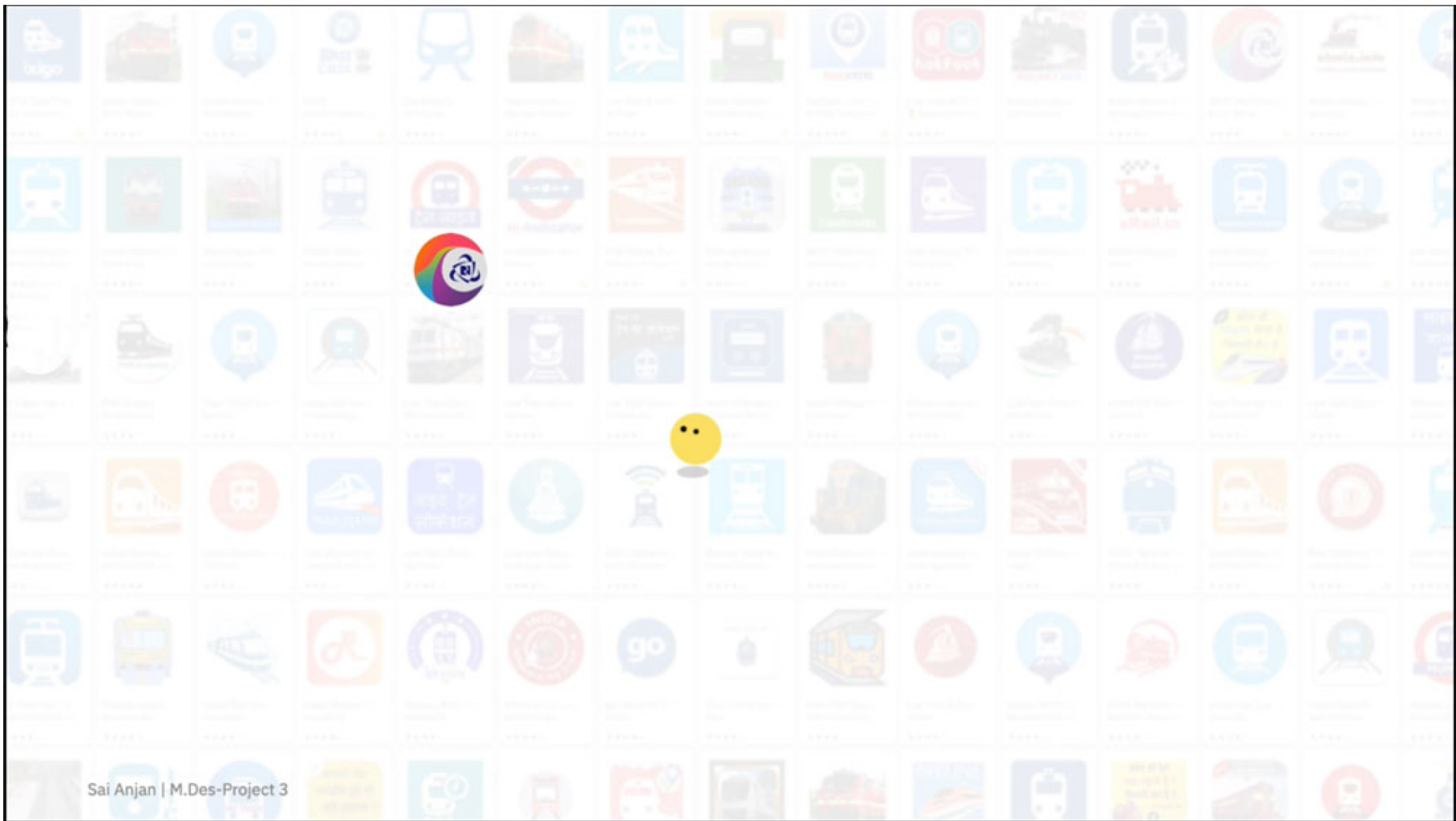


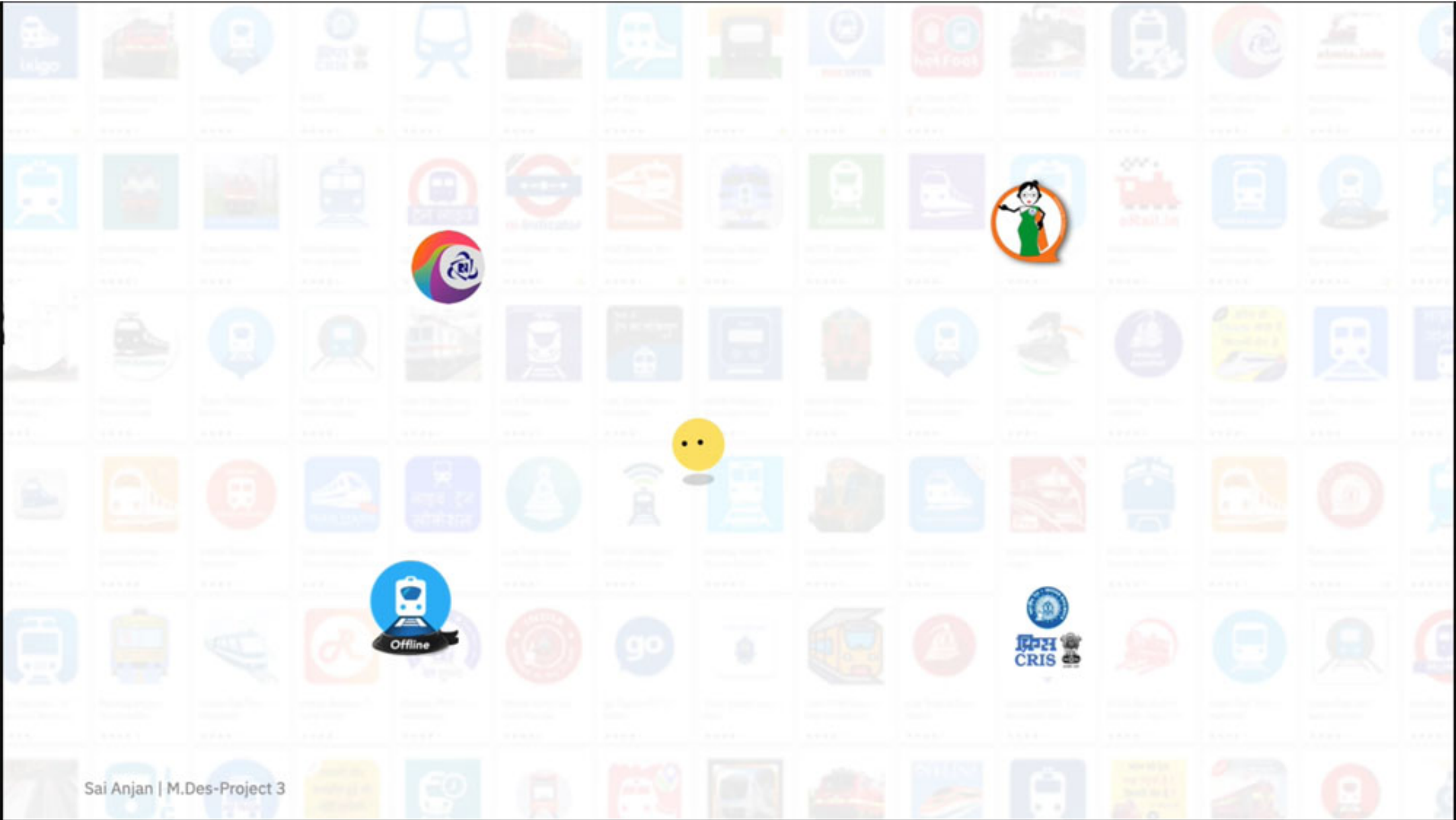
A conversational design approach to enquiry system for Mumbai CSMT

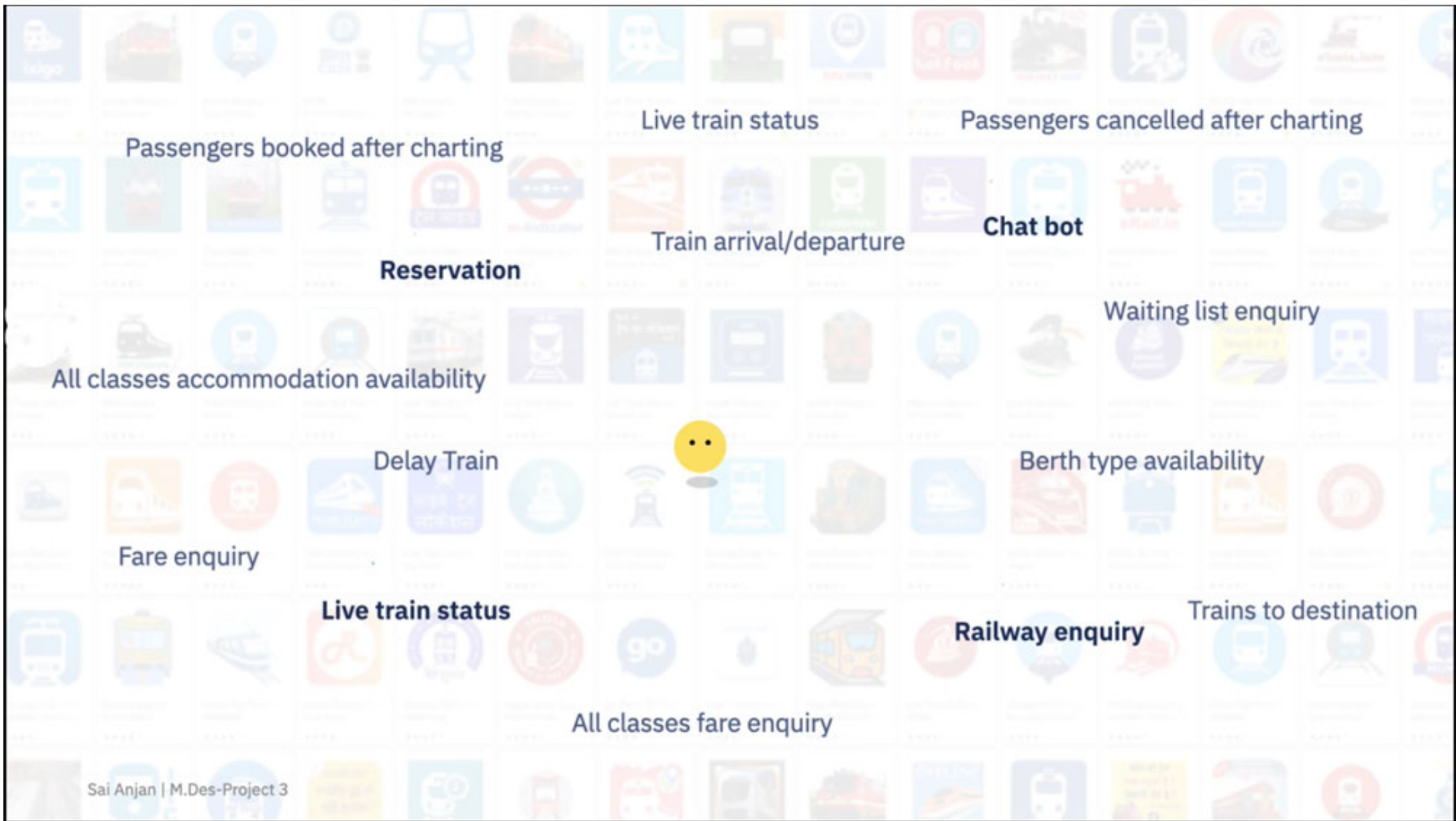
Guided by Prof. Ravi Poovaiah











Passengers booked after charting

Live train status

Passengers cancelled after charting

Reservation

Train arrival/departure

Chat bot

Waiting list enquiry

All classes accommodation availability

Delay Train

Berth type availability

Fare enquiry

Live train status

Railway enquiry

Trains to destination

All classes fare enquiry



सोलापुर जाना है





आज सोलपुर के लिए नांदेड़ एक्सप्रेस १०:३०
बजे को प्लेटफॉर्म ६ से निकलेगी

क्या तुम एक जनरल टिकट बुक कर सकती हो





ये लीजिये मुंबई CST से सोलापुर जंक्शन तक
आपका जनरल टिकट

सुपरफास्ट

CSTM **SLPR**
छत्रपति शिवजी म ट सोलापुर जंक्शन

अडल्ट्स: 1 बच्चे: 0 23 जून 2020





ये लीजिये आपका रिमाइंडर

31

मुंबई CST से सोलापुर

saianjan.margani@gmail.com

10:30



Primary research

Interviews with 3 passengers and enquiry staff at Mumbai CSMT.

Secondary research

Looked at the applications that are stated by the users and the most used railway apps.

The enquiry system

Understood the different categories of enquiry and information from the staff and the control center.



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Understood the different categories of enquiry and information from the staff and the control center.

Autonomy

The current enquiry process clearly indicates a need for self service system.

- Mumbai CSMT station has **18 platforms** and there are **no self service systems** on these platforms making the dependance to be on the enquiry counter at the station entry/exit.
- Passengers in the enquiry queue have a sense of **rushness** because of others in the queue.
- “Most of the enquiry questions are **same.**”
- “The 5 important categories are the same and the **way** the questions are asked **is different.**”



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Autonomy

The current enquiry process clearly indicates a need for self service system.

- “In CSMT **1 person** sits for **12 hours** staring at a computer screen and answering in the MIC.”
- “Passengers questions **irritate** us a lot of time and they are **repeated.**”
- “Railways already spends **50%** of its expenditure on **manpower.**”
- “But we are still **underpaid.**”



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Orientation

People doesn't really know how to use all the different platforms.

- Most of the emergent users are **dependent** on their family members for using the mobile applications.
- While enquiry counters can be used on the station, mobile applications are mostly used for **planning a journey** and making a **reservation**.
- **Digital payments** is an big hurdle for these emergent users.
- The UI requires the user to **login every time**. The app requires to verify mobile number and email id everytime.



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Governance

People are finding too many disconnected platforms to find information.

There is a disconnect in terms of what application does what.

- This app handles **only** the **reservation** and **booking** part of the indian railways leaving other parts of the information to 3rd party apps.
- Definitely mobile applications are creating a **confusion** because of the existence of **numerous number** of applications.
- There should be another **meta mode** of **information dissemination**.



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Process

There is a process of applying thinking to plan a journey in the applications/websites.

- Information display systems require the passengers to be able to read while the face to face enquiry provides **voice as the mode** of interaction.
- While these apps provide the most important parts of the information required these require the passengers to apply **cognitive thinking**.



Primary research

Interviews with 3 passengers and enquiry staff at Mumbai CSMT.

Secondary research

Looked at the applications that are stated by the users and the most used railway apps.

The enquiry system

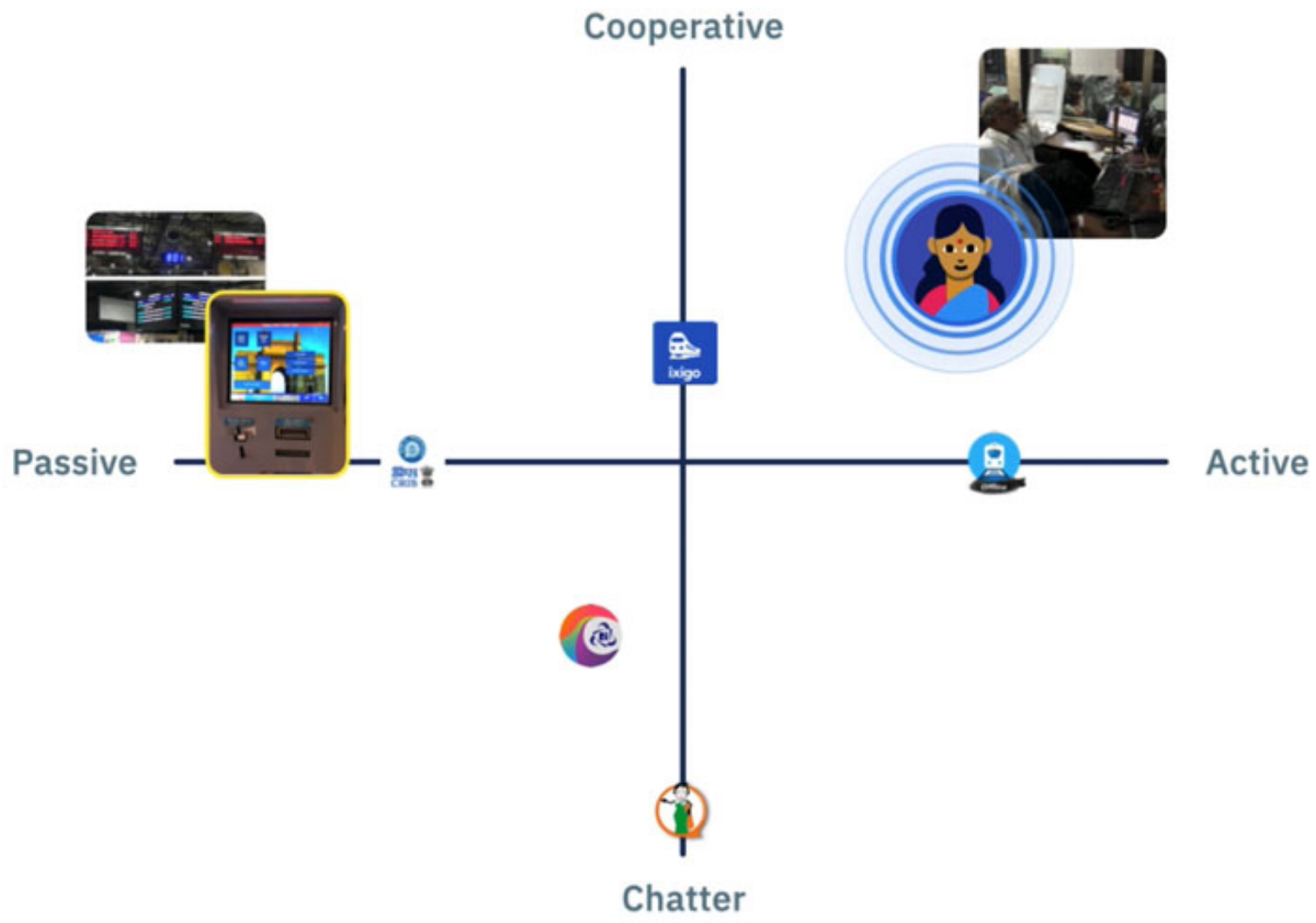
Understood the different categories of enquiry and information from the staff and the control center.

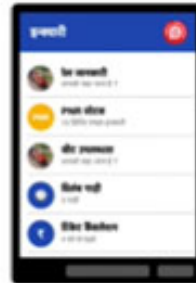
Active conversation

- The whole chatbot interface is an execution of orthodox method of conversation. A lack of passive conversation in the process of enquiry causes a disconnect.

- Ask DISHA is a **chatbot** which makes it another addition to the older technologies that Indian railways employs when it comes to digital solutions.
- Chatbot also uses artificial intelligence to answer questions. But the interaction is based on certain rules.
- Chatbots are **passive conversational agents** in the sense that it doesn't get involved in the co-operation part of the enquiry.
- These are extensively **FAQs** picked up from a guidebook.







Self service
kiosk

+ Cloud based +

Conversational
agent



“A conversational agent which acts as an active agent in conversation that can be installed on platform and be used on personal mobile phones.”



Goal/Objectives

Accessing information which is live and correct on the platform/station so as opposed to accessing it on a private app where **only small parts** of it is **available** which might be **inaccurate/incorrect**.

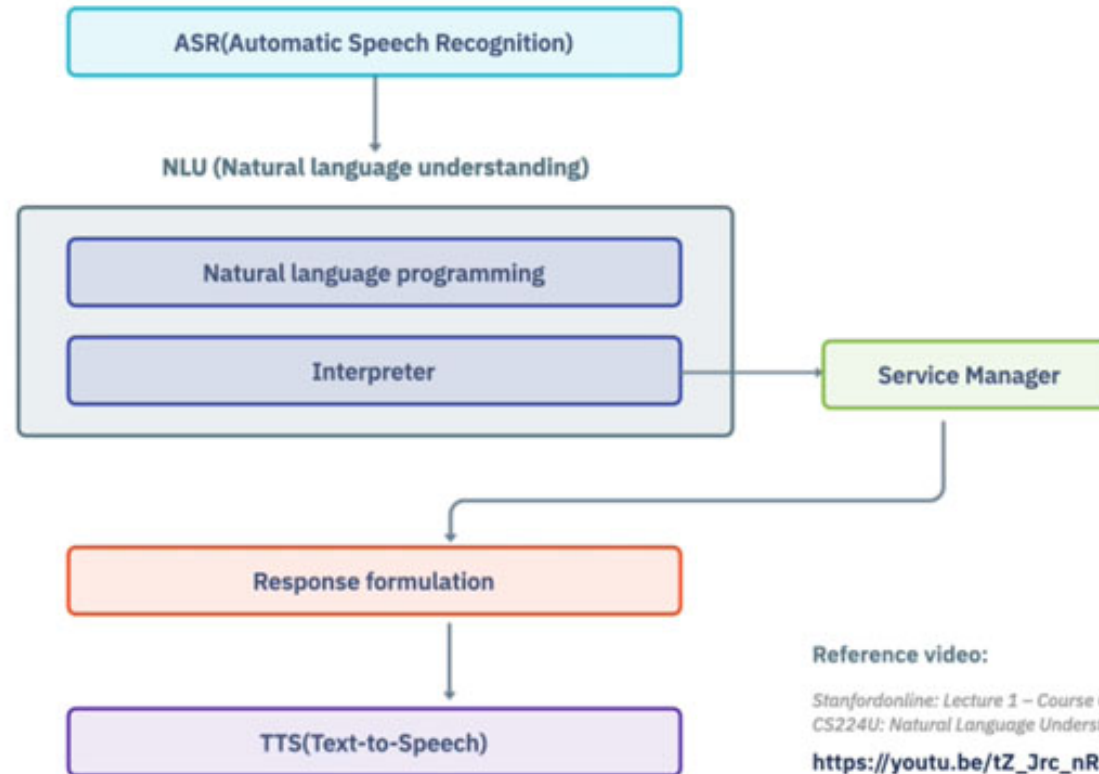
Having another form of information gathering which **saves** the passengers time from **standing in a queue**.

Disseminate information from the primary form which is going and enquiring a staff face to face in the enquiry section.

Use **voice** as the **mode of interaction** by employing an conversational agent



How do CAs work



Reference video:

Stanfordonline: Lecture 1 – Course Overview | Stanford
CS224U: Natural Language Understanding | Spring 2019

https://youtu.be/tZ_Jrc_nRjY



That being said...



Dialogflow

Natural language understanding



Google assistant

Available on android phones

NLU (Natural language understanding)

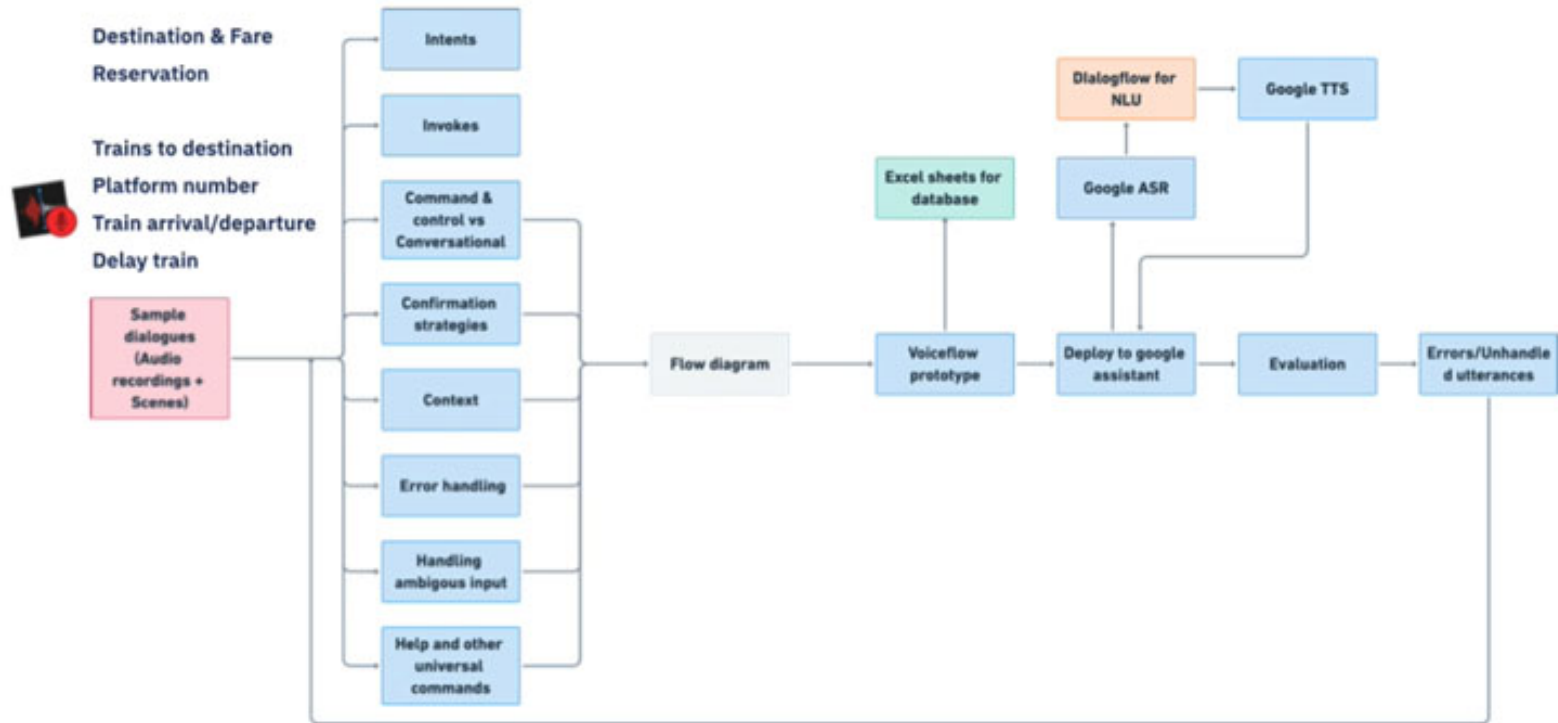


Non goals

- Not an **M.L** or **Deep learning** model design
- Not a better speech recognition for **indic language**
- not building a new **NLU Model**.



Conversation design



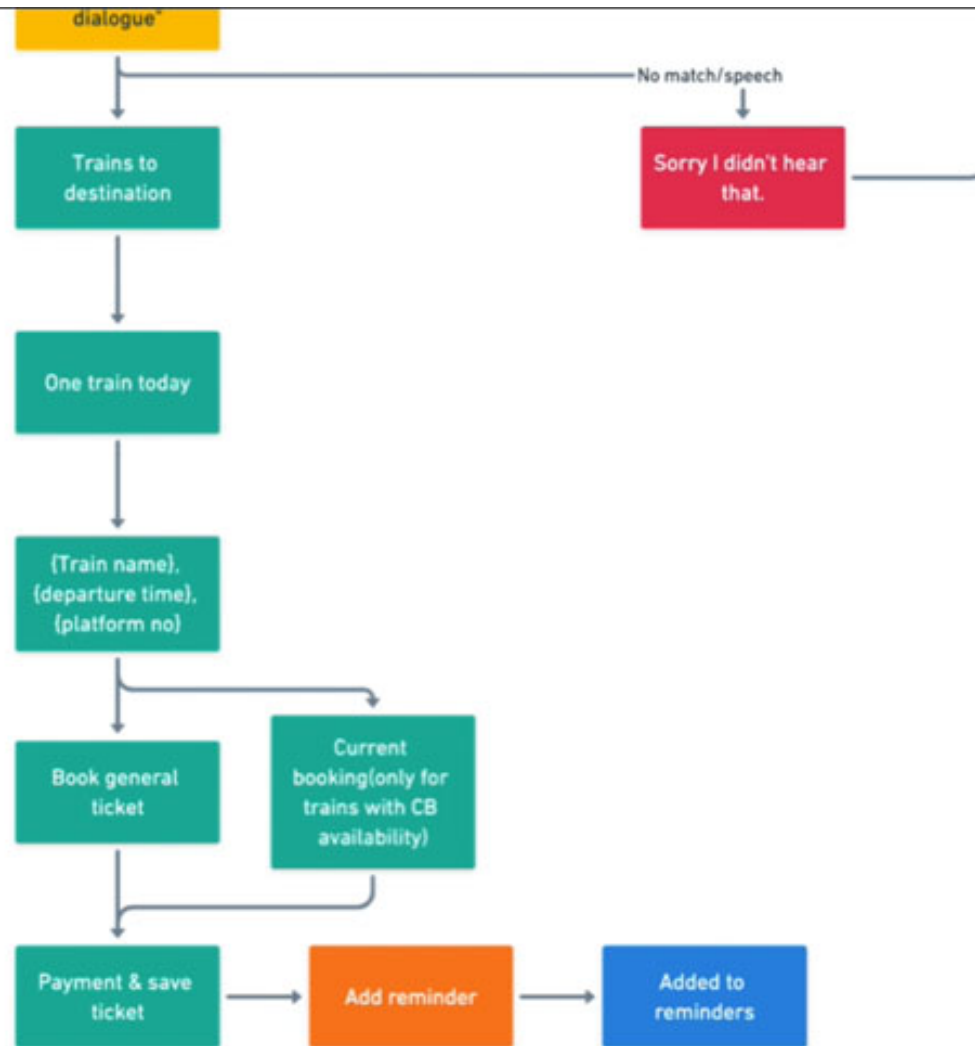
Refers to the sample conversations from the enquiry counter at CSMT station with the permission of central railways. Conversations from this recording are shown in the next sections but the audio is not disclosed here.



Trains to destination + Reminder



Trains to destination + Reminder



Trains to destination + Reminder

Intent

Train to destination

Context

Same:
Passenger asked for a train today to a destination and then asked the next train the day after without mentioning the destination. Agent should find the next train tomorrow to the first mentioned destination.

Confirmation strategies

Implicit:
In this case of conversations an implicit confirmation of the passenger requirement can be given
Ex:
USER - "Hyderabad ke liye"
AGENT - "Hyderabad ke liye Hussain sagar, 9:25, Platform 6"

Invoke

{station} ke liye
{station} ke liye kuch gaadi hai kya?
Abhi {station} ka hai gadi koi?
{station} ka koi train hai
{station} jana hai
{station} ke liye jana hai

Conversational

When even asked about the platform number of a train to a destination it is better to let the user know the departure time, platform number and the train name to avoid any further confusion.

Passenger is looking for the next train to a destination but haven't mentioned the same day or the next. Asking a question about when is required here.

Error handling

If the input is not heard the agent can confirm by asking "Kya aap ko hyderabad ke liye gadi chahiye?"



Trains to destination + Reminder

Idea - Be Safe 7:37 89%

इंडियन रेलवे इन्क्वायरी

नमस्ते मेरा नाम तुलसी है। मई आपकी रेलवे इन्क्वायरी में मदद कर सकती हूँ।



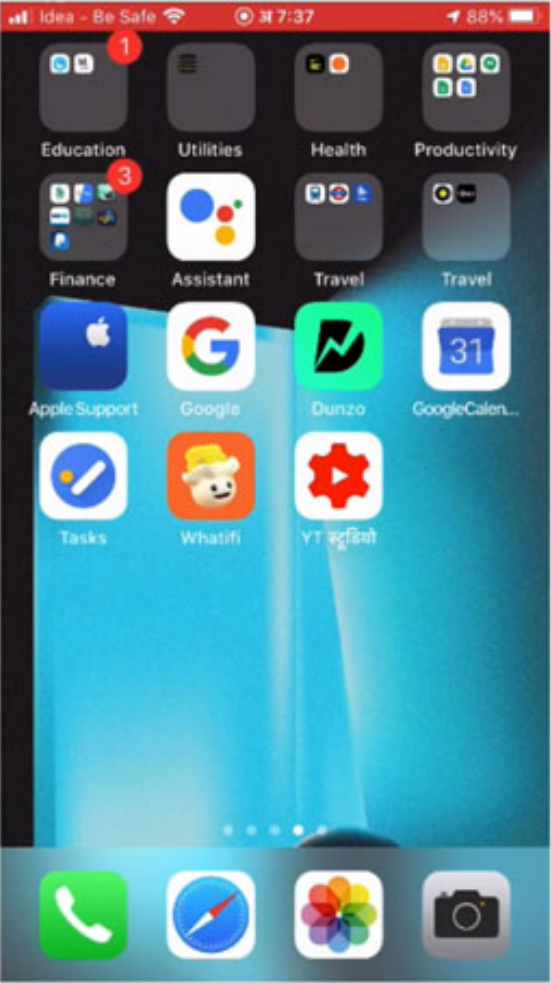
Trains to destination + Reminder



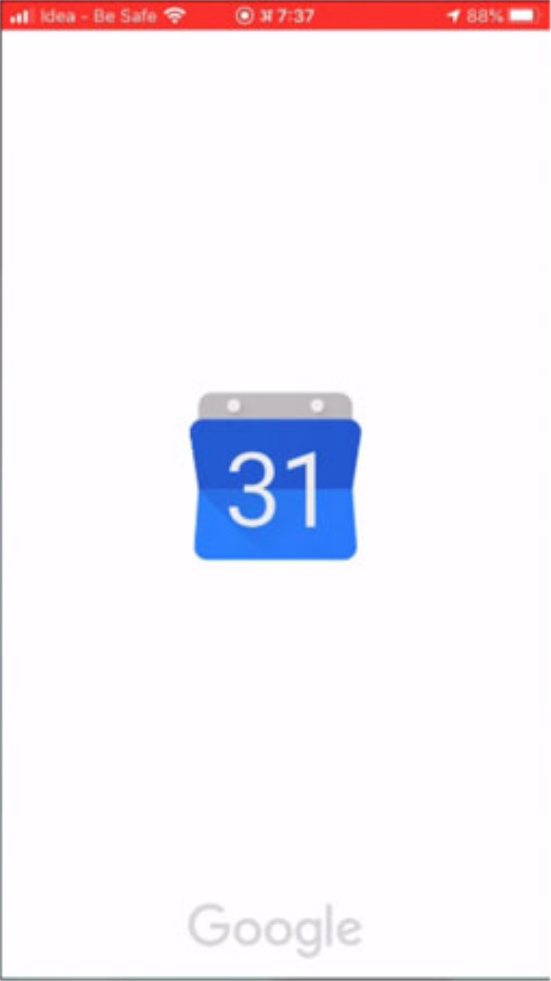
Trains to destination + Reminder



Trains to destination + Reminder



**Trains to destination +
Reminder**



Trains to destination + Reminder



Trains to destination + Reminder



Delay train

Intent

Train arrival/departure or status

Invoke

{train number} time change hua hai kya?

Mos of the questions are similar to trains to destination, train arrivals/ departures

Conversational

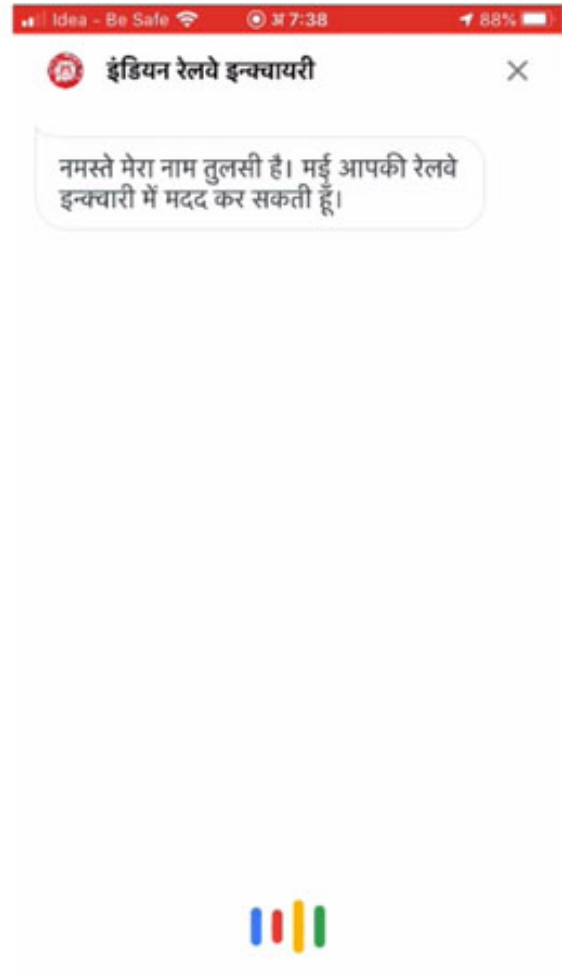
Especially for delay train there are a couple of options that the passenger can avail on station. One is boocking a dormitory room and taking rest other is going to the waiting room.

But also there are alternate trains to few destinations that this particular train was supposed to go and got delayed.

So for this the agent can further ask the passenger if he/she is interested in any of the above options.



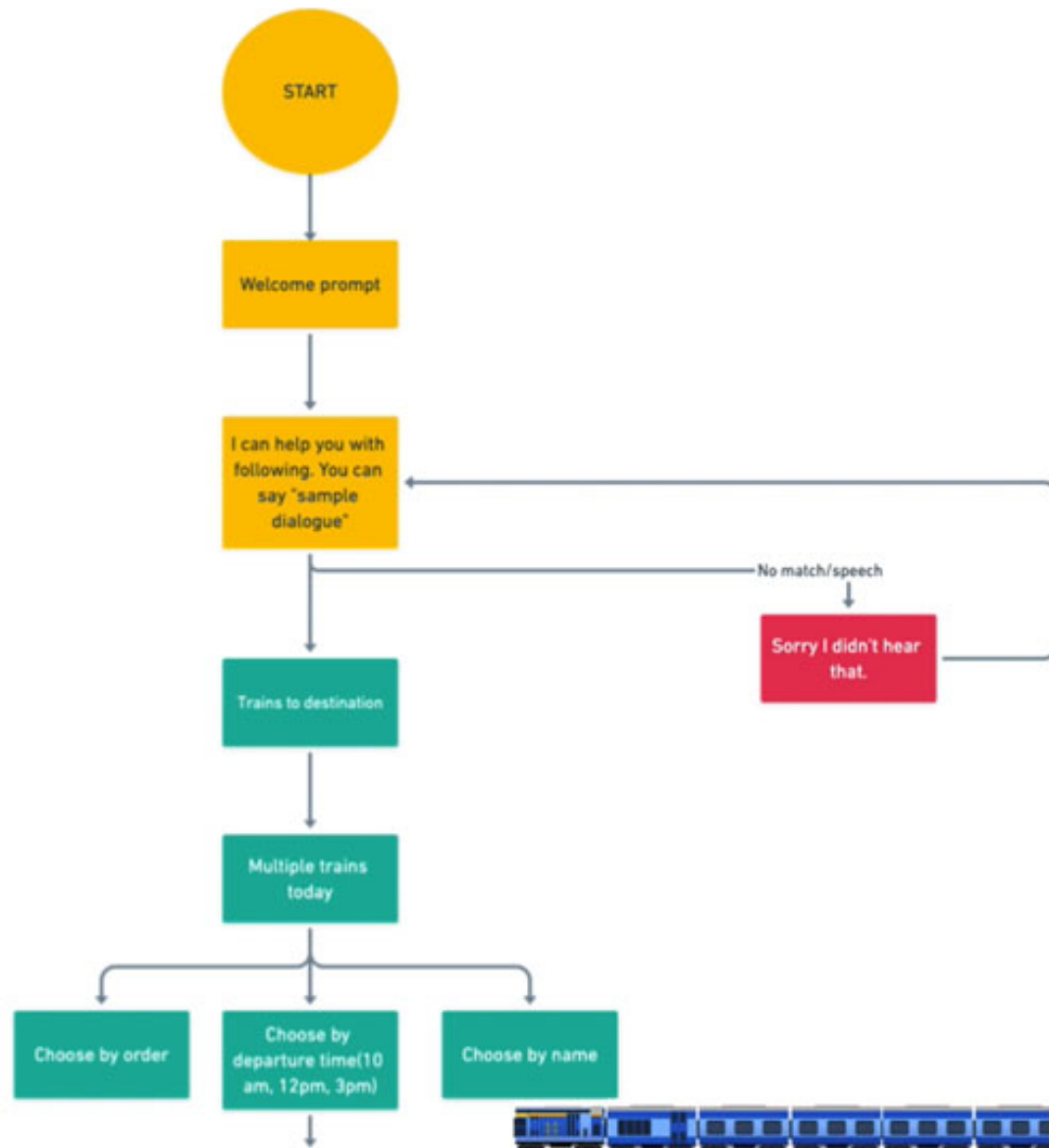
Delay train



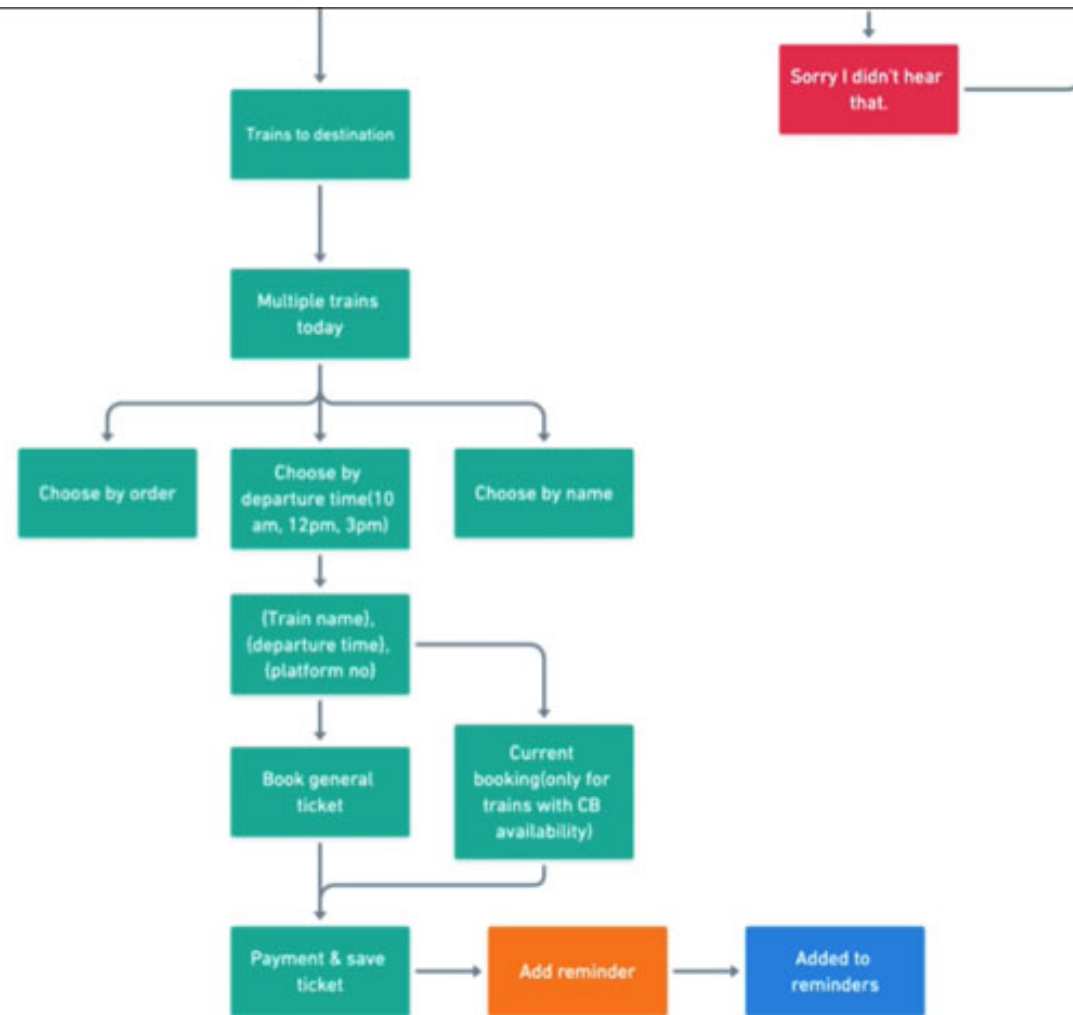
Delay train



Multiple trains final prototype



Multiple trains final prototype



Multiple trains final prototype

Intent

Train to destination - multiple trains available

Confirmation strategies

Implicit:

After getting the list of trains by time the user might not be looking at the screen and can ask which platform without mentioning the train. Then it's better to give the details of the first train so that if that's not the choice then the user can ask about the preferred train from the list by saying "ye nahi, dusra".

Invoke

{station} ki train kitne baje se hain?

Context

Same:

User first asked about trains to a destination and when the multiple trains are available user might address the trains as "first, second and third". In this case if there is a question like "Pehla kaunsa platform pe aayegi" then the context is about the same trains.

Conversational

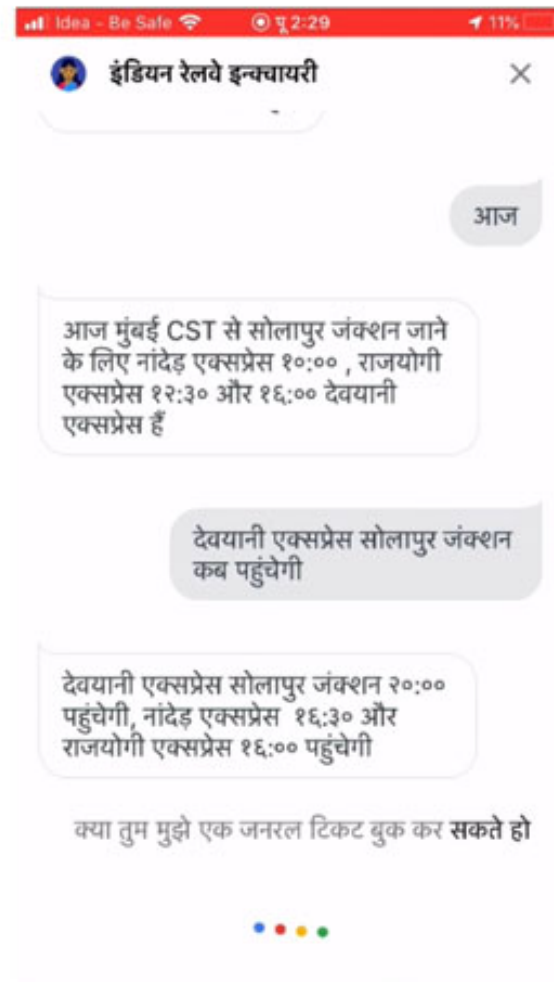
User wanted the list of trains by time. But the next question can be about any of the train from the list(3 trains). So in this case it is better to show the list of trains with train name, departure time, platform no. But the dialouge can be only about the list by time "pune ke liye pehla gadi 3:30, dusra 3:45 aur 9:45 ko hai."



Multiple trains final prototype



Multiple trains final prototype



Reservation

Platform number

Train arrival/departure

Cluster trains



Voiceflow Prototype



36% +

View Zoom Add Slide

Play Keynote Live

Table Chart Text Shape Media Comment

Collaborate

Format Animate Document

37

38

39

40

41

42

43

44

45

46

47

48

Voiceflow Prototype

Sai Anjan | M.Des-Project 3

Slide Layout

Title

Change Master

Appearance

Title

Body

Slide Number

Background

Colour Fill

Edit Master Slide

Indian Railway Enquiry CST Today - Google Sheets

creator.voiceflow.com/project/4VdAEggzd3/canvas/4U950hYdFswcZCvbcTXvpCQ6asyMMg...

Apps Sai Anjan IDC IxD 2018-20 -... Inbox (762) - saia... URHope Placement Revamp Data Viz assignme... P2 Stuff Freehand - Create... References

Indian Railway Enquiry Saved Google Assistant Share Upload to Google

Design Prototype Build

Home

Hey Google, start इंडियन रेलवे ...

Commands

- Stop
- Help

Welcome

नमस्ते मेरा नाम तुलसी है। मैं आपकी रेलवे इन्फार्मेशन में मदद कर सकती हूँ।

Block

- trains_to_destination
- reservation
- Else

Block

आप यह कहकर देख सकते हैं "पुणे जाना है" या "मुंबई सीएसटी से पुणे जंक्शन तक रिवॉरसन चाहिए।"

today_train
not_today
Else

Indian Railway Enquiry x CST Today - Google Sheets x +

creator.voiceflow.com/project/4VdAEggzd3/canvas/4U950hYdFsweZCvbcTXvpCQ6asyMMg...

Apps Sai Anjan IDC IxD 2018-20 - ... Inbox (762) - saia... URHope Placement Revamp Data Viz assignme... P2 Stuff Freehand - Create... References

Indian Railway Enquiry

Design Prototype

Upload to Google

Intents Slots Variables

Intent	Count
platform_number	2
today_train	1
trains_to_destination	25
single_train	
train_name	
reservation	5
reminder	2
cstm	7
nanded_des_arr	18
nanded_book	9
rajayogi_des_arr	21
rajayogi_book	11

platform_number

Utterances 2

Slots

Search Intents

today_train

not_today

Else

Block

destination

Block

आप देख सकते हैं "पुणे जाग है" सटी से पुणे जंक्शन तक "रा।"

today

not

Indian Railway Enquiry

creator.voiceflow.com/project/4VdAEggzd3/canvas/4U950hYdFswcZCvbcTXvpCQ6asyMMg...

Indian Railway Enquiry

Design Prototype

Intents Slots Variables

Slot Name	Type
{station}	Custom
{source}	Custom
{destination}	Custom
{date}	Date
{train_name}	Custom
{passenger_number}	Number

Slot Name: {station}

station

Slot Type: Custom

शोलापुर जंक्शन	शोलापुर
सोलापुर जंक्शन	सोलापुर
देवयानी एक्सप्रेस	देवयानी

Add custom value

Slot Color

Color selection: [Checked] [Teal] [Purple] [Orange] [Red] [Dark Red] [Blue] [Dark Blue] [Green] [Dark Green] [Brown] [Black]

Search Slots

Upload to Google

today_train

not_today

Else

Block

destination

Block

श देव सब्जे है "पुणे जाग है" सटी से पुणे जंक्शन तक री।"

today

not

Indian Railway Enquiry

creator.voiceflow.com/project/4VdAEggzd3/canvas/4U950hYdFswcZCvbcTXvpCQ6asyMMg...

Apps Sai Anjan IDC IxD 2018-20 -... Inbox (762) - saia... URHope Placement Revamp Data Viz assignme... P2 Stuff Freehand - Create... References

Indian Railway Enquiry Saved Google Assistant Share Upload to Google

Design Prototype Build

Welcome

नमस्ते मेरा नाम तुलसी है। मैं आपकी रेलवे इन्क्वायरी में मदद कर सकती हूँ।

Block

- trains_to_destination
- reservation
- Else

Retrieve Data in Trains

- IF (delay) = Yes
- (station) ≠ (destination)
- Else

Block

- आपको कब निकलना है?
- today_train
- not_today

Block

- IF (source) = (छत्रपति शिवाजी म...)
- Else

आप यह कहकर देख सकते हैं "पुणे जगन है" या "मुंबई सीएसटी से पुणे जंक्शन तक रिजर्वेशन चाहिए।"

**Onboarding-Final
prototype**











शुरु करने से पहले ये करिये

1.

IRCTC खाता

2.

अनुकूल स्टेशन

3.

पेमेंट



अनुकूल स्टेशन

जहाँ से आप ज्यादातर यात्रा करते हैं

CSTM

छत्रपती शिवाजी महाराज टर्मिनस



पूर्व

अगला





नमस्ते!

मेरा नाम तुलसी है।

मैं आपके रेलवे इन्फार्मरी में मदद कर सकती हूँ।



समस्याएं को ढूँढें



टिकटिंग



विशेष गाड़ी







**Visual design-Final
prototype**

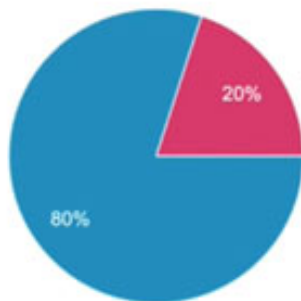


**On platform kiosk
prototype**



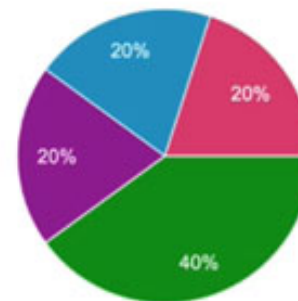
Evaluation results - Likability

I like the idea of being able to interact like this
5 responses



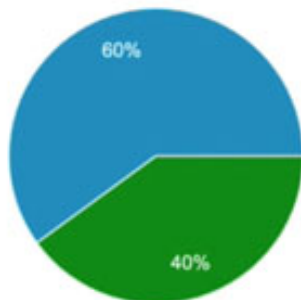
- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

It is fun to play around with the system
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I find the system entertaining
5 responses

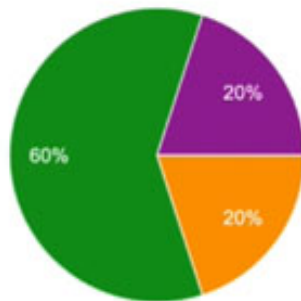


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



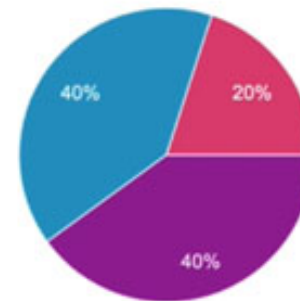
Evaluation results - Conversation flow

The conversation is too choppy
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I like the flow of the conversation
5 responses

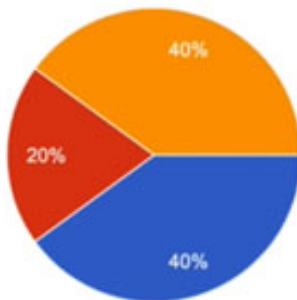


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



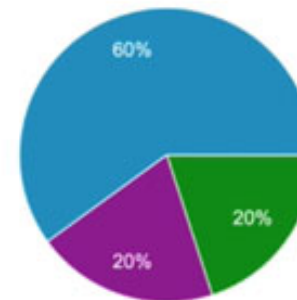
Evaluation results - Ease of use

I will try to avoid using this system in the future
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

The system is easy to use
5 responses

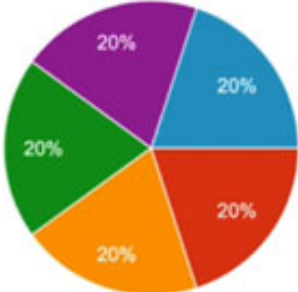


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



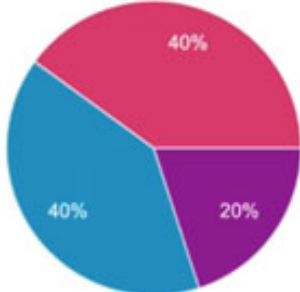
Evaluation results - Advice offered

Sometimes the advice seems irrelevant
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

I am happy with the advice offered
5 responses

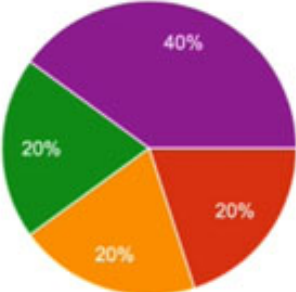


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



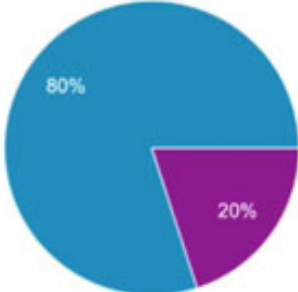
Evaluation results - Accuracy

The system is confusing
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

The system understands what I say
5 responses

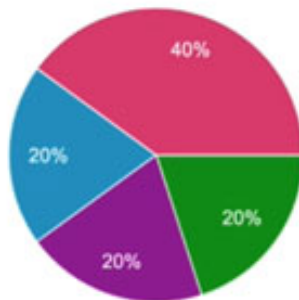


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



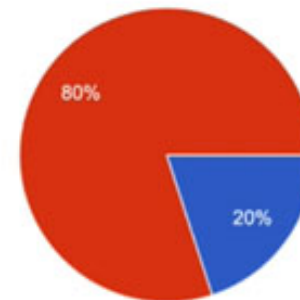
Evaluation results - Concept

I would be happy to use this system again and again
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

The idea of talking to mobile strikes me as strange
5 responses

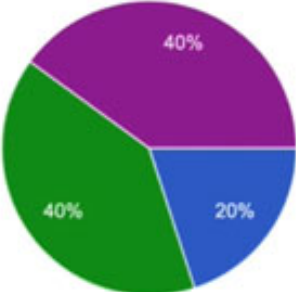


- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



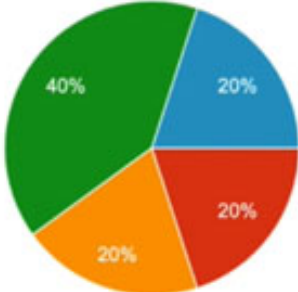
Evaluation results - Authenticity of conversation

The conversation feels very canned to me
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree

It feels like I am having a conversation with someone
5 responses



- Strongly disagree
- Disagree
- Somewhat disagree
- Neutral
- Somewhat agree
- Agree
- Strongly agree



Conclusion

Conversation plays an essential role in how users want to interact with their devices.

Participants describe that this kind of new system would be encouraged to use while saying that they still know that the responses were pre written

Conversations can be appropriate in various Indic language situations like healthcare, information search if not enquiry

When combined with google assistant natural language understanding the conversations need more design.

