

Digital Evolution: The Role of AePS in Banking Service

Mr. Shashidhar Channappa Chatni

Research Scholar
Department of Studies in Commerce
Davangere University

Dr. Sharanraj

Assistant Professor
Department of Studies in Commerce
Davangere University

Abstract:

The Indian government, along with NPCI, has launched a digital payment interface as part of a digital economy project. NPCI has created a number of payment systems, including UPI, IMPS, NFS, NACH, and AePS. AePS is a modern payment system that NPCI launched in India in order to encourage banking transactions using the Aadhaar biometric identity system. This study focuses on analyzing the AePS system's conceptual overview, its development, and a comparison of a range of AePS transactions. The trend projection method and two sample T-tests are used to analyze descriptive statistics. According to this report, AePS will continue to grow, and the Off-us transaction is the most popular one within the AePS system.

Keywords: Digital payment, AePS(Aadhaar enabled Payment System), NPCI(National Payment Corporation of India), banking.

Date of Submission: 06-11-2022

Date of Acceptance: 20-11-2022

I. Introduction

India started its transformation towards a unified identity system for the citizens of the country under the governance of the Unique Identification Authority of India (UIDAI). The UID or Aadhaar provides a unique proof of identity to people which could be substantiated through authentication, anywhere, anytime to provide financial, other subsidies, and services wherever they are across the country. Aadhaar authentication is intended to make life easier for Indians since it is a practical way to authenticate one's identification without having to present identity verification documents whenever a person requests a service. The method of Aadhaar authentication involves providing the UIDAI (Central Identities Data Repository - CIDR) with the Aadhaar number and the Aadhaar holder's personal identifying data, such as biometric and demographic information, for matching. If the data match, the UIDAI confirms the Aadhaar number based on the match. Depending on the data available at the moment of authentication, UIDAI either confirms the identity evidence or checks the information provided by the resident.

To increase the financial inclusion in the system RBI has established two committees on micro-ATM and Central infrastructure connectivity for Aadhaar-based financial inclusion services. To increase the financial inclusion system the Government of India through NPCI has developed the Aadhaar enabled Payment system (AePS).

Objectives of the study:

- To know the conceptual overview of the AePS system.
- To forecast the future value of AePS transactions.
- To compare the various payments within AePS.

Need of the study:

Previous research concentrated on the design of digital payment systems and how they function. Additionally, the distinction between onus and offus transactions is a key focus of this paper's analysis of the current state and projected growth of the AePS (Aadhaar enabled Payment system). This study sheds insight into how the Indian banking industry achieves the goal of digital empowerment.

Research methodology:

The following methodology has been used to attain the aforementioned goals. A secondary source was used to gather the data for this research. The National Payment Corporation of India (NPCI), news stories, and a few reputable periodicals serve as the sole sources of secondary data for the current study.

II. Literature Review

Vishnoi. Y. C. (2021) According to the survey, it took just five years for India to exceed the United States in terms of real-time payment transactions. The UPI system in India allows for the reduction of black money, corruption, and the promotion of green transactions, and it deserves all the credit for this accomplishment.

Chaudhari. C., Kumar. A (2021) Covid-19 has a favourable effect on the electronic payment system, according to the report. However, in 2016 when the government implemented a demonetization plan, digital payments assumed a new face in the economy. However, following COVID-19, public awareness and usage of these payments significantly rose, leading to a 3% increase in total payments.

Baghla. A. (2018) India is making faster progress toward a cashless society, but it will take a long time for that to happen completely. As an addition to the digital payment system, commercial institutions are introducing e-wallet apps like Paytm, Phonepe, etc. through government initiatives. However, there is still a significant obstacle for the government, namely, a lack of public awareness regarding digital payments. In order to advance the digital economy, the government must take action to inform the populace about the digital payment system.

Satish Kumar, Sudheer (2018) Government of India has taken steps to develop the nation's digital economy, and as a result, NPCI has created the digital payment interface for online fund transfers like UPI, IMPS, etc. Although UPI has experienced faster growth in the payment system, further development of the digital payment system is still required.

Ahmad. S. Bano. M (2018) The secure biometric online transaction mechanism is AePS. However, non-financial AePS transactions, such as balance enquiries and KYC updates, are on the rise, and the majority of AePS transactions are made by rural residents.

Joshi. M. C. (2017) Throughout the past three years, individuals have gradually adapted to the digital world thanks to government attempts to improve digital payment in the nation. However, in the years following demonetization, people's attitudes regarding digital payments changed, and other payment methods including as NACH, IMPS, UPI, and BHIM(UPI) replaced digital payments. As a result, there is a potential that the country's digital economy may expand in the future.

Aadhaar Enabled Payment System (AePS)

AePS is a bank-led model which allows online transactions at micro-ATM, and mobile devices through the authorized business Correspondent of any bank using Aadhaar authentication. Any resident Indian having an Aadhaar-enabled bank account can avail of the AePS facility.

The NPCI's, AePS solution can be accessed at any biometric-enabled touch-point via Micro ATMs, which may be all-in-one integrated devices, or mobiles /PCs/tablets, with accessories that meet technical specifications defined by UIDAI. AePS also enables Aadhaar seeding status checks for Direct Benefit Transfer beneficiaries to receive DBT, Social Security Pension, or government subsidies.

Table 1 - Member banks

Banks	On-us Approved Banks	Off-us Approved Banks	Total member Banks
Commercial Banks	32	32	38
Regional Rural Banks	42	42	43
Co-operative banks	28	15	41
Small Finance Banks	09	11	13
Non-Banks	-	-	03
Total			138

Source: NPCI

The information about the banks that offer their clients the AePS system is displayed in the table above. There are a total of 41 co-operatives, 13 small finance banks, and 3 non-banks that are members of the AePS system in the nation. There are a total of 38 commercial and 43 regional rural banks that are the main AePS service providers in the nation.

Table 2- AePS Transaction in the year 2021-22

Month	Transaction volume (In Mn)	Transaction Value (in Bn.)
Apr-21	276.95	221.390
May-21	292.93	246.192
Jun-21	333.49	246.670
Jul-21	344.76	234.471

Aug-21	400.7	273.538
Sep-21	344.21	232.909
Oct-21	359.37	254.075
Nov-21	359.06	256.830
Dec-21	377.53	258.55
Jan-22	445.09	293.384
Feb-22	371.88	255.085
Mar-22	408.06	291.541

Source: NPCI

The total amount exchanged through these transactions is detailed in Table 2 along with the total number of transactions approved in a year. The overall amount of AePS fund transactions was 221.390 billion in April 2021 compared to 276.95 million total transactions, and 273.538 billion in August 2021 compared to 400.7 million total transactions. Immediately after that month, that is, until December 2021, the fund amount gradually increased. In January 2022, it grew to a maximum of 293.384 billion, which was more than the financial year's greatest transaction volume of 445.09, for the months that followed.

Table 3- Trend projection

$Y_n = a + bx_n$			
Y - Predicted Trend value		x - time	
a - Y-intercept value		n - period	
b - Slope of the trend line			
a=226.312	b=4.473	n=Apr-22 May-22 Jun-22	X=Apr-13 May-14 Jun-15
Apr-22= 226.312+4.473(13) =284.46 May-22= 226.312+4.473(14) =288.93 Jun-22= 226.312+4.473(15) =293.40			

The projected forecasted transaction amount for the next three months, April, May, and June 2022, is shown in table 3 above. Using the numbers from table 1, the values are generated using the trend projection method. Where a stands for the intercept value, b for the slope of the trend line, n for the period, and Y for the expected trend value, which are respectively, 284.46, 288.93, and 293.40.

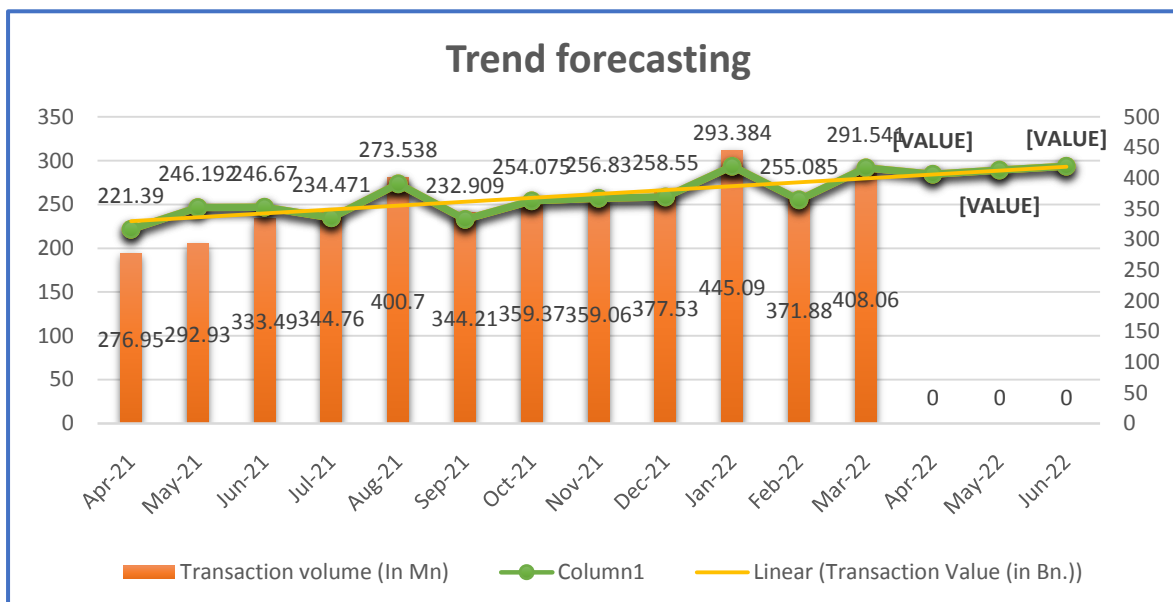


Diagram 1- Trend forecasting

The AePS system's overall approval totals and future anticipated values are shown in diagram 1 above. The total amount approved as of April 21 is 221.39 billion, and it gradually increased until August 21 when it reached 273.538 billion. After that, it gradually varied until December 21 and January 22, when it reached 293.384 billion, the maximum amount circulated through the AePS system for the year. Continuous variation in

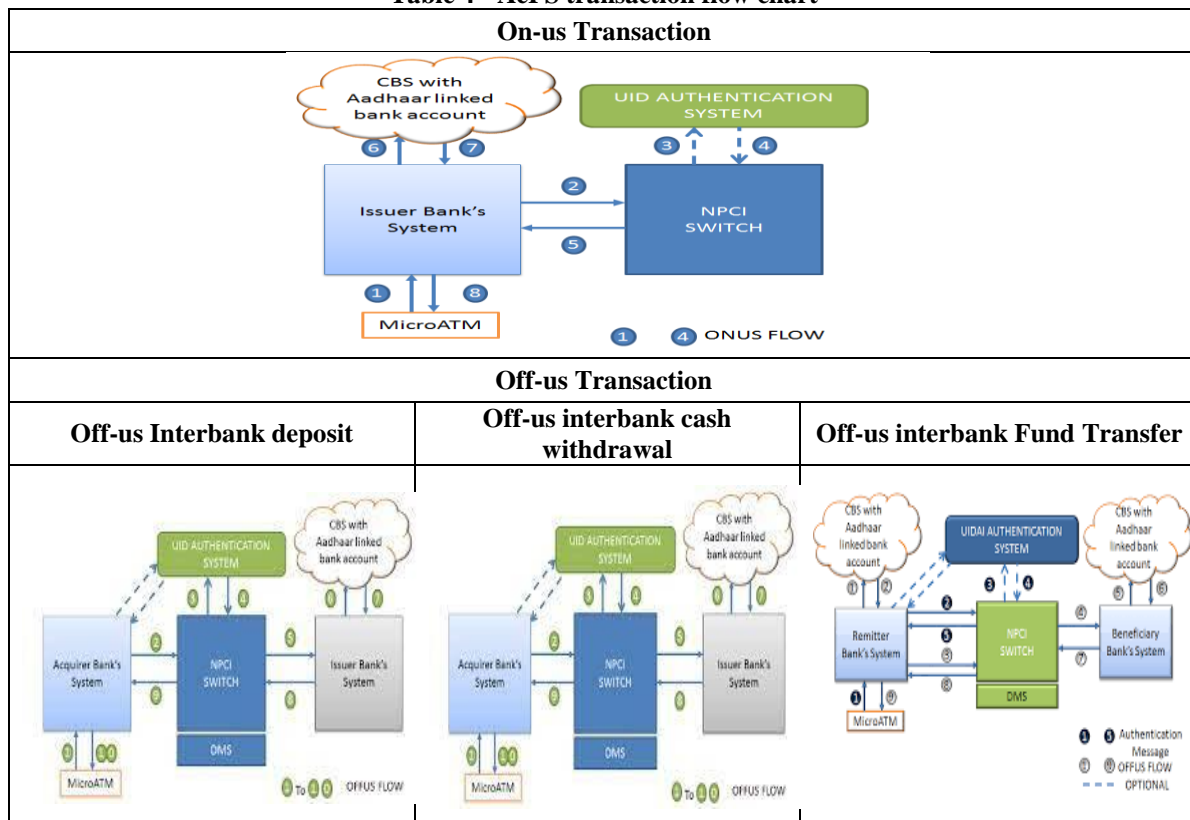
the immediately preceding. With the help of this data and the trend projection approach, it was determined that the values for the three months of April, May, and June 2022 are 284.461, 288.93, and 293.407, respectively. This demonstrates that Aadhaar-enabled Payment Systems in India will continue to grow.

AePS transaction system

AePS primarily concentrates on the On-us and Off-us transaction interfaces. An on-us system is created at the same bank or credit union where it is also deposited and cashed. A check that is deposited or cashed at the same banking institution from which it was issued is known as an "On-Us" check.

The interface for transactions between two independent banking institutions is called off-us. In other words, the customer issuing bank and the merchant acquiring bank are distinct entities. This transaction type is also known as an Off-us transaction in the payments industry.

Table 4 - AePS transaction flow chart



Source: NPCI

AePS functional procedure

❖ **On-us transaction**

The acquiring bank, which is also the issuing bank, has the ability to fully process ON-US transactions. Banks may use their authentication for ON-US transactions if they have access to biometrics, or they may fall back on Aadhaar authentication.

❖ **Off-us transaction**

Withdrawal

1. Operator enters customer BIN+Aadhaar number and transaction amount. (MicroATM may allow customer Aadhaar numbers to be automatically read from a card via a device such as a card reader or barcode scanner but the manual entry of customerBIN+Aadhaar numbers by the operator must also be supported.)
2. Device displays transaction details and prompts for confirmation.
3. Customer indicates confirmation by supplying biometric authentication by default, or other methods such as OTP as a fallback.
4. Success or failure of the transaction is displayed on the micro-ATM screen. (Device may also notify operator and customer of the success or failure of transaction through other methods such as voice message or SMS but display and the paper receipt are required).
5. If a transaction has been successfully processed, the operator dispenses cash.
6. Customer's account is debited, and the operator's account is credited.

7. Receipt is printed and handed over to the customer.

Deposit

1. Customer hands over cash to operator.
2. Operator enters customer BIN+Aadhaar number and transaction amount. (MicroATM may allow customer BIN+Aadhaar number to be automatically read from a card via a device such as a card reader or barcode scanner but the manual entry of customer Aadhaar number by the operator must also be supported.)
3. Device displays transaction details and prompts for confirmation.
4. Customer indicates confirmation by supplying biometric authentication by default, or other methods such as OTP as a fallback.
5. Success or failure of the transaction is displayed on the micro atm screen. (Device may also notify operator and customer of the success or failure of transaction through other methods such as voice message or SMS).
6. In case of rejection, the operator returns cash to the customer.
7. In case of success, a customer account is credited, and the operator's account is debited.
8. Receipt is printed and handed over to the customer

Funds transfer

1. Operator enters customer BIN+Aadhaar number, recipient identifier (BIN+Aadhaar number, IFSC+Account number, or BIN+mobile number), and transaction amount. (MicroATM may allow customer BIN+Aadhaar number to be automatically read from a card via a device such as a card reader or barcode scanner but the manual entry of the customer's Aadhaar number by the operator must also be supported.)
2. Device displays transaction details and prompts for confirmation.
3. Customer indicates confirmation by supplying biometric authentication by default, or other methods such as OTP as a fallback.
4. Success or failure of the transaction is displayed on the micro-ATM screen. (Device may also notify operator, customer, and recipient of the success or failure of transaction through other methods such as voice message or SMS).
5. In case of success, the customer account is debited, the operator account is credited with the commission, and the recipient account is credited with the rest of the amount.
6. Receipt is printed and handed over to the customer.

Table 5 - AePS On-us and Off-us Transaction

Month Wise	Off-us Transaction (In Mn)	On-us Transaction (In Mn)
Apr-21	141.59	133.97
May-21	166.56	124.63
Jun-21	177.00	154.73
Jul-21	178.84	164.17
Aug-21	215.49	183.02
Sep-21	176.47	165.81
Oct-21	194.66	162.56
Nov-21	196.02	161.06
Dec-21	207.76	167.81
Jan-22	255.75	186.89
Feb-22	206.67	163.69
Mar-22	225.33	180.78

Source: NPCI

The above-5 table lists the AePS-related Off-us and On-us transactions for the period 2021–2022. Up until the month of August 21 (when the off-us transaction was 215.49 million and the on-us transaction was 183.02 million), there were 141.59 million total off-us transactions compared to 133.97 million total on-us transactions. Following that, both transactions experience ongoing variation.

Due to the fact that semi-urban or rural residents use the AePS system. It is impossible to determine which AePS transaction system is used the most from the aforementioned statistics. To find a significant result, two-sample t-test statistics were utilized.

H₀: There is no significant difference between the variable in terms of the transaction.

H₁: There is a significant difference between the variable in terms of the transaction.

Table 6 - Descriptive Statistics

Offus Transaction (In Mn)	Value	Onus Transaction (In Mn)	Value
Mean	195.1783	Mean	162.4266
Median	195.34	Median	163.93
Standard Deviation	30.0303	Standard Deviation	18.3499
Sample Variance	901.8236	Sample Variance	336.7219
Range	114.16	Range	62.26
Minimum	141.59	Minimum	124.63
Maximum	255.75	Maximum	186.89
Sum	2342.14	Sum	1949.12
Count	12	Count	12

Table 6 provides descriptive statistics for information pertaining to Off-us and On-us AePS transactions over the course of the previous year, from April 21 to March 22. Because customers used AePS transactions during the period, the mean of both off-us and on-us are 195.178 and 162.42 million, respectively, indicating there has been more rapid growth than the initial value of 141.59 and 133.97 million. The sum of both transaction values during the past year is 2342.14 and 1949.12, respectively, demonstrating the mediums' notable resemblance.

Table 7 - T-test analysis

Particular	Offus Transaction	Onus Transaction
Mean	195.1783333	162.4266667
Variance	901.8236879	336.7219515
Observations	12	12
Pooled Variance	619.2728197	
Df	22	
t Stat	3.223799481	
P(T<=t) one-tail	0.001953292	
t Critical one-tail	1.717144374	
P(T<=t) two-tail	0.003906583	
t Critical two-tail	2.073873068	

The table-7 shows the details of the analysis of the T-test statistics. From the table two sample mean and variances are 195.178(901.823) and 162.42(336.72) respectively. The two-tailed calculated t-Statistic is 3.223 and the p-value for this test is 0.0039. Since the p-value is less than 0.05 confidence level, this provides evidence to reject the null hypothesis i.e., There is a significant difference between the Off-us and On-us transaction volume.

III. Conclusion:

A country's economy is better positioned when it embraces adaptive changes such as financial transformation, digital innovation, and improved banking systems. To bring changes in the digital banking system and boost the digital economy of the Indian government, RBI has implemented many digital payment systems like UPI, IMPS, NFS, etc. in collaboration with NPCI (National Payments of India) in recent years. NPCI has launched a new Payment System called AePS (Aadhaar Enabled Payment System) to help semi-urban and urban people opt for banking services more easily through Aadhaar identity.

AePS offers services like balance inquiries, interbank deposits, KYC updates, and fund transfers. On-us and Off-us transactions are the two different types of transaction systems that AePS offers. From the above t-test analysis, it says that the majority of customer who opts for the AePS is for the Off-us transaction for the purpose of interbank fund transfer, cash withdrawal and deposit.

Reference:

- [1]. Vishnoi. Y. C. (2021), Critical Study of Unified Payment Interface (UPI): E-Payment Mode of Digital Revolution, Academic Social Research, ISSN No.:2456-2645, Vol.-7No.-4 (2021): October to December.
- [2]. Chaudhari. C., Kumar. A (2021), Vidyabharati International Interdisciplinary Research Journal,ISSN 2319-4979, volume 12(2)-page no. 99-102.
- [3]. Baghla. A. (2018), A Study on The Future of Digital Payments In India, IJRAR- International Journal of Research and Analytical Reviews, e ISSN 2348 –1269, Print ISSN 2349-5138, VOLUME 5, ISSUE 4, OCT. – DEC. 2018.
- [4]. Satish Kumar, Sudheer (2018), A Study on Growth of UPI(Unified Payment Interface) In Digital Empowerment, Asm’s International E-Journal on Ongoing Research in Management &IT, E-ISSN: 2320-0065.
- [5]. Ahmad. S. Bano. M (2018), Role of Aadhaar Enabled Payments System (Aeps) In Retail Payments, International Journal of Research in Management & Social Science Volume 6, Issue 1 (IX): January - March 2018 Part – 2.
- [6]. Joshi. M. C. (2017) Digital Payment System: A Feat Forward of India, Research Dimension ISSN: 2249-3867, <https://ssrn.com/abstract=3043609>.
- [7]. <https://www.npci.org.in/>
- [8]. <https://rbi.org.in/scripts/NEFTView.aspx>

Mr. Shashidhar Channappa Chatni, et. al. “Digital Evolution: The Role of AEPS in Banking Service.” *IOSR Journal of Business and Management (IOSR-JBM)*, 24(11), 2022, pp. 01-07.