Business Would Drive Use of Plastic Money and Virtual Wallet Services using new channel

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Abstract— **Business is changing faster than ever before with new alternate payment methods and use of diverse channels to serve the customers. The biggest revolution in business that is driven by the business itself is to break the traditional way of money transaction and the false sense of security. Business drives the change with the advent of new path breaking technology with has made it possible to send money via unsecured means. Electronic transactions are no longer confined to gateways and have exploded in all areas. In fact anything digital can be a future vehicle to transact money. We look at email, hashtag banking transactions and few security considerations around it. Business and individual would make quicker transaction and take informed decision which in turn would make each penny work very harder in the days to come.**

Keywords— **Credit card, debit card, mobile wallet, USSD, virtual money, bitcoin, Bengaluru, hashtag banking.**

I. Introduction

Banking is gone social and viral. Yes you heard it right and very few of us contemplated these changes in payment in banking industry. Banks have gone a long way from paperless banking to digital payments. The more recent innovation in payment is brought about by the requirement to push immediate payments using alternate payment methods. Security and transaction have been always the basic requirements in the banking industry and continue to be same, the only thing that has changed over time is the need to have efficient banking transaction with an acceptable risk or threat mechanism. Social banking and mail money are two prominent vehicles to tap new untapped market. We look at the technical possibility and the business value these new payment delivery vehicles bring to the table.

India's first digital bank just went live and the Jan Dhan Yojana in India has been a tremendous success with 12.5 crore families enrolling for the scheme in just 100 day's [1]. This has given tremendous impetus to believe that small banking transactions would be omnipresent and would be the growth engine for future developments

This paper takes a glimpse of the new faster instant payment mechanism and the good and bad effect of the same from technology and business side of things.

II. Transactions Revolution In Banking Industry

Our current regulatory mechanism aims at providing safe transaction and over the time the industry has matured enough to learn from the digital banking transactions. From the business side the push was to reduce the time taken between the sale and the check encashment and now business has realized that the customers can change their mind in no time. The best deal would be to close the payment cycle instantly, just when the need for the service is felt. With this in mind banks have come up with instant payment mechanisms and now there is no need to carry credit and debit cards to make a transaction.

It would be important to say that debit and credit cards are still a growth vehicle but technology has eliminated the need to carry these cards along with you. Whether it is a mobile wallet technology or the upcoming hashtag banking technology, it would create the same or similar kind of transactions as was done with credit and debit cards. More often than not these channels are acting as new ways to deliver limited functionality and would not act as a bank in the near future.

A. Mail Money

Mail money works on the concept of imitating small or micro payments via email which can be withdrawn at the receiving end. In some cases the money is treated in its pure digital form and can only be used to make digital payments. In other business cases the digital currency can be cashed at a nearby bank.

This concept is a variation of the telegram concept that was considered as fast way of transferring money decades back. The entire concept involves exchange of SECRET tokens between the parties. Once the secret is generated via one time pass or equivalent means, only the party who knows the pin can cash the money.

Telegrams were delivered by postman at the doorstep who verified the credentials and handed over the money. In the modern scenario emails have replaced the postman and the TOKEN is sent via email. The receiving party can use the token and complete the payment cycle by going to the nearest bank or making online payment.

Banks have added additional layer of security by introducing multi-channel security check. Banks would ask the sender to provide the email and the mobile number of the receiver and consequently only person having the mobile can withdraw the money.

This working is considered reasonable secure as the token is passed over the email and even if this message is compromised the cell number acts as another secret token without which the transaction cannot be completed.
Variations to this method include the use of one time password and few other security measures to validate the user details.

B. HashTag Banking as a Form of Convenience Banking

Hash tag banking is different way to approach payments as it is for convenience. Once certain hashtags are registered and preconfigured with the banking system. The banking systems can talk to any social media channel mostly like twitter and Facebook to link and recognize any command issued from these social channels. As these tags are preconfigured, so there is a way recognize the command and initiate simple transaction via the bank API gateway. Similarly the banks can pull the profile detail and validate the credentials. This does not need two factor authentication or multichannel authentication for simple commands as there is a federation agreement between the social media platform and the banks which helps to validate the user's details. This does not replace debit or credit cards

but makes it all the more relevant.

C. Tap to purchase using Mobiles and Mobile Wallet

Driven by new innovation in short range communication techniques using mobile Near Field Communication and Bluetooth has created a new market wherein customers can transfer small currency simply by tapping the phones or bringing the phone in close proximity to establish the Bluetooth connection. Once the connection is establish all these technology exchange a set of embedded information to identify the device and create a secure connection.

There are security and wave interference or a distortion that does limit the technology and coupled with this the technology is at its infancy. It also requires additional hardware embedded in mobiles.

While there are other issues with the system user can use Wallet technology which stores credit and debit card data in encrypted form or on cloud and enables the users to initiate and transfer the money using the electronic credit/debit card information.

Adding to this infrastructure is the Beacon technology with the power to locate the device and use the geolocation to serve relevant adds or use maps interactively. The use of interactive maps is done by displaying a layer of information on top of maps.

D. Social Banking for Convenience

Social banking is a way to provide extended small transaction facility without leaving the social network. This is a reasonably secure considering the amount of innovation and tracking that is possible in the secure social networks. As of today the set of commands that these payment systems understand is in infancy but is likely to have a great adoption rate considering the growth of the social networking sites, social media and the similar internet based systems.

This demand is a logical extension of the OMNI channel experience and the digital experience the new sites are trying to sell. Users are given a feel that they can do most of the transactions without leaving their favorite application. The demand for this transaction would only grow because these social sites are the place where users praise or curse the product. Companies have also built a system to track user ratings and user comments in the prominent social channels. Business case for these channels is very strong in many senses as these channels work on the concept of LIKES or recommendation's. Once a user recommends or spreads the good word, it is more likely to get more attention and consequently more business. I can

see that the business deals would happen after each recommendation there would be a simple and convenient way to buy the products in ONE CLICK.

In fact we would move to something like ONE CLICK SALES AND REFERAL programs in social networking sites.

While the social sites require an active internet connection, there are options like USSD which is Unstructured Supplementary Service Data that can be used to close a transaction at the click of the button. It is worth mentioning that this is risky in many senses and there are security challenges around this gamut of technology.

E. Virtual money in unregulated markets

An interesting development in the world of payments is BITCOIN. It does not need a physical currency to support itself and is making steady inroads in the payment scenarios. This is the anonymous currency of the virtual world called BITCONINS and is likely to pave the way to new kind of thinking that permeates the industry. I consider BITCOIN as a more social phenomenon that makes us think like a citizen of the globe with a unique currency that is not dictated by terms and conditions of the government. This sector is in its infancy and would soon draw the attention of lawmakers as this increases the risk of anonymous money transfer.

Social media uses analytics and other tracking mechanism that can help in BITCOIN accounting and tracking. This would also pave the way for wider social acceptance of virtual currency around the globe. I feel that business would soon benefit from the use of various virtual currencies in true sense. Though bitcoins are abstract entities, they are gaining acceptance as an alternate denomination and there is lot of sales that is currently happening via bitcoins.

III. ADVANTAGE OF SOCIAL BANKING AND OTHER INSTANT PAYMENT MECHANISM

Instant payment mechanism is main-stream. In fact all payments mechanisms are instant or almost instant nowadays. It is only REFUNDS or returns that are not instantly done by business.

All the alternate payment mechanisms are working as an instant pay channel except where there are government regulations and historical reasons to wait for payments. The only variation to this is the ESCROW services wherein the payment is locked by a third party like the bank and this payment acts as a security for both the parties. Our study

highlights that the debit and credit card is more relevant in the new age banking and the digital currency as of today. We explore these in detail.

A. Credit/Debit Card transactions in Social banking

Social banking is a diverse topic and I would like to highlight the importance of this media. As per my research it is eminent that the companies are trying all ways to lure the customers. Companies are using QR code to give product information and even reduce the total cost of transactions using the QR code. The reason for highlighting QR code is to show you that the payment mechanism is no longer confined to the standard ways of collecting payee and card information.

Using this as the background, there is ample scope for experiments in the real world. All these services are trying to build their own account numbers, virtual credit card numbers and virtual debit card numbers. Some of these efforts can see as redundant as most of the ways of automating financial transactions is already in place and the customers can be well of using existing accounts and cards rather than use new entities in the virtual payment space.

Google wallet is a good example that uses this technique wherein user's credit and debit card information is stored in the application and makes it easy to carry out a transaction.

The other challenge in this industry is the reason why people are spending. Conventionally the money was mostly spent on buying essential items and luxury items for self or family. Currently additional avenues like micro credit, crowd funding and electronic gifts are driving small but significant changes in the payment industry. The system is currently not geared to account for all kinds of payments, refund, EMI payments and escrow scenarios.

I personally feel that alternate payments should use the best of the new and old worlds of payments including the best of current technology and the existing account numbers, credit/debit card numbers instead of reinventing the core banking process.

B. Mobile wallet, NFC and virtual money for Social Banking

Some of this new fascinating technology like NFC is primary driven by the users from of the mobile banking channel or equivalent mobile channels. This makes the users life convenient and gives a lot of value to this new means of transfer.

The quick transfer of money makes these attractive options for users on the move and users in the poor sections of the society who would prefer the mobile as almost everyone in the world owns one or has easy access to mobile.

Mobile is also viewed as a personal device which makes

it important in the world of payments as a secure device to hold and transact. With the advent of Bluetooth and near field communication, it is this small hand held device that has re defined the world of payments.

The biggest advantage of the mobile is to serve as a reliable second channel for two factor authentication and verification service. With the help of mobile each channel can do another round of user verification using Bluetooth code, NFC code, one time passwords, embedded bar codes, USSD and VOIP (voice over internet protocol). There are risk which we cover in the next section.

IV. DISADVANTAGE OF SOCIAL BANKING AND OTHER INSTANT PAYMENT MECHANISM

The new channels or delivery vehicles like hash tag banking would not evolve like a full-fledged bank in the near future as these instruments cannot be used to provide loan. There can be a way to provide micropayments but I do not see this new instant payment mechanism to work like a full fled edged bank in the near future. These are facilitating transactions and do not provide means of creating wealth via fixed or recurring deposits as these are supposed to be a core banking facility. There is a business case to initiate fixed deposits via these channels but that would mean changes to the banking regulations.

A. Credit/Debit Card use in Social Banking Lacks Standardization and Governance

We all know that the credit and debit cards have gone digital and there is no reason to carry your card. With the digital equivalent it is easy to carry out a transaction using mobiles and social channels.

The bigger problem is the innovation in this space itself which is trying to use the digitized information in multiple ways and leading to lot of innovation without a reliable standardization and governance framework.

Another problem would be interoperability of these payment methods wherein payments initiated by multiple systems give rise to a new problem when interfaces fail to carry out the transactions as some of these alternate payment mechanisms do not follow the conventional payment patterns.

As of now the problem is not acute, as active users generally use only one channel. With the advent of Internet of things, Smart city and the artificial intelligence, it would be possible to give auto debit or auto credit actions to online transaction processing systems and the likes. This would mean that multiple channels can run into deadlocks or other result in other security threats. It also increases the risk of noncompliance to government standards.

Another issue is the use of NO SQL which does not guarantee the data security that is present in conventional relational database systems. Most of the social channels use NO SQL for data storage which means that the new systems may be a combination of NO SQL and relational databases with little control over the end to end transaction.

B. Hashtag and Mail Money is Relying on Tokens

There are few disadvantages of these payment methods. All these payment methods depend on token exchange mechanism. In case both the tokens are compromised then there is a chance to lose the money. It also increases compliance issues as anonymous payments using these digital currency like bitcoins etc. can be hard to track and violate the money laundering rules that are given by Reserve bank of India or other international agreements. It just takes one hack to find the way and syphon millions of dollars from individual accounts at a lightning speed. **This may become what I call FLASH ATTACKS on mobile transactions.**

C. Mobile wallet and Virtual money are In Infancy

Mobile driven technology has its own set of challenges as smart phones can tap user information sent via SMS, Messages, Voice and screen activity. This information may be sufficient for hackers to break the two factor authentication mechanism as both the screen and the one time password is sent to the same device.

V. MOBILE PAYMENT PATTERNS

This section is based on my experience of the mobile payment scenario and my work and my research topic related to plastic money, mobile payments and virtual wallet.

While working in the field of API management and data virtualization has given a better understanding of how the new patterns would emerge in the future. Given below are few ways of handling key concerns while designing a payment system.

A. Payment Transaction integrity while using JSON message

Mobile uses JSON messages which are light weight and does not have a rigid structure like SOAP based web services. This makes it seemingly difficult to tackle security, message integrity and one time guaranteed message delivery.

As ACID transactions which emphasizes the atomicity, consistency and other parameters is not easy

to replicate in the JSON world.

A simple solution is achieved by using another channel to confirm the transactions. Users are prompted to use one time password or validate via SMS and other similar mechanism.

I have found that this method is susceptible to hack and is not sufficient to ward of all threats in the smart phone scenario. One example is when the person uses mobile banking and receives the one time password on the same mobile. Once the device is compromised, the hackers can read the SMS and complete money transfer.

The only way to avoid this attack is to either use two different physical devices to complete a transaction or use VOIP to send one time password via calling services.

This risk is reduced when banks allow transaction via registered mobile device but unfortunately this is not a very good way to handle all payments. E Commerce and Mobile commerce has enabled people to complete the transactions from any device and banks must be able to support any device.

- Mobile payments are initiated when the user logs into the system and generates a token for a specific interval of time. The token changes over time interval and thus wads of attackers.
- API keys which are attached with the URL of the service also offer a level of protection.
- One time password which is sent is also another security measure that payment transaction must use. Other equivalent multifactor authentication.
- Further protection can be added when the user provides a secret transaction password to complete the transaction. This secret should be predefined or set much before the transaction.
- In addition to all this the mobile application is also provided with a client id, client secret , Bluetooth or NFC distinct device numbers or equivalent which can be used to identify the caller /device.

I feel Indian payment systems should adopt deep packet inspection technique to embed and check secret information at the API gateway layer. This secret should vary on each message and is only known to the gateway layer**. Deep packet inspection is a technique to open a data packet and try to understand the information and then again re packing it before sending it to the destination.**

B. Other Transaction (non payments) integrity while using JSON message

While using JSON for nonpayment transactions, it is important to use reconciliation techniques to secure the transactions. This reconciliation can be manual or automatic and would be in addition to the existing token, Api key and other security mechanism.

There are many nonpayment transactions which need to be closely monitored. Some of these are adding third party beneficiary, changing the registered mobile number etc.

Some of these can be reconciled automatically via getting details from mobile operator or local authorities. These can also be done manually wherein the user or banks have to review the data via electronic means. This would help in making the non-core banking activities faster.

C. Using compensation flows in case of multi transaction

In scenarios where more than one payment transaction is done by a service and there is a dependency in service as they should be done completely or avoided. In such scenarios it is important to design a rollback mechanism or compensation flow.

In a JSON world the compensation flow can be better achieved with synchronous services as the service always returns a message or status.

D. Other security

Other software security includes IP filtering to check the geography and international payment security. In two ways SSL, each party identifies itself and exchanges secret information before establishing the connection. SQL and JSON threat can be protected using policy management at the gateway layer or at the final service endpoint.

E. Session hack protection

A hacker starts a session from his machine and passes the session id to the victims machine or mobile and the victim logs in with his or her credentials. Once the victim falls prey to this attack the hacker would use the token and the session id to initiate calls to the service provider and thus break the security.

This can be prevented by automatically discarding

the session cookie before loading the login page.
The software should also use a secret token in session secure area. This token by default should not be accessible from any other device.

When the hacker tries to do a session hack, the session id is not available to him or her as this is kept in a secure store that is only accessible by the local device. Hacker has to use a false key. Consequently the service provider can identify the real and fake caller by using this secure token.

F. Artificial intelligence to ward off attacks

I feel that Indian companies should adopt streaming analysis, business rules and artificial intelligence to detect any nonstandard user patterns early during the transaction to ward of attackers or to raise an alarm.

G. TLS to replace SSL

Transport layer security standards have recently removed the secure socket layer security as the secure socked layer was vulnerable to attacks. Attackers had found a way to intercept the entire stream of message after receiving the first few bits of information.

H. USSD based attacks

With the arrival of new payment mechanism, people exchange mobile talk time instead of money. This can be used to exchange small amounts of money like it is done in Kenya. Unstructured Supplementary Service Data (USSD) is a way to initiate a service or payment without using the internet. It uses the existing phone connection and takes user input via the smart screen interface. Malicious software would tempt in a user clicking a link or a button to initiate an USSD transfer. This can be extended to transfer recurrent payment.

New software has come up in the market to prevent auto USSD hacks. But none the less the threat is real as there is no way to recover the money once such a hack happens. It is important to frame suitable laws in the country to prevent such mishaps. The laws can mandate or bar such services in India where the USSD codes are regulated and there is an appellate authority to look after such incidents. **My finding and research showed that these USSD hackers pretend to offer mobile Value added service and misguide users via false screens. The user may be clicking a discount coupon but would actually clicking the approve button of an USSD transaction and thus accepting the USSD value added service (payment). The user realizes this attack after a while once the credit balance decreases more than expected by user.**

VI. HOW BUSINESS DRIVES CHANGE IN THE PAYMENT SPACE

My research has highlighted the following areas of improvement in the payment space. Business can drive this change and would fail in customer satisfaction, retention and many other parameters if Indian business does not evolve like the other competitors across the globe.

Given below are some of the key areas of change.

A. Refunds And Claims needs to evolve

My research clearly indicates that business has to work on refunds and fasten the claims cycle. When a user pays installments on time, the same user would need the refund on time.

The complex business process and the due diligence that goes behind the scene before honoring the claim is not required. Most of the claim can be processed faster by automation and SLA management.

B. Micro credit

Indian banks have just opened the mobile wallet payment space and there is a need to offer micro credit as and when required. This would be a great benefit to the masses and would need RBI's attention in this space.

C. Peer to Peer credit

Indian mobile wallet does not allow direct transfer of money as of today. This is also not beneficial to buyers. Few banks have started adopting mail money and hashtag banking. Without the ability to transfer peer to peer money, the users would mostly sift to faster and more convenient immediate payment methods offered by global providers once they enter Indian market. These convenient banking techniques need banks to provide immediate payments in Omni channels.

D. Payments and legal standards

Research also highlight that many people use credit/debit cards and checks because these are more

readily accepted by law and court proceedings and the chances of alternate mode of payments look bleak. Indian law should adopt a more pragmatic view of payments as some of the channels work differently than others. It remains to be seen if the lawmaker's impose specific restrictions on few payment methods or increase the accountability and traceability for these electronic transactions.

BITCONS and crypto currency are under the scanner and business needs to come up with adequate mechanism to safeguard them to avoid government litigation. Mobile payments have been accused of money laundering and with the passage of time new cases would surface. It would be better if business can ensure more tracking mechanism like **registering the geographic location of the person doing the transaction via mobile where ever possible.**

E. Other non-core banking transactions should also be quicker

Other important activities like changing the registered mobile number takes 6 days in India which is not acceptable in the age of electronic systems.

The process is slow because most banks send a physical document via post to a central location. This can be avoided by scanning the request and sending the request via electronic form. There is no need to keep piles of papers in store house when the same can be made available in electronic form.

VII. CONCLUSION

As we see that a lot of innovation is possible in the space of payment s and companies, developers and researchers are finding newer ways to tap new customers and service the needs of the customer in a flash.

As companies struggle to find what works best for them, it is important for the companies to understand each payment mechanism and discover which one works best for them.

There are innumerable use cases and we have just scratched the surface in the payment industry. The payment and banking industry was stagnant in focused in automation and one click payments, but now the focus is shifting to more of a value creation and value store mechanism. Credit or debit cards would just be one of the ways transactions are made over the internet. The future is unpredictable and ever evolving space where powerful organizations can act like nations. They can create their own social currency and bend the rule of the game.

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