Ayushman Bharat Digital Mission: An Initiative of Digital Transformation towards Healthcare

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Sakshi Narayan
Pallavi Seth
Amity University
(sakshi.narayan1@s.amity.edu)
(pseth@amity.edu)
Deepa Shrivastava
Indian Institute of Travel Tourism and Management
(deepa.mittal@iittmnoida.ac.in)

The Ayushman Bharat Digital Mission is a critical project in India's healthcare industry, trying to accelerate digital transformation through innovative technology solutions. The mission, which was launched to create a seamless and inclusive digital health ecosystem, aims to use digital technology to improve access, efficiency, and quality of healthcare delivery across the country. This study investigates the Ayushman Bharat Digital Mission's fundamental concepts, aims, and strategic components, focusing on its potential to change healthcare service delivery, enhance patient outcomes, and empower stakeholders across the healthcare ecosystem. This research sheds light on the revolutionary influence of digitalization on public health management in India by examining the mission's implementation obstacles, possibilities, and early results. Finally, the Ayushman Bharat Digital Mission exemplifies how digital efforts may shift healthcare paradigms, leading to a more integrated, responsive, and egalitarian healthcare system for all residents.

Keywords: - Ayushman Bharat Yojana, Ayushman Bharat Digital Mission, Digital Transformation, Innovation, Healthcare Industry

1. Introduction

The new India has transformed many old and outdated industries into updated and advanced industries with the help of digitalization. One of the best examples is the healthcare industry. Smart healthcare management strategies have shown substantial promise in delivering the most effective healthcare to all, as they are the most effective approach to addressing the issues that arise in meeting the goal of providing good healthcare to all.

United Nations Population Fund states the elderly population of India is expected to reach 173 million in 2025and 240 million by 2050. The population percentage of older persons is predicted to rise from 8% in 2015 to 19% in 2050 and 34% by the end of the century. This forecasted scenario highlights the realism and severity of the situation that the country is likely to confront, while also laying the groundwork for planning and implementing actions for a healthy, self-sufficient society. (Subbarao, C., Renu kappa, S., Suresh, S., & Menon, S. (2022). To overcome this gap and make healthcare fairer for everybody, it is critical to implement digital or smart healthcare systems. Therefore, India and many other nations are looking at digital transformation to fill the gap, but progress has been happening slowly, and the digital maturity of providers,both within and across countries. The government of India has launched the digital health program under the Ayushman Bharat Scheme, which eases the health records of each citizen of India.

On 27th September 2021, our Prime Minister launched the Ayushman Bharat Digital Mission (ABDM), which aims to link digital health solutions of hospitals nationwide. The Mission will streamline hospital operations while also improving the quality of life. The Digital Ecosystem will also enable a wide range of other services, like digital consultation, patient permission to allow medical practitioners access to their information, and so on. This technique ensures that no outdated medical records are lost because they are stored digitally. Ayushman Bharat DigitalMission (ABDM) _ NDHM) (Shevchuk et al., 2020)

1.1 Healthcare Industry in India

The Indian Parliament set up the National Health Policy in 1983, later revised in 2002 and again in 2017. The most recent four major revisions in 2017 address the need to focus on the growing burden of non-communicablediseases, establishing a dynamic healthcare industry, increasing cases of unsustainable expenditure due to healthcare expenses, and rising economic growth enabling better fiscal capacity. (Healthcare in India – Wikipedia, n.d.)The healthcare system is divided into primary, secondary, and tertiary levels. Sub Centers and Primary Health Centers (PHCs) run at the primary level. Secondary healthcare facilities include Community Health Centers (CHCs) and smaller Sub-District hospitals.

As of fiscal year 2018, India's health insurance penetration was 35%. This was a modest increase over the previous year when penetration levels were at 33%. In fiscal year 2021, around 514 million people in India were covered by health insurance programs, with premiums for government-sponsored health insurance plans totaling around 43 billion Indian rupees. (Kumar, 2023)

It is anticipated that the Indian healthcare industry would treble, from US$ 110 billion in 2016 to US$ 372 billion in 2022, at a compound annual growth rate (CAGR) of 22%. India's healthcare system is predicted to cost INR 1713 per person annually

by FY22. India's public healthcare spending increased from 1.6% of GDP in FY21 to 2.1% in FY23 and 2.2% in FY22, according to the Economic Survey 2022-23. Health insurance companies' insured premiums rose to Rs. 73,582.13 crore (US$ 9.21 billion) in FY22. 33.33% of the nation's gross written premiums are earned in the health segment. (Healthcare System in India, Healthcare India – IBEF)

The Indian healthcare sector is projected to triple from US$ 110 billion in 2016 to US$ 372 billion by 2022, rising ata 22% CAGR. By FY22, India's healthcare infrastructure is predicted to cost $349.1 billion (about $1,100 per personin the US).

The market is estimated to grow at a CAGR of 22.52% from 2016 to 2022. Healthcare profit pools will increase at a 4% CAGR from US$654. The sector is projected to grow from $372 billion (about $1,100 per person in the US) in 2022 to $790 billion (about $2,400 per person in the US) by 2026. The Indian healthcare industry, estimated at US$ 86 billion in 2016, is expected to reach US$ 367 billion by 2023 and US$ 638 billion by 2025. The e-health industry is expected to reach US$ 10.6 billion by 2025. Healthcare System in India, Healthcare India - IBEF (n.d.)

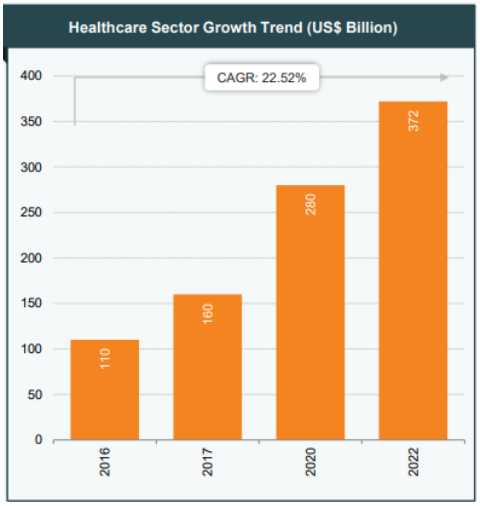

Figure 1 *Healthcare Sector Growth Trend, India*

In 2021, Health insurance coverage, around 500 million individuals were only 37% of the population in India who were covered by health insurance programs. There are around 400 million Indians without health insurance. Approximately 70% of the population is projected to be covered by public or voluntary private health insurance. The remaining 30% of the population, or more than 40 crore people, do not have health insurance. In terms of health insurance premiums, in 2021, the gross written premiums for health insurance in India were estimated to be worth around INR 637 billion. Public sector health insurers collected INR 272 billion in insurance premiums, private sector health insurers collected INR 159 billion, and freestanding health insurers collected around INR 151 billion in India. Top Health Insurance Statistics of 2024 – Forbes Advisor INDIA (n.d.)

1.2 Digital Transformation in the Health Insurance Industry

When digital technology is integrated into every part of a business, it can drastically change how it operates and offer value to customers. This is known as digital transformation. It is a progressive approach to business that shows the new path in the competitive world with the help of digitalization. Additionally, it is a change in culture that forces businesses to experiment, confront failure, and continuously question the status quo.

The digital transformation landscape includes five domains: Organizations may approach innovation differently by focusing on customers, competition, data, innovation, and value. Agile approaches and design thinking can increase learning while minimizing expenses. Digitization has been a widespread practice throughout businesses, including thefinancial industry.

Insurance businesses understand the need to invest in current digital technology to carry out cost-cutting and revenue-growth targets. The insurance industry's competitiveness is dependent on the ability to analyze consumer data and offer the proper products. The insurance sector is a difficult field in which consumer data must be accurately examined.(Guzmán-Ortiz et al., 2020)

The need for digital transformation in the insurance industry plays a vital role as it helps the industry streamline its functions and policies. The paperwork can be minimized by executing electronic transactions, e-stamping, and e- signatures by the customers. With the increase of speed in the work, the automated claim handling process has becomefaster and user friendly. This avoids the chances of fraud in the industry. Most customers live in rural or undevelopedareas, where direct contact is not possible. So, to provide them access, insurance companies are producing the digitaltransformation concept to connect with each customer easily. The visual screening during the claim process has also smoothened the effort of insurance companies in settling the claims on time. The rise in growth rates in the volume ofpremiums or investments in the insurance industry, and the development of this sector's regulatory environment, contributes to an increase in national production. (Sherif Mahmoud Radwan, 2019)

1.3 Digital Transformation for Patients

Digital disruption has become a phenomenon of the 21st century that is transformational in all traditional industrial contexts Organizational adoption of digital solutions necessitates methodical adjustments to "working, roles, and business offering." Digital trends at several levels are incorporated into the DT idea, including technology, organizational elements, procedures, and society—particularly the disruption of business models. The term artificial intelligence (AI) refers to the conversion of service operations into automated procedures that depend on intelligent computer systems or computer-controlled robots that can perform intelligence-related tasks without the need for human participation. It made use of the Big Data concept. At the moment, digital technologies make it possible to homogenize and store massive volumes of data utilizing big data analytics, which refers to sophisticated tools and methods for processing, storing, and analyzing vast amounts of data.

An example of this is improved research and care delivery. The way stakeholders communicate has changed significantly since the mid-1990s when the Internet was introduced. The HC business has only slightly changed overthe past 20 years due to changes in fundamental assumptions in HC organizations.

1.4 Ayushman Bharat Digital Mission: An Initiative by the Government of India

On September 27, 2021, the Ayushman Bharat Digital Mission was launched via video conferencing to improve healthcare accessibility and equity. The goal will be to use IT and related technologies to supplement current health services in a 'citizen-centric' way. ABDM's goal is to create a digital health ecosystem for the country that encourages universal health coverage in a timely, safe, economical, accessible, inclusive, and efficient way. Improved efficacy, efficiency, and transparency of healthcare services are anticipated outcomes of the mission. People will have access to both public and private health services, and medical personnel will be able to give better care since they will know more about their patient's medical histories. NHA _ Official Website Ayushman Bharat Digital Mission (n.d.)

Open, interoperable, standards-based digital technologies are used by the National Digital Health Eco-system to deliver a variety of data, information, and infrastructure services while ensuring the security, privacy, and confidentiality of personal health information. This guarantees the effective, timely, safe, accessible, inclusive, and economical promotion of universal health coverage. The Ayushman Bharat Digital Mission is known as ABDM National Portal of India (n.d.)

Figure 2 *The NDHM Ecosystem*

1.5 Key Features of Ayushman Bharat Digital Mission

1. **ABDM Health ID:** Each citizen is assigned a unique ID that includes health records, lab tests, and medicationinformation.
2. **Electronic Medical Records (EMR):** Digitize all medical records so that anybody can access themanywhere in the country.
3. **Teleconsultation:** ABDM uses telemedicine technology to allow remote consultations with doctors.
4. **Online Pharmacy:** ABDM encourages online pharmacies, which allow individuals to get medicinesremotely.
5. **Health Information Share:** All healthcare providers may share medical reports, enabling consistent accessto healthcare services regardless of location.

1.6 Key Benefits of Ayushman Bharat Digital Mission

1. Better access to healthcare services: By combining digital technology with healthcare services, ADM makesit easier to obtain healthcare services from anywhere in the country.
2. Enhanced privacy and confidentiality: digital health records are encrypted and protected against unwantedaccess.
3. Taking paper paperwork to doctors is no longer necessary thanks to the easy online access of ABDM EMRs (electronic medical reports).
4. Efficient healthcare: ADBM teleconsultation and online pharmacy save patients time and money on travel andwait times.
5. Comprehensive health records: ABDM's unique health IDs allow for centralized health records storage,making it easier for doctors to diagnose and treat patients.

The government has created the Ayushman Bharat Digital Mission (ABDM) to transform India's healthcare industry, providing citizens with inexpensive and convenient access to healthcare services. To construct this platform, a solid foundation of digital transformation has been laid. The foundation stone of ABDM are:

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1. **Health ID:** The creation of health IDs is promoted in order to standardize the identification procedure among medical professionals. In order to provide a Universal Health ID (UHID), the system gathers basic data about the person, including contact details, location, family/relationship status, and demographics. Individuals will be uniquely identified by the health ID, who will authenticate them and, with their informed consent, share their medical records with other stakeholders and healthcare systems.
2. **Healthcare Professionals Registry (HPR):** A comprehensive database of all medical professionals from both modern and traditional medical systems would be created as part of the Ayushman Bharat Digital Mission. Healthcare professionals can access India's digital health ecosystem by enrolling in the Healthcare Professionals Registry (HPR).
3. **Health Facility Register (HFR):** The Health Facility Registry (HFR), like HPR, is a comprehensive database of healthcare facilities. The HFR would build diagnostic labs, imaging centres, clinics, hospitals, pharmacies, and other public and commercial health services. The register would allow medical establishments to join India's Digital Health Ecosystem.
4. **Personal Health Records (PHR):** A personal health record (PHR) is an electronic copy of a person's medical record or records that satisfies interoperability criteria set by the country. It is available from a number of sources and is supported, shared, and controlled by the individual. The most important feature of the PHR is that the person controls the data. Through the Personal Health Record (PHR) System, people would have complete control over their medical care. Lab results, discharge summaries, treatment information from one or more medical facilities, and his or her health data would all be included in the longitudinal record.

1.7 Architectural Framework of National Digital Health Ecosystem

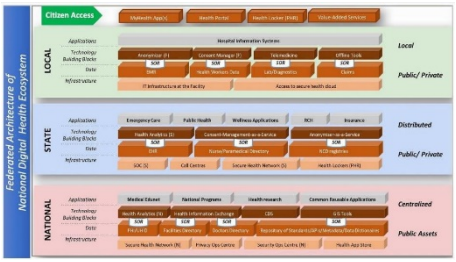

Figure 3 *Architectural Framework of National Digital Health Ecosystem*

The architectural framework of the National Digital Health Ecosystem divides the responsibilities between the national, state, and municipal levels. At the national level, the administration will focus on developing and supportingvital building blocks as envisaged, which include health. The eco-system relies on registries for professionals and health facilities to function smoothly. It delegated further responsibility to states and municipal governments. The datastored on healthcare facility servers will not be moved without one's authorization. Athaley (2023)

2. Review of Literature

The influence of digital transformation on the insurance industry is discussed in the study, but there is no comparison with other industries. Additionally, it ignores user viewpoints and technology uptake, both of which potentially advance comprehension. Implementation obstacles like organizational resistance or resource constraintsare also ignored in the article. Both the effect on the workforce and the role of regulatory frameworks in the adoption of digital transformation are not investigated. Furthermore, not enough attention is paid to how organizational culture might help or impede digital transformation. (Musaigwa & Mutula, 2022)

The report mostly focuses on one expert and lacks thorough insights into digital change in healthcare. Additionally, there is a dearth of empirical data about how digital transformation affects operational effectiveness and patient outcomes. The study lacks a thorough grasp of ethical and regulatory issues and does not examine technologies like telemedicine or artificial intelligence. Additionally, it does not examine interdisciplinary approaches to digital healthprojects, patient engagement, or change management procedures. These gaps require more investigation. Alt & Zimmermann (2021).

Although digital transformation in healthcare is discussed in the study, there is no holistic model that incorporates organizational, technological, and human variables. Additionally, it ignores patient-centered research in favor of organizational and technological considerations. The review concentrates on present patterns without looking at trendsthroughout time, which shows a lack of longitudinal study. Additionally, the paper lacks diversity in situations and ignores implementation hurdles in favor of benefits. It also lacks in-depth research on certain technologies like AI, telemedicine, or EHR systems, as well as a discussion of the ethical and regulatory ramifications. (Kraus et al., 2021)

Although the digital transformation of the Indian insurance industry is discussed in the paper, a thorough examination of international best practices and lessons learned is absent. Additionally, it ignores the effect on consumer involvement and experience, lacks long-term effects longitudinal studies, and does not thoroughly examine implementation difficulties. Along with ignoring employee viewpoints and data privacy and security issues, the document ignores how rules influence digital initiatives. To offer useful insights on customer uptake and trust, more research is needed. (Satuluri & Radhika, 2021)

The study might ignore more significant effects of digital transformation, like interdisciplinary cooperation and patient-centered treatment. Longitudinal research on long-term impacts on staff performance and healthcare outcomes might be lacking. The effect of socioeconomic elements on the efficacy of digital transformation may not be fully understood. There might not be enough studies comparing various healthcare settings. Patient opinions about digital health tools might not be thoroughly examined, and implementation issues might not be adequately handled. There may not be much interdisciplinary cooperation between healthcare specialties. Future studies on the digital transformation of healthcare may receive help from finding these gaps. Digital Transformation in Healthcare.The Challenges of Translating Knowledge in a Primary Research, Educational and Clinical Centre (n.d.)

The study addresses the digital transformation of healthcare, yet it is devoid of thorough success measures. Furthermore, it ignores long-term research on its development and effects over time. The insights could not encompassa range of viewpoints from patients, technology providers, and frontline healthcare professionals. Additionally, the influence on patient care and implementation issues are not addressed in the research. Furthermore, it does not considerorganizational and cultural elements that affect the effectiveness of digital transformation. The need for additional study is highlighted by the paper's potential failure to thoroughly examine the global context of digital transformationand its policy consequences. Burton-Jones et al. (2020)

Although the paper talks about a variety of technologies, it does not include the difficulties and best practices associated with incorporating them into healthcare systems. Additionally, it ignores usability and user experience, has no lasting effects on healthcare delivery, and falls short in addressing the consequences of data security and privacy. Additionally, the research ignores regulatory issues and patient-centric strategies, underscoring the necessity of interdisciplinary cooperation. To discover a variety of difficulties and solutions, a comparative analysisof digital transformation across many nations or healthcare systems may be necessary, as the article may lack globalperspectives. (Gopal et al., 2019)

3. Objectives

1. To study the impact of the use of digital technology in health Insurance.
2. To study the awareness about innovative technology applications among the beneficiaries of the Ayushman Bharat Digital Mission.
3. To study the challenges being faced by the beneficiaries of Ayushman Bharat Digital Mission.

4. Data Analysis

The study uses primary data collected from Ayush Mitras and other hospitals. Python 3 and Google Colab were utilized to examine the data. 130 data points can be analyzed to determine the level of public awareness regarding the Ayushman Bharat Yojana and its recently introduced Ayushman Bharat Health Account (ABHA Account). More research is conducted to understand the public's awareness, influence, and issues.

The demographic profiles of the respondents are shown in the Table below.

Table 1 *Demographic Profiles*

SECTIONS	PERCENTAGE
1. Gender	
Male	52.3
Female	47.69
2. Age Group	
Below 20	2
20-30	47
30-40	27
40-50	22
50 Above	32
3. Type of Occupation	
Government Employees	13
Private Employees	49
Business / Professional	28
Others	40
4. Educational Qualification	
Up to class 12th	5
Diploma	5
Under Graduate	28
Post Graduate	92
5. Income Earned Per Month	
Below 20000	27
20000-50000	39
50000-80000	32
80000 & Above	32

The percentages for the general awareness level of ADBM are shown in the table below.

Table 2 *Awareness Level of ABDM*

QUESTIONS	AWARE	UNAWARE
Are you aware of health insurance?	98.8%	1.2%
Are you aware of the government-sponsored Ayushman Bharat Digital Mission?	78.3%	21.7%
Are you aware of the AyushmanBharat health account?	78.3%	21.7%

According to the data above, most people are aware of the Ayushman Bharat Digital Mission and the Ayush Bharat Health Account. Now that they are aware of health insurance, they want to be protected against the costs associated with medical problems.

Further, to analyze the data, the survey is categorized into 7 segments:

- In-depth Awareness
- Digital Awareness
- Security
- Personalization
- Claim Awareness
- Additional Benefit Services Awareness

4.1 Significance of the Chi-Square Test

To determine the relation between observed data and expected data, a Chi-Square test is conducted, which shows

4.1.1 In-Depth Awareness

Chi-Square Calculation:

$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]

χ^2 = [(34-20)^2/20 + (26-20)^2/20 + (20-20)^2/20 + (10-20)^2/20 + (10-20)^2/20]
$\chi^2 \approx 21.5$

Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4

Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$

p-value:
p-value ≈ 2.86e-4

According to the report, respondents' knowledge of the Ayushman Bharat Yojana Scheme's paperwork, advantages of ABDM, local health centres, hospitals with empanelled status, and hospital facilities are not uniform. There is a wide range in the frequency of answers to these questions, suggesting that respondents' viewpoints are not uniform. Given that the p-value for these answers is greater than the crucial value, it may be concluded that respondents' awareness levels are consistent. According to the study's findings overall, participants are aware of the documentation required for the program.

4.1.2 Digital Awareness

Chi-Square Calculation:

$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]

χ^2 = [(19-20)^2/20 + (24-20)^2/20 + (20-20)^2/20 + (26-20)^2/20 + (11-20)^2/20]
$\chi^2 \approx 10.2$
Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4

Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$

p-value:
p-value ≈ 0.037

According to the report, respondents' understanding of chatbots driven by AI in health insurance companies varies widely. Blockchain and smart contracts are dispersed equitably, while self-service options like the Internet of Things are not. Although a significant majority strongly agree or highly agree, the distribution of mobile apps related to health insurance is not equal. These locations' p-values are higher than the crucial value, suggesting that respondents' knowledge is not dispersed equally.

4.1.3 Digital Security Awareness

Chi-Square Calculation:

$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]

χ^2 = [(29-20)^2/20 + (43-20)^2/20 + (17-20)^2/20 + (13-20)^2/20 + (8-20)^2/20]
$\chi^2 \approx 43.1$
Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4
Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$

p-value:
p-value ≈ 5.51e-9

The survey demonstrates a uniform distribution of views about online claim processing, cybercrime prevention, policy information access, beneficiary medical records accessibility, and simple payment methods in India. Opinions are not evenly split, nevertheless, with a sizable majority agreeing or strongly agreeing. The value of p is less than α.

4.1.4 Personalization Awareness

Chi-Square Calculation:

$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]

χ^2 = [(24-20)^2/20 + (38-20)^2/20 + (22-20)^2/20 + (10-20)^2/20 + (4-20)^2/20]
$\chi^2 \approx 34.12$

Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4

Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$

p-value:
p-value ≈ 4.41e-7

According to the study, respondents' opinions on a range of customer interaction topics are not evenly distributed. These include appropriate medical evaluation with fewer questions, digital fraud detectability, screen/whiteboard sharing, video interaction, video chats, and SMS services. A substantial majority of the observed frequencies strongly agree or agree, and they are distributed uniformly. There is also a uniform distribution in the computed χ^2 (34.12), χ^2 (23.1), χ^2 (19.3), χ^2 (25.6), and χ^2 (53.2).

4.1.5 Claim Awareness

Chi-Square Calculation:
$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]

χ^2 = [(24-20)^2/20 + (38-20)^2/20 + (26-20)^2/20 + (12-20)^2/20 + (4-20)^2/20]
$\chi^2 \approx 34.12$

Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4
Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$
p-value:
p-value ≈ 4.41e-7

According to the study, respondents' opinions on the following topics are not evenly distributed: evidence-based, easily accessible, high-quality care; access to patients' long-duration medical records; faster claim processing availability; and

awareness of cashless transactions in ABDM. The findings imply that respondents' opinions on these factors are not evenly distributed, with a sizable majority either agreeing or strongly agreeing. According to the results, opinions on these factors are not evenly spread.

4.1.6 Additional Benefit Service Awareness

Chi-Square Calculation:
$\chi^2 = \Sigma$ [(Observed Frequency - Expected Frequency)^2 / Expected Frequency]
χ^2 = [(34-20)^2/20 + (43-20)^2/20 + (24-20)^2/20 + (14-20)^2/20 + (5-20)^2/20]
$\chi^2 \approx 59.9$
Degrees of Freedom (DF):
DF = Number of categories - 1 = 5 - 1 = 4
Critical Chi-Square Value ($\alpha = 0.05$):
$\chi^2(0.05, 4) \approx 9.488$
p-value:
p-value ≈ 1.23e-12

Perceptions of internet connectivity availability, multilingual language provision, professional availability, telemedicine awareness, web portals, and mobile applications in healthcare/ABDM are not evenly distributed, according to the study. Although the majority of people strongly agree or agree, the frequency of these perceptions is not evenly distributed. Furthermore, opinions among respondents regarding the length of time it takes to settle eligible claims vary widely. These results imply that there is a lack of uniformity in the perspectives of telemedicine, web portals, mobile applications, professionals' availability, internet access, and multilingual language provision.

4.2 Significance of ANOVA Test

4.2.1 In-Depth Awareness

The study discovered that there were notable variations in the respondent groups' knowledge about the advantages of ABDM, empanelled hospitals, hospital amenities, and the paperwork needed for the Ayushman Bharat Yojana program. Tukey's HSD and other post-hoc tests were employed to identify the particular groups that were different from one another. Since the p-value (1.224e-17) is less than α (0.05), the null hypothesis—that all group averages are equal—is rejected. Additionally, a notable disparity in knowledge of the documents needed for the strategy was found by the study.

Table 3 *In-depth Awareness ANOVA Test*

R-squared	0.229
Adj. R-squared	0.134
Least square F-statistic	2.419
Prob (F-statistic)	0.00526
Log-Likelihood	-3.2432
No. Observations	130

4.2.2 Digital Awareness

Response groups' knowledge of AI-enabled chatbots, blockchain, smart contracts, the Internet of Things, self-service alternatives, mobile apps, and mobile apps related to health insurance products varied significantly, according to the survey. Tukey's HSD and other post-hoc tests were employed to identify the particular groups that were different from one another. The null hypothesis that the means are the same for all groups was rejected since the p-values were less than 0.05. A notable disparity in knowledge regarding mobile applications related to health insurance products was also found in the study.

Table 4 *Digital Awareness ANOVA Test*

R-squared	0.2
Adj. R-squared	0.102
Least square F-statistic	2.039
Prob (F-statistic)	0.0206
Log-Likelihood	12.347
No. Observations	130

4.2.3 Digital Security Awareness

Significant disparities in responder groups' views on several topics, including payment systems, policy specifics, processing claims, preventing cybercrime, and access to medical records, were discovered by the study. The null hypothesis that the means are the same for all groups was rejected since the p-values were less than 0.05. Post-hoc tests, like Tukey's HSD, were employed to determine the differences between particular groups. According to the findings, response groups differ in terms of perceived convenience, quicker access to policy specifics, and appropriate measures to stop cybercrime.

Table 5 *Security Awareness ANOVA Test*

R-squared	0.123
Adj. R-squared	0.015
Least square F-statistic	1.137
Prob (F-statistic)	0.334
Log-Likelihood	45.602
No. Observations	130

4.2.4 Personalization Awareness

Significant differences in opinions were found in the study regarding several aspects of customer interaction, including the perceived availability of SMS services, video interaction, video chats, proper medical assessment with fewer questions, access to patients' long-duration health records, and the smooth availability of health records. Tukey's HSD and other post-hoc tests were used to reject the results and identify the groups that differed from one another. The findings imply that not all groups have the same mean for these discrepancies.

Table 6 *Personalization Awareness ANOVA Test*

R-squared	0.123
Adj. R-squared	0.015
Least square F-statistic	1.137
Prob (F-statistic)	0.334
Log-Likelihood	45.602
No. Observations	130

4.2.5 Claim Awareness

The study discovered notable disparities in response categories' views regarding evidence-based, easily accessible, high-quality care, the development of a robust digital health ecosystem, quicker claim processing, access to patients' long-duration medical records, and awareness of cashless transactions in ABDM. Tukey's HSD and other post-hoc tests were employed to identify the particular groups that were different from one another. When the p-value is less than 0.05, it indicates that the means of each group are not the same.

Table 7 *Claim Awareness ANOVA Test*

R-squared	0.162
Adj. R-squared	0.059
Least square F-statistic	1.575
Prob (F-statistic)	0.0969
Log-Likelihood	28.133
No. Observations	130

4.2.6 Additional Benefit Service Awareness

Significant disparities were seen across response categories in terms of perceived internet connectivity availability, multilingual language, professional shortage, and knowledge of telemedicine, web portals, and mobile applications in healthcare/ABDM. Tukey's HSD and other post-hoc tests were employed to identify the particular groups that were different from one another. Since the p-value (1.526e-12) is less than α (0.05), the null hypothesis—that all group averages are equal—is rejected. The survey also found that different answer categories had significantly different views on the delay in settling qualified claims.

Table 8 *Additional Benefit Service Awareness ANOVA Test*

R-squared	0.207
Adj. R-squared	0.109
Least square F-statistic	2.23
Prob (F-statistic)	0.0153
Log-Likelihood	39.832
No. Observations	130

5. Conclusion

This article aimed to study the impact of the use of digital technology in health Insurance, the awareness of innovative technology applications among the beneficiaries of the Ayushman Bharat Digital Mission, and the challenges they face.

To evaluate the effects of digital technology use in health insurance, participants' understanding of the paperwork needed for the program is adequate, but they still need to learn more about AI-enabled chatbots, blockchains, contracts, self-service options, and mobile apps. Nonetheless, the majority believe that sufficient measures have been implemented to stop cyber fraud.

Regarding the availability of medical records throughout India, most respondents still feel ignorant. For most respondents, the same is true for video communications with patients and SMS services. Nonetheless, the majority of them are aware of ABDM's cashless transactions and quicker claim processing options.

Although there is no shortage of professionals, this study demonstrates that inadequate internet access and, in certain situations, the delay in settling valid claims pose significant challenges. The results show that a greater patient understanding of digital transformation is necessary. Results show that beneficiaries' awareness and knowledge gaps are viewed as a barrier, even in the face of Healthcare's ongoing digital transformation. Overall, the goal of Digital Health Care will be more successful if patient knowledge empowerment and digital technological developments are coupled. Being a key component of India's larger digital revolution, ABDM has the potential to completely revolutionize the nation's healthcare system and make it more patient-centered, technologically sophisticated, and competitive internationally. As a major step toward universal, sustainable, and inclusive healthcare, its digital success will serve as a model for other countries looking to use digital technologies for universal health coverage.

6. References

1. Athaley Chinmay, (2023, September 1), Ayushman Bharat Digital Mission- India's Leapfrog Moment, https://abdm.gov.in:8081/uploads/Ayushman_Bharat_Digital_Mission_India_s_Leapfrog_Moment_495788b1eb.pdf
2. Alt, R., & Zimmermann, H. D. (2021). The digital transformation of healthcare-An interview with Werner Dorfmeister. *Electronic Markets*, *31*(4), 895-899.
3. Burton-Jones, A., Akhlaghpour, S., Ayre, S., Barde, P., Staib, A., & Sullivan, C. (2020). Changing the conversation on evaluating digital transformation in healthcare: Insights from an institutional analysis. *Information and Organization*, *30*(1), 100255.
4. Cobianchi, L., Dal Mas, F., Piccolo, D., Peloso, A., Secundo, G., Massaro, M., ... & Gimenez, M. E. (2020). Digital transformation in healthcare. The challenges of translating knowledge in a primary research, educational and clinicalcentre. In *Education Excellence and Innovation Management: A 2025 Vision to Sustain Economic Development during Global Challenges*. International Business Information Management Association (IBIMA).
5. Gopal, G., Suter-Crazzolara, C., Toldo, L., & Eberhardt, W. (2019). Digital transformation in healthcare–architectures of present and future information technologies. *Clinical Chemistry and Laboratory Medicine (CCLM)*, *57*(3), 328-335.
6. Guzmán-Ortiz, C., Navarro-Acosta, N., Florez-Garcia, W., & Vicente-Ramos, W. (2020). Impact of digital transformation on the individual job performance of insurance companies in Peru. *International Journal of Data andNetwork Science*, *4*(4), 337-346.
7. IBEF (India Brand Equity Foundation), (2024, February), Growth of Healthcare Expenditure Over the Years, https://www.ibef.org/download/1707219974_Healthcare-December-2023.pdf
8. IBEF (India Brand Equity Foundation), Ministry of Commerce and Industry, Government of India, (2024, February), Healthcare Industry in India, https://www.ibef.org/industry/healthcare-india
9. Kumar, A. (2023). The Transformation of The Indian Healthcare System. *Cureus*, *15*(5)
10. Kraus, S., Schiavone, F., Pluzhnikova, A., & Invernizzi, A. C. (2021). Digital transformation in healthcare: Analyzing the current state-of-research. *Journal of Business Research*, *123*, 557-567.
11. Musaigwa, M., & Mutula, S. (2022). Impact of digital transformation on strategy in the insurance sector.
12. *International Journal of Research in Business and Social Science (2147-4478)*, *11*(4), 69-76.
13. National Health Authority (2021, October 01), Ayushman Bharat Digital Mission, https://www.india.gov.in/spotlight/ayushman-bharat-digital-mission-abdm
14. National Health Authority (2024, February 12), Digital Health Incentive Scheme for ABDM Adoption, https://abdm.gov.in/DHIS
15. Pradhan Dipen and Jain Aashika, (2024, February 28), Top Health Insurance Statistics of 2024, Forbes Advisor, https://www.forbes.com/advisor/in/health-insurance/health-insurance-statistics/
16. Radwan, S. M. (2019). The Impact of digital Technologies on Insurance Industry in light of digital transformation.
17. *Blom Egypt investments and Insurance Brokerage & Consultancy*, *2*.
18. Satuluri, R. K. (2021). Digital transformation in Indian insurance industry. *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, *12*(4), 310-324.
19. Shevchuk, O., Kondrat, I., & Stanienda, J. (2020). Pandemic as an accelerator of digital transformation in theinsurance industry: Evidence from Ukraine. *Insurance Markets and Companies*, *11*(1), 30.
20. Wikipedia (2024, October 23), Healthcare in India, https://en.wikipedia.org/wiki/Healthcare_in_India#:~:text=Since%202005%2C%20most%20of%20the,%2C%20and%2081%25%20of%20doctors