

RuPay : The Indigenous Electronic Card Payment Scheme

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ABSTRACT

RuPay is an Indian domestic card scheme like Visa and MasterCard conceived and launched by National Payments Corporation of India (NPCI). NPCI is an institution driven by Reserve Bank of India(RBI) to support/drive all the retail payment systems in the country. NPCI was founded in 2008 under RBI with ten core promoter banks. It's mission is to fulfill RBI's vision of having a domestic, open loop and multilateral system of payments in India. RuPay hopes to give banks new opportunities to operate in the card payments domain of India. The President of India Shri Pranab Mukherjee on May 8, 2014 dedicates 'RuPay' to the nation. The core objective of the RuPay Payment scheme is to consolidate and integrate the multiple payments systems with varying service levels into nation-wide uniform and standard business process for all retail payment systems. With the introduction of the RuPay card India is one of the few countries to have developed a card system domestically. RuPay can be used at ATMs, at Points of Sale(PoS) or retail shops all over the country and for online shopping as well. It will offer immense convenience to Indian consumers.

I INTRODUCTION

The Indian banking sector has come a long way from its initial technology adoption. Information technology is one of the most important facilitators for the transformation of the Indian banking industry in terms of its transactions processing as well as for various other internal systems and processes. The various technological platforms used by banks for the conduct of their day to day operations, their manner of reporting and the way in which interbank transactions and clearing is affected has evolved substantially over the years.

The technological evolution of the Indian banking industry has been largely directed by the various committees set up by the RBI and the government of India to review the implementation of technological change. No major breakthrough in technology implementation was achieved by the industry till the early 80s, though some working groups and committees made stray references to the need for mechanization of some banking processes. This was largely due to the stiff resistance by the very strong bank employees unions. The early 1980s were instrumental in the introduction of mechanisation and computerisation in Indian banks. This was the period when banks as well as the RBI went very slow on mechanisation, carefully avoiding the use of 'computers' to avoid resistance from employee unions. However, this was the critical period acting as the icebreaker, which led to the slow and steady move towards large scale technology adoption.

ATMs were introduced to the Indian banking industry in the early 1990s initiated by foreign banks. Most foreign banks and some private sector players suffered from a serious handicap at that time- lack of a strong branch network. ATM technology was used as a means to partially overcome this handicap by reaching out to the customers at a lower initial and transaction costs and offering hassle free services. Since then, innovations in ATM technology have come a long way and customer receptiveness has also increased manifold. Public sector banks have also now entered the race for expansion of ATM networks.

Development of ATM networks is not only leveraged for lowering the transaction costs, but also as an effective marketing channel resource.

In the Asia-Pacific region, India is one of the fastest growing countries for card payments. The share of card payments, both in terms of volume and value has increased significantly in recent years. As per the RBI reports, as on 31 March 2014, there are 19181567 credit cards and 394421738 debit cards are in use in India, which are issued by various banks. According to the RBI, the debit card transactions in India have increased by around 22% in 2013-14 to reach Rs 85,770 crore from about Rs 66,940 crore in 2012-13 and the number of debit cards in use also rose by 30.48% during this period. Despite the decline in the number of outstanding credit cards, the volume and value of transactions using credit cards have increased by 13.2% and 18.1% respectively in 2010-11. In 2013-14 there are 461.05 million transactions using Credit card having the amount of Rs. 1454.87 billion.

The increasing Internet penetration and availability of more payment options boosted the e-commerce industry in 2013. According to the survey, India's e-commerce market, which stood at \$ 2.5 billion in 2009, reached \$ 8.5 billion in 2012 and rose 88% to touch \$ 16 billion in 2013. The survey estimates the country's e-commerce market to reach \$ 56 billion by 2023, driven by rising online retail1.

Table 1
Growth of ATMs, Credit Cards and Debit Cards in India

Year	No of ATMs	No of Outstanding Credit Cards (in million)	No of Outstanding Debit Cards (in million)
2005-06	21,523	17.33	49.76
2006-07	27,088	23.12	74.98
2007-08	34,789	27.55	102.44
2008-09	43,651	24.70	137.43
2009-10	60,153	18.33	181.97
2010-11	74,505	18.04	227.84
2011-12	95686	17.65	278.28
2012-13	114014	19.55	331.19
2013-14	160055	19.18	394.42

Upto 31 March 2014

Table 2
Card Payments at Point of Sale Transactions in India

Year	Credit Cards			Debit Cards		
	Number of transactions (in million)	Amount (in billion)	Growth (in%)	Number of transactions (in million)	Amount (in billion)	Growth (in%)
2005-06	156.09	338.86		45.69	58.97	
2006-07	169.54	413.61	18.1	60.18	81.72	27.8
2007-08	228.20	579.85	28.7	88.31	125.21	34.7
2008-09	259.56	653.56	11.3	127.65	185.47	32.5
2009-10	234.24	618.24	-5.7	170.17	264.18	29.8
2010-11	265.14	755.16	18.1	237.06	386.91	31.7
2011-12	287.44	883.73	14.55	306.68	465.34	16.85
2012-13	356.16	1112.17	20.54	456.72	669.40	30.48
2013-14	461.05	1454.87	23.55	569.81	857.70	21.95

Up to 31 March 2014²

RBI did an analysis of the card transactions happened in India and concluded that most of the card transaction done by Indians were in India only but due to using the services of multinational brands like Visa and MasterCard for payment solutions Indian banks & customers are ending up paying these multinationals. So, in order to fix up this issue, RBI asked the Indian Bank Association (IBA) to launch a non-profit payment solutions company keeping in mind the requirements of Indian banks. And the outcome of this effort was RuPay. With the launch of RuPay, now Co-operative banks and smaller commercial banks will also start issuing card which were earlier not issuing due to high cost of initial participation fee and quarterly minimum processing fees to get payment solution service from global payment processing firms.

Rupay is an Indian domestic card scheme conceived and launched by National Payments Corporation of India (NPCI) on the lines of China's UnionPay on 26th March 2012. NPCI is an institution driven by RBI to support/drive all the retail payment systems in the country. NPCI was founded in 2008 under RBI with ten core promoter banks. The core objective is to offer a domestic, open-loop, multilateral system which will allow all Indian banks and financial institutions in India to participate in electronic payments. NPCI will soon provide a full range of card payment services including the RuPay ATM, RuPay MicroATM, Debit, Prepaid and Credit Cards which will be accepted in India and abroad.

II NATIONAL PAYMENTS CORPORATION OF INDIA (NPCI)

Reserve Bank of India, after setting up of the Board for Payment and Settlement Systems in 2005 released a vision document incorporating a proposal to set up an umbrella institution for all the Retail Payment Systems in the country. The core objective was to consolidate and integrate the multiple systems with varying service levels into nation-wide uniform and standard business process for

all retail payment systems. This led to the formation of National Payments Corporation of India, (NPCI)[3].

The NPCI has ten core promoter banks (State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda, Union bank of India, Bank of India, ICICI Bank, HDFC Bank, Citibank and HSBC). It has been incorporated as a Section 25 company under Companies Act and is aimed to operate for the benefit of all the member banks and their customers[2].

The vision of NPCI being able to provide citizens of our country anytime, anywhere payment services which are simple, easy to use, safe, and secure, fast and also cost effective. NPCI aims to operate for the benefit of all the member banks and the common man at large.

The main objectives in developing of the India's own payment system are as follows:

- (a) To handle India-specific electronic retail payment system
- (b) To facilitate an affordable payment mechanism to benefit the common man across the country and help financial inclusion
- (c) Reduce overall transaction cost for the banks in India by introducing competition to international card schemes
- (d) Provide card payment service option to many banks who are currently not eligible for card issuance under the eligibility criteria of international card schemes
- (e) Build environment whereby payment information of the country remains within the country
- (f) Shift Personal Consumption Expenditure (PCE) from cash to electronic payments

III WHY RUPAY CARD?

RBI's Vision Document 2009-12[4] has stated that the need for a domestic payment card system and Point of Sale (POS) switch network for issuance and acceptance arises from two major considerations: (1) the Indian banks have to bear the high cost of affiliation with international card associations in the absence of a domestic payment system,

(2) around 90% of our card-based transactions are routed through a switch located outside the country.

As there is no domestic card, banks do not have an option but to tie up with Visa or MasterCard for connectivity between cardholders, merchants and issuing banks across the globe. Every transaction done using a debit or credit card issued by a domestic bank is routed through network switches owned by Visa or MasterCard, which are based outside the country. All these transactions involve some charges which goes into the pockets of Visa and Mastercard for providing these services. On an average, banks pay around Rs 500 crore every year to Visa and MasterCard for processing all debit and credit card payments[5]. The Rupaya initiative imposes the setting up of a network switch, which acts as a payment gateway that connects all the ATMs and points-of-sale terminals. The domestic system will eventually displace payment settlement providers like MasterCard and Visa.

India is one of the few countries to have developed a card system domestically. RuPay is 7th payment network in the world after Visa, MasterCard, American Express, Discover, Diners Club, and JCB[6]. On May 8, 2014, President Pranab Mukherjee dedicated the payment network to the nation. In the speech Mr. President says -

“An indigenous system like RuPay will, hopefully, not only reduce the dependence on cash and cheque modes of settlement but will also make it easier to offer products based on specific requirements of diverse user sets within the country,” he said, *while adding that India is one of the few countries in the world to meet domestically the need for card payment system.*

Table 3
Top 10 Banks with Highest Number of ATM & POS Installed in India

Top 10 Banks with highest Number of POS installed		
Bank Name	No. of POS	% Share
ICICI Bank Ltd.	283162	26.95
Axis Bank Ltd.	248482	23.65
HDFC Bank Ltd.	215524	20.51
State Bank of India	135853	12.93
American Express Bkg. Corp.	20347	1.93
Citibank	17844	1.69
IDBI Ltd.	14726	1.40
Corporation Bank	13501	1.28
HSBC	12497	1.18
Bank of Baroda	10998	1.04
Others Bank	77389	7.36
Total (As on 31 st March. 2014)	1050323	100

The term RuPay was coined from Rupees and Payment[7]. It's India's answer to growing plastic money floating around the world. RuPay works to enable electronic payment at all Indian banks and financial institutions. It will reduce drastically the need to use cash for financial transactions. Currently 12.6 per cent of GDP worth cash and coins are in circulation which is quite high[8]. RuPay can be used at ATMs, at Points of Sale or retail shops all

over the country and for online shopping as well. It will offer immense convenience to Indian consumers. There are plans in the offing to tie up with international institutions and take the card overseas. It will be available at much lesser cost as compared to international cards. This is because the processing will happen domestically and it will save a lot of money in clearance and settlement, thus reducing the processing fees drastically. Banks will not pay in foreign currency but in Indian currency. It is being seen as a tool to reach out to the rural unbanked. Within two years of launch, NPCI has issued over 17 million RuPay cards as of end March 2014.

The growing popularity of electronic payments is evident from the fact that the RuPay card scheme which was launched by NPCI in 2012, already has twelve million cards in circulation in the country. 50% of RuPay cards are used by the semi-urban and rural population which gives access to Tier-2 and Tier-3 cities. NPCI's commitment to electronify payments in the country is visible by the fact that RuPay cards are now accepted at all the ATMs in the country and over 10 lakh POS terminals nationwide i.e. nearly 100% POS acceptance. Mr. A P Hota, (MD & CEO, NPCI) affirms that *“RuPay definitely has potential to change dynamics in due course of time by striking a chord with the semi-urban and rural population. The impact of e-commerce is evident from the fact that State Bank of India, the largest issuer in the country wanted RuPay to go live on e-commerce in order to begin the issuance of RuPay cards.”* Soon you can book train ticket on IRCTC (Indian Railway Catering and Tourism Corporation) through RuPay pre-paid card. RuPay network is just like Visa and Master Card and provides an alternative system for banks to provide debit card service. RuPay, like any other debit card, works on three channels, ATMs, Point of Sales (PoS) and online sales beside Aadhar-based micro ATM.

To support financial inclusion, NPCI is offering Aadhar-enabled Rupaya cards to public sector banks for their no-frill account holders[9]. NPCI is also in talks with state owned lenders to issue cards to regional rural banks (RRBs). Using an Aadhar-enabled RuPay card, a customer can withdraw money from both, normal and micro ATMs, with the help of biometric technology. So far, NPCI has offered such cards to Bank of India, Corporation Bank and Union Bank of India.

So far, 31 scheduled commercial banks based in public and private sector, 49 regional rural banks and 175 co-operative have issued over 2 crore RuPay cards. This card is accepted at all the 1.6 lakh ATMs, 95 per cent of point of sales terminals (9.45 lakh+) and most of the online merchants (about 10,000) in the country. RuPay card is accepted at all ATMs (1.6 lakh plus), 95 percent of PoS terminals (9.45 lakh plus) and many of the eCom merchants (about 10,000) in the country.

A variant of the card called 'Kisan Card' is now being issued by all the public sector banks in addition to the mainstream debit card which has been issued by banks. Further, a separate card for payment of milk purchases has also been launched.

NPCI's RuPay PaySecure solution has integrated with 500-plus merchant websites across multiple categories that

would accept RuPay card for online payment services. NPCI is aiming to cover 100% of e-commerce market by this year-end, for which, significant efforts are being made consistently.



Fig 1 : The RuPay Card Issued by Gramin (Rural) Banks

IV BENEFITS OF RUPAY CARD

The new card will bring a paradigm shift in the payment system in India as the objective of the RuPay card is to encourage more debit card usage in the country, especially in rural and semi-urban areas. At present, the debit and credit card penetration is concentrated in Tier-1 and Tier-2 cities as many of the cooperative banks and RRBS from Tier-3 and Tier-4 cities are unable to issue debit cards to their customers, mainly on account of higher joining fees and a minimum quarterly fee levied by international schemes. With RuPay, rural banks and small cooperatives banks will be able to offer debit card services and will also get access to the wider ATM network spread across the country.

Though the challenges in India Market are high, Indian market offers huge potential for cards penetration. The needs of Indian consumers, merchants and banks will be addressed by RuPay. The benefits of RuPay debit card are the flexibility of the product platform, high levels of acceptance and the strength of the RuPay brand-all of which will contribute to an increased product experience.

As far as safety and security is concerned the NPCI has procured a state-of-the-art fraud monitoring solutions for RuPay scheme and its risk management team is implementing the system in stages. The rules for alerts and monitoring are framed on real time and near real time basis.

For providing internet transactions to RuPay cardholders NPCI has tied up with a US based company to provide internet-based card payment system technology. Thus, soon the RuPay card-holders can make transactions at various e-commerce sites with the two factor authentication, which will be more secure than the internet transactions under the current 3-D secure mode.

(a) **Lower cost and affordability:** Since the transaction processing will happen domestically, it would lead to lower cost of clearing and settlement for each transaction. This will make the transaction cost affordable and will drive usage of cards in the industry.

- (b) **Customized product offering:** RuPay, being a domestic scheme is committed towards development of customized product and service offerings for Indian consumers.
- (c) **Protection of information related to Indian consumers:** Transaction and customer data related to RuPay card transactions will reside in India.
- (d) **Provide electronic product options to untapped/unexplored consumer segment:** There are under-penetrated/untapped consumers segments in rural areas that do not have access to banking and financial services. Right pricing of RuPay products would make the RuPay cards more economically feasible for banks to offer to their customers. In addition, relevant product variants would ensure that banks can target the hitherto untapped consumer segments.
- (e) **Inter-operability between payment channels and products:** RuPay card is uniquely positioned to offer complete inter-operability between various payments channels and products. NPCI currently offers varied solutions across platforms including ATMs, mobile technology, cheques etc and is extremely well placed in nurturing RuPay cards across these platforms. The NPCI is planning to integrate payments through various channels - cards, mobile, money transfer, etc, and will have special emphasis on integrating mobile payment system using the RuPay scheme

Some of the benefits of RuPay over global brand like Visa & Master Card are as follows:

- This will make more people use cards for payments which will lead to electrification of payments.
- RuPay is a non-Profit company which will allow banks to use this service without any participation or quarterly processing fee.
- RuPay will help banks to reduce their cost of issuing debit cards.
- RuPay will help in extending payment network in rural and semi-rural areas also.
- RuPay will remove the extra 2% charge which customers have to pay on making payment using card.

- RuPay will reduce the cost of transaction processing by 40% as compare to international schemes.
- RuPay will take all fees in Indian currency as compare to global companies which take fees in foreign currency.

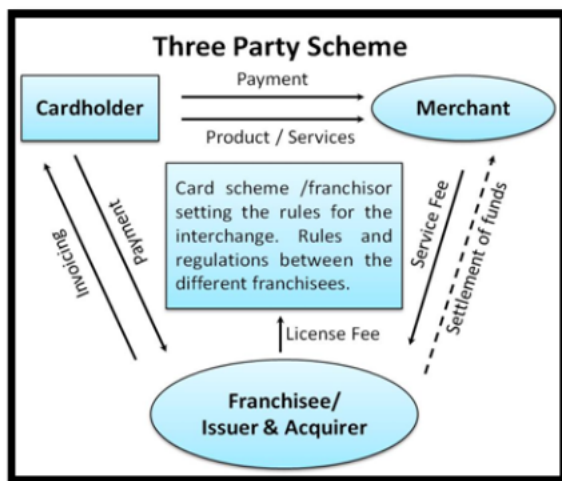


Fig 2 (A) – Three Party Scheme

- The fee structure under RuPay scheme is transparent and not subject to one-on-one negotiation with member banks.
- RuPay will help reducing the cost of banks, a part of benefit may be passed to customers by way of reduced customer charges.

V TECHNICAL DETAILS OF RUPAY PAYMENT CARD SCHEME

Technically, there are two types of schemes is applicable to all card payment - a **three-party scheme** (or **closed scheme**) or a **four-party scheme** (or **open scheme**).

A three-party scheme consists of three main parties as described in the figure 1. In this model, the issuer (having the relationship with the cardholder) and the acquirer (having the relationship with the Merchant) is the same entity. This means that there is no need for any charges between the issuer and the acquirer. Since it is a franchise setup, there is only one franchisee in each market, which is the incentive in this model. There is no competition within the brand; rather you compete with other brands. Examples of this setup are Diners Club, Discover Card, American Express and other closed loop system like restaurant checks

In a four-party scheme, the issuer and acquirer are different entities, and this scheme is open for other members of the scheme to join in the competition. This signifies card schemes such as Visa ,MasterCard and RuPay. There is no limitations as to who may join the scheme, as long as the requirements of the scheme are met.

You can use your RuPay debit card for online transactions using the *PaySecure* payment service on Internet. The *PaySecure* allows the customer to use his ATM PIN to make the payment online. It uses a simplified yet secure architecture. It offers additional security measures wherein

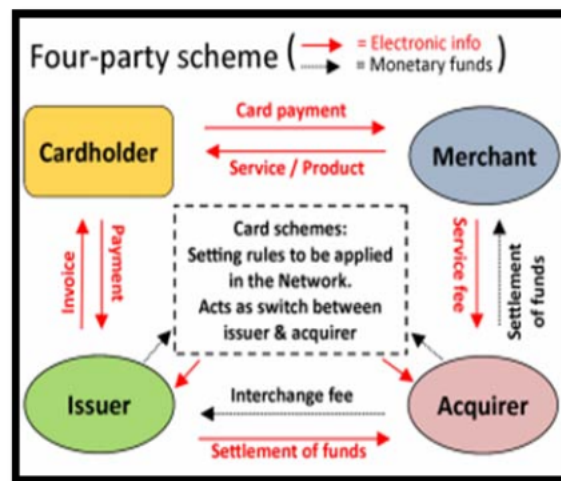


Fig 2 (B) – Four Party Scheme

the mode of validation is by selecting an image and passing a phrase[10].

PaySecure is the first software-only service that allows consumers to use PIN debit for Internet purchases. PIN debit is a popular payment method at the retail point of sale because it is secure and convenient but until PaySecure, PIN debit has never been offered as an online payment option. PaySecure brings the convenience and security of PIN debit to the Internet with a simple to use service that's just like using PIN debit at the retail point of sale. All you need is your debit card and PIN. There's no enrollment, no sign-up or special passwords, and no redirection to another website.

RuPay PaySecure conforms to the RBI mandate of two factor authentication- firstly, it uses two security parameters to authenticate a customer and authorize transaction through the participating banks, and secondly, the solution uses 'image selection' for ensuring additional security of every single transaction. This innovative authentication methodology simplifies and improves the existing e-commerce experience of the cardholder as they don't need to remember complicated passwords or suffer through transaction drops or time-outs, thus making the service more user-friendly and quicker.

PaySecure is the most customer-friendly debit card payment service on the market, simply requiring the entry of the PIN the cardholder already knows, allowing you to quickly authenticate the customer without the need for enrollment in a separate authentication service, a new password/one-time PIN, or redirection from your website. The Figure 3 describes how the customer can use RuPay PaySecure to make online transactions[11]:

VI RUPAY ROADMAP

RuPay is well poised to support issuance of debit and prepaid cards by banks in India and thereby supporting the growth of retail electronic payments in India. RuPay is also working towards enhancing the acceptance ecosystem in the country. Further RuPay is well poised to explore

innovative payment opportunities such as Contactless to facilitate and increase the efficiency of increasing the small ticket payments electronically.

RuPay envisions becoming a prominent player in the Indian card payments industry by increasing its acceptance at various retail payment touch points. Various stages of the RuPay roadmap are as follows[12]:

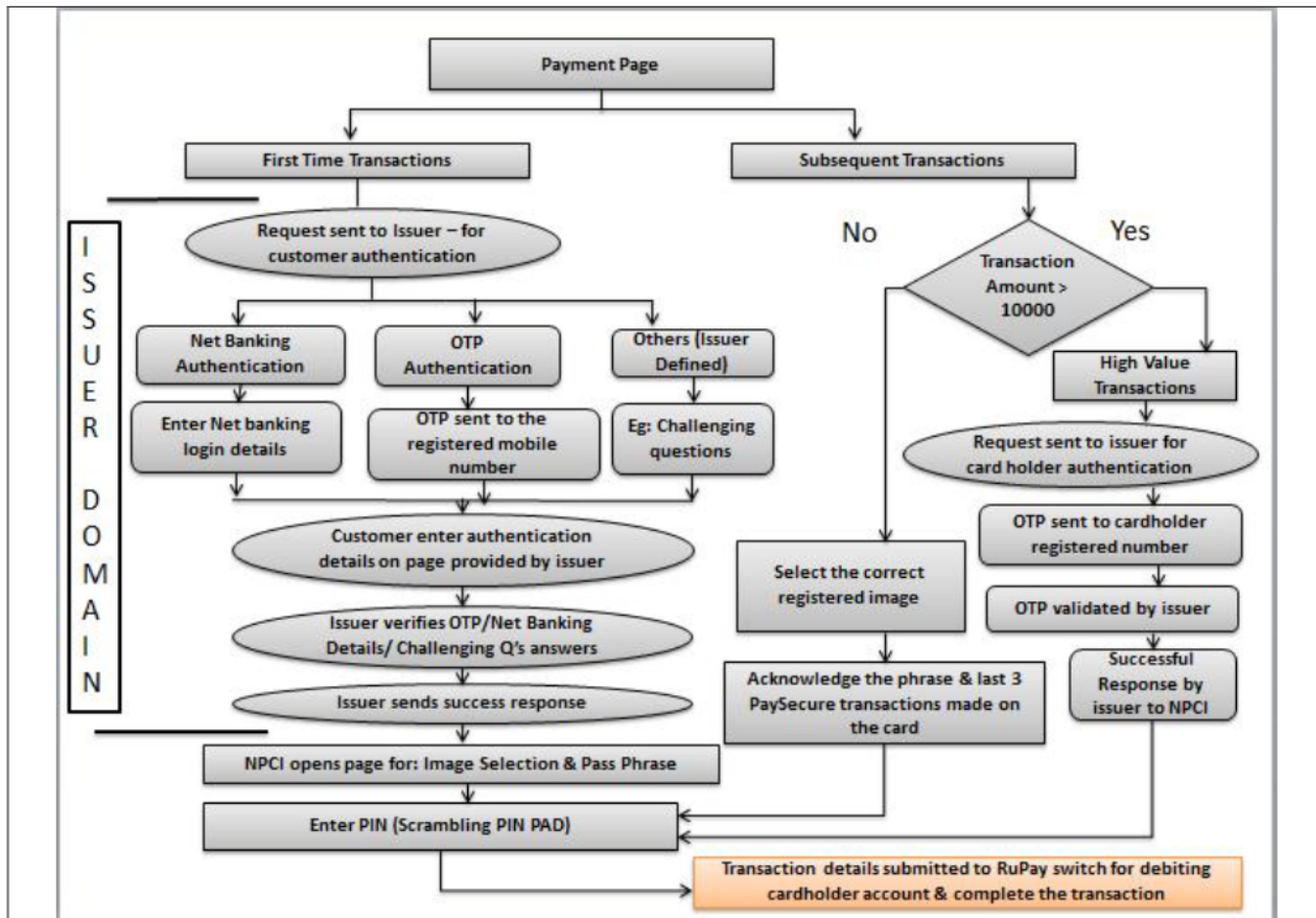


Fig 3 : Process flow and how the customer can use RuPay PaySecure to make online transactions

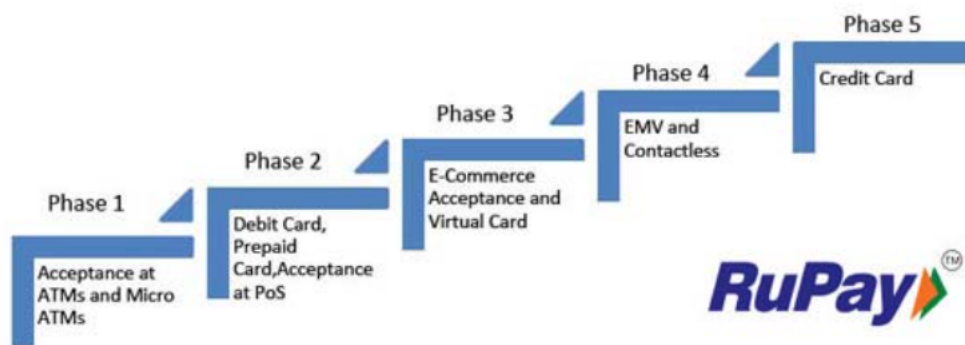


Fig 4 – Rupay Roadmap

- (a) Acceptance at ATMs and micro-ATMs.
- (b) Debit card, prepaid card, acceptance at PoS.
- (c) E-Commerce acceptance and Virtual Card.
- (d) EMV and contactless.
- (e) Credit card.

VII CONCLUSION

With the RuPay scheme India could also witness a cashless revolution which would lower transactions costs coupled with enhanced security and transparency leading to better governance. With the NPCI'S three distinct value propositions - pricing, governance and control - the RuPay scheme will further strengthen the payment system of the country all leading to promote orderly economic development and growth. RuPay PaySecure not only provides a platform for e- transactions but also gives the customers a complete unique shopping experience. The RuPay Card can be used at all ATMs, merchant establishments in India for online transactions and payments.

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