

# THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE HEALTH SECTOR IN INDIA: AN ECONOMIC PERSPECTIVE

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## Abstract

In today's world, artificial intelligence is impacting every sector of the economy, enabling faster, more accurate, and more efficient results at minimum cost. The health sector is one important part of the economy where AI is used to enhance productivity and efficiency, improve quality of life, and conduct research and development. In the present era AI is used in automation in hospitals, the pharma industry, and patients' treatment. Like other sectors, health services are dependent on AI for data analysis and management.

The market size of AI in the health sector has increased from \$0.13 billion in 2022 to \$0.83 billion in 2023. Indian Government has also taken many initiatives for digitization and use of AI in the health sector. One such scheme is Ayushman Bharat Digital Mission. This paper has attempted to analyze the scope of AI in the health sector in terms of its future budget requirement and what challenges are their for the health sector.

**Keywords:** Artificial Intelligence, Health Sector, Ayushman Bharat Digital Mission.

## INTRODUCTION

India's healthcare sector faces many challenges, including medical treatment and rural healthcare accessibility issues. However, due to the introduction of AI, the sector has improved in enhancing efficiency, reducing cost, and improving various services. According to NASSCOM, India's healthcare market has grown from \$110 billion in 2016 to \$372 billion in 2022 and added \$25 billion to India's GDP by 2025. Additionally, the market size of the AI health sector market was \$0.13 billion in 2022 and \$0.83 billion in 2023.

Max Healthcare, Apollo Hospitals, the National Centre for Disease Control, Medanta, and Dr. Reddy are the leading AI adopters in healthcare. India's AI healthcare market is expected to grow significantly, driven by government initiatives like the Ayushman Bharat Digital Mission and private sector investments.

The government has taken the initiative to introduce the Ayushman Bharat Digital Mission to strengthen the accessibility and equity of health services. It can help to digitally identify people, doctors, and health facilities, facilitate electronic signatures, ensure non-repudiable contracts, make paperless payments, securely store digital records, and contact people providing opportunities to streamline healthcare information through digital management.



Source – National Health Authority

## REVIEW OF LITERATURE

Artificial intelligence in health care plays a major role in creating awareness regarding health and in preventing disease that is fatal to human beings. Numerous research has been done that explain a positive relationship between the health sector and AI, especially the impact of machine learning on various sectors. However, few papers have analysed the relationship between the role and nature of AI in its market size and budget allocation from an economic perspective point of view. A few studies that merit consideration are:

1. Tripathi, et.al (2020) conducted a study on The Impact of Artificial Intelligence on Health Protection Schemes in India. They explained the role of AI in the healthcare industry through the Ayushman Bharat Health Protection Scheme by analyzing various technologies that help improve customer services and the experience in India.
2. R.S. Sharma (2023) conducted a study on The Ayushman Bharat Digital Mission (ABDM): making of India's Digital Health Story. To implement the AI in health sector the government has introduced the Ayushman Bharat Digital Mission which has increased digital public goods and make availability, affordability and acceptability of healthcare and suggest digital innovation can make equitable digitalisation of healthcare across the country.
3. Sainger, G. (2024) conducted a study on Artificial Intelligence in the Healthcare Sector in India: Application, Challenges and a Way Forward. He explained that in the context of the current situation, AI should be applied in hospitals, medical insurance, telemedicine, etc. but still facing difficulty in design, development, and implementation. But due to introduction of AI and research and development needs can improve the challenges faced by AI in India.

## RESEARCH GAP

In this paper, we analysed the role of government, by taking the initiative to introduce AI in the health sector. The Ayushman Bharat Digital Mission aims to record electronic health records of every citizen of India with the objective of universal health coverage and health access. This paper throws light on what challenges the government faces in budget allocation and what future of the Market Share covered by AI in the Health Sector of India could be.

## OBJECTIVES

1. To evaluate Government Expenditure in Ayushman Bharat Digital Mission for years 2021 to 2023.
2. Analysing the Market Size of AI in the Health Sector of India and Forecasted till Year 2030

## DATA ANALYSIS

Evaluating the pattern of Government Budget allocation in Ayushman Bharat Digital Mission for Special Category State (in Crores) for year average F.Y. 2021 to 2023

If we look at the table-1 it is evident that most of the special category states have spent less than 15 percent of the amount allocated in ABDM during the period 2021 to 2023. The highest-spending state is Meghalaya, and the lowest-spending state is Tripura.

**Table 1 - Government Budget allocation in Special Category State (in Crores) for the year average F.Y. 2021 to 2023**

Special Category States	Fund allocated	Fund released	Expenditure
Arunachal Pradesh	3.98	1.43	1.05
Himachal Pradesh	7.19	0.5	0.38
Assam	10.48	1.99	0.73
Jammu & Kashmir	7.74	1.25	0.58
Manipur	4.38	0.49	0.41
Meghalaya	4.39	1.5	1.28
Mizoram	3.97	1.05	0.95
Nagaland	4	0.74	0.42
Sikkim	3.61	0.51	0.35
Tripura	4.41	0.41	0.27
Uttarakhand	7.65	1.28	0.89

Source- Govt. of India (Press Information Bureau)

The fund released by the government shows a very depressive status of all the special category states in India. More than 70 percent of funds allocated to a given state are not released by the government.

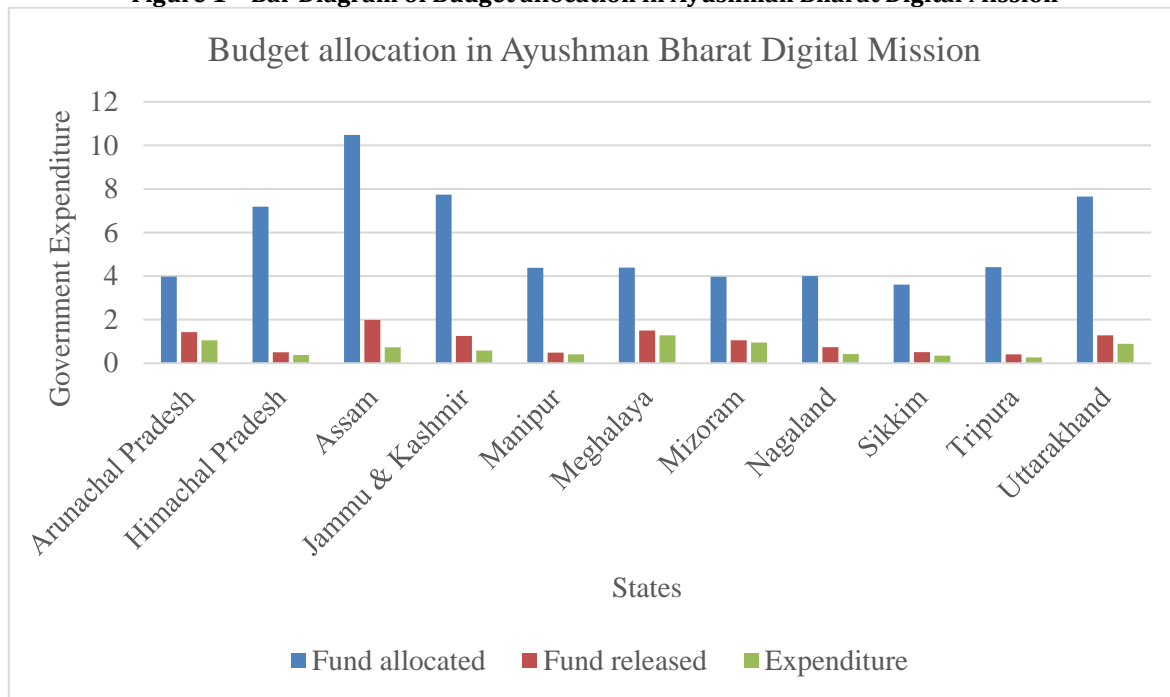
Based on diagram-1, Blue bars represent the Funds allocated, Orange bars represent Funds released and Grey bars represent Actual Expenditure across special category states.

The Fund allocated is significantly higher than the other, which indicates a gap between budget allocation and actual fund utilization due to fund disbursement, administrative challenges or inefficiencies in implementation. Now, Assam received the Highest fund allocation (Rs 10.48 Cr) but only Rs 1.99 Cr was released and actual expenditure was very low (Rs0.73 Cr) which suggests underutilization of resources.

Himachal Pradesh and Jammu Kashmir have moderate allocations (Rs7.19 Cr and Rs7.74 Cr respectively) Uttarakhand has relatively high fund allocation (Rs7.65Cr) and Expenditure (Rs 0.89Cr) indicating better fund utilization compared to others.

Sikki, Tripura, and Nagaland have the lowest allocation (below Rs4.5Cr), with very low fund released and expenditure.

**Figure 1 – Bar Diagram of Budget allocation in Ayushman Bharat Digital Mission**



**Impact of AI in the Health Sector on Market Size in India**

In terms of the market size of AI in the health sector, it has increased marginally from \$0.13 to \$0.83 billion. This only shows that government has spending less as compared to other sectors of the economy. The reason may be: -

- a) skilled persons may not be available
- b) the efficiency of data sources
- c) sensitivity of health services
- d) wide variety of complications related to patients' condition, location, funds availability
- e) different socio-political conditions of the states

All the above conditions resulted in marginal increases in government spending and its market size.

**Table 2 (a) - Impact of AI in the Health Sector on Market Size in India**

Year	Market Size (in billions)
2022	\$0.13
2023	\$0.83

Source- Govt. of India (Press Information Bureau)

Let us forecast for next 3 years,

$$\text{Growth Rate} = \frac{0.83 - 0.13}{0.13} * 100 = 538.5\%$$

Using Exponential Trend,

$$Y = 0.13e^{bt}$$

Therefore,  $0.83 = 0.13e^b$

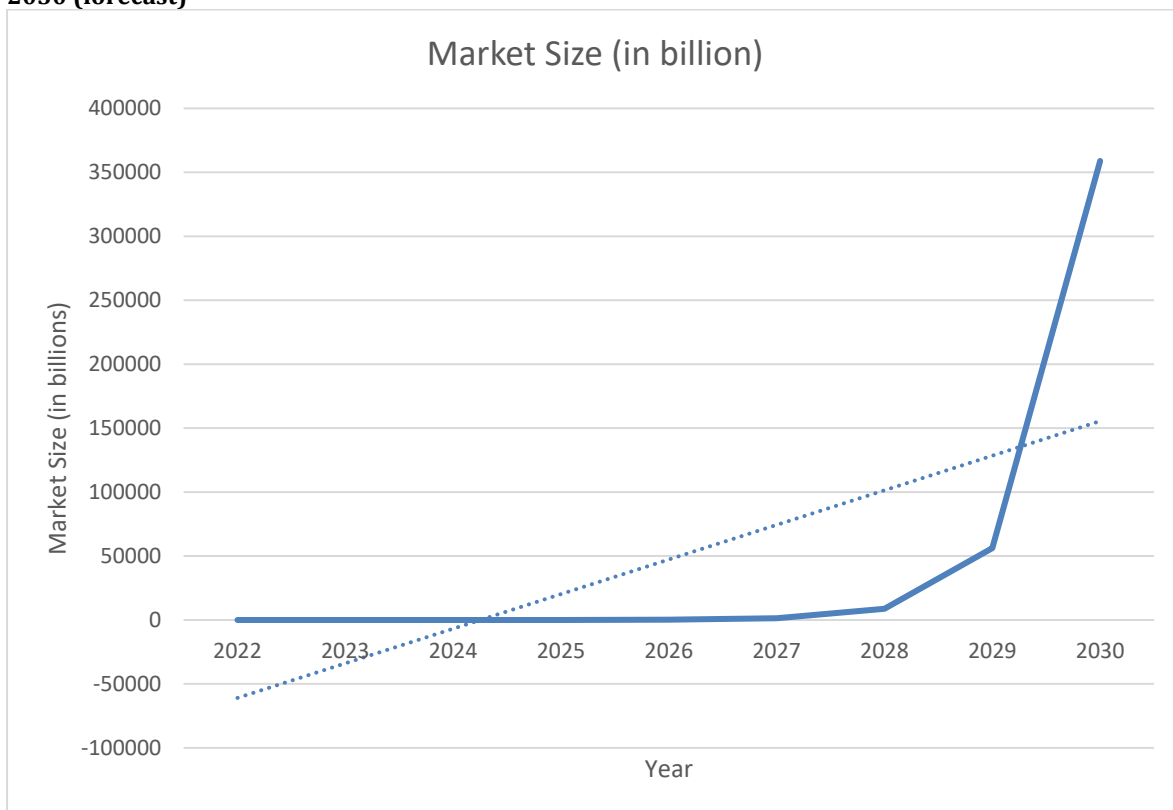
$$b = \ln\left(\frac{0.83}{0.13}\right) = \text{around } 1.85$$

we substitute  $t = 2, 3, 4, 5, 6, 7, 8$   
 $y(2024) = 0.13e^{1.85 \times 2} = \$ 5.3$  billion  
 $y(2025) = 0.13e^{1.85 \times 3} = \$33.83$  billion  
 $y(2026) = 0.13e^{1.85 \times 4} = \$216.01$  billion  
 $y(2027) = 0.13e^{1.85 \times 5} = \$1379.17$  billion  
 $y(2028) = 0.13e^{1.85 \times 6} = \$8805.45$  billion  
 $y(2029) = 0.13e^{1.85 \times 7} = \$56,219.44$  billion  
 $y(2030) = 0.13e^{1.85 \times 8} = \$358,939.52$  billion

**Table 2 (b) - Market Size covered in AI in the Health Sector of India for years 2022 to 2030 (forecast)**

Year	Market Size (in billions)
2022	\$ 0.13
2023	\$0.83
2024*	\$5.3
2025*	\$33.83
2026*	\$216.01
2027*	\$1379.17
2028*	\$8805.45
2029*	\$56,219.44
2030*	\$358,939.52

**Figure 2 - Exponential Trends of Market Size cover AI in the Health Sector of India for years 2022 to 2030 (forecast)**



The data and forecast are presented in Table 2 (a) and (b) and Figure 2 highlights the exponential growth of the AI market in India's Health Sector from 2022 to 2030.

In Historical Growth (2022-23), the Market Size grew from \$0.13 billion in 2022 to \$0.83 billion in 2023, which indicates a 538.5% increase in one year.

In Forecasted Growth (2024-2030), the Market Size is projected to increase exponentially, reaching \$5.3 billion in 2024, \$33.83 billion in 2025, and so on.

The exponential model assumes a constant high growth rate ( $b=1.85$ ), which may not be sustainable in the long run. Also, a logistic model will give a more realistic representation.

### Implications

To improve the Digitalisation of the Health sector of the various areas to be focused:

- ❖ Internet Facility: the government needs to improve high-speed internet, help in expanding connectivity, and real-time health monitoring and also provide at low cost.
- ❖ Vast population: Expanding broadband and mobile internet penetration will enable telemedicine, and remote diagnostics and remove rural-urban disparities.
- ❖ Cyber security- to protect patient trust and ensure safe digital health transformation is crucial.
- ❖ Paramedical facilities- which play a crucial role in emergency care, patient support services, etc
- ❖ Awareness- The government should initiative to provide lectures on how to use AI, launch a Healthcare Awareness program, and also improve continuous medical education programs.

This rapid expansion of AI in the Healthcare Sector will help to improve more compared to forecasted. Also, the Government should overcome challenges including cybersecurity threats, digital infrastructure gaps, and lack of awareness to be improved.

In conclusion, AI has the potential to revolutionize India's Healthcare system, and help for achieving Sustainable Development Goal 3 in India.

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