Automated Scheduling For PPI Based E-Wallet

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Abstract: It is the era of paperless money, and 24X7 processing by the help of internet and information technology. The money transfer and its gross settlement is possible in just few seconds. The internet technologies have been used and new concepts based on previous experiences are now coming into research and discussion. The lot of research paper for wallet creation and internal process are available. Specially, wallet process through different approaches like BC Wallet, RBI Wallet, Domestic Pay Service Wallet are main consideration in this research work. The main objective of this research is to solve the problem during the wallet transaction between issuer system to banking system. The involvement of NPCI(National Payment Corporation of India) system result the proper response to the issuer system and customer as well. So the successful transaction is achieved through a scheduling mechanism, which is an intelligent approach to solve problem in critical time and give customer satisfaction. The results are calculated on real life example and presented which shows the impact of intelligent approach.

Keywords: Modern RBI Instrument, Limited kyc, Wallet creation, Limited KYC Instrument, Pre-paid payment instruments, Open & Close Instrument.

I. INTRODUCTION

The RBI under this Act has issued a set of Guideline for theregulation of various instruments falling under the Act. The Issuance And Operation of PrePaidPayment Instruments in India (RBI) Directions 2009 incorporate the regulatory framework pertaining to prepaid payment instruments in India. We show the implementational algorithm for “Intelligent Transaction Scheduling on Bank Exception” which make transaction automated in case of bank exception and server issue. In this paper basically implement the wallet system process through Semi-Open RBI Instrument, which is a specific type of wallet sytem in which a customer transfer amount and beneficiayary received the amount, this functionality avliable only this Semi –Open wallet system, as per RBI regulation created wallet as per this Semi-Open Instrument(RBI).

When a customer need to transfer money for some one, then need a semi –Open Wallet, basically this wallet provide by Issuer as bank wallet or Issuer system wallet or it also known as Domestic pay service, in case of DMT (Domestic Money Transfer). Issuer system create a wallet, this wallet take place may be BC-wallet(Bank Chanel Wallet) or Domestic wallet. After creation of this wallet sender can send money to beneficiary account as per wallet limit as per RBI norms for bank chanel wallet limit 25 K INR per wallet or domestic wallet limit 20K INR per wallet.[1][2].

II. PROBLEM DESCRIPTION

2.1. Statement of the Problem

When a transaction are passed from issuer system to bank system, its possible to face any issues like server crash, in this case the transaction will be incontinuous state through agent system to the issuer system and move to bank system. Sometimes banking system is down due to server crash problem, when transaction are continuously route from customer system to bank, in this case bank does not give any response. So to overcome these type of issues, the response to the transaction are done by an autonomous program, without any change in data.

2.2. Identified Issues

It is possible to get issues in different phases of PPI,(prepaid Instrument), therecognized issues are issuer level, agent level, customer level, bank level.

- Issuer level: A system that provide the platform for agents, distributor, branch to perform live transaction is known as issuer system. It exist like an employment system.
Fig. 1: M-Wallet (Semi-Open RBI Instrument)

Agent level: -

A semi-open wallet comes with a facility to transact but only with those merchants with whom the m-wallet service provider is tied up. So for example – Airtel Money is tied up with eBay, so once your phone is signed up for Airtel Money, every one should be able to pay using the m-wallet while buying goods from eBay. However, Semi-open wallets do not allow an individual to withdraw cash. Issue is that when agent load money in customer wallet for transaction purpose, but due to no response from bank, agent unable to transfer the amount to beneficiary account.

Customer level:-

When a customer need to transfer money to someone’s account for any personal or other requirement, customer go to issuers system (Like money transfer kiosk), who held an POS system with Semi-open system (Modern RBI Instrument), customer deposit cash, which not allow in any other wallet system except this one, this wallet provide by Issuer as bank wallet or Issuer system wallet or it also known as Domestic pay service, in case of DMT (Domestic Money Transfer). Issuer system create a wallet, this wallet take place may be BC-wallet (Bank Chanel Wallet) or Domestic wallet. After creation of this wallet sender can send money to beneficiary account as per wallet limit as per RBI norms for bank chanel wallet limit 25 K INR per wallet or domestic wallet limit 20K INR per wallet, but in case of bank response as exception, customer unable to sent money to beneficiary account, in this case customer also facing a big issue due to not sent amount, which may be must due to any reason like business, medical, personal, banking loan, etc.

Fig. 2: Wallet Creation Process

2.2.4 Bank level

After wallet creation in through bank channel or issuer channel, both wallet transaction always pass through bank Account. But in case of bank exception due to any reason, bank is unable to respond to issuer system and unable to further processing to bank wallet to NPCI (National Payment Corporation of India).

In this case All loaded wallet transaction failed, this is huge loss of business for bank and each part of this who is connected to this process including agent, branch, distributor, customer.[1][2]

III. PROPOSED APPROACH

In This approach we implement algorithm for Unexpected Behavior of bank (For Bank Exception)

In This approach we implement algorithm for Unpredicted Behavior of server (For Bank Exception / Banking server). basically when a Issuer System perform the live transaction using Modern RBI Instrument like E-Wallet, for this Issuer system directly create some agents, distributor and branches and all customer perform transaction through these agents, branch and distributor, all these are basically create the E-Wallet for customer and upload the amount as per customer necessity Under RBI rules for E-Wallet and perform the transaction.

But in back end in technical part (Issuer server side) where transaction push from Issuer system to banking system and then pass on to NPCI (National Payment Corporation of India) and load the customer E-Wallet transaction Issuer system to bank System after that got the response of transaction from bank server to Issuer System.
But some time Issuer system can’t receive the response dynamically from banking server due to (server crash, server not performing at that moment, server not responding, server, network flooding or another issue like this) at that time we make the issuer system dynamic to pushing all transaction till time not getting the response as defined during the development of code. Help of this approach we applied below algorithm and resolve that server issue and make issuer system more reliable and secure.

IV. IMPLEMENTATION WORK

In the implementation part we show how we make a amount loading successfully in case of bank exception like server crash or not hit due to any reason, how we push a wallet amount put to bank sever until not getting response.

4.1 Fresh Transaction beforeUploading by Scheduler

As per our new approach Scheduler pick transaction from database in automated way, as per our new modified condition (Is_sent :=0) , we can easily understand this change through work bench tool, snapshot also attached here

```
/Begin
Set isSent_Status ## false
} scheduler ➦ hook transaction
@ scheduler_Timer_Tick{ 
  set the transaction isSent_Status ## true
}
/label:bankStatus
scheduler_bank_process_status ➦ timer_tick{  
  Set transaction_status ➦ Processed
}
scheduler_bank_process_updater ➦ timer_tick{  
  Set transaction_process_status ➦ update
}
If (isSent ≠ true) {
  goto /Begin
}
If (transaction_status ≠ true || transaction_process_status := false){
  goto /label:bankStatus
}
/End.
```

4.2 Scheduler After successfully Uploading transaction

We can easily understand the approach for bank exception how our un uploaded transaction is change state to Uploaded transaction.

![Fig. 3: Schedular Initial State(before transaction)](image)

Un-Uploaded Transaction ➤ Uploaded Transaction (After 50 Sec)(Before)Is_Sent:=0 ➤ Is_Sent :=1(After)

![Fig. 4: Successful Transaction Uploading Log](image)
To make the system more reliable and traceable for security, auditing purpose we write some logs as below.

Transaction log:
- **I. Transaction Upload log**
- **II. Success transaction log**
- **III. Fail transaction log**
- **IV. Suspect transaction log**

**A. Transaction Upload log**
When we upload a transaction through this new approach, this must for us that we ensure that what we sent to the bank or upload to the bank channel. So we can give elucidation for future to avoid any problem for bank end or auditing purpose.[8][9]

**B. Success transaction log**
As per our new approach we continuously getting the response from the bank. This response may be as success or fail, if it is success we can write the same response to make system more reliable or to avoid any problem for bank end or auditing purpose[8]

**C. Fail transaction log**
As per our new approach we continuously getting the response from the bank. This response may be as success or fail, if it is fail we can write the same response to make system more reliable or to avoid any problem for bank end or auditing purpose.

**D. Suspect transaction log**
As per our new approach we continuously getting the response from the bank. This response may be as success or fail, but may be possible due any wrong information for beneficiary. If the response is suspect transaction status, we cannot say success or fail, both things possible but it will always finalize from the bank or NPCI end. Until we are not getting final status we will show as pending or suspect after getting final confirmation from the bank system give response it may be success or fail. If it is fail we can write the same response to make system more reliable or to avoid any problem for bank end or auditing purpose[9].

[Example logs attached]
V. RESULT & DISCUSSION

In case of Semi-Open Wallet transaction, we can easily understand the result of this approach. Below table in which we are showing the result of transaction status processing in both cases before applying the approach and after applying the approach.

Here we can easily check the effect the approach that before the approach we can easily say we are push only 1000 transaction in whole day out of 10000 transaction only 900 transaction got transaction status success out of 1000 push and overall 10000 transactions, 9000 transaction got transaction status as failed due to avoided new bank exception algorithm, and 10 transaction status are suspect in cases of any reason from bank side these are reconcile in next three days end of NPCI. Final status of transaction always depend on NPCI, for any case, if we need any inquiry at agent, distributor, branch or customer level for any dispute we check Transaction UTR Number (Universal Transaction Number), which is Universal transaction no for all banks of India, may be govt. sector bank, pvt sector bank, or rural bank.

Table 5.1
Transaction Status Before and After

<table>
<thead>
<tr>
<th>Approach</th>
<th>No Of Transaction</th>
<th>Bank Response</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Push</td>
</tr>
<tr>
<td>Before</td>
<td>10000</td>
<td>1000</td>
</tr>
<tr>
<td>After</td>
<td>10000</td>
<td>9990</td>
</tr>
</tbody>
</table>

After applying the approach, result of this approach directly calculated through above table 5.1, after applying this approach now system can perform transaction more reliable and push 99.99% transaction, without any interruption, so this approach is most effective for wallet system.

VI. CONCLUSION

Fig 5 Transaction Status Before And After Bank Exception Algo. Graphical Representation of Transaction status:-
We implement bank exception algorithm, through this we make transaction uploading process more convenient successfully. After this approach we can see result difference in both for uploading or pushing cases, through graphically representation we can see how number of success transaction and number of push transaction are exponentially grow.

As per above fig 5, we can easily understand difference of Number of transaction for Success, Fail, Push, Pending, Network Issue for before applying the bank exception Algorithm and after applying the Algorithm.After applying the transaction we can see no of push Transaction.

VII. CONCLUSION & FUTURE WORK
As in the scenario, we have repented a delayed approached to push the transaction towards the bank. This causes a delay of few seconds in the seconds for the transaction in the system, while holding the transaction for these status bits enhances the extra caution, security and override any exception of getting multiple query at the same instance removing any chances of fraudulent or mistaken double entries also ensure the success ration for the transaction toward the semi-wallet providers and the kiosk that holds the transaction for their perspective clients.

Need for Increasing Awareness: M-wallet services across the country faces a major issue of lack of awareness regarding their benefits and usage. Majority of Indians are still reluctant to use m-wallet because of security and safety issues. The m-wallets companies must take important steps to gain their consumers’ trust. Measures such as efficient and effective customer care services, 3-D or OTP security, data back-up system etc can be taken to increase awareness among people.

Exigency for Safety: There is an urgent need for a safe, trustworthy, flexible, cross platform, official mobile wallet applications in order to gain consumers’ trust to face the liquidity crunch in the economy. Consumers still do not have trust in online payments because of the increasing incidence of fraud cases and internet theft as use of the Adhaar card is not mandatory. Mobile wallets needs to be made as prejudiced vehicles for convenient cash transfer, and if the government is pushing for a cashless economy, as vegetable and fruit sellers have now accepting payments through m-wallet. Government should take steps to ensure people of India that there will be no online theft and their money will be secure in their wallet

Introducing Low Priced Smart Phones: Since some m-wallets are compatible with operating systems like IOS (Apple) which are expensive and not everyone can afford them.

To tackle this problem, mobile phone companies should introduce low priced cell phones in the market which can be bought by all the customers, as the ultimate goal of m-wallet is to improve financial inclusion in the country. With existence of expensive smartphones, the goal would be difficult to achieve.

Increased Limit of Transaction Amount: Limited amount can be transacted or transferred through m-wallets in a month which hinders the Indian m-wallet market. M-wallet companies should increase the limit of number of transaction and transaction amount even in the case of basic account

Need for Transparency in Regulatory Policy: The regulatory policy of m-wallet industry is quite cumbersome and involves inflexible and complicated terms and conditions which make it difficult for companies to decide whether their product need RBI approval or not. Crystal clear policies and a common regulatory body for all m-wallets (closed, semi-closed etc) are required. The existence of such body would bring clarity in procedures & policies between the m-wallet companies and the RBI.

Need for Relaxation of RBI’s Policy: The RBI licensing regime is discouraging mobile wallet growth in the country. The present system allows only e-transfer of money and approves semi-closed pre-paid instrument issuance while it does not allow “cash out” from the semi-closed wallet. The RBI should relax its current policies and allow cash withdrawals from the semiclosed wallets. Also, RBI does not allow all the entities (including Banks, NBFC, Telecom Companies etc) to operate any kind of m-wallet, there are copious of strict RBI policies which encumbrance the growth of m-wallets in India.

Introduction of Attractive Offers: The m-wallet companies should pay a small amount of interest on the amount that has been kept in the wallet for a month/quarter/year. This would attract customers and 23M-Wallet: Scenario Post Demonetisationthey would load money in their wallet in order to get interest rate benefits.

Focus on Technology and Compatibility: Some m-wallets are not made for all type of operating systems (Andriod, Windows etc); they are only compatible with one or few operating systems. Therefore, there is a need for technological advancement by the m-wallet companies so that their m-wallets are compatible with all operating systems and they do not have pay extra money every time to launch their application on a new platform. They must develop a common platform for their application to save money and time. This would ultimately result in reduction in cost and expansion in user base and hence revenue.


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