Offline Transaction System

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Why? For Whom?

Removing the bottleneck of payment system

1

Most of the existing solutions rely on a core assumption of having a working internet connection on both or either of the customer and merchant mobile devices.

2

According to data shared by TRAI (in March 2021), connectivity issues plague large swathes of the country even in relatively developed urban areas.

3

As per RBI, absence of or erratic, internet connectivity, especially in remote areas, is a major impediment for adoption of digital payments.

Offline payments are transactions that are either processed without a data connection or where the transaction is recorded offline and processed and settled at a different point of time when connectivity becomes available with one or either parties involved in transaction.

In any transaction system a connection between sender, receiver and the server is preliminary.

According to our research there were three main methods.

Bluetooth/ Nfc

Bluetooth or NFC system to directly transfer money from one mobile to another in their phone wallet.

Mesh

Create a mesh of devices using mobile hotspots. The user would then be able to send money from their mobile wallet to the receiver.

SMS

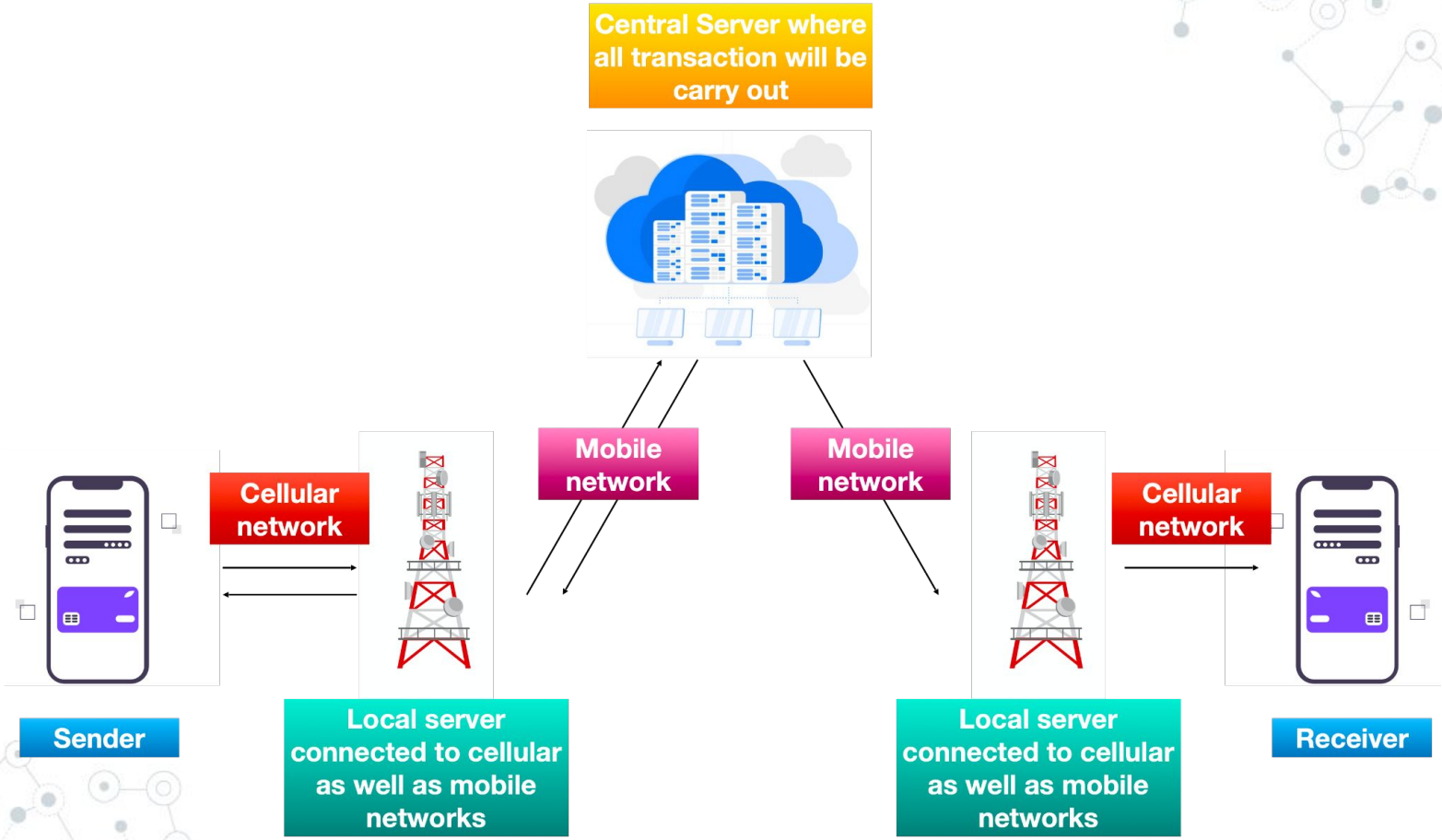
Send and receive data using cellular network. In this way data will transfer through the server hence actual account to account money transfer possible.

Why SMS/ Cellular Network?

	Bluetooth/ NFC	Mesh Technology	SMS/ Cellular network
DIstance	Very Short	Short - Medium	Large Distances
Transfer Mode	Wallet to wallet	Wallet to wallet	Actual account transfer
Reliability	Very	Not so much	Very
Production capability	Can be made into production build	Can be but hotspot uses lot of mobile battery so not feasible	Definitely. Just some encryption would be required to secure data
Additional Hardware requirements	None	None	Servers which are connected to both mobile and cellular network

System Design

A look into the working of the offline transaction system


Central Server where all transaction will be carry out
Mobile network
Mobile network
Cellular network
Cellular network
Sender
Local server connected to cellular as well as mobile networks
Local server connected to cellular as well as mobile networks
Receiver

How the system works?

1

The user will first have to register themselves from our bank-website so that their details will be saved in our database.

2

Registered users can send each other money to and fro from our Client App. In it the user will have to enter ‘Phone number of the receiver’, ‘amount’, and an accompanying ‘message’.

3

The details provided by the customer will then be sent to a dual network server via cellular network **(No internet connection required!).**

4

The server will then forward the details to backend through internet connection where the request will be processed followed by updating the database. **This is where the transfer of money happens!**

5

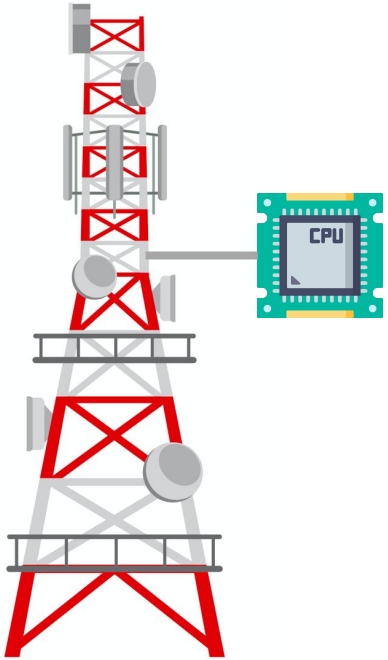
After the completion of the process a success prompt will be sent to the dual network server via internet connection.

6

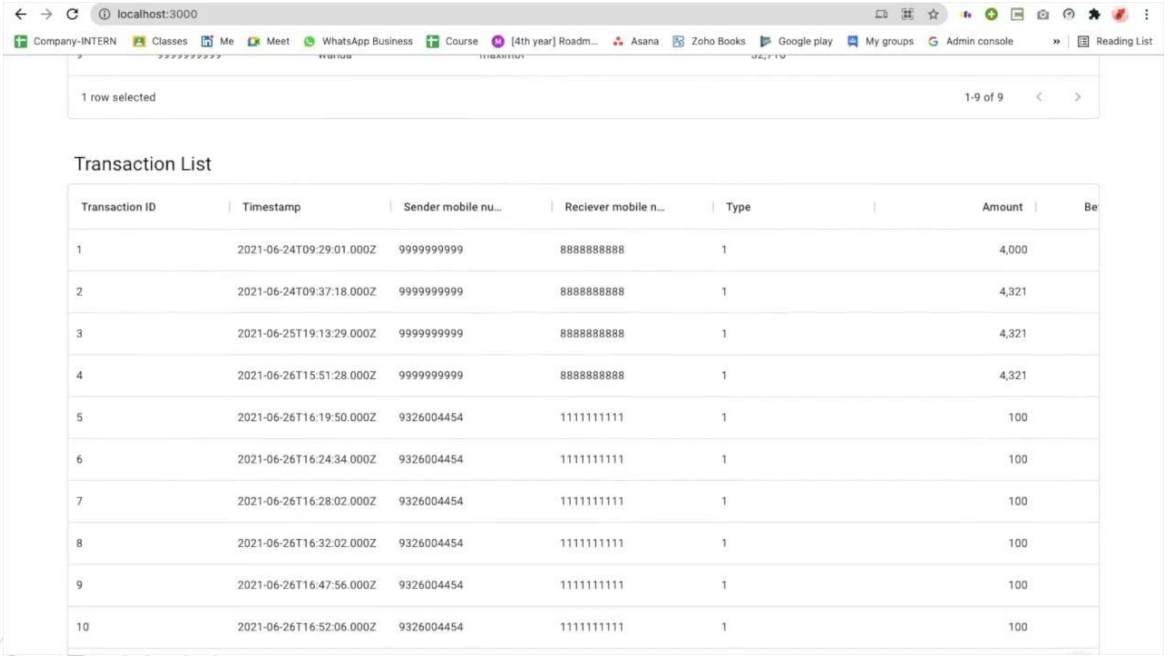
The DNS will send a success confirmation to both sender and receiver through cellular network. This is the final step where both receiver and sender will be prompted with the message saying whether the transaction was successful or not.

Dual network server (DNS)

A dual network server is a server that is connected to both mobile network and cellular network. This is key for relaying data received from user to the server. In our prototype we did not have access to such a server so we converted a mobile phone into a server. (Mobile phone has connection to both cellular and mobile network.)



Work Done



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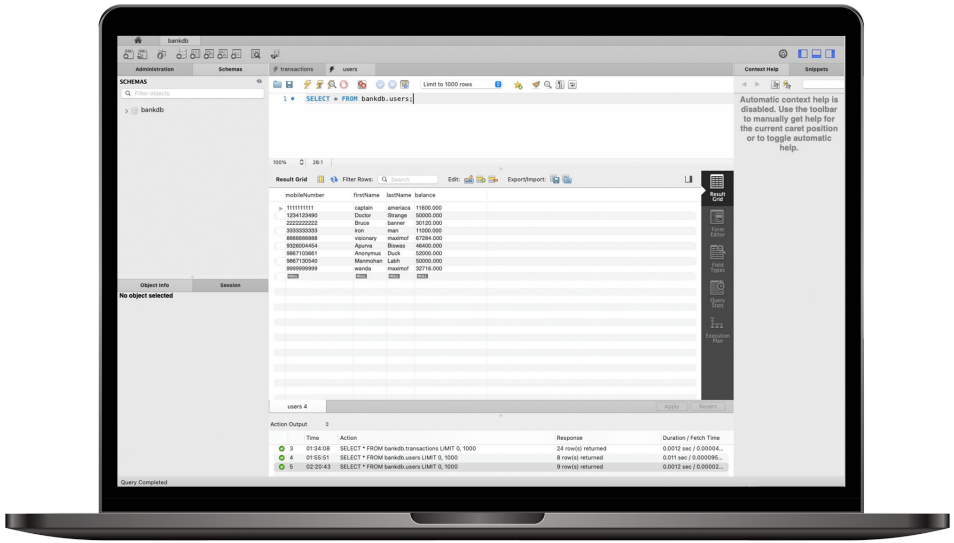
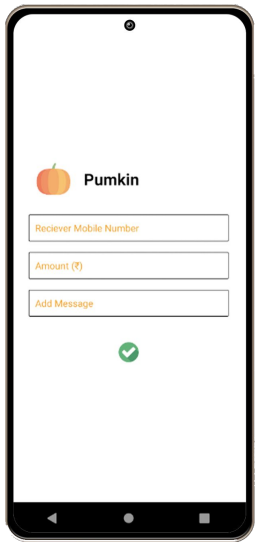
User will first have to register using their Mobile number from website. This website also shows the list of all the users currently registered and the list of transactions that took place. We used Material UI for design.

Work Done





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When the user registers into our web portal their details are feeded into the user database then they’re free to use the pumkin app! Now the user can send money from anywhere without having to worry about the internet issues!

Work Done

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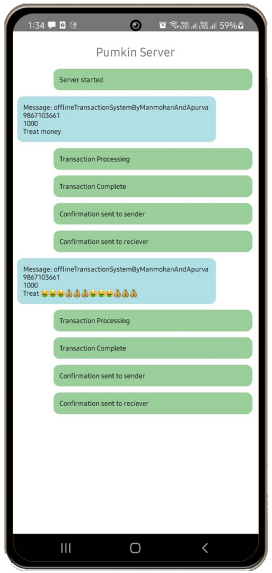
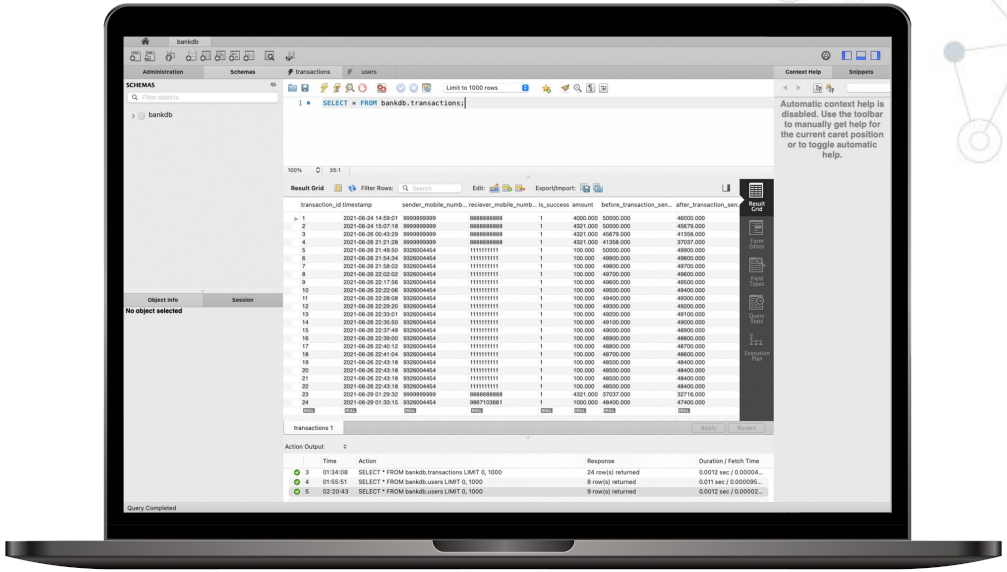
During a translation the DNS will receive the message via cellular network. Thereafter the details from the DNS will be sent to the main server which directs the backend to enter transaction into our database.

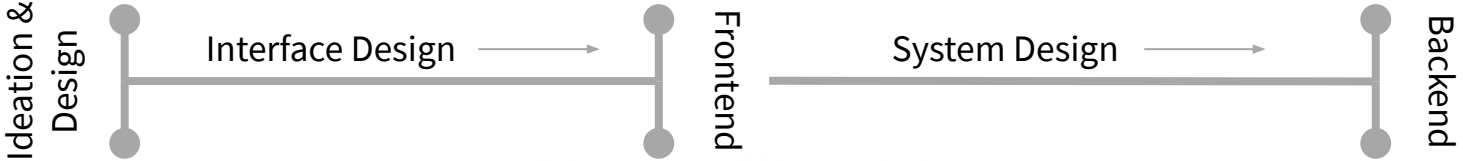




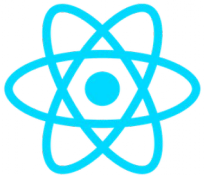
Tech stack

Ideation

React Native



Figma



React

Who are we?

Manmohan Labh
B.Tech Mechanical Engineering

CV
https://drive.google.com/file/d/1c8EpZAmvNPpLIgR9m0l9FbQKehKvgcIn/view?usp=sharing

Apurva Biswas
B.Tech Electronics &
Communication Engineering

CV
https://drive.google.com/file/d/1-gnNFmUG0pfnakanLtJGZQF38H9X0dUs/view?usp=sharing

Project Repository Link

https://github.com/labhmanmohan25/Offline-Transaction-System

Thanks!