E-GOVERNANCE IN TERTIARY HEALTH CARE SERVICE DELIVERY: A DELHI BASED STUDY

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CERTIFICATE

30/06/2024

This is to certify that Shruti Agarwal, a student of Dr B.R Ambedkar University, Agra, 282006, U.P, has satisfactorily concluded the research report titled – e-Governance in Tertiary Health Care Service Delivery: A Delhi Based study as part of the internship program at the National Centre for Good Governance (NCGG) under my mentorship.

I, Sigamani Panneer, hereby validate the successful completion of the internship report within the internship program at the National Centre for Good Governance (NCGG). The report submitted by Shruti Agarwal is an authentic work carried out by him/her under my supervision and guidance. I have reviewed and assessed the intern's performance throughout the internship period.

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Shruti Agarwal

Ms. Shruti Agarwal

UNDERTAKING

The dissertation "E-Governance in Tertiary Healthcare Service Delivery: A Delhi-Based Study" is my original work, I therefore submit. This work draws heavily from a wide range of sources, including special reports found in journals, articles, and magazines, as well as from the internet, newspapers, and standard works like books and secondary data for conceptual anchoring. I also acknowledge any shortcomings and restrictions, if any. I attest that I have not plagiarized any content and that I have correctly cited all references utilized in accordance with University Grants Commission, Government of India requirements. Additionally, I attest to having examined this thesis for plagiarism, which falls within the UGC's established parameters.

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ABBREVIATIONS

e-Governance – Electronic governance

HMIS – Hospital Management Information System

HDI – Human Development Index

NSO – National Statistical Office

EAT – Efficiency Accessibility and Transparency

IT – Information and Technology

AIIMS – All India institute of Medical Research

ICT – Information and Communication Technology

NIC – National Information Centre

SMART – Simple, Moral, Accountable, Responsive and Transparent

ORS – Online Registration System

NIMHANS – National Institute of Mental health and Neurosciences

NIN – National Identification Number

ABDM – Ayushman Bharat Digital Mission

EHR – Electronic Health Record

AI – Artificial Intelligence

MoHFW – Ministry of Health and Family Welfare

HIS – Hospital Information System

WHO – World Health Organization

MTI – Medical Tourism Index

ICMR – Indian Institute of Medical Research

HIT – Healthcare Information Technology

HISO – Health Information Standards Organization

MIS – Medical Information System

GOI – Government of India

NSSO – National Sample survey Office

NGO – Non-Governmental Organization

PPP – Public Private Partnership

ABSTRACT

In the tertiary healthcare sector, e-governance is essentially in its infancy, and its lack of accessibility can lead to inequities among various segments of the population. The current dissertation showcased the evolution and various domains of e-Governance services. Additionally, it mentions the comparative analysis of different countries in maintaining e-Governance services in tertiary healthcare service delivery. The challenges and positive knock-on impacts of e-governance services at Delhi's public and private tertiary healthcare facilities are discussed in this study.

To improve accessibility, integration, transparency, and affordability, among other things, the research touched briefly on government initiatives such as electronic Health Records, My Health app, HMIS, paperless hospitals, image capture, computerized prescriptions, etc. The accessibility limitations of e-Governance services in the health sector like lack of digital literacy, internet facilities, privacy issues, and others for beneficiaries such as the younger generation, the elderly, migrated populations, etc. are the main emphasis of this research.

The result indicated that e-governance has the immense potential to enhance accessibility, efficiency, data management and others. However, challenges such as low awareness, low adoption, privacy concerns, inadequate training, and infrastructure problems need to be addressed.

The study recommends addressing these hindrances through public awareness campaigns, mandatory staff training, improved infrastructure. Moreover, the study suggests to enhance telemedicine services and data digitalization for better accessibility and data driven governance.

CHAPTER 1 INTRODUCTION

India's population has proliferated over the past seven decades with 861 million people in 1950 and is expected to be 1.668 billion by 2050 (United Nation's world population prospects, 2023). In this scenario, it is crucial to emphasize the growth and development of the population. The Human Development Index (HDI), which takes into account factors like having a decent level of living, being knowledgeable, and living a long and healthy life, shows the progress of development. The main emphasis of the current study is to accomplish a long and healthy life by providing healthcare services electronically in every corner of the country. The ease of access to healthcare services mainly in the tertiary healthcare services will not only glorify the health and wellbeing of the nation but also enhance the public service delivery mechanism in the sector of health.

India's economy is one of the world's fastest-growing (World Bank, 2023), showing promising signs of sustaining its momentum. India aims to achieve upper middle-income status by 2047, the year of its 100th anniversary of independence(World Bank, 2023). To achieve these objectives factors like the reduction of poverty, surge in the education level of the population, and progress in the employment rate, among many others are important. Still, the factor of health is primary and most important to be focused upon. From the perspective of India, prioritizing the accessibility of healthcare is crucial, particularly considering its status as a developing nation and the potential strain that a burgeoning population might impose on its resources.

According to the *Ministry of Health and Family Welfare's Report of the Technical Group on Population Projections*, youth aged 15 to 29 made up 27.2% of the population in 2021. However, by 2036, this percentage is predicted to drop to 22.7%. Nonetheless, with a population of 345 million people, it still represents a substantial segment of the population (Ministry of Statistics and Program Implementation, 2022). According to the National Statistical Office (NSO) Senior in India 2021 report, the number of Indians over 60 who are considered senior will increase by 41% during a ten-year period, from 138 million in 2021 to 194 million in 2031(Zompa, 2021). Hence, it becomes naturally

important for India to steer its youth and elderly population in the correct way to transform the potentially dangerous scenario into a doable journey.

The accessibility of tertiary healthcare services can be enhanced through the implementation of Information and Communication Technology. E-Governance stands as a potential avenue for improving tertiary healthcare accessibility. E-Governance can decrease out-of-pocket expenditure, reduce the distance to seconds away, and increase interoperability and interconnectedness between patients and doctors. The adoption of e-governance in the tertiary healthcare sector has the potential to improve accountability, transparency, and efficiency (EAT) (Ali Amzad, 2016) which are considered pillars of Good Governance.

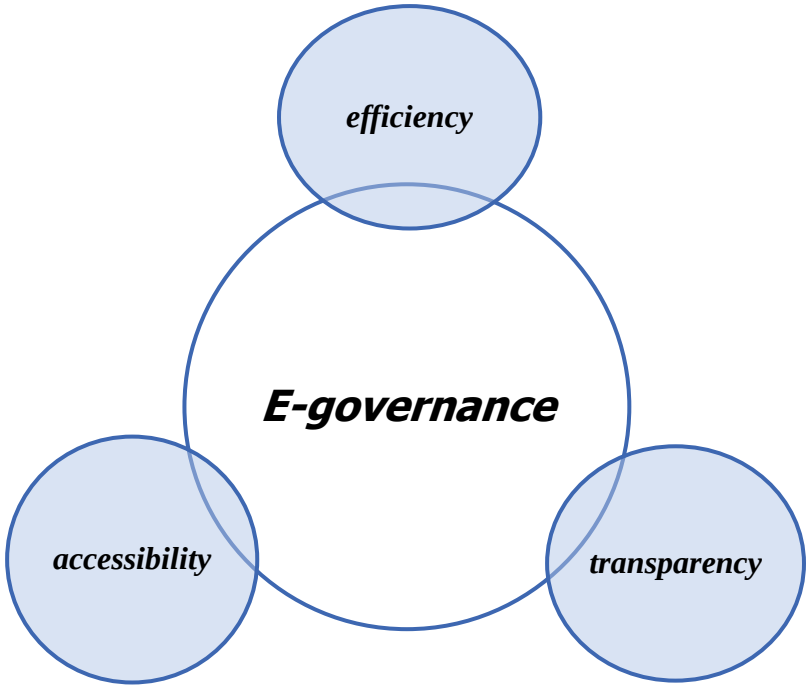


Figure 1 Interconnectedness of E-Governance with EAT

The concept of efficiency pertains to achieving the intended results with the least amount of time, money, and resources (Goodrich, 2015). E-Governance services like digital payments to receptionists, telemedicine, video conferencing, and E-office are helpful. Accessibility refers to how easy something is to reach, enter, use, and see (oxford) in which initiatives such as the National Health Portal, E-Hospitals, and Paperless hospitals can contribute significantly to advancing the health sector. Transparency concerns itself with the comprehension and clarity of a given circumstance or dispute. Transparency can be promoted through e-governance, as is often recognized.

The word "tertiary" was used concerning healthcare frequently in the study therefore a description is needed. Specialized medical services, usually offered in hospitals or other great medical facilities, are referred to as tertiary healthcare (Bhatnagar S. C., 2014). These services are extremely specialized and entail difficult processes and therapies. Using e-governance in the healthcare industry can greatly enhance the effectiveness, affordability, and transparency of service delivery by giving professionals, policymakers, healthcare providers, and the general public a shared platform(Bhatnagar s. c., 2014). E-Governance services contributed to tertiary health care services, but as they are still in their infancy, it is important to examine the usage and accessibility of these services. This research investigates the e-governance programs in India's healthcare industry and compares them on a national and international level.

Further, the study also throws some light on the comparison of e-governance services in tertiary health care between public and private hospitals in Delhi. This study looks at the relationship between E-Government and the infrastructure of the healthcare industry, evaluating the level of digitalization and general IT usage in public and private institutions. The comparison can aid in analyzing the disparity between the healthcare services provided by the public and private sectors within the country's infrastructure. Information management and communication procedures are essential to public health which heavily rely on the availability of information. Even though the field has advanced since telemedicine was first introduced a few years ago, much work still needs to be done (Bhatnagar s. c., 2014). It will not only help the government to equalize itself

with the private sector in terms of providing services as well as move towards a *welfare state* (Article 38) (Constitution of India, november,1949)**.** The comparison in the current study holds a vital impact as a wealthy person can afford private healthcare services at their doorstep however, the unprivileged lags behind. To bridge the rich and poor divide, government hospitals need to come to the forefront and deliver their services to the unprivileged section of society at their doorstep. In this context, e-governance can serve as a jewel in the crown.

1.1 Objectives

- To find out the level of usage and accessibility of e-Governance services in hospitals.
- To find out the reasons for the inaccessibility of e-Governance services to the beneficiaries along with a comparison between private and public tertiary hospitals.
- To explore the potential areas for the use of ICT in hospitals in Delhi

1.2 Study Area

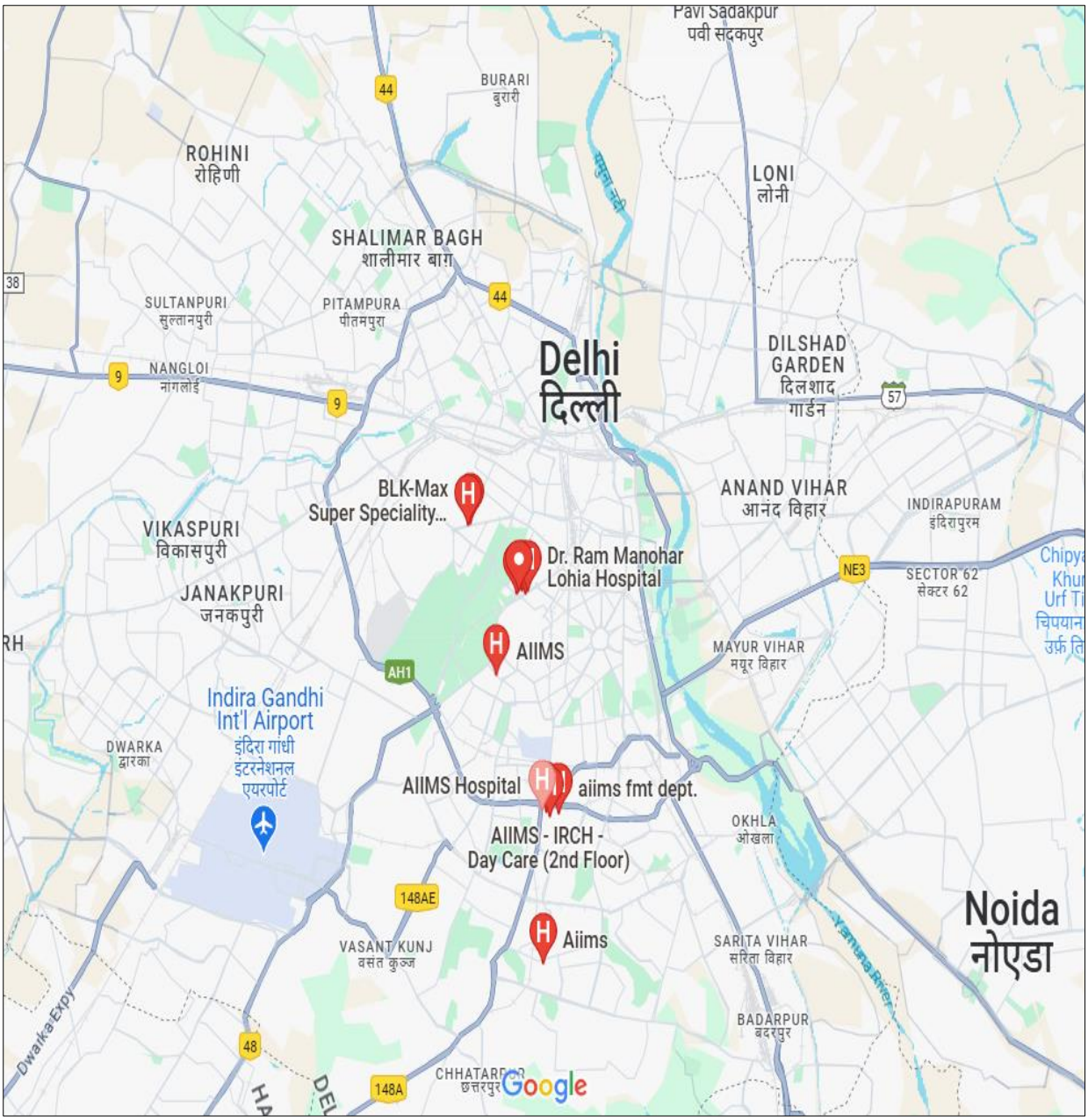
The current study is conducted in Delhi as it is among the best cities in India for the health industry (De, 2021). It boasts a robust healthcare system with many hospitals, clinics, and medical facilities offering a variety of services. Some of Delhi's top hospitals are internationally renowned for their expertise in a variety of medical specializations, including cardiology, cancer, neurology, and orthopedics. Furthermore, the city hosts numerous conferences, workshops, and seminars about healthcare that promote professional networking and knowledge exchange. While Delhi offers a vibrant and dynamic environment for the tertiary health sector, there are certain obstacles in place for both public and private hospitals, including a lack of digital infrastructure, high costs, and burdens, concerns about data privacy, a lack of interoperability in hospital software's, the digital divide, resistance to change, etc. Since the majority of patients in Delhi come from rural, remote, underdeveloped areas, and

other countries, e-Governance may connect people and provide the information that leads to data governance in a more long-term mode for them and the government. The study area is broadly represented in the map shown below:

Map 1 Location of Study area (Delhi)

India, particularly Delhi, offers far less expensive medical care than other nations. The majority of hospitals in Delhi offer top-notch medical care at incredibly low costs. Delhi provides excellent healthcare services to guarantee that the quality of medical care is upheld, even though treatment costs are cheaper than in other cities.

This study was carried out at three significant hospitals in Delhi, namely Ram Manohar Lohia Hospital, AIIMS, and BL Kapoor Hospital which provide tertiary healthcare service delivery and locations of these hospitals are well represented in the below shown map.



Map 2 Representing three surveyed hospitals (New Delhi)

1.3 Chapterization framework

The dissertation is divided into five chapters, with an appendix at the conclusion and references throughout.

Chapter 1 states the focus of the study which comes under the heading of introduction. This chapter also provides the present research's aims, study area, and structure of the research study.

Chapter 2 deals with a literature review of the study. It sheds light on the idea of e-governance, including its applications, historical development, and current government activities. Additionally, this chapter includes information on the tertiary healthcare sector's specifics, significance, and difficulties. It also discusses e-governance services in the tertiary healthcare sector, compares them with other nations worldwide, and concludes by discussing e-governance services in Delhi's tertiary healthcare sector.

Chapter 3 deals with the research methodology of the study where, it is explained how the data was gathered, including primary data that was obtained by going to the field and secondary data that was obtained by reading journals, papers, and other websites. The current study's field survey was carried out in Delhi's public and private hospitals, the names of which are listed in Chapter 3.

Chapter 4 covers the analysis and results on the basis of findings. The outcome was examined using a SWOT analysis, which brought to light an organization's strengths and those of the individuals who contributed to the data collection.

Chapter 5 mentions the findings of the study. These findings were coming from data collection and are represented through graphics. The findings involved the data from interviews and surveys which are conducted by respondents.

In chapter 6, recommendations are involved against the shortcomings that were highlighted in the study. This chapter ends with the conclusion where the summary of the whole study is mentioned.

CHAPTER 2 REVIEW OF LITERATURE

2.1 Introduction to E-Governance

E-Governance is defined contrarily by different people in different ways. However, generally speaking, it refers to the use of ICT (Information and Communication Technology) and web-based Internet applications by governments along with the processes that implement these technologies to improve government operations or the accessibility for the public and deliver the information and services at all times (Baum Christopher, 2000). The World Bank defines "e-government" as the application of information and communication technologies (such as wide area networks, mobile computing, and the Internet) by government organizations to analyze and modify their interactions with the public, business community, and other government branches. These technologies have countless applications, including improved government administration, information access for citizen empowerment, strengthened ties with enterprises and industries, and improved citizen service delivery (World Bank, 2015). The use of ICT (Information and Communication Technology) to improve governance at different levels of the public sector, government, and beyond is known as "electronic governance," or "e-Governance" (Bedi, 2001). The government uses the Internet to deliver its services directly to citizens, businesses, and other stakeholders. In e-governance, the government uses the internet as effectively as possible to communicate with the general public and businesspeople and to provide them with information (Nikita yadav, 2013). It generally points out the use of information and communication technology (ICT) and other web-based technologies to enhance the way that the government provides services to the public (leslie buddha, 2000). The phrase "e-Governance" denotes the processes of using digital tools to facilitate the creation of policies as well as to monitor and supervise their fulfillment. This covers the creation of banks of policy-relevant resources in knowledge management systems, the use of formal meeting management tools, and the formal modeling of policy challenges (The Scope of E-governance, 2004).

2.2 Historical Development of E-Governance

With a focus on internal government applications in the areas of planning, economic monitoring, defence, and the use of ICT to handle data-intensive tasks like tax administration, census administration, and election management, e-government first gained traction in India in the 1970s (Drishti IAS, 2019). The first major move towards e-Government in India was the Department of Electronics, which was founded in 1970 with an emphasis on "information and communication" (Drishti IAS, 2019). The National Informatics Centre (NIC), established in 1977 with the goal of computerizing every district office in the country, launched the District Information System initiative (Insight IAS, n.d.). The main catalyst for e-Government was the creation of the national satellite-based computer network, NICNET, in 1987. Since then, e-Government projects have been multiplying (Drishti IAS, 2019).

Subsequently, the phases of e-Governance commenced, consisting of four stages as shown below:

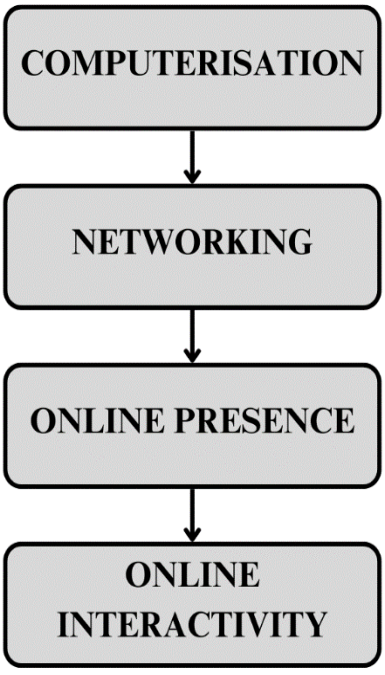


Figure 2 Stages of e-Governance in India (Insight IAS, n.d.*)*

When personal computers became widely available, many government departments installed computers during the initial phase. Word processing was the first application of computers, and data processing shortly followed. During the second phase, a hub connected some government organization units, facilitating data flow and information sharing across other government agencies (Insight IAS, n.d.).

Having a presence on the internet became increasingly important as internet connectivity increased. This led to government agencies and other organizations maintaining their websites. These webpages/websites often included data on the goals and mission statements of the individual government agencies, as well as information regarding reports, publications, organizational charts, and contact information (Insight IAS, n.d.). The opening of communication lines between government agencies and the public, civil society organizations, and others was a logical result of their online presence. By making forms, instructions, acts, rules, and other documents downloadable, the primary goal of the online interactive stage was to reduce the amount of face-to-face interaction with government agencies. This has in certain instances already resulted in the online submission of Forms. The majority of citizen-government interactions might be placed on an e-government platform (Insight IAS, n.d.). To establish "Simple, Moral, Accountable, Responsive, and Transparent (SMART)" governance, information and communications technology is essentially applied to government operations through e-governance (HK Manjula, 2023) and initiatives aimed at e-governance, which uses technology to boost administrative efficiency, improve service delivery, and encourage citizen participation, have grown to be a mainstay of Indian governance (Dharmendra K Meena, 2023).

Today, e-Governance covers a huge territory. The government uses e-government in practically every sector, from politics to education, and from urban states to rural ones. The roots of governance are everywhere. The general public, the private sector, and businesspeople all rely heavily on e-governance (Nikita Yadav, 2013).

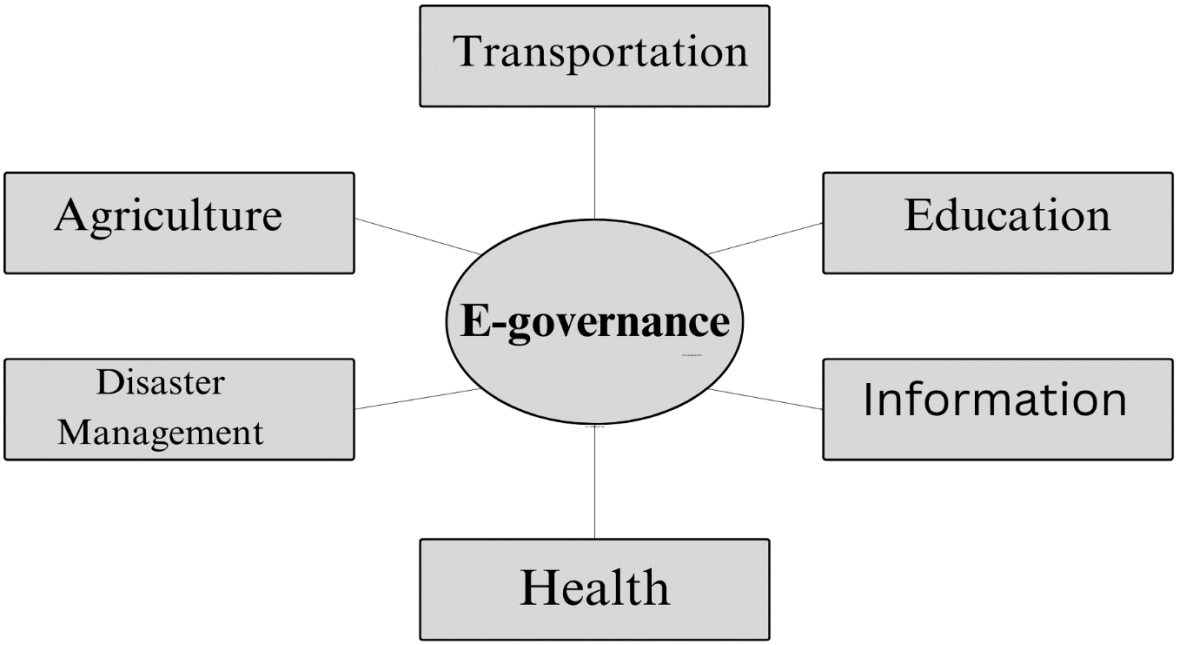


Figure 3 Different domains of e-Governance

The various domains where e-Governance is extensively employed are highlighted above (Nikita Yadav, 2013) but the current study mainly focuses on the usage of e-Governance in healthcare service delivery.

2.3 Overview of E-Governance Applications in Healthcare in India

The idea of employing electronic communication in the health industry was originally supported by the National Health Policy, which was amended in 2002 after being passed by the Indian Parliament in 1983. The National Health Policy 2017 reiterated the significance of digital technology in the delivery of healthcare services (Ministry of Health and Family Welfare, 2017). The application of the e-Governance services has been done when required and several initiatives are already in practice that are mentioned in the next subheading.

2.4 E-Governance Initiatives in the Tertiary Healthcare Sector

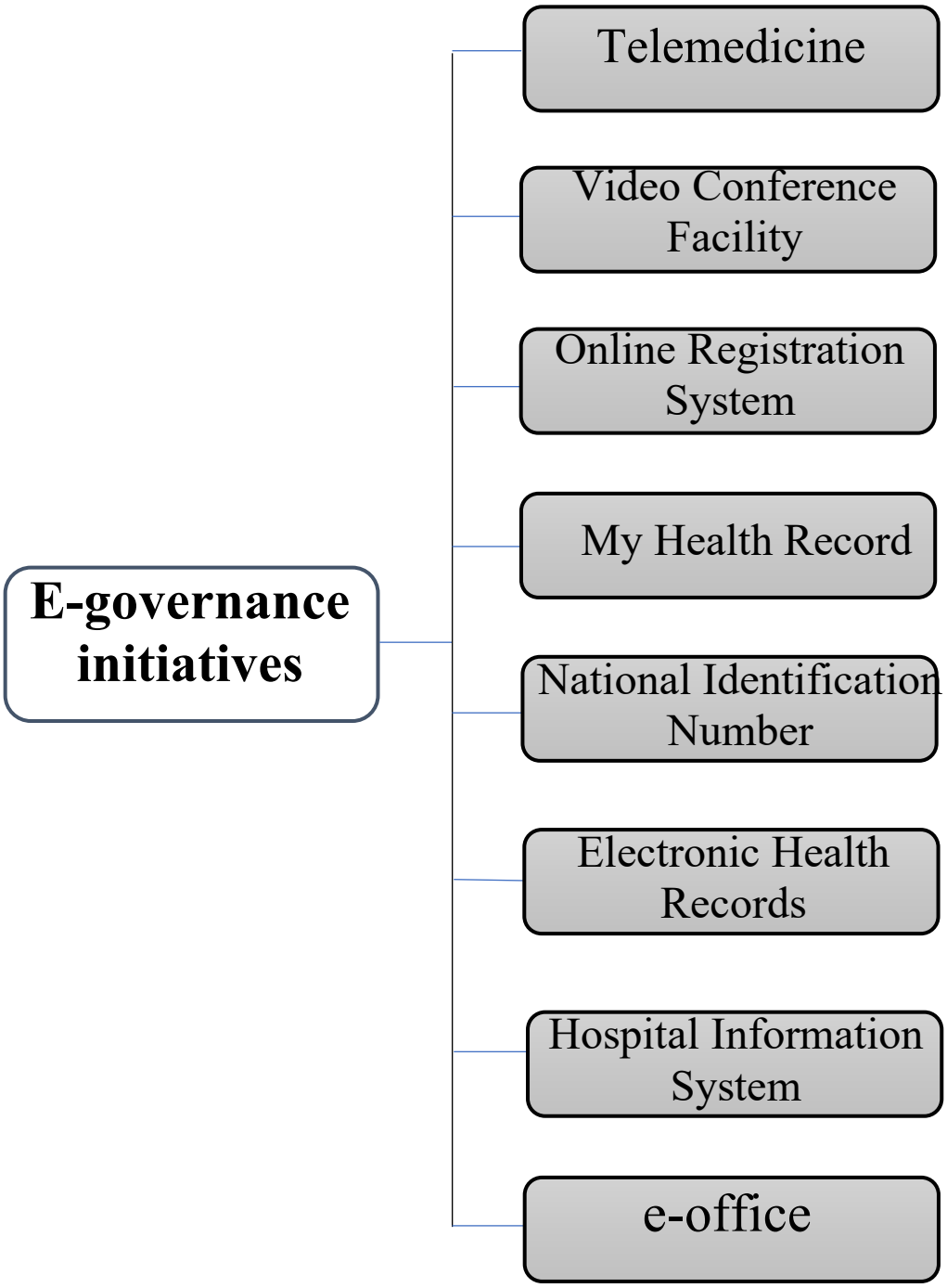


Figure 4 E-Governance initiatives

<u>According to the Ministry of Health and Family Welfare, the glimpse of the initiatives are as follows-</u>

TELE MEDICINE – It is a rapidly developing field that is simply described as the dissemination of health-related services and information via electronic data and telecommunication technology. Patients who live in remote towns and remote places greatly benefit from telemedicine (Oluwasegun Solaja, 2021).

Figure 5 USE OF TELEMEDICINE

Source- <u>Telemedicine Facilities in India - India (mapsofindia.com)</u>

VIDEO CONFERENCING FACILITY- A software-based video conferencing system has been put in place to improve efficiency, expedite office procedures, foster greater collaboration in the workplace, and make officials always available to discuss crucial issues regardless of their geographic locations.

ONLINE REGISTRATION SYSTEM- It is a system that connects several hospitals to provide online registration, fee payment, appointment scheduling, online diagnostic reports, online blood availability inquiries, and others., around 190 hospitals are on board ORS, including Agartala Government Medical College, Safdarjung Hospital, NIMHANS, AIIMS, New Delhi, and other AIIMS (Jodhpur; Bihar, Rishikesh, Bhubaneswar, Raipur, and Bhopal). Over 20 lakh appointments have been made online thus far.

MY HEALTH RECORD- Patients and doctors alike have access to MY HEALTH RECORD at any time and from any location, which increases the flexibility to allow patients to come to hospitals for checkups and treatment with any doctor without the

need to carry physical files, which will be advantageous to both doctors and the general public.

Figure 6 MY HEALTH RECORD PORTAL
Source- Bp VIP.net to release My Health Record for specialists: A co-designed approach with ADHA - Insight (insightnews.com.au)

It has the following advantages and aids the doctor in understanding the patient's past medical history, which is crucial in the course of treatment (Ministry of Health and Family Welfare, 2017-2018):-

a) It aids in the retrieval of medical records that may have been misplaced physically.

b) Data analytics can be performed on the standardized formatted data to comprehend trends in diseases, among other things.

b) Enhances patient compliance and lowers medical errors.

d) Assists patients in getting a second opinion and gives unconscious or unsupervised patients emergency medical documents.

NATIONAL IDENTIFICATION NUMBER (NIN) - It's a unique identifying number, and obtaining interoperability and establishing electronic health records depend on it. Its purpose is to enable interoperability between deployed health IT systems and is being distributed to all healthcare facilities, both public and private. Approximately 99 percent of public health facilities currently have a NIN assigned to them.

ELECTRONIC HEALTH RECORDS - Semantic interoperability is addressed in the Electronic Health Record Standards in a number of areas, including digital imaging, communication, disease classification, medical and clinical language, and laboratory data interchange(Ministry of Health and Family Welfare, 2017-2018). The Ayushman Bharat Digital Mission (ABDM) has been initiated by the Indian government with the aim of creating an Electronic Health Record (EHR) that is personalized for every individual. The goal of the ABDM is to create a platform that will allow health data to

be shared throughout the health ecosystem(Update on AI in Health sector, 2023). Multiple registries are established under ABDM to guarantee the dissolution of data silos and the creation of longitudinal electronic health records (EHRs). Furthermore, to improve the performance of health services, it will merge cutting-edge technologies—such as blockchain, Internet of Things, and artificial intelligence—with already available health IT applications. To encourage the development and application of AI-based solutions in healthcare, the Ministry of Health has also recently named AIIMS Delhi, and AIIMS Rishikesh as Centres of Excellence for Artificial Intelligence (Update on AI in Health sector, 2023). MoHFW has devised a system aimed at establishing citizen's Electronic Health Records (EHRs) which will be accessible, and available online to improve decision support systems, affordability, and health outcomes.

HOSPITAL INFORMATION SYSTEM (HIS) - The introduction of HIS will allow for electronic patient EHR/EMR registration and recording. Moreover, this will facilitate workflow management, improving patient service delivery and process effectiveness. The government-built hospital management information system is about to be implemented at the New Delhi-based All-India Institute of Medical Science (Ang, 2022). It serves as a one-stop shop that connects doctors, hospitals, and patients on a single digital platform and enables healthcare facilities to digitize their internal workflows and operations. Its work is ultimately aimed at improving healthcare services delivery across India.

2.5 Positive Notions Of E-Governance Services in Healthcare Sector

According to a 2004 statement from the World Health Organization (WHO), technology has always been crucial to the healthcare industry since it lays the groundwork for the provision of services for sickness prevention, diagnosis, treatment, and recovery. E-governance is a technology that any government can utilize to improve healthcare and healthcare services(Daly, 2003). Some advantages of this system include long-term cheap costs, improved service delivery, and increased openness and citizen-government interaction(Alia Sabri, 2012). Every stakeholder gains simultaneously, government

information is easily accessible to the public, and government has the advantage of developing, advocating for, and implementing policies to address local issues (M Sarpoulaki, 2008). E-Governance may also be described as a means by which governments make use of the most cutting-edge ICTs to enhance service quality and offer more chances for citizens to engage with democratic institutions and procedures. (Zhiyuan, 2002) (Chen Yining N, 2006). Using e-governance in the healthcare industry can greatly improve service delivery efficiency, transparency, and cost-effectiveness by giving professionals, policymakers, healthcare providers, and the general public a shared platform (Bhatnagar S. C., 2014).

In India, socioeconomic positions, location, and gender of the population are the main determinants of inequality, even with improvements in access to healthcare. The healthcare system in urban and rural areas differs significantly, and this regional inequality is mostly caused by a dearth of facilities and resources for healthcare in rural portions of the nation. The population is being forced by rising healthcare prices to look for alternative ways to cut costs without sacrificing access to necessary medical care. Thus, in this instance, above mentioned e-governance initiatives can be used to great effect when implementing e-governance in the healthcare sector. (De, 2021). The health care sector's e-Government activities benefit both medical tourists and the nation's resident population (internal visitors). India is ranked 10th out of 46 destinations worldwide in the Medical Tourism Index (MTI) for 2020–21, according to the Medical Tourism Association(Ministry of Tourism, National Strategy & Roadmap for Medical and Wellness Tourism, 2022). The top travel destinations for wellness travellers are the United States, Germany, China, France, Japan, Austria, and India, based on the size of the wellness tourism market. Over the years, India has emerged as a top medical value travel destination because of its exceptional ratings on a number of factors that impact the overall standard of care. One of the best healthcare systems in the world is found in India(Ministry of Tourism, National Strategy & Roadmap for Medical and Wellness Tourism, 2022). Reputable medical professionals perform complex surgical procedures in a top-tier international hospital for a significantly lower price than they would in

other nations (Ministry of Tourism, National Strategy & Roadmap for Medical and Wellness Tourism, 2022).

The following provides information on the number of medical tourists that have visited India throughout the previous four years:

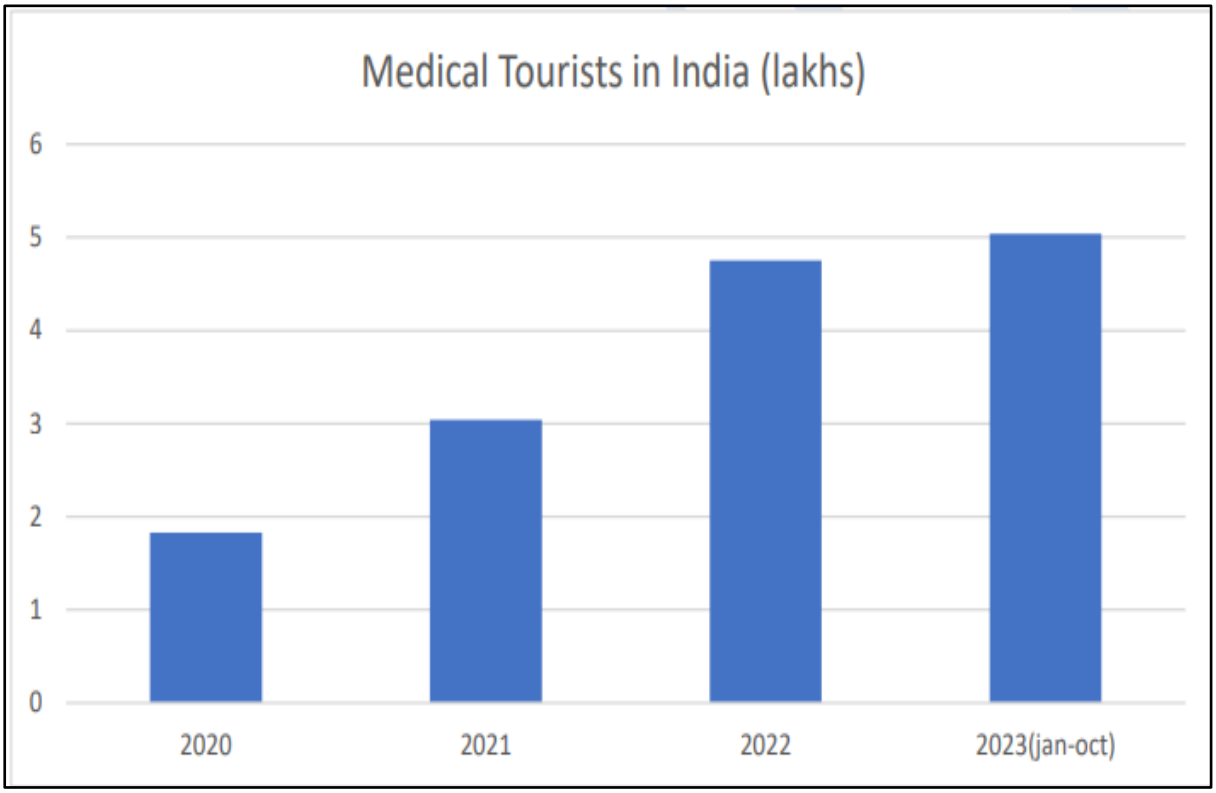


Figure 7 Medical tourists in India

From the above figure, we can see that India receives one of the highest medical tourists in the world mainly from underdeveloped and some developing nations. Medical tourists are becoming more common each year, therefore it's critical to address their concerns as well, which include how to deliver healthcare services in a transparent, efficient, and accessible way that can be aided by e-Government(Ministry of Tourism, Development of Medical Tourism Hubs, 2023).

2.6 Obstacles to Implementing E-Governance Services in the Healthcare Sector

However, e-governance is enabling health professionals to handle patient information, communicate more effectively, and provide better medical education (HK Manjula, 2023). The relationship between citizens and bureaucracy, corruption, the digital divide, a lack of political support, a lack of human resources, and inadequate infrastructure are only a few of the major issues with e-Government services(Bhuiyan, 2010). Additionally, the other study also highlighted some hindrances in the way of adopting e-Governance in the healthcare sector research on e-health should go beyond just focusing on technological use, lack of public acceptance, institutional changes, and government regulations are all essential for the effective deployment of e-Governance in the health sector (Ali Amzad, 2016). Regarding public and private organizations, there is a definite contrast in the degree of digitalization. Government hospitals are still in the early stages of implementing these technologies, and as such, their current focus is on achieving a few fundamental objectives that will serve as the cornerstone for further advancements in this area. Their overall competitiveness is being raised through the deployment of technologies like the HMIS (Hospital Management Information System), which help to increase accountability, transparency, and efficiency. Both government and private hospitals, however in varying phases of updating themselves to keep up with the swift advancements in technology. This is concerning because it's the only way for those who don't utilize the internet to improve their experiences—for a variety of reasons—to get greater connectivity (Isha Gole, 2017).

The Security Standards and the Privacy Standards are inextricably linked. Security precautions are necessary for any health record system in order to ensure that the data is not misused, incorrectly used, disclosed, accessed, changed, or destroyed while being transmitted or stored (Electronic Medical Records in India, 2013). The Security Standards work with the Privacy Standards to develop appropriate controls and safeguards. Health sector organizations that are required to follow the Privacy Standards are also required to follow the Security Standards(Electronic Medical Records in india, 2013).

CASE STUDY – PRIVACY CONCERN IN AIIMS

As mentioned above the major problem in the implementation of e-Governance services is privacy concerns so it is necessary to safeguard vital national health infrastructures that have been brought to light by the rising frequency of ransomware attacks on eminent Indian healthcare facilities, including the Indian Council of Medical Research (ICMR), New Delhi, and the All-India Institute of Medical Sciences (AIIMS) (Bhushan, 2023). The potential exposure of sensitive data, including employee login credentials and 40 million patient medical records, by a hack on AIIMS Delhi sparked national conversations about cyber-biosecurity (Bhushan, 2023). There is a deficiency in public knowledge regarding data security and there are some economic, political, and social ramifications of high-profile ransomware attacks (Bhushan, 2023).

In addition to this, the following list of cultural barriers to the adoption of e-governance services in the healthcare industry (Alia Sabri, 2012):-

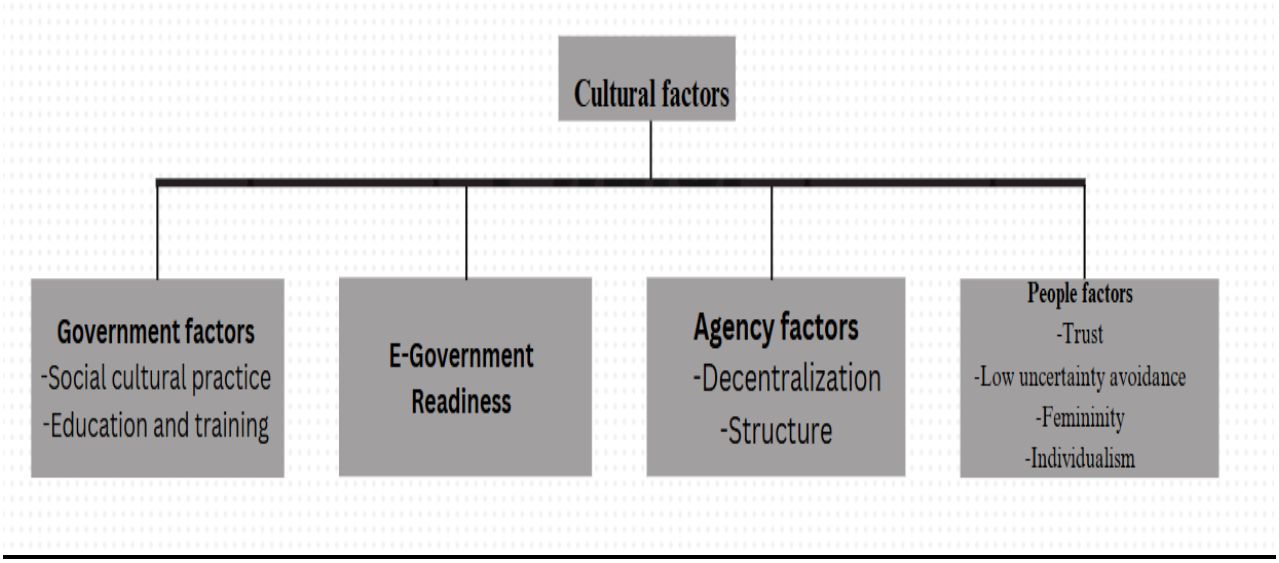


Figure 8 Cultural barriers in the implementation of e-Governance services

2.7 Tertiary Healthcare Services

India's healthcare system, which serves 1.4 billion people, is a sophisticated, multifaceted network of governmental and commercial organizations that provide a broad range of medical services (Kumar, 2023). The public sector includes primary, secondary, and tertiary care facilities, which are governed by the federal and state governments(Health System, 2023).

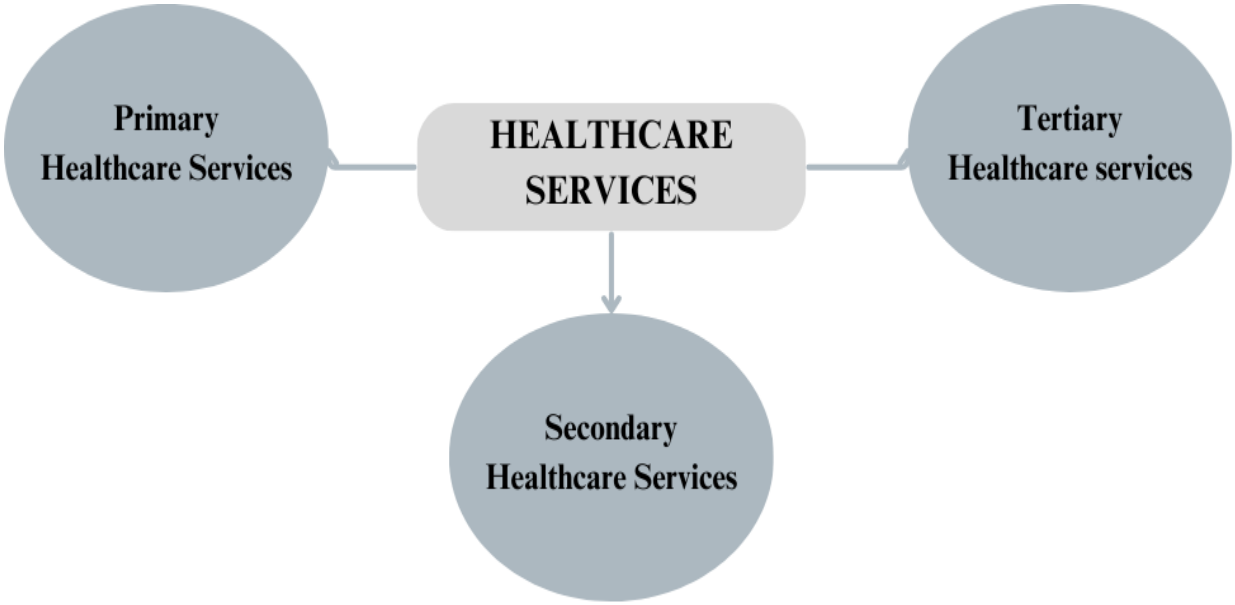


Figure 9 Types of healthcare services

Primary healthcare services are delivered by primary health centres, community health centres, and sub-centres and serve as the patient's initial point of contact. The primary focus of secondary care is on specialized and acute services offered by district hospitals. The term "tertiary care" describes sophisticated medical treatments, such as specialty and super-specialty care offered by medical schools. Corporate hospitals, assisted living facilities, private clinics, and solo practitioners make up the private sector (Health System, 2023).

A "tertiary care" program must, by definition, comprise intricate diagnostic and therapeutic treatments carried out by medical specialists in cutting-edge facilities.

Tertiary care must be set up for all acute trauma cases, emergency cases, and chronic illnesses that incapacitate (Kallakuri Sailaja, 2023). Although the phrase "tertiary care" first appeared in hospital jargon a few decades ago, it wasn't until 2013 that it was included in the Medical Subject Headings thesaurus of the US National Library of Medicine (Flegel, 2024). Its definition at the time was "highly specialized and technical care, given in a medical setting, typically one connected to a university, for patients with exceptionally severe, complex, or uncommon health problems" (Flegel, 2024). The word "tertiary" was used about healthcare frequently in the study therefore a description is needed. Specialized medical services, usually offered in hospitals or other great medical facilities, are referred to as tertiary healthcare (Bhatnagar S. C., 2014). These services are extremely specialized and entail difficult processes and therapies.

2.8 Importance of Tertiary Healthcare

India is a large country with many different economic, cultural, and geographic zones. Seven and a half decades after the country's independence and two years after the COVID-19 pandemic, India today boasts one of the most efficient healthcare delivery systems in the world (Kallakuri Sailaja, 2023). A few instances of tertiary care services include advanced neonatology, plastic surgery, heart surgery, neurosurgery, palliative care, treatment for severe burns, and other complex medical and surgical treatments (Levels of Healthcare, n.d.). Other medical experts as well as the patient's primary care physician refer them to this kind of care (Levels of Healthcare, n.d.). These patients may require advanced medical procedures, such as major surgeries, transplants, replacements, and long-term medical care management for illnesses like cancer and neurological disorders. Specialized consultative medicine, which manages all major medical operations, is the highest level of healthcare practice. Advanced diagnostic centres, specialist critical care units, and state-of-the-art medical facilities are the mainstays of tertiary medical care (Levels of Healthcare, n.d.). In 2021, the Indian government decided to implement the national policy of building one medical college in each district. Around the nation, this has greatly increased interest in medical education and healthcare delivery (Kallakuri Sailaja, 2023). It will ensure that the public can obtain specialist treatments and that medical students receive enough training. On

the other hand, infrastructure needs to be crucial to the identification, management, and staging of chronic conditions. The successful operation of tertiary care needs meticulous preparation, dedicated execution, and follow-up based on initial input(Kallakuri Sailaja, 2023).

2.9 Challenges in The Tertiary Healthcare Sector

The main problem with the idea of "tertiary medical care" is that it emphasizes the ailment rather than the patient—as stated by William Osler. Even though not every patient in tertiary centres will meet a certain eligibility requirement, they may nevertheless have conditions that call for highly qualified and experienced care (Flegel, 2024). Rather than the complexity or distinctiveness of the illness, factors such as multimorbidity, a person's perspective, personality, and personal and family circumstances may necessitate care in a tertiary setting(Flegel, 2024). Although it has changed significantly over time, there are still a number of obstacles to overcome (Kumar, 2023). Tertiary healthcare lacks digital networks and communications for e-hospital services and management. Indian government hospitals are deficient in record-keeping and follow-up. Public healthcare institutions are typically overburdened with specialized curricula (Kallakuri Sailaja, 2023). District headquarters must have access to tertiary care. The infrastructure development branch of that State is in charge of the planning, building, and upkeep of every structure within the institution. As of right now, teaching hospitals connected to medical schools are considered Tertiary Care Facilities. They're not, in actuality. In terms of buildings, specialized departments, and super specialty departments, they lack a unified plan (Kallakuri Sailaja, 2023).

2.10 E-Governance in Tertiary Healthcare Service Delivery

Information and communication technology, or ICT, has the ability to improve the management of the public health system and the provision of healthcare services. To significantly improve the delivery of public healthcare, MoHFW is supporting e-governance in health, or digital health, which is the use of information and communication technology with the goals of "reaching services to citizens" and "citizen

empowerment through information dissemination." Ensuring the availability of services on a larger scale is the goal of e-governance projects in tertiary healthcare service delivery (Ministry of Health and Family Welfare, 2017). This is especially true through telemedicine, which makes healthcare accessible to rural and inaccessible places. By making the most use of currently available resources, these projects close the gap in health and human resources. By granting access to medical records, they also improve patient safety and lower healthcare expenses (Ministry of Health and Family Welfare, 2017). Field-level relevant interactions are made possible by efficiently integrating Management Information Systems and keeping an eye on geographically distant tasks. Additionally, these initiatives promote evidence-based planning and decision-making, which improves the general quality of healthcare service(Ministry of Health and Family Welfare, 2017). They also increase the efficacy of programs designed to increase training and capacity. By utilizing ICT, e-Governance ensures that even the most remote populations obtain high-quality healthcare by enabling the provision of complete and integrated services (Ministry of Health and Family Welfare, 2017).

2.11 Comparative Framework among various Countries

We will be exploring the e-Governance mechanisms in the healthcare sector across various countries:

NEW ZEALAND

The Healthcare Information Technology (HIT) standards, standardization procedures, and governance structure that are currently in place in New Zealand were examined in a study that was based on e-governance services in the tertiary healthcare sector of New Zealand (Benson, 2012). We were able to confirm through this investigation that, there the government is a major player in the standardization of HIT. HIT standards and regulations are extremely important to modernize the healthcare businesses. (Benson, 2012). Unlike governments in other nations, the government of New Zealand has designated HIT entities, such as the National Health IT Board, the HISO (Health Information Standards Organisation), and the Health Sector Architects Group, to spearhead and facilitate standardization(young-taek, 2015). These organizations take an active part in the process of standardization. After compiling creative ideas from the public and healthcare sectors, they develop a number of HIT standards. Within the organization, standardization procedures and guidelines are clearly defined in New Zealand. It was also clear that HIT has led to a variety of specialized outcomes in tertiary healthcare, such as e-prescribing and e-referral systems. These initiatives are planned, developed, and carried out in direct cooperation with the government(young-taek, 2015).

UNITED STATES

The private sector is essential to the standardization of HIT when compared to the US. Standard developing organizations include the American Society for Testing and Materials, the American Society of Mechanical Engineers, Health Level Seven, and many more. The government is actively supporting the commercial HIT business in the US as it takes the lead in developing and implementing standards(young-taek, 2015).

WESTERN AUSTRALIA

Governance, Evidence, Knowledge and Outcome (GEKO) is a non-commercial electronic quality management system that is accessible in Western Australian public hospitals. This system was put in place by a tertiary hospital in Washington at the beginning of 2000 to track information about clinical governance and quality improvement programs. It allows activities and forms to be performed, submitted, and evaluated electronically, tracking both finished and continuing activity. The system has experienced a number of enhancements in the last 10 years to bring it into compliance with quality initiative closures. Establishing visual governance committees can improve the system's governance structures and expedite the submission and reporting review process (Li, 2017).

PAKISTAN

In Pakistan, the government's policy enlarges the duties of the provincial government; nonetheless, in comparison to the population, they still lack adequate health workers and infrastructure. Across the nation, private hospitals are a major player in the provision of healthcare services (Ali Amzad, 2016). The majority of clinics are located in cities and are outfitted with the newest medical technology. There is a higher need for private healthcare than for public healthcare in Pakistan. The medical information system (MIS) for patients, the biometric attendance system for physicians and other paramedical staff, the online payment system for treatments via bank card, the internet, computers, and mobile phone-based doctor appointments are among the ICT resources currently available in Pakistan's health industry (Ali Amzad, 2016)

NIGERIA

Like every other developing country in the world, Nigeria is striving to reach the stage where e-Government is accessible. Over time, telehealth, e-training, and health information systems would be made possible by Nigeria's e-Governance, elevating the country's public health system to the level of wealthy nations(Oluwasegun Solaja, 2021). There are a number of obstacles to e-governance facing the Nigerian public health sector, such as erratic power supply, inadequate finance, a lack of infrastructure,

and a few significant incidences that have placed the sector in grave danger throughout time(Oluwasegun Solaja, 2021).

2.12 E-Governance in Delhi Healthcare Service Delivery

Delhi, one of India's fastest-growing cities, is a city that perfectly combines modern and traditional architectural design. Additionally, it serves as the hub for the government's judicial and legislative branches (Mukul, 2019). In 1911, Delhi took over as India's capital. In 1956, it was regarded as a Union Territory. It is situated in the nation's north and has developed as the political hub of the nation. It was allocated to the Legislative Assembly in 1991 by the 69th Constitutional Amendment Act (Mukul, 2019). The metropolis, which is 216 meters above sea level and spans 1,483 square kilometres, borders the states of Uttar Pradesh and Haryana. According to the 2011 Census, Delhi had the highest population density of any state or union territory during this time, with 11,320 people per square kilometre (compared to 382 people nationwide). For those residing in the nation's capital, health has emerged as a paramount concern as a state matter (Mukul, 2019).

In Delhi, healthcare is provided by a variety of institutions, including society hospitals, multi/super specialty hospitals, polyclinics, Aam Aadmi Mohalla Clinics, dispensaries and seed PUHCs, and polyclinics, in order of decreasing level of care. The medical facilities offer guidance and preventive care in addition to the primary, secondary, tertiary, and quaternary levels of care that Delhi residents need. The Delhi government wants to create a healthcare service delivery paradigm that is tier-based, effective, and high-quality throughout the National Capital Region(Health and Family Welfare Department, n.d.).

The Health Department plans to take benefit of the latest developments in information technology to establish a cutting-edge, citizen-centric ICT Health Management System that boosts the efficiency of Delhi's state-run hospitals and institutions as well as the State Health Department (Health and Family Welfare Department, n.d.)

CHAPTER 3 RESEARCH METHODOLOGY

The specifics of the procedures used in carrying out the current investigation are included in this chapter. In order to gather relevant data, evaluate information, and draw important conclusions on the degree of e-Government initiative usage and accessibility in tertiary healthcare service delivery in Delhi hospitals, the current study employed a methodical strategy. A thorough evaluation of the literature was done in order to achieve the research's goals. In order to find pertinent research articles, reports, government publications, and other trustworthy sources of information about e-governance in tertiary healthcare, various websites like Google Scholar, Research Gate, Pib (GOI), Scite, and others were deeply searched.

To gather primary and secondary data, several online databases, including scholarly publications and research repositories, were searched. The information was retrieved and carefully organized for further research on a wide range of subjects related to India's e-Governance level in the healthcare sector. The collected data was analyzed thoroughly. After this secondary data collection, fieldwork was begun. Firstly, a pilot study was done in one of the tertiary hospitals in Delhi where interviews and surveys from patients and healthcare staff were conducted. After conducting the pilot study, it was observed that there were certain limitations in the questionnaire. The limitations were carefully studied and corrections were made to the questionnaire and Google form. Then the study passages toward the second step which is conducting interviews and surveys with IT personnel, Healthcare staff, and patients in three hospitals in Delhi, namely BL Kapoor Super Speciality Hospital, Ram Manohar Lohia Hospital, and AIIMS Hospital, New Delhi. Of the three hospitals, the former one is a private hospital and the latter ones are public hospital. The current study focused on tertiary healthcare services provided by tertiary super-specialty hospitals which is why particularly mentioned hospitals were identified. Following this, several tasks, including compiling data from multiple sources, identifying trends, and weighing the benefits and constraints of implementing e-governance in the healthcare sector were carried out. Ultimately, all of the information gathered from primary and secondary data sources was examined and presented in the current study using graphs, pie charts, and other visual aids.

Additionally, the SWOT analysis has been done on the basis of the findings in which significance, weakness, opportunities, and threats of accessing e-governance in tertiary healthcare service delivery were examined.

A strategic planning method called a SWOT analysis is used to evaluate the opportunities, threats, weaknesses, and strengths of a business (Gurel, 2017) It identifies the strong and weak spots in an organization's environment by analysing its many components. Additionally, in order to identify environmental possibilities and risks, it also examines external elements. SWOT analysis offers useful information for aligning the organization's competencies and assets with the competitive landscape in which it competes (Gurel, 2017). The following diagram shows the components of SWOT Analysis:

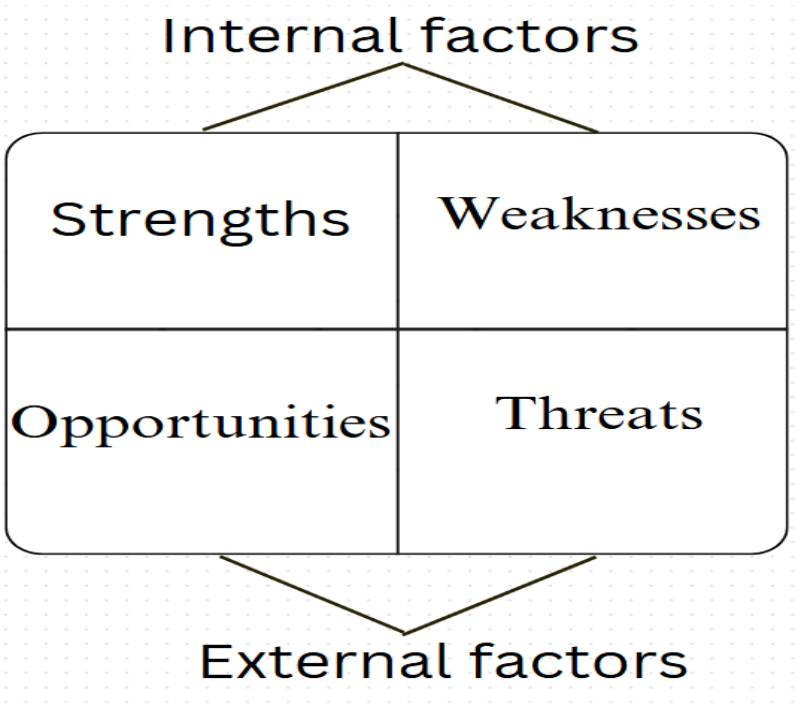


Figure 10 Components of SWOT Analysis

At last, the study was concluded with suggestions and a summary on the basis of findings.

CHAPTER 4 ANALYSIS AND RESULT

This chapter deals with the details of the analysis and results of the research study. In this study, the analysis is done through SWOT. The details about the swot are already mentioned in the previous chapter.

This study involves companies, including both public and commercial tertiary healthcare hospitals, SWOT analysis was performed. An organization's possibilities, external threats, and capabilities and constraints may all be measured with the help of the effective and straightforward SWOT analysis tool(Gurel, 2017). The conducted SWOT Analysis for the study is fully based on the findings and review of literature which are mentioned in different chapters.

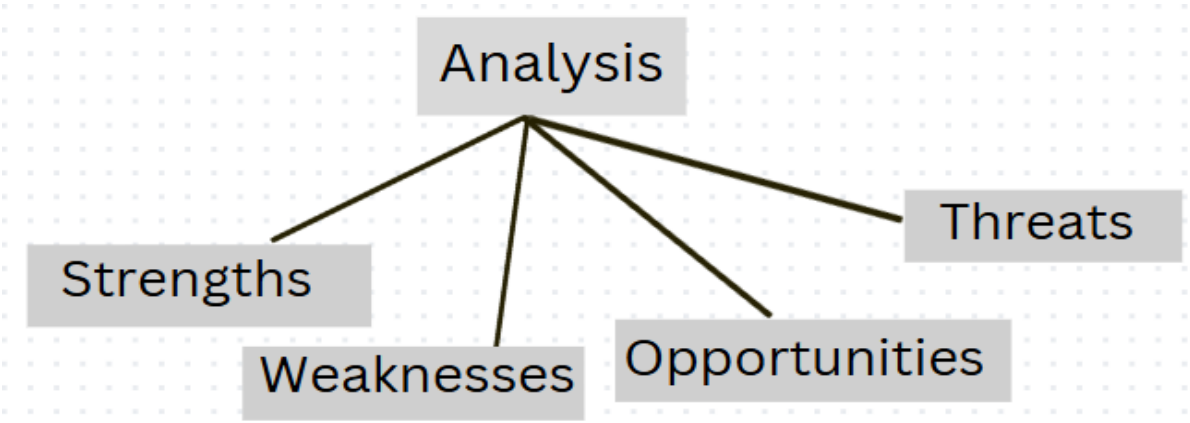


Figure 11 Analysis

4.1 STRENGTHS:

- **Increased Accessibility:** Telemedicine and online appointments are two examples of e-governance efforts that have the potential to cut down on travel time and enhance access to healthcare services, particularly for people living in distant locations or with complicated medical issues. It is evident by figure 16

where 27% people belong to the area having a distance of four to five hours from hospitals.

- **Increased Efficiency**: Streamlining processes, reducing paperwork, and introducing digital payment options can all contribute to an overall increase in the efficiency of healthcare delivery. It can be realized through the various initiatives taken by the Government of India as cited in the chapter of review of literature from the source of Ministry of Health and Family Welfare.
- **Better Data Management**: Digitizing medical data can result in better data handling, higher-calibre treatment, and fewer medical errors. The medical data can save dollars for the country which is evident by the study of NSSO (National Sample Survey Organisation).

The National Sample Survey Organization (NSSO) has revealed that between 2000 and 2014, GDP per capita based on buying power parity climbed by 121%; nevertheless, medical spending surged by 176%, or 60% more. The NSSO estimates that the adoption of a digitalized healthcare system will result in yearly savings of about $400 billion.

4.2 WEAKNESSES:

- **Low Awareness and Adoption**: Many staff members and patients are either unaware of or uneasy with utilizing e-governance services like electronic health records, hospital management information systems, and others. This might be brought on by worries about privacy, the digital divide, or a lack of digital knowledge.
- **Inadequate Training**: Poor e-Governance platform training can prevent healthcare personnel from utilizing and implementing the technology effectively. It is evident by figure 20 which shows that only 47% healthcare staff received adequate training.
- **Infrastructure Problems**: To properly support e-governance projects, public hospitals frequently lack the necessary infrastructure, including skilled staff and

cutting-edge equipment. It was understood at the visit to Ram Manohar Lohia Hospital where healthcare staff talked about this problem.

- **Technical Difficulties**: Problems with data management and server crashes might cause service delivery to be disrupted, hence frustrating users. This was evident from the visit that was conducted in AIIMS Hospital, New Delhi**.**

  When I asked the IT personnel of AIIMS, Delhi to demonstrate to me how the medical information system could be used in your facility, his computer crashed and he advised me to wait till the issue was fixed. If the infrastructure can malfunction in front of me, then it must be an everyday occurrence for them.

4.3 OPPORTUNITIES:

- **Government Initiatives**: The acceptance and efficacy of e-governance in healthcare can be greatly enhanced by government investment in training programs, public awareness campaigns, and infrastructure development.
- **Technological Developments**: New developments in technology, such as telepresence platforms and mobile health apps, can enhance accessibility and user experience even further.
- **Public-Private Partnerships:** By combining resources and skills, the public and private healthcare sectors can enhance total service delivery via e-governance.

4.4 THREATS:

- **Cybersecurity worries**: Breach of data security and privacy can damage confidence and deter the use of e-governance services. Thia is proved by the case study of AIIMS, New Delhi as elaborately mentioned in the chapter 2.
- **Durability Challenges**: In environments with limited resources, maintaining and modernizing e-Governance infrastructure may prove difficult.

- **Ethical Frameworks:** Data protection, equitable access, and potential bias in algorithms used in e-Government systems should all be carefully considered and governed by ethical standards.

This SWOT analysis highlights the potential of e-Government services to improve healthcare delivery, but it also points up significant implementation issues that need to be resolved. By focusing on strengths, addressing weaknesses, grabbing opportunities, and lowering risks, e-governance may dramatically increase healthcare access and efficiency.

CHAPTER 5 FINDINGS

This chapter details about findings of the current study conducted in three tertiary care hospitals of Delhi, namely, Ram Manohar Lohia Hospital, AIIMS, and BL Kapoor Super Speciality Hospital, all are located in New Delhi.

The study's goal is to ascertain how frequently government and private hospitals use and have access to e-governance services in the course of their regular operations. This study also identifies the causes behind the inaccessibility of various sections of population to the different e-Government services and activities that are available. The research methodology chapter has previously provided a clear definition of the primary and secondary data gathering techniques employed in this study.

The data was collected from three types of respondents including patients, healthcare staff, and IT personnel. As shown in figure 12, 28.6% were healthcare staff, 7.1% were IT personnel, and 64.3% were patients. The percentage of patients in the data collection was higher as compared to healthcare staff and IT personnel because the study mainly focuses on the issues that are being faced by patients and their family members. The inclusion of healthcare staff in the study was needed to showcase the pattern of the usage of e-Governance services by them on a daily basis. The data of respondents is represented by the figure 12:

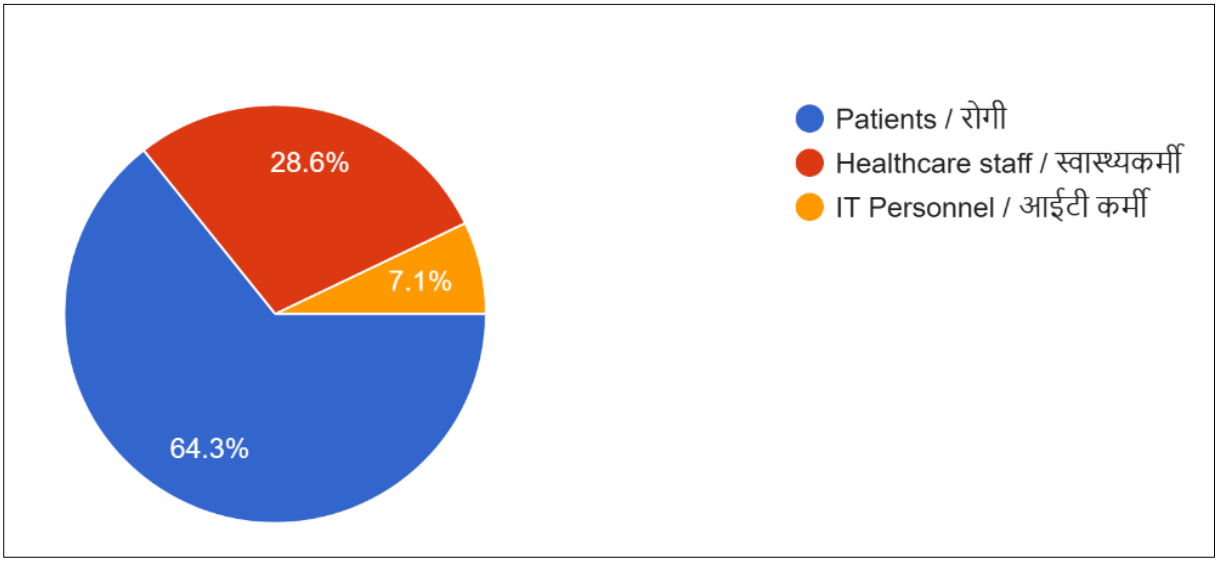


Figure 12 Data of Respondents

During data collection, the study discovered that individuals over the age of 40, alongside younger people, are more frequently utilizing tertiary healthcare services, as illustrated in Figure 13. In this, ageing can be one of the factors as they are more likely to experience several complex health conditions at the same time. It reminds us that an increase in the ageing population of the country will cause distress for that country particularly in the sector of health because the longer we live, the more we have to rethink the social and economic institutions to guarantee the well-being of citizens. In this scenario, e-Governance facilities in healthcare service delivery will serve as a relief.

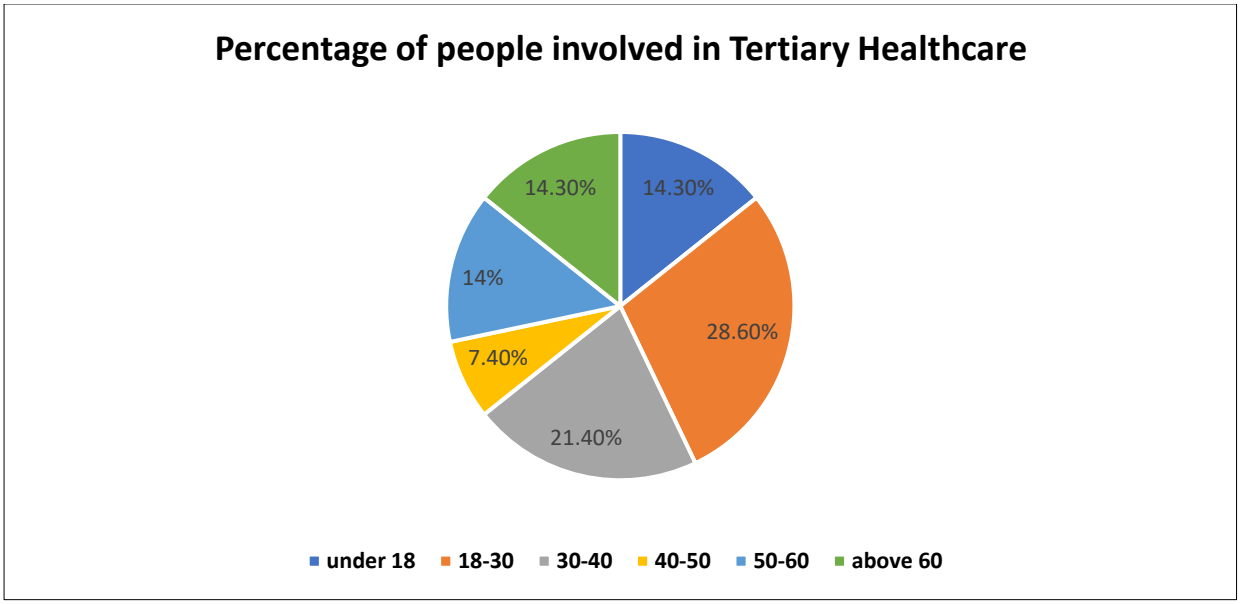


Figure 13 Percentage of people involved in Tertiary Healthcare

The percentage of patients who visit tertiary healthcare facilities, occasionally and frequently is high enough as shown in Figure 14. If the facilities of telemedicine and videoconferencing are available and accessible to them then they didn't need to travel so long and can save time and cost overrun.

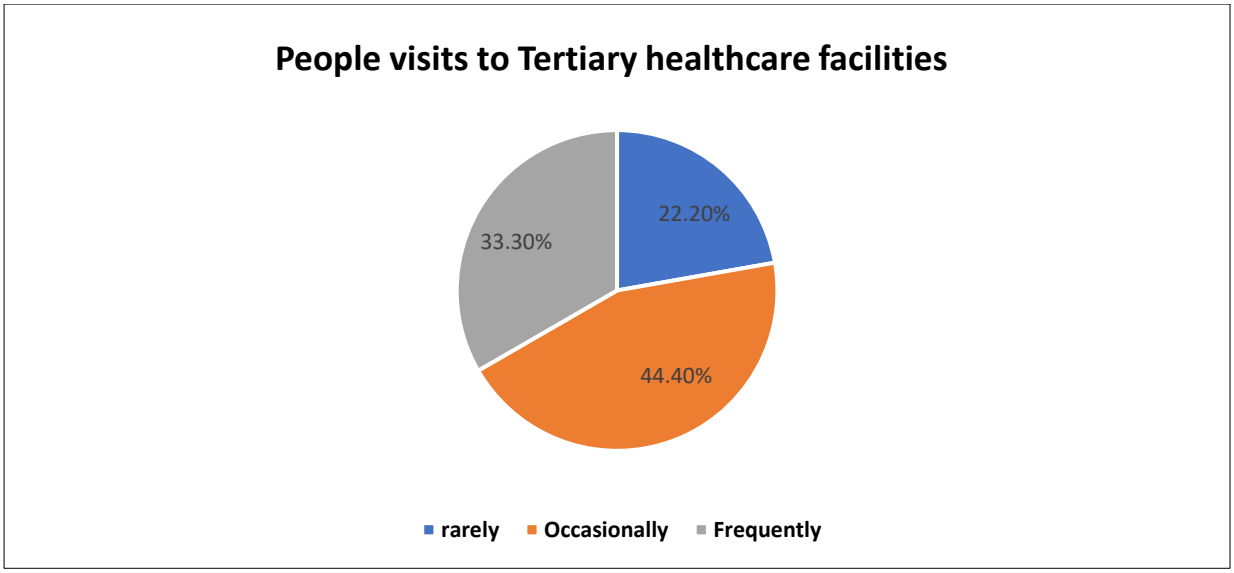


Figure 14 People visit to Tertiary healthcare facilities

Tertiary healthcare services like cancer chemotherapy, heart, and vascular treatment, neurology, burn and plastic surgery and others need regular checkups and updates which puts the patients and their family members in a worse condition as they have to travel a long firstly which represents in the figure 15, then waiting period for appointments makes the situation more hectic along with long queues for appointments, payments, etc.

The travel time needed by patients to get to the hospital, see doctors in person for appointments, pick up prescription drugs, and carry out other relevant tasks was also examined in this study. Figure 15 shows that different patients had different travel times to get to the hospitals. According to Figure 15, 27% of patients traveled five to six hours, 15.50% traveled four to five hours, 21 % traveled three to four hours, and 12.50% traveled less than two hours. Furthermore, it was noted that patients attending public hospitals were more likely than those attending private hospitals to have lengthy journey times. This is due to the fact that public hospitals provide inexpensive services that are affordable for the nation's middle-class and lower-class citizens. These people are prepared to give up their day and time in order to get access to reasonably priced medical care.

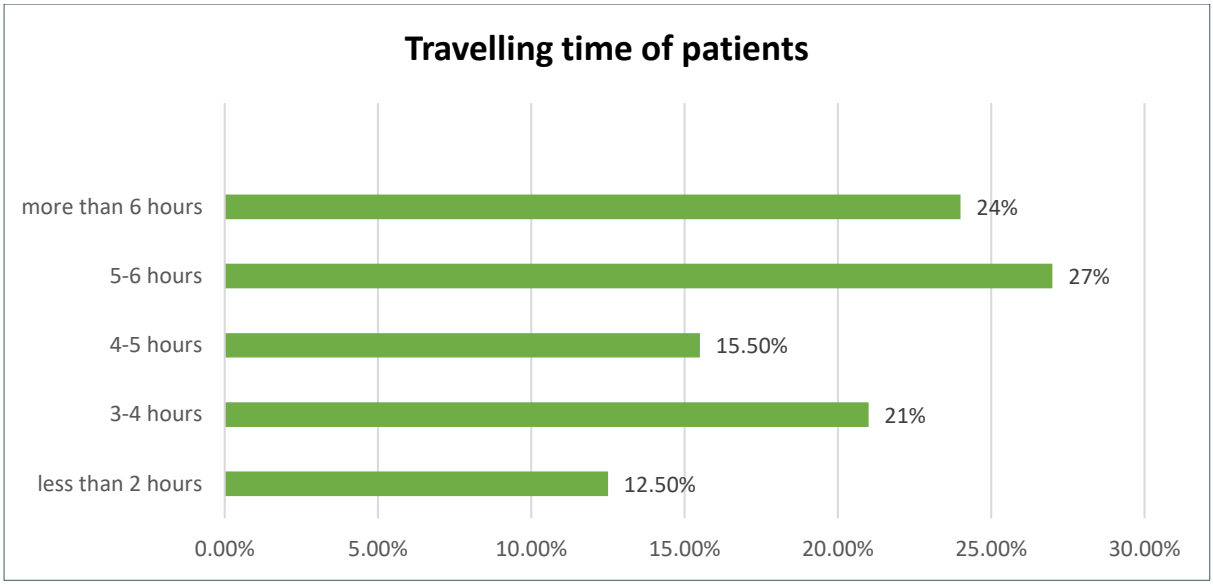


Figure 15 Travelling time of patients

The government implemented several e-Government initiatives in the health sector to address the challenges mentioned above; these initiatives are previously mentioned in the study's chapter on the review of literature. Fig. 16 evaluates whether or not the initiatives are having a good impact on the beneficiaries.

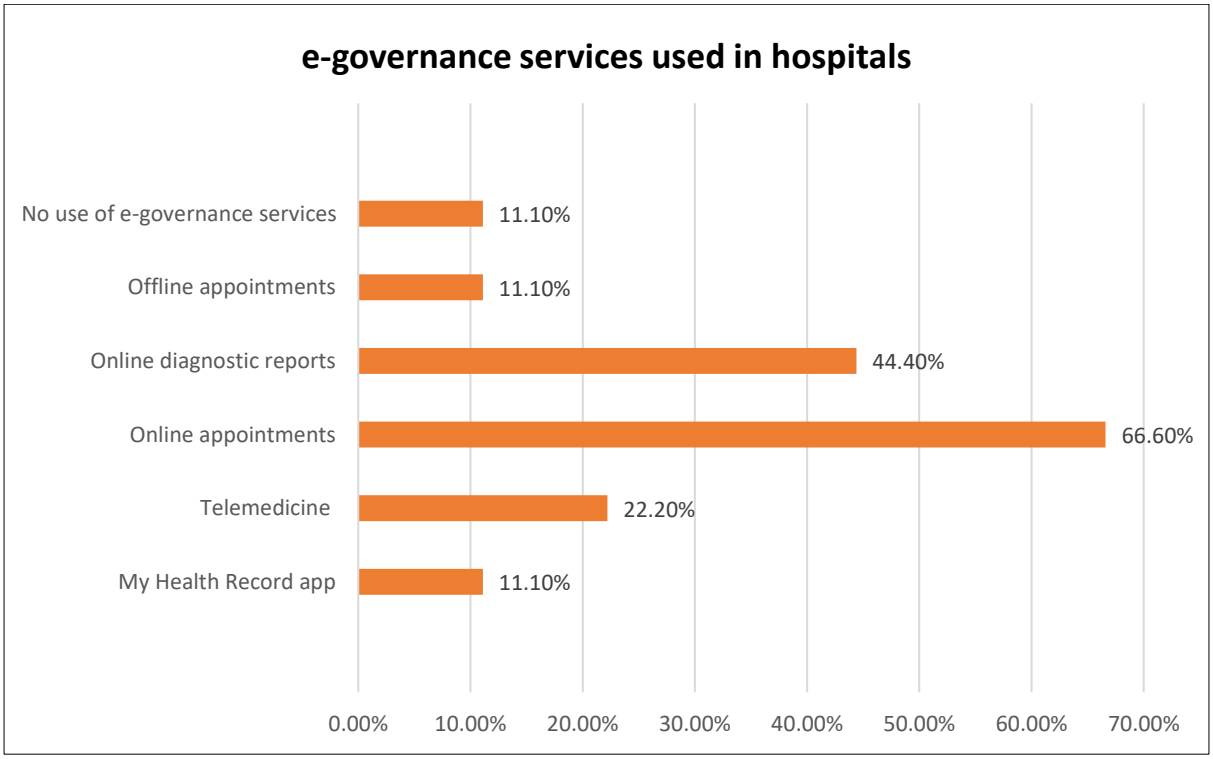


Figure 16 e-Governance services used in hospitals

Among all surveyed, only 11.10 % of patients were using the My Health Record app to track and update their health conditions. The remaining ones were not aware of the app and its use. Those who knew about it were not able to use it because of digital illiteracy, the digital divide, and others which are already discussed in the review of literature chapter. During the visit to the hospitals, some people said that they would download it if it would be useful and some people were afraid about their privacy.

Healthcare is not a one-time phenomenon; it lasts till our life ends. During that time, we visit our doctors many numbers of times, and every time doctor starts afresh as the availability of data is limited. It exposes the physician to unintentional errors, such as giving the patient the incorrect prescription or test, among other mistakes that put their health at risk. Patients are not able to recall every medication and visit concerning their health. My Health Record App provides obvious advantages like examining the health patterns, allergic drugs, and medical history, deletion of physical files, less chances for errors, and at last, it will be efficient.

Additionally, the online diagnostic reports percentage was high in private hospitals in comparison to public hospitals because of a lack of trained personnel or healthcare staff and the number of patients is also high. This is evident by the interview taken with the lab technician who told about the handling higher number of reports and the lack of technical staff in the Ram Manohar Lohia Hospital.

This study surveyed some healthcare staff which is represented by Fig. 17 to find out what and how they are using the e-Governance services in hospitals.

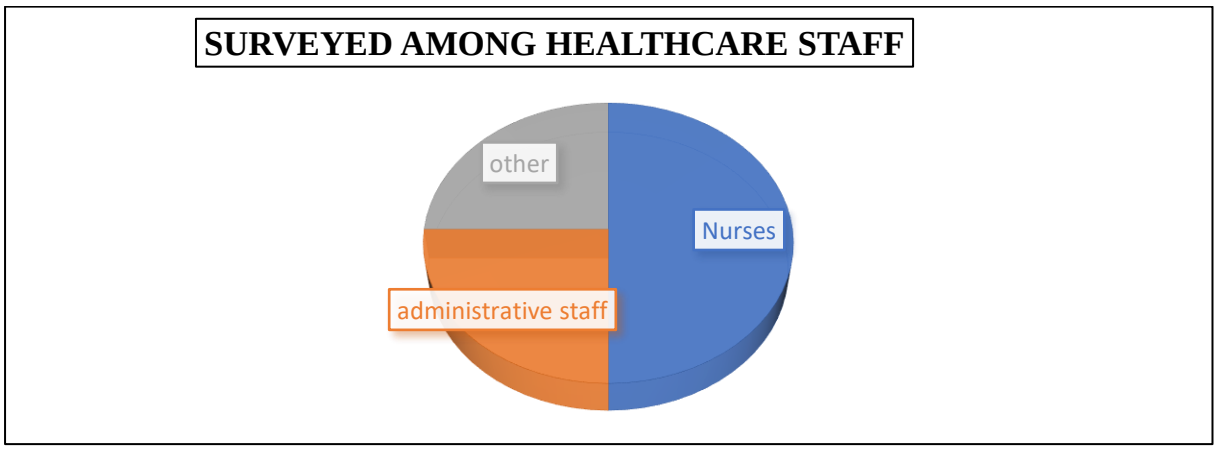


Figure 17 Surveyed among healthcare staff

Among those surveyed, the staff was using e-governance services like patient portals, electronic health records systems, telemedicine platforms, digital payment systems, and others. The usage of these facilities varied with time as shown in Fig. 18.

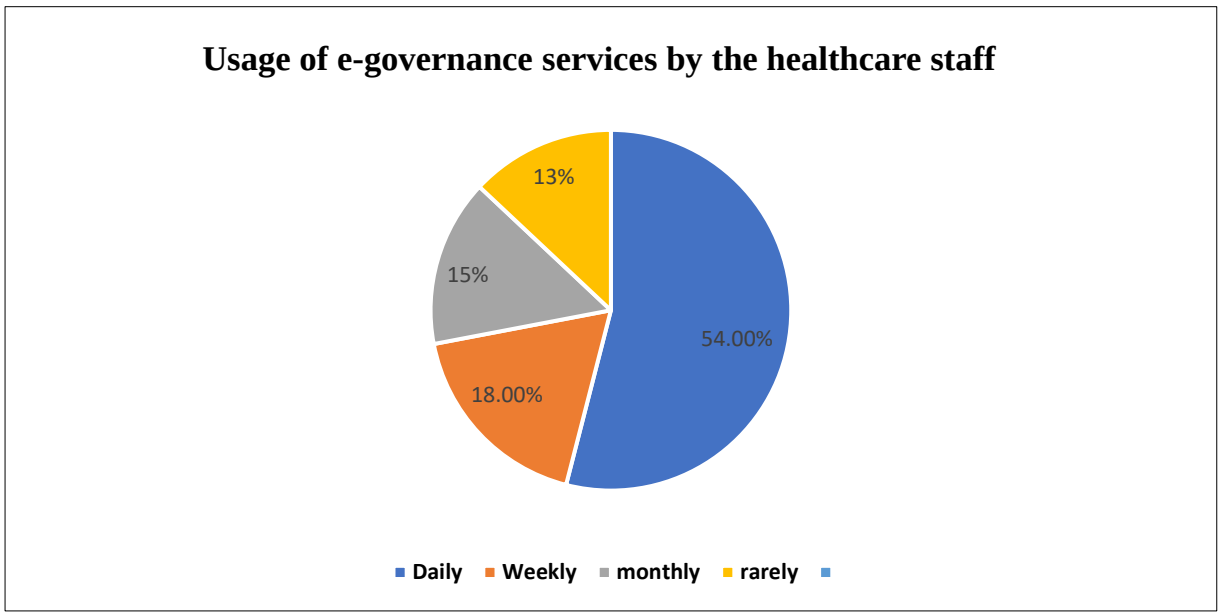


Figure 18 Usage of e-governance services by the healthcare staff

Despite the fact that 54% of the workers used e-Governance services on a regular basis, 13% only occasionally used them because of a lack of training, a lack of familiarity with ICT and online resources, and other issues. A number of problems were faced by regular users of e-Governance services. Private hospitals experienced issues with their servers and had trouble keeping a lot of data organized in one software package. The problems faced by public hospitals were an excessive number of patients, a lack of qualified personnel, and subpar equipment. These problems make it difficult to use e-governance services effectively and draw attention to the need for increased funding and training to make these systems more functional and efficient overall in both public and commercial healthcare settings.

The survey also measured that only 47% of the staff were trained adequately for using e-Governance services after enrolling in the job as shown in Fig. 19.

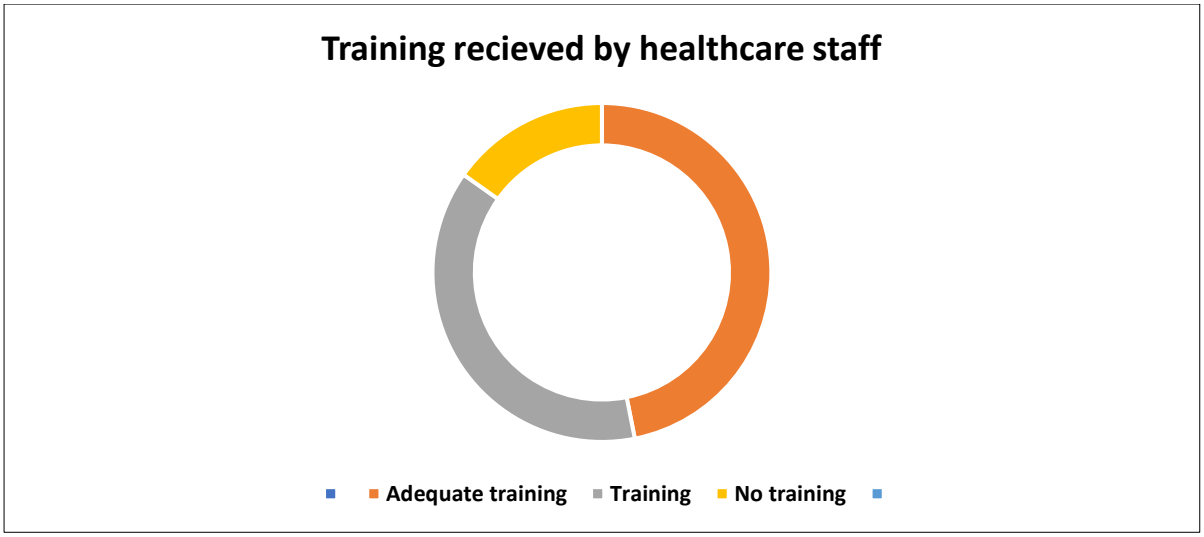


Figure 19 Training received by healthcare staff

The current study found that the system of digital payments was not well in public hospitals and large queues were there for submitting the fees with cash. There was a large chunk of people who were waiting for their turn to meet the doctors and ironically there were no systematic sitting arrangements for them in public hospitals. Queue and enough number of people were also present in private hospitals and even people were not happy with the healthcare staff, and long waiting hours between appointment booking and checkups in private healthcare facilities. However, the management and maintenance system of private facilities was applaudable like sitting arrangements, helpers, and an online diagnostic reports system as seen at the time of visit.

Fig. 20 shows that the usage of telemedicine platforms and digital lab reports is less whereas online appointments and patient portals are being used more. But they are not satisfied results as we need to spread their usage to the last mile. The practice of electronic health records is also being used in less percentage. The digitalization of data is the need of the hour in which India is lagging.

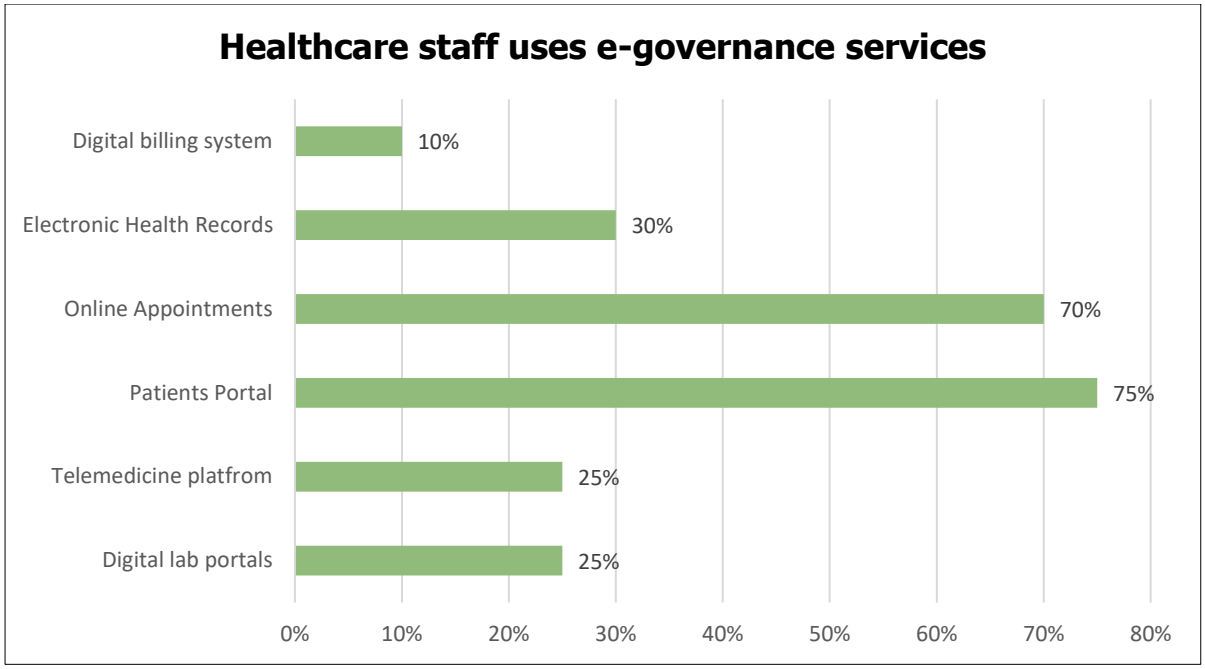


Figure 20 Healthcare staff uses e-Governance services

The absence of data digitization exacerbates some issues, like the unavailability of health insurance, as insurance companies require precise information regarding diagnoses, patients, ailments, and medications. Large portions of the population experience under-penetration as a result of this. Digitizing data has several advantages because it reduces expenses without compromising the efficiency, security, and calibre of the healthcare system.

It is clear that e-Government services can only be applied to improve public satisfaction with healthcare facilities. Tertiary healthcare facilities are specialized ones and the availability and accessibility of e-Governance services should be in an adequate manner because here regular checkups go and severe diseases are mainly treated.

Only 22.2% of users who used websites and applications to get information about hospital facilities, appointments, bookings, doctor appointments, checkups, and other related topics expressed satisfaction; the remaining users encountered problems using e-Government services, with the reasons for this already discussed.

Here the patients are already suffering distress as they have severe diseases and the burden of standing in long queues, waiting for appointments, errors in medication, maintaining multiple physical files, and lack of cashless and digital billing systems are

also on their heads. At the third ladder i.e. tertiary healthcare services, e-Governance initiatives, and services need to be available, and accessible to the beneficiaries which leads to efficacy and efficiency.

CHAPTER 6 SUGGESTIONS AND CONCLUSION

This chapter talks about the suggestions or recommendations that can help in overcoming the problems that are already showcased in the chapter on findings and weaknesses and threats part of the analysis.
This chapter also includes a conclusion to summarise the whole research.

5.1 Suggestions

- **Behavioural change**: Community organizations and NGOs can work together to reach rural populations and inform and educate them about telemedicine, the My Health app, and other resources. These organizations can also provide training sessions and workshops to reduce the digital divide.

- **Recruitment and Training:** To manage the growing workload and guarantee the seamless operation of e-Government services, the hospitals should hire more employees. Before hiring healthcare personnel, it is necessary to give them obligatory and, above all, sufficient training sessions. It is advisable to conduct these sessions while they are working to ensure that they are exposed to emerging technology on the job. This can be further improved by offering incentives to ensure that they retain the skills. These courses may cover data security procedures, specialized software, and patient engagement best practices.

  It is evident from the visit to BL Kapoor Hospital that where Person expressed extreme dissatisfaction with the mindset of the medical staff at the private hospital. She made an online appointment, and the staff called her at 9:00 am for her mother's routine chemotherapy check-up. She waited for the therapy for six hours, but the staff did not respond to her. Thus, the relationship that needs to be maintained between the patient and the medical personnel was not present at that time.

- **Expansion of available services**: Expand the availability of telemedicine, video conferencing, online diagnostic reports, and remote care services to save travel costs and time while improving accessibility for populations that live in rural areas.

- **Infrastructure and Technical support:** Provide funding to improve the public hospital's IT infrastructure, which includes computers, software, networking, cashless systems, and other components. This will assist in handling high public demand and service interruptions while guaranteeing the smooth operation of medical facilities. Upgrade software and server capabilities in private hospitals to effectively handle massive amounts of data in tandem with it.

- Both public and private hospitals should have user and language-friendly websites and applications. There should be a provision in the hospitals to provide diagnostic reports, booking updates, an online booking system, regular checkup updates, and available slots of doctors on the app of a particular hospital. With this initiative, it will become mandatory for the patients of that hospital to install the health app and its usage will be increased.

- **Data Digitalization**: Every person's health information must be installed digitally so that it is accessible from anywhere, at any time. Planning for healthcare, allocating resources, managing diseases, drafting public policy, and keeping tabs on the health sector are all made possible by the data gathered through e-governed platforms.
- **Data security and privacy:** As large amounts of information become more digitalized, privacy issues may arise. To address them, we also need to take certain steps, such as setting up strong cybersecurity units at specific hospitals. Clear data privacy policies and user education on data management procedures should go hand in hand with it.

- **Public and Private Partnership (PPP)**- Collaboration between public and private healthcare facilities is encouraged in order to exchange resources, best practices, and implementation knowledge for e-government solutions.

Healthcare organizations can overcome the drawbacks of e-governance in tertiary healthcare and realize its full potential to raise the standard of treatment for all patients by putting the aforementioned suggestions into practice. The integration of e-governance initiatives in the tertiary healthcare sector will lead to promote efficiency, accessibility, efficacy, and transparency which are also considered the pillars of Good Governance.

5.2 Conclusion

E-governance holds immense potential to transform tertiary healthcare service delivery in India. By addressing the identified limitations and implementing the suggested recommendations, healthcare institutions can harness the power of e-governance to improve efficiency, accessibility, and ultimately, the quality of care for all patients. This will contribute to achieving the goals of good governance in the healthcare sector by promoting transparency, efficiency, accessibility, and efficacy.

PLAGIARISM REPORT

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E-GOVERNANCE IN TERTIARY HEALTH CARE SERVICE DELIVERY: A DELHI BASED STUDY

ORIGINALITY REPORT

5%	5%	3%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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ANNEXURE

GOOGLE FORM QUESTIONS FOR THE DATA COLLECTION

1. Name (Optional)
2. Gender – a. Male
   b. Female
   c. other
3. Age – a. Under 18 years
   b. 18-30 years
   c. 30-40 years
   d. 40-50 years
   e. 50-60 years
   f. above 60 years

4. Role - a. patients
   b. Healthcare Staff
   c. IT Personnel

5. Question for Patients:

A. How often do you visit tertiary healthcare facilities in Delhi?

a. Rarely

b. Occasionally

c. Frequently

B. Which e-governance services have you used in the healthcare facility?

a. My health Record app

b. Telemedicine

c. Online appointments

d. Online diagnostic reports

e. Other

C. Have you faced any issues with e-governance services in the healthcare facility?

D. Are you happy with the e-governance services the hospitals are providing?

a. yes

b. no

6. Question for healthcare staff:

A. your role in the healthcare facility

a. Nurse

b. administrative staff

c. Other

B. How frequently do you use e-governance tools in your daily work?

a. Daily

b. Weekly

c. Monthly

d. Rarely

C. Which e-governance tools do you use?

a. electronic health records

b. Online appointment system

c. Digital billing system

d. Patient portals

e. Telemedicine platform

f. Other

D. Have you received adequate training to use e-governance tools?

a. yes

b. no

E. What challenges do you faced while using them?

F. Are you satisfied with these technologies?

a. yes

b. no