TEAM

Background - The members of our team are majoring in Computer engineering and currently are in their Junior year at Netaji Subhas University of Technology

Members:

1. Team Lead - **Muskan Khandelwal**
   - She is experienced in leading her team at multiple competitive events & hackathons. She has trained in web development & machine learning.
2. **Ishaan Rawat**
   - He is like an information bank for the team, he stays updated on the latest technologies & often comes up with innovative solutions using them
3. **Anish Jangra**
   - He can quickly learn new technologies & helps lead the implementation phase efforts. He has experience in web development & deep learning
4. **Divya Rawat**
   - She is the fastest bug hunter amongst us all. She has experience in web development & machine learning
5. **Mansi Joshi**
   - She is a multi-tasker & has an eye for details. She leads the backend & frontend integration efforts. She is a deep learning enthusiast as well
6. **Shrey Jain**
   - He is a visionary & helps the team realise the needs of the clients or the purpose that the app has to solve. He leads the research efforts in the ideation stage

Vision - We are a team who have always learned new technologies by ourselves. We have the motivation to push through every daunting obstacle & we never shy away from learning new things. We have a perfect mix of people some of whom are exceptionally good at ideating new concepts and some are always innovative with how to bring these ideas to life! Most of us have previously participated in finance-based case study competitions as well as hackathons, giving us a good idea of the financial aspects and the ability to comprehend what true purpose the app we develop should serve.

Upgrading Jan Dhan Darshak App - The Money Mitra

Problem Statement: MK21
Organization: Department of Finance
Category: Software
Domain Bucket: Software - Mobile App Development

Team Name: QuackQuackQuack

TEAM MEMBERS:

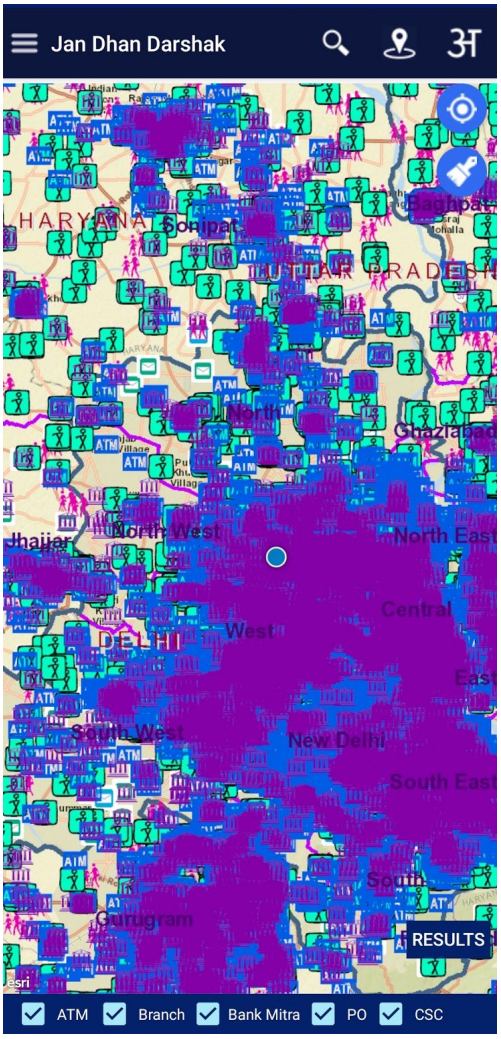
1. Team Leader:
   Muskan Khandelwal (2017UCO1596, muskankhandelwal369@gmail.com)
2. Ishaan Rawat (2017UCO1644, ishaan.rawat611@gmail.com)
3. Anish Jangra (2017UCO1654, jangra.anish11@gmail.com)
4. Divya Rawat (2017UCO1610, rawat.divya1000@gmail.com)
5. Mansi Joshi (2017UCO1576, mansij.co.17@nsit.net.in)
6. Shrey Jain (2017UCO1647, shrey.jain1107@gmail.com)

THE PROBLEM

Pain points

- It has a very **unsmooth user experience**, especially for unfamiliar people

(a typical interface looks like this:)



- **Its a Data Dump**:
  - Shows irrelevant data – ATMs 15 km away
  - Renders the content only after the fetch request has been completed, making the app very slow
  - No navigation feature – No point of seeing an ATM on the map if the app won't tell how to reach to it
  - Static & inaccurate information – shows ATMs that are non-functional & no means to update that an ATM isn't functional at a given point of time
- It's more convenient to Google or any other search engine instead
- The challenge involves upgrading the application with more insights and features & seamless UX

THE SOLUTION

Proposition:

- Upgradation of existing features:
  - Significant improvement of UI: Money Mitra, an interactive bot makes the user experience seamless & the app is easy to learn to use
- Additional features:
  - The **FinT**(financial touchpoint) **Search Engine**, ranks search results in terms of distance, rating, no. of visits & no. of closed days in a month & other parameters
  - Crowdsourcing to make static location dataset into a dynamic dataset. For instance, users can rate or mark a point as out of service (if within 10m)
  - Navigation to the touchpoint through govt. improved MapMyIndia App
  - Multi-Language support through **Pootle,** a software used to convert static English text to a local language
  - **Money Mitra Information Centre (MMIC) that uses a form-filler chatbot** to get the necessary information from the user. With the user's financial info, Money Mitra suggests the best policy that the user is eligible for using **K-means Clustering**

Value to User:

As mentioned in the Problem Statement, the application is meant for common people. However, the application has been made with a special focus on providing a seamless user experience to Technologically Challenged people (i.e. Aged people and people currently not a part of the banking system, typically belonging to not well-to-do households).

The following features of Money Mitra make it valuable to the target audience:

- Money Mitra provides a seamless user experience with a very friendly & easy-to-learn UI, the **app is easier to use for the technologically challenged people**
- One-Tap or Two-Tap **quick app navigation** that helps find the nearby touchpoints in the **fewer clicks than even Google**!
- Money Mitra provides the user with an option to set relevant filters. Thus, only a few practically feasible locations are highlighted instead of showing a lot of irrelevant information as in the original Jan Dhan Darshak app
- Money Mitra provides an additional feature of MMIC that helps a user find the best policies based on his financial information

MARKET SIZE

(We derive the numbers from the following report on Financial Inclusion Initiative)

Officially, the app is for everyone. Tasks like finding an ATM or a bank is something a regular citizen often does. However, the majority does the task through a simple web search instead of a dedicated app for the same.
Hence, the target audience that we've kept in mind while developing this app is the **technologically challenged section** of society as an extension to the financial inclusion initiative by the Government of India (GOI).

Our Target Audience

51% of 1.25 billion Indians do not have a bank account yet! These are the users that are the beneficiaries of FII.
49% of financially included people **have some fraction** of them that **do not know** yet, how to use the ATM, whom to contact for information on their bank account, what to do with their bank account etc.
We do not expect everyone to use this app per se as googling information is the most basic task. Google also offers features like crowdsourcing to alert the user if the ATM isn't functionals. It has multiple dedicated teams working on such things — thus, the results are often quicker, truer & more reliable.

MARKET VALIDATION

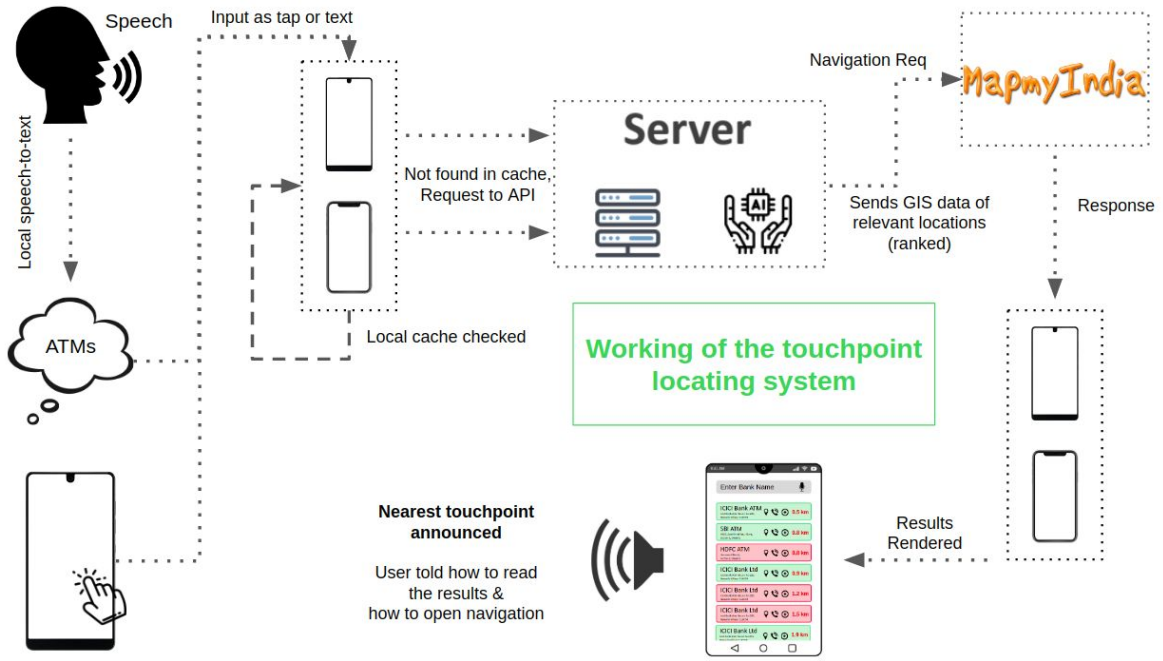
Phases:

1. Building the basic structure of the app:
   24 manhours i.e. 4 team-hours
2. Setting up APIs and serverless architecture within the app:
   18 man hours i.e. 3 team-hours
3. Setting up voice navigation:
   36 manhours i.e. 6 team-hours
4. Setting up the server with the policy recommendation system:
   24 manhours i.e. 4 team-hours
5. Server integration with the app, along with voice navigation:
   12 manhours i.e. 2 team-hours
6. Training dataset preparation for the recommendation system:
   6 manhours i.e. 1 team-hour
7. Testing & finalising the app (incl. FinT engine, recommendation system):
   24 manhours i.e. 4 team-hours

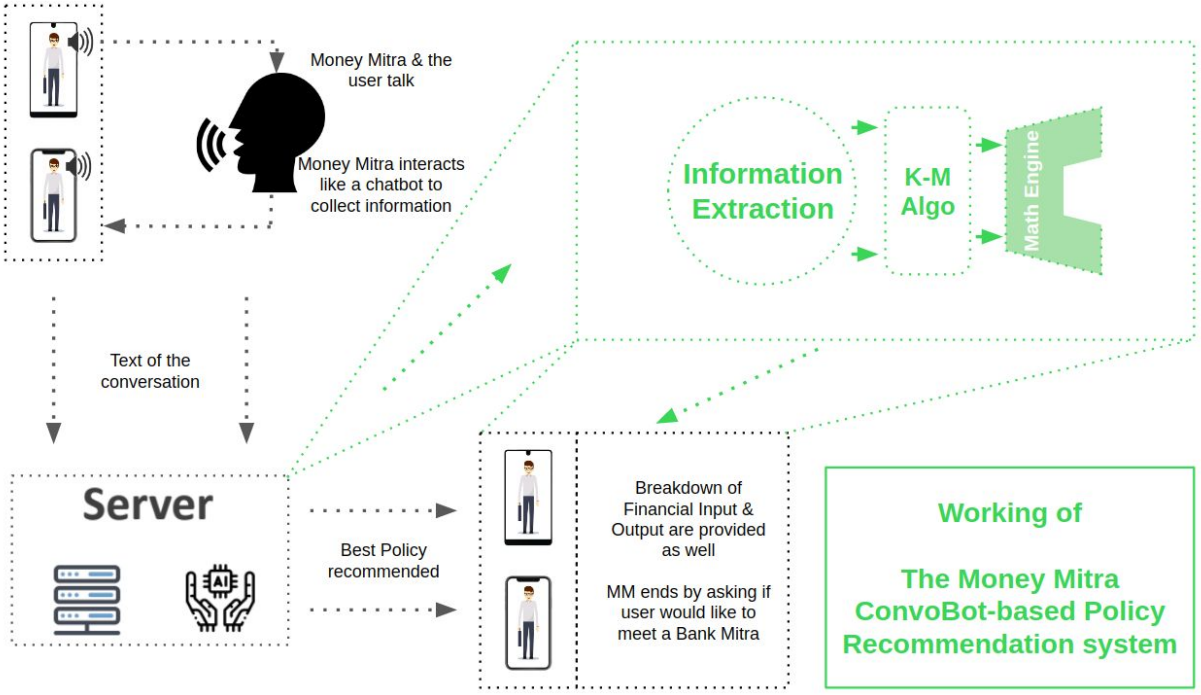
PRODUCT

- Architecture

(Flow diagram for location of nearby financial touchpoints)
(FTs include ATMs, Banks, Post Office, Bank Mitras & Common service centre)



(Flow diagram of voice-controlled MMIC policy recommendation system)



- Ecosystem -
    - Native Mobile Application
    - Server built using python (can be deployed on hosts like AWS)
    - The third-party libraries used are React Native Elements, MapMyIndia API for navigation (which is authorised by the GOI) and Pootle library for multi-language support
- Adjacent Markets - This app can be further integrated with BHIM UPI app to elevate the government's objective from financial inclusion to digital financial inclusion
- Metrics - Number of users, number of calls to MapMyIndia API, number of server responses of policy recommendations
- Saleability - This is an application by the government, hence there is no profit or loss involved.
- Channels - The app would be available to download from the play store for android & app store for iOS devices. Promotion would be done by the government under the FII scheme's promotion e.g. TV ads, posters in govt. establishments

Business Model

This application has been developed for financial inclusion of all sections of society. Therefore, the intent of this application is to act as a guide for the common people and not to generate revenue.

Competition

Currently, this application does not face any direct competition. However, it faces indirect competition from search engines, for instance, Google. Google search will render more comprehensible results easily. However, our application Money Mitra has a competitive edge over these search engines as it offers a seamless user experience, unlike its competitors who make it extremely difficult for the technologically challenged people to access such information.

Financial model & Projections

Financial model includes costs (cash outflows) but no revenue (cash inflows).

Investment to develop include a set of developers i.e. our team!
No other monetary assistance is required during the development of application

The app's motive, universal financial inclusion, is non-commercial & hence the app shouldn't involve measures that help generate revenue for the government.

Costs will include the maintenance cost of the application that is being borne by the government right now as well. We intend to simplify the server's operations, and hence, we can expect these costs to go down. However, additional costs may arise from the maintenance of a database to store the ratings & reports submitted by users. Storing the aggregate of ratings & keeping reports of only the past one month will minimize the storage required

Potential revenue streams include - placement of an advertisement banner in the app, adding private policy providers' schemes in the app & charging promotional fee from them upon a successful customer conversion

Competitive Advantage

Money Mitra has a competitive edge over Google search due to the following reasons:

- Googling nearby ATMs, Banks etc takes more clicks every time. Money Mitra, however, provides the same information in at max 2 clicks
- Google is a For-Profit organisation. Googling this information will make the technologically-challenged people gullible to the MNC's money-making schemes, e.g. adverts
- For a person used to feature phones, finding the right content using google search is not easy. Money Mitra, on the other hand, makes this information accessible to the technologically challenged people and provide them with seamless user experience.

ASSUMPTIONS AND RISK

Strengths	Weaknesses
● Money Mitra, a personal digital assistant to make the app easy to use ● Easy to learn UI - users get the ATMs near you by the click of a button rather than typing or googling ● Empowerment the technologically handicapped through voice-enabled navigation	● People might shift to Google after learning to use smartphones. However, Money Mitra can be given credit for helping them with that ● The application depends on external services for navigation. However, the previous application did not provide even that

Opportunities	Threats
● The app can be further integrated with BHIM UPI app, expanding the objective from FII to DFII (digital financial inclusion initiative) ● The app can be further expanded to connect phones with ATMs. This'll reduce frauds, such as pin capture, that occur while using an ATM ● The app can be used as a means to train the technologically-challenged audience at using smartphones	● Use of the third-party libraries e.g. react-native, Reddit API ● Use of third-party services e.g. MayMyIndia

Summary

We were tasked with making the Jan Dhan Darshak app more featureful, insightful & easier to use and that perfectly captures what our proposed upgrade offers!

We have brought the app to life by introducing Money Mitra, a guide for the app. The users can now see their closest ATMs and 4 other types of financial touchpoints in only 2 taps and get to navigate to their desired point in another tap. Moreover, users can now help their fellow users know if an ATM isn't functional, which bank served them the best etc through the rate & report functionality.

-We have introduced the Money Mitra Information Bank which helps users understand different schemes from the government and even recommends the best policy based on their information.

Questions and Answers

Faculty evaluation questions and answers

Product/Idea

1. What are the problems you are trying to solve?

- The current app is, in essence, a data dump which doesn't provide utility functions such as navigation to a point. This leads to poor user experience.

We aim to make the UX better and seamless & add additional features such as a recommender system for govt schemes & interactive workflow

2. How does your idea address the problem?
- We are keeping only the minimalistic features within the app & are adding some more essential features as well. We have turned it into a two-way information exchange channel instead of the one-way information conveyor medium it is right now.

3. Who are the target customers?
- The technologically challenged section of society, mainly senior citizens and the digitally-illiterate.

4. What makes your idea unique?
- Our comprehensive understanding of the target audience & our ability to realise the true needs of the users makes our idea stand out amongst the rest. We are taking a bold step of not simply adding more features but going ahead and trimming the unnecessary features thereby best serving our users. Our customer-centric approach to ideation makes our idea unique!

5. Do you have a revenue generation model?
- No, our app is a non-profit initiative for financial inclusion. However, it can be further extended to include multiple revenue generation channels as explained previously in this document.

6. What are the geographies, do you think the idea would be suitable?
- The entire country, as it is with the previous version of the app. Yes, we firmly believe in the country-wide utility of the application owing to its multi-linguistic feature

7. What are the risks associated with your idea and how can you mitigate it?
- Imminent risks include our target audience slowly shifting to Google or other search engines once they can navigate their way around their smartphones. However, we do not think of mitigating it, but we take pride in bringing digital literacy to the masses.
- Another risk is the storage of sensitive financial information which is being mitigated through storing the data anonymously in case of ratings & reports and not storing the financial information of the users on the server but only on their local device

8. Who are the stakeholders involved in order to bring this idea/product/service to the market?

- Stakeholders involved can be categorised as follows:
    - Users: the general public or to be more specific, technologically challenged people i.e. our target audience
    - Development team, i.e. us!
    - Maintenance team
    - The government, they give us access to the GIS database & policy information
    - Third-party libraries such as react native, mapmyindia etc

Intellectual Property Assessment

1. Is your idea patentable or patented?

- Yes, our FinT search engine and the policy recommendation system is patentable.

2. Is your idea built on existing work? If so, how is it different?

- Yes, our idea is an improvement of the existing app, as required by the problem statement. It's different in terms of the functionalities we've added, i.e, Replacing the map with a list, ranking results through FinT search engine, Policy Recommendation system etc.

Prototype/Proof of concept

1. What is the nature of the prototype/ proof of concept, you would be able to submit?

- We're submitting a basic structural frame of the application. Along with that, we're submitting a sample chatbot that showcases the control & data flow of policy recommendation system

2. Have you completed pilot tests for your prototype/POC?

- Yes, we have conducted pilot tests on our prototype. However, the prototype is far from the intended final app and hence further testing will be necessary

3. What is the approximate cost of developing the prototype?

- The production version doesn't require any upfront cash inflow. Only maintenance & storage will add to costs which will be very insignificant compared to bringing digital literacy & financial inclusion of the masses.

4. Please share the relevant elements while submitting the POC/ Prototype?
    - Block diagram: (Submitted)

- Software Architecture - Control/Data flow
  (Submitted)
- Block Diagram of Data Flow
  (Submitted)
- Hardware architecture
  (Not required, only software-based innovation)
- Components/ Connectors
  (Not required)
- CAD models
  (Not required)
- Visual/Touch Interface
  (Submitted)
- (Mechanical actuators/switches, touch sensitivity, haptics)
  (Not required)

Supporting Details

1. What regulatory requirements have to be met to bring the idea to life?
- The policy information has to be accurate
2. Do you have a business plan/ commercialization strategy?
- Yes, we do. However, the primary aim is to further the FI initiative of the Indian government hence we do not intend to make the commercialised product

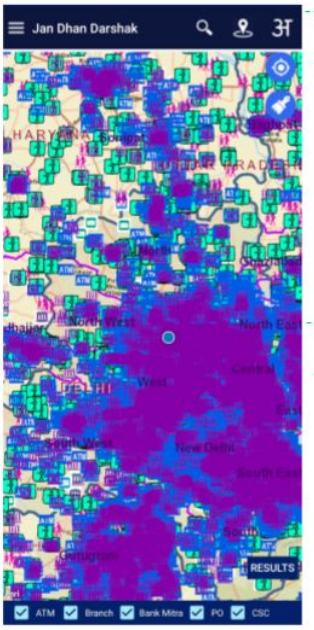
3. What is a rough estimate of manufacturing/operational costs?
- Implementing the crowdsourcing feature includes setting up a database where ratings and reports will be stored anonymously. We expect zero costs from the alpha and beta version however additional costs may be borne once the feature is being widely used.
  We also expect to lower the server's load by serving only the relevant results & also save on data storage space being used currently. This will optimise the costs involved in the existing version of the app.

4. What is the volume of products/ amount of revenue do you expect to make in the first year?
- As mentioned before, it is a non-profit app solely made to enhance accessibility & to further the Indian government's financial inclusion initiative.

  The number of downloads (as per PlayStore) is 100K+. We can expect the userbase to further grow as the app now provides much more functionality.

Appendix/Backup

All the problems with Jan-Dhan Darshak App



It's a DATA DUMP!

Too much to show
Poor map visibility and inaccuracies
Illogical to show me ATMs 15km away!

Too much to Load
On a slow data connection,
Sluggish data retrieval
Slow location detection

No Navigation feature
Location of spots are visible but
Options to navigate to them not available

Inaccurate static Information
Doesn't specify Bank/ATM details such as if it has cash or not

Nightmare for a digitally-illiterate

Bad User Experience
Can't use a smartphone well?
Difficult to use the JDD app

No demo

Entire map shaded blue & purple

UX very troublesome!

Googling stuff is easier

"ATMs near me", "Banks near me", "Post office near me"

These searches will render more comprehensible results!

Using google is the easiest, it's dynamic, it's better in every sense!

When Google does the job even better than JDD, why do we need the app at all!?

Money Mitra's Target Audience

Officially: Everyone!

Actually:
Technologically-challenged People

i.e. (generally)

Old-aged people

Not well-to-do households, not part of the banking system

Why not everyone?

Googling information is the easiest & most basic task

Google has multiple dedicated teams working on such things, e.g. crowdsourcing — results often quicker, truer & more reliable

What the Target Audience needs?

1. **One-Tap or Two-Tap Quick In-App Navigation**
Actions such as finding nearby touchpoints should be done in least no. of clicks

2. **Relevant Data Only**
Filters to help find what the user is looking for, Only a few practically feasible locations highlighted

3. **Navigation to the selected location**
The user should be able to start the navigation process with minimal taps

4. **Easy-to-learn UX**
Actions such as finding ATMs are as easy as 'pressing the first red button'!

Why MM? Why not Google it?

1. **Google takes more clicks, every time!**
Be it finding a particular location or browsing the FAQs, MM beats Google!

2. **Google is a for-profit!**
Digital illiteracy shouldn't make these people gullible to these MNCs' adverts

3. **MM utilises Google's crowd-sourcing**
No one can beat Google's efficacy at navigation, MM simply allows easier usage

4. **Googling is easy & difficult!**
For a person used to feature phones, finding the right content not easy

Presenting to you JDD 2.0, features the Money Mitra introduces into the app...

Money Mitra

Money Mitra is a personal digital assistant

Helps in navigating through the app seamlessly

One has to tell Google what they want, but MM understands what they want through (max) 2 questions

The FinT(ouchpoint) Search Engine

We rank nearest financial touchpoints in terms of distance, rating, no. of visits & no. of closed days in a month & other params

The user gets a ranked list of points, like in a SE

Reroutes to MapMyIndia/Google Maps for navigation

Multi-language support - Pootle

The application can switch between languages within 2 taps!

Pootle is used to convert static English text to a local language

From Static to Dynamic - Crowdsourcing

Person at the touchpoint

Within 10m radius, can review or mark point as non-functional

Person Rates

They get a review form on visiting a location (e.g. uber/ola after ride rating form)

FinT SE counts it

Results displayed users give the best ATM, not simply just the closest one

MMIC - Stochastic ML - through a Quora-like forum

MMIC recommends a policy

A bot used to get info from user

With user's financial info, MM suggests the best policy, using K means Clustering

If user unsure or unsatisfied

User info anonymised & shared on a private subreddit (In-app)

Other People, e.g. Bank Mitras make their recommendation

K means updated

Stochastic K means,

- no need to remember previous values

- update model for each new input

Technology: Implementing the Idea

Data Data Data

Currently

Location data of user sent to server along with categories to be displayed

Server returns GIS data & maps it on

JDD 2.0

Location data of user sent to server along with category

Server serves results from APIs

Why React Native?

Offers out of the box focus on UI and access to Native API

Needs lesser memory and runs third-party apps smoothly

Main Aim is to improve UI/UX
React Native is known for its elegant & easy to implement designs

Third-party Libraries Used

REACT NATIVE ELEMENTS

MapmyIndia

Pootle

reddit

For referential purposes

collect.chat
(Bot-like Interactive Forms)

Voice-enabled navigation

Tap on MM to toggle

Tapping on Money mitra equivalent to calling out "Ok, Google" or "Hey Siri" or "Alexa"

Tapping MM activates the bot

TTS API (Pyttsx3)

Alpha version with only english language support

Beta version with Multi-language support using Pootle Library

Commands like

"Money Mitra, show me the nearest ATMs" (renders list of closest ATMs)

"Money Mitra, recommend a policy" (Opens Info bank)

Implemented Using Python & React Native(JS) Libraries

K-Means Clustering

No. of Policies = No. of Clusters

Input: Infor. that a bank mitra asks before making a recommendation

Output: Best Policy

Interactive Forms

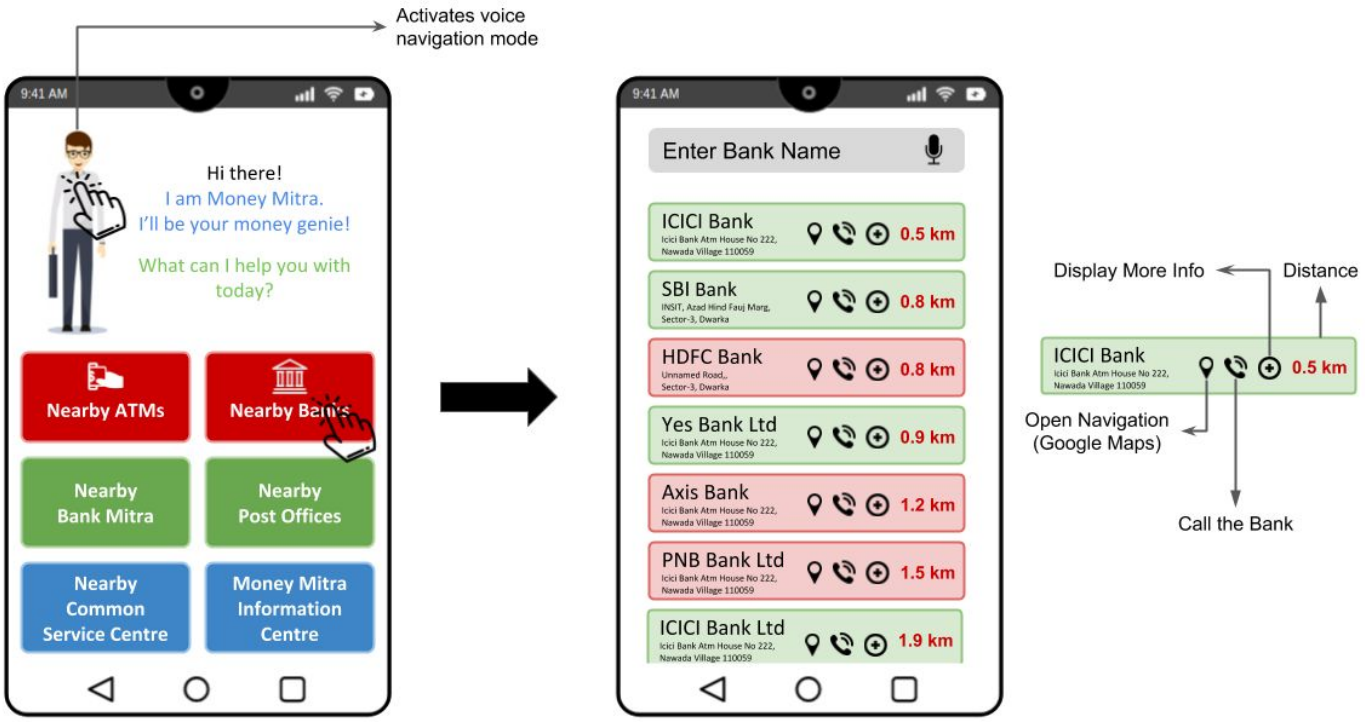
Parameters needed for k-means are collected not through a boring form

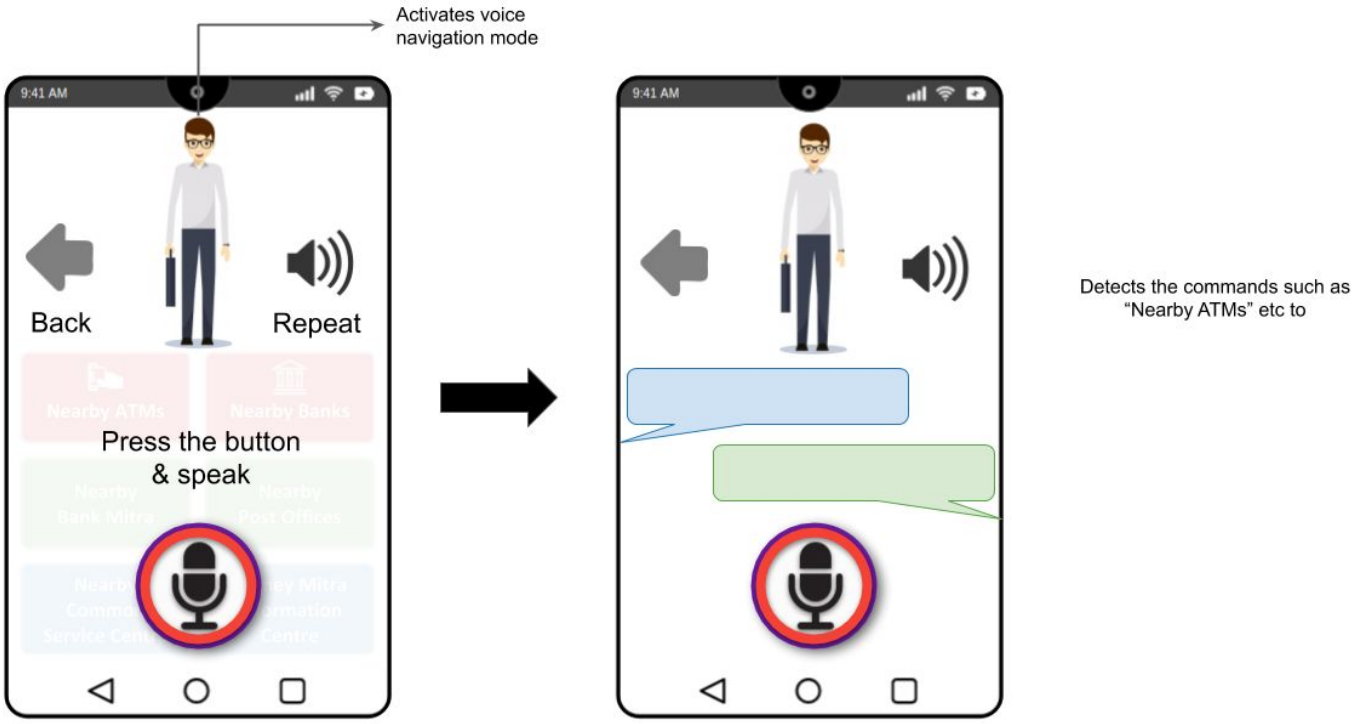
But by the MM (chatbot-like) interactive assistant

Speech-to-Text & Text-to-Speech

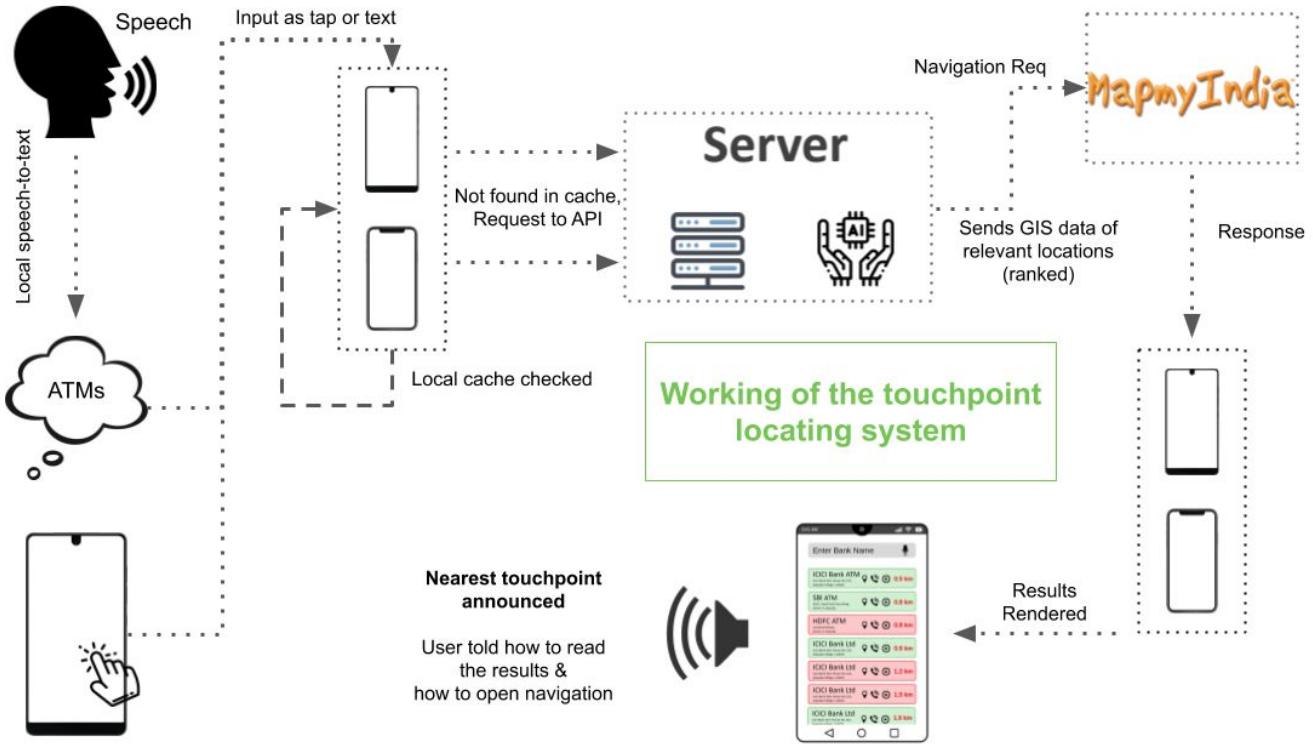
(Only English language supported)

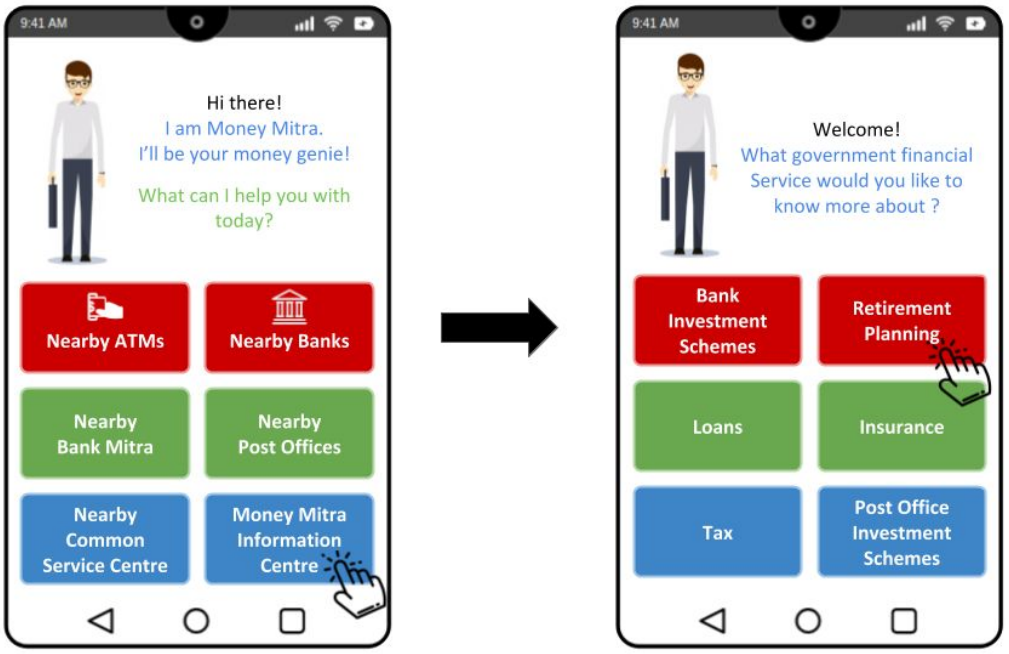
Static information prestored in-app
Dynamic data, e.g. listings, through libs

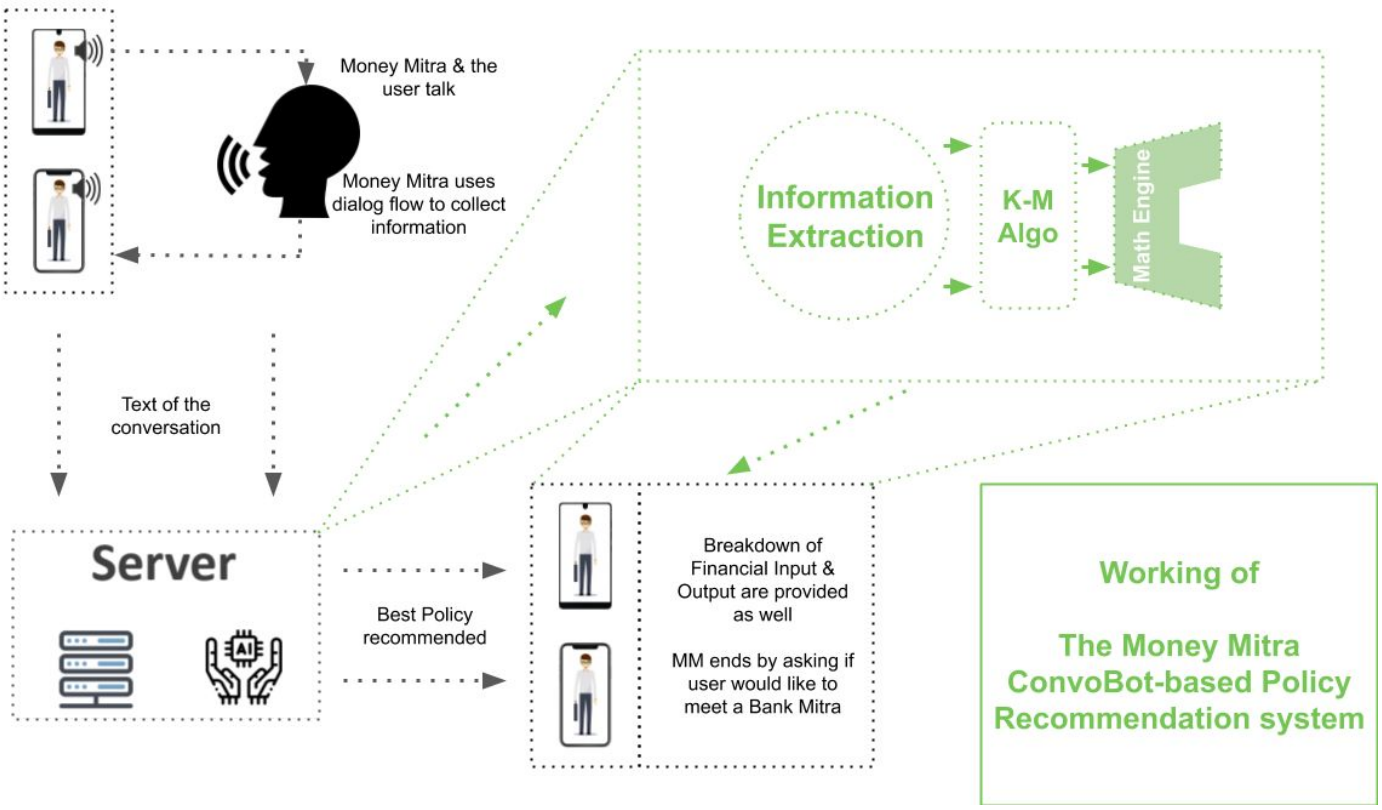


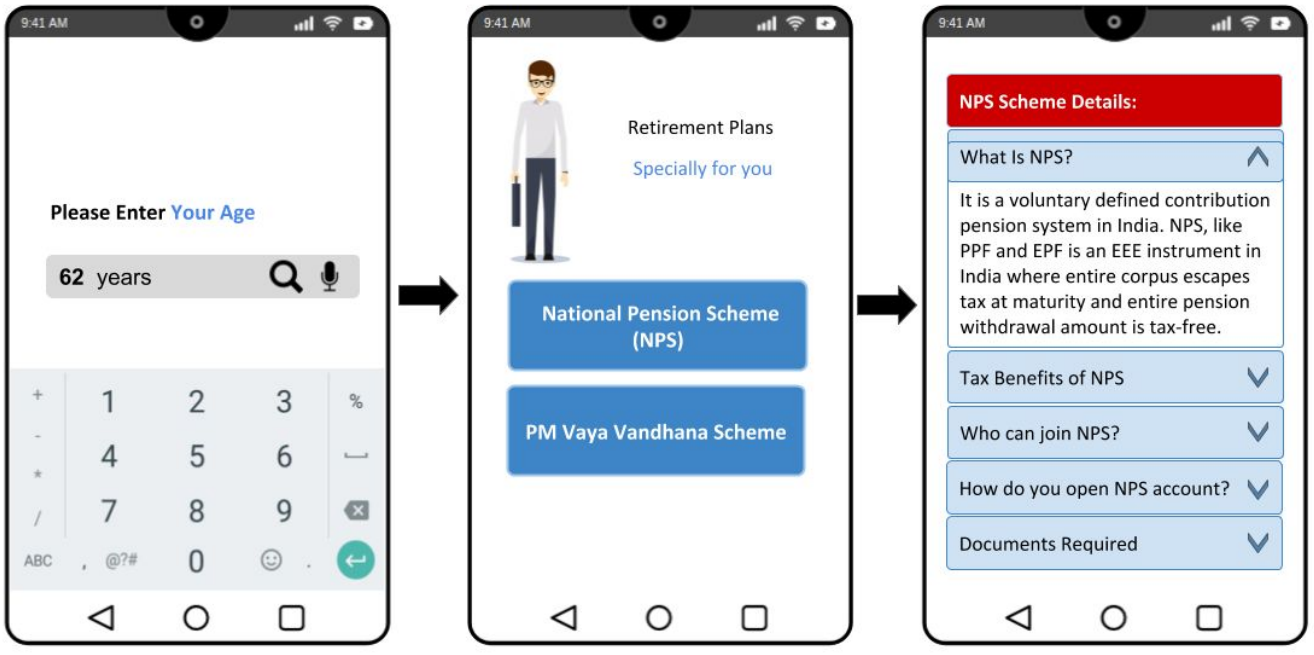


Detects the commands such as "Nearby ATMs" etc to


Speech
Input as tap or text
Local speech-to-text
ATMs
Server
Not found in cache, Request to API
Local cache checked
Navigation Req
MapmyIndia
Sends GIS data of relevant locations (ranked)
Response
Working of the touchpoint locating system
Nearest touchpoint announced
User told how to read the results & how to open navigation
Results Rendered


9:41 AM
Hi there!
I am Money Mitra.
I'll be your money genie!
What can I help you with today?
Nearby ATMs
Nearby Banks
Nearby Bank Mitra
Nearby Post Offices
Nearby Common Service Centre
Money Mitra Information Centre
9:41 AM
Welcome!
What government financial Service would you like to know more about ?
Bank Investment Schemes
Retirement Planning
Loans
Insurance
Tax
Post Office Investment Schemes


Money Mitra & the user talk
Money Mitra uses dialog flow to collect information
Information Extraction
K-M Algo
Math Engine
Text of the conversation
Server
Best Policy recommended
Breakdown of Financial Input & Output are provided as well
MM ends by asking if user would like to meet a Bank Mitra
Working of
The Money Mitra ConvoBot-based Policy Recommendation system


9:41 AM
Please Enter Your Age
62 years
9:41 AM
Retirement Plans
Specially for you
National Pension Scheme (NPS)
PM Vaya Vandhana Scheme
9:41 AM
NPS Scheme Details:
What Is NPS?
It is a voluntary defined contribution pension system in India. NPS, like PPF and EPF is an EEE instrument in India where entire corpus escapes tax at maturity and entire pension withdrawal amount is tax-free.
Tax Benefits of NPS
Who can join NPS?
How do you open NPS account?
Documents Required

Thank You!

Appendix

Limitations down the road

Turbulent Evolution	More Policies added	Performance Issues
React Native is young	New policies may be added	React Native can't do multi-threading like Java
Upgrades deprecate features	A huge scale disruption highly unlikely	Heavy-weight processing difficult
Backward compatibility issues	Model reconfiguration may be required	