations, social influence, and trust are important elements that influence consumers' propensity to embrace and use healthcare applications for personal medical services. Kataria et al., (2022) investigates into the potential of technology in enhancing healthcare accessibility in India, particularly for rheumatology patients. Reports confirm about the commitment of India to harnessing digital health as an intervention to strengthen the healthcare system, which has been evident from the implementation of National Digital Health Mission. Digital health technologies are being utilized in India to enhance healthcare accessibility and improve the health system. However, they also inquire details about the potential impact on private health markets and the necessity of thoughtful consideration during implementation of digital health projects.

1.5.1 Ayushman Bharat Digital Health Mission (ABDHM)

An important step in the digital transformation of healthcare services in India is the August 2020 launch of the “*Ayushman Bharat Digital Health Mission*

(ABDHM)” by the Indian government. Through the National Digital Health Ecosystem (NDHE), the ABDHM aims to create a comprehensive digital infrastructure with the goal of obtaining universal health coverage. This ambitious initiative capitalizes on the power of Digital Healthcare Information Technologies (DHIT) to revolutionize healthcare delivery and ensure equitable access to quality care for all citizens of India. This work investigates the implementation of DHIT in India and its role in paving the way for the successful implementation of the ABDHM. Further, the mission focus on digitalization of medical records and the seamless sharing of patient data across hospitals.

One important initiative to guarantee the use of DHIT in hospitals throughout India is the Ayushman Bharat Digital Mission (ABDM). A primary objective is to incorporate contemporary technologies with accessible data and artificial intelligence, a concept sometimes referred to as "Health 4.0"(Ajmera & Jain, 2019).

The Indian healthcare system recognized for its high potential for integration of digital technologies to address the challenges for providing accessible and efficient healthcare services to diverse population. The implementation of DHITs in India provided groundwork for the ABDHM by establishing a foundation for the digitalization of healthcare services. DHITs encompass a range of technologies, including electronic health records (EHRs), health information exchanges (HIEs), telemedicine, and mobile health applications, all of which contribute to the digitization and interoperability of medical records.

One of the key components of the ABDHM is the creation of a centralized repository of health records, accessible to healthcare providers across the country.

DHITs have enabled the digitalization of medical records, replacing traditional paper-based systems with electronic formats. This transition has streamlined the storage, retrieval, and sharing of patient data, eliminating the inefficiencies associated with physical records and reducing the risk of errors in data entry and management. In addition to enabling remote access to patient data, the digitization of medical records has helped healthcare providers make better decisions and guarantee continuity of care, especially in isolated or less-served locations.

The Ayushman Bharat Digital Health Mission (ABDHM) is a significant initiative in India's healthcare sector. Ganesan, (2022) discusses the importance of informed consent in a digitized health ecosystem, which is a crucial aspect of the ABDHM. They put out a framework for the interchange of health data that strikes a compromise between personal freedoms and data science advancements. In order to help healthcare administrators and decision-makers, Ajmera & Jain (2019) identified fifteen obstacles to the adoption of Health 4.0 in the Indian healthcare sector. This model could be instrumental in addressing the challenges in implementing the ABDHM. Chandra & Patwardhan, (2018) discuss the role of Allopathic and AYUSH practitioners in rural India, advocating for a system of trained medical auxiliaries. This approach could be beneficial in the context of the ABDHM, which aims to improve healthcare accessibility in rural areas. Prinja et al. (2018) provide insights into the cost-effectiveness of implementing mHealth interventions in healthcare, which is a key component of the ABDHM. Establishing an inclusive, efficient, and integrated national digital health ecosystem is the goal of ABDHM. These studies collectively provide a comprehensive understanding of the ABDHM and its implications for the healthcare sector in India. Below are the components of ABDHM

- ABHA Number: A unique identification number assigned to individuals for identifying them across healthcare providers.
- Healthcare Professionals Registry (HPR): A comprehensive database of medical specialists who work in both conventional and modern medical systems.
- ABHA Mobile App (PHR): An electronic record of health-related data for individuals is called a Personal Health Record (PHR).
- Health Facility Registry (HFR): A thorough database of medical facilities from various medical systems.
- Unified Health Interface (UHI): An open protocol for digital health services, providing a platform for various digital interactions between patients and healthcare service providers.

1.6 National Accreditation Board for Hospitals and Healthcare Providers (NABH) Standards

The National Accreditation Board for Hospitals and Healthcare Providers (NABH) established comprehensive standards and objectives for patient information management in Indian healthcare organizations. Adherence to these standards has become an important indicator of a hospital's capacity to effectively leverage technology for quality care delivery.

The confidentiality and security of patient health records are prioritised in NABH rules, which also outline the measures that must be taken to avoid unauthorised access and disclosure. Sustaining patient confidence and encouraging the use of technology depend on this. The standards also promote accuracy, integrity and availability of data through proper backup, disaster recovery and interoperable systems. This enables the continuity of care and use of data for care improvements.

Additionally, NABH standards guide staff training for responsible use of information systems. A trained clinical workforce is fundamental for smooth adoption of healthcare technologies. Through its accreditation program, NABH plays a key role in promoting technology readiness among Indian hospitals. Studying NABH compliant hospitals can provide valuable insights into effective strategies for patient information management and technology implementation.

Here are a few reasons why studying NABH accredited hospitals

- NABH standards emphasize the importance of information management and technology. The "Information Management System (IMS)" IMS chapter covers areas like confidentiality of patient data, data security, data accuracy, integrity and availability, which are crucial for digital systems. Studying hospitals that adhere to NABH reflects those that prioritize robust IT policies and infrastructure.
- Obtaining NABH accreditation requires investment in information systems and training of staff on using those systems responsibly. NABH accredited hospitals are likely further along in adopting healthcare IT compared to non-accredited ones.
- The IMS standards promote integration of systems and data to provide continuity of care. This encourages implementation of interoperable digital systems. NABH hospitals will enable studying technology adoption in a more integrated environment.
- As NABH is an Indian healthcare accreditation body, studying its accredited hospitals will provide insights specifically in the Indian healthcare context. This is valuable given country-specific challenges and barriers to technology adoption.

- Hospitals invest significant time and resources to achieve NABH accreditation. Studying these motivated organizations will better reflect healthcare settings proactively adopting technology to provide quality care.

NABH accreditation validates hospital commitment to effective information management and technology use. Studying their IT adoption provides valuable and locally relevant insights to advance digital healthcare in India. The standards act as a useful framework to assess technology readiness and use by healthcare professionals.

1.7 Challenges in adoption of DHITs

There are many challenges in introducing new technologies in the hospitals. Clark et al., (2020) advocate the process of adopting new technology is not straight and simple but curvy and complex. The new way of observation can help the hospitals to adopt new tools and use them effectively for improving services. To use these new tools properly, people need to be oriented and trained properly. In the realm of healthcare education, resources such as technical assistance and training must be made available to early adopters of these technologies (Botha-Ravyse & Blignaut, 2017). When the early users are supported, they can better use these tools, and this can lead to better outcomes. These include an efficient use of the new tools could make confident the worker to perform different tasks.

Apart from training, the technology itself needs to fit well with the existing system (Anderson et al., 2006). Also, there are difficulties of adding new health information technology (HIT) systems in hospitals regarding installation of technology. If these difficulties are removed, the technology can be properly added to the current healthcare systems. This will help in improvement of the

patient care, making work processes more efficient, and improving patient health. However, hospitals have a complex and divided system that makes it hard to introduce mobile technology. These include better strategies to introduce the new tools, more skill in using these tools, a better fit of HIT systems, more efficient work, and better patient health.

Adopting new technology in hospitals leads to many challenges initially, which are related to privacy and security. Ahouanmenou et al., (2023) argue that there are many gaps in the research on keeping information secure and private in hospitals. These weaknesses are seen in big areas like big data, internet of things (IoT), cloud computing, laws, and regulations. To make sure that privacy and security measures in healthcare settings are strong, these weaknesses need to be addressed. There are many ways in healthcare that uses cloud computing, fog computing, IoT, and telehealthcare technologies to share data among people. These issues need to be addressed to protect patient privacy and keep sensitive healthcare data safe.

The results of a study (Moore, 2012) shows that people regularly using the system give importance on usefulness and compatibility of the system. This shows that the system needs to be compatible to be adopted in the field of digital healthcare. Asua et al., (2012) further looked into the willingness of professional staff to use telehealth. They use TAM and compatibility in their analysis. Their research shows that compatibility plays a big role in adopting digital healthcare technology. This affects whether healthcare professionals will accept telehealth solutions. Other studies in the literature also show the compatibility on individual acceptance of technology. These studies support the idea highlight the compatibility issues as a challenge in adopting digital healthcare technology. This

is especially true when there are different needs and systems across different departments in hospitals.

To sum it up, it is not easy for hospitals to introduce and use new technology. The process is not simple and straight but complex and curvy. People need training and support to use these new tools. The technology also needs to fit well with the existing system. There are also major challenges related to keeping things private and secure. But if these challenges are addressed, the new tools can lead to better strategies, more skill in using the tools, a better fit of the tools in the system, more efficient work, and better patient health. The system also needs to be compatible with the needs and systems across different departments in hospitals.

1.8 Need of the Study

The adoption of Digital Healthcare Information Technologies (DHIT) in hospitals has become a topic of critical importance and intense discussion globally. The revolutionary impact of DHIT in various sectors, including education, health, agriculture, and entertainment, is evident and ongoing. In light of this, there is a compelling need to examine the adoption of DHIT in hospitals and understand its significance.

By incorporating DHIT, hospitals can enhance the efficiency and effectiveness of healthcare providers in their profession. This adoption encompasses essential aspects such as maintaining patients' records through computerized database management systems, utilizing internet resources for knowledge acquisition and updates, facilitating information sharing, and enabling communication through various channels like telephone, mobile phones, email, and mobile applications. The extensive range of potential applications of DHIT in healthcare is being

recognized and implemented to enhance performance in numerous developed countries.

As one of the fastest developing nations globally, India has acknowledged the potential of DHIT diffusion in the e-health sector for its rapid growth. The adoption of e-health practices can be observed at both the national and state levels in government and private hospitals. While some initiatives may have faced challenges and encountered setbacks, several others have thrived and are functioning exceptionally well. Consequently, it is crucial to investigate the adoption of DHIT in hospitals, particularly by healthcare providers, and comprehensively understand its impact on their profession.

The integration of DHIT empowers healthcare providers with advanced tools and resources, significantly augmenting their ability to deliver high-quality care. Through DHIT, healthcare providers can access and maintain comprehensive electronic health records (EHRs) for their patients, ensuring efficient and accurate documentation. Moreover, DHIT enables healthcare professionals to stay updated with the latest medical research, treatment guidelines, and best practices through internet-based resources. Furthermore, DHIT facilitates seamless communication and information sharing among healthcare providers, promoting collaboration and coordinated care.

Although the use of DHIT in healthcare has demonstrated how it can enhance patient outcomes and expedite procedures in industrialised countries, its use in Indian institutions needs close scrutiny. To guarantee successful adoption, factors like infrastructure constraints, healthcare providers' differing degrees of digital

literacy, and the requirement for strong data security measures must be taken into account.

A crucial area of study now is the implementation of Digital Healthcare Information Technologies (DHIT) in hospitals. The incorporation of DHIT in hospitals has the potential to improve healthcare provider's efficacy and efficiency. In the Indian context, where e-health practices are being adopted at national and state levels, investigating the adoption of DHIT in hospitals and understanding its implications is crucial. By comprehensively studying the adoption of DHIT in hospitals, we can assess its significance and contribute to the advancement of the healthcare sector in India.

1.9 Chapter Summary

This chapter, explored the profound influence of technology on healthcare, emphasizing the seamless flow of patient health information and its integration with DHIT. While discussing various digital health technologies, a specific focus was given to the scenario in India and the pivotal role of NABH in maintaining the patient data. The intricacies of the healthcare landscape in India, combined with the global technological advancements, highlight the urgency and challenges in implementation of DHIT effectively. As we delved into these challenges, the chapter underscored the imperative need for the study, setting the stage for in-depth exploration in the subsequent chapters.

Further this study follows the research plan outlined as below to accomplish the research objectives.

Chapter 2 – Literature Review

Chapter 3 – Objectives and Theoretical framework

Chapter 4 – Research Methodology

Chapter 5 – Data analysis and Results

Chapter 6 – Discussion and implications

Chapter 7 – Conclusion with Limitations and Future scope

CHAPTER - 2

LITERATURE REVIEW

2. Literature Review

This chapter is a summary of the elements influencing the adoption of technologies. Details of the gaps in adoption of healthcare technologies are discussed. Further, issues relating to security and privacy of patient data along with compatibility are highlighted in healthcare setting. To comprehend the complexities of technology adoption in the Indian healthcare setting, theories relating to adoption of technology, such as the Unified Theory of Acceptance and Use of Technology (UTAUT), are being implemented. The chapter elaborates about the healthcare technologies adoption studies using the UTAUT. It further discusses relevant studies related to “Type of Job Position (TJP)”, which is used as a moderator to test the relevant models.

2.1 Factors affecting the Technology adoption in healthcare

Information and communication technology (ICT) integration is becoming a strategic priority for global health systems, and Gagnon's (2006) research is a pioneering study that discusses the technological evolution in detail. The exploration of the ICT adoption process, specifically amongst healthcare providers highlights how technology is shaping contemporary healthcare environments. Gagnon's work elucidates how such technological incorporation is not merely an adjunct but is steadily becoming a necessity to maintain and enhance the efficiency and effectiveness of healthcare delivery systems worldwide. This research underscores the need for healthcare providers to adapt and embrace these technological changes as integral components of their

professional practice. By doing so, they can drive the health system towards the overarching goal of improved patient outcomes, thereby redefining the paradigm of modern healthcare practices.

In a landscape where technology adoption is crucial, Marin et al., (2014) identified key challenges, notably in Brazil, that help the uptake of clinical information systems. Central to these challenges is the lack of patient information accessibility, a hurdle that significantly impacts the seamless integration of ICT into healthcare settings. Their study elegantly illustrates the intricate layers of complexity that make the implementation process far from straightforward. Beyond the primary challenge, Marin and his colleagues also mapped out a range of additional factors shaping ICT adoption in healthcare facilities. These elements span from infrastructural issues, regulatory frameworks, cultural norms and staff training. The researchers' comprehensive analysis underscores that the task of technology adoption in healthcare is entwined with a broader ecosystem of variables. It suggests that a successful shift towards a tech-enabled healthcare environment is less about isolated change and more about a coordinated, holistic transformation that addresses the multifaceted challenges identified. The research by Marin et al. thereby contributes a crucial lens to understand the intricate interplay of the diverse elements influencing the ICT adoption landscape in healthcare.

Marin et al., (2014) noted that the primary obstacle in adopting clinical information systems, especially in Brazil, was the unavailability of patient information. They investigated into a variety of other factors influencing the implementation of ICT in healthcare facilities, suggesting a more complex, multifaceted adoption environment. While availability of quality patient

information is crucial, a holistic view accounting for other adoption drivers is essential for healthcare organizations to successfully use of ICT tools.

In a follow-up study, Gagnon et al. (2016) discovered that barriers to the adoption of m-health included a range of factors, including perceived usefulness and ease of use, design and technical challenges, cost, time constraints, privacy and security worries, familiarity with the technology, risk-benefit evaluation, and social interaction.. This highlights the need for a comprehensive understanding and mitigation of these barriers to foster the successful implementation of m-health.

The economic benefits of Healthcare Information Technology (HIT) adoption were explored by Police et al., (2010). They found that the integration of HIT led to cost savings for physician groups and also provided insights into adoption rates of HIT in physician practice organizations, clinical outcomes, use of vaccinations, medication adherence, staff productivity, and patient-provider interactions.

The role of healthcare providers' perceptions in the successful deployment of mHealth applications was stressed by Zakerabasali et al., (2021), emphasizing that overcoming perceived barriers is crucial for optimal application of these technologies. The study highlights that healthcare providers' perceptions influence mHealth adoption, and strategies to address their concerns are needed alongside technological implementation for successful deployment. Their perspectives should be considered as a priority for improvement of services.

On the policy front, Taylor et al., (2005) advocated for government intervention in HIT adoption across different types of healthcare organizations. Taking into account the breadth of clinical and administrative HIT applications, Electronic

Medical Records (EMR), Computerised Physician Order Entry (CPOE), and Picture Archiving and Communication Systems (PACS), they closely examined the present state and trend of HIT adoption. These are the same technologies that are widely used in India.

Gagnon et al., (2010) explored the uncertain outcomes of interventions promoting ICT adoption by healthcare professionals. The study measured a number of factors such as searching skills, frequency using electronic databases, the role of the internet for audit and feedback, and the use of email for provider-patient communication. These findings emphasize the need for more targeted and effective strategies to foster ICT adoption within healthcare, pointing to the complexity and multiplicity of factors that influence these processes.

2.2 Security and Privacy of patient data

Karunaratne et al., (2021) discusses the use of wireless healthcare monitoring systems in hospitals and healthcare practices. It emphasizes the need for a systematic approach to ensure security and privacy in the context of the “Internet of Things (IoT)” in healthcare. However, the paper does not through light into specific research gaps or limitations. This study rightly point out the need for a systematic approach to ensure security and privacy in wireless healthcare monitoring systems using Internet of Things (IoT).

Jennath et al., (2020) highlights the concerns regarding the sharing of sensitive information and the importance of data security and privacy in healthcare. The paper explores role of blockchain technology in securing patient data and enabling trusted artificial intelligence. However, it does not explicitly address research gaps or limitations.

A review paper by Nanayakkara et al., (2019) focuses on the security and privacy issues in IoT-based healthcare applications, specifically in different layers of the IoT architecture. It provides an overview of threats, attacks, and risks in IoT-based healthcare applications and analyzes various sensor devices used in these applications. The review identifies network layer as the most vulnerable to security and privacy threats. However, it does not explicitly discuss research gaps or limitations in the operational aspects.

Masood et al., (2018) focuses on the privacy and security challenges posed by the distributed environment of sensor-cloud infrastructure (S-CI) in healthcare. It examines current methods for “S-CI patient data security and privacy”, including attribute-based encryption, pairwise key formation, and multibiometric key creation. The study offers a general architecture consisting of six steps for guaranteeing the privacy and security of patient physiological parameters (PPPs) in S-CI. Future directions and unresolved issues in this field of study are also covered.

With the introduction of new technology like electronic patient records and sensor networks for in-home patient monitoring, Meingast et al., (2006) examine how the healthcare industry is evolving. It emphasizes the need to analyze privacy and security implications to ensure the social acceptance of these systems. The paper explores existing methods for handling privacy and security issues in health care technologies and identifies areas that require further consideration.

The intrinsic vulnerability of patient data exchanged over the Internet is brought to light by Levine (2002). It highlights how crucial it is for medical staff to be aware of security threats and take the necessary precautions to safeguard patient

information. This study emphasizes that clinicians must have basic knowledge of potential threats like data interception, unauthorized access, and cyberattacks that can compromise online data. Healthcare workers should follow security best practices like encryption, access controls, and timely software updates to mitigate risks. Awareness of risks coupled with training on protection methods is critical for medical practitioners to leverage connected technologies while prioritizing patient privacy and data security.

Meinert et al., (2018) underscores the significance of data protection within the context of healthcare technology integration. It highlights the potential risks and challenges that healthcare organizations face when adopting technology solutions, including noncompliance with data protection policies. These policies are critical for safeguarding patient privacy and maintaining the security of sensitive healthcare information. The study emphasizes the need for robust data governance to ensure the integrity and responsible handling of collected data. By addressing these concerns and implementing comprehensive strategies, healthcare organizations can navigate data protection issues effectively and harness the benefits of technology while maintaining patient trust and ethical standards.

2.3 Compatibility in Healthcare Technology Adoption

The factors impacting the sustainable adoption of e-health technologies in developing nations—particularly Nigeria—are the subject of a study conducted by Zayyad & Toykan (2018). The results made clear how important it is for healthcare professionals' attitudes, willingness, belief, and perceived utility to play a part in the adoption process. Although the study did not specifically address compatibility, it did imply that user beliefs and the technology's perceived utility

must coincide for adoption to occur, underscoring the significance of compatibility between the two in the adoption process.

In their research, Karahoca et al., (2017) examined the intention of healthcare providers to adopt IoT technology in healthcare products. Their findings emphasized the significance of system compatibility in affecting adoption rates. The study further reinforced the notion that successful adoption requires that new technologies align well with existing infrastructures, workflows, and user preferences.

Systematic review by Garavand et al., (2016) identified multiple factors influencing the adoption of health information technologies. The study suggested that the rate of adoption can be increased by considering several factors, including compatibility. This underlines the need to ensure new health technologies align with existing practices and systems, suggesting that compatibility is a vital factor for technology adoption in healthcare settings.

Peng et al., (2014) investigated the role of knowledge transfer in the adoption of Healthcare IT. Although they didn't focus on compatibility explicitly, they found that knowledge flow within provider networks is crucial for fostering technology adoption. This study underscores that compatibility isn't just about technology, but also about compatibility with knowledge and expertise within healthcare provider networks.

The research by Williams & Dickinson, (2010) suggested that knowledge management could potentially improve the rate of technology adoption in healthcare. However, the authors noted the absence of a "single knowledge-related

magic bullet," emphasizing the multifaceted nature of healthcare technology adoption where compatibility plays a crucial but not the only role.

Christensen & Remler, (2009) analyzed the slow adoption rate of ICT in U.S. healthcare. The authors found that high replacement costs and the need for technical compatibility were significant barriers to ICT adoption. The study underscores the importance of technology compatibility and also presents it as a potential hurdle if not addressed properly.

England et al., (2000) discussed the issue of collisions between organizations and technology during technology adoption in healthcare. They suggested that the relative immaturity of strategic health IT, marked by its complexity and inability to show quantifiable benefits, impeded adoption. The study, therefore, draws attention to the need for technology compatibility at the organizational level to facilitate successful adoption.

2.4 Unified Theory of Acceptance and Use of Technology (UTAUT)

A comprehensive framework (see Figure 4) called the Unified Theory of Acceptance and usage of Technology (UTAUT) integrates multiple theories to explain people's acceptance and usage of technology. It incorporates eight theories: the Social Cognitive Theory (SCT), the Model of PC Utilisation (MPCU), the Combined TAM-TPB (C-TAM-TPB), the Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), the Motivational Model (MM), and the Theory of Reasoned Action (TRA) (Venkatesh et al., 2003). A novel theory that offers insights into the variables impacting people's

acceptance and usage of information technology has been developed as a result of this integration.

Theory of Reasoned Action (TRA): According to the TRA, a person's attitude towards the behaviour and subjective norms have an impact on their intention to behave in a certain way. It highlights the significance of a person's ideas about the drawbacks of utilising technology and the impact of social norms on their intention to use it in the context of technology acceptance.

Technology Acceptance Model (TAM): TAM centres on the correlation between an individual's acceptance and utilisation of technology and its perceived usefulness and simplicity of use. It implies that people are more inclined to accept and make use of technology if they believe it to be practical and user-friendly.

Motivational Model (MM): To comprehend technological acceptability, the MM takes both extrinsic and intrinsic incentive elements into account. It highlights how motivation shapes a person's intention to utilise technology, taking into account elements including effort expectancy, performance expectancy, and perceived enjoyment.

Theory of Planned Behaviour (TPB): TPB expands on the TRA by incorporating an individual's perceived behavioral control. It suggests that the perceived control individuals have over their behavior influences their behavioral intention. In the context of technology acceptance, it highlights the importance of individuals' perceived control over using technology.

Combined TAM-TPB (C-TAM-TPB): The essential components of TAM and TPB are combined in C-TAM-TPB to offer a more thorough knowledge of technology

acceptance. It integrates the perceived usefulness and ease of use from TAM with the subjective norms and perceived behavioral control from TPB.

Model of PC Utilization (MPCU): MPCU focuses on the adoption and use of personal computers (PCs) and considers factors such as computer self-efficacy, computer anxiety, and computer experience. It recognizes the importance of individuals' confidence, comfort, and familiarity with using PCs in determining their acceptance and use.

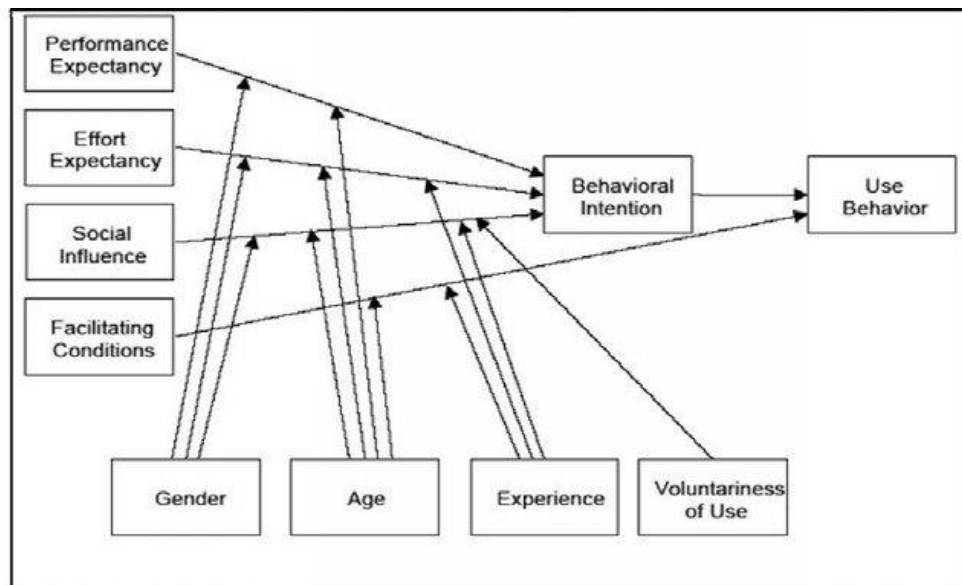
Innovation Diffusion Theory (IDT): IDT investigates the adoption and dissemination of innovations within social systems. It considers factors such as relative advantage, compatibility, complexity, trialability, and observability of an innovation in influencing its adoption. IDT provides insights into the diffusion process of technological innovations.

Social Cognitive Theory (SCT): SCT places a strong emphasis on how social influence and observational learning shape people's behaviour. It emphasises how crucial social elements are in determining how someone accepts and uses technology, including social support, norms, and role models.

To better understand users' continued behaviour towards digital health information systems, researchers have expanded the UTAUT model. For example, Dwivedi et al., (2019) utilized the UTAUT model to understand users' continuance intention towards electronic health record systems

Figure.4:

UTAUT model (Venkatesh et al., 2003)



They found that factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions significantly influence users' intention to continue using these systems. The UTAUT model has also been applied to examine patients' behavior towards the adoption of contactless healthcare applications, including telehealth. Through the application of the UTAUT model, scholars have discerned variables such as social influence, effort expectancy, and performance expectancy that impact patients' inclination to embrace and employ telehealth services (Dwivedi et al., 2019).

Furthermore, the UTAUT model has been employed to investigate healthcare providers' acceptance and utilization of various healthcare technologies. Ahmed et al., (2020) used the UTAUT model to study the factors impacting healthcare practitioners' acceptance and usage of electronic health records, clinical decision support systems, and telemedicine. They discovered that the intention of healthcare practitioners to accept and use these technologies is highly influenced

by variables like social influence, effort and performance expectations, and enabling environments.

In the area of healthcare, the UTAUT model has shown to be a useful framework for comprehending people's acceptance of technology and its usage. The UTAUT model offers a thorough knowledge of the aspects influencing technology acceptance and use in healthcare settings by taking into account a variety of variables, including “performance expectancy, effort expectancy, social impact, and enabling conditions”. Researchers and practitioners can evaluate and encourage the usage of digital health information technology with its help.

2.4.1 UTAUT in Healthcare technology adoption

Bramo et al., (2022) focused on the acceptability of ICT based health information services in primary health centres in South Ethiopia. The results showed that factors other than those covered in the UTAUT model also affect people's willingness to accept these services. Technology adoption, the degree of simplicity related to performance expectancy, use/effort expectancy, enabling conditions, societal concerns, individual variance, and organisational culture were among the outcomes that were measured.

Gu et al., (2021) extended the UTAUT model to evaluate e-health technology adoption in a developing nation. The researchers found that elements including effort expectations, social influence, enabling conditions, task-technology fit, trust, privacy, and individual innovativeness in information technology are the main determinants of the desire to embrace electronic health technology.

Using the UTAUT paradigm, Jayaseelan et al., (2020) investigated how Indian medical physicians were utilising ICT in their practice. The results showed that

the UTAUT model can be used to explain how technology is adopted in the healthcare industry. Performance expectancy, effort expectancy, social influence, conducive conditions, voluntariness of use, behavioural intention, and use behaviour were among the outcomes that were measured.

Nurhayati et al., (2019) utilized the UTAUT model to predict the adoption of a nutrition information system by nutrition officers of primary health care. The research emphasized that the factors related to use behavior are behavioral intention. The outcomes measured included the adoption of the nutrition information system, use behavior, and behavioral intention.

From the standpoint of clinical personnel, Venugopal et al., (2019) examined the impact of UTAUT predictors on the intention to use and the actual usage of telemedicine and electronic health records (EHR). The results showed that behavioral intention was highly influenced by performance expectancy, effort expectancy, and social influence. The outcomes measured included behavioral intention, usage behavior of electronic health records, and usage behavior of telemedicine.

Using UTAUT, Fuad & Hsu, (2018) presented a preliminary framework for researching the uptake of health IT in poor nations. It highlighted the importance of considering context-specific dimensions to modify UTAUT in health IT adoption studies within these countries.

UTAUT predictions were integrated by Kohnke et al., (2014) to better understand how doctors and patients receiving home care adopt medical telemedicine equipment. The researchers emphasized the significant growth of telemedicine programs within healthcare organizations as a means to reduce expenditures and

improve efficiency. The outcome measured was the behavioral intention to use telehealth equipment.

Phichitchaisopa & Naenna, (2013) explored the factors affecting the adoption of healthcare information technology. The researchers recommended that healthcare organizational management put more of an emphasis on enhancing the behavioral intentions of healthcare personnel and creating favorable circumstances for healthcare supply chain management. The behavioral intention to use healthcare technology as well as direct usage behavior were among the outcomes examined.

Ifinedo, (2012a) analyzed technology acceptance by health professionals in Canada using a modified UTAUT model. The results showed that various healthcare professionals in Canada's intents to use information systems and their usage practices were highly influenced by effort expectancy, social influence, compatibility, and organizational facilitating conditions.

Venkatesh et al., (2011) focused on the adoption and use of EMR systems by doctors. The results showed that age was the sole significant moderator in the adoption and utilization of EMR systems. The measured outcomes encompassed the intention to adopt EMR systems and their usage.

Wills et al., (2008) assessed healthcare professionals' acceptance of electronic medical records (EMRs) using UTAUT. The research concluded that the Unified Theory of Acceptance and Use of Technology provides a reasonable assessment of healthcare professionals' acceptance of EMRs. The outcomes measured included the acceptance of EMRs among registered nurses, certified nurse practitioners, physician assistants, and overall healthcare professionals, as well as intention to use EMRs and actual use of EMRs.

2.5 Type of Job Position and technology adoption

The literature reviewed presents a diverse array of studies collectively exploring the impact of job positions on the adoption of new technologies within organizational settings. These studies delve into the multifaceted relationship between the nature of job roles and the integration of digital innovations, offering insights into various facets of this phenomenon.

The use of “type job position (TJP)” as a mediator in the acceptance of mobile technology by employees for competence development is examined by Kuciapski, (2019). By using TJP as a mediator, the study builds upon the Unified Theory of Acceptance and Use of Technology (UTAUT) model. Data gathered from 810 employees in Poland's diverse sectors was used to validate the model. The results show that user autonomy, relative usability, social impact, performance expectancy, effort expectancy, and facilitating conditions are among the different variables which are impacting the acceptance of IT. TJP also moderates the significance and strength of these factors. The study also emphasizes how social influence, particularly among managers, affects their intention to adopt mobile technology for knowledge sharing. Furthermore, across a range of TJP values, user autonomy influences the perceived effort needed for mobile learning—managers excluded. The work has implications for future research in both theory and practice.

Sengewald et al., (2020) contribute to this discourse by investigating how user types influence the acceptance of digital innovations in the workplace. Their exploration of user diversity sheds light on how distinct roles may influence the receptiveness and effectiveness of technology adoption. This study reveal how

user diversity shapes acceptance of new technologies, emphasizing that unique needs of different roles must be considered for effective implementation.

Baskaran et al., (2020) offer a specific lens into the Malaysian manufacturing industry, probing the connection between technology adoption drivers and employee job performance. The study discerns factors such as job stress, motivation, and workload as key components shaping the intersection between technology assimilation and job effectiveness. They emphasize an intertwined relationship between work environment, employee outlook, and technology integration.

Berkelaar, (2017) suggests technology utilization can inadvertently foster parasocial employment relationships, highlighting the impact on organizational dynamics (different job roles). Study investigates the intricate dynamics between new information technologies and conventional organizational practices, shedding light on how technology utilization may inadvertently create parasocial employment relationships.

Within the realm of technology adoption and its implications in diverse organizational landscapes, the role of job positions and associated responsibilities emerges as a pivotal determinant. The studies discussed herein collectively illuminate the nuanced interplay between job roles and the acceptance as well as efficacy of technology integration. Through a comprehensive exploration of this dynamic, these investigations shed light on how specific job positions assume a moderating role, shaping the impact of various factors on technology acceptance. Moreover, the significance of tailoring adoption strategies to accommodate the distinctive requisites of diverse job roles is underscored, emphasizing the need for

a nuanced approach. Furthermore, the intricate relationship between technology assimilation and job performance is dissected, unraveling the intricate threads that interconnect factors such as job stress, motivation, and workload. In a thought-provoking revelation, the studies unveil the inadvertent emergence of parasocial employment relationships catalyzed by technology utilization, unravelling a subtle yet profound dimension of organizational dynamics. Collectively, these scholarly inquiries contribute to a holistic understanding of how job roles intricately intersect with the landscape of technology adoption, beckoning further research and deliberation in this intriguing domain.

2.6 Summary of Literature Review

The Literature Review chapter offers a comprehensive exploration into the determinants influencing technological integrations within the healthcare sector. A significant emphasis is placed on the pivotal challenges surrounding the security and privacy of patient data. The narrative also underscores the relevance of compatibility in the healthcare ecosystem, emphasizing its role in technology assimilation. A deep dive into theoretical frameworks provides insights from the Unified Theory of Acceptance and Use of Technology (UTAUT), showcasing its applicability in understanding the adoption of healthcare technologies. Additionally, the chapter delineates the influence of job positions, advocating for its role as a moderating factor in technology acceptance.

Having established a robust foundation of the existing literature and understanding the dynamics of technological adoption within healthcare, the next chapter, "Research Gaps, Objectives, and Theoretical Framework," will delve deeper into identifying the prevailing gaps in the current body of research. This

critical examination will set the stage for our study's objectives and the theoretical scaffold we plan to employ, illuminating our trajectory for the subsequent phases of research.

Chapter-3

Objectives and Theoretical Framework

3. Outline of Chapter

This chapter delves the foundational aspects of the research, providing a comprehensive overview of the objectives, research gap, theoretical framework, and hypothesis development. Also, explains the research model designed for this study. By exploring these key elements, the chapter sets the stage for the subsequent phases of the study.

3.1 Research Gaps:

The concept of a research gap refers to the absence or insufficiency of information in the existing literature pertinent to the research problem. Through an exhaustive review of the literature, the following distinct research gaps have been identified.

3.1.1 Limited understanding of the specific factors influencing DHIT adoption

While there have been studies examining the factors contributing to the adoption of DHIT among healthcare workers, there is still a need to further investigate and identify the specific factors that play a significant role in influencing DHIT adoption in hospital settings. This gap in knowledge highlights the importance of conducting research that goes beyond general factors and explores the unique contextual factors that impact DHIT adoption among hospital workers. A study conducted by Jean-Francois et al., (2021) underscores the deficiencies in health information technology, particularly in documenting social determinants of health,

minimizing implicit bias, ensuring adherence to clinical guidelines, and integrating telemedicine and risk assessment technologies to tackle disparities in maternal morbidity and mortality. While general technology adoption factors have been studied, the healthcare context introduces unique complexities. By taking a targeted look at hospital workers, this study's goal is to uncover the precise drivers and barriers that impact their willingness and ability to adopt new DHIT. This will provide hospital leaders and system designers with actionable insights to develop implementation and change management strategies that optimally facilitate adoption.

3.1.2 Limited research on the impact of perceived protection of patient data on DHIT adoption

While the objective includes examining the impact of perceived protection of patient data on the adoption of DHIT, there is a lack of comprehensive studies investigating this relationship among hospital workers. Existing literature primarily focuses on the importance of data security and privacy in healthcare, but there is a need for research that directly explores the influence of perceived protection on DHIT adoption among hospital workers. A study conducted by Alexandrou & Chen, (2019) accentuates the imperative for customized security measures and varied training methodologies to mitigate risks and augment compliance among healthcare practitioners leveraging mobile devices.. Given the sensitive nature of patient health information, perceptions around data protection are likely a key consideration influencing hospital workers' adoption of new DHIT. However, there is limited research examining this relationship. This study seeks to directly assess the extent to which concerns over patient data security and privacy act as barriers or enablers to DHIT adoption among hospital staff. This

will help illuminate an important piece of the adoption puzzle, while also informing data governance best practices as DHIT continues to expand.

3.1.3 Insufficient understanding of the influence of DHIT compatibility on adoption

Although the objective mentions assessing the influence of DHIT compatibility on individual adoption, there is a research gap in understanding the extent of this influence among hospital workers. While compatibility is recognized as a critical factor in technology adoption, there is a need for studies that specifically examine the relationship between DHIT compatibility and adoption within the hospital workforce. A study by Liang et al., (2003) investigated the impact of technology compatibility on healthcare professionals' acceptance of health information systems but did not focus on hospital workers. Compatibility is frequently considered as a variable when extending the original TAM to adapt to dynamic health service environments, reflecting its importance in aligning ICT applications with existing practices and systems (Rahimi et al., 2018). While compatibility is a well-established factor in technology adoption theories, its specific relationship to DHIT adoption among hospital workers requires further examination. This study aims to provide robust evidence quantifying the role of DHIT compatibility in hospital workers' adoption decisions. This will delineate compatibility as an adoption driver, while also guiding DHIT design approaches that effectively integrate with existing hospital technology ecosystems and workflows.

3.1.4 Lack of studies exploring the moderating role of Type of Job Position (TJP) in DHIT adoption

The objective highlights the importance of exploring the moderating role of TJP in the relationship between various factors and DHIT adoption. However, there is limited research that has specifically investigated this moderating effect among hospital workers. Understanding how TJP influences the adoption of DHIT can provide valuable insights into tailoring interventions and strategies to different job positions within hospitals. Dubromel et al., (2020) emphasize the significance of organizational factors in healthcare decision-making and the critical role of information technology and healthcare management, respectively which is not specific on the role of TJP. As we see that TJP likely influences adoption in the complex social structures of hospitals. This study seeks to fill the research gap on how TJP moderates other DHIT adoption factors. This will uncover variation in adoption drivers and barriers across different hospital roles. The insights can then be leveraged by hospital leaders to craft tailored interventions promoting adoption among all job types. This work will provide both theoretical and practical contributions.

By addressing these research gaps, future studies can contribute to a deeper understanding of the factors influencing DHIT adoption among hospital workers, the impact of perceived protection and compatibility, and the moderating effect of TJP.

3.2 Objectives of the study

In the ongoing era of healthcare digitalization, this study focuses on an in-depth exploration with the following objectives. Firstly, it seeks to investigate the

multifaceted factors that contribute to the adoption of Digital Healthcare Information Technology (DHIT) among hospital workers. This can be done by recognizing their diverse influences on technology adoption decisions. Secondly, it examines the pivotal impact of perceived protection of patient data on individual DHIT adoption within the healthcare workforce. This objective acknowledges the paramount importance of data security in healthcare technology adoption. Thirdly, this study assesses the influence of DHIT compatibility on individual adoption within hospital settings. This objective can be achieved by recognizing the significance of seamless integration with existing healthcare practices and workflows. Lastly, it aims to explore the moderating role of Type of Job Position (TJP) in the relationship between various factors and the adoption of DHIT among hospital worker. Thereby acknowledging the nuanced diversity of roles within healthcare organizations and its potential impact on adoption dynamics. These objectives collectively shape the inquiry into DHIT adoption within the complex and ever-evolving healthcare landscape.

- To investigate the factors that contribute to the adoption of Digital Healthcare Information Technology (DHIT) among hospital workers.
- To examine the impact of perceived protection of patient data on the individual adoption of DHIT among hospital workers.
- To assess the influence of DHIT compatibility on the individual adoption of DHIT among hospital workers.
- To explore the moderating role of Type of Job Position (TJP) in the relationship between various factors and the adoption of DHIT among hospital workers.

3.3 Hypotheses development

Hypothesis development is a critical aspect of research, providing a structured framework for inquiry and investigation. By formulating clear and testable statements about the relationships between variables or expected outcomes, hypotheses guide researchers in designing studies, collecting data, and analysing results. They serve as a roadmap, directing research efforts toward specific objectives and enabling researchers to systematically explore phenomena of interest.

3.3.1 Performance Expectancy (PE)

PE is an individual's belief about the degree to which Utilizing a technology can improve an individual's job performance. Extensive research has emphasized the crucial role of PE in predicting behavioral intention towards technology adoption. For example, in the educational sector, Gan et al., (2022) found that PE (usefulness) was a significant predictor of teachers' intention to adopt technology for teaching. Similarly, Ngampornchai & Adams, (2016) discovered that PE significantly impacted students' intention to use e-learning platforms. Based on this, we hypothesize that

H1: Performance expectancy (PE) positively influences behavioral intention (BI) towards DHIT adoption.

3.3.2 Effort Expectancy (EE)

EE refers to the ease of use perceived by the individual in using the system. Scheibe et al., (2015) found a significant relationship between EE and the behavioral intention to use mobile health services. Also, in the context of IT

adoption by nurses, EE was found to positively influence behavioral intention (Hung et al., 2014). Therefore, we propose that

H2: Effort expectancy (EE) on DHIT positively influences behavioral intention (BI) towards DHIT adoption.

3.3.3 Facilitating Conditions (FC)

FC relates to an individual's perception of the resources and support available to perform a behavior. Petersen et al., (2020) explains that FC to significantly influence intention to adopt the technologies. Furthermore, FC was found to predict the usage of many technologies in the different fields (Fuad & Hsu, 2018; Ifinedo, 2012a). Thus, we draw the hypotheses

H3: Facilitating conditions (FC) positively influence behavioral intention (BI) towards DHIT adoption, and

H4: Facilitating conditions (FC) positively influence use behavior (UB) of DHIT.

3.3.4 Compatibility (CM)

CM is the extent to which an innovation is thought to be in line with current needs, experiences, and values. CM was found to influence significantly students' adoption intention towards technology-enhanced tools (Bunker et al., 2006). It also positively impacted healthcare professionals intention to Technology (Ifinedo, 2012b). Given these, we hypothesize

H5: Compatibility (CM) positively influences behavioral intention (BI) towards DHIT adoption, and

H6: Compatibility (CM) positively influences use behavior (UB) of DHIT.

3.3.5 Perceived Protection (PP)

PP refers to the belief that one's information in a system will be secure. Although specific research examining the role of PP in DHIT adoption is scarce, in the broader context of technology acceptance, PP has been considered as a significant factor (Meingast et al., 2006). Based on this, we hypothesize

H7: Perceived protection (PP) positively influences behavioral intention (BI) towards DHIT adoption, and

H8: Perceived protection (PP) positively influences use behavior (UB) of DHIT.

3.3.6 Behavioural Intention (BEI)

The previous studies show that people's intention to act has a strong influence on their use of healthcare technology in the UTAUT model. Suroso & Sukmoro, (2021) discovered that behavioral intention positively affects the use of mobile healthcare applications in Indonesia. Venugopal et al., (2019) also revealed that behavioral intention significantly affects the use of electronic health records and telemedicine among clinical staff. Ofori & Wang, (2022) further support this relation, demonstrating that behavioral intention has a significant impact on consumers' willingness to embrace health information on social media Jianbin & Jiaojiao, (2013) found that behavioral intention positively influences the use of medical and health websites. Overall, these studies emphasize the importance of behavioral intention in driving the use of healthcare technology.

H9: Behavioural Intention (BI) positively influences use behavior (UB) of DHIT.

3.3.7 Type of job position (TJP)

The role of different job position, the influence of job types on technology acceptance has been found in the literature. Kuciapski, (2019) found that the type of job position (TJP) influenced the acceptance of mobile technologies for knowledge transfer. Sengewald et al., (2020) contribute to this discourse by investigating how user types influence the acceptance of digital innovations in the workplace. Their exploration of user diversity sheds light on how distinct roles may influence the receptiveness and effectiveness of technology adoption. Based on the existing literature and the recognition that different departments within hospitals have unique needs and characteristics, we propose the following set of hypotheses regarding the moderating role of Type of Job Position (TJP) in the adoption of Digital Healthcare Information Technology (DHIT).

The perceived performance benefits individuals associate with DHIT may be influenced by their specific job positions within the hospital. For instance, doctors, nurses, and administrative staff might have different expectations about how DHIT could improve their work, and these expectations could significantly impact their intention to adopt DHIT.

H10a. The relationship between the variables performance expectancy (PE) and behavioral intention (BEI) towards DHIT adoption is moderated by TJP.

The ease or difficulty individuals perceive in using DHIT could vary depending on their job positions. Different roles may have varying levels of familiarity with technology, affecting their perception of how easy it is to incorporate DHIT into their daily routines.

H10b. The relationship between the variables effort expectancy (EE) and behavioral intention (BEI) towards DHIT adoption is moderated by TJP.

The following hypothesis suggests that how well DHIT aligns with the specific tasks and responsibilities associated with various job positions may influence individuals' intentions to adopt it. Compatibility with existing workflows and department-specific needs may play a crucial role in DHIT acceptance.

H10c. The relationship between compatibility (CM) and behavioral intention (BEI) towards DHIT adoption is moderated by TJP.

The compatibility of DHIT with different job positions also affects the actual usage behavior. Even if DHIT is compatible with a job position, its impact on daily tasks and patient care may vary across different roles within the hospital.

H10d. The relationship between compatibility (CM) and use behavior (UB) of DHIT is moderated by TJP.

The availability of necessary resources and support for DHIT adoption may be perceived differently by individuals in different job positions. Some roles might have better access to resources or support systems, which could influence their intention to adopt DHIT.

H10e. The relationship between the variables facilitating conditions (FC) and behavioral intention (BEI) towards DHIT adoption is moderated by TJP.

The following hypothesis explores whether the facilitating conditions, such as training and technical support, have varying effects on the actual usage of DHIT depending on the job positions. Some roles might have better access to these conditions, leading to more effective DHIT use.

H10f. The relationship between facilitating conditions (FC) and use behavior (UB) of DHIT is moderated by TJP.

As we see the framed hypotheses which are 9 direct relations mentioned in Table.1 and 6 moderating effect of TJP on the different relations mentioned in Table.2. All the relations are proposed as positive paths and these hypotheses further frames the research model.

Table 1

Direct relationships of the variables

Relation	Hypothesis	Path
PE -> BEI	H1: PE positively influences BI towards DHIT adoption	Positive
EE -> BEI	H2: EE positively influences BI towards DHIT adoption	Positive
FC -> BEI	H3: FC positively influences BI towards DHIT adoption	Positive
FC -> UB	H4: FC positively influences UB of DHIT	Positive
CM -> BEI	H5: CM positively influences BI towards DHIT adoption	Positive
CM -> UB	H6: CM positively influences UB of DHIT	Positive
PP -> BEI	H7: PP positively influences BI towards DHIT adoption	Positive
PP -> UB	H8: PP positively influences UB of DHIT	Positive
BI -> UB	H9: BI positively influences UB of DHIT	Positive

Table 2

Hypotheses of moderating effect of TJP

Hypothesis	Moderation Relationship
H10a: The relationship between PE and BEI towards DHIT adoption is moderated by TJP.	TJP x PE -> BEI
H10b: The relationship between EE and BEI towards DHIT adoption is moderated by TJP.	TJP x EE -> BEI

H10c: The relationship between CM and BEI towards DHIT adoption is moderated by TJP.	TJP x CM -> BEI
H10d: The relationship between CM and UB of DHIT is moderated by TJP.	TJP x CM -> UB
H10e: The relationship between FC and BEI towards DHIT adoption is moderated by TJP.	TJP x FC -> BEI
H10f: The relationship between FC and UB of DHIT is moderated by TJP.	TJP x FC -> UB

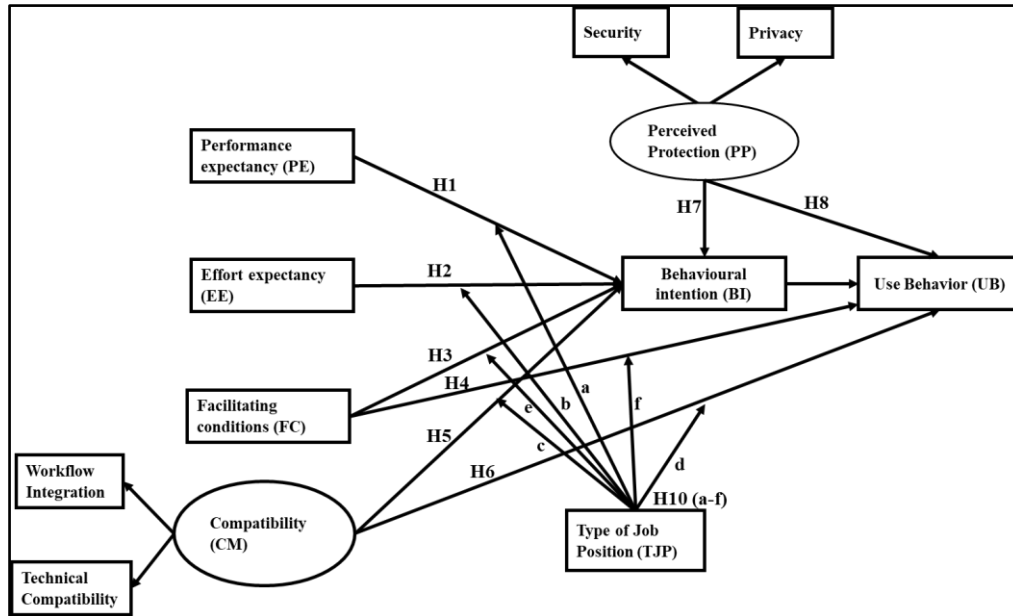
3.4 Research Model

The research model (see Figure.5) is constructed to investigate the factors influencing the adoption of Digital Healthcare Information Technology (DHIT) within a hospital context. It also considers the moderating role of Type of Job Position (TJP) on these relationships. The model is built on well-established technology adoption and acceptance theories and is grounded in empirical evidence from prior research. Here's an overview of the key components of the research model.

Our research model is a bold extension of the established UTAUT framework by introducing "Perceived Protection" and "Compatibility" as independent variables. Also, by integrating the influential moderator "Type of Job Position (TJP)," our model offers a holistic lens through which we explore DHIT adoption within the hospitals. This enhanced model empowers us to adapt adoption strategies to the unique needs and expectations of hospital staff. Fostering more effective DHIT implementation and utilization while addressing the critical aspects of data security and alignment with existing practices.

Figure 5

Proposed research model



3.5 Chapter Summary

This chapter presented the theories used for the study like UTAUT model. It also introduced the identified research gaps which are required attention. The chapter reveals the proposed hypotheses with the variables which develop the new relations. this chapter also gives the research model which was proposed based the hypotheses for this study. As a result, this chapter offered an in-depth and comprehensive perspective on the theoretical foundation used in this study.

RESEARCH METHODOLOGY

4. Outline of Chapter

This chapter explains an overview of the research methodology of the study. It introduces the research design, emphasizing the rationale behind adopting a cross-sectional methodology to capture a comprehensive snapshot of DHIT adoption within a specific timeframe. The chapter illuminates the significance of various components such as target population selection, the introduction of a novel moderator—Type of Job Position (TJP), the purposive sampling technique, ethical considerations, and the structured data collection method. It provides an insight into the measures and variables utilized for a nuanced examination of technology adoption among healthcare professionals.

4.1 Research design

The research design for this study adopts a cross-sectional approach, which is a widely recognized method in research studies aimed at understanding phenomena within a specific timeframe. This study focused on the adoption and implementation of Digital Healthcare Information Technology (DHIT) in healthcare sector of India. This investigation was conducted subsequent to the comprehensive implementation of DHITs across various operational facets within the hospital infrastructure.

The cross-sectional study design enables to collect data from specified target population, in this case healthcare workers, at a single point in time. This methodology is particularly beneficial when aiming to assess the current state of a

certain conditions, behaviors, and practices, such as the adoption and usage of DHIT. The study gives an opportunity to examine a part of the situation as it exists in the present moment, without the requirement of following up over an extended period. The cross-sectional study employed in this research holds several strengths that contributed to its effectiveness in investigating the adoption of Digital Healthcare Information Technology (DHIT) among healthcare professionals (Maier et al., 2023). The cost-effectiveness and relative ease of data collection from a pertinent population were key advantages of this approach. By swiftly assembling a comprehensive dataset, the study efficiently captured a snapshot of the healthcare professionals' perspectives on DHIT adoption within a specific timeframe.

This methodological choice served as a valuable tool for establishing baseline information crucial for further research endeavours in the field of DHIT adoption. Moreover, cross-sectional studies, like the one conducted in this research, are adept at identifying emerging trends, such as the impact of technology on various aspects like the metaverse or climate change. They provide a window into the current landscape, enabling researchers to discern evolving patterns and generate hypotheses that can be explored in more extensive and targeted investigations.

One of the significant advantages of this design is its economic efficiency. As data collection occurs within a single frame, the costs associated with prolonged data collection and follow-ups are considerably reduced. It offers a practical solution for studies like ours that require an extensive survey of a large population while operating within limited resource constraints.

Moreover, the cross-sectional design is time-efficient, as it allows for the swift collection and subsequent analysis of data. This is especially crucial in a fast-paced domain like healthcare technology, where conditions and practices evolve rapidly. Post Covid we have seen the digitalization of healthcare information and usage has been increased many folds especially DHITs than before.

This design is well-suited for our research purpose, which aims to study the current state of DHIT usage. The snapshot of data acquired through this method can provide valuable insights into the current levels of acceptance, challenges encountered, and overall attitudes towards DHIT. These insights can, in turn, inform strategies to enhance digital health information technology integration within healthcare systems. Also, it helps many hospital IT managers and policy makers to understand the usage of the DHITs and end users' behaviors towards DHITs.

4.2 Target Population

The primary focus of the study centers on a specific group of individuals: healthcare professionals currently engaging with Digital Healthcare Information Technology (DHIT) in their daily work routines. The rationale behind focusing the study on this group is due to the ability of healthcare workers to offer a first-hand perspective on how DHIT integrates with healthcare processes. Ultimately this provides practical and experiential insights about the use of technology in a healthcare setting.

These professionals are not just doctors and nurses; they also include technicians, pharmacists, therapists, and administrative staff who work in multi-speciality

hospitals which are accredited by the National Accreditation Board for Hospitals & Healthcare Providers (NABH).

The NABH is an autonomous body in India that establishes and operates accreditation programs for healthcare organizations. Its primary objective is to ensure and promote quality and patient safety by setting stringent standards for healthcare delivery, assessing healthcare facilities against these benchmarks, and accrediting those that meet the defined criteria. NABH aims to foster a culture of continuous improvement in healthcare services while emphasizing patient-centered care and optimal clinical outcomes. Accreditation fosters a culture of continuous improvement, demonstrating a healthcare organization's unwavering commitment to quality care and patient safety, ensuring optimal clinical outcomes.

This accreditation plays a pivotal role in our study, as it ensures a certain level of standardization and quality assurance in terms of the services provided and the technologies used in these hospitals (NABH, 2020). The tenth chapter of NABH “Information Management System (IMS)” detailed the insights into management of medical records within NABH accredited hospitals are instrumental in supporting our study on DHIT adoption by healthcare workers (NABH, 2018). The outlined policies and procedures for handling medical records, covering aspects like storage, security, and retention, provide a valuable framework for this research, enabling an exploration of how healthcare professionals embrace DHIT in such structured healthcare settings.

The environment of NABH-accredited multi-speciality hospitals is characterized by high patient volumes, diverse healthcare needs, and the presence of advanced medical equipment and procedures. This unique and dynamic setting presents a

fertile ground for the implementation and evaluation of DHIT. The professionals in this environment often need to adapt quickly to new technologies, making them an ideal group for studying the adoption and utilization of DHIT.

By focusing on this group, this study taps into their lived experiences, perceptions, and attitudes towards DHIT. These insights are invaluable as they reveal the real-world benefits and challenges encountered by healthcare workers while using these technologies. By understanding these experiences, this study aims to inform strategies for better DHIT integration, increasing its effectiveness and efficiency in enhancing patient care.

Hyderabad, the capital city of Telangana state in India, has emerged as a major hub for healthcare and medical tourism. The city is known for its world-class hospitals, cutting-edge medical technology, and a large pool of highly skilled healthcare professionals. Several factors contribute to Hyderabad's reputation as a healthcare capital (Gopal, 2021). In the process of sample collection, deliberate attention was directed towards specifically targeting NABH accredited tertiary hospitals situated in Hyderabad. This meticulous approach ensured a stringent selection criterion aligned with the research parameters of the study. These hospitals meet the rigorous quality standards set by the National Accreditation Board for Hospitals and Healthcare Providers (NABH), indicating their excellence in providing healthcare services. The inclusion of these hospitals in the study ensures that the research encompasses institutions that meet high-quality benchmarks and contribute to the healthcare landscape of Hyderabad.

4.3 Type of Job Position (TJP) as moderator

In this study, the inclusion of moderators like user groups, from different departments of the hospital underscores the potential impact on technology acceptance. Consequently, a novel moderator, TJP was proposed. It is posited that the type of job position significantly influences the relationships between the variables in the model upon their respective job positions within the healthcare setting. TJP has been categorized based on The International Standard Classification of Occupations (ISCO), the study adapts three distinct types of job positions relevant to the DHIT adoption study (see Table.3):

Regular Worker: Employees performing fundamental and routine tasks that primarily require basic skills, often without the need for continuous knowledge and skill enhancement.

Specialist: Employees necessitating specialized professional qualifications acquired over an extended period, often involving certification. Specialists are engaged in roles that demand creative problem-solving and consistent skill development.

Manager: Individuals involved in managerial or decision-making roles, overseeing employees.

These categories might include roles might include nurses, doctors, lab-technician receptionists, clerical staff, billing administrators, or security personnel, different level managers. This categorization can be seen in the TJP table.

Table 3

Categorization of TJP

Category	Examples of Job Positions
Regular Worker	Administrative Staff: Receptionists, Clerical Staff, Billing Administrators, Security Personnel,

	etc.
Specialist	Doctors: Cardiologists, Neurologists, Surgeons, etc.
	Nurses: Registered Nurses, Nurse Practitioners, Specialized Nurses, etc.
	Lab Technicians: Pathology, Microbiology, Hematology Specialists, etc.
Manager	Nursing Managers, Floor Managers, Patient Relationship Managers, Patient Services Managers, etc.

The study hypothesizes that technology acceptance within these distinct job position categories may vary, considering their differing usage frequencies and applications within their respective work domains (Kuciapski, 2019). The specific role of job position type as a moderator in technology acceptance, particularly in DHIT contexts, remains an unexplored aspect within subject matter literature.

4.4 Sampling Technique

In designing this study, the sample technique adopted is the purposive sampling method, a non-random technique also known as judgmental or selective sampling. The decision to employ purposive sampling emerged from the specific characteristics of this research question and the data collected.

Purposive sampling, at its core, revolves around the principle of selecting participants based on their ability to provide the most valuable insights into the research question. The richness, relevance, and diversity of data that these participants can provide make purposive sampling a particularly effective tool for this study. Rather than random selection, this method emphasizes the knowledgeable selection of participants who can contribute to the depth of

understanding the research topic, in this case, the adoption and utility of DHIT in healthcare settings.

In the context of this study, the purposive sampling method allowed to handpick healthcare professionals who were actively involved in using DHIT in their everyday practice. This group was deliberately chosen because their experiences and perspectives offer an in-depth understanding of the practical application, advantages, and challenges associated with DHIT. This valuable information contributes significantly to the study's comprehension of the complex phenomena surrounding DHIT in healthcare environments like hospitals.

It's also crucial to note that while the purposive sampling method comes with significant advantages, it is not devoid of limitations. The most important is the risk of researcher bias, as the selection of participants is largely based on the researcher's judgment. To mitigate this risk, this study defines clear and relevant criteria for selecting participants, guided by the research objectives and questions.

Purposive sampling was an appropriate choice for this study, enabling to delve deeper into the research question by focusing on the experiences and insights of healthcare professionals who have direct interaction with DHIT in their daily practices.

4.5 Ethical Considerations

The research obtained ethical approval from the Institutional Ethics Committee at the University of Hyderabad (File No: UH/IEC/2021/160) to conduct data collection. Additionally, permissions were duly acquired from the respective hospitals where the study was conducted. Prior to data collection, explicit consent was obtained from all participating respondents. The data collection process took

place between October 2021 and September 2022, adhering to the approved ethical guidelines and time frame.

4.6 Data Collection Method

For this study the primary source of data collection employed was a carefully structured questionnaire. This tool's role in extracting vital information pertinent to this study was instrumental, mainly due to its design and framework that ensured clear, unbiased, and relevant data.

Questionnaire was constructed around a five-point Likert scale, a widely recognized instrument used to gauge respondents' attitudes, beliefs, and perceptions. The beauty of this scale lies in its simplicity and accessibility. It offers respondents a range of options from "strongly disagree" to "strongly agree", creating a spectrum for them to articulate their feelings and perceptions regarding the adoption and use of Digital Healthcare Information Technology (DHIT). The questionnaire has been circulated online using Google Forms. This ensured that study's questionnaire could be accessed and completed conveniently, anytime and anywhere, increasing the likelihood of receiving a higher number of responses. Moreover, Google Forms also offers an organized platform to gather all the responses in one place, making data handling more efficient.

The questionnaire focused on various facets of DHIT usage, such as perceived benefits, challenges encountered, and overall satisfaction. Each question was carefully crafted to be concise and comprehensible, mitigating any potential misunderstandings. The unbiased nature of the questions was also paramount in maintaining the integrity of the data collected. As the quality of responses directly correlates to the questionnaire's design, this study followed meticulous procedures

to ensure that tool was clear, unbiased, and capable of garnering meaningful responses. Additionally, ensured that the responses remained confidential and anonymous, thereby reducing any hesitation on the part of respondents in expressing their genuine feelings and thoughts.

4.7 Measures:

This study has several key variables to understand the adoption and utility of Digital Healthcare Information Technology (DHIT) in the healthcare sector. These variables, influenced by previous work in the field, are integral to the study's exploration. The variables from the UTAUT model have been utilized in this study.

The scale, Compatibility, was adopted from the work of Aubert et al., (2012) . This refers to the degree to which using DHIT is expected to be consistent with the existing practices, values, and needs of the healthcare professionals. It examines whether the new technology aligns with the current way of doing things and the potential ease or difficulty of integrating it into daily routines.

Next, is Performance Expectancy, drawing from the pioneering work of Venkatesh et al., (2003). Performance expectancy is the degree to which a person expects that employing DHIT will enable them to improve their work performance. Essentially, it examines the belief that using this technology will enhance the efficiency and effectiveness of their tasks.

Variable Effort Expectancy, also draws inspiration from the studies by Venkatesh et al., (2003), and it is further refined by questions about the search and easy availability of patient data. Effort expectancy deals with the degree of ease

associated with the use of DHIT. It scrutinizes whether using the technology is straightforward and user-friendly, or complicated and confusing.

The next factor in this study is Facilitating Conditions, borrowed from Venkatesh et al., (2003). It concerns the extent to which a person thinks there is a technological and organisational infrastructure in place to facilitate the use of DHIT.

Behavioral Intention, which was derived from the work of Venkatesh et al., (2003), refers to the degree of a healthcare professional's readiness to use DHIT. It aims to assess whether the individual is inclined to use this technology in their professional duties.

Lastly, Use Behavior, inspired by Venkatesh et al., (2003), measures the extent to which individuals actually use DHIT in their tasks. Unlike behavioral intention, use behavior gauges the actual utilization of the technology, providing a measure of real-world application.

Investigating each of these variables provides a distinctive lens through which the experiences and attitudes of healthcare professionals toward DHIT can be analyzed and understood. With these tools, this study takes a comprehensive approach to decoding the complex landscape of DHIT in healthcare.

4.8 Sample Size

The centerpiece of any empirical study lies in the robustness of its sample size. Researchers are consistently mindful that a well-represented sample can significantly influence the validity of the study's findings. Hence, in this study, particular attention was given to determining and securing the appropriate sample size. The study commenced by targeting a group of 600 respondents, comprising

active healthcare professionals operating within the realm of NABH-accredited multispeciality hospitals. These individuals, recognized as primary users of Digital Healthcare Information Technology (DHIT), were considered pivotal in providing the sought-after insights.

This survey was launched into this pool of prospective respondents, over time, a total of 515 responses were received. However, it was acknowledged that not every response would meet the required quality standards for the study due to various potential reasons. Hence, began meticulous screening process. Carefully, sifted through the responses, analyzing each for its suitability and relevance. When the screening process was complete, 487 solid, usable responses, presenting with a treasure trove of insights were found.

The obtained response rate slightly exceeded 61%, which was found to be notably satisfactory. Following the research guidelines, this response rate comfortably surpassed the acceptable threshold, thereby validating the conducted efforts and affirming the credibility of the collected data.

4.9. Reflections on the Data Collection Process for this Study

This research delved into Digital Healthcare Information Technology (DHIT) adoption among diverse healthcare professionals in NABH-accredited tertiary hospitals in Hyderabad, India. This research focused on diverse healthcare practitioners, including doctors, nurses, technicians, pharmacists, therapists, and administrative staff, operating within these accredited multi-speciality hospitals. The data collection process for this study presented a series of challenges primarily centered around the scheduling constraints of healthcare professionals within the hospital settings. Securing appointments during their available time

slots proved to be a demanding task, leading to the adoption of a strategy involving multiple visits to hospitals. This approach allowed the research team to navigate the complexities of healthcare professionals' schedules, ensuring access to the required data while accommodating their availability. Moreover, in instances where time constraints prevented direct participation in filling out Google Forms or questionnaires, an alternative approach was taken. Researchers facilitated the data collection process by filling out the forms themselves, basing the responses on the information acquired through interactions and discussions with the healthcare professionals. This adaptive approach enabled the capture of valuable insights despite the challenges posed by limited time availability, ensuring the collection of essential data for the study on DHIT adoption among healthcare practitioners.

4.10 Chapter Summary

Chapter outlines the systematic approach employed to investigate the adoption of Digital Healthcare Information Technology (DHIT) within Indian healthcare settings. The chapter highlights the cross-sectional research design's suitability for capturing current DHIT usage among diverse healthcare professionals in NABH-accredited multi-speciality hospitals in Hyderabad. It emphasizes the significance of purposive sampling, ethical considerations, and the introduction of a novel moderator—Type of Job Position (TJP)—to analyze technology acceptance. The meticulous data collection method using structured questionnaires, along with a detailed explanation of key variables, underscores the study's depth and rigor. The chapter culminates with reflections on the challenges encountered during data collection, demonstrating adaptability in ensuring comprehensive insights despite scheduling constraints faced by healthcare professionals.

CHAPTER - 5

DATA ANALYSIS AND RESULTS

5. Outline of Chapter

In this chapter, the data analysis on the adoption of Digital Healthcare Information Technology (DHIT) among healthcare workers is presented. The data analysis encompasses preliminary data examination, reliability and validity checks, assessment for the measurement of the model, and the adoption of structural model on DHIT. The chapter presenting the results of hypothesis testing pertaining to the adoption of DHIT among healthcare workers.

5.1 Demographic Profile of Healthcare Workers

The initial phase of data analysis revolves around examining the demographic characteristics of the participants involved in the adoption of Digital Healthcare Information Technology (DHIT) among healthcare workers. Understanding the demographic composition of a study is crucial for contextualizing results and drawing meaningful conclusions. The demography data provided for this study includes key variables such as gender, age, education, job position, job experience, and experience about use of Digital Healthcare Information Technology (DHIT). This dataset provide a comprehensive view of the participant's profiles, enabling an in-depth analysis of the topic under study.

Table 4

Distribution of demographics of the study

Variable		Frequency	Percent
Gender	Male	257	52.77
	Female	230	47.23
	Total	487	100
Age	20-25	58	11.91
	26-30	222	45.59
	31-35	135	27.72
	above 35	72	14.78
	Total	487	100
Education	Diploma	60	12.32
	Graduation	320	65.71
	PG	107	21.97
	Total	487	100
Type of Job Position (TJP)	Managers	90	18.48
	Regular	187	38.4
	Specialists	210	43.12
	Total	487	100
Experience in Job (Exp_Job)	1-5 Yrs	231	47.43
	6-10 Yrs	177	36.34
	above 10 Yrs	79	16.22
	Total	487	100
Experience with DHIT (Exp_DHIT) (in Years)	1	105	21.56
	2	160	32.85
	3	151	31.01
	above 3 yrs	71	14.58
	Total	487	100

The gender distribution is nearly balanced (see Table.4), with males representing 52.77% and females 47.23% of the total 487 participants. This diverse gender representation ensures that the study captures perspectives from both genders, which is essential in avoiding gender bias, especially when studying areas where gender may have an impact.

The age distribution shows a heavy leaning towards the younger section, with 45.59% falling within the 26-30 age group and 27.72% in the 31-35 age group. Only 11.91% are aged between 20-25, and 14.78% are above 35. The age data suggest that the study predominantly covers the perspectives of young to middle-aged adults, which is important in understanding technology-related topics such as DHIT.

In terms of education, the participants are highly educated, with a significant 65.71% having a graduation degree, followed by 21.97% with post-graduate qualifications. Those with a diploma form the smallest group at 12.32%. This suggests that the participants likely have a certain level of understanding, literacy, and engagement with the modern professional and technological environments.

Looking at the job position, specialists make up the highest proportion (43.12%), followed by regular positions (38.4%) and managers (18.48%). This job position data offers insight into the professional status and responsibilities of the participants, which potentially indicate different levels of interaction with DHIT in their professional roles.

Experience in the job is another key factor. Those with 1-5 years of experience make up nearly half (47.43%) of the population, while those with 6-10 years and those with more than 10 years represent 36.34% and 16.22% respectively. This

reveals that majority of the participants are relatively early to midway in their professional journey. This information is valuable as it may be that attitudes towards and experiences with DHIT differ based on the length of time in the professional field.

Finally, experience with DHIT is a critical demographic factor for this study. The distribution is quite balanced with the largest group having 2 years of experience (32.85%), closely followed by those with 3 years (31.01%). Participants with 1 year of experience comprise 21.56% of the sample, while those with more than 3 years form the smallest group (14.58%). This demonstrates a wide range of familiarity with DHIT among the participants, which could lead to a nuanced understanding of how DHIT experience impacts the study outcomes.

This diverse and comprehensive demographic data set will provide a robust foundation for analyzing and interpreting the study results. The balanced and broad spectrum of categories will ensure that the conclusions drawn are representative and fair, addressing the perspectives of various demographic groups.

5.2 Factor Loadings

Factor loadings in Structural Equation Modeling (SEM) indicate the strength of the relationship between an observed variable (the item in the study) and its corresponding latent variable (the factor or construct it is intended to measure). They serve as an indicator of how much the variance in an item is "explained" by its associated factor.

In the context of SEM, factor loadings above 0.7 are generally considered strong, suggesting a high degree of shared variance between an item and its factor, as per

the guideline provided by Hair Jr et al (F. Hair Jr et al., 2014). This is crucial in ensuring the validity and reliability of the constructs in the model.

Upon examining the study results, it was found that each factor consists of multiple items, all of which exhibit a factor loading exceeding 0.7 (Table.5). This suggests a strong alignment between these items and the constructs which are intended to measure.

Starting with Behavioral Intention (BEI), all three items (BEI1 to BEI3) show strong loadings, suggesting that they effectively represent this construct. Compatibility (CM) and Ease of Use (EE) both also have items with strong loadings, indicating that these items are well-aligned with their respective constructs.

Facilitating Conditions (FC), Performance Expectancy (PE), Privacy Perception (PP), and User Behavior (UB) show similar patterns, with all items presenting factor loadings above 0.7, confirming a strong correlation with their corresponding constructs.

The results indicate that the items in study are solid indicators of their respective constructs. Therefore, the constructs in SEM model are well represented, contributing to the overall robustness of model. Still, it's crucial to remember that factor loadings are only one part of the picture in SEM and other aspects, like overall model fit and path coefficients, should also be considered when interpreting results.

Table 5

Factor loadings for the items

	BEI	CM	EE	FC	PE	PP	UB
BEI1	0.741						
BEI2	0.812						
BEI3	0.84						
CM1		0.939					
CM2		0.913					
CM3		0.903					
CM4		0.888					
EE1			0.839				
EE2			0.701				
EE3			0.837				
EE4			0.878				
FC1				0.965			
FC2				0.974			
FC3				0.749			
PE1					0.853		
PE2					0.866		
PE3					0.908		
PE4					0.853		
PP1						0.732	
PP2						0.945	
PP3						0.934	
PP4						0.745	
UB1							0.909
UB2							0.718
UB3							0.828

The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity are statistical tests used to check the appropriateness of factor analysis for a given dataset. The KMO measure assesses the adequacy of the sample size for factor analysis. KMO value is 0.816, which is closer to 1, indicating an adequate sample size. A KMO value less than 0.5 would suggest an inadequate sample size, and factor analysis would not be appropriate. So, data passed this test.

Bartlett's test of sphericity, on the other hand, checks if variables are correlated enough for factor analysis. The test should be significant (p-value less than 0.05) for factor analysis to be suitable. In this study the significance level is 0, which is less than 0.05, suggesting that variables are sufficiently correlated for factor analysis.

Both tests suggest that factor analysis is suitable for data. It means the factor loadings observed from SEM analysis are meaningful and reliable. Other tests and checks should also be conducted to confirm the appropriateness and accuracy of SEM analysis.

Table 6

KMO and Bartlett's results

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.816
Bartlett's Test of Sphericity	Approx. Chi-Square	10617.559
	df	300
	Sig.	0.00

5.3 Common Method Bias

It relates to a technique called Harman's single-factor test, which is used to test the presence of common method variance (CMV). Common method variance refers to the amount of spurious covariance shared among variables due to the measurement method instead of the constructs the measures represent.

In Harman's single-factor test, all variables in a study are put through an exploratory factor analysis to check if a single factor shows up, or if the majority of the covariance between the measures is explained by one general factor. If just one element appears or one general factor explains more than 50% of the variance according to Podsakoff et al., (2003) , it suggests that a substantial amount of common method variance exists.

Referring to the Table.7, the first factor in factor analysis explains 27.235% of the total variance, which is less than the 50% threshold. Thus, this result would suggest that common method variance is not a major concern in dataset, according to Harman's single-factor test.

Table 7

Total Variance Explained for different components

Total Variance Explained						
Component	Initial Eigenvalues					
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.809	27.235	27.235	6.809	27.235	27.235
2	3.901	15.603	42.838			
3	2.769	11.075	53.913			
4	2.334	9.335	63.248			
5	1.902	7.61	70.858			

6	1.103	4.411	75.268			
7	0.898	3.593	78.861			
8	0.756	3.025	81.887			
9	0.704	2.816	84.702			
10	0.615	2.46	87.162			
11	0.5	1.999	89.161			
12	0.429	1.714	90.875			
13	0.395	1.579	92.454			
14	0.335	1.338	93.792			
15	0.296	1.184	94.977			
16	0.256	1.023	96			
17	0.202	0.806	96.806			
18	0.153	0.612	97.419			
19	0.147	0.589	98.008			
20	0.115	0.461	98.469			
21	0.111	0.444	98.914			
22	0.1	0.4	99.313			
23	0.081	0.324	99.637			
24	0.053	0.211	99.849			
25	0.038	0.151	100			

The Variance Inflation Factor (VIF) can be used to check for multicollinearity among predictor variables in model. Multicollinearity refers to when predictor variables are highly correlated with each other, which can cause problems in regression analyses because it can increase the variability of the regression coefficients, making them less stable and challenging to interpret.

The VIF values in data all are below 5, which, according to the threshold suggested by F. Hair Jr et al., (2014) and Chin, (2010), indicates that

multicollinearity is not a serious concern in model. Generally, a VIF value above 5 or 10 (depending on the threshold you adopt) would be indicative of high multicollinearity.

The low VIF values in model suggest that predictor variables are not highly correlated with each other (Table.8). Therefore, it's less likely that common method bias, caused by the measurement method, would be a major issue.

Taken together with the results from Harman's single-factor test, these findings provide additional confidence that "common method bias" is not a concern in study, and the relationships you observe between variables are unlikely to be artifacts of the measurement method used.

Table 8

VIF values for items

	VIF
BEI1	1.365
BEI2	1.401
BEI3	1.48
CM1	3.802
CM2	2.36
CM3	2.82
CM4	2.98
EE1	1.987
EE2	1.58
EE3	1.794
EE4	2.446
FC1	3.015
FC2	2.601
FC3	1.934
PE1	2.158
PE2	2.587
PE3	2.98
PE4	2.616
PP1	1.555
PP2	2.551
PP3	2.996
PP4	1.13
UB1	1.495

UB2	1.002
UB3	1.497

5.4. Measurement Model Examination

5.4.1 Reliability

Reliability in research refers to the consistency or dependability of a set of measurements or a measurement instrument. In the context of this study, reliability has been examined using two statistical measures: Cronbach's Alpha and Composite Reliability.

Cronbach's Alpha

Cronbach's Alpha is a statistical measure of internal consistency. It evaluates how closely related a set of items are as a group. The value of Cronbach's Alpha ranges between 0 and 1. A high value above 0.7 as per Hair et al., (2013) a high degree of internal consistency since the items inside each construct measure the same underlying concepts. In this study, Cronbach's Alpha values for all constructs (BEI, CM, EE, FC, PE, PP, UB) are above the 0.7 threshold, ranging from 0.718 (BEI) to 0.932 (CM) (Table.9). This high level of internal consistency signifies that the items of each construct are cohesive and are measuring the same underlying concept consistently.

Composite Reliability

While Cronbach's Alpha is a commonly used measure of reliability, it assumes that all items are equally reliable. To overcome this limitation, Composite Reliability (CR) was developed. CR does not assume equal reliability of all items, making it a more robust measure for assessing internal consistency. The acceptable threshold for CR is also 0.7 (F. Hair Jr et al., 2014).

The Composite Reliability values for all constructs in this study exceed this threshold, ranging from 0.734 (BEI) to 0.989 (PP) (Table.9). This implies that the items within each construct are not only cohesive but also contribute differently to the construct, thereby providing a more robust measure of internal consistency.

In conclusion, the measurement instruments used in this study exhibit strong reliability. Both Cronbach's Alpha and Composite Reliability results of all constructs surpass the recommended threshold of 0.7, indicating high internal consistency. This consistency across all constructs bolsters the overall reliability of the measurement instruments in this study, thereby supporting the validity of the study findings.

Table 9

Cronbach's alpha and CR values of the variables

	Cronbach's alpha	Composite reliability (CR)
BEI	0.718	0.734
CM	0.932	0.935
EE	0.836	0.868
FC	0.899	0.948
PE	0.894	0.904
PP	0.753	0.989
UB	0.748	0.802

5.4.2 Validity

Validity in research refers to the accuracy or truthfulness of the inferences, interpretations, and actions made based on the study's findings. It determines whether the research truly measures what it was intended to measure. An important aspect of validity in PLS-SEM is Convergent Validity, which will be discuss below.

Convergent Validity

Convergent validity is a part of different types of construct validity. It assesses the degree to which two measures of constructs that theoretically should be related, are in fact related. In PLS-SEM, Average Variance Extracted (AVE) is used as a measure of convergent validity. An AVE of 0.50 or above, as suggested by Hair et al., (2013), is considered acceptable. This means that, on average, the construct explains more than half of the variance of its indicators.

In this study, the AVE values for all constructs (BEI, CM, EE, FC, PE, PP, UB) exceed the 0.50 threshold, indicating adequate convergent validity. The AVE values range from 0.52 (UB) to 0.83 (CM) (Table.10). This demonstrates that the measurement items are appropriate indicators of their respective constructs and, on average, each item's construct accounts for more than half of the variance in the set.

In conclusion, the analysis of Average Variance Extracted confirms the presence of convergent validity in the study. This validates that the constructs used in the study provide satisfactory explanation of the variance in their corresponding indicators. Therefore, the measurement model in this study is considered to have adequate validity, supporting the credibility of the study's findings.

Table 10

AVE values for the variables

Construct	Average variance extracted (AVE)
BEI	0.638
CM	0.83
EE	0.666
FC	0.814
PE	0.758

PP	0.571
UB	0.52

Discriminant Validity

Discriminant validity is an assessment of the extent to which a construct is truly distinct from other constructs. It measures the lack of a relationship among constructs that are supposed to be unrelated. Two ways to establish discriminant validity in a PLS-SEM analysis are the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio (HTMT).

Fornell-Larcker Criterion

This criterion indicates that a construct exhibits a stronger correlation with its related indicators compared to any other construct within the model. In simpler terms, the square root of the AVE of a construct should be greater than its correlations with any other construct. Looking at the given table, all diagonal values (representing the square root of AVE) are larger than the off-diagonal values in their respective rows and columns. For example, for BEI (0.799) is larger than all its correlations with other constructs (e.g., 0.499 with CM) (Table.11). This confirms that each construct is more strongly correlated with its own indicators and satisfies the Fornell-Larcker criterion, indicating the presence of discriminant validity.

Table 11

Fornell-Larcker Criterion values

	BEI	CM	EE	FC	PE	PP	UB
BEI	0.799						
CM	0.499	0.911					
EE	0.205	0.024	0.816				

FC	0.172	0.183	0.266	0.902			
PE	0.585	0.378	0.043	0.166	0.87		
PP	0.224	0.187	0.232	0.116	0.114	0.756	
UB	0.531	0.839	-0.123	0.242	0.422	0.259	0.721

Heterotrait-Monotrait Ratio (HTMT)

The HTMT is a more recent and conservative approach to assess discriminant validity. It compares the mean of the item correlations across constructs (heterotrait-heteromethod correlations) with the mean of the item correlations within the same construct (monotrait-heteromethod correlations). A value less than 0.85 or 0.90 (Hair et al., 2017) is considered indicative of adequate discriminant validity. All HTMT ratios in the provided in Table.12 for this study are below this threshold, thus confirming discriminant validity.

In summary, the study demonstrates good discriminant validity. Both the Fornell-Larcker criterion and the HTMT results confirm that the constructs measured are distinct from each other. This adds to the robustness and validity of the research findings.

Table 12

HTMT Values for discriminant validity

	BEI	CM	EE	FC	PE	PP	UB
BEI							
CM	0.599						
EE	0.245	0.084					
FC	0.21	0.183	0.325				
PE	0.713	0.405	0.121	0.177			
PP	0.24	0.191	0.472	0.143	0.255		

UB	0.823	0.835	0.326	0.448	0.844	0.559	
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5.5. Structural Model

In Partial Least Squares Structural Equation Modeling (PLS-SEM), the Structural Model evaluation is the second step, following the Measurement Model assessment. This phase is focused on understanding the relationships among the constructs of the research model.

R-square

In the evaluation of the structural model, looking at the R-square values, which represent the extent to which the independent variables explain the variance in the dependent variables. According to Hair et al., (2017) R-square values equal to or greater than 0.10 are considered acceptable.

In this study, the R-square values far exceed this threshold, signifying that the model has a good explanatory power. The R-square for Behavioral Intention (BEI) is 0.526, indicating that the model explains around “52.6%” of the variance in BEI. Similarly, for UB, the R-square is 0.733, implying that about 73.3% of the variance in UB can be explained by the independent variables in the model (Table.13). This suggests the model is not overly complex and justifies the inclusion of predictors in the model.

Table 13

R-Square values for the model

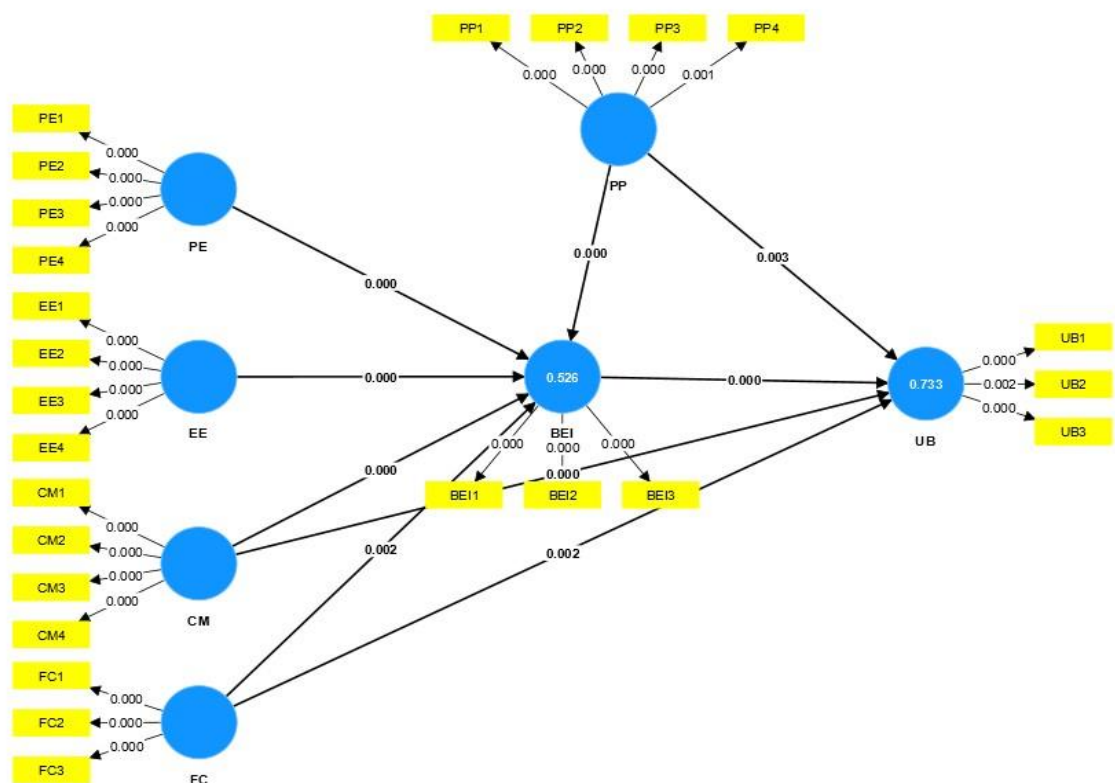
Dependent Variable	R-square
BEI	0.526
UB	0.733

5.5.1 Results of Direct Relationships

Within the framework of the research model, it was important to examine the direct relationships among the constructs. These relationships shed light on the factors that directly influence healthcare professionals' Behavioral Intention (BEI) and Use Behavior (UB) towards Digital Health Information Technology (DHIT) adoption. The results of these direct relationships are presented in detail as follows (see Figure.6 and Table.14):

Figure 6

Direct relations from Smart PLS



Hypothesis 9 - Behavioral Intention to Use Behavior (BEI -> UB): Our results indicated a significant direct effect ($\beta=0.128$, $t=4.166$, $p<0.001$). Thus, it was found strong evidence supporting that Behavioral Intention directly and positively

influences Use Behavior. Behavioral Intention (BEI) positively influences Use Behavior (UB) towards Digital Health Information Technology (DHIT) adoption, showcasing the inclination to act on the intention.

Hypothesis 5 - Compatibility to Behavioral Intention (CM $\rightarrow$ BEI): Compatibility demonstrated a significant impact on behavioural intention which is positive ($\beta=0.283$, $t=10.141$, $p<0.001$), reinforcing the role of Compatibility in promoting Behavioral Intention. Compatibility fosters a sense of alignment and agreement, significantly boosting healthcare professionals' intention to embrace DHIT, indicating its pivotal role in acceptance.

Hypothesis 6 - Compatibility to Use Behavior (CM $\rightarrow$ UB): Compatibility's effect on Use Behavior was highly significant ($\beta=0.746$, $t=30.035$, $p<0.001$), suggesting that Compatibility substantially encourages Use Behavior. Compatibility remarkably drives actual Use Behavior (UB) of DHIT among healthcare professionals, highlighting its substantial impact on implementation and utilization.

Hypothesis 2 - Effort Expectancy to Behavioral Intention (EE $\rightarrow$ BEI): Effort Expectancy was found to significantly influence Behavioral Intention ($\beta=0.305$, $t=9.83$, $p<0.001$), emphasizing the role of ease of use in driving intention.

Effort Expectancy, reflecting ease of use, significantly affects the intention to adopt DHIT, underlining the importance of perceived simplicity in driving motivation.

Hypothesis 3 - Facilitating Conditions to Behavioral Intention (FC $\rightarrow$ BEI): Facilitating Conditions also had a significant positive effect on Behavioral Intention ($\beta=0.105$, $t=3.134$, $p<0.01$), highlighting the importance of resources and support in shaping intention.

Hypothesis 4 - Facilitating Conditions to Use Behavior (FC → UB): Facilitating Conditions displayed a significant positive influence on Use Behavior ($\beta=0.107$, $t=3.083$, $p<0.01$), pointing to the role of conducive conditions in promoting actual use. Facilitating Conditions positively impact both the intention to adopt DHIT and the actual usage among healthcare professionals, emphasizing the role of resources and support in enabling and sustaining adoption.

Hypothesis 1 - Performance Expectancy to Behavioral Intention (PE → BEI): Performance Expectancy significantly influenced Behavioral Intention ($\beta=0.454$, $t=17.175$, $p<0.001$), underscoring the key role of perceived usefulness in shaping intention. Performance Expectancy, portraying perceived usefulness, significantly shapes the intention to adopt DHIT, signifying its pivotal role in influencing decision-making.

Hypothesis 7 - Perceived Protection to Behavioral Intention (PP → BEI): Perceived Protection showed a significant positive impact on Behavioral Intention ($\beta=0.176$, $t=5.151$, $p<0.001$), indicating that perception of security encourages intention. Perceived Protection significantly influences the intention to adopt DHIT, emphasizing the importance of security perceptions in fostering willingness to use.

Hypothesis 8 - Perceived Protection to Use Behavior (PP → UB): Perceived Protection significantly influenced Use Behavior ($\beta=0.102$, $t=2.97$, $p<0.01$), reinforcing the importance of perceived security in facilitating actual use. Perceived Protection also contributes to actual Use Behavior (UB), indicating its role in facilitating the practical application of DHIT among healthcare professionals, likely due to enhanced trust and confidence in security measures.

Our analysis confirms all proposed direct relationships in the research model. These findings provide valuable insights into the direct influences among the constructs, contributing to our understanding of DHIT adoption among healthcare professionals.

Table 14

Significance of direct relations of the variables

Direct Relationships	Path Coefficient	T statistics	P values	Status
BEI -> UB	0.128	4.166	0.00	Accepted
CM -> BEI	0.283	10.141	0.00	Accepted
CM -> UB	0.746	30.035	0.00	Accepted
EE -> BEI	0.305	9.83	0.00	Accepted
FC -> BEI	0.105	3.134	0.002	Accepted
FC -> UB	0.107	3.083	0.002	Accepted
PE -> BEI	0.454	17.175	0.00	Accepted
PP -> BEI	0.176	5.151	0.00	Accepted
PP -> UB	0.102	2.97	0.003	Accepted

5.5.2 Results of Moderation Effect of TJP

Having examined the direct relationships, the study next explored the moderation effects of the Type of Job Position (TJP) on the relationships between key determinants and the Behavioral Intention (BEI) as well as the Use Behavior (UB) towards Digital Health Information Technology (DHIT) adoption. The results of these moderation effects are summarized as follows (see Table.15):

Hypothesis 10a (TJP x PE -> BEI): Our analysis revealed a significant moderating effect of TJP on the relationship between Performance Expectancy and Behavioral Intention ($\beta=0.129$, $t=2.932$, $p<0.01$). This suggests that the job

position of healthcare professionals significantly alters the influence of Performance Expectancy on their intention to adopt DHIT.

Hypothesis 10b (TJP x EE $\rightarrow$ BEI): However, the moderating effect of TJP on the relationship between Effort Expectancy and Behavioral Intention was not found to be significant ($\beta=0.061$, $t=1.679$, $p>0.05$). This indicates that the job position does not significantly change the impact of Effort Expectancy on the intention to use DHIT.

Hypothesis 10c (TJP x CM $\rightarrow$ BEI): The moderating effect of TJP on the link between Compatibility and Behavioral Intention was found to be significant ($\beta=0.162$, $t=3.903$, $p<0.001$). This means that the job position significantly influences the effect of Compatibility on the intention to adopt DHIT.

Hypothesis 10d (TJP x CM $\rightarrow$ UB): it was also discovered a significant moderating effect of TJP on the relationship between Compatibility and Use Behavior ($\beta=0.171$, $t=5.941$, $p<0.001$). This signifies that the job position considerably modulates the influence of Compatibility on actual DHIT usage.

Hypothesis 10e (TJP x FC $\rightarrow$ BEI): The effect of TJP as a moderator on the relationship between Facilitating Conditions and Behavioral Intention was significant ($\beta=0.113$, $t=2.675$, $p<0.01$), highlighting the differential role of facilitating conditions based on the job position in shaping behavioral intention.

Hypothesis 10f (TJP x FC $\rightarrow$ UB): TJP was found to significantly moderate the relationship between Facilitating Conditions and Use Behavior ($\beta=0.067$, $t=2.898$, $p<0.01$), further emphasizing the varying influence of facilitating conditions on actual DHIT use depending on the job position.

In summary, except for the relationship between Effort Expectancy and Behavioral Intention, TJP was found to significantly moderate all the proposed

relationships. This provides valuable insights into how the impact of different factors on DHIT adoption may vary depending on the job position of healthcare professionals.

Table 15

Moderation effect of TJP on the direct relations

Moderation Relationship	Path-coefficient	T-Statistics	P-Value	Status
TJP x PE -> BEI	0.129	2.932	0.004	Accepted
TJP x EE -> BEI	0.061	1.679	0.094	Reject
TJP x CM -> BEI	0.162	3.903	0.00	Accepted
TJP x CM -> UB	0.171	5.941	0.00	Accepted
TJP x FC -> BEI	0.113	2.675	0.008	Accepted
TJP x FC -> UB	0.067	2.898	0.004	Accepted

5.6 Demographic Factors' Impact

In the conducted research, an in-depth investigation was undertaken into the various demographic factors, including Gender, Age, Education, Type of Job Position, Experience in Job, and Experience with Digital Health Information Technology (DHIT). These factors were meticulously incorporated into the model as control variables, acknowledging their probable contextual impact on the intricate relationships within the study.

The examination of these demographic variables revealed intriguing insights into their influence on both Behavioral Intention (BEI) and Use Behavior (UB) concerning the adoption of Digital Health Information Technology (DHIT). The path coefficients, T statistics, and corresponding P values obtained from the analysis provided valuable quantitative evidence supporting the relationships between these factors and BEI (Figure.7).

Table 16

Demographics effect and direct relations with variables

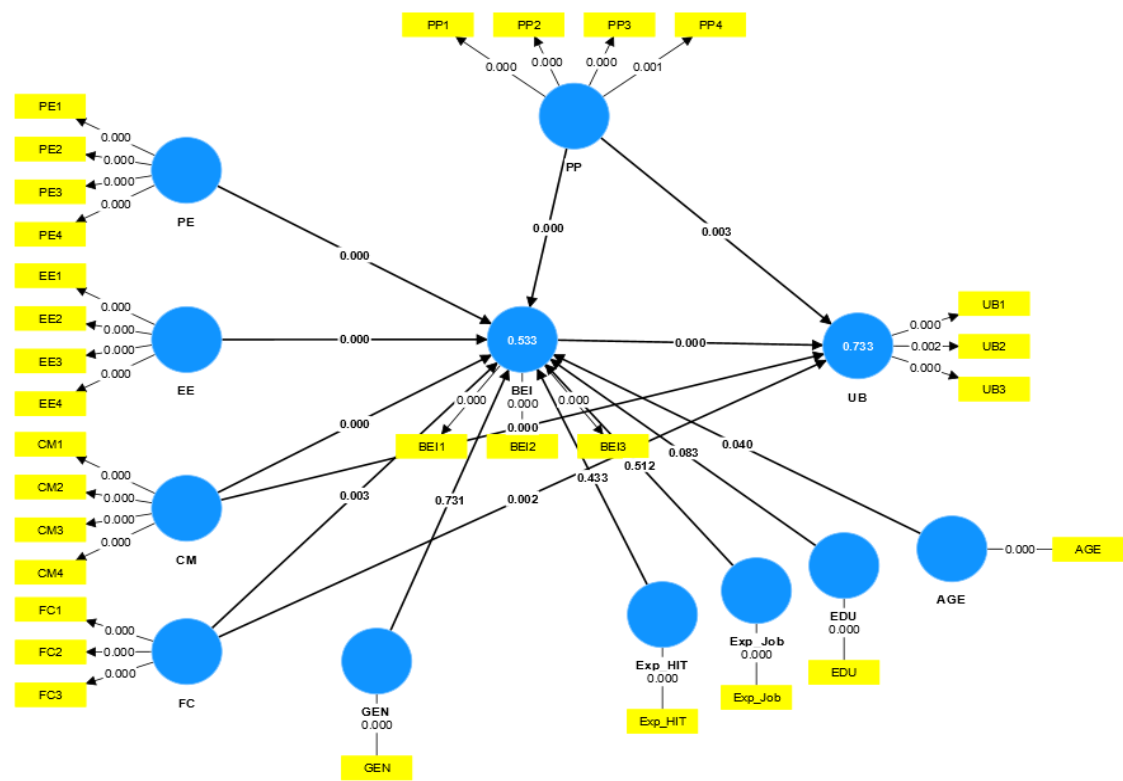
Relation	Path-coefficient	T statistics	P values
AGE -> BEI	0.073	2.111	0.04
EDU -> BEI	-0.053	1.429	0.154
Exp_HIT x PE -> BEI	-0.081	1.286	0.199
AGE x EE -> BEI	-0.043	1.226	0.221
EDU x PE -> BEI	0.034	1.158	0.247
Exp_HIT -> BEI	0.063	0.825	0.41
GEN x EE -> BEI	0.067	0.722	0.471
Exp_Job -> BEI	-0.053	0.711	0.478
Exp_Job x PE -> BEI	0.043	0.696	0.487
Exp_Job x EE -> BEI	-0.057	0.691	0.49
Exp_HIT x EE -> BEI	0.047	0.622	0.534
GEN -> BEI	-0.029	0.342	0.733
EDU x EE -> BEI	-0.014	0.34	0.734
AGE x PE -> BEI	0.01	0.288	0.773
GEN x PE -> BEI	0.002	0.024	0.981

Notably, the findings showcased that Age demonstrated a statistically significant positive path coefficient (0.073, $T = 2.111$, $p = 0.04$) concerning its influence on BEI. Conversely, Education revealed a negative yet non-significant path coefficient (-0.053, $T = 1.429$, $p = 0.154$) in its relationship with BEI. Furthermore, the interactions between Experience in Job and Personal Experience with DHIT (-0.081, $T = 1.286$, $p = 0.199$) and Age and Type of Job Position (-0.043, $T = 1.226$, $p = 0.221$) exhibited non-significant but discernible impacts on BEI (Table.16).

Additional analyses uncovered a range of relationships between demographic variables and BEI, shedding light on their nuanced roles in influencing the intentions towards adopting DHIT. These empirical findings contribute significantly to understanding the multifaceted dynamics that shape behavioral

intentions and usage behavior concerning Digital Health Information Technology adoption among diverse demographic groups.

Figure 7
Demographics effect on variables



5.7 Summary of Hypothesis Testing Results

Within the framework of examining the adoption of Digital Health Information Technology (DHIT) among healthcare professionals, a Structural Equation Modeling (SEM) analysis was conducted to explore the direct relationships and moderation effects of job position on key determinants influencing Behavioral Intention (BEI) and Use Behavior (UB) towards DHIT adoption. The study found strong support for the direct relationships between various factors and BEI/UB, emphasizing their influence. Factors such as Compatibility, Effort Expectancy,

Facilitating Conditions, Performance Expectancy, and Perceived Protection significantly impacted BEI and UB, highlighting their crucial role in driving DHIT adoption among healthcare professionals. Additionally, the analysis unveiled significant moderation effects of job position (TJP) on most relationships, indicating that the influence of certain factors on DHIT adoption may vary based on healthcare professionals' job positions. Notably, while Effort Expectancy did not significantly affect BEI with regard to job position, other determinants showed considerable variations in their impact, shedding light on the nuanced dynamics within healthcare settings concerning DHIT adoption. These findings provide valuable insights into the complexities of DHIT adoption in healthcare contexts and underscore the importance of tailored strategies considering the diverse job positions within the sector.

5.8 Chapter Summary

The Chapter presents a comprehensive examination of the demographic profile of healthcare workers and the findings derived from Structural Equation Modeling (SEM) in the context of Digital Healthcare Information Technology (DHIT) adoption. It delineates the demographic composition, factor loadings, suitability tests for factor analysis (KMO, Bartlett's test), assessment of common method bias, reliability measures (Cronbach's Alpha, Composite Reliability), and validity analyses (Convergent and Discriminant Validity) of the measurement model. The chapter elucidates the strength of direct relationships among constructs, moderation effects of Type of Job Position (TJP) on key determinants, and Behavioral Intention (BEI) as well as Use Behavior (UB) towards DHIT adoption. Overall, chapter reveals substantial insights into the factors influencing DHIT

adoption among healthcare professionals, addressing the demographic profile, model reliability, validity, direct relationships, and moderation effects based on job positions.

CHAPTER – 6

DISCUSSION AND IMPLICATIONS

6. Introduction

This chapter critically examines and elucidates the implications of the research outcomes concerning the adoption of “Digital Healthcare Information Technology (DHIT)” among healthcare professionals. Extending the existing understanding of the UTAUT model, the study incorporates the variable of "Perceived Protection" to comprehensively explore the factors influencing DHIT adoption. The chapter extensively discusses the main findings, notably focusing on Performance Expectancy, Effort Expectancy, Facilitating Conditions, Compatibility, and the novel variable, Perceived Protection. Additionally, the chapter examines the role of Type of Job Position (TJP) as a moderating factor, highlighting the variances across diverse job roles in the healthcare sector regarding DHIT adoption dynamics.

6.1 Main Results

This study focused on extending the understanding of the UTAUT model by investigating its applicability in the context of Digital Healthcare Information Technology (DHIT) adoption among healthcare professionals. We also examined the novel addition of the "Perceived Protection" variable, an individual's belief that one's information in a system will be secure. The findings revealed significant insights that build on the existing literature, providing a more nuanced understanding of the determinants that influence DHIT adoption.

The study contributes to the growing body of evidence that supports the critical determinants influencing the adoption of Digital Healthcare Information Technology (DHIT) among healthcare professionals. The findings provide valuable insights into the specific dynamics shaping Behavioral Intention (BI) and User Behavior (UB) of DHIT.

6.1.1 Performance Expectancy

Performance Expectancy is anticipated to positively influence Behavioral Intention regarding DHIT adoption. Aligning with research from Ngampornchai & Adams,(2016) the findings underscore the substantial role of Performance Expectancy (PE) in dictating the behavioral intention towards DHIT adoption. The perceived benefits and expected outcomes of DHIT adoption emerge as critical factors in shaping the intentions of healthcare professionals. This suggests the necessity of effective communication strategies that articulate how such technology can boost job performance and optimize healthcare outcomes. Developing DHIT with customizable features that align with various job roles could ensure that different professionals perceive the technology's benefits from their individual perspectives.

6.1.2 Effort Expectancy

Effort Expectancy was expected to have a positive influence on Behavioral Intention concerning DHIT adoption. The observations regarding Effort Expectancy (EE) in this study echo the conclusions of Scheibe et al., (2015) and Hung et al., (2014). This noteworthy relationship between the perceived ease of use and behavioral intention underscores the importance of intuitive, straightforward, and user-friendly digital health interfaces. This finding magnifies

the need for simplifying the user experience when integrating new technology into healthcare settings, where professionals often grapple with time constraints. Healthcare IT Developers should prioritize intuitive and user-friendly design elements in DHIT interfaces. They should also focus on developing interfaces that seamlessly integrate into existing healthcare workflows, reducing the effort required for professionals to adapt new systems.

6.1.3 Facilitating Conditions

Facilitating Conditions were expected to have a positive influence on both Behavioral Intention and User Behavior concerning DHIT adoption. Consistent with the study of Petersen et al., (2020). Facilitating Conditions (FC) emerged as a significant factor influencing both behavioral intention and user behavior (Fuad & Hsu, 2018; Ifinedo, 2012a). The availability and accessibility of necessary resources, support, and infrastructure are paramount in the decision-making process concerning DHIT adoption. The result put emphasis on the responsibility of the healthcare ecosystem to foster a conducive environment that encourages the practical implementation of DHIT. Hospital IT Managers could allocate sufficient resources and support systems to facilitate DHIT implementation, ensuring about healthcare professionals to have the necessary tools and infrastructure for adoption of the technology effectively. Offering continuous training and support could further optimize DHIT usage. Healthcare IT Developers should provide scalable DHIT solutions adaptable to various hospital sizes and infrastructure capabilities.

6.1.4 Compatibility

Compatibility was anticipated to positively influence both Behavioral Intention and User Behavior related to DHIT adoption. The study found that Compatibility (CM) with current workflows and technical infrastructure significantly impacts both behavioral intention and user behavior, in agreement with the studies of Bunker et al., (2006) and Ifinedo, (2012b) These findings underscore that the successful adoption of technology extends beyond the features of the technology itself. It includes the ease of integration into existing systems and workflows. Hospital IT Managers could encourage customization of DHIT to align seamlessly with existing healthcare workflows and conduct pilot testing phases before full-scale deployment. For Healthcare IT Developers, developing DHIT solutions with customization capabilities to accommodate diverse healthcare settings is crucial. Prioritizing standardized integration protocols would facilitate compatibility with different healthcare systems.

6.1.5. Perceived Protection

Perceived Protection, a novel addition in this study, was anticipated to positively influence Behavioral Intention regarding DHIT adoption. The novel addition of Perceived Protection (PP) in the study holds noteworthy implications. Drawing parallels with Meingast et al., (2006) insights, this study demonstrates the considerable impact of PP on DHIT adoption. Given the sensitive nature of data in healthcare, trust and data privacy become significant factors influencing the acceptance of technology. This outcome amplifies the need for stringent data protection features in DHIT design and robust data privacy regulations within the healthcare sector. Hospital IT Managers should establish and enforce strict data

security policies and conduct awareness campaigns among healthcare professionals about robust data protection measures. For Healthcare IT Developers, prioritizing robust data encryption, access controls, and compliance with healthcare industry data privacy regulations are crucial to ensure comprehensive protection of patient information within DHIT systems.

6.2 The Role of TJP as a Moderating Variable

The study findings also unravel interesting dynamics associated with the type of job position (TJP) as a moderating factor in the adoption and usage of DHIT. It was observed that TJP significantly moderates several relationships in the proposed model, providing an extended layer of comprehension in our understanding of the adoption of DHIT.

Beginning with the influence of TJP on Performance Expectancy (PE) and Behavioral Intention (BEI) to adopt DHIT, the relationship was found to be significant. This implies that healthcare professionals' understanding of the benefits and expected outcomes from the adoption of DHIT might differ based on their respective job positions, which is in line with Kuciapski's, (2019) study that reported variation in the acceptance of mobile technologies for knowledge transfer across different job positions. This gives us an indication that perhaps the benefits and expected outcomes of DHIT are not universally understood or perceived across different job roles, signifying the need for a more role-centric approach when introducing DHIT in the healthcare setting.

On the other hand, the moderating effect of TJP on the relationship between Effort Expectancy (EE) and Behavioral Intention (BEI) was found to be non-significant. This suggests that the ease of using DHIT, as perceived by healthcare

professionals, may not substantially differ based on their job position. This echoes earlier research (e.g., Li and Liu, 2020) which suggests that perceived ease of use is a fairly universal determinant of technology adoption, cutting across diverse job roles.

Further, TJP was found to significantly moderate the relationship between Compatibility (CM) and both Behavioral Intention (BEI) and User Behavior (UB) of DHIT. This accentuates that the integration of DHIT into existing workflows and technical systems might have varying degrees of impact on the adoption intention and actual use, depending on the specific job positions within the healthcare industry. It can be deduced that certain job roles may find the DHIT more compatible with their workflows than others, indicating a possible need for tailoring the technology to suit the requirements of various roles.

Finally, the moderating effect of TJP also extended to the relationships between Facilitating Conditions (FC) and both Behavioral Intention (BEI) and Use Behavior (UB) of DHIT. This signifies that the presence of necessary resources and support for DHIT adoption might be perceived differently based on one's job position. Certain job roles may have more access to or require different types of resources and support compared to others. This supports the argument made by Kripanont, (2007) that facilitating conditions are crucial determinants of technology adoption and should be tailored according to the specific needs of different job roles.

Given the significance of Type of Job Position (TJP) as a moderating factor in the adoption of Digital Health Information Technology (DHIT), Hospital IT Managers should consider a more tailored and role-centric approach in implementing DHIT

within healthcare settings. They should conduct thorough assessments to understand how different job positions perceive the benefits, expected outcomes, and compatibility of DHIT with their specific workflows. This insight will aid in customizing training programs, communication strategies, and resource allocations according to the diverse needs of various job roles. Additionally, Hospital IT Managers should collaborate with Healthcare IT Developers to design DHIT solutions that are adaptable and customizable to suit the distinct requirements of different positions within the healthcare industry. Healthcare IT Developers, in alignment with these findings, should focus on developing DHIT interfaces and functionalities that can be easily customized and integrated into diverse healthcare workflows. Creating flexible DHIT systems that accommodate various job positions' specific functionalities and demands would enhance adoption rates and overall usability within the healthcare setting. Moreover, providing role-specific support and resources would further optimize DHIT adoption and usage among healthcare professionals.

Table 17

Previous studies supporting the Study's findings

Serial No.	Variable	Studies Supporting
1	Performance Expectancy	Gan et al., (2022), Ngampornchai & Adams, (2016)
2	Effort Expectancy	Scheibe et al., (2015), Hung et al., (2014)
3	Compatibility	Bunker et al.,(2006), Ifinedo, (2012b)
4	Facilitating Conditions	Petersen et al., (2020)
5	Perceived Protection	Meingast et al., (2006)

6	Moderating Effect of TJP	Kuciapski, (2019)
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6.3. Implications

Our study's findings have several theoretical, managerial, and policy implications that could influence future strategies in healthcare technology adoption and contribute towards the achievement of the Universal Health Coverage (UHC) as outlined in the Sustainable Development Goals (SDG 3).

6.3.1 Theoretical Implications

The results of this study contribute to the existing body of knowledge on DHIT adoption in healthcare. In particular, our findings regarding Performance Expectancy (PE), Effort Expectancy (EE), Facilitating Conditions (FC), Compatibility (CM), and Perceived Protection (PP) provide a nuanced understanding of the key determinants influencing DHIT adoption among healthcare professionals. The inclusion of PP as a significant determinant represents a novel contribution to the technology acceptance literature in the context of healthcare, emphasizing the crucial role of data security and privacy concerns.

This study introduces a novel approach by incorporating the Type of Job Position (TJP) as a moderating variable within the Unified Theory of Acceptance and Use of Technology (UTAUT) model in the context of hospital settings. The inclusion of TJP as a moderator in understanding Digital Health Information Technology (DHIT) adoption among healthcare professionals is a distinctive extension of the existing UTAUT framework. This innovative approach illuminates the nuanced

influence of job positions on the relationships between key determinants and the behavioral intention and use behavior related to DHIT. By recognizing and analyzing the role of TJP, this study offers a more comprehensive and tailored understanding of the adoption dynamics of DHIT within healthcare, providing a novel perspective for future research endeavors in technology adoption and implementation in hospital settings. This approach contributes to the theoretical landscape by highlighting the necessity of considering job roles as a critical factor in shaping technology adoption within healthcare contexts, thereby enriching the theoretical implications of the UTAUT model.

6.3.2 Managerial Implications

From a managerial perspective, these findings provide critical insights to healthcare administrators and IT decision-makers. The significance of PE highlights the need to effectively communicate the benefits and value of DHIT in enhancing job performance. The role of EE underscores the necessity of user-friendly interfaces and simplified user experience. The influence of FC suggests the importance of providing adequate resources, infrastructure, and support for successful DHIT implementation. The impact of CM highlights the importance of ensuring that new technologies align with existing workflows and infrastructure. Finally, the importance of PP underscores the need to prioritize robust data protection features in DHIT design to enhance trust and acceptance among users. Understanding the varying impact of the Type of Job Position (TJP) on the adoption dynamics of DHIT emphasizes the need for tailored strategies. Hospital IT managers should adopt a segmented approach, acknowledging the diverse job roles within healthcare settings. Additionally, fostering an environment that facilitates collaboration between IT developers and healthcare professionals

across different job roles can ensure that DHIT solutions align seamlessly with their respective responsibilities, thereby promoting a more successful and harmonious adoption process.

6.3.3 Policy Implications

The study's policy implications extend beyond the healthcare sector, engaging diverse stakeholders such as government health departments, regulatory bodies, technology developers, insurers, and patient advocacy groups. Policymakers can harness these implications to craft comprehensive policies addressing Digital Healthcare Information Technology (DHIT) adoption and robust data protection measures. These findings contribute to a global trend, notably observed in developed nations, highlighting the pivotal roles of Facilitating Conditions (FC) and Perceived Protection (PP) in fostering successful DHIT adoption. Aligning with governmental healthcare modernization agendas, these implications advocate for cost-efficient strategies and improved patient outcomes. Additionally, they offer the insurance sector enhanced data access for more refined risk assessment, aligning insurance services with evolving technological advancements.

Moreover, the study underscores the imperative of stakeholder collaboration for effective DHIT implementation. It emphasizes the need for concerted efforts among healthcare providers, technology developers, insurers, and patients. This collaborative approach ensures the integration of DHIT into existing healthcare frameworks while emphasizing the importance of data security and privacy. By acknowledging and incorporating the study's implications, policymakers can drive policy formulations that not only facilitate DHIT adoption but also safeguard

sensitive healthcare information, ultimately fostering a more efficient, patient-centric healthcare ecosystem.

6.3.4 Implications for Universal Health Coverage (SDG3)

Our findings have implications for achieving Universal Health Coverage (UHC) as part of Sustainable Development Goal 3. By understanding the key determinants influencing DHIT adoption among healthcare professionals, we can devise strategies to promote the wider acceptance and use of digital health technologies. The effective adoption of DHIT can enhance healthcare delivery, improve patient outcomes, and promote health equity – all critical elements of UHC. These insights can guide strategies aimed at leveraging digital health technologies to advance towards UHC and contribute to the broader goal of health and well-being for all.

6.3 Summary

The Discussion and Implications chapter synthesizes significant insights derived from the study, enriching the discourse on the determinants of DHIT adoption among healthcare professionals. The in-depth exploration of factors such as Performance Expectancy, Effort Expectancy, Facilitating Conditions, Compatibility, and Perceived Protection unveils critical facets influencing Behavioral Intention and Use Behavior in DHIT adoption. Furthermore, the chapter underscores the pivotal role of Type of Job Position as a moderator, emphasizing the necessity for a tailored and role-centric approach when introducing DHIT within healthcare settings. The implications drawn from this chapter hold theoretical, managerial, and policy relevance, illuminating pathways

to enhance DHIT adoption and contributing substantially to the pursuit of Universal Health Coverage as outlined in Sustainable Development Goal 3.

CHAPTER – 7

CONCLUSION WITH LIMITATIONS AND FUTURE RESEARCH SCOPE

7. Introduction

This chapter concludes about novel findings of the determinants influencing the adoption of Digital Healthcare Information Technology (DHIT) among healthcare professionals. This chapter presents a synthesis of findings derived from an extended Unified Theory of Acceptance and Use of Technology (UTAUT) framework in healthcare sector. It encapsulates the critical factors influencing DHIT adoption, including Performance Expectancy (PE), Effort Expectancy (EE), Compatibility (CM), Facilitating Conditions (FC), Perceived Protection (PP), and the moderating role of job positions (TJP). The chapter aims to consolidate key insights and delineate future research directions to enrich the understanding of DHIT adoption determinants in health sector.

7.1. Conclusion

This research investigates the critical determinants influencing the adoption of Digital Healthcare Information Technology (DHIT) among healthcare professionals. The study employed an extended version of the Unified Theory of Acceptance and Use of Technology (UTAUT) framework, where factors such as Performance Expectancy (PE), Effort Expectancy (EE), Compatibility (CM), Facilitating Conditions (FC), and Perceived Protection (PP) are given primacy. The study also examined the moderating role of the type of job position (TJP). The research provides several significant insights to adopt in hospital settings.

Firstly, Performance Expectancy (PE) and Effort Expectancy (EE) were both found to be influential in shaping healthcare professionals' behavioral intentions to adopt DHIT. This aligns with existing literature, reinforcing the notion that the perceived usefulness and ease of use of a technology which play a pivotal role in its adoption.

Secondly, Compatibility (CM) and Facilitating Conditions (FC) were both shown to have significant influences on both behavioral intention and user behavior, affirming the importance of these factors in successful technology adoption. These findings suggest that the practical aspects of technology adoption, such as the integration with existing systems and the provision of supportive conditions, are as crucial as the intrinsic characteristics of the technology itself.

Lastly, Perceived Protection (PP) emerged as a vital determinant of DHIT adoption, underscoring the essential role of trust and security in health-related technology. With this, the study brings into sharper focus the need for more comprehensive and robust data protection measures in DHIT. Simultaneously, the study also demonstrated that the Type of Job Position (TJP) significantly moderates several relationships within the extended UTAUT model. This suggests that the job position of a healthcare professional can significantly influence their perceptions and intentions towards DHIT adoption, necessitating a more nuanced understanding of these effects.

This study offers valuable insights that deepen our understanding of DHIT adoption in healthcare settings. The findings provide not only a robust empirical basis for future research but also practical insights for healthcare organizations, technology developers, and policy-makers alike. By fostering a better

understanding of the determinants of DHIT adoption, there is strong believe that the research contributes significantly to the broader goal of achieving Universal Health Coverage (UHC), an essential part of Sustainable Development Goal 3. Through this, there is hope to support the development of more effective strategies for DHIT implementation, ultimately leading to improved health outcomes and a healthier future for all.

7.2 Limitations

In acknowledging the boundaries of the research, it can be noted that while this study has provided meaningful insights, but the study also carries certain limitations. The demographic variables considered as control variables within the research model might not capture complete array of factors that could potentially influence the adoption of DHIT. Despite the non-significant direct or moderating effects observed in the analysis for the included demographic variables, it has been recognized that the omission of other potentially impactful factors, such as the level of education, degree of technology literacy, or extent of prior experience with technology, might limit the comprehensiveness and breadth of our model.

Additionally, the scope of the study was geographically confined, with the sample predominantly drawn from a specific region. This regional concentration may pose limitations to the universal applicability and generalizability of findings. Differences in regional healthcare practices, technology infrastructure, and culturally specific attitudes towards technology could significantly influence the perceived ease of use, usefulness, and acceptance of DHIT. Therefore, the findings of this study should be interpreted with an understanding of this context-specific limitation.

These limitations, however, also lay the groundwork for further research, presenting opportunities to extend and refine the understanding of the factors influencing the adoption of DHIT among healthcare professionals.

7.3 Scope for Future Research

The limitations of this study open avenues for future research. Future research could consider a more diverse set of demographic variables, including but not limited to technology literacy and previous experience with similar technologies. This would provide a more comprehensive view of the factors influencing the adoption of DHIT among healthcare professionals. Furthermore, future studies could attempt to replicate our study in different geographical and cultural contexts to enhance the generalizability of the findings.

Additionally, as technology continues to evolve rapidly, newer determinants may emerge that influence the adoption of DHIT. Future research should continually reassess the key determinants and consider additional ones relevant to the changing landscape of healthcare technology. It would also be worthwhile to investigate further the role of various job positions in moderating the relationships within the UTAUT model, considering the vast diversity of roles within the healthcare sector.

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<https://doi.org/10.7717/peerj.4436>

Annexure 1

Survey Instruments

Variable	Items
Performance Expectancy (PE)	PE1: Using DHIT will significantly enhance my job performance. PE2: I believe that utilizing DHIT will improve my efficiency at work. PE3: DHIT has the potential to positively impact my professional outcomes. PE4: I am confident that using DHIT will increase my productivity in my role.
Effort Expectancy (EE)	EE1: Learning to use DHIT effectively seems straightforward to me. EE2: DHIT simplifies the tasks I need to perform in my job. EE4: I find DHIT's interface and navigation to be user-friendly. EE4: I believe I can easily adapt to and use DHIT without encountering significant difficulties.
Facilitating Conditions (FC)	FC1: My organization provides adequate resources for me to use DHIT effectively. FC2: Training and assistance for using DHIT are readily accessible to me. FC3: I can easily access technical support systems to address any DHIT-related issues.
Compatibility (CM)	CM1: DHIT aligns well with my current professional needs, experiences, and values. CM2: I believe that DHIT is compatible with the way I prefer to work and communicate. CM3: DHIT resonates with my personal preferences and expectations for technology. CM4: I feel that DHIT is in line with the technological tools and solutions I am accustomed to using in my profession.
Perceived Protection (PP)	PP1: I trust that DHIT provides adequate protection for patient's sensitive information and data. PP2: I feel confident that patient's personal and professional information will remain secure while using DHIT. PP3: DHIT's security measures give me peace of mind regarding the confidentiality of patient data. PP4: I believe that DHIT prioritizes the protection of users' information and privacy.
Behavioral Intention (BEI)	BEI1: I intend to use DHIT in my professional activities in the near future.

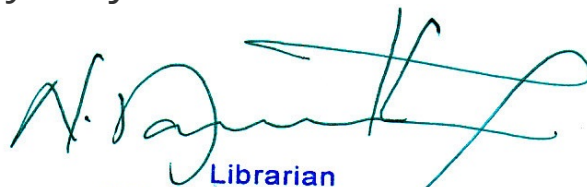
	BEI2: I am likely to adopt DHIT as part of my regular work routine.
	BEI3: I plan to actively explore and familiarize myself with DHIT features and capabilities.
Use Behavior (UB)	UB1: I have already begun using DHIT in my professional activities.
	UB2: I frequently utilize DHIT to accomplish various tasks in my job.
	UB3: I actively engage with DHIT features and functionalities on a regular basis.

Annexure 2

- **Presented papers in different international conferences mentioned below**
 - Software Product Management Summit India 2023 IIM Bangalore
 - The 2nd International PRISM Conference in IIM - Nagpur
 - The 2nd International Healthcare Management Conference 2022”
 - International Conference on Safe and Sustainable Hospital, SASH 2021.
- **Published research paper titled**
 - Determinants of Satisfaction in the Usage of Healthcare Information Systems by hospital workers in Hyderabad, India – Neural Network and SEM approach. *Asia Pacific Journal of Information Systems*. (ABDC-C and Scopus)
 - “Determinants of Digital Health Information Search (DHIS) Behaviour: Extending UTAUT with healthcare behaviour constructs”. *Asia Pacific Journal of Health Management*. (ABDC-C and Scopus)
 - “Role of Health Financing in Provision of Health Care and Universal Health Coverage in India.” *Journal of Clinical & Diagnostic Research* (ESCI)
 - “The Function of Mid-day Meal Scheme: A Critical Analysis of Existing Policies and Procedures in Rayagada District of Odisha (India)”. *The International Journal of Community and Social Development* (Scopus)

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