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A STUDY ON THE TRENDS OF THE DIGITAL PAYMENTS SYSTEMS IN THE INDIAN BANKING SECTOR

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Abstract
The research paper presents a comprehensive information of the different of payment systems in the Indian banking sector over the past ten years, from 2015-2016 to 2023-2024. The study employs a quantitative approach, utilizing secondary data sources to examine the trends in the adoption and usage of digital payment channels. The key findings of the research indicate that the Indian banking sector has witnessed a significant shift towards digital payment channels, driven by technological advancements, regulatory initiatives, and the growing demand for convenient and accessible financial services. The introduction of technologies such as artificial intelligence and machine learning has enhanced the efficiency, security, and accessibility of payment systems, leading to improved customer experience and increased customer satisfaction. The study also identifies the challenges and opportunities in the digital payments domain, including the need for improved cybersecurity measures, increased financial literacy, and the integration of emerging technologies like the Internet of Things.
Keywords: Indian Banking Sector, Payment Systems, Digital Payments, Financial Inclusion.

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1 Introduction

The banking sector in India has undergone a significant transformation in recent years, driven by the rapid advancements in artificial intelligence and other emerging technologies that have not only enhanced the efficiency of banking operations but have also had a profound impact on the profitability of private sector banks in India. (Agarwall et al., 2022) This research paper aims to investigate the different payment systems within the Indian banking sector over the past ten years, from 2015-2016 to 2023-2024.Digital transformation in the core banking process has brought about several changes, including the automation of routine tasks, the introduction of digital channels for customer interaction, and the utilization of data analytics to enhance decision-making. These advancements have the potential to improve operational efficiency, reduce costs, and enhance the customer experience, all of which can contribute to improved profitability for the banks. (Burragoni, 2017)

The demographic dividend and 850 million mobile subscriptions have significantly changed India's banking and payment systems, supported by improved infrastructure. Payment systems like UPI, IMPS, and NEFT are widely used. Government initiatives, including demonetization and the Digital India program, have promoted digital payment adoption, and increased digital transactions. Additionally, the COVID-19 pandemic has further accelerated the shift towards contactless payments, as people sought to minimize physical interactions and cash transactions. (2020).

The rise of mobile devices, the internet, and electricity has helped cashless transactions grow in India, making it important to track digital payment trends in the banking sector. New banks, like small finance and payment banks, offer high-tech, low-cost services, increasing digital payment use from 60 billion transactions in 2012-13 to 4,018 billion in 2015-2016. However, challenges

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like bank connectivity, trust issues, and lack of performance improvements hinder progress. To overcome these, the government and Reserve Bank of India have introduced UPI 123 Pay and are promoting technology innovations. Blockchain technology is also seen as a way to improve transaction security and transparency.

In conclusion, the digital payment systems in the Indian banking sector have undergone a remarkable transformation, driven by government initiatives, technological advancements, and the growing demand for cashless transactions. The industry's transition towards a digital payment ecosystem has brought about significant benefits, such as increased financial inclusion, enhanced security, and improved efficiency. However, the sector still faces challenges, and continuous efforts are required to address them and further promote the adoption of digital payment systems in the country.

2 Methodology

This research paper employs a quantitative approach to study the trends of payment systems in the Indian banking sector over the past ten years, from 20159-2016 to 2023-2024.

The study utilizes secondary data sources, including annual reports, industry reports, and academic publications, to gather information on the following key aspects:

Trends in the adoption and usage of digital payment channels (such as mobile banking, internet banking, UPI, IMPS, NEFT, etc.) by the customers.

The study will also incorporate relevant data and statistics from the sources provided to support the findings and conclusions.

3 Objectives

- To list the various payments systems available in the Indian Banking sector, including their key features, adoption trends, and usage patterns.
- To analyse the trends and patterns in the adoption and usage of digital payment channels by customers in the Indian banking sector over the past ten years.
- To find the challenges in the usage of different payment systems

4 Payment Systems in the Indian Banking Sector

4.1 Historical Overview of Payment Systems in India

The Indian banking sector has witnessed a significant transformation in its payment systems over the past few decades. In the early years, cash and paper-based instruments, such as cheques and demand drafts, dominated the payment landscape. (Burragoni, 2017)

- In the 1980s, the introduction of credit cards marked a shift towards electronic payments, (Mohd. & Pal, 2020).
- The 1990s saw the emergence of debit cards, which enabled direct debits from customer bank accounts.
- The 2000s brought about a surge in internet banking and electronic funds transfer services, such as NEFT and RTGS, catering to the growing demand for faster and more efficient payment solutions.
- The landmark event in the evolution of India's payment systems was the launch of the Unified Payments Interface in 2016.

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4.2 The diverse range of payment systems, each with its unique features and use

1 RTGS

It means Real time Gross Settlement, which is a funds transfer system where the transfer of money takes place from one bank to another on a "real time" and on a "gross" basis. It takes place electronically and is used for high-value transactions.

2 Credit Transfers means electronic payments made from one bank account to another. it includes the following :

1. AEPS means Aadhaar Enabled Payment System, which allows users to carry out banking transactions using their Aadhaar number this was introduced in 2016.
2. APBS is Aadhaar Payment Bridge System, which facilitates the direct benefit transfers by the government. This makes use of Aadhaar as the key identifier for transferring benefits to beneficiaries' accounts. It requires to have a bank account linked with Aadhaar number. It was introduced in 2016.
3. ECS Cr stands for Electronic Clearing Service. It is a mode of electronic funds transfer from one bank account to another. it is used by institutions for making bulk transactions like payment of salary, dividends, pensions etc. ECS Cr was launched in 1994.
4. NACH stands for National Automated Clearing House, it facilitates bulk transactions like salary, dividends, loan repayments, insurance premium etc. It was launched in 2012 to consolidate multiple ECS systems.
5. IMPS means Immediate Payment Service, a 24X7 real-time interbank electronic funds transfer service through mobile phones.it was launched in 2010.
6. NEFT means National Electronic Funds Transfer. it is used for fund transfer up to Rs.2 lakh. It was launched in 2005.
7. UPI The Unified Payments Interface has emerged as the dominant digital payment platform in India, enabling real-time, interoperable, and seamless transactions between bank accounts and mobile wallets.

3 Debit transfers mean payments made from one bank account to another, including:

1. BHIM Aadhar Pay is a mobile payment service which uses Aadhaar as the identifier to facilitate digital payments, targeted at improving financial inclusion.
2. ECS is the Electronic Clearing Service, a mode of electronic funds transfer from one bank account to another.
3. NACH is the National Automated Clearing House, which facilitates bulk transactions such as salary, dividends, loan repayments, and insurance premium payments.
4. NECTC is the National Electronic Toll Collection, a program launched by the National Payments Corporation of India to enable toll payments on highways using electronic tags in 2014.

4 Card Payments are the payments that are made using debit or credit cards.

1. Credit Card was first introduced in India by Andhra Bank in 1981.it is used for cashless transactions, loan repayment etc.
2. Debit Card facilitates electronic transfer of funds directly from the customer's bank account to the merchant's account. it was introduced in India in the early 1990s.

5 Prepaid payment instruments are payment instruments that facilitate the purchase of goods and services against the value stored on such instruments. it includes Wallets, Digital payment apps like Google Pay, PhonePe etc

6 Paper based instruments are those which involve physical exchange of payment instruments, such as cheques, demand drafts, etc.

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These payment systems have played a crucial role in the transformation of the Indian banking sector, enabling seamless and secure transactions, improving financial inclusion, and driving innovation in the financial services industry. Overall, the Indian banking sector's payment systems have evolved significantly, leveraging digital technologies to enhance financial inclusion, efficiency, and security.

Table-1 Total payments and the Digital Payments in Value Rs

Year	Total Payments in ₹ Crores	Total Digital Payments in ₹ Crores	% of Total Payments
2015-16	10,02,24,409	9,20,38,330	91.83
2016-17	12,01,95,541	11,20,99,726	93.26
2017-18	14,51,71,804	13,69,78,311	94.36
2018-19	17,19,59,490	16,37,13,425	95.20
2019-20	16,97,93,503	16,19,68,681	95.39
2020-21	14,70,85,596	14,14,58,488	96.17
2021-22	18,10,51,565	17,44,01,233	96.33
2022-23	21,58,57,776	20,86,84,872	96.68
2023-24	25,00,36,131	24,28,23,799	97.12

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

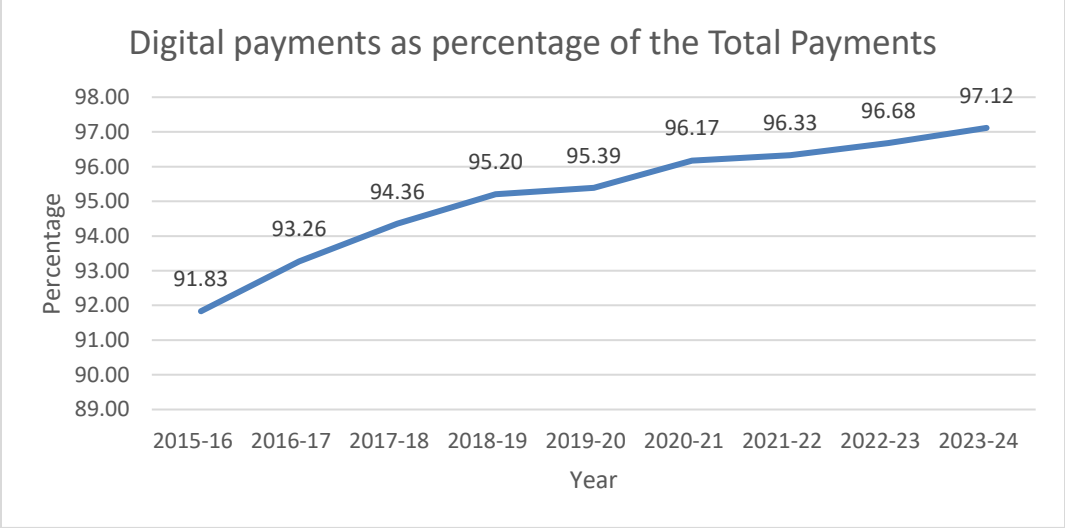

Figure-1 Graph showing the trend in usage of digital payments

This graph representation of Table -1 shows that how there is an increasing trend in the usage of the digital payments out of the total payments in the Indian Banking Sector.

5 Analysis and Findings

5.1 Overall Digital Payments in Volume and Value: (Table-2)

Digital payments in volume increased from 59,361 in 2015-16 to 16,44,302 in 2023-24, showing significant growth. Credit transfers are the largest portion of digital payment volume, with regular credit transfers growing explosively. Debit transfers and direct debits have consistent growth, indicating more use for recurring payments. Card payments showed fluctuating trends; growth initially but plateaued, due to alternative methods like UPI.

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• Prepaid payment instruments have steady but slower growth compared to credit transfers.

5.1.1 Potential Factors Driving Growth:

Government initiatives like demonetization and promotion of digital payments have driven growth. Advanced technologies like UPI, mobile wallets, and better internet access made digital payments easier. Tech- savvy consumers prefer digital payments for their convenience and speed. Growth in e- commerce boosted demand for digital payment options.

5.1.2 In the case of the Value of the Digital payments over the period we can see that :

Total digital payments increased from ₹9,20,38,330 crores in 2015• 16 to ₹24,28,23,799 crores in 2023• 24, indicating a shift to digital transactions. RTGS holds the largest share in total digital payments, showing its importance for high• value transactions. Credit transfers have significant growth but a smaller share than RTGS, driven by UPI's popularity. Debit transfers, card payments, and prepaid instruments showed smaller growth contributions.

5.2 The trend in Credit Transfers (Table 4)

UPI emerged as the dominant credit transfer method in volume and value, with remarkable growth. NEFT retains a significant share in value, relevant for certain transactions. Other methods like IMPS and ECS Cr contribute smaller roles but still show growth.

5.3 The trend in Debit Transfers (Table-5)

NACH Dr consistently dominates debit transfers in volume and value. Overall volume and value of debit transfers have increased, reflecting broader adoption.

5.4 The trend in Card payments (Table-6)

Card payments grew significantly from ₹3,99,588 crores in 2015• 16 to ₹24,23,563 crores in 2023• 24. Credit card payments have increased in value, while debit card values fluctuated. There is a notable difference between transaction volume and transaction value.

5.5 The trend in Prepaid Payment Instruments (Table-7)

PPI transactions grew significantly until 2019• 20, then volume increased slowly, and value slightly declined. The rise in PPI usage between 2016• 17 and 2017• 18 connected to demonetization impacts. According to the Integrated Annual Report 2023-24, India has seen a growing acceptance of digital payments, with the value of digital transactions increasing from ₹69.8 trillion in 2019-20 to ₹380.7 trillion in 2023-24 (2019).

5.6 Challenges and Opportunities in Indian Payment Systems

The Indian banking sector faces several challenges in its payment systems, including:

1. Cybersecurity threats and the need for robust fraud detection and prevention mechanisms.
2. Expanding digital infrastructure and ensuring universal access to digital payment services, particularly in rural and underserved areas.
3. Enhancing customer trust and adoption of digital payment solutions through effective financial literacy programs.

6 Conclusion

The research paper analyses trends in payment systems in the Indian banking sector over the past ten years. It finds a significant shift towards digital payment channels, driven by technology, regulations, and demand for convenience. Despite progress, challenges like cybersecurity, financial literacy, and new technologies remain. The study's 10-year limit suggests that additional analyses, such as correlations with external factors and visual data presentation, could enhance understanding of trends in card payments in India.

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7 Tables

(All the Volumes are in Lakhs and all the Values are in Crores, Rupees)

Table-2 Total Digital Payments (Volume in Lakhs)

Year	1. Large Value Credit Transfers - RTGS	2. Credit Transfers	3. Debit Transfers and Direct Debits	4. Card Payments	5. Prepaid Payment Instruments	Total Digital Payments (Volume)
	Volume	Volume	Volume	Volume	Volume	Total
2015-16	983	28,536	2,769	19,593	7,480	59,361
2016-17	1,079	38,381	2,952	34,864	19,637	96,912
2017-18	1,244	58,793	3,788	47,486	34,590	1,45,902
2018-19	1,366	1,18,481	4,914	61,769	46,072	2,32,602
2019-20	1,507	2,06,297	6,027	72,384	53,941	3,40,155
2020-21	1,592	3,17,868	10,457	57,787	49,366	4,37,068
2021-22	2,078	5,77,935	12,189	61,783	65,783	7,19,768
2022-23	2,426	9,83,621	15,343	63,325	74,667	11,39,382
2023-24	2,700	14,86,107	18,250	58,470	78,775	16,44,302

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

Table-3 Total Digital Payments Value in ₹ crores

Year	1. - RTGS	2. Credit Transfers	3. Debit Transfers	4. Card Payments	5. Prepaid Payment Instruments	Total in ₹ crores
2015-16	8,24,57,801	89,01,828	2,30,354	3,99,588	48,758	9,20,38,330
2016-17	9,81,90,376	1,28,58,406	3,08,855	6,58,289	83,801	11,20,99,726
2017-18	11,67,12,478	1,88,14,295	3,90,869	9,19,035	1,41,634	13,69,78,311
2018-19	13,56,88,187	2,60,90,471	5,24,556	11,96,888	2,13,323	16,37,13,425
2019-20	13,11,56,475	2,85,56,593	6,05,939	14,34,813	2,14,860	16,19,68,681
2020-21	10,55,99,849	3,35,04,226	8,65,520	12,91,799	1,97,095	14,14,58,488
2021-22	12,86,57,516	4,27,28,006	10,34,444	17,01,851	2,79,416	17,44,01,233
2022-23	14,99,46,286	5,50,09,620	12,89,611	21,52,245	2,87,111	20,86,84,872
2023-24	17,08,86,670	6,75,42,859	16,87,658	24,23,563	2,83,048	24,28,23,799

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

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Table-4 Credit Transfers and different systems.

Year	2. Credit Transfers		2.1 AePS (Fund Transfers)		2.2 APBS		2.3 ECS Cr		2.4 IMPS		2.5 NACH Cr		2.6 NEFT		2.7 UPI	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2015-16	28,536	89,01,828	-	-	7,175	18,598	390	1,05,944	2,208	1,62,226	6,234	2,87,751	12,529	83,27,311	-	-
2016-17	38,381	1,28,58,406	1	51	9,491	34,838	101	14,408	5,067	4,11,106	7,319	3,87,074	16,221	1,20,03,968	180	6,961
2017-18	58,793	1,88,14,295	6	300	12,980	55,948	61	11,864	10,098	8,92,497	7,031	5,21,001	19,464	1,72,22,852	9,152	1,09,832
2018-19	1,18,481	2,60,90,471	11	501	14,949	86,226	54	13,235	17,529	15,90,257	8,834	7,29,673	23,189	2,27,93,608	53,915	8,76,971
2019-20	2,06,297	2,85,56,593	10	469	16,747	99,048	18	5,146	25,792	23,37,541	11,100	10,37,079	27,445	2,29,45,580	1,25,186	21,31,730
2020-21	3,17,868	3,35,04,226	11	623	14,373	1,11,001	0	0	32,783	29,41,500	16,465	12,16,535	30,928	2,51,30,910	2,23,307	41,03,658
2021-22	5,77,935	4,27,28,006	10	575	12,573	1,33,345	0	0	46,625	41,71,037	18,758	12,81,685	40,407	2,87,25,463	4,59,561	84,15,900
2022-23	9,83,621	5,50,09,620	6	356	17,834	2,47,535	0	0	56,533	55,85,441	19,257	15,41,815	52,847	3,37,19,541	8,37,144	1,39,14,932
2023-24	14,86,107	6,75,42,859	4	261	25,888	3,90,743	0	0	60,053	64,95,652	16,227	15,25,104	72,640	3,91,36,014	13,11,295	1,99,95,086

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

Table-5 Debit transfers and different systems.

Year	3. Debit Transfers and Direct Debits		3.1 BHIM Aadhaar Pay		3.2 ECS Dr		3.3 NACH Dr		3.4 NETC (linked to bank account)	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
2015-16	2,769	2,30,354	-	-	2,248	1,65,150	521	65,204	-	-
2016-17	2,952	3,08,855	-	-	88	3,914	2,865	3,04,941	-	-
2017-18	3,788	3,90,869	20	78	15	972	3,738	3,89,781	15	39
2018-19	4,914	5,24,556	68	815	9	1,260	4,830	5,22,461	6	20
2019-20	6,027	6,05,939	91	1,303	1	39	5,842	6,04,397	93	200
2020-21	10,457	8,65,520	161	2,580	0	0	9,646	8,62,027	650	913
2021-22	12,189	10,34,444	228	6,113	0	0	10,755	10,26,641	1,207	1,689
2022-23	15,343	12,89,611	214	6,791	0	0	13,503	12,80,219	1,626	2,601
2023-24	18,250	16,87,658	194	6,112	0	0	16,426	16,78,769	1,629	2,777

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

Table-6 Card Payments

Year	4. Card Payments		4.1 Credit Cards		4.2 Debit Cards	
	Volume	Value	Volume	Value	Volume	Value
2015-16	19,593	3,99,588	7,857	2,40,662	11,736	1,58,927
2016-17	34,864	6,58,289	10,871	3,28,382	23,993	3,29,907
2017-18	47,486	9,19,035	14,052	4,58,965	33,434	4,60,070
2018-19	61,769	11,96,888	17,626	6,03,413	44,143	5,93,475
2019-20	72,384	14,34,813	21,773	7,30,894	50,611	7,03,920
2020-21	57,787	12,91,799	17,641	6,30,414	40,146	6,61,385
2021-22	61,783	17,01,851	22,399	9,71,638	39,384	7,30,213
2022-23	63,325	21,52,245	29,145	14,32,255	34,179	7,19,989
2023-24	58,470	24,23,563	35,610	18,31,134	22,860	5,92,429

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Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

Table-7 Prepaid Payment Instruments

Year	5. Prepaid Payment Instruments	
	Volume	Value
2015-16	7,480	48,758
2016-17	19,637	83,801
2017-18	34,590	1,41,634
2018-19	46,072	2,13,323
2019-20	53,941	2,14,860
2020-21	49,366	1,97,095
2021-22	65,783	2,79,416
2022-23	74,667	2,87,111
2023-24	78,775	2,83,048

Source: RBI Statistical data on Payments systems Indicator (2015-16 to 2023-24)

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