

# Catalyzing healthcare accessibility through cashless payment gateways in India: a digital revolution

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The global payment gateway landscape has undergone a significant transformation, resonating across various sectors, including healthcare. Within India, digital payment transactions have consistently risen, with a notable leap from 3134 crore (FY 2018–19) to 7422 crore (FY 2021–2022).<sup>1</sup> The National Payments Corporation of India (NPCI) supported by Reserve Bank India and India Bank Association, has been instrumental in this trend by introducing secure digital payment gateways (UPI, BHIM, RuPay), facilitating various transactions from person-to-person to government-to-person for social schemes.<sup>2</sup> Gateways have streamlined transactions, eliminating bureaucratic intermediaries through direct customer-to-business interactions.<sup>3</sup> This transformation of payment dynamics is exemplified by events like demonetization, enhancing digital payment use, and validating this positive shift.

In India's ongoing pursuit of comprehensive universal healthcare, progress has been made in enhancing the quality of care at government health centers.<sup>4</sup> Nevertheless the lack of full-fledged implementation of a universal healthcare program and the rapid growth of the private sector, healthcare has become prohibitively

expensive for a significant number of citizens. The Ministry of Health's commitment to digital payment integration, along with initiatives like 'Jan Dhan Aadhaar Mobile Yojana', reinforces the significance of digital payments in ensuring equitable healthcare access.<sup>5</sup> Furthermore, the COVID-19 pandemic has emphasized the role of digital payments, aligning with the 'new normal' of social distancing and advocating contactless payment approaches.<sup>1</sup> These gateways enable caregivers of patients to prioritize family needs, close involvement in patient care, and pay bills remotely without visiting the hospitals.

## Barriers in using cashless payment gateways and mitigation strategies: an illustration

We conducted a scoping review and identified trends, challenges, and strategies for promoting digital gateways in Indian healthcare (Table 1). While digital gateways surpassed traditional debit cards, BHIM-UPI stands as the preferred mode, recording 452.75 crore transactions by February 2022.<sup>1</sup>

Key barriers to adoption include security issues, privacy apprehensions linked to mandatory verification, with Aadhar numbers, digital-awareness gaps, disparities in utilization among the lower-socioeconomic and rural population, technical challenges like connectivity issues, and sluggish grievance redressal processes.<sup>1,6</sup> India faces a dearth of research on healthcare digital payment system utilization in contrast to high-income countries that are exploring approaches to surmount implementation challenges and integrate digital payment systems within healthcare facilities.

The Digital Payment Security Controls Directions, multi-factor authentication for promoting confidentiality, formulation of the Indian Computer Emergency Response Team to ensure safe digital technology usage, awareness generation through Financial Literacy Week targeting geriatrics and rural populations, and formulating an efficient grievance resolution system are RBI's strategies for promoting Indian digital-payments system.<sup>1</sup> The Ministry of Electronics and Information Technology launched the "Pradhan Mantri Gramin Digital Saksharta Abhiyan" to boost digital literacy and raise awareness about secure payments in rural areas.

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Study (Author and year)	Country (state)	Type of publication	Study details	Findings
1. Vivek and Mihir/ April 2020	Pan-India	Report Impact of the COVID-19 outbreak on digital payments	The data was collected from all the sectors e.g., Health, telecom, etc	Payment players associated with the healthcare/ pharma sector will see an increase in digital payments due to the COVID-19 pandemic
2. Yalanchmanchili et al./February 2020	Andhra, South India	Original article, Cross-sectional study (A Study on the Impact of Demonetization on Utilisation of Private Health Care Services in a South Indian City)	The study was conducted in 10 health-facilities involving 200 participants	Penetration of cashless payments in private healthcare was very poor. The low-income groups had highest impacted by demonetization and their health care accessibility was affected. This means cashless payment was used less by these socio-economic strata
3. McKinsey Global Institute/August 2020	Pan-India	Report; <a href="https://d.docs.live.net/b7ee28a3704d5dee/Scoping%20Review_%20Lancet%20Commission/Manuscript/Literature_comment_scoping/MGI-Indias-turning-point-Report-August-2020-vFinal.pdf">https://d.docs.live.net/b7ee28a3704d5dee/Scoping%20Review_%20Lancet%20Commission/Manuscript/Literature_comment_scoping/MGI-Indias-turning-point-Report-August-2020-vFinal.pdf</a>	This report discusses about the economic agenda in India supporting spur of economic development and jobs. It has added few information on digital payment gateways and its impact on health care accessibility.	Appropriate and robust digital payment methods can accelerate medical tourism in India.
4. Shorbaji N/July 2021	Pan-India	Book chapter	This is a chapter in a book "Healthcare Access" titled as improving healthcare access through digital health: the use of information and communication technologies	The author reports that with the digitalization of health care which includes payment, will help in improved accessibility to health-care in India.
5. Khedekar N/ November 2016	Pan-India	News-report ( <a href="#">Demonetisation: Digital payments could help us deal with corruption- Technology News, Firstpost</a> )	This is a news-report published in Firstpost titled as "Demonetisation: Digital payments could help is deal with corruption"	This report is not exclusive to health-care system. This news reports about all the fields in general. It mentions that plastic money can reduce corruption, increase accountability. Demonetization has made digital transactions popular among the Indian citizens. However, still ~95% of transactions are made via cash, and for deeper penetration digital transactions a greater number of merchants and services should be supporting plastic money. The rural population is always required to be made aware of this mode.
6. Nasscom/ August 2021	India	Report ( <a href="#">Open digital systems to unlock \$700-billion opportunities by 2030: Nasscom - The Hindu</a> )	This report was published in newspaper and the data was collected from a report: Digital India: The Platformisation play	This article projects that the government health services available to people in a more efficient and convenient manner by use of digital payment tool like UPI and the market value \$ 700 billion opportunities. Sectors such as healthcare, agriculture to benefit the maximum.
7. Rathi A/ November 2019	India	Report ( <a href="#">Is India's Digital Health System Foolproof?; Is India's Digital Health System Foolproof? — The Centre for Internet and Society (cis-india.org)</a> )	This report was published in economic and political weekly	This article as highlighted that the cashless modes of transaction and delivery has been accelerated in India after the demonetisation drive. This has resulted into rapid uptake of digital payment in all the fields which includes health also.
8. Bijapurkar R et al./2020	India	Report (Digital Payments adoption in India, 2020) <a href="#">Report on Digital Payment India 2020_14th Jan'21_2_Final (ice360.in)</a>	This report was published by the national payments' corporation of India.	Doesn't specifically mention about health sector. The adoption of the cashless payment had triggered during the lockdown period. This adoption of digital payment was found to be universally accepted across all the segments/ fields like: payment at health care facility, buying household items, banking etc. Factors motivating the customers to use digital mode of payments are: safety and convenience and instant payment mode, strategies like SMS communication to customers after payment etc.
9. National Payment corporation of India (NPCI)/ February 2021	India	Report (Harnessing technology; creating a less cash society); <a href="#">NPCI_Booklet_A5Size_final_2_2 (mohfw.gov.in)</a>	This report was published by the national payments' corporation of India.	This report highlights the various modes of digital payment. Also, it mentions the latest mode called the Bharat bill payment system and its use in paying insurance premium (online) and helping in health care accessibility.

(Table 1 continues on next page)

Study (Author and year)	Country (state)	Type of publication	Study details	Findings
(Continued from previous page)				
10. Wadhwa et al./ February 2018	India (Vadodara, Gujrat)	Original cross-sectional designed article. (A cross-sectional questionnaire survey to evaluate the factors affecting the use of digital payment system among the healthcare professionals in Vadodara.)	This is a cross-sectional study conducted among the health care professionals to assess the knowledge, awareness and use of digital payment in their routine life.	This study reported that medical doctors, dentists and physiotherapists used the digital mode of payment for insurance premium payment and medical bills. However, it was found that there was significant difference among the adoption of digital payment mode among the physiotherapist, dentist and medical doctors. The author concluded that generating awareness through seminars, awareness campaign and advertisement can help to bridge this knowledge gap.
11. R Geetha et al./ October 2017	India (Bangalore, Karnataka)	Original article, cross-sectional study	A study to examine the financial Literacy and usage pattern of mobile wallets across gender groups and the various factors that can affect a consumer's decision to adopt mobile wallet as a mode of online payment	Findings reveal a significant untapped market for mobile wallets, necessitating heightened awareness and usage. Convenience and time efficiency drove adoption, while safety concerns remained paramount, hindering broader acceptance due to security threats.
12. Singhal R et al./ February 2021	Pan-India	Original article; secondary data from different research papers, reports & government data has been reported.	The study aims to assess the impact of India's shift towards a cashless economy, its potential as an effective credit-based system, and the consequences of adopting digital payment systems on citizens.	Government and RBI's payment initiatives have led to increased acceptance and penetration of non-cash payment methods, supported by advancing technology and telecommunication, while traditional methods like checks as payments have waned in relevance, and government measures like GST and demonetization are expected to expand the tax base and formal economy.
13. Ministry of Electronics & IT, India/March 2022	Pan-India	Report Increase In Digital Payments; <a href="https://pib.gov.in">Press Information Bureau (pib.gov.in)</a>	This report summarizes the current status of digital payment system in India, challenges and strategies taken by Govt. Of India for dealing with challenges.	Major shift in usage of digital transactions. The various regulatory adoption for mitigation of security related issues, digital awareness generation and prompt grievance redressal have been taken up by RBI, NPCI and Ministry of Electronics & Information Technology
14. Gupta N et al./ March 2022	Pan-India	Original article, secondary data from different research papers, reports & government data has been reported.	The study aims to comprehend the concepts of digital payment systems and cashless transactions, explore current digital payment options, assess the impact of digital payment systems in India, ascertain the benefits of cashless transactions, analyze the issues associated with digital payment systems, and identify the opportunities and challenges of e-payment systems in India.	Digital payment systems for both customers and bank officers is evident, with multiple options available in India's financial system; however, a considerable portion of the population lacks familiarity with this system due to low digital literacy levels. The underdeveloped and limited spread of digital payment systems in India is influenced by social and infrastructure challenges. Nonetheless, mobile banking is gaining popularity due to its user-friendly nature and accessibility, necessitating the enhancement of digital literacy. To facilitate the adoption of these systems and strategies for national progress, the alignment with Indian culture and the support of the government are essential.

Table 1: Important studies/reports on digital payment gateways in India.

Furthermore, NPCI promotes digital payment awareness, emphasizing BHIM-UPI fraud prevention.<sup>1</sup>

Additionally, a few Indian researchers propose leveraging Lucky Grahak Yojana and DigiDhan Vyapar Yojana to promote electronic payments.<sup>7</sup> Health savings accounts and electronic vouchers could enhance the redemption of healthcare. Empowering women through digital training may foster equitable healthcare access. Fueled by social marketing and societal acceptance, India's transition to a cashless

healthcare ecosystem can offer individual, and societal advantages, potentially positioning the nation as a medical tourism hub.<sup>8</sup>

Drawing lessons from global experiences reveals that 65% of health consumers prefer providers offering advanced digital payment options.<sup>9</sup> Challenges in advanced technology adoption include limited resources, the push for consumer-focused value-based healthcare, and price transparency gaps.<sup>9</sup> Promising technological trends include automation, HIPAA-

compliant solutions, and integrated payment systems. Digital transformation is evident in patient engagement, with 44% of bill payments expedited through digital alerts and robust online portals, boosting patient involvement in healthcare.<sup>10</sup> 76% of healthcare beneficiaries expressed concern about touching payment devices.<sup>10</sup> To build trust, healthcare facilities are promoting contactless solutions like QR codes, mobile applications like Turnkey, and contactless cards. Improving service compliance, 24/7 online chat and IVR have contributed to streamlined support.<sup>10</sup> 56% and 40% of beneficiaries find comfort in resolving payment queries via text or video chat and IVR respectively. Virtual Credit Cards (VCCs) have gained traction for secure transactions.<sup>10</sup>

In conclusion, integrating cashless payment gateways in India's healthcare holds transformative potential, as it will foster transparency, equitable access, and heightened patient experiences. Technology-policy convergence can be key as fintechs innovate with cost-effective solutions, and flexible policies ensure competitiveness, innovation, and streamlined processes.

#### Contributors

BGP was involved in data curation, validation, visualization, writing original and revised version and editing the comment (type of article).

GM was involved in data curation, validation, visualization, and editing.

VC was involved in guidance of data curation, validation and expert opinion.

MSK was involved in project administration, provision of logistics for data generation (e.g., software), supervision and support during entire review process, validation, writing and editing the comment (type of article).

#### Data sharing statement

The data is available on request.

#### Declaration of interests

The authors declare no conflict of interest.

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