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Unified Payment Interface & Cashless Economy: Imperatives For An Emerging & Developing Economy

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Abstract-

The emergence of the Unified Payment Interface (UPI) has transformed the financial environment, particularly in emerging and developing economies. This article examines the necessities and transformational capabilities of UPI in promoting a cashless economy. UPI, a real-time payment system created by the National Payments Corporation of India (NPCI), enables immediate financial transfers between bank accounts using mobile devices. Its simplicity, interoperability, and security attributes have facilitated extensive acceptance, establishing it as a fundamental component of the digital financial ecosystem. The research examines the principal factors and advantages of a cashless economy, such as heightened financial inclusion, greater transaction efficiency, diminished corruption, and enhanced tax compliance. This article analyzes the influence of UPI on these aspects, demonstrating how digital payment systems can drive economic growth and development in emerging nations. The article examines the obstacles to the extensive adoption of UPI and cashless transactions, including digital literacy, internet access, and cybersecurity issues. By adopting digital payment technology, emerging economies can facilitate a more inclusive, efficient, and transparent financial system, hence advancing their sustainable development.

Keywords: *Unified Payment Interface, Cashless Economy, Financial Inclusion, Digital Payments, Emerging Economies, Economic Growth, Digital Literacy etc.*

1. INTRODUCTION

The Unified Payment Interface (UPI) is a real-time payment system enabling customers to promptly move funds between bank accounts via their smartphones. In the contemporary digital era, UPI is crucial in advancing a cashless economy by offering a secure and convenient method for users to conduct transactions without real currency. The transition to a cashless economy diminishes dependence on paper currency and enhances transaction tracking, resulting in a more transparent financial system. The extensive adoption of UPI has facilitated financial

inclusion by granting accessible banking services to people lacking traditional bank accounts. This has facilitated the connection between the banked and unbanked populations, creating opportunities for individuals formerly marginalized by the official financial system. UPI has transformed financial transactions, fostering a more efficient, transparent, and inclusive economy.

The implementation of UPI has not only enhanced financial inclusion but has also positively influenced businesses, especially small and medium enterprises (SMEs). UPI has facilitated the expansion of SMEs' client bases and market reach by offering a seamless and economical payment alternative. This has resulted in heightened economic growth and job creation, further propelling economic development. Furthermore, the simplicity and security provided by UPI have enhanced customer confidence in digital transactions, resulting in a transition from cash-based transactions. Consequently, the economy has grown more robust and less susceptible to foreign disruptions. The extensive implementation of UPI has enabled SMEs to optimize their operations and enhance productivity, resulting in greater profitability. Enhanced and secure payment alternatives enable organizations to decrease transaction expenses and mitigate fraud risk. This has enhanced both individual enterprises and the general competitiveness of the economy. As an increasing number of enterprises use digital payments via UPI, the economy is set to maintain its upward momentum, fostering a sustainable climate for growth and innovation. A small manufacturing firm in India has streamlined its cash flow management by utilizing UPI for receiving client payments and disbursing payments to suppliers. This has enabled the organization to conserve time and resources that would have previously been allocated to manual processes and documentation. Consequently, the company has experienced a rise in profits, enabling it to reinvest in its operations, which has fostered additional growth and expansion. Furthermore, by employing UPI, the organization has enhanced transparency and efficiency in its financial transactions, hence diminishing the chance of errors and fraud. This has bolstered confidence and

credibility with both clients and suppliers, ultimately enhancing the company's reputation and long-term performance in the market.

2. CASHLESS PAYMENT SYSTEM

Cashless payments are a method by which products and services can be acquired and utilized without the presence of physical currency. Various strategies driven by digital information technology have supplanted cash. They can facilitate the movement of funds from one individual bank account to another. These are termed "systems" due to their distinct traits, characteristics, and approaches that operate in conjunction with other devices. Since the inception of universal payments, concerns regarding safety and reliability have emerged. All forms of payment, including barter, have always been susceptible to fraud. In a cashless society, transactions occur in an electronic format of monetary exchange. This ensures safety and security for all users. Traders sell the product to customers, who pay the price efficiently and securely through cashless transactions.

A study by the Boston Consulting Group indicated that global payments are evolving rapidly. In the past twelve to eighteen months, there has been heightened activity marked by four notable alterations in the global scene. The ongoing digital and technological change, driven by the rising use of smartphones and mobile internet, has transformed digital payments. Secondly, numerous non-bank entities providing payment services and solutions have penetrated the payment sector. Thirdly, consumers exhibit significant impatience and anticipate immediate, one-touch payment options. Ultimately, substantial modifications were implemented in the regulatory structure. The payment landscape in India has mirrored these changes in recent years, with digital payments experiencing significant growth. A 2016 study by Shah et al. indicates a significant rise in mobile internet usage. The number of people utilizing mobile internet services is projected to attain 3 billion by 2020, representing 65 percent of the global adult population, in contrast to approximately 1.9 billion in 2015.

Effortless and secure monetary transfers are essential for ensuring efficiency and fostering trust in financial operations. The Unified Payments Interface (UPI), launched by the National Payments Corporation of India (NPCI) in April 2016, has transformed payment processes, offering a rapid, secure, and dependable platform for both businesses and people. UPI enables businesses to send cash directly from their bank accounts to recipients without requiring extensive account information, such as account numbers or IFSC codes. Only a mobile phone and a UPI ID are necessary, streamlining the procedure for both the sender and the recipient. The user-friendliness of UPI has rendered it an indispensable instrument for various transactions, including vendor payments, supplier invoice settlements, and online payments for goods and services.

UPI provides B2B clients, encompassing startups, SMEs, and major corporations, with the benefit of real-time payments, facilitating improved cash flow management and diminishing dependence on tedious old payment systems. UPI's safe design and instantaneous transfer capabilities allow organizations to optimize their financial operations and enhance overall productivity. The Unified Payments Interface (UPI) is a real-time payment system enabling instantaneous money transfers between bank accounts via a smartphone. Created by the National Payments Corporation

of India (NPCI), UPI facilitates the transfer of funds without the necessity for conventional banking information such as account numbers or IFSC codes. The primary characteristic of UPI is its continuous operation, 24/7, including holidays, facilitating instantaneous monetary transfers at any time. Users can generate a distinct UPI ID by associating their bank account with a UPI-enabled application. This UPI ID serves as a virtual payment identifier.

How a Unified Payments Interface (UPI) Works?

The Unified Payments Interface (UPI) facilitates instantaneous money transfers between bank accounts via a straightforward and safe mechanism. It consolidates many bank accounts into a single UPI-enabled application, facilitating effortless fund transfers for both consumers and merchants. UPI operates through two primary mechanisms: PUSH (for transmitting funds) and PULL (for receiving funds).

UPI Transaction Process

- PUSH Transactions are initiated by the sender for payments such as bills, purchases, or personal transfers.
- PULL Transactions are initiated by the recipient to request money, commonly used by businesses or for bill collection.

1. PUSH Transactions: Transferring Funds

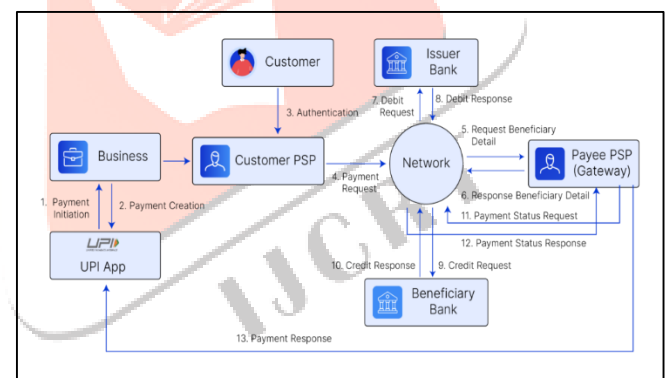


Fig 1: UPI Send Money Flow

Source: <https://www.instantpay.in/blog/2024/09/26/what-is-upi/>

To Commence a PUSH Transaction

- The user launches a UPI-enabled application and chooses the Pay or Send option.
- The sender enters the recipient's UPI ID, mobile number, or scans a QR code.
- The sender designates the bank account from which the payments will be withdrawn.
- The sender inputs the amount and an optional message.
- The sender subsequently inputs their UPI PIN to authenticate the payment.

Flow of Transactions

- Upon the sender's authorization of the payment using the UPI PIN, the UPI application transmits

the request to the sender's Payment Service Provider (PSP).

- The PSP transmits the payment request to the National Payments Corporation of India (NPCI), which serves as a clearinghouse for all UPI transactions.
- The NPCI authenticates the transaction data, while the sender's bank (issuing bank) assesses the availability of funds, thereby verifying the transaction through security and authentication measures.
- Upon verification of the transaction, monies are withdrawn from the sender's account and transferred to the recipient's acquiring bank.
- A successful message containing a unique Transaction Reference ID is produced to verify completion.

2. PULL Transactions: Receiving Money

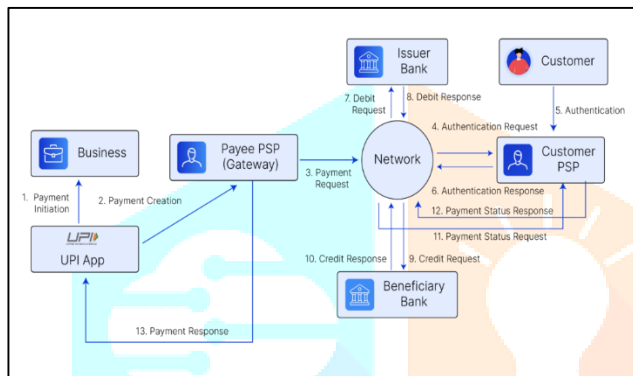


Fig 2: UPI Collection Flow

Source: <https://www.instantpay.in/blog/2024/09/26/what-is-upi/>

In PULL transactions, the recipient initiates a payment request:

- The recipient logs into their UPI-enabled app and selects the Collect or Request Money option.
- They enter the payer's UPI ID and the amount to be requested.
- The recipient selects the bank account where the funds should be credited.

Transaction Flow

- The UPI app sends the payment request to the recipient's PSP, which forwards it to NPCI.
- NPCI routes the request to the payer's bank (debtor's bank) via the payer's PSP.
- The bank checks for account balance, security verification, and authorizes the payment once the payer confirms the transaction by entering their UPI PIN.
- The payer's bank transfers the requested amount to the recipient's bank (creditor's bank).

3. STATEMENT OF PROBLEM

The Indian Government is actively promoting the reduction of cash usage and the adoption of technology since the implementation of demonetization. Regardless of this, there appears to be a significant lack of growth levels following the ignition stage. India predominantly relies on cash for its transactions, only few of all payments being conducted electronically. Cash is the predominant form of currency in the economy, surpassing all other payment methods, and is closely associated with a significant amount of criminal activity involving cash. Indians have a strong inclination towards using cash as a primary form of payment. Despite the existence of debit cards and credit cards prior to the demonetization initiative, cash remained the dominant form of payment in the market. If given the opportunity, cash was the preferred choice for settling any payments. Our country still has a significant distance to go in achieving widespread adoption of cashless transactions. An in-depth analysis of customer loyalty towards cash as a payment method needs to be conducted to address the pressing issue of money usage. Some of the obstacles to achieving financial inclusion in India include expensive banking services, lack of financial knowledge, and burdensome regulatory and compliance demands. The payments sector is hindered in achieving widespread adoption of cashless payments due to the absence of effective help centres for resolving online payment issues, addressing consumer complaints, and providing customer assistance. An in-depth analysis is required to comprehend the factors that motivate customers to use cash and the barriers that prevent them from consistently using cashless payment methods. Hence, the main statement of problem is "UNIFIED PAYMENT INTERFACE & CASHLESS ECONOMY: IMPERATIVES FOR AN EMERGING & DEVELOPING ECONOMY". Hence, the main objective of this work is to find out the factors affecting the promotion of UPI and cashless transactions

4. RESEARCH METHODOLOGY

The current study's research design is exploratory and descriptive. For this research, the survey approach is used to obtain respondents' data. In the light of the purposes of research, this proposed study is mainly of applied nature as the researcher tried to study the different ways of getting success through technical analysis.

Nature of Study: The research is descriptive, exploratory, analytical and comparative in nature because the study necessitates in-depth understanding and data analysis.

Target Respondents: 400 respondents were taken from various age groups, communities and different localities who are using UPI methods for any payments. Table 1 shows the sampling of districts.

Table 1: Sampling of Districts

SN	District	NFS Volume (in mn)	Literacy Rate (%)	Number of Respondents
1	Gurugram	2.16	84.70	80
2	Karnal	0.39	74.73	80
3	Ambala	0.45	81.75	80
4	Faridabad	1.31	81.70	80
5	Sonipat	0.44	79.12	80

Source: NPCI Statistics 2024

The sample size required for this study was concentrated for UPI users of selected divisions of Haryana state, with 400 people of various age groups and covered Gurugram, Faridabad, Karnal, Ambala and Sonipat based on NPCI network file system (NFS) data with usage of ATM and cashless transaction and literacy rate. Table 2 shows the reliability analysis based on fields below:

Table 2: Reliability Analysis

Structure	Statements	Reliability (Alpha Value)
To understand cashless payment systems usage among the consumers and find the influence of demographic factors on use of UPI and cashless payments	17	0.743
To find out the factors affecting the promotion of UPI and cashless transactions	9	0.751
To analyse the role of Cashless transactions and use of UPI in economic development	14	0.766
Overall	40	0.711

(Source: SPSS Tool)

Statistical Tool: Exploratory Factor Analysis (EFA) using KMO

Exploratory Factor Analysis (EFA) is a statistical method employed to uncover latent correlations among observed data. It aids in comprehending the configuration of a collection of variables by identifying the fundamental components. The Kaiser-Meyer-Olkin (KMO) statistics evaluate the suitability of data for factor analysis.

5. DATA ANALYSIS

Exploratory Factor Analysis (EFA) is a statistical method employed to uncover latent correlations among observed data. It aids in comprehending the configuration of a variable set by identifying the fundamental components. The Kaiser-Meyer-Olkin (KMO) statistics evaluate the suitability of data for factor analysis. EFA is used to uncover the underlying structure of a relatively large set of variables. It helps in identifying latent constructs by grouping variables that are correlated with each other. The KMO statistic measures the proportion of variance among variables that might be common variance. It ranges from 0 to 1. Its KMO value is 0.740 which is middling or

acceptable in nature. Table 3 shows the KMO analysis below:

Table 3: KMO Analysis

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.740
Bartlett's Test of Sphericity	Approx. Chi-Square	3409.872
	df	300
	Sig.	.000
Communalities		
	Initial	Extraction
obj2 factors affecting the promotion of UPI and cashless transactions: Design Simplicity	1.000	.078
Smoother Integration	1.000	.288
"Service" as a Customer Acquisition Strategy	1.000	.738
Useful Product Development	1.000	.654
Strong Regulator Backing	1.000	.722
Supporting Bank Policies	1.000	.642
KYC Compliance Support	1.000	.514
Easily transaction history and Patterns	1.000	.681
Ease of Use	1.000	.409
Consumer awareness	1.000	.542
Consumer trust	1.000	.519
Perceived risk	1.000	.701
quite convenient	1.000	.342
Efficiency	1.000	.384
Absence of processing fees	1.000	.592
get a lot of benefits with cashless transactions	1.000	.625
Privacy	1.000	.493
Individual Attitude	1.000	.586
Novel technologies	1.000	.353
Comfort and willingness	1.000	.575
gained popularity after demonetization in India	1.000	.586

help in keeping a track of the expenditure	1.000	.470
Education and awareness campaigns	1.000	.657
Incentives and rewards for using UPI	1.000	.677
Collaboration with retailers and businesses to accept digital payments	1.000	.329
Extraction Method: Principal Component Analysis.		

Source: Primary Data

The table demonstrates that almost all the statements' extraction values are equal to or higher than the table's 0.4 minimum threshold value. The Eigen value, which shows how many factors were extracted and whose sum should be equal to how many items were submitted to factor analysis, is shown in the following table. Its KMO value is 0.740 which is acceptable. It extracted total 05 factors after analysis. Table 4 shows the eigen values below:

Table 4: Eigen Values

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.399	17.594	17.594	4.399	17.594	17.594
2	3.285	13.140	30.735	3.285	13.140	30.735
3	2.404	9.617	40.351	2.404	9.617	40.351
4	1.690	6.760	47.112	1.690	6.760	47.112
5	1.379	5.516	52.627	1.379	5.516	52.627
6	1.193	4.772	57.399			
7	1.125	4.502	61.901			
8	1.023	4.093	65.993			
9	.899	3.597	69.590			
10	.819	3.277	72.867			

11	.789	3.156	76.023			
12	.666	2.665	78.688			
13	.664	2.655	81.343			
14	.565	2.259	83.602			
15	.547	2.189	85.791			
16	.497	1.987	87.778			
17	.467	1.868	89.646			
18	.436	1.744	91.389			
19	.419	1.674	93.064			
20	.388	1.553	94.616			
21	.355	1.420	96.036			
22	.319	1.276	97.312			
23	.306	1.226	98.538			
24	.226	.903	99.440			
25	.140	.560	100.000			
Extraction Method: Principal Component Analysis.						

Source: Primary Data

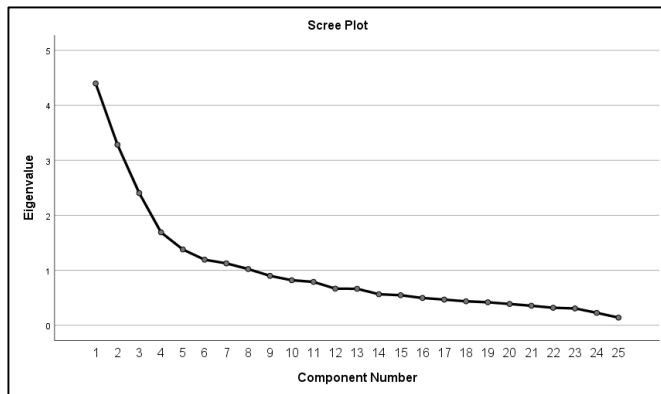


Fig 3: Scree Plot

A scree plot in Exploratory Factor Analysis (EFA) visually depicts the eigenvalues from a factor analysis, with the x-axis representing the factor number and the y-axis illustrating the variance explained by each factor. It assists researchers in determining the optimal number of factors to retain by pinpointing the juncture where the curve notably flattens, commonly termed the "elbow," signifying that the inclusion of additional factors would not substantially enhance the explanation of variance in the data.

Table 5: Factor Loading Matrix

Factor	Statements	Factor Loading Value
Technology & Benefits	get a lot of benefits with cashless transactions	0.596
	Privacy	0.472
	Individual Attitude	0.534
	Novel technologies	0.472
	Comfort and willingness	0.453
	gained popularity after demonetization in India	0.705
	help in keeping a track of the expenditure	0.603
	Education and awareness campaigns	0.513
	Incentives and rewards for using UPI	0.699
Policies & Compliance	Smoother Integration	0.402
	"Service" as a Customer Acquisition Strategy	0.753
	Useful Product Development	0.744

	Strong Regulator Backing	0.742
	Supporting Bank Policies	0.735
	KYC Compliance Support	0.537
Ease of Use	Easily transaction history and Patterns	0.624
	Ease of Use	0.533
Risk & Trust	Consumer awareness	0.518
	Consumer trust	0.503
	Perceived risk	0.519
Efficiency	Efficiency	0.49
	Absence of processing fees	0.58

Source: Primary Data

The output's commonalities table shows how much of the variation, or the communality value, should be more than 0.5 to be taken into consideration for additional study. For instance, the highest extraction value accounts for approximately 98% of the variance in "like inexpensive automobiles exclusively & prefer consistent quality of goods". Numerous statistics exist, including the Kaise-Meyer-Olkin measure of sample adequacy (KMO). The KMO statistics can be calculated for a single variable or for several variables. The KMO statistics have a value between 0 and 1. Typically, KMO values which is greater than 0.5 are regarded as acceptable. Additionally, it is important because its P-value is less than 0.05. The table makes it evident that KMO's value is 0.740, which is higher than its threshold limit of 0.5 and significant value 0.00, which is lower than 0.05. Therefore, the data was appropriate for the data reduction process. After analysis, only 5 factors are extracted based on their Eigen values.

Factor 1: Technology & Benefits: This factor is made from the 09 statements with highest factor loading value 0.70 for gained popularity after demonetization in India.

Factor 2: Policies & Compliance: This factor is made from the 06 statements with highest factor loading value 0.753 for "Service" as a Customer Acquisition Strategy.

Factor 3: Ease of Use: This factor is made from the 02 statements with highest factor loading value 0.624 for statement Easily transaction history and Patterns

Factor 4: Risk & Trust: This factor is made from the 03 statements with the highest factor loading value 0.513 for Perceived risk.

Factor 5: Efficiency: This factor is made from the 02 statements with the highest factor loading value 0.58 for Absence of processing fees.

6. CONCLUSION

In conclusion, the Unified Payment Interface (UPI) has demonstrated its disruptive impact on the financial landscape, particularly in emerging and developing economies. The capability of UPI to provide real-time, smooth, and secure transactions has not only improved financial inclusion but also markedly advanced the development of a cashless economy. The benefits of a cashless economy, such as enhanced transaction efficiency, diminished corruption, greater tax compliance, and economic growth, are abundantly demonstrated by the extensive adoption of UPI. Notwithstanding the myriad advantages, obstacles including digital literacy, internet connectivity, and cybersecurity issues remain prevalent. These challenges must be resolved to guarantee ongoing success and increased use of cashless payment systems. Strategic initiatives by governments, financial institutions, and technology providers are essential for surmounting these obstacles. This includes activities designed to augment digital literacy, broaden internet accessibility, and strengthen cybersecurity protocols.

Based on p-value, it rejects null hypothesis. Hence, the hypothesis: There is no significant relationship between factors affecting the promotion of UPI and cashless transactions is rejected and proved. Hence it is concluded that there is a significant relation between factors affecting the promotion of UPI and cashless transactions.

The incorporation of UPI into the financial frameworks of emerging economies possesses significant potential for fostering sustainable development. By adopting digital payment technology and promoting a culture of innovation, emerging regions can attain enhanced financial transparency, economic stability, and social equality. The ongoing advancement of UPI and other digital payment systems will significantly influence the future of global finance, presenting substantial prospects for growth and prosperity in the coming years.

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