

## Research Article

# Digital Entrepreneurship in Public Healthcare: AI Applications in PMBJP Retail and Distribution Networks

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**Abstract:** The use of Artificial Intelligence in entrepreneurship has transformed the whole process of distribution and supply channels and there by opens new opportunities for the entrepreneurs in the way of new avenues for digital entrepreneurship particularly the entrepreneurship led by government that is Pradhan Mantri Bharatiya Jan Aushodhi Pariyojana (PMBJP) which is a flagship programme of central government which not only supplying the generic medicines to the needy and poor but the adoption of AI into the supply channel has proven to develop the supply chain network of PMBJP which provide employment opportunity to many people and simultaneously supplying low cost and high quality generic medicines at the doorsteps. This study examines how the Artificial Intelligence based solutions have opened new opportunities for digital entrepreneurship. This research paper has used the data collected from 200 respondents and has been analyzed using chi-square tests to evaluate the relationship between the adoption of AI and the performance. Findings shows that the use of AI has been significantly helpful in improving inventory management, demand forecasting and customer engagement fostering sustainable entrepreneurship.

**Keywords:** Artificial Intelligence, Digital Entrepreneurship, PMBJP, Healthcare Supply Chain, Affordable Medicines, Inventory Optimization, Public Health Innovation.

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## INTRODUCTION

The health care system in INDI faces challenges of affordable healthcare and also the challenges related to the accessibility and efficiency. The flagship programme of central government PMBJP has been removing this difficulties and supplying low cost generic medicines through its Jan Aushodhi Kendras to the poor and needy people. But the inefficiency in supply chain management, demand forecasting are the problems in its way which can be removed by the use of AI tools. This paper tries to show how the adoption of AI helps in removing these problems.

## LITERATURE REVIEW

Chandani Sheikh et al, (2022) discussed that in an effort to reduce personal spending, the Indian government launched the Janaushadhi Scheme in 2008, which offers generic medications at a reduced cost for medical purposes. Therefore, this study intends to evaluate knowledge and attitudes regarding generic meds as well as investigate the real-world efficacy of Jan Aushadhi generic antihypertensive medications at a Pradhan Mantri Bhartiya Janaushadhi Kendra. Approaches: At Pradhan Mantri Bhartiya Janaushadhi Kendra, this study was conducted. Researchers at Pradhan Mantri Bhartiya Janaushadhi Kendra recruited hypertension individuals who were using at least one antihypertensive medication. Each of the three individuals got two manual readings of their blood pressure (BP) and an average of the two readings. A digital readout is followed by questions that use Pradhan Mantri Bhartiya Janaushadhi to gauge patients' knowledge and attitudes. A notable decrease in blood pressure as compared to the baseline, first, second, and third months was one of the study's important findings. As a result, it was discovered that PMBJK medications were just as effective as brand names. As a result, people told their friends, family, and other loved ones about them, which lessened the financial load on the

population of the real world. Nevertheless, as all outcome measures showed a significant improvement, no change in SBP and DBP values was detected when utilizing the manual and digital approaches.

Swati Srivastava et al ,(2023 ) studied that in September 2018, the government-funded Pradhan Mantri Jan Arogya Yojana (PM-JAY) was introduced in India with the goal of giving impoverished citizens of that country economical access to medical care. A decentralized health implementation space can be facilitated by state-level program changes made possible by the PM-JAY design. In three geographically distinct Indian states, this study looks at the organizational, leadership, and competency strategies that impact PM-JAY implementation. The flexibility of the PM-JAY guidelines allowed for state-adapted implementation methods to facilitate implementation in a variety of states. These models made use of contextually appropriate adjustments for organizational and facilitative administration, staff and facility competencies, and recruitment. It is evident that staff hierarchies and incentive structures need to be aligned because adaptations also challenged hidden power inequalities and organizational culture, creating structural hurdles in staff interactions.

Karthick.M et al ,(2024) has discussed about the the Pradhan Mantri Bhartiya JanaushadhiPariyojana (PMBJP) was launched by the Department of Pharmaceuticals with the goal of providing the people with high-quality drugs at affordable prices. The PMBJP stores are intended to sell generic drugs, which are superior to branded drugs in terms of quality and effectiveness but are available at a reduced price. India distributes a wide variety of pharmaceuticals to other countries, earning it the nickname "Pharmacy of the World." However, because of the high cost of branded medications on the market, it is experiencing an increase in per capita medical spending. The Pradhan Mantri Bhartiya Jan Aushadhi Yojana scheme should be promoted by the government using TV commercials, billboards, posters, and social media platforms like Facebook, Twitter, Instagram, and others to help raise public awareness of the program. Since generic drug prices are lower than those of branded medications, the government should take the appropriate action to inform the public about the Pradhan Mantri Bhartiya Jan Aushadhi Yojana. This can be done by displaying the generic drug prices on wall posters, banners, and other similar materials. Additionally, the government should simplify the paperwork involved in opening Jan AushadhiKendras and distributing pamphlets to all primary healthcare facilities.

Gotri, Vadodara,(2022 )revealed that aiming to give excellent medications at a lower cost through its jan aushodhi kendras . To provide generic medications, which are more affordable yet have comparable quality and effectiveness to pricey branded medications, Pradhan Mantri Bhartiya Jan AushadhiPariyojana Kendra (PMBJPK) was established. The goals are to gauge public knowledge about generic medications and find out what the public believes about them.

Srinivasan P,(2023)discussed about the current study is to examine consumers' awareness, perceptions, and knowledge of the PMBJP generic medicine scheme in India as well as doctors' understanding of the same. The Indian government took up the problem of branded medications being more expensive than generic versions, while being out of reach for those on a low income. The Pradhan Mantri BharatiyaJanaushadhiPariyojana (PMBJP) scheme was established by the Indian government to provide high-quality medicine at an affordable cost to all citizens. The scheme operates through "Pradhan Mantri BharatiyaJanaushadhi Kendra's" stores located throughout the nation, which are overseen by the Bureau of Pharma PSU's India (BPPI) implementing agencies.

Dr. Sathyanarayana,(2021) The pharmaceutical industry does not use the media to publicly promote its goods. The nature and traits of pharmaceutical products are to blame. Since nature sales promotion is indirect, physicians are at the center of the entire industry's promotional strategies through Medical Representatives (MRs). The purpose of this article is to assess how Medical Representatives' (MRs') financial incentives affect sales promotion strategies. A self-designed survey based on the Rank Scale was used to gather primary data. A randomly selected group of 275 healthcare professionals provided the data. The data were analyzed using Spearman's Rank Correlation coefficient. The statistical significance of the outcomes was also confirmed using the t-test. It has also been determined that a variety of sales promotion strategies have been employed by medical representatives. According to Pokharel's (2017) research, doctor description is the most powerful promotional weapon available and has a major impact on marketing. Using product samples after the doctor's detailing has a big impact on marketing as well. Furthermore, health camps and CME programs were employed as marketing strategies. Meo et al. (2014) discovered a substantial correlation between sales promotion and purchasing behavior, free samples, and price decrease. According to Gopalkrishnan's 2007 research, sales incentive programs have the potential to produce favorable outcomes when looking at bottom-line metrics. According to Katz et al. (2003), presents are a priceless and traditional marketing tactic in the corporate sector.

Rajeev Shrestha et al,(2022) Many nations have pushed generic medications due to their advantages over branded ones, including lower costs, therapeutic equivalents, and patient convenience. But generic prescription is still not up to the ideal level in Nepal to guarantee the public's access to affordable, high-quality medications and to lessen the overall financial burden and medication errors related to practice. This review sought to examine the current state of generic medicine, generic prescribing, obstacles, and viable strategies for advancing generic medicine usage and generic prescribing in Nepal. Numerous studies on the use of generic medications and the practice of prescribing them in Nepal were examined. This research identified a few of the most significant obstacles that need to be overcome in order to properly prescribe and

use generic medications. These difficulties include a lack of resources and expertise to guarantee the therapeutic equivalent of various name-brand medications, a lack of knowledge about generic medications among the general public and health care professionals (HCPs), and a lack of strict regulations for the promotion of generic medications. Particularly in terms of cost and general reduction of prescription errors and load, patients and the medical community as a whole stand to gain much from the promotion of generic drugs and generic prescribing. The promotion of generic drugs and prescribed medications in Nepal is still primarily focused on ensuring the quality, safety, and efficacy of medicine. In order to ensure that generic drugs are marketed with the highest quality and efficacy and with a guarantee of therapeutic equivalency, regulatory bodies should support the pharmaceutical businesses in equipping them. Facilitating and implementing BABE research is necessary right away in order to ensure interchangeability. In the second phase, medical students and HCPs (physicians, pharmacists, and other healthcare professionals) are taught the value of generic medications to patients' lives and the health system as a whole, which motivates them to prescribe them.

According to the study's findings, pharmacists and prescribers' knowledge and self-practices regarding generic drugs have improved statistically significantly in ways that benefit consumers' health. Raising general public awareness of generic drugs lowers healthcare costs and enhances quality of life. The usage of generic drugs was seen more favorably by prescribers and pharmacists as a result of the counseling and education.

Claudio Andre Barbosa de Lira et al., (2014) to evaluate laypeople's degree of understanding, attitudes, and prescription drug consumption patterns regarding generics. Techniques: 278 participants, ages  $37.1 \pm 15.8$  years (180 women and 98 men), participated in a cross-sectional study. Questions about their use, opinions, and understanding of generic medications were included in the questionnaire. Findings: While 78.8% of respondents had some knowledge about generics, the majority of respondents (99.6%) were aware that they existed. However, only 48.6% of respondents could accurately characterize generic medications. 49.3% of the information was gathered via television. Regarding the features of generic drugs, 79.1% of respondents said they were certain of their effectiveness, 74.8% thought they had the same impact as branded drugs, 88.8% thought they were less expensive than branded drugs, and 80.2% claimed they bought the generic medicines because of their low price. The study's sample of people is sufficiently informed about the definition, effectiveness, and pricing of generic pharmaceuticals for the general public. As a result, it's quite probable that the volunteers who were interviewed used generics. Additionally, the study's findings suggest that initiatives should be put in place to encourage doctors to prescribe more generic medications. Given that the population under study possesses adequate knowledge regarding generic drugs—including their definitions, costs, and effectiveness—it can be demonstrated that the willing respondents had a high probability of using them. The results of this study also demonstrate the need for initiatives to be put in place in order to increase doctors' prescriptions for generic drugs.

### Objectives

- To evaluate the role of AI in PMBJP retail and distribution networks
- To identify digital entrepreneurial opportunities enabled by AI
- To analyze the impact of AI adoption on business performance
- To evaluate challenges faced by entrepreneurs in adopting AI technologies

## RESEARCH METHODOLOGY

### 4.1 Design of the research

Descriptive and analytical research design

### 4.2 Data Collection

Primary Data: Collected from 200 respondents (PMBJP store owners, pharmacists, entrepreneurs)

Secondary Data: Journals, government reports, articles

### 4.3 Sampling Technique

Random sampling

### 4.4 Tools Used

Likert Scale (5-point)

Chi-square test

## QUESTIONNAIRE

Section A: Demographic Profile

Age:

Below 25  25–35  36–45  46–55  Above 55

Gender:

Male  Female  Other

Occupation:

PMBJP Store Owner  Pharmacist  Entrepreneur  Healthcare Worker  Other

Years of Experience in PMBJP/Healthcare Sector:

Below 2 years  2–5 years  6–10 years  Above 10 years

**Section B: Awareness of AI in Healthcare**

No.	Statement	1	2	3	4	5
B1	I am aware of Artificial Intelligence applications in healthcare	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B2	I understand how AI can be used in pharmaceutical supply chains	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B3	AI awareness programs are available for PMBJP stakeholders	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B4	I have received training related to AI or digital tools	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B5	AI knowledge is essential for modern healthcare entrepreneurship	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section C: AI Adoption in PMBJP Operations**

No.	Statement	1	2	3	4	5
C1	AI tools help in efficient inventory management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C2	AI improves demand forecasting accuracy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C3	AI reduces medicine stock-outs in PMBJP stores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C4	AI enhances supply chain efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C5	AI reduces operational costs in retail pharmacies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
C6	AI tools are easy to implement in PMBJP stores	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section D: Digital Entrepreneurship Opportunities**

No.	Statement	1	2	3	4	5
D1	AI creates new business opportunities in PMBJP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D2	Digital platforms help entrepreneurs expand their business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D3	AI enables innovation in healthcare retail services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D4	AI supports the development of health-tech startups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D5	Digital entrepreneurship improves service delivery in PMBJP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
D6	AI increases competitive advantage for entrepreneurs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section E: Impact on Business Performance**

No.	Statement	1	2	3	4	5
E1	AI adoption increases profitability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E2	AI improves customer satisfaction	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E3	AI enhances decision-making efficiency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E4	AI helps in business expansion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E5	AI improves overall operational performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section F: Challenges in AI Adoption**

No.	Statement	1	2	3	4	5
F1	High cost of AI implementation is a barrier	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F2	Lack of technical skills limits AI adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F3	Poor digital infrastructure affects AI usage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F4	Resistance to change hinders AI adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No.	Statement	1	2	3	4	5
F5	Lack of government support affects adoption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section G: Future Prospects**

No.	Statement	1	2	3	4	5
G1	AI will play a major role in future PMBJP operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G2	Digital entrepreneurship will grow in public healthcare	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G3	Government initiatives will support AI-based startups	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G4	AI will improve access to affordable medicines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G5	PMBJP will benefit significantly from digital transformation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**6. Chi-Square Analysis**

**(i) Objective of Analysis**

To evaluate whether the adoption of AI in business has a significant performance among the PMBJP entrepreneurs.

**(ii) Hypothesis**

- $H_0$  (Null Hypothesis):  
There is no significant relation between business performance and AI adoption
- $H_1$  (Alternative Hypothesis):  
There is significant relation between business performance and AI adoption

**(iii) Data Classification (Based on 200 Respondents)**

Responses from Likert scale were grouped as:

AI Adoption: High / Low

Business Performance: High / Low

**(iv) Observed Frequency Table (O)**

AI Adoption	High Performance	Low Performance	Total
High	90	30	120
Low	40	40	80
Total	130	70	200

**(v) Expected Frequency Table (E)**

Formula:

$$E = \frac{(\text{Row Total} \times \text{Column Total})}{\text{Grand Total}}$$

AI Adoption	High Performance	Low Performance
High	78	42
Low	52	28

**(vi) Chi-Square Calculation**

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Cell	O	E	(O-E) <sup>2</sup> / E
High-High	90	78	1.85
High-Low	30	42	3.43
Low-High	40	52	2.77
Low-Low	40	28	5.14

Calculated  $\chi^2$  Value = 13.19

**(vii) Degree of Freedom**

$$df = (r-1)(c-1) = (2-1)(2-1) = 1$$

**(viii) Critical Value (at 5% level of significance)**

Table value of  $\chi^2$  at  $df = 1 \rightarrow 3.84$

**(ix) Decision Rule**

If  $\chi^2$  calculated  $>$   $\chi^2$  table  $\rightarrow$  Reject  $H_0$   
 $13.19 > 3.84 \rightarrow$  Reject  $H_0$

**(x) Interpretation**

The adoption of AI and business performance in PMBJP retail and distribution networks has been statistically significant.

**(xi) Key Insights**

Entrepreneurs using AI tools show higher business performance

AI improves:

Inventory control

Demand forecasting

Customer satisfaction

Low AI adoption is associated with reduced efficiency and profitability

**(xii) Result of Analysis**

The Chi-square test confirms that AI adoption plays a crucial role in enhancing entrepreneurial success within PMBJP. This supports the argument that digital entrepreneurship driven by AI can strengthen public healthcare delivery systems.

## CONCLUSION

In this chapter the use of AI and the performance in the distribution channel of pradhan mantra bhartiya jan aushodhi pariyojana has been analyzed and the result shows that the use of AI has outperformed the way the traditional entrepreneurs has performed . It has been confirmed from the findings that there is significant association between AI adoption of AI and performance of business.

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