
IDC
IIT Bombay

Banking for the Urban Low-Income Group

Degree Project Two

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Project Sponsor : FINO
Finance Information Networks and Operations

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M Des (Interaction Design)

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Abstract

Bank is a fundamental financial setup which formalizes our financial activities. Banks have played a major role in helping manage our money, offer fair savings and credit products. With intervention of digital technologies banks have re modified their functioning and reach. But there is a large section of society is still unbanked or under served.

In my project I have tried to understand financial needs of Urban Low Income users and mismatch between current banking services offered to them. Their needs and cognitive potential is different due to low levels of literacy, low monthly earning and low digital technology intervention. The most felt needs for this user group is of easy account enrollment, suitable savings, credit and remittance products with micro value transactions on a suitable delivery channel.

As per plans of Financial Inclusion, RBI has introduced No Frills Savings Account with relaxed KYC norms and encourages banks to partner with banking facilitators like FINO which help them source banking services to unserved and under served population. This project in partnership with FINO's current setup allows me to explore potential of mobile banking which offers suitable financial services in a safe and usable interactive experience.

Design Process Overview

Why (Needs and Opportunities)	How (Process)	What (Deliverables)
Needs A large section of society in India is still unbanked or underserved by current financial institutions. There is a lack of suitable financial product for low literate, low income segment. There is a lack in delivery capacity.	Literature Study Banking Theory Interfaces for low literate Financial Institutions	Final Design Options IVRS Banking IVRS+Flash SMS Banking IVRS Mobile Application
	Contextual Inquiry User Recruitment, Screener, Pilot studies, Interviews.	
	Analysis and Interpretation Affinity mapping of User Statements, Insights, Observations, Design Ideas, Mind Maps.	Design Use Scenarios Video Recordings of users using Mobile Banking in contextual setting.
Opportunities Bottom of pyramid, emerging markets, the next 4 billion. Financial Inclusion Plan. Advances in ICT4D and changing adaptability to digital medias.	Project Brief Project definition by Industry Sponsor FINO to design a mobile application.	
	Design Scope Defining suitable financial product, services and delivery channels.	
	Design Consideration Interface for low literates and technological constraints.	
	Design Ideation Through Low and Medium Fidelity Prototypes.	Future Scope Usability Evaluation

Literature Study

Financial Exclusion

Financial exclusion is the lack of access by certain consumers to appropriate, low cost, fair and safe financial products and services from mainstream providers. Financial exclusion becomes of more concern in the community when it applies to lower income consumers and/or those in financial hardship. There is a large overlap between poverty and permanent financial exclusion. Both poverty and financial exclusion result in a reduction of choices which affects social interaction and leads to reduced participation in society.

Gradations of Financial Exclusion

- Core Exclusion: Who operate their financial affairs completely outside the regulated financial system.
- Limited Access: May have a basic bank account but poor financial habits and little advice.
- Included but using inappropriate products: Victims of inappropriate products.

The financially excluded sections largely comprise marginal farmers, landless labourers, oral lessees, self employed and unorganized sector enterprises, urban slum dwellers, migrants, ethnic minorities and socially excluded groups, senior citizens and women. In India 59 % of adult population have bank accounts – in other words 41 per cent of the population is unbanked. In rural areas the coverage is 39 % against 60 % in urban areas.

Financial Inclusion

Financial Inclusion is delivering Banking facilities, financial services to all the people in a transparent and equitable manner at affordable cost.

Hon'ble Union Minister of Finance budget speech 2005- 06:

"The financial inclusion provides business opportunity for the financial institutions at the bottom of the pyramid to expand the volume of business. Profitability can be increased only by finding newer avenues for deployment of funds."

Economically and socially empowering poor and low income people leads to overall development of the Households, Villages, States and finally the Nation.

Basic Challenges of Financial Inclusion:

- Coverage.
- Access to diversified financial products and services.
- Delivery model for day to day transactions.

There are two obstacles to greater financial inclusion. The first is simply commercial. Transaction costs for both banks and clients remain high, particularly in disbursing credit, which is essentially a high cost, distributed business. Further, interest rates remain high in the absence of structured credit assessments.

The second obstacle is policy requirements such as know your customer (KYC) procedures that limit the geographical reach of financial services beyond physical bank branches.

RBI has moved to enforce multiple policy and industry changes to bring in Financial Inclusion:

- Banks have been asked to voluntarily make available a no frills account, and all printed bank material has to be made available in regional languages.
- KYC procedures have been simplified for low income groups.
- Significantly, since January 2006 banks can provide a full range of banking services through a business facilitator and correspondent (i.e. MFI partnership) models. Previously, MFIs could only provide credit, but not open bank accounts.
- The Credit Information Bureau Act, 2006, will eventually establish a credit bureau that makes available credit histories of individuals and small businesses. This should lower risk for banks, in extending credit further.

Contextual Inquiry

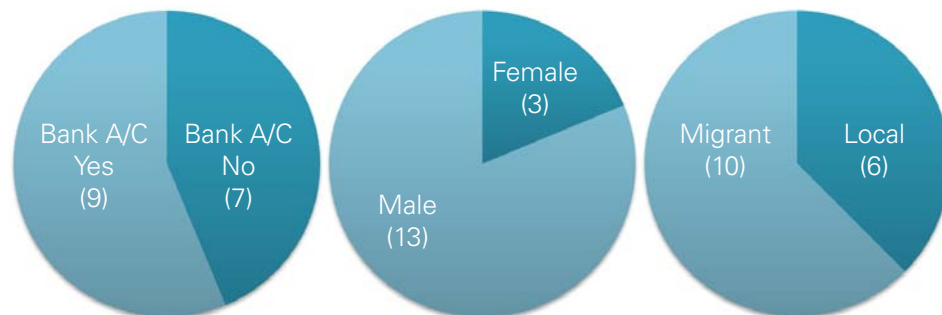
To understand the ground realities at base of pyramid, needs and problems people actually face, I conducted User studies of three user categories:

- End Users- 16 Users
- Stakeholders- 2 Bank Managers
- Banking Facilitators- 2 Managers, 3 Agents

My focus of conducting user studies was to discover end users financial behaviors. Initially I conducted 10 rapid interviews in IIT Campus and neighbourhood as a warm up exercise to frame base for my detailed contextual inquiries. After that Users were recruited for detail conversations in urban locations of Mumbai for example at construction sites, places of work like shops etc.

User Profiles:

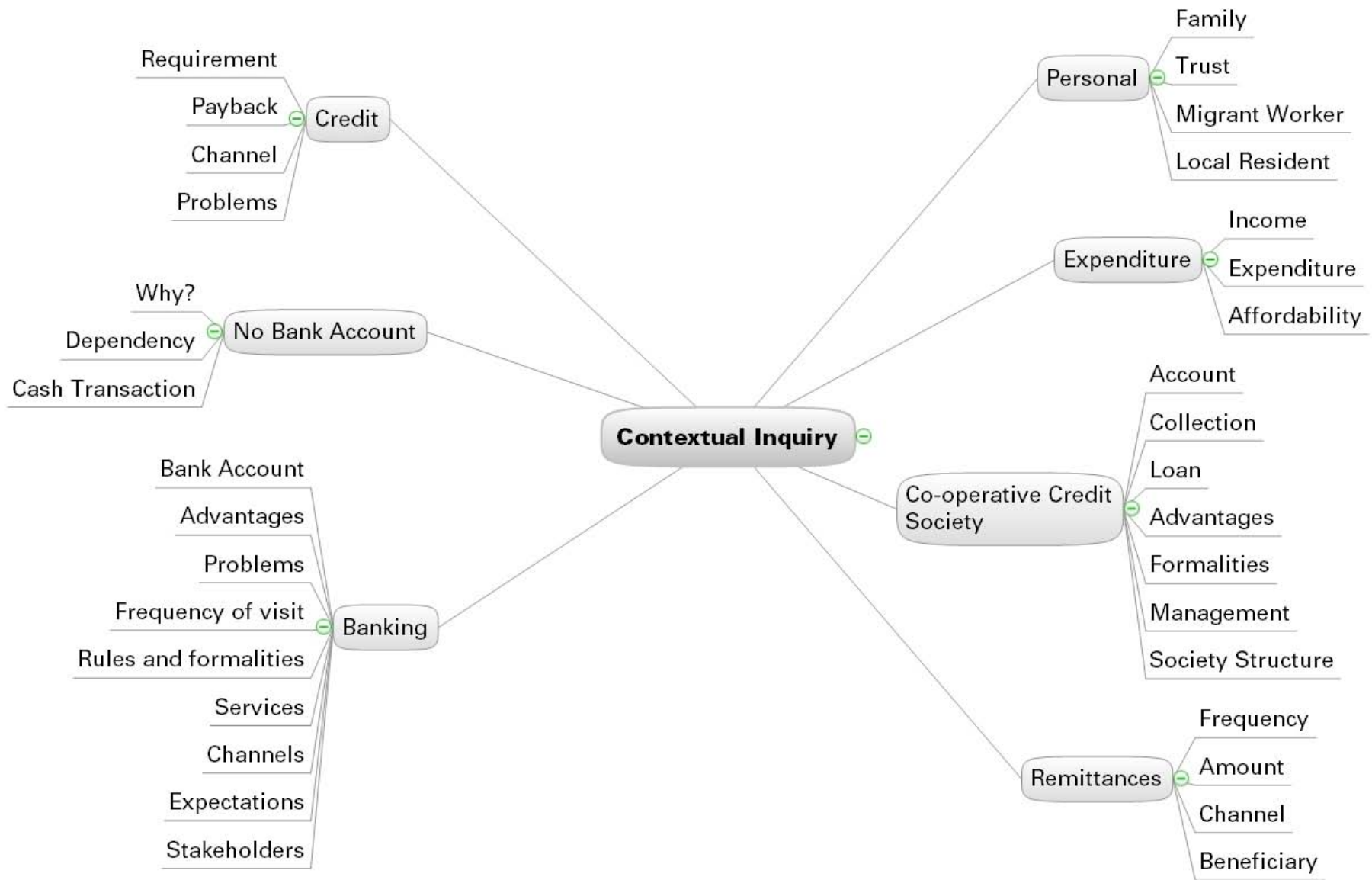
- All users 18-60 years old.
- Classified users based on their Income, Literacy Level ,if they already have bank accounts or not, Local or Migrant workers and gender.



User	Sex	Literacy	Income (pm)	Bank A/C	Residence
1	F	NO	3k-4k	N	Local
2	M	NO	7k-8k	N	Migrant
3	M	NO	5k	N	Migrant
4	F	NO	3.5K	Y	Migrant
5	M	5th	4k-5k	N	Migrant
6	M	7th	4k	Y	Migrant
7	M	7th	18k	Y	Local
8	M	8th	3k-4k	N	Local
9	M	9th	7k	Y	Local
10	M	10th	10k	N	Migrant
11	M	10th	3.5k	Y	Local
12	M	12th	10k	N	Migrant
13	M	Graduate	14k	Y	Migrant
14	F	Graduate	8k	Y	Migrant
15	M	Graduate	8k	Y	Migrant
16	M	Post Graduate	25k	Y	Local



Contextual Inquiry | Affinity mapping



Contextual Inquiry | Interpretation

User Study Findings: User Profile

After conducting user studies, I defined targeted users essentially as Urban dwellers from Low Income segment with Low Literacy level. The findings after affinity mapping yielded following characteristics to understand user segment at base of pyramid.

- Residential
- Occupation
- Finance
- Literacy

Residential

Locals

- Usually have Photo ID and Residential Address proofs- Ration Card, Electricity Bill, Election Card, PAN Card etc.
- They get benefits of local domicile.
- Their attitude towards migrant workers is- 'Ye UP, Bihar ke log bahut chalu hote hai, sab humari naukri khat hai'.
- They are comfortable with Local language.

Migrant Workers

- They usually have Residential Proof of their home state, which is not valid in other state.

- They prefer to stay in a community of people coming from same location.
- Local language becomes a big trouble for them.

Occupation

Formal Sector



Government Job, Private Job like Security Guard in IIT

- Have better safety of Job.

- Salaried employees and have savings like PF etc.
- Employer takes care of medical needs.

Semi Formal Sector



Jobs under a contractor like construction labor under Godrej Constructions.

- Have constant risk of losing job.
- Get income as daily wages or monthly salary.

Informal Sector



Unauthorized jobs like Vegetable seller, Hawker

- Seasonal nature of job.
- High risk of loss like- "I purchase a pineapple for Rs 23 and sell it for Rs 25, I just earn Rs 2 as profit and if the pineapple gets spoiled, I lose all the money"
- Municipal authorities and police charges fine.

Finance

Income

- Typically user income ranges from: Rs 3000 to Rs 8000 per month.
- They get income as Daily wages or Monthly salary.
- Some people get salary in two breakups- Advance salary on 25th and balance salary on 10th every month.
- Non taxable income.

Expenditure

- Carry a cash of Rs 50 to Rs 200 in pocket everyday.
- They prefer to accept cash and make all payments in cash.
- Major expenditure is on basic amenities like- daily travel, ration, rent etc, usually maintain a credit account (Khata) in ration shops.
- Festivals bring over expenditure.
- To purchase anything, they take just that much cash, with extra money you tend to spend.
- Males spend around 40-50 rupees per day in drinking, they have become habitual.

Literacy

- Users are functionally literate.
- They can recognise numbers and perform primary calculations for daily life activities.
- They have either low or no formal education.
- They are comfortable with local language.
- Reading and writing in English is a trouble.
- For literacy works they are dependent on Literates.

Five levels of functional literacy

- Level 1 indicates persons with very poor literacy skills: they have some alphabetic knowledge, but they cannot use this knowledge in a functional manner.
- Level 2 persons can deal only with text material that is simple, short and clearly laid out. Therefore reading and writing tasks for this group should not be too complex.
- Proficiency on level 3 is considered to be a suitable minimum for coping with the demands of everyday life and work in a complex literate society. This level requires the ability to integrate several sources of information and solve more complex textual problems.
- Levels 4 and 5 describe persons who demonstrate command of higher-order information processing skills.

User Study Findings: Financial Needs

The financial behavior of this user segment is different from what we normally see in current banking structure. They essentially deal in a cash economy. Findings from user studies gave me an idea of the mismatch between current banking products offered today compared to what actually these users want.

There main financial needs can be classified in following three categories:

- Savings
- Remittance
- Credit

Savings I Family

- Wants a secure future for children.
- Joint family: elders are there to take care of emergency needs.
- Shares his PIN no. with wife and nephew.
- Limits his spending so as to save money to send home.
- Gives all money to wife.

Savings I Affordence

- Monthly savings are minimal as nothing is left.
- FD kya karne ka..itna parivare hai khana kha se khayenge
- Low income, so do small savings as cash at home.

Savings I Investments

- People in formal service sector have some financial backup, and get pension after they retire.
- Parental property- agricultural land at home.
- Prefers to invest money in small property in village.
- Does not have any backup if require large cash in times of emergency.
- Investment in Gold is not preferred.

Savings I Unknown Investments

- Wife secretly saves some money every month.
- Father had some parental property in village, he died so I am not aware.

Remittances I Frequency

- A very strong need of migrant workers.
- Sends Rs. 2000 to 2500 pm.
- Sends money every month or once in two months.
- Sends money as soon as they get salary.

Remittances I Channel

- Cash through a friend
- Money Order (pays extra money)
- Through an agent (pays commission)
- Rarely use Joint bank account.

Credit I Requirement

- Take small loans like Rs 100, Rs 700, Rs 2000 for daily needs.
- Big Loans- Rs 5000, Rs 10000, Rs 50000 etc. for emergency needs.
- Take loan of Rs 50000 to purchase land in village.

Credit I Channel

- Take small loans from employer.
- Take loans from local moneylender.
- Relatives and Friends.
- Credit cooperative societies

Credit I Payback

- Employer deducts small amount every month from salary.
- Easy to pay back to relatives.
- Escapes Interest on loan.
- If you don't pay back, relationships get spoiled.
- Mutual trust is must.
- Local moneylender cheats them by charging extra money.

Financial Institutions

As per the presence of formal financial institutions in urban areas, the following three FIs are dominantly used by users for financial activities in urban areas.

- Bank.
- Credit Cooperative Society.
- Post Office.

Bank

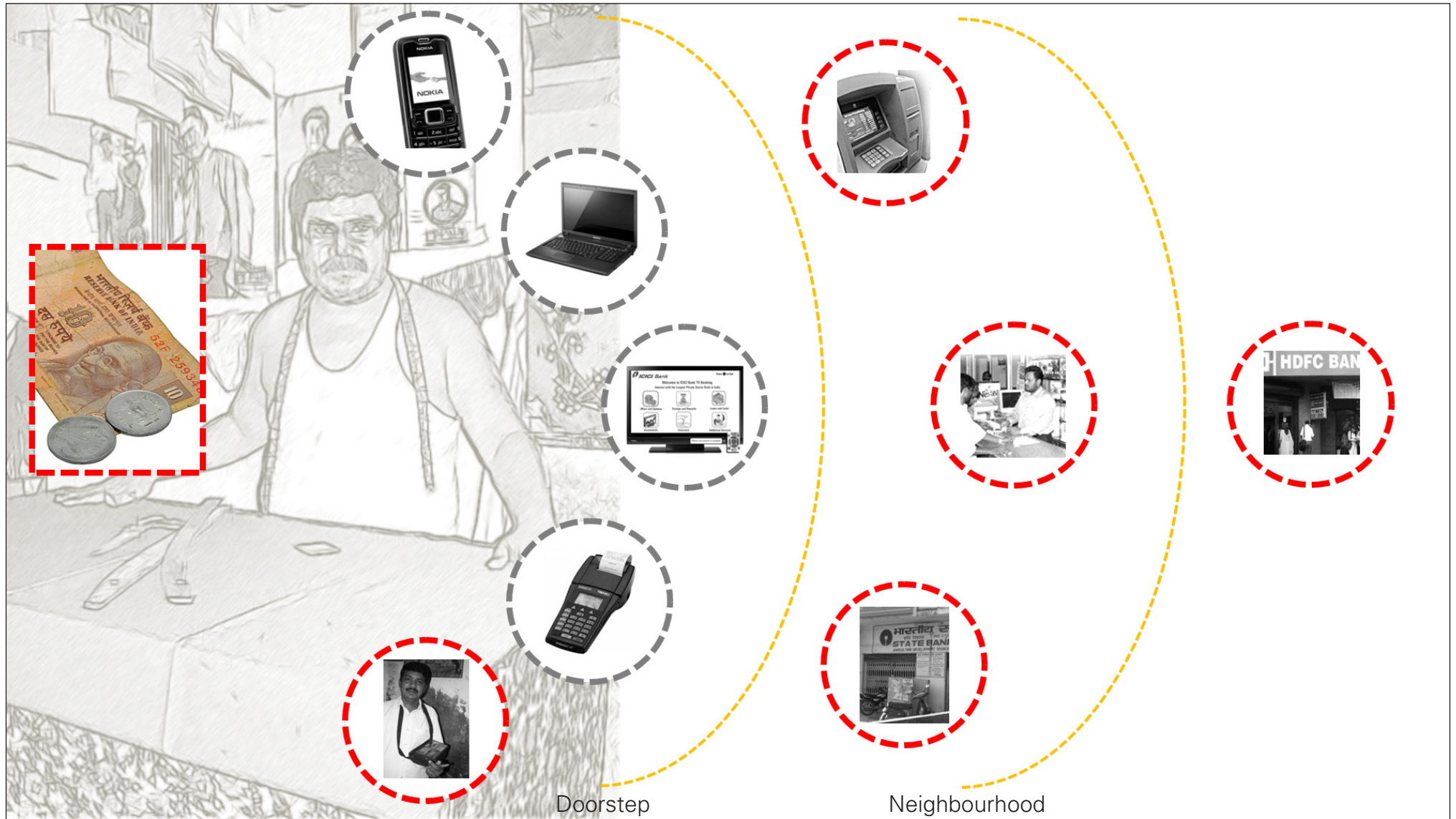
A bank is a financial institution licensed by a government. Its primary activities include borrowing and lending money. Banks today offer many services through traditional and contemporary distribution channels.

Currently, India has 88 scheduled commercial banks (SCBs). 27 public sector banks (that is with the Government of India holding a stake), 31 private banks (these do not have government stake; they may be publicly listed and traded on stock exchanges), 38 foreign banks. They have a combined network of over 53,000 branches and 17,000 ATMs. According to a report by ICRA Limited, a rating agency, the public sector banks hold over 75 percent of total assets of the banking industry, with the private and foreign banks holding 18.2% and 6.5% respectively.

Banking Services Vs. Channels

Banking Services Vs. Channels	Branch	ATM	Mobile	Agent	Telephone banking	EFTPOS	Branch Free Banking	TV Banking	Telegraphic Transfer	Mail	Internet
Raising Funds											
Fixed Deposits	Y	N	N	N	N	N	Y	N	N	N	Y
Saving Deposits	Y	N	N	Y	N	Y	Y	N	N	N	Y
Current Deposits	Y	N	N	N	N	N	N	N	N	N	Y
Recurring Deposit Account	Y	N	N	N	N	N	Y	N	N	N	Y
Lending of Money											
Cash Credit	Y	N	N	Y	N	Y	N	N	N	N	N
Over Draft	Y	N	N	N	N	N	N	N	N	N	N
Loans	Y	N	N	Y	N	Y	N	Y	Y	Y	Y
Discounting of Bills	Y	N	N	N	N	N	N	N	N	N	N
Agency of Services											
Collection	Y	Y	N	Y	N	Y	N	N	Y	N	N
Payments	Y	Y	N	Y	N	Y	N	N	Y	N	N
Account Statements	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Execution of Standing Orders	Y	N	N	N	N	N	Y	N	N	Y	Y
Collection of Dividend and Interest	Y	N	N	N	N	Y	Y	N	Y	N	N
Purchase and Sale of Securities	Y	N	N	N	N	N	Y	N	N	Y	Y
Transfer of Funds from one Bank or	Y	Y	N	N	N	N	N	N	N	N	Y
Acting as a Trustee or Executor	Y	N	N	N	N	N	N	N	N	N	N
Acting as Agent, Correspondent or	Y	N	N	N	N	N	N	N	N	N	N
Miscellaneous Services											
Letters of Credit	Y	N	N	N	N	N	N	N	N	N	N
Foreign Exchange	Y	N	N	N	N	Y	N	N	N	N	N
Safe Custody of Valuables and Secu	Y	N	N	N	N	N	N	N	N	N	N
Acting as a Referee	Y	N	N	N	N	N	N	N	N	N	N
Information and Statistics	Y	N	N	N	N	N	N	N	N	N	N
Underwriting	Y	N	N	N	N	N	N	N	N	N	N

Cash Transaction and Channel Proximity



How does bank looks at this user group:

- Person who can not sign is an illiterate.
- Rules to be properly explained to them by officer.
- LTI should be attested in the account opening form by introducer.
- Identification proof as per KYC norms.
- No cheque book to be issued.
- All transactions should be witnessed by some other customer in bank.
- Transactions more than Rs 5000 should be through manager with oral confirmation.
- Account marked as high risk.
- Passbook is verified by photo, not the LTI.
- Opening of Joint account with a literate should not be a matter of routine.
- In processing of loans banks make no difference for poor.

How does user looks at the bank:

Why they don't do banking?

- Financial constraints restricts them.
- Not aware of banking benefits.
- Someone in family has a bank account.
- Dependency on others for literacy work.
- Not familiar of banking formalities and processes.
- Bank does not open their account due to lack of ID proofs.
- Banking services and channels don't solve their real needs.

Why they do banking?


- Employer opened the bank account as he pays by cheque.
- Had collected some money, so opened a bank account.
- Government benefit schemes deposit money to bank accounts.
- Village pradhan suggested to open a joint bank account.

Rules and Regulations

- Not aware, has never been told.
- Not aware of bank branch numbers.
- Different banks have different fees.
- Policies are not transparent.
- Confused- Debit card is credit card.
- Will ask someone who has a bank account.
- Don't get update notifications of changes in rule.

Formalities

- Too many formalities are confusing.
- Learn basic processes like filling up the slip to deposit and withdraw money.
- Directly goes to the known staff, gives him cheque, and takes cash from his counter.
- Bank asks for 100 different questions and paperwork to give loan.
- It takes around 30 minutes in a bank.



Canara Bank

www.canarabank.com
Toll Free Helpline 1800 425 0018

Account Opening Form for Savings Bank / Current A/c (For Individuals and Joint A/c)

(Please fill this form in Capital letters and tick appropriate boxes)

Account No. _____ Customer ID. _____ Customer IC. _____

The Manager,
Canara Bank, _____ Date _____

I / We request you to open
☐ Savings Bank A/c ☐ Canara Saral ☐ Canara Champ ☐ Current Account ☐ Others, Please Specify

I. PERSONAL DETAILS.

FIRST APPLICANT

First Name *Mr/Mrs/Ms* _____ Middle Name _____
 Last Name _____ Father/Husband's Name _____
 Mother's Name _____ Nationality _____

Date of Birth _____ PAN No. _____ or Form 60/61 submitted _____

Staff No. _____ (If employee or ex-employee of the bank)

Occupation ☐ Service ☐ Business ☐ Housewife ☐ Ex-Servicemen ☐ Student ☐ Retired

Canara bank Account Opening Form (6 Pages, 388 Text fields)

	<h1 style="margin: 0;">केनरा बैंक</h1> <p style="font-size: 1.2em; margin: 0;">(भारत सरकार का उपक्रम)</p>	<p>प्रधान कार्यालय : जे सी रोड, बेंगलूर - 560 002, भारत संपर्क करें : www.canarabank.com</p>
<h2 style="margin: 0;">इंटरनेट / मोबाइल / टेली बैंकिंग सुविधाओं के लिए आवेदन पत्र</h2>		
सेवा में : शाखा प्रबंधक : केनरा बैंक	केवल वर्योत्तर के उपयोग के लिए : आवेदन क्रम संख्या : दिनांक.....	
मैं आपकी इंटरनेट / मोबाइल / टेली बैंकिंग सुविधाओं के लिए उपयोगकर्ता के रूप में आवेदन करना चाहता हूँ :- आवेदक का नाम : <table border="1" style="float: right; height: 20px; width: 80%;"></table>		
पता : 	<div style="border-bottom: 1px solid black; position: relative; height: 20px;"> पिन : </div>	
जन तिथि : टेलीफोन (का) : (और) :	मोबाइल नं. : ईमेल आई डी :	एराग्रोटेशन/एयुएस/वेबोएम/वेबोओ
परिवालन की शर्त		
एकमात्र स्वामी / एयूस, प्राधिकृत हमलावर कर्ता जोओएम, संबुक्ता या प्रथम, ने ओ ओ , संबुक्ता या अन्य		
मेरी खाता नं. : या वे या सा श्री डी	खाता नं. 	

Seprate telebanking application Form.

[illegible]

Illiterate users are identified by photograph.


आंक क्र. लिन्स क्र. LINE NO.	तारीख दिनांक DATE	विवरण PARTICULARS	चेक क्रमांक CHEQ. NO.	नकली नकली मॉडल AMOUNT WITHDRAWN	देवली जमा की गई रकम AMOUNT DEPOSITED	शेष बकरी जमा BALANCE	शेष इस दिनांक शेष शेष	नकली नकली मॉडल AMOUNT WITHDRAWN
1	17/04/09	BY CLS	21465		4302.00	4659.00 Cr		
2	17/04/09	DUPLICAT			50.00	4609.00 Cr		
3	17/04/09	Unclef Amt	4302.00 Cr	0.00	Clear Bal	307.00 Cr		
4	17/04/09	BY CLS	21465		4302.00	4659.00 Cr		
5	17/04/09	DUPLICAT			50.00	4609.00 Cr		
6	23/04/09	CSH NDL Paid to SELF		3000.00		1609.00 Cr		
7	19/05/09	CSH NDL Paid to self		1000.00		609.00 Cr		

Tracing passbook entries is very difficult.

Credit Cooperative Society

The urban credit cooperative societies cater to the needs of the urban population, particularly to meet their requirements of credit for consumer articles. There are 2,106 Urban cooperative Banks in the country having deposits of Rs.1.10 lakh crore. Out of these, there are nearly 650 Urban Cooperative Banks in Maharashtra, having the total deposits of Rs. 65,000 crore.

- Locally called Patpedhi
- A field agent visits every member for daily collection.
- People deposit small denominations like Rs 10, 20 daily.
- Very helpful staff in bank, they do all the paper work for them.
- For account opening, one just needs to have one ID proof and one introducer earlier known to the bank.
- Easy loans starting from Rs 10000.
- The concept of credit cooperative societies grow through social networking.
- All the literature is available in local language only, so migrant workers can not open their account.

 **जय मल्हार को.-ऑप. क्रेडिट सोसायटी लि.**
(नोंदणी क्र. : बी ओ एम / डब्ल्यू एस / आर. एस. आर / सी आर / सी ३७८/सन १९९६-१९९७)
मुख्य कार्यालय : १/बी, देवीव्हाळ चाल, तुळशीनगर, कांजुरमार्ग पूर्व, मुंबई - ४२.

बचत/आवर्त/मुदत ठेव
चालू करण्यासाठी फॉर्म

मा. व्यवस्थापक
शाखा : कांजुर

मा. महाशय,
कृपया खालील बचत / आवर्त / मुदत ठेवीचे खाते उघडावे.

देवीचा प्रकार रक्कम रु. कालावधी (दिवस / महिने / वर्षे) व्याज दर

दिनांक : / / २०

बचत / आवर्त / मुदत ठेवीबाबतचे सोसायटीचे नियम मी / आम्ही वाचले आहेत व ते माझ्यावर / आमच्यावर बंधनकारक राहतील.

मुदत संपलेली मुदत ठेव मुदतीनंतर सोसायटीकडे राहिल्यास सदर ठेवीवर बचत खाल्याप्रमाणे व्याज दिले जाईल. तसेच मुदत ठेवी मुदतपूर्व १४ दिवसांच्या आत काढून घेतल्यास सदर कालावधीसाठी व्याज दिले जाणार नाही व मुदत संपलेल्या मुदत ठेवीचे नूतनीकरण केल्यास कालावधीप्रमाणे लागू असलेल्या व्याज दराने दिले जाईल.

स्वतःचे नांव	वडिलांचे नांव / पत्नीचे नांव	अडनांव	वय
१. _____	_____	_____	_____
२. _____	_____	_____	_____
३. _____	_____	_____	_____

निवास स्थान पत्ता : _____

व्यवसाय / मोकरीचा पत्ता : _____

फोन : _____

जन्म दिनांक : / / पॅन क्र. : _____

खाते चालविण्याचे अधिकार - स्वतः / संयुक्त / च्या पैकी कोणीही / च्या पैकी एक

परिचय करून देणार _____ आपला विश्वासू
नांव _____ ठेवीदाराची सही

खाते क्र. _____

Account opening form (Front)

वारसदार

सहकारीसंस्था कायदा १९६० कलम ड. १.११ नुसार ठेवीदारांनी आपल्या वारसाची नेमणूक करणे कायद्याने बंधनकारक आहे. मी/आम्ही खाली व्यक्तीस वारस नेमत आहे.. मी/ आम्ही / माझा/ आमचा/ अज्ञानाचा मृत्यू झाल्यास खालील निर्दिष्ट असणाऱ्या जय मल्हार को.-ऑप. क्रेडिट सो. लि. ने खालील खाल्यातील शिल्लक रक्कम द्यावी.

ठेवीचा प्रकार	क्रमांक	वारसाचे नाव व पत्ता	वय	खातेदाराशी नाते	वारस अज्ञान असल्यास त्याची/ तीची जन्मतारीख
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

आजच्या तारखेस वारस हा अज्ञान असल्याने आणि वारसाच्या अज्ञान कालावधीत माझे/ आमचे अज्ञानाचे निधन झाल्यास श्री / श्रीमती _____

पत्ता _____

फोन : _____

यांची वारसाच्या वतीने ठेवीची रक्कम स्विकारण्यासाठी म्हणून नेमणूक करीत आहे / आहेत.

फोटो

फोटो


फोटो

सही :- _____

ठिकाण : कांजुरमार्ग तारीख : / / २००

लेजरकिपर लेखापाल मा. व्यवस्थापक / शाखाधिकारी

Account opening form (Back)


ठेव नावे
व्हावचर क्र.

जय मल्हार को-ऑप. क्रेडिट सोसायटी लि.

(नोंदणी क्र.: बी.ओ.एम./डब्ल्यु.एस./आर.एस.आर./सी.आर./८३७८/ सन१९९६-१९९७)
 १/बी, देवीदयाळ चाळ, तुळशीनगर, कांजुरमार्ग (पुर्व), मुंबई-४०० ०४२.

खाते क्र.
बचत/मुदत ठेव खाते
 दिनांक: / / २००

खातेदाराचे नांव _____

माझ्या / आमच्या बचत खात्यामध्ये जमा असलेल्या रकमे पैकी

रुपये (अक्षरी) _____
 रुपये

माझे वर नमूद केलेल्या बचत ठेव खात्यास नावे लिहून द्यावी.

कॅश / चेक क्र. _____

खातेदाराची सही

जयमल्हार को-ऑपरेटिव्ह
क्रेडिट सोसायटी लिमिटेड

जय मल्हार को-ऑप. क्रेडिट सोसायटी लि.

गोवर्धनी ब्र.

दुरधवली
5789217

(रजि. बी. को. एम/बन्सु एस्./आर. एस्. आर/सी. आर/८१४८ सन १९६५/१०)
इंडिया नगर, मेरी मैन्सरी कॉलनी, केनी चाऊड नं. १, सोनी नं. १२,
कांजुर मार्ग (पुर्ब), मुंबई ४०० ०४२.

पास-बुक

१) शीर्षक खाते _____
२) बचत खाते १/१०३
३) कर्ज खाते _____

नांव कमिटी सौमरीय उन्मम कमिटी
अवसाधाचा पत्ता कांजुरमार्ग पुर्ब

जयमल्हार को-ऑपरेटिव्ह क्रेडिट
सोसायटी लिमिटेड

जय मल्हार को-ऑप. क्रेडिट सोसायटी लि.
दुरगवडी

१/११, मेकलेस हिल्स कॉलोनी,
मुंबईसह राजेच्या बाजूला, कोजूर
ब्रीलेज रोड, मांजुप (पुणे), मुंबई ४२.

ओळखपत्र

पास-बुक

१) दोघर्ष खाते _____
२) बचत खाते _____
३) कर्ज खाते _____

मांव _____
जयवसायाचा घरा _____

वडी _____

Deposit Slip



जय मल्हार

को-ऑप. क्रेडिट सोसायटी लि.

मुख्य कार्यालय : १/बी, देवीदास पाठ, तुळशीनगर, कांदुलगांव पूर्व, मुंबई - ४२.

सीली क्र. : बी.ओ.ए. / वसुध, एल. / आर.एल.आर. / सी.आर. / C३७C / सन १९९६-९७

[: २५७८ ७२९७]

पा. क्र. दि. :

नाय : यांज कऊ

खाते क्र. रोखा क्र.

पा. क्र. दि. :

नाय : यांज कऊ

खाते क्र. रोखा क्र.

अ. नं.	जमा तपशील	रुपये
 <p style="margin: 0;">नकल प्रत</p>		

रोख/ट्रान्झर/बेक नं. एकूण

शाखा (बुक भूल द्यावी घ्यावी)

अक्षरी रुपये :

रोख/ट्रान्झर/बेक नं. एकूण

शाखा (बुक भूल द्यावी घ्यावी)

अक्षरी रुपये :

व्यवस्थापक/लेखापाल लेजरकिपर

रोखापाल

व्यवस्थापक/लेखापाल लेजरकिपर

रोखापाल

Receipt

Passbook

ચચત ટેબ					
તારીખ	ટેબ હજા		ટેબ મોંઢે		મિલકત ટેબ
	રૂ.	પૈ.	રૂ.	પૈ.	
૨૬/૧૦/૨૦૨૩	૨૫૩		૨૦૦૦		જાલ
૨૭/૧૦/૨૦૨૩			૨૫૩		જાલ
૨૮/૧૦/૨૦૨૩	૨૫૩		૨૦૦૦		
૨૯/૧૦/૨૦૨૩	૨૫૩		૫૦૫૮		
૩૦/૧૦/૨૦૨૩	૫૩૫		૫૫૫૩		
૩૧/૧૦/૨૦૨૩	૫૫૩		૫૦૨૬		
૦૧/૧૧/૨૦૨૩	૨૫૩		૫૦૫૫		
૦૨/૧૧/૨૦૨૩	૨૫૩		૫૦૫૩		જાલ
૦૩/૧૧/૨૦૨૩	૨૨૫૫		૫૦૫૮		જાલ
૦૪/૧૧/૨૦૨૩	૫૫૩		૫૦૫૫		જાલ
૦૫/૧૧/૨૦૨૩	૨૫૩		૫૦૫૩		જાલ
૦૬/૧૧/૨૦૨૩	૨૫૩		૨૦૫૦		જાલ
૦૭/૧૧/૨૦૨૩	૨૦૨		૨૦૦૦		જાલ
૦૮/૧૧/૨૦૨૩	૨૦૨		૨૦૨૫		જાલ
૦૯/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૦/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૧/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૨/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
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૧૪/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૫/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
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૧૮/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
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૨૭/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
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૨૯/૧૧/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
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૦૨/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૩/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૪/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૫/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૬/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૭/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૮/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૦૯/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૦/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૧/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૨/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૩/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૪/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૫/૧૨/૨૦૨૩	૨૦૦		૨૦૦૦		જાલ
૧૬/૧૨/૨૦૨					

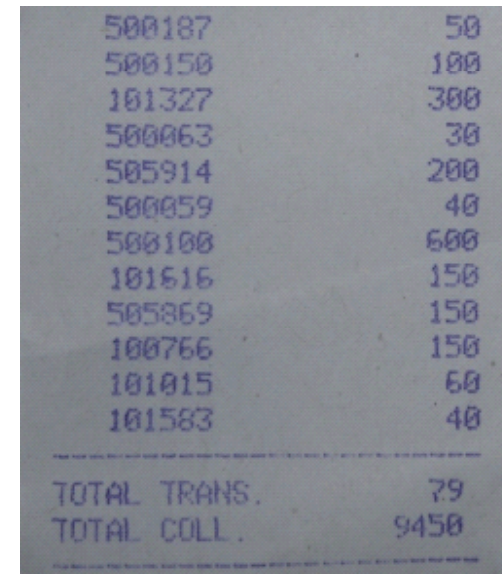
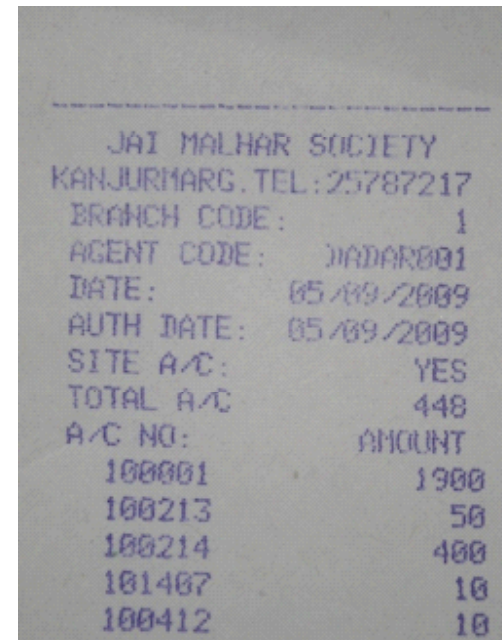
Passbook



Agent



Deposit Receipt



Daily Collection Receipt



Handheld Machine and printer

Space for Communication

----- Postman to detach here -----

M.O. 8
25 Paise

INDIA POST MONEY ORDER

Pay Rupees _____ To _____

Rs. _____

Sender's Signature _____ PIN [][][][][]

Date _____

----- SECOND FOLD -----

P. O. OF ISSUE

M.O. No. _____ Date _____ Rupees _____

Combined Oblong Stamp _____ Assistant _____ Postmaster _____

Rs. _____

FOR OFFICIAL USE ONLY

P. O. OF PAYMENT

Round M.O. Stamp _____ Received Rs. _____

Oblong Stamp _____ Signature of Payee _____

Signature of Witness/Identifier _____

Signature of Paying Official _____

----- FIRST FOLD -----

MONEY ORDER ACKNOWLEDGEMENT

Date Stamp _____ M.O. No. _____ Sender's Address _____

Received Rs. _____ on _____

Signature of Payee _____ PIN [][][][][]

Do not write below this line

Money Order Form

Post office

Post offices have played a major role as a financial institution by offering various banking services like savings bank account, kisan Vikas patra, money order etc.

Money Order in particular has played a major role in Remittance options.

- Users Prefer sending MO over bank transfer.
- Home delivery of cash.
- Family members always use MO.
- Asks employer to fill MO form.
- Don't mind paying extra charges on MO.

Problems I Savings

	Bank	Business Facilitator	ATM	Mobile
Open a savings account	Write in 388 fields (6 Pages form)	One page form with essential info		Agent keys info in mobile
	One error means, refill the form	Fills the form for client		
	Go to bank branch to submit the form	Can do it on behalf of customer		
	Don't understand banking terms and declaration			
	Address Proof is of home state, not accepted in other states	Relaxed KYC- Election Card		
	Bring two witness and one introducer to open an account			
	One week to open an account after address verification	Can get the a/c open in few hours		
	Minimum balance of Rs 500	Zero Balance Account		
Account Information	Go to bank with passbook- takes time	Gives Receipt (fades in one week)	Difficult to understand transactions in mini statement	
	Difficult to understand abbreviations in English	No account statement		
Account Authorization	Thumb impression in presence of one witness	Swipe Biometric Smart Cards	Forget PIN no., account gets blocked	Takes a long time to get user name and password
	people can fake signature	Machine asks agent to put finger right hand ring finger, left hand index finger on scanner	Takes one month to get ATM card and PIN no. separately	Additional password for transactions
Deposit/ Withdraw Cash	Always fill a slip, without errors		Minimum Withdraw of Banknote of Rs 100	
	Go to bank and stand in line	Doorstep accept/gives cash	Minimum Deposit of Banknotes Rs 100, 500, 1000	
	Micro-value transactions not allowed like Rs 10, 20	Allows micro-value transactions	Deposit Each note one by one	
	Frequency of visiting bank is less	Comes daily at mutually decided location	Go to ATM for transactions	
		Daily transaction limit of Rs 5000		
	Update in A/C in one hour	Delay in A/C update	Problem with MDM- accepts cash without updating account	
	Operates in fixed time of 9am to 5pm, lunch timings coincide with customer lunch timings	Customer can come to agent in case of emergency withdrawal or deposit, but depends on Agents availability	ATM machine- out of order or NO 100 rs banknotes available in machine	

Problems I Remittances

Remitter	Bank	Business Facilitator	ATM	Mobile	Post Office
Register beneficiary Party	Beneficiary A/C no. and Bank Name must be known	Verbally tell agent the beneficiary a/c details	Select pre registered user	Self Key In Beneficiary Details with a/c no and bank details	Fill a MO form, with remitters residential address
	IFSC code of the receiving branch				
Deposit Cash	Go to that particular bank	No need to fill slip, agent accepts cash	Same as above	No Cash Transaction	
	Fill the slip and stand in queue				
Transfer from a/c	RTGS Authorization from remitter bank	Agent does it through remitter account	Self Service, Interface is confusing	Self Service, Interface is confusing	
	Must to have an account for both	Must to have an account for both in same bank	Must to have an account for both	Must to have an account for both	
Transfer	Takes approx 1 hour for clearing and transfer in same bank	Takes 24-48 hours for clearing and transfer	Immediate transfer	Immediate transfer	
	Takes 48-72 Hours for clearing and transfer				
	Extra charges for third party transfer	20 Rupees extra for intra bank transfer			
		third party transfer not available			
Notification	Debit shows in Passbook entry without details	Debited amount in receipt			
	Problem in tracing the status of clearing	No account statement			
Beneficiary	Bank	Business Facilitator	ATM	Mobile	Post Office
Notification	No personal update	No personal update	No personal update	Possibility of personal update	
	Go to bank, and ask the officer	Account balance in receipt	Account balance in receipt		
	passbook update		Confusion in understanding- actual balance and withdraw balance		
Withdraw/ Accept Cash	Go to Bank a/c to withdraw	Ask agent to withdraw money from your a/c	Go to atm to withdraw cash		Doorstep delivery of cash by postman

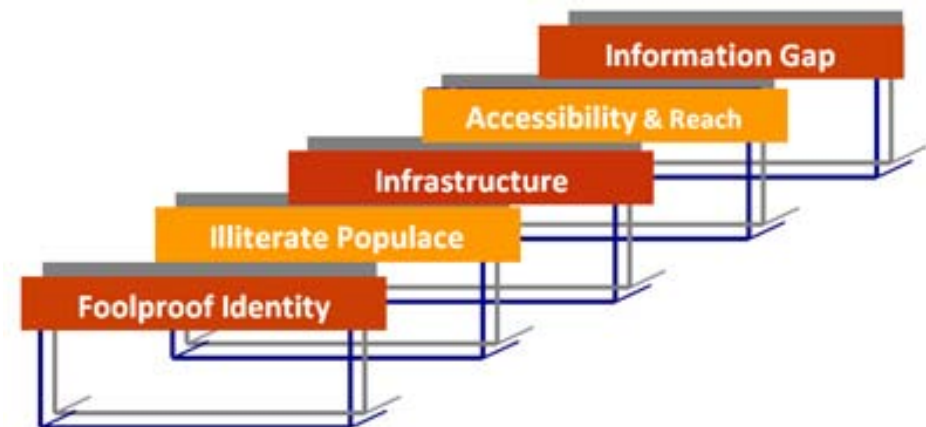
Problems | Credit

	Bank	Business Facilitator	ATM	Mobile
Apply for loan	Problem in filling a detailed form	Agent fills the form at doorstep		Possibility of applying for loan
	Bring a guarantor known to bank			
	Explain the reason for taking loan	Explain the reason for taking loan		
	As per strict KYC norms, many ID proofs are required, which they don't have like salary slips etc	Relaxed KYC norms, Election card works as ID proof + one address proof		pre submitted biometric identity
	Verification of address proof	Agent knows personal address		
	eligible if you are a Salaried individual of good quality corporate, self employed engineer, doctor, architect, chartered accountant, MBA with minimum 2 years standing.	Real-time processing of loan applications within 24 hours		
Amount	Minimum loan of Rs 24000 in Urban Areas	UBI launched Shobagya and Bhagya Loan schemes		
	Minimum loan of 10000 in rural/ semi-urban	Small loans starting from Rs 3000 to 10000 available		
Payback	maximum 48 Installments	Easy Repayment in micro-amounts weekly	Transfer from a/c to loan a/c	Transfer from a/c to loan a/c
	Penalty on late payment	penalty on late payment after grace period		
Security	Mortgage	Minimum deposit of Rs 5000 for the first time in Bank a/c		
	Guarantor			
Withdraw/ Accept cash	Bank usually gives a cheque	Agent delivers cash from loan a/c		
	Bank opens a new loan account			
	Difficult to keep a track of new account			
Notification	No reminder of dew date from bank	Agent personally reminds	No reminder of dew date	Possibility of reminding
		Agent maintains log of transactions		
Credit Scoring	Bank does a detailed credit scoring of a customer on social, physical, salary characteristics etc	Agent does a detailed credit scoring based on set parameters		

Project Sponsor I FINO

Financial Information Network & Operations Ltd. (FINO) was founded on 13th July, 2006 with the single objective of building technologies to enable financial institutions (FIs) to serve the under-served and the unbanked sector and also to service the technology requirements of entities engaged in servicing the bottom of pyramid customers.

One of the biggest challenges in the micro banking industry is the huge amount of paperwork and human effort traditionally involved in supporting micro-transactions and credit scoring potential customers. Other hurdles include Information gap, accessibility and reach, infrastructure, illiterate populace & fool proof identity. High costs coupled with low returns did not make microfinance viable beyond a certain threshold, thus hampering growth. The concept of FINO was germinated to overcome all the above mentioned hurdles and make financial services available to the unbanked.



Hurdles in Micro Banking

FINO is committed to providing a standardized and shared pan – India infrastructure to Banks, Microfinance Institutions, Insurance companies and Government entities that will link clients and financial service providers across the financial spectrum, reducing costs of client acquisition and servicing across the value chain while ensuring that the basic premise of door step delivery to rural customers remains intact.

FINO is a Multibank promoted, professional, financially strong with a Board comprising of Customer Banks and MFI. FINO has the Largest acceptance among FI's and has received awards and recognition from reputed organizations. FINO works on National priority projects (NREGA, RSBY, SSP, etc). Therefore helping reach a Critical Mass to provide economy of scale to all customers. Product Innovation that is derived from deep insight into the requirements of the client segment gained from pioneering work done with MFI, Banks and Research organizations. Pure and complete focus on this segment enables us to sensitize our products and services to meet client needs.

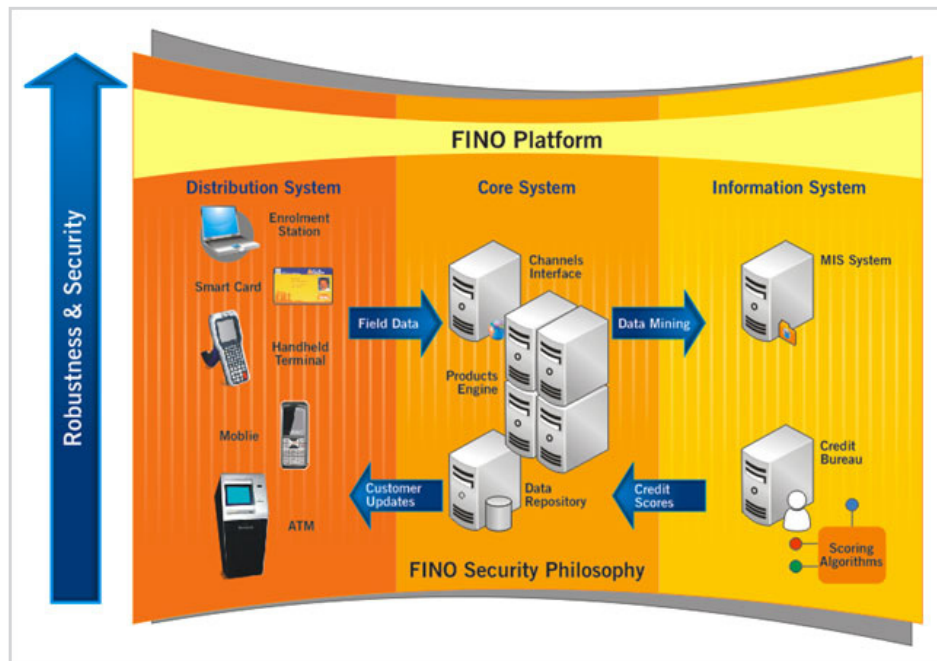
FINO has an in-house Technology R&D team to develop and enhance offerings. Centralized Processing Centre which is ISO 9001:2000 certified and with Robust contingency management procedure. FINO has its Own network of agents (Business Correspondents) at ground level and also works with several partners to reach the remotest parts of the country.

FINO has positioned itself to become the premier provider of technology services to the financial institutions that provide services to the world's unserved and under served populations.



FINO platform's simplicity and robustness is an amalgamation of the strength of 3 integrated pillars –

- Core System
- Distribution System
- Information System



Core System:

- **Channels Interface:** This is imperative component responsible for data management on and from field devices – Transaction and Enrolment alike. It also manages all parameters that govern the field devices application behavior during both online and off-line scenarios.
- **Products Engine:** This component manages the various financial and non-financial product definitions along with their subtle variances for a principal.
- **Data Repository:** This component, as the name suggests, maintains the various principal-customer-products relationships along with their current status and transaction history.

Distribution System:

- **Enrolment Stations:** This component is responsible for capture of the customer demographic and authentication information.
- **Smart Card:** This component is responsible for managing the customer demographic, fingerprint authentication, product relationships – their status and transaction history.
- **Field Transaction Devices:** All devices ingrained with FINO security philosophy and business logic implementation fall under this component i.e. all hand held terminals and fixed terminals.

Information System:

- **MIS System:** This component manages all logics for data messaging to produce information for day-to-day planning and management of operations. The principals may utilize some of the pre-designed reports by FINO or ask for customized reports.
- **Credit Bureau:** This component employs a mix of complex algorithms to assess the credit worthiness of a customer on the FINO platform.

Biometric Enabled Multi- Application Smart Cards:



All customers touched by FINO are provided with a smart-card, which carries their fingerprint, demographic information and financial relationship information on the chip; while the fascia holds the demographic information and cardholder's photograph along with Card Issuer's details. FINO cards, thus, offers itself as a fool-proof unique identity tool, allowing the customer to authenticate self on an offline hand-held device for fulfillment of any transaction without any need to remember a password (PIN). The card can maintain up to 8 relationships with financial (Banks, MFIs, etc) or non-financial (PDS, etc) institutions along with their individual transaction history of up to last 10 transactions. Further, FINO's robust fingerprint validation engine ensures that a customer exists in the system once and once only.

The service agents of the principals of the financial/ non-financial institutions under the FINO umbrella are also given a smart-card with similar details, which forces them to authenticate themselves with their fingerprints as well. This ensures a secure offline transaction authenticated by the customer and principal's representative.

While, the smart-card is an important tool to maintain the sanctity of the offline transaction, it does not mean that all transactions must be offline on FINO platform i.e. based on the nature of transaction, it can be designed to go online.

Biometric Enabled Handheld Devices:



FINO developed customized application for various biometric enabled hand-held devices enforces biometric authentication of the financial/non-financial principal's representatives and the end customer as a pre-requisite of an offline transaction. This, in addition to system level card authentication, forms the basis of the security at the very foundation of the offline transaction system allowing the customer to enjoy the benefits of the product functionality offered to him by the principal. The principal can also be sure that the transaction will be consummated only after due customer biometric authentication..



FINO branch manager fills one page form with one ID proof.



Agent keys in all the entries on a gprs based mobile application.



Agent clicks the photograph through the mobile application.



All the data is uploaded to FINO server.



Information and biometric details are transferred to smart-card through POT device



Biometric smart card is printed immediately.



Micro Deposit Machine, only deposits Rs 100, 500, 1000



Agent puts their finger on biometric sensor for authentication.



Agent visits regular customers daily for collection of Rs 20, 30 etc.



Transaction receipt fades away in a day.

Project Brief

FINO Mitra (Mobile Based Information and TRAnsactions)

FINO is developing mobile based banking solutions, as the intervention of mobile phones is very high in India. The potential of mobile phone as a personal information and communication device can not be ignored. Use of mobile phone in banking has been explored upto various limits and its advantages and limitations are evident.

Today there are over 350 million mobile subscribers in India and around 15 million subscribers are added every month. Mobile networks today are reaching remote towns and villages in far corners of India. The cost of the mobile services in India is amongst the cheapest and continues to get lower as each day progresses. Thus mobile networks with their wide reach and cost effective operations provide the perfect alternative channel for enabling microfinance. Realizing the exciting opportunities offered by mobile as a platform, FINO has launched FINO - MITRA (Mobile Based Information and TRAnsactions) a comprehensive set of end-to-end offerings for enabling microfinance initiatives leveraging mobile as a platform.

FINO - MITRA covers the entire range of services starting from operational tasks such as enrollment to complex transactions such as mobile commerce. FINO - MITRA caters to the needs of the agents/ middlemen as well as the end users. For the agents FINO - MITRA offers Mobile Based Enrolment as well as Mobile Based POT. For the end users it offers Mobile Banking, Mobile e-wallet, M-commerce thus completing the solution ecosystem for enabling financial inclusion using mobile as a platform.



Project Aim

Design a mobile banking application for urban low income user segment.

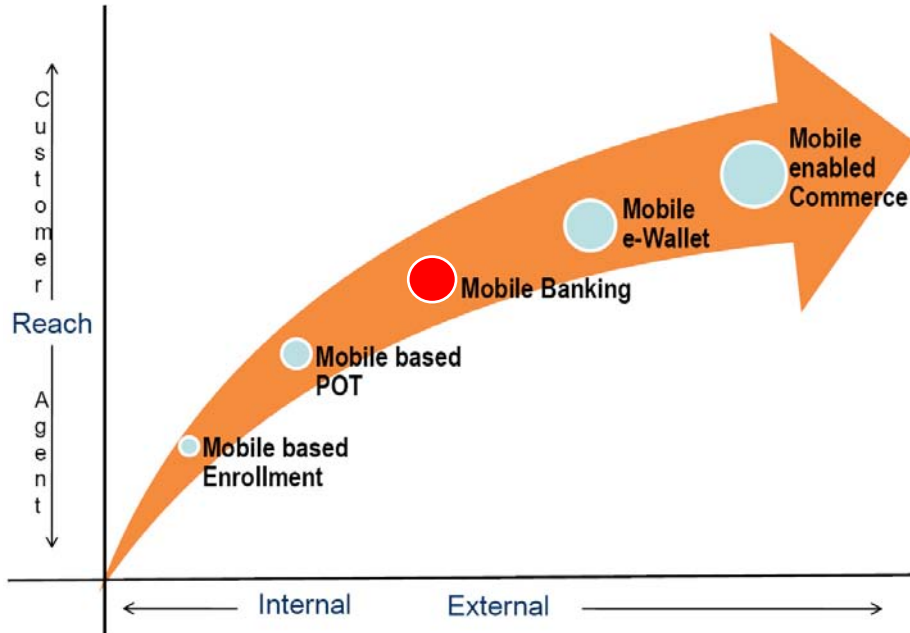
The missing element is a mobile banking application for this user segment, with very important considerations like:

- Delivery of suitable financial products for this user segment.
- Accessing information and interaction with banking interface.
- Accommodating their cognitive and literacy limitations.
- Foolproof authentication and access to financial information.
- Personal control and privacy of banking information in a shared public environment.

Banking Environment

FINO acts as a banking facilitator to Indian banks, through field agents.

Agent takes care of all account enrollment and cash transactions with the end users.



Suitable Banking Products

Savings

- No Frills Savings Bank Account
- Low KYC norms- One ID proof.
- Zero Balance Account.
- One page form.
- Micro Value Deposit
- Micro Value Withdrawal
- Doorstep Banking

Credit

- Micro Value loans
- Easy Payback amount
- Payback Reminders
- Less formalities

Remittance

- One time beneficiary registration through agent.
- Auto debit from bank account through electronic transfer.
- Home delivery of cash.




UBI - FINO स्मार्टकार्ड धारको के लिए अनोखी ऋण (Loan) योजना भाग्य और सौभाग्य

- परिक्रामी आधार पर ऋण योजना,
भाग्य लोन : Rs. 3000/- से Rs. 12000/-
सौभाग्य लोन : Rs. 1000/- से Rs. 10000/-
- कम-से-कम ब्याज दर!
- LIC की ओर से संलग्नित Rs. 50000/- का जीवन बीमा
- बहुविकल्पित साप्ताहिक भुगतान का प्रावधान
- नो प्रोसेसिंग फीज / कम-से-कम डॉक्युमेंटेशन

पात्रता सूची :


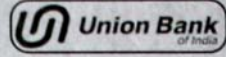
- अक्टिव स्मार्ट कार्ड धारक
- कम-से-कम 10 ट्रैन्सैक्शन अथवा एक महीने से अधिक ट्रैन्सैक्शन अवधि
- दो अतिरिक्त स्मार्ट कार्ड धारकों द्वारा गारंटी
- साप्ताहिक किश्त के अलावा कम-से-कम Rs. 50 की बचत जरूरी
- 50% जमानत राशि (केवल 'सौभाग्य' लोन के लिए)






9401 2415 1234 2678

Affordable Credit Scheme

भाग्य

ऋण (Rs)	साप्ताहिक किश्ते (Rs)				
	7 हफ्ते	14 हफ्ते	21 हफ्ते	28 हफ्ते	35 हफ्ते
3000	440	225	155	X	X
6000	X	445	305	235	X
9000	X	X	455	350	285
12000	X	X	605	465	375

सौभाग्य

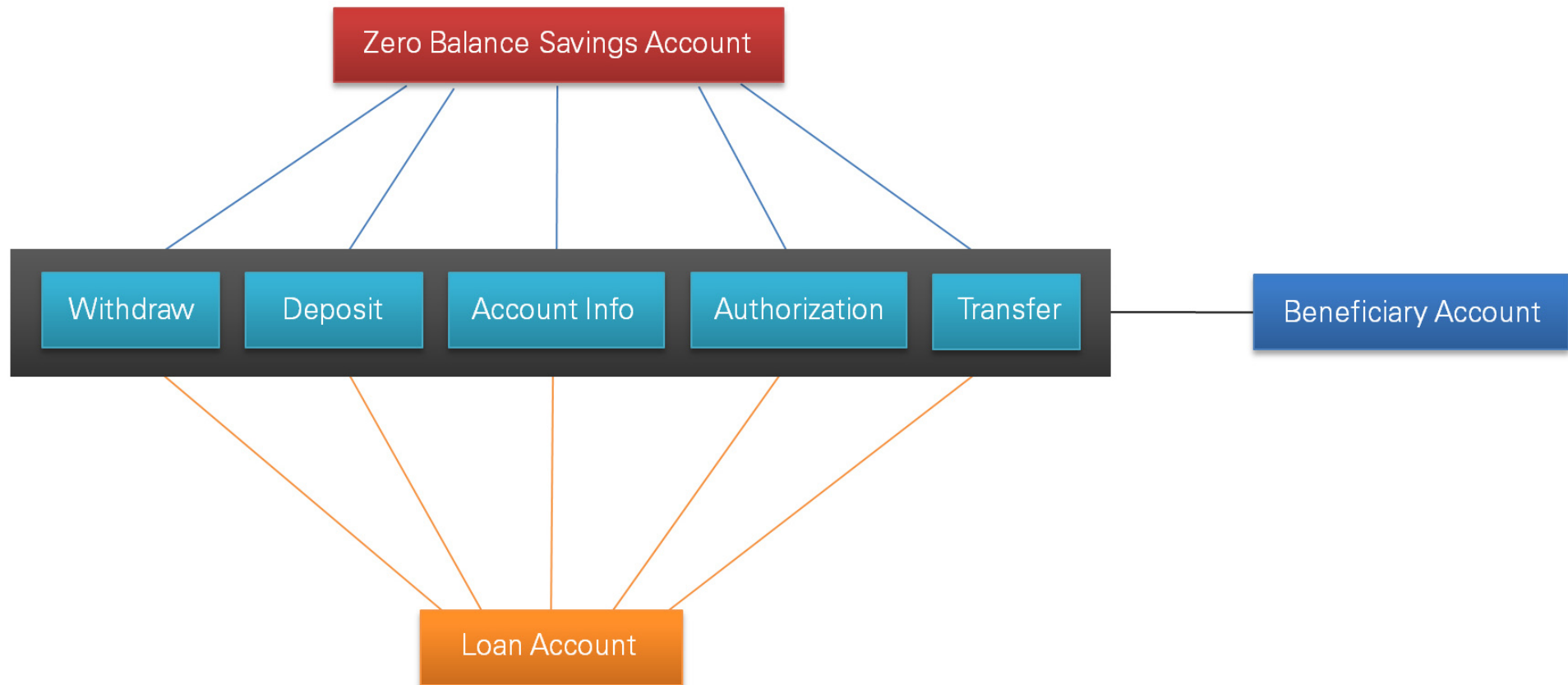
ऋण (Rs)	साप्ताहिक किश्ते (Rs)				
	7 हफ्ते	16 हफ्ते	21 हफ्ते	36 हफ्ते	44 हफ्ते
1000	150	70	55	35	30
2000	295	135	105	65	55
3000	440	200	155	95	80
4000	585	265	205	125	105
5000	730	330	255	155	130
6000	875	395	305	185	155
7000	X	460	355	215	180
8000	X	525	405	245	205
9000	X	590	455	275	230
10000	X	655	505	305	255

लोन अप्लाय करने हेतु/अधिक जानकारी के लिए FINO ब्रँच में संपर्क करें

मुंबई - 9870988763 (शिवाजी नगर) दिल्ली - 9958792852
 9870988762 (घासवी) 9717096169
 9870981880 (घाटकोपर)

Loan and EMI Options

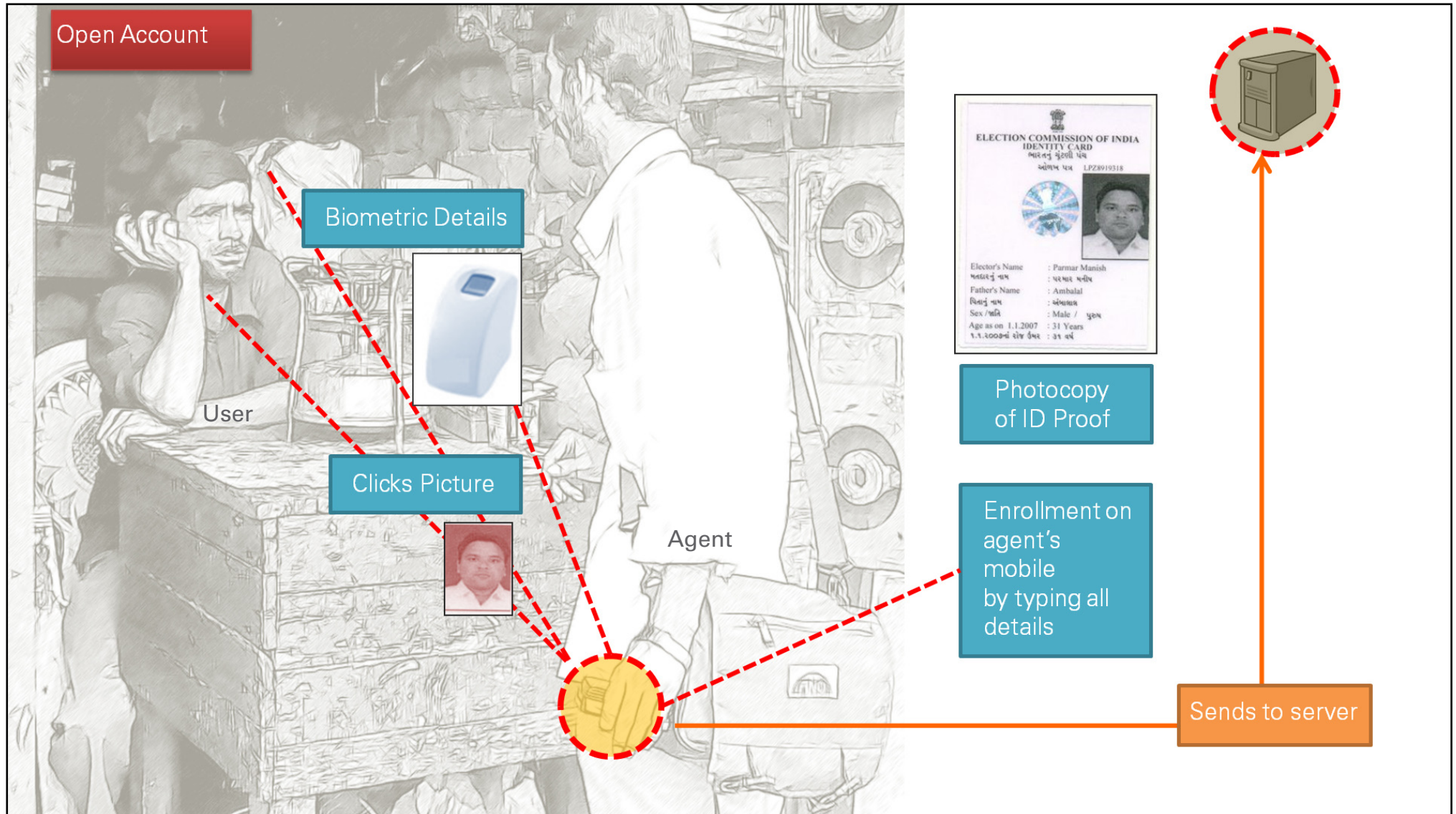
Design Scope I Account Structure



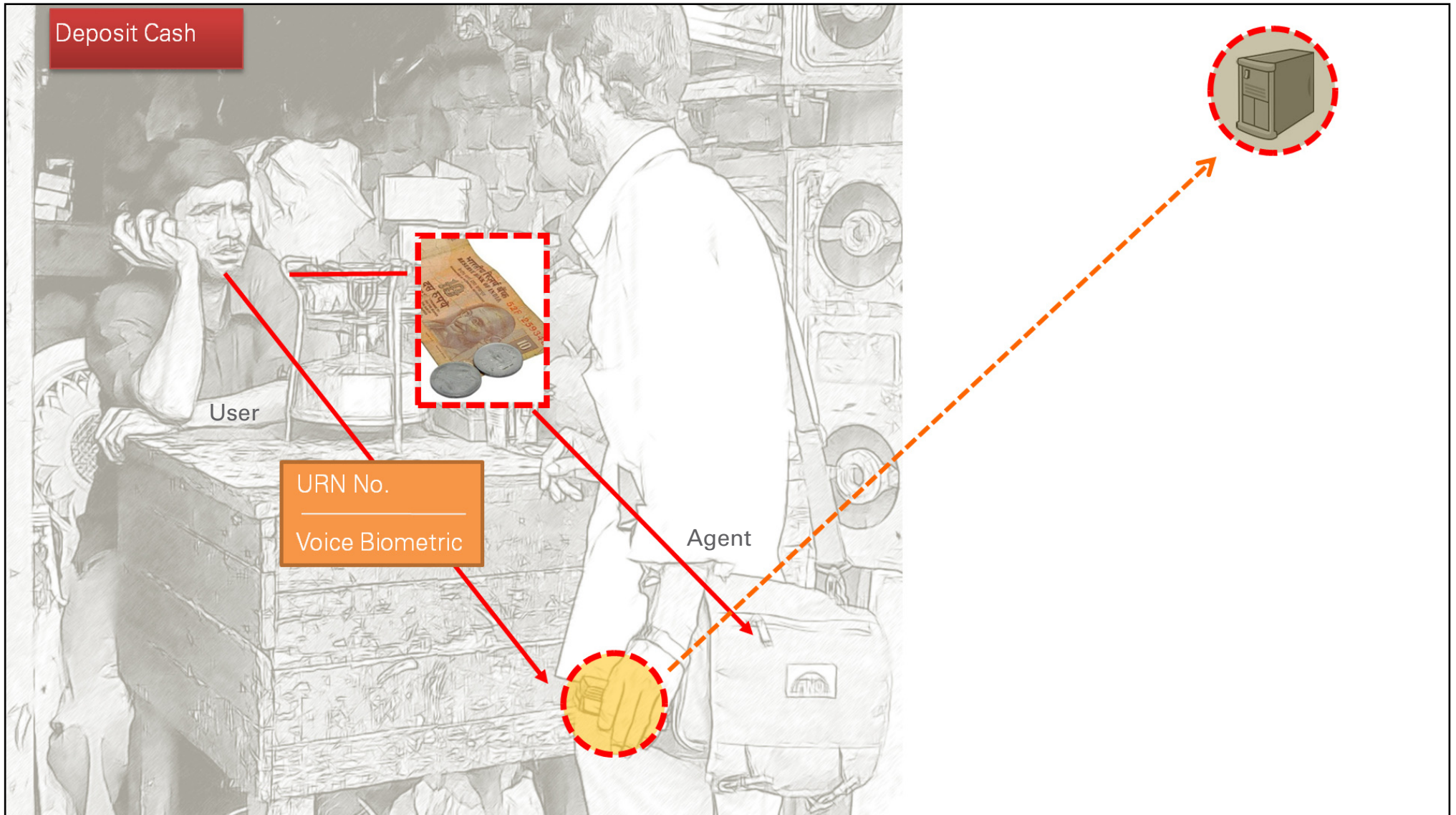
Design Scope | User Agent Environment



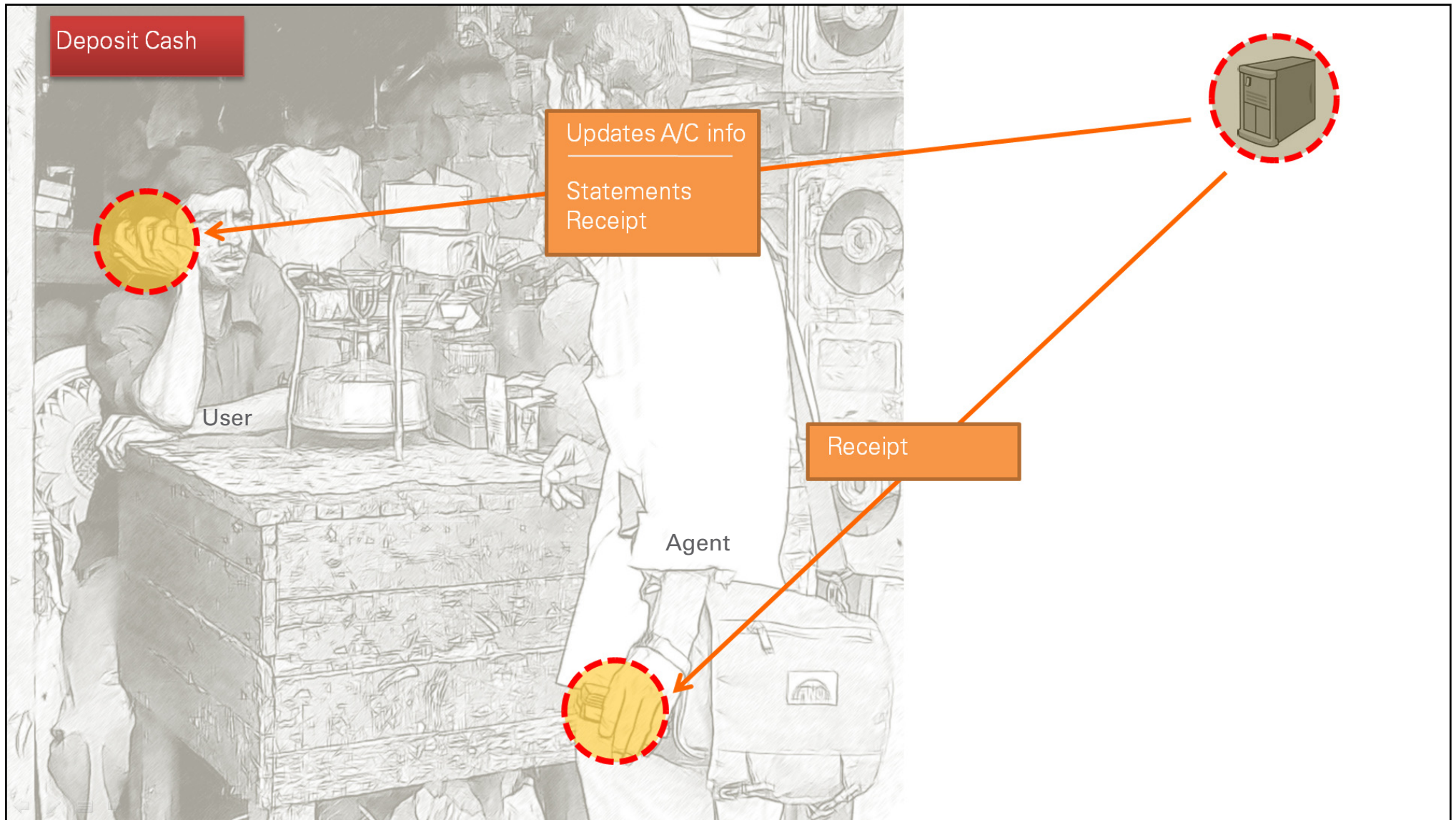
Design Scope | Account Enrollment



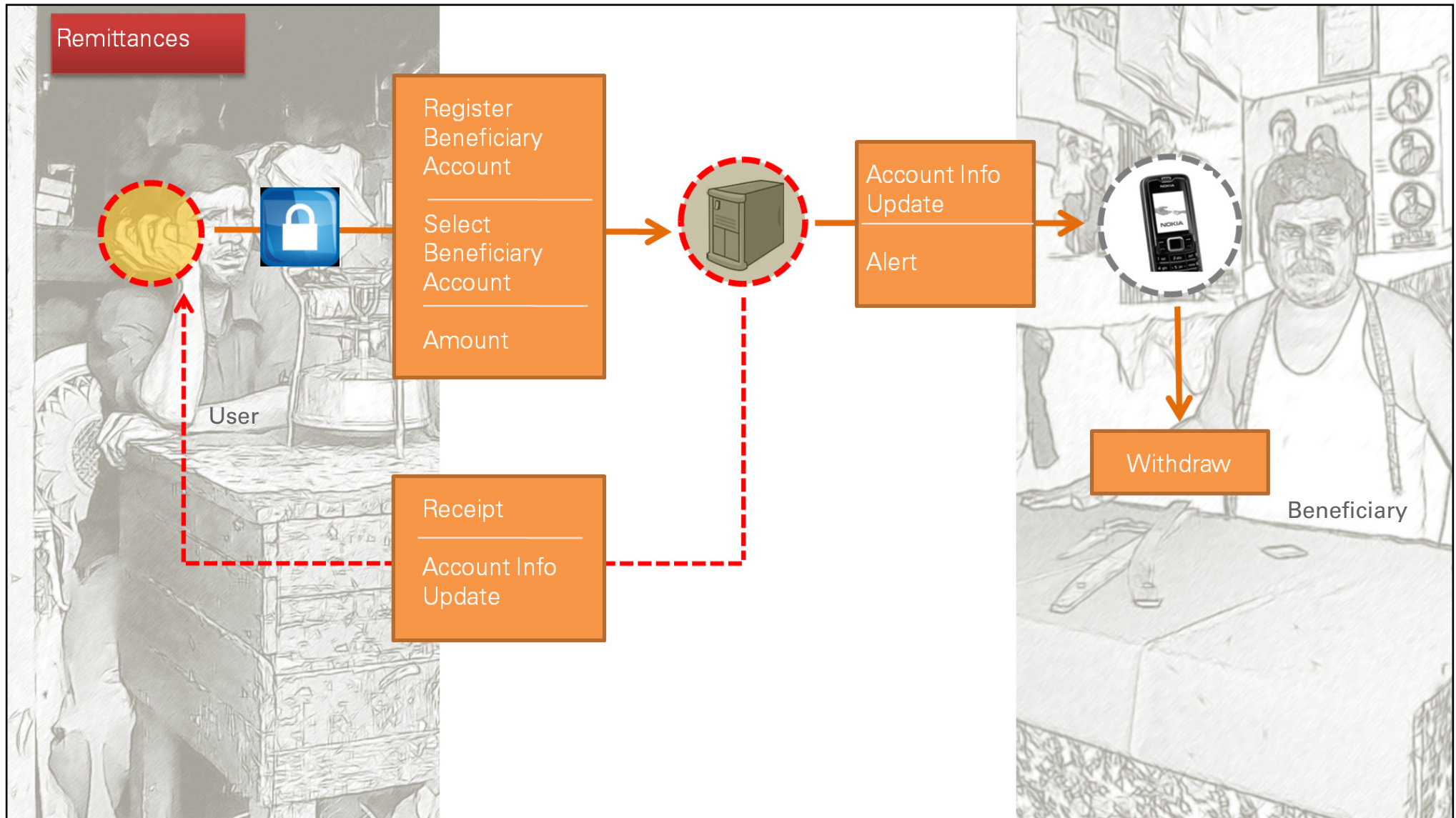
Design Scope | Cash Transaction on Site



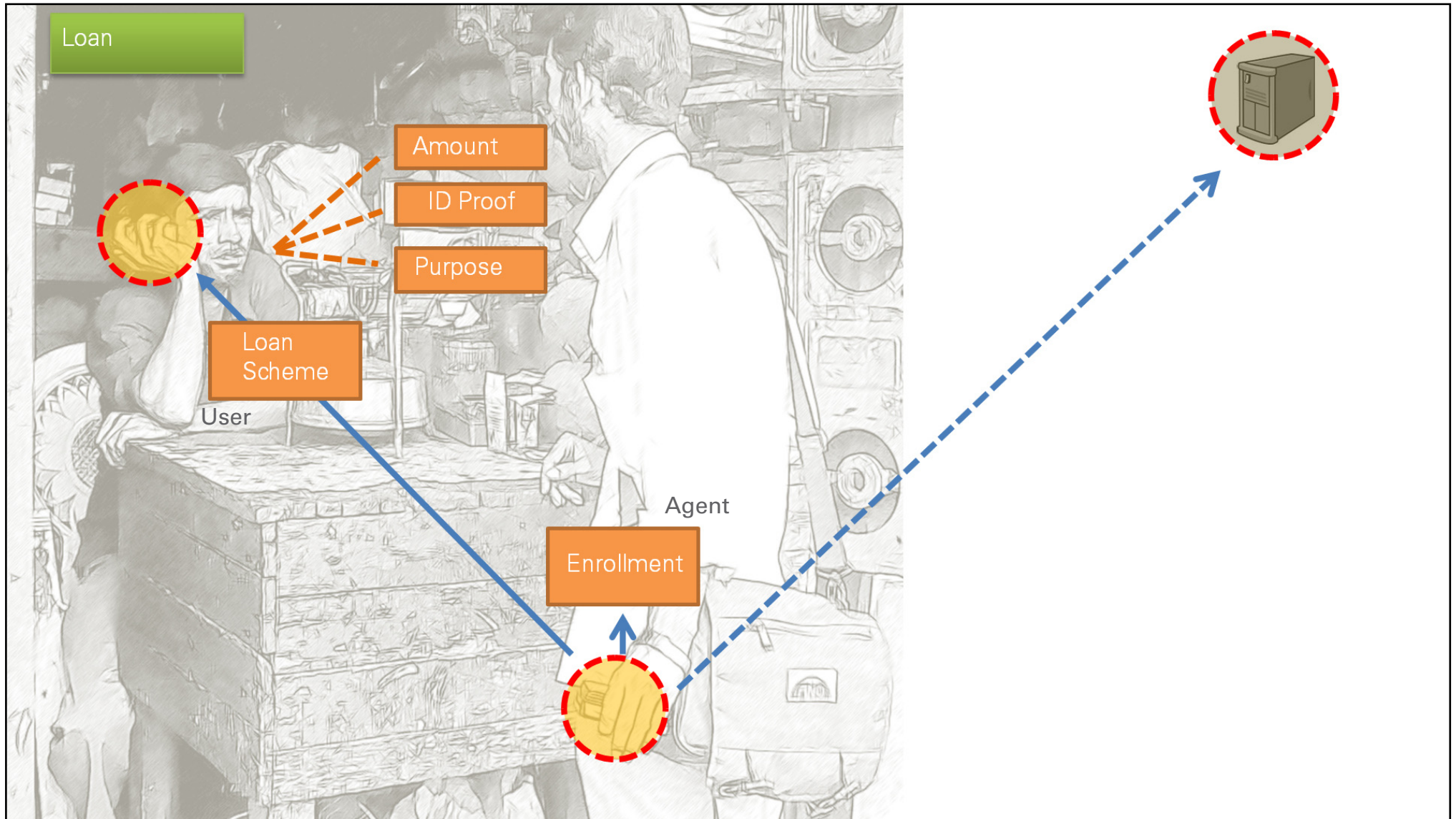
Design Scope | Feedback | Receipt



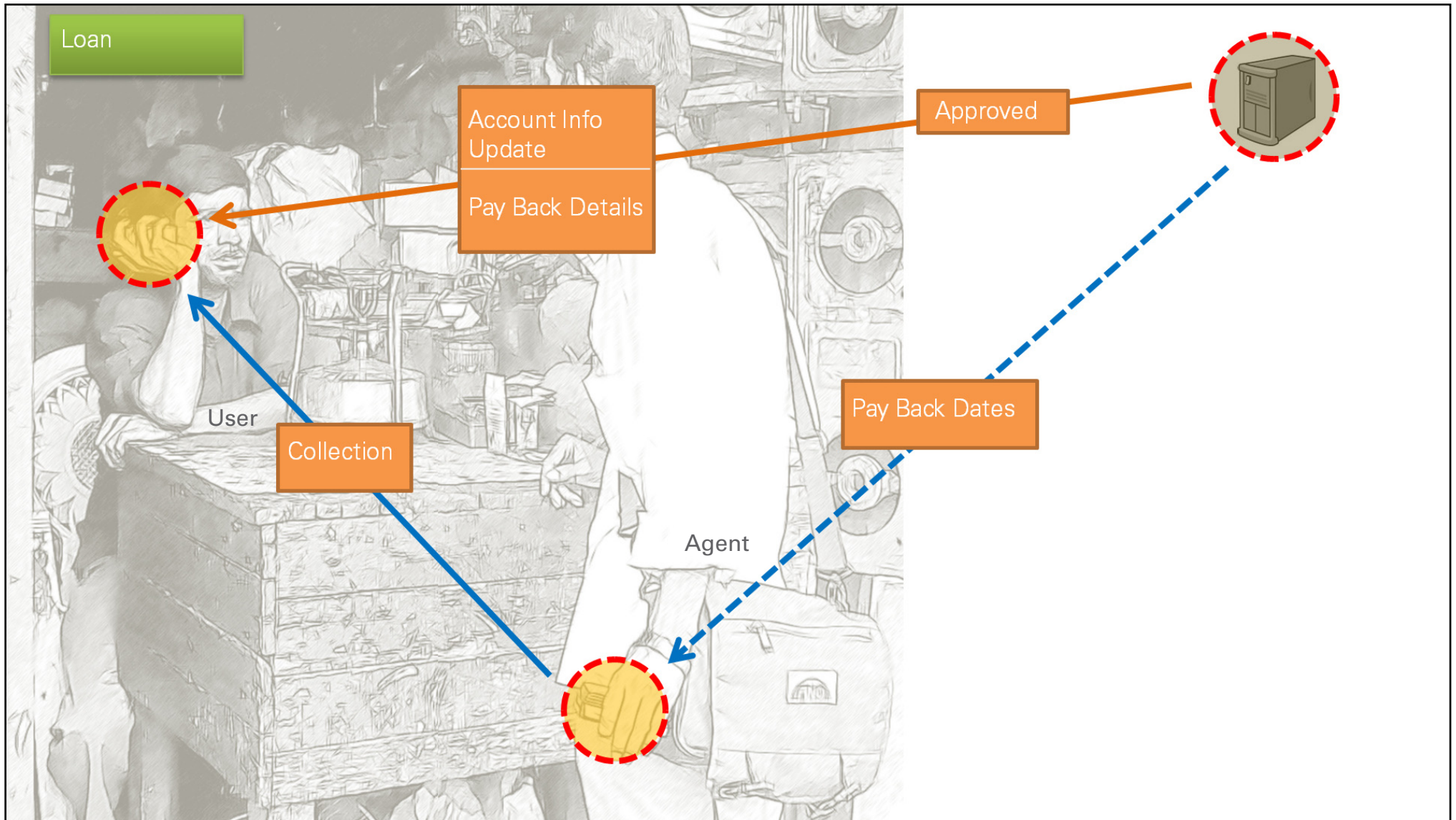
Design Scope | Remittances



Design Scope I Loan Enrollment



Design Scope | Loan Payback



Design Considerations

Considering the potential of low income, low literate users, its a must to look at alternative ways of designing interactions and simplify the way information is dealt with. This user group has considerably low exposure to digital technology, though they own a mobile phone, their usage is limited to making voice calls and perform few basic tasks. To make design more friendly and usable I am considering these following guidelines:

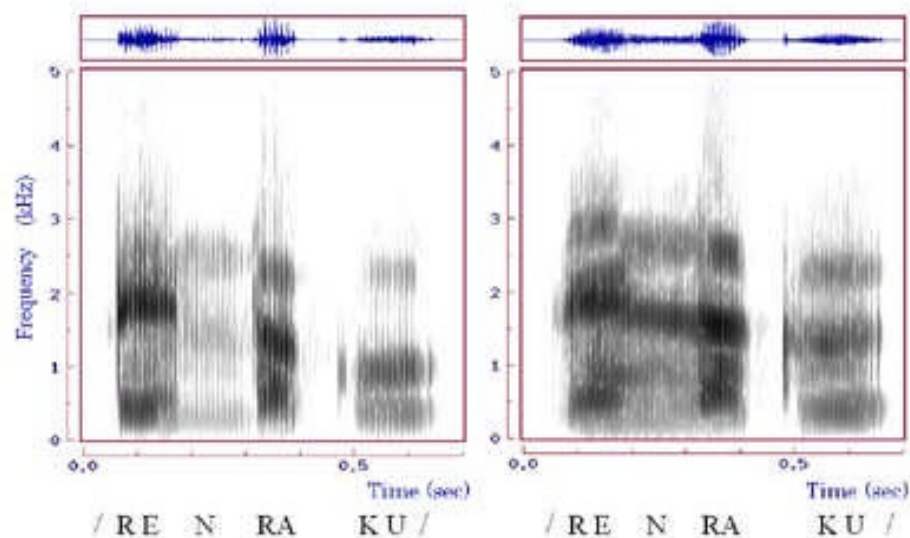
- Design for low cost basic mobile phone on which external applications can not be installed.
- Use of Audio based interface.
- Users prefer Instructions.
- Use of Voice + Green Key + Red Key + Numeric Keypad as input.
- Design for Small Screen sizes like 128 x 128, 128 x 160, 176 x 220
- No text Input.
- Output display in local language and numbers.
- Use of Voice Biometric for authorisation.



Design Consideration I Voice Biometrics

The underlying premise for voice authentication is that each person's voice differs in pitch, tone, and volume enough to make it uniquely distinguishable. Several factors contribute to this uniqueness: size and shape of the mouth, throat, nose, and teeth, which are called the articulators, and the size, shape, and tension of the vocal cords. The chance that all of these are exactly the same in any two people is low. The manner of vocalizing further distinguishes a person's speech: how the muscles are used in the lips, tongue and jaw. Speech is produced by air passing from the lungs through the throat and vocal cords, then through the articulators. Different positions of the articulators create different sounds. This produces a vocal pattern that is used in the analysis.

A visual representation of the voice can be made to help the analysis.



These voiceprints are a visual representation of two different speakers saying "RENRAKU". There are three broad categories of sounds:

1. Voiced sounds –produced when the vocal cords vibrate. This includes vowel sounds. The resonance frequencies for these sounds are called formants.
2. Unvoiced sounds –produced when the vocal cords do not vibrate. An example of an unvoiced sound is "Sh". These sounds do not produce resonant peaks.
3. Plosive sounds –produced when a build up of pressure is released, as in the 'b' in 'butter'. Plosives can be voiced or unvoiced.

It is quick to enroll in a voice authentication system. The user is asked to speak a certain set of words or phrases, or to speak for a certain length of time. From that sample, a digital representation of the voice, called a voiceprint, is created. A good voiceprint is between 2-8 seconds of speech.¹ Authenticating a user is accomplished by comparing the voiceprint that was created at enrollment to a sample given when the user wants to enter the restricted area or system. Authentication is very fast; it can be completed in 0.5 seconds.

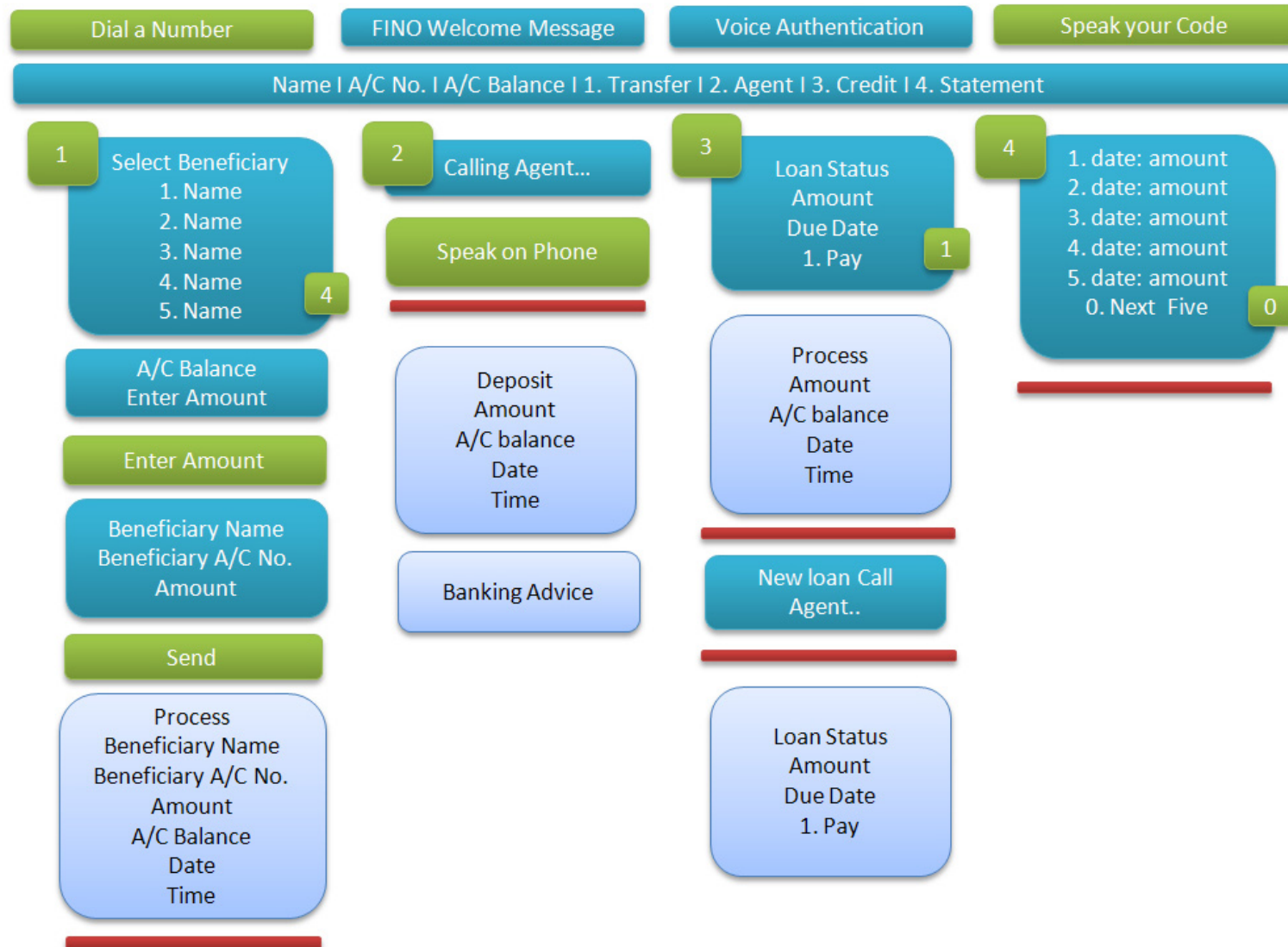
Use in Banking

Reducing crime at Automated Teller Machines is an ongoing struggle. Banks have started using biometrics to authenticate users before allowing ATM transactions. Users generally must provide a pin number and a voice sample to be allowed access. Royal Canadian Bank is using voice authentication to allow access to telephone banking.

Design Ideation | IVRS Application

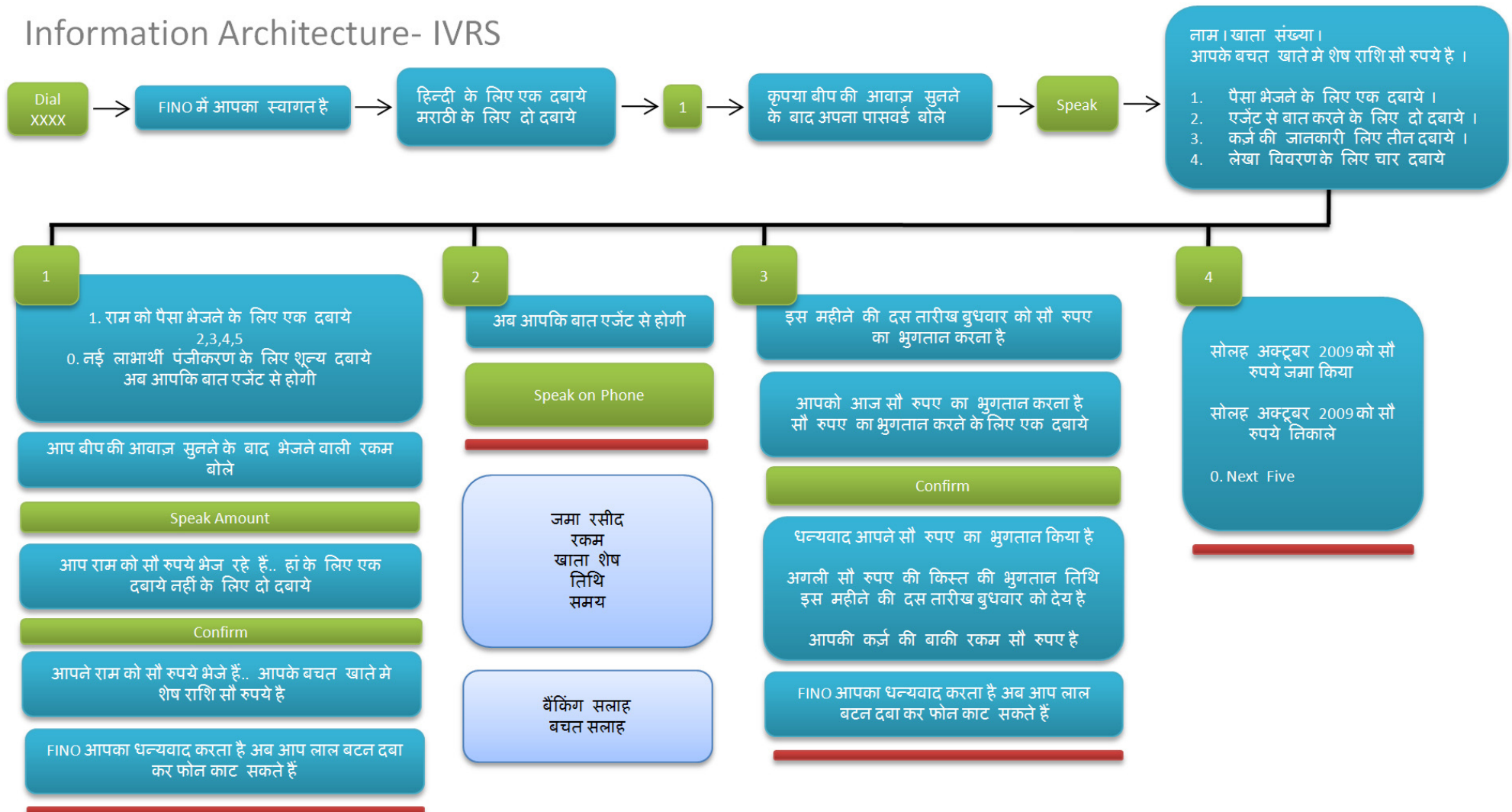


Design Ideation | IVRS Application



Design Ideation | IVRS Application

Information Architecture- IVRS



Design Ideation I Flash Message + IVRS

To add redundancy to the spoken dialogue system in an IVRS call, pop up flash messages containing instructions and account information can be sent on the user's mobile phone in between IVRS calls. In this system of interaction user does not need to install any third party software. If designed in a thoughtful manner, these messages and audio output can match a GUI based application.

Flash message

A flash SMS message is an SMS message that, instead of being stored in the SIM or memory of the receiving phone, pops-up on the receiving phone's screen, without the user taking any action. When dismissed the message is usually gone.

On phones (all Nokias, Siemens, Ericsson, Motorola etc..) a class 0 message will appear as a flash SMS message. These messages appear on the screen immediately upon arrival, without the need to press any buttons on the phone. If the data coding scheme is set to 16-bit unicode (ucs2), and the message starts with "0001", it will appear as a blinking flash message.

Design Ideation (Low Fidelity Prototype) | Flash Message + IVRS



Design Ideation (Medium Fidelity prototype) | Flash Message + IVRS



Final Design

Flash Message + IVRS Prototype (Rollover)



Welcome Screen, Select Language



Speak Password



Main Menu Options - 1. Send Money,
2.Agent, 3. Loan, 4. Account Statement



Key Input



Select Beneficiary



Speak Amount



Confirm Transaction Details



Transaction Receipt

Design Ideation (Low Fidelity Prototype) | Mobile Banking Application



Design Ideation (Medium Fidelity Prototype) | Mobile Banking Application



Final Design

Mobile Banking IVRS Application (Rich Multimedia: Audio + Iconic Interface) Prototype (Rollover)



FINO welcome message



Select language



Speak Password



Account unlock



Main menu options



Select Beneficiary



Speak Amount



Confirm Details

Design Use Scenarios

Design Scenarios (Rollover): Account opening | Deposit money | Loan | Account Statement | Remittance



Future Scope

To Develop usable Interfaces for the above mentioned design ideas for low literate users, which are more natural and offer a sense of security when dealt with private financial information. Currently I am performing usability tests on design options and improving interfaces as per users feedback.

Important aspect to add in design are future accommodation of new financial services and scalability of this design to other user segments like Visually impaired etc.

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