Re-Designing

AUTOMATIC TICKET VENDING MACHINE

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Overview

- Need of project
- Research
- Problem identification
- Explorations
- Final concept

Need of project

- Wastage of time because of long queue at ticket counters.
- Trains being cheapest and fastest mode of transport so more and more people turning towards it.
- Everyday increasing population, but inadequate number of ticket counters.
- Money change problems
- Varied range of users, training is impossible so simple and easy interface.

Research

Study of Existing System

Research

Field Study

- Commuters are not comfortable booking ticket using machines.

- Route maps are not properly positioned.

- Overcrowded stations and long queue hides the ticketing machines.

Research

Map Study

Existing map on machine

- LOCATE YOUR ZONE : bad readability because of shadow.

- Zones (Z1,Z2,Z3…) are unrecognizable.

- Tracks looks very complicated and chaotic .

- No bullet or marking of station on tracks because of which it feel as if there is no relation between the two.

- Stations are not properly aligned, haphazardly arranged.

- The cursor on screen is confusing.

- Because of small screen size, stations are very closely placed which gives feeling of selecting two stations by mistake.

- Small font size therefore low clarity.

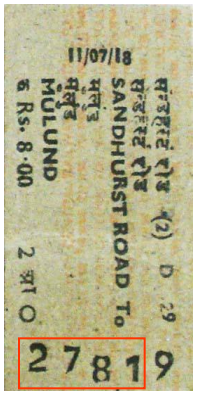
- No. stations in zone are very random (like some zone has 20 station and some has 4 stations)

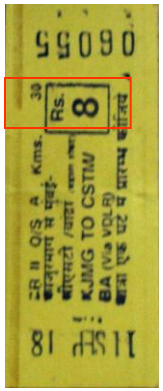
Research

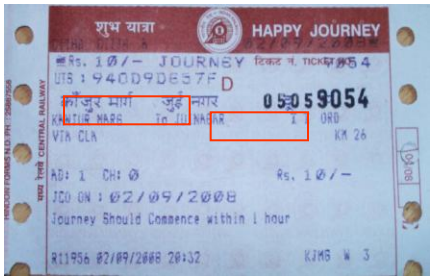
Mumbai route study :

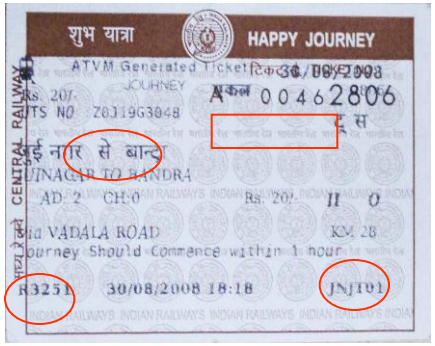
The geographical map of Mumbai metro is very chaotic and finding ones destination station is very difficult, and one gets confused.
Further study of map reveled that the complete Mumbai metro route is divided into three routes (central, western and harbor). Which itself is the differentiating characteristics and can be considered while redesigning map.

Research









Ticket Study:

Ticket study reveals that there are some information on the ticket which is not useful for the commuter.(marked on ticket images)

To reduce printing time some fixed information which may or may not be important for user can be pre-printed

Pre- printed:

- ATVM generated ticket
- Journey should commence within 1hr.
- Central railway and western railway.
- Happy journey
- Railway logo.
- Logo printed all over the ticket area as back ground.

Problems:

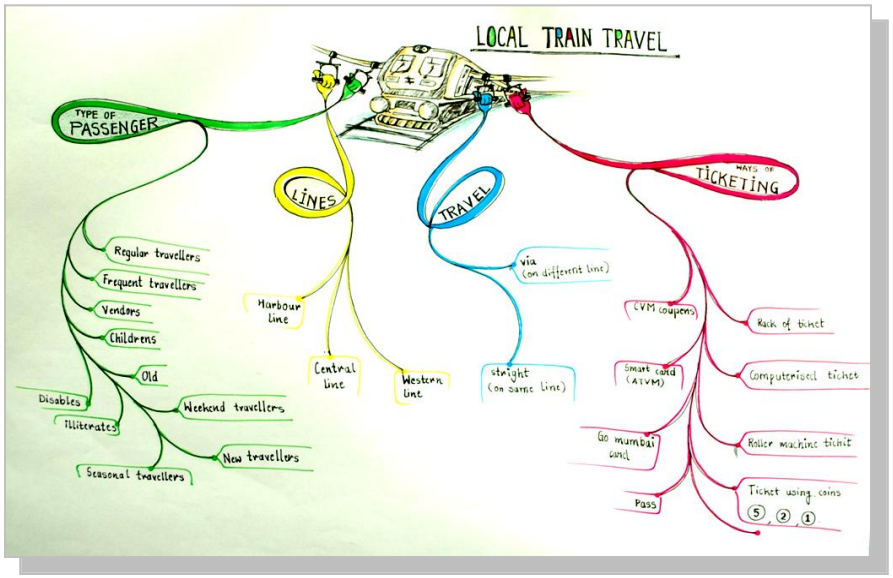
- Date printed twice on ticket.
- Printing over problem.
- Readability problem because of pre printed background.

Problem identification

Problem definition:

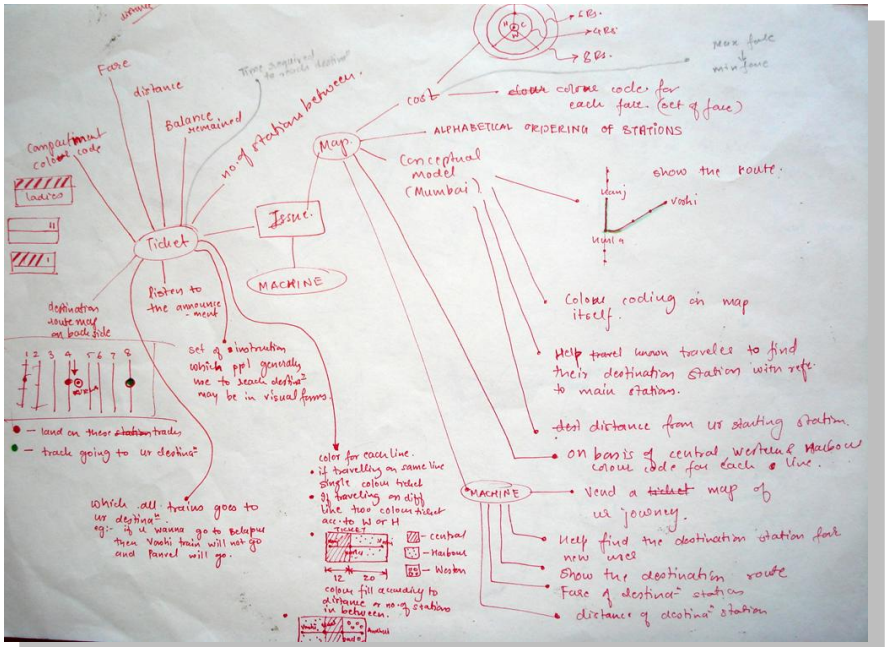
The project aim to provide easy and fast ticketing to familiar/unfamiliar, multilingual and handicap commuters.

Mind maps

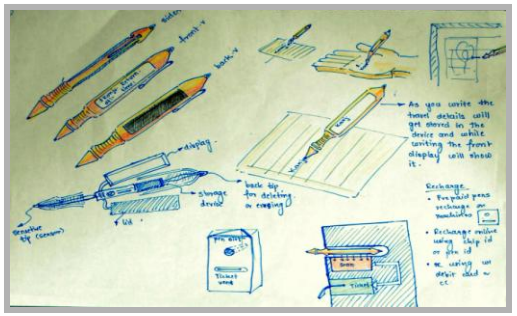


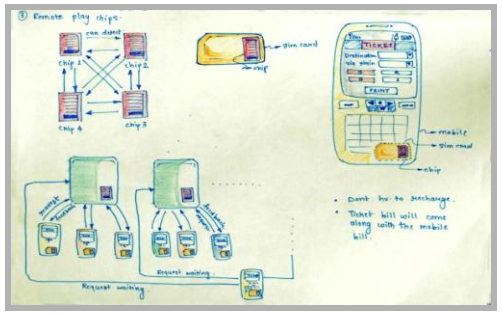
This mind map lists out the different kind of passengers travel through local trains, different routes (central, western and harbor) in which the complete suburban railways is divided, kind of travel and various ways of ticketing.

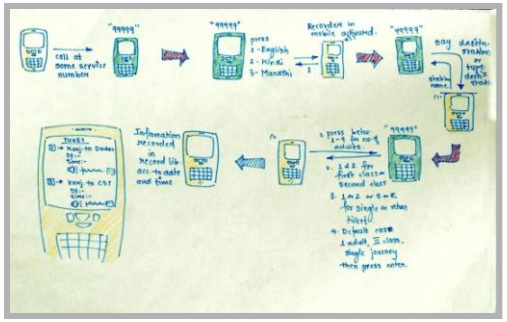
In this map issues related to ticket, map and machine are discussed and quick ideation on solving those problem.
In ticket what different information can be added, similarly whether maps could help in any way and how machine can help out commuters is discussed.

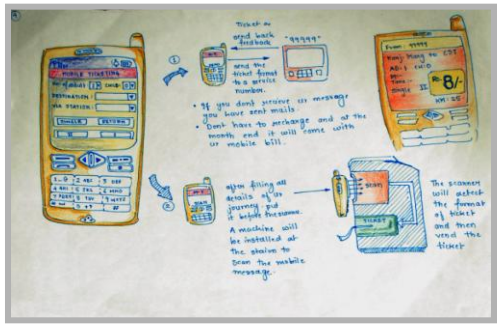


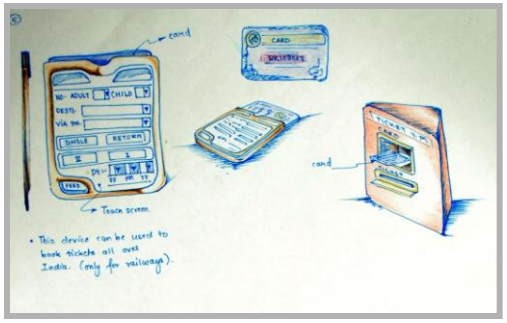
Explorations

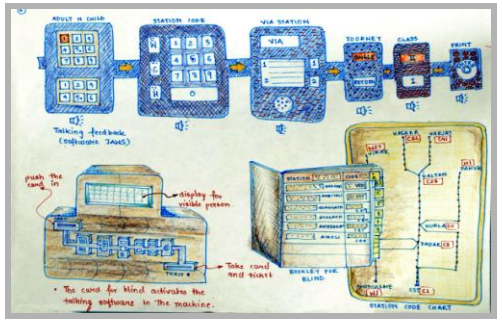










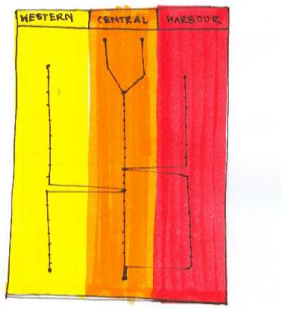


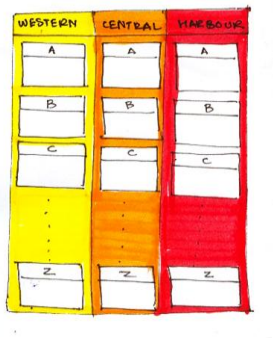
- In all these exploration cash payment for ticketing is avoided and pre paid cards are used

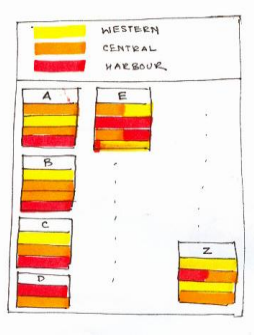
- Placing map behind the machine will help commuters save their time to search for the destination station.

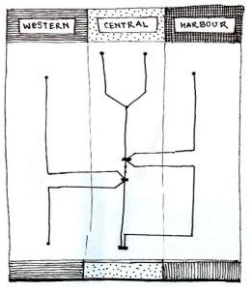
- Using map on screen can solve the different language problem and maintaining consistency between map on wall and on screen will help commuters.

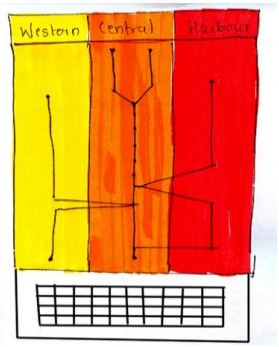
Exploration

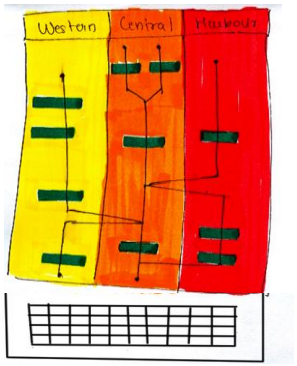






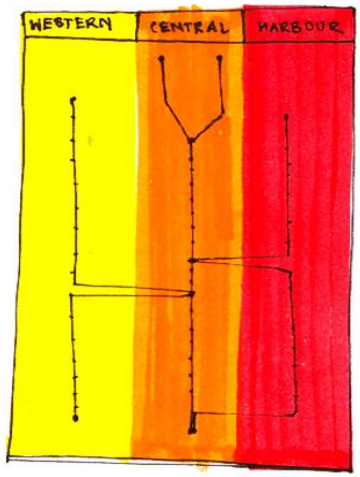




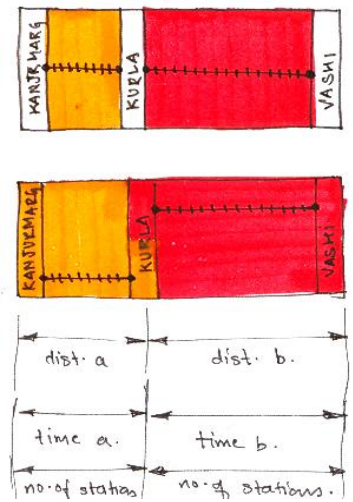


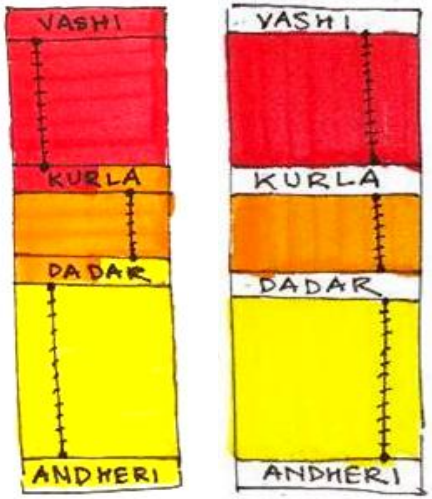
- Color code for each route
- Arranging stations of each route in alphabetical order.
- Arranging all stations in alphabetical order and color code for each route.
- Dynamic map.

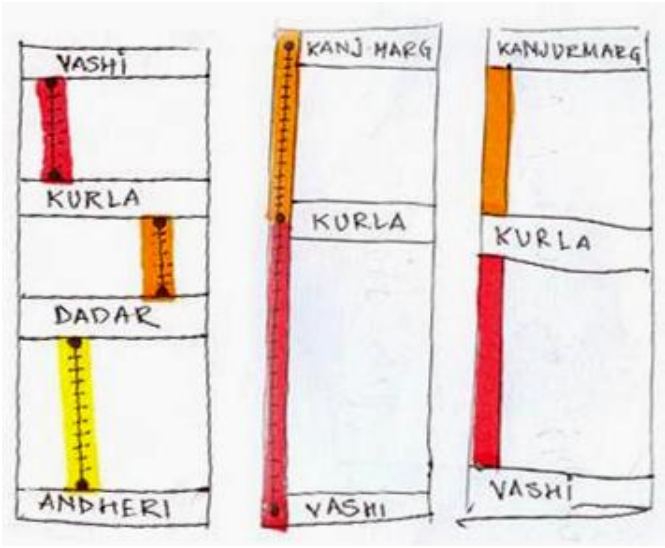
Exploration



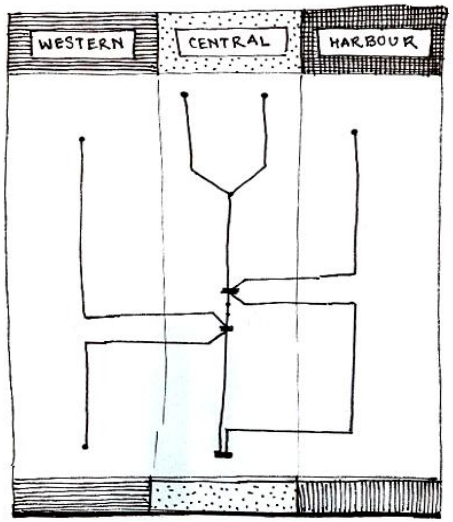
Ticket idea 1:



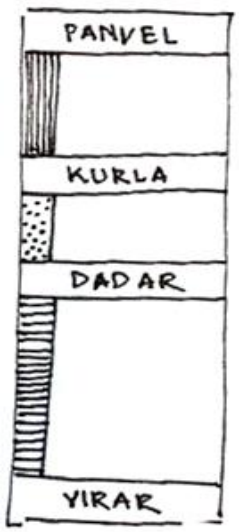


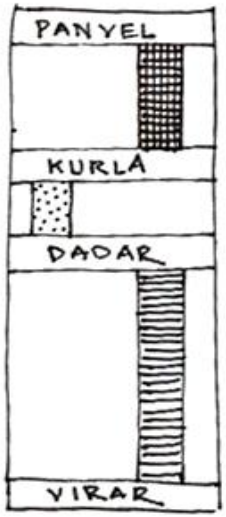


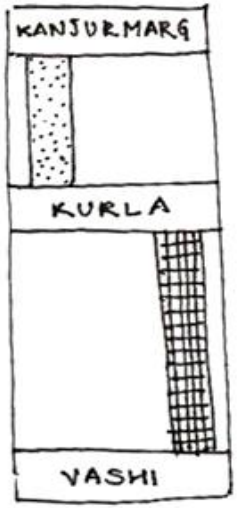
Exploration

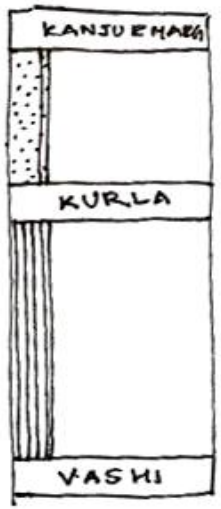


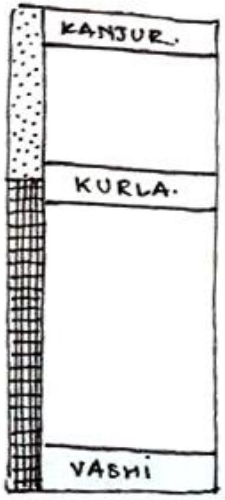
Ticket idea 2:

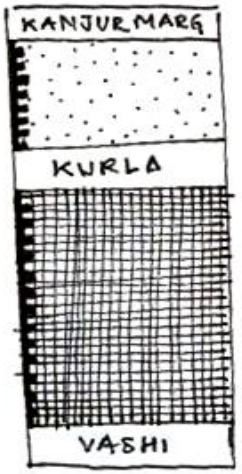






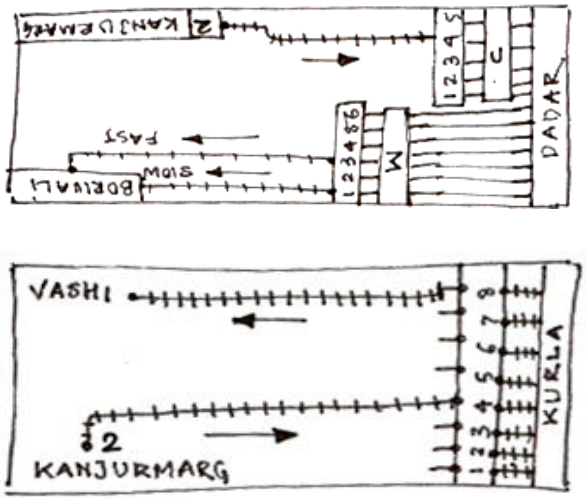


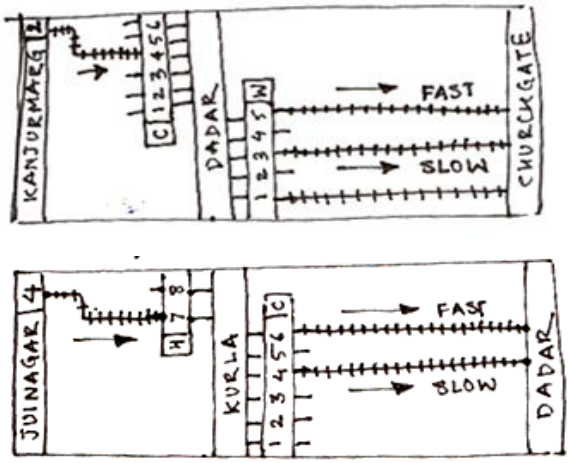




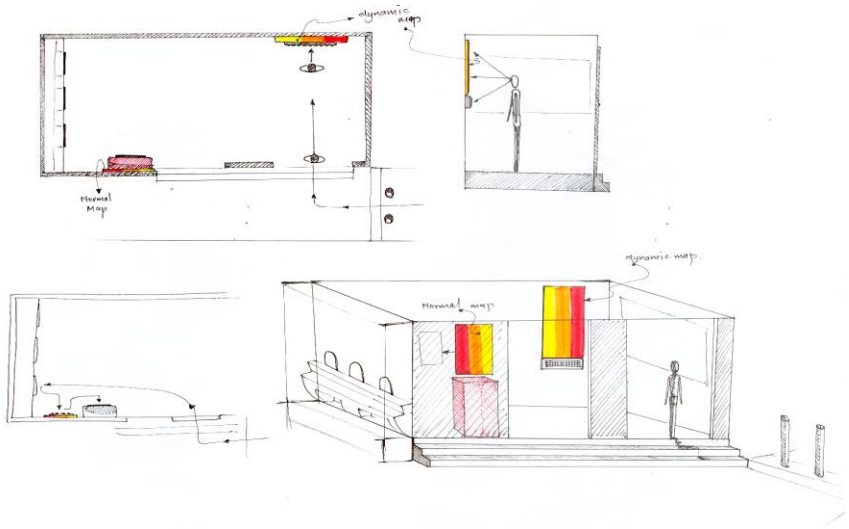
Exploration

Ticket idea 3:

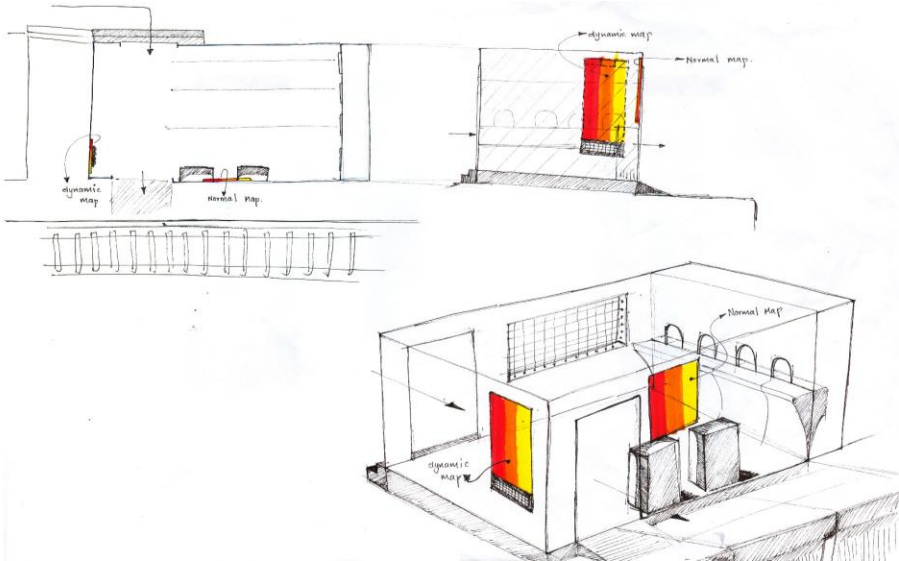




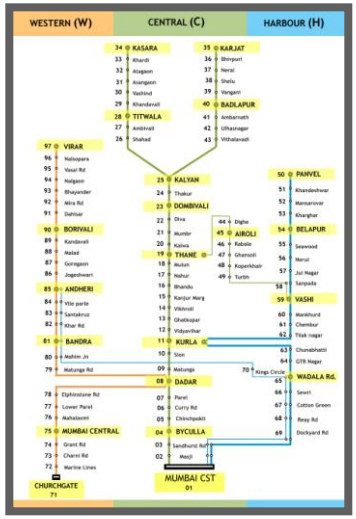
Exploration



Map and machine placement on station :



Exploration

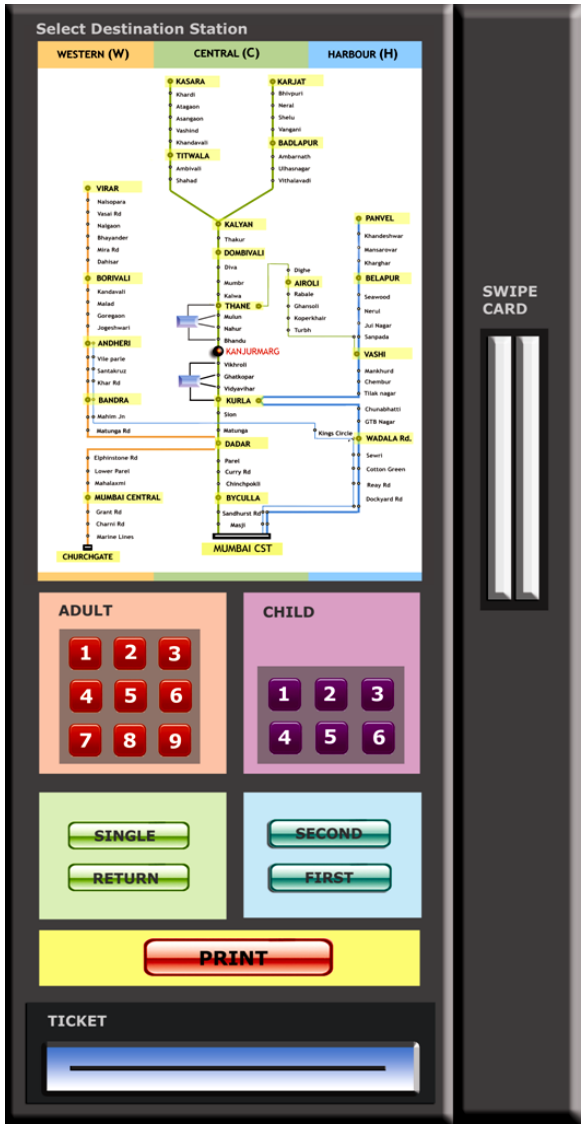


Machine idea 1:

This idea is based on code of ones destination station.

Each station will be given a code which Commuter have to search and then use on machine.

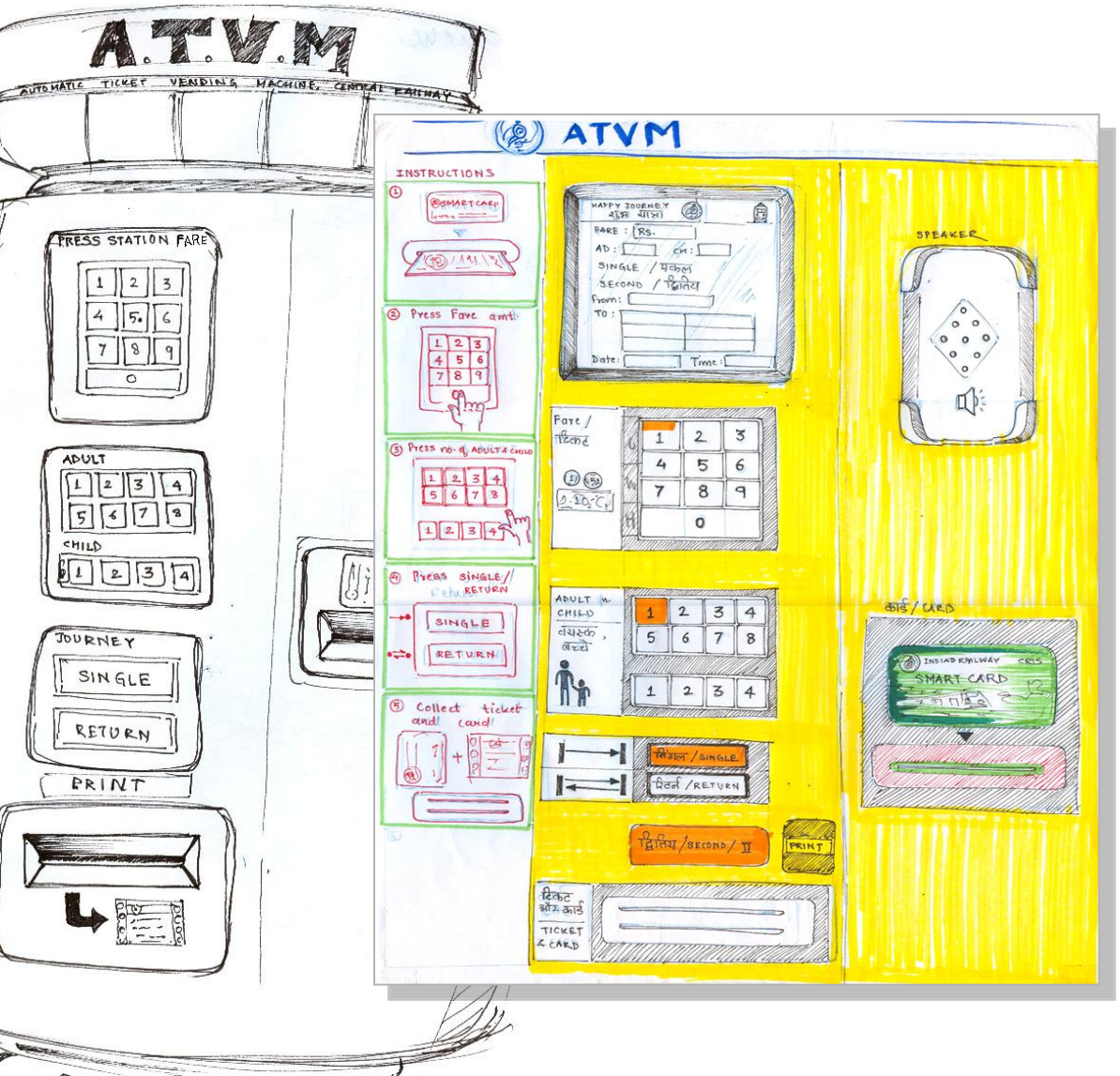
Exploration



Machine idea 1:
In this idea one have to select their destination station on screen and other interface off screen

Map on screen have an advantage of multilingual option in map.

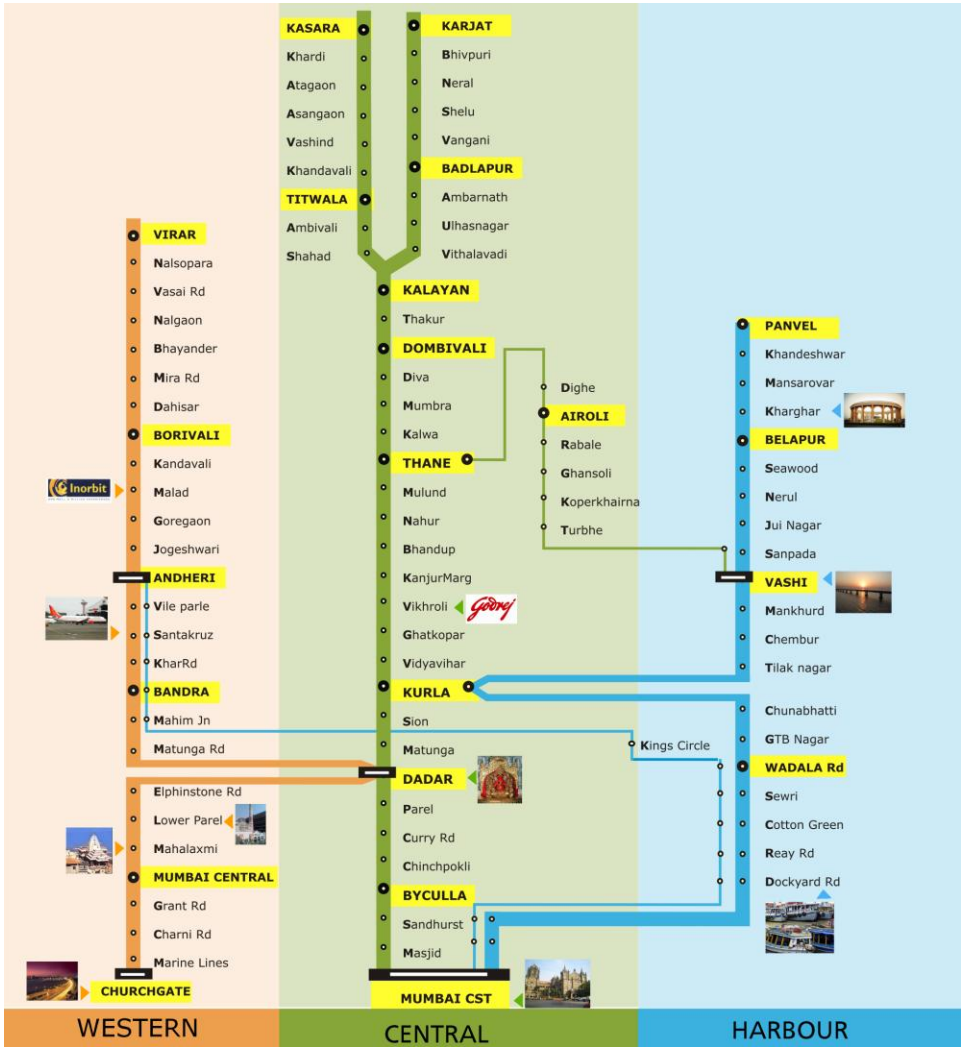
Exploration



Machine idea 3:

This machine based on fare of the destination station.

Final concept



Final map concept:

Features of the map

- Bold and highlighted main stations. Which can help people to find there destination by taking it as a reference.

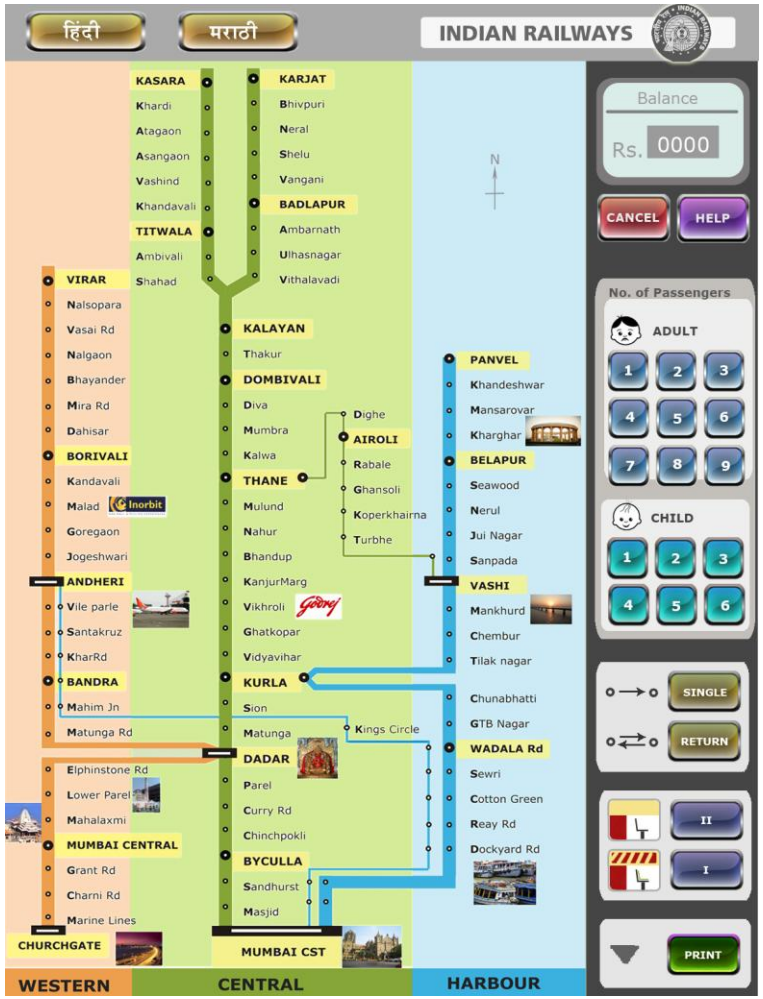
- left aligned stations. People generally have tendency to search the initial alphabet if they are unfamiliar with the route. So this arrangement can help commuters.

- Bold initial alphabet. This will emphasize more on initial alphabet which helps in searching.

- color code for each route . If unfamiliar commuter knows address like the destination station lies on central, western or harbor line then he or she just need to search within that line.

- photographs of monuments or landmarks besides that station.
-.

Final concept



Final interface :

Features:

-A 20" touch screen is used in vertical form (total active area is 308mm x 406mm with aspect ration of 4:3)

-Hindi and Marathi options for commuters who don't know English

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-Balance display shows the current balance and at the end after pressing print will show the remaining balance. If the balance goes below Rs.10 then the balance box flashes

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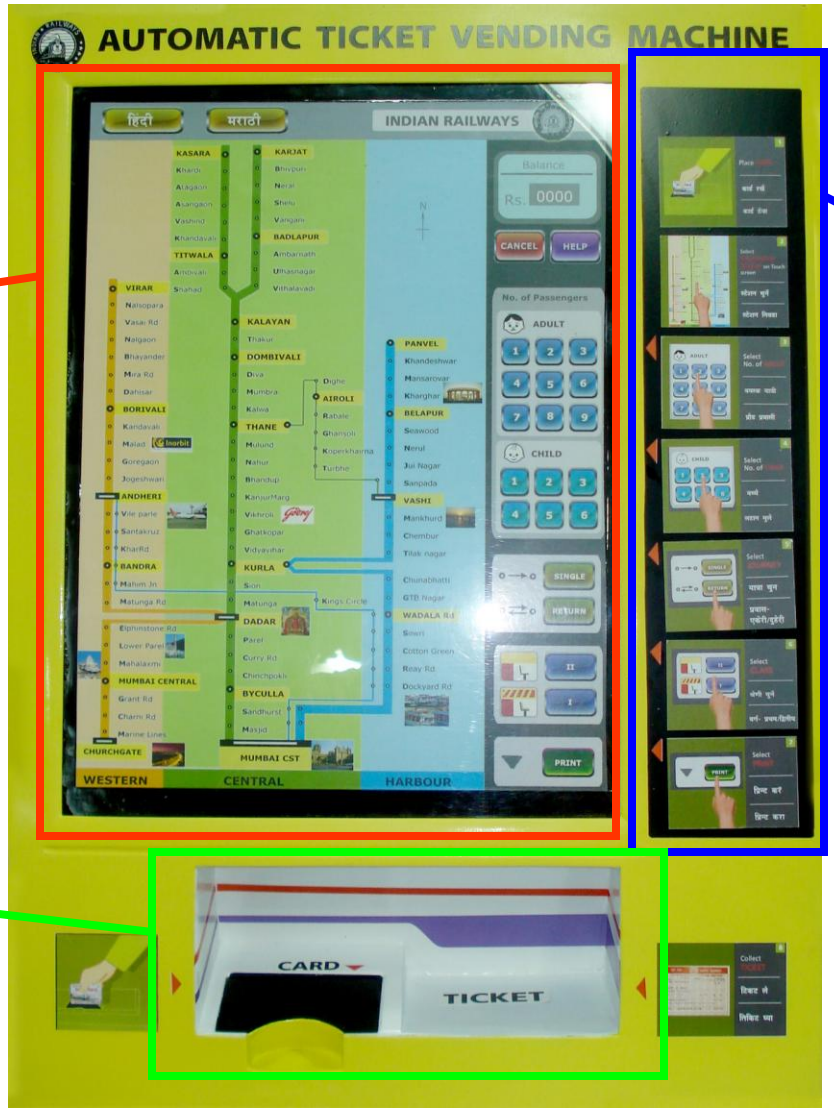
-Cancel button is to stop printing and help button if one faces problem with machine.

-Symbols are for each feature to help illiterate commuter.

Final concept

FINAL INTERFACE



Display or touch screen space

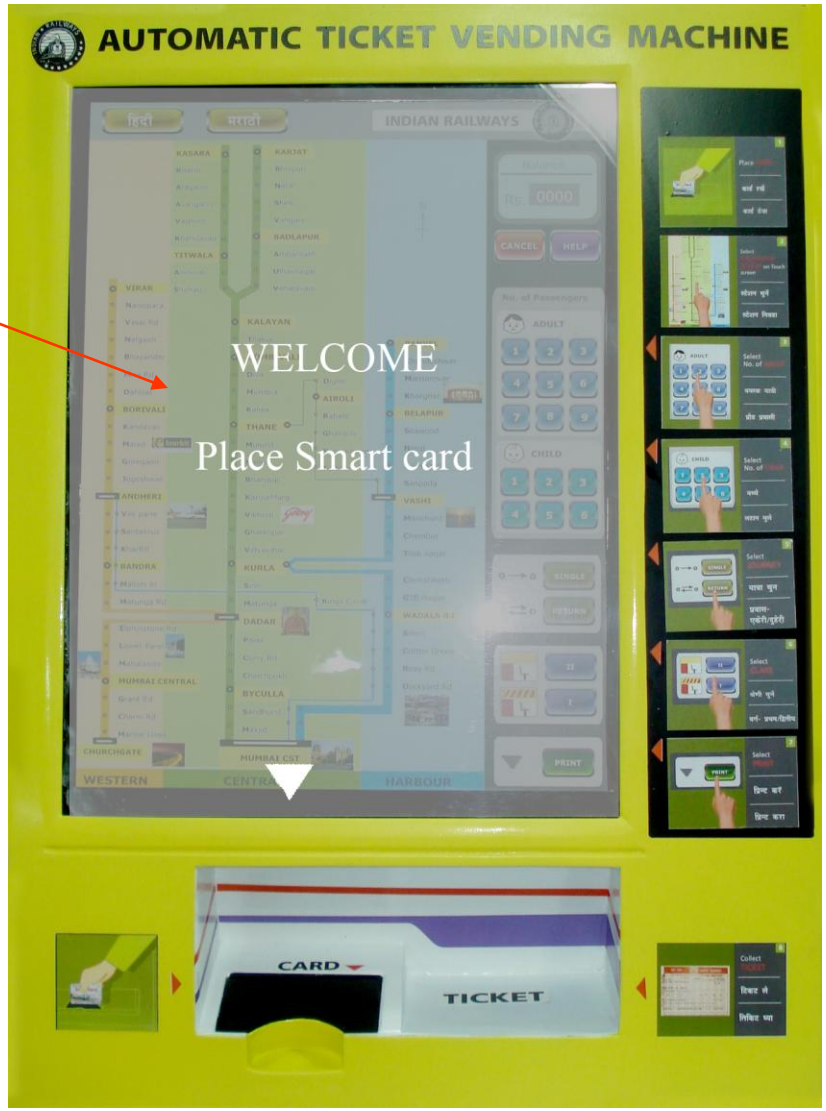
Instruction space

Card and ticket space

Final concept

FINAL INTERFACE

Normal machine screen



Final concept

FINAL INTERFACE

Place smart card to activate screen

Final concept

FINAL INTERFACE

SELECT YOUR
DESTINATION STATION

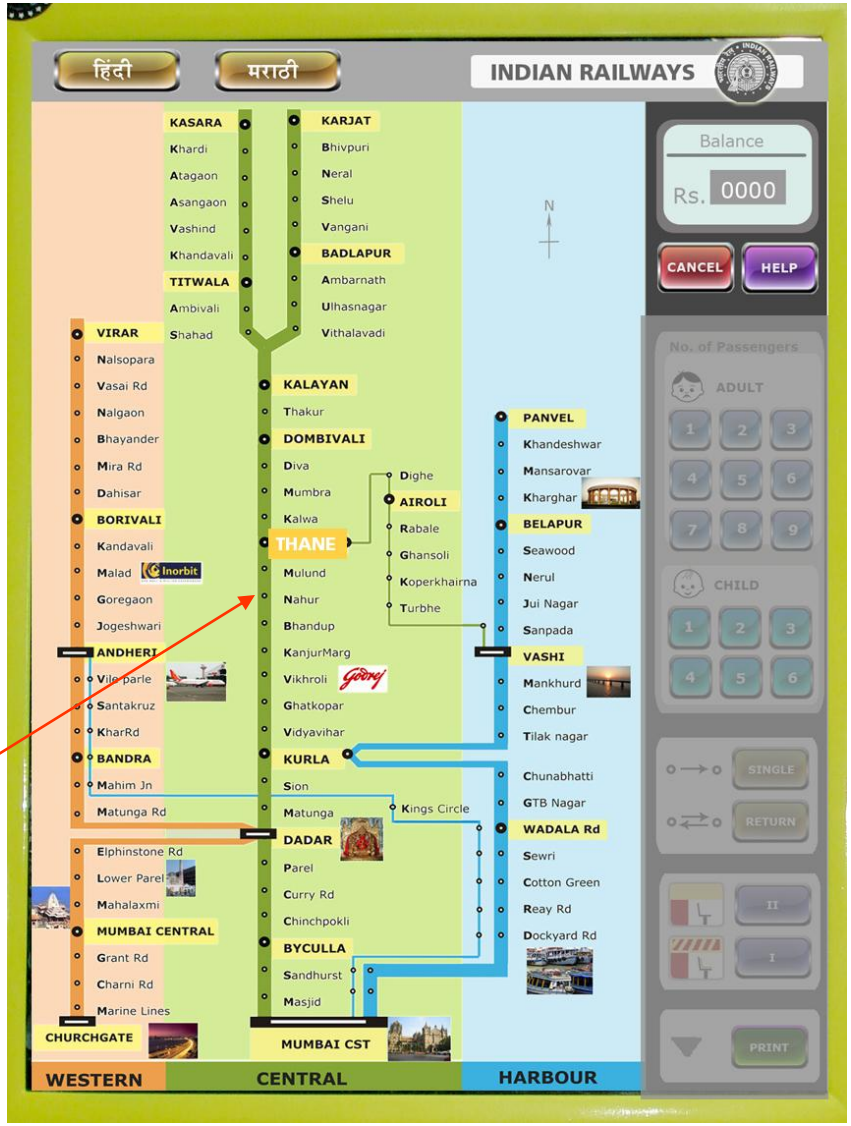
2

Final concept

FINAL INTERFACE

DESTINATION STATION

3

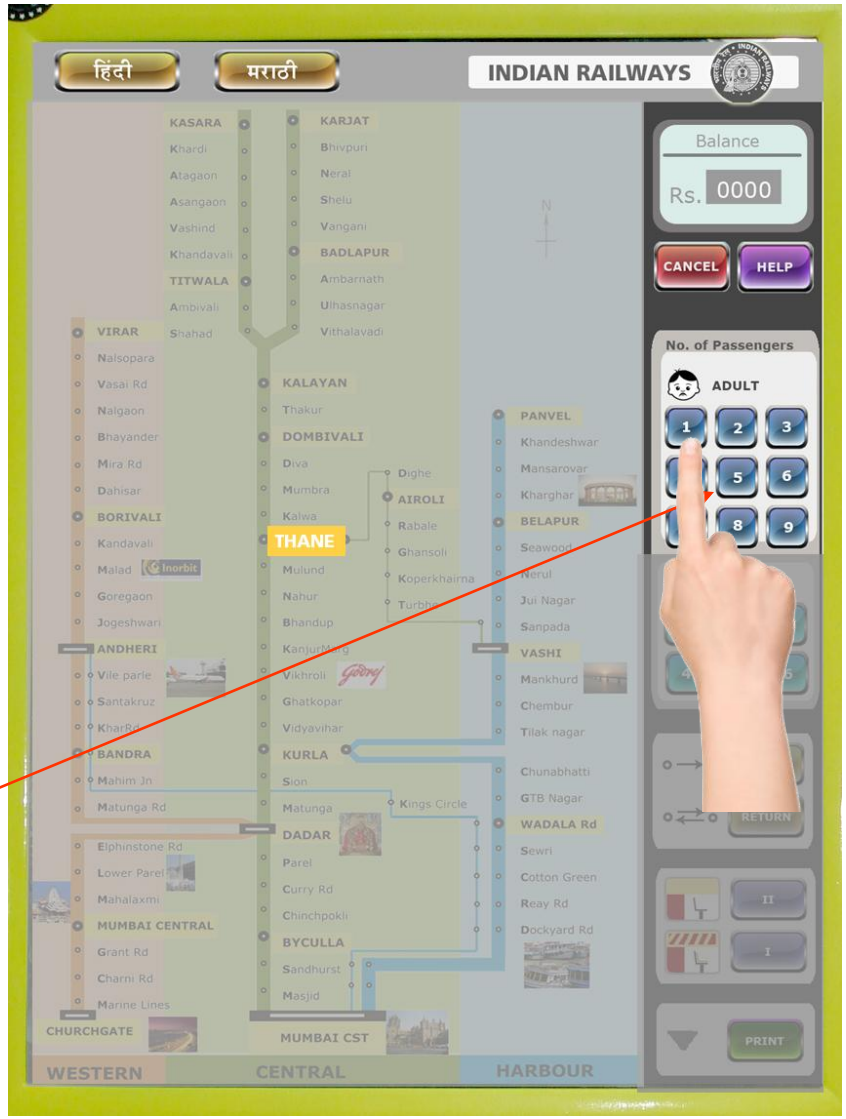


Final concept

FINAL INTERFACE

SELECT
NO. OF ADULT

4

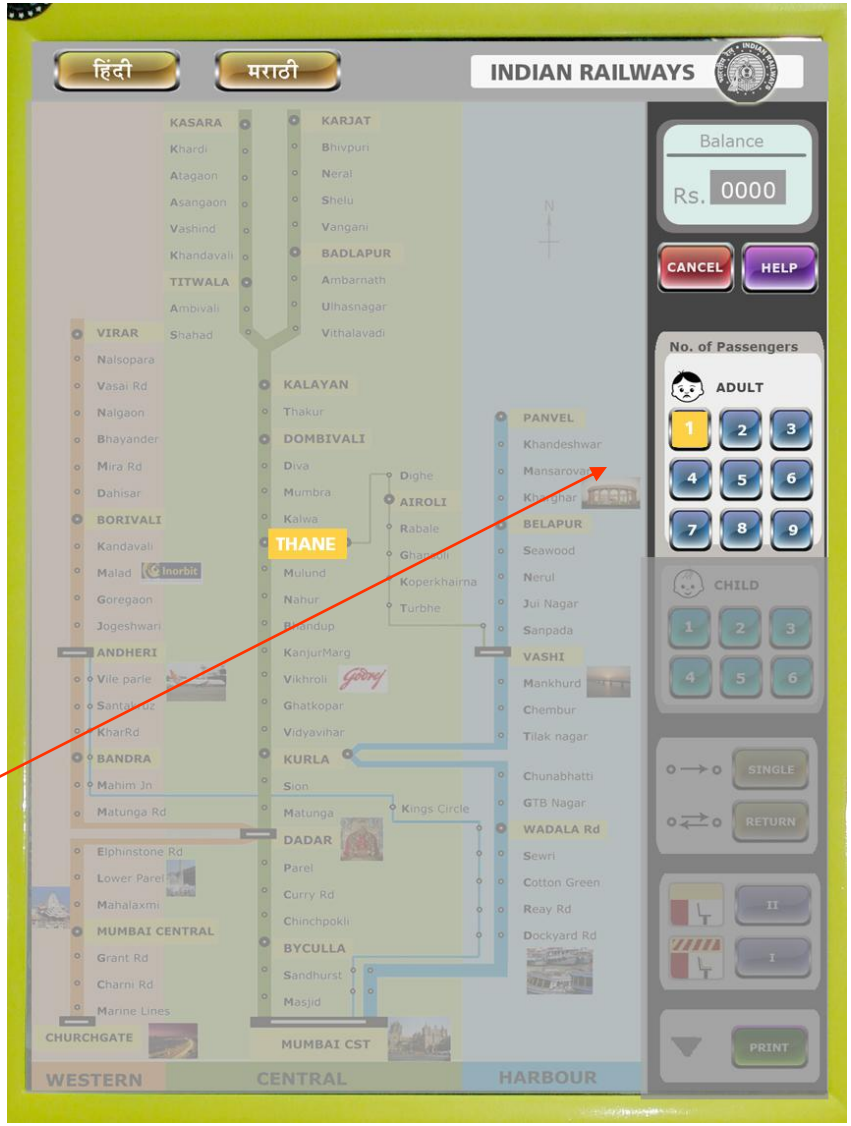


Final concept

FINAL INTERFACE

SELECT
NO. OF ADULT

5

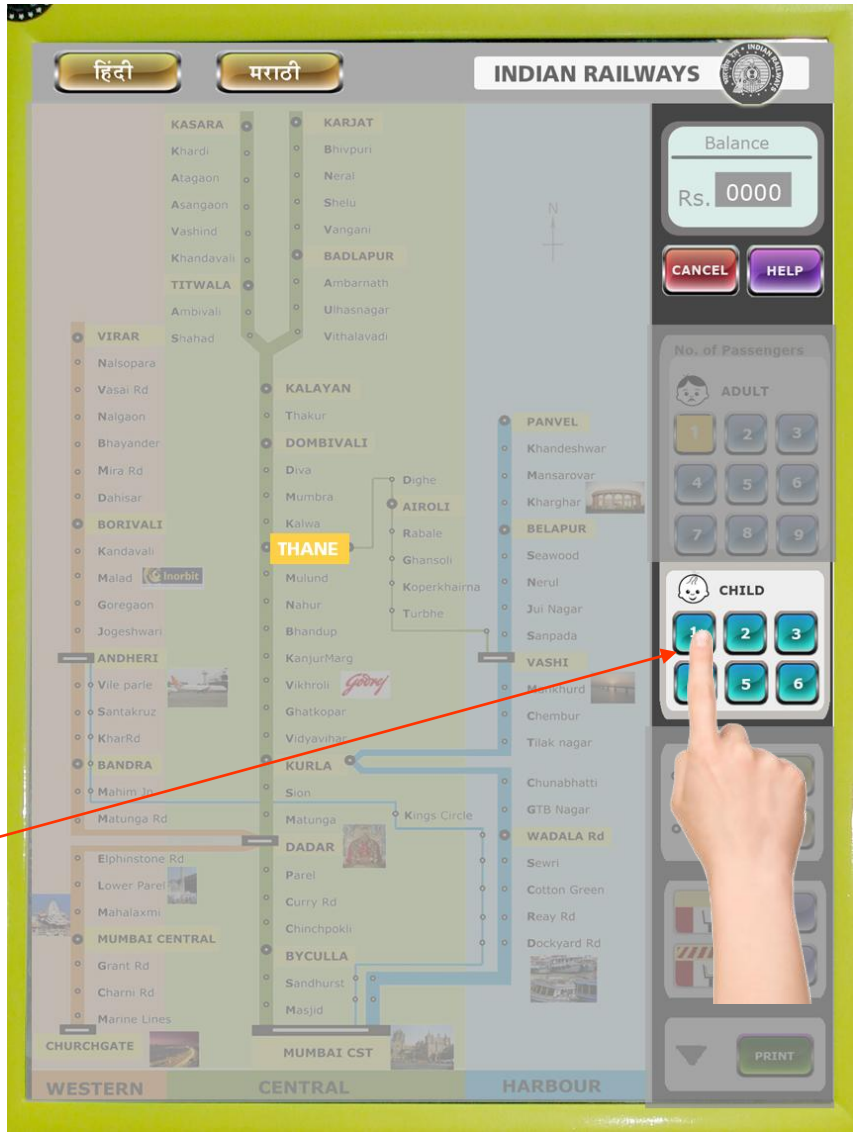


Final concept

FINAL INTERFACE

SELECT
NO. OF CHILD

6

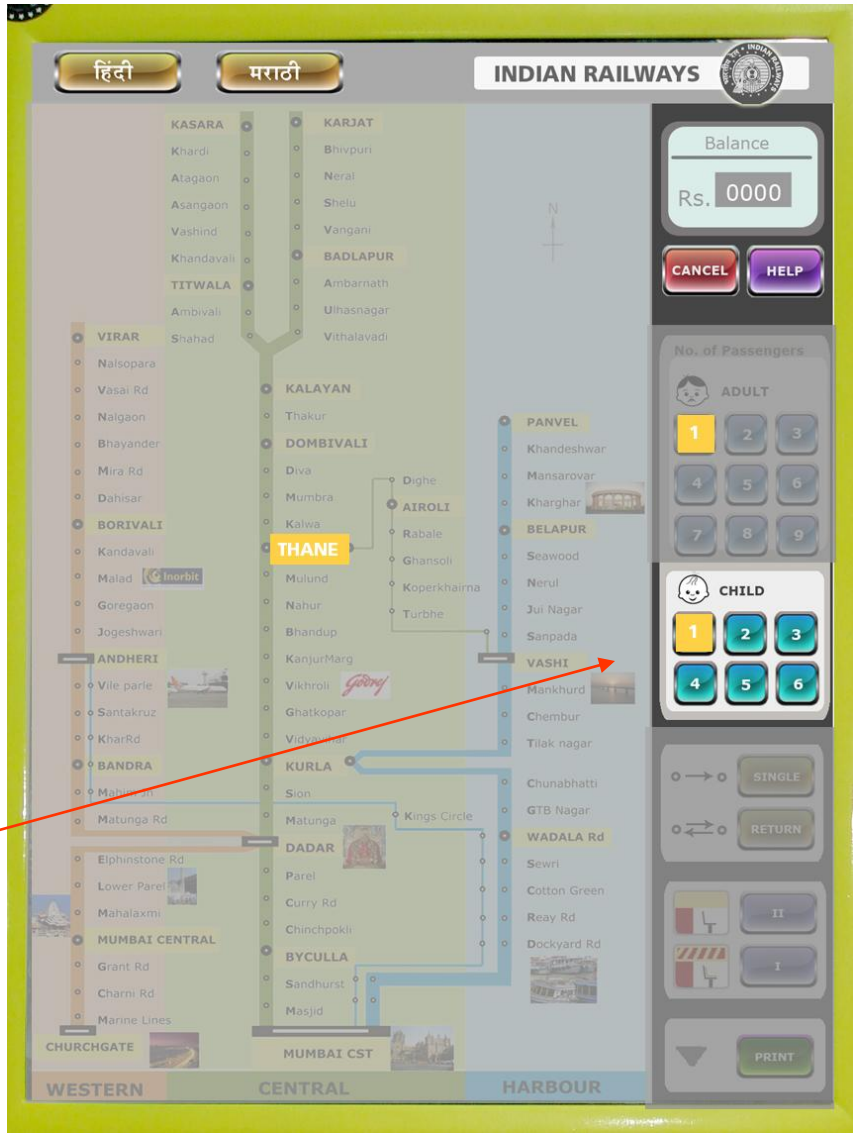


Final concept

FINAL INTERFACE

NO. OF ADULT

7

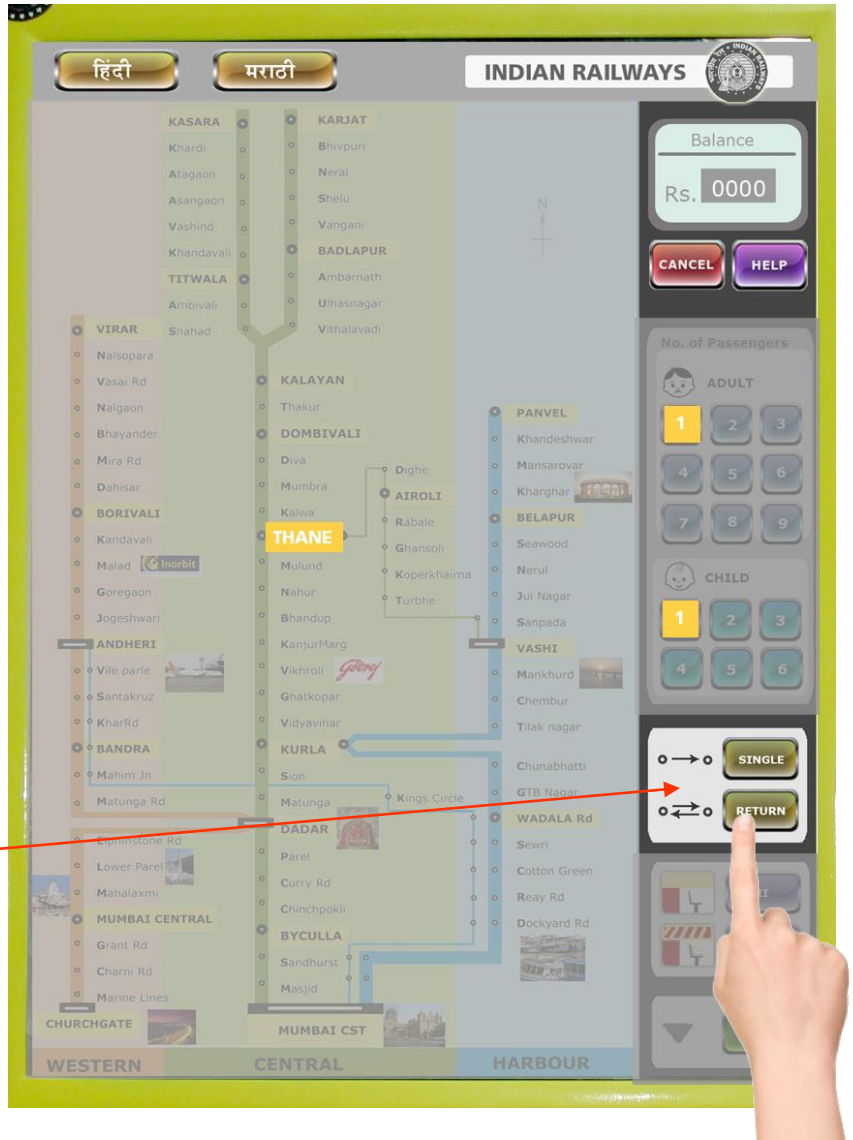


Final concept

FINAL INTERFACE

SELECT
JOURNEY

8



Final concept

FINAL INTERFACE

SELECT
JOURNEY

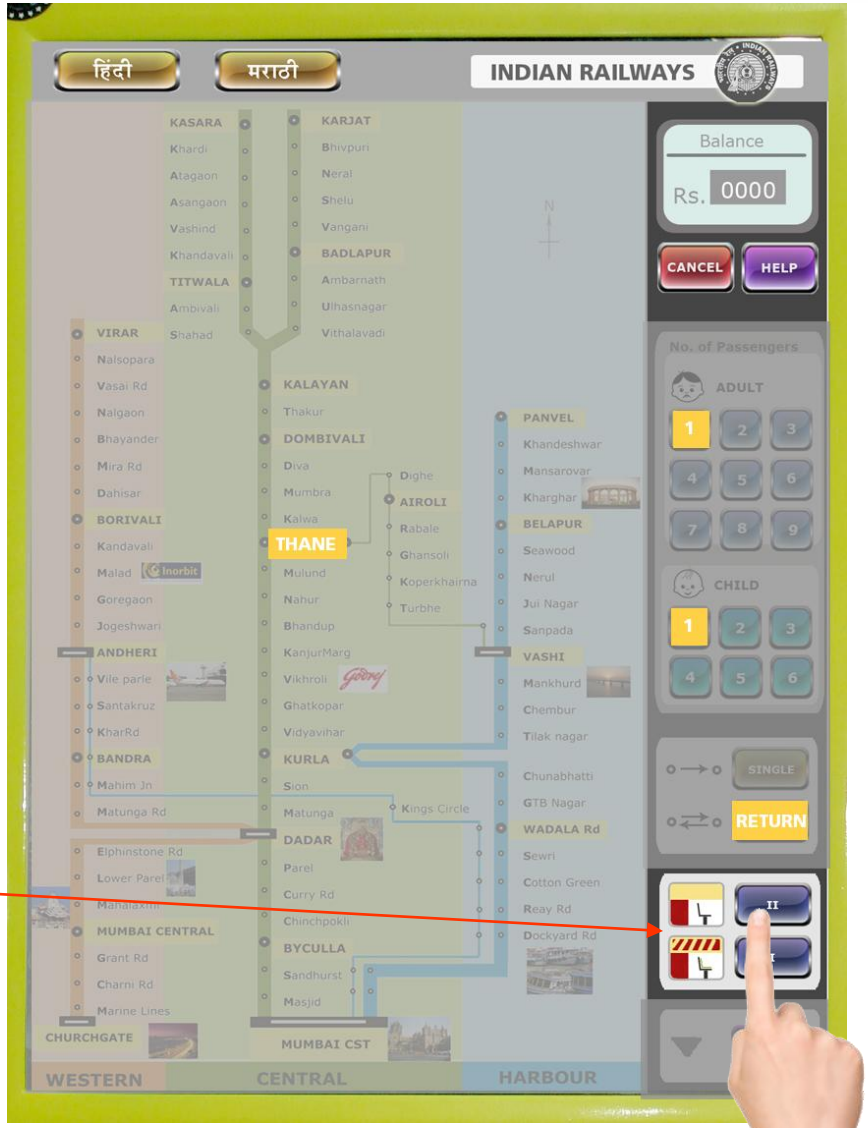
9

Final concept

FINAL INTERFACE

SELECT CLASS

10

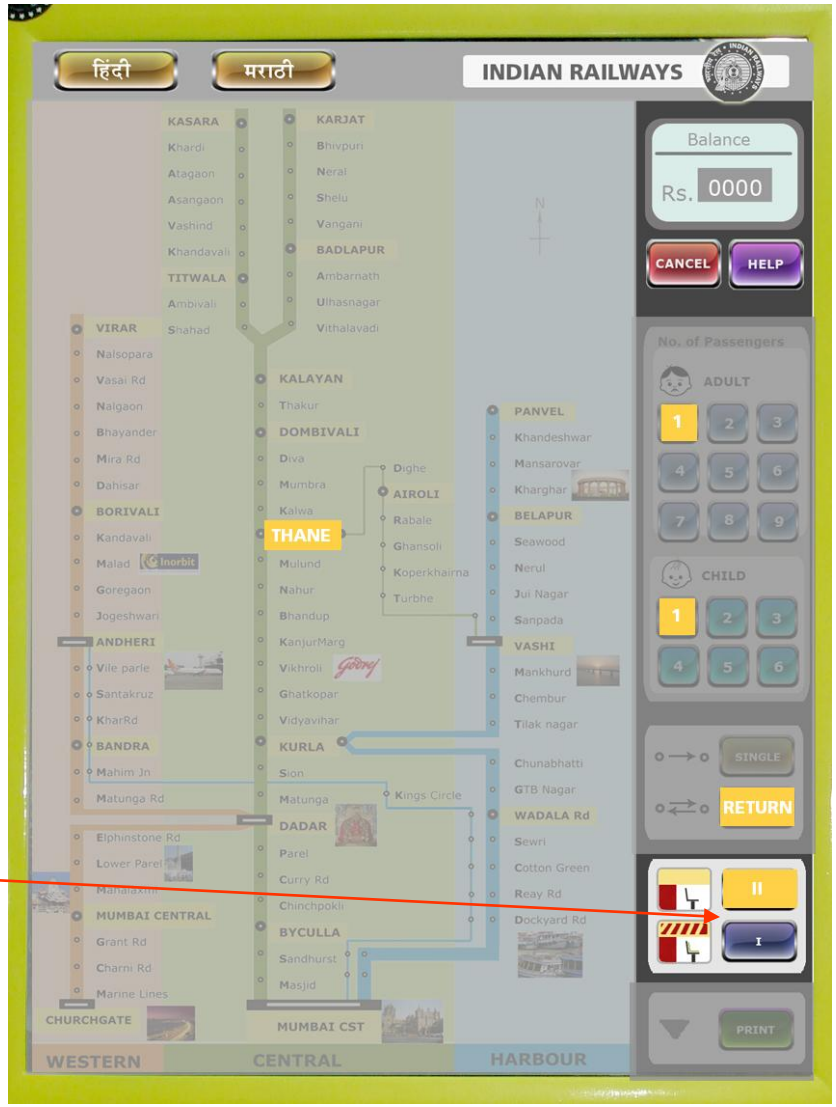


Final concept

FINAL INTERFACE

CLASS

11

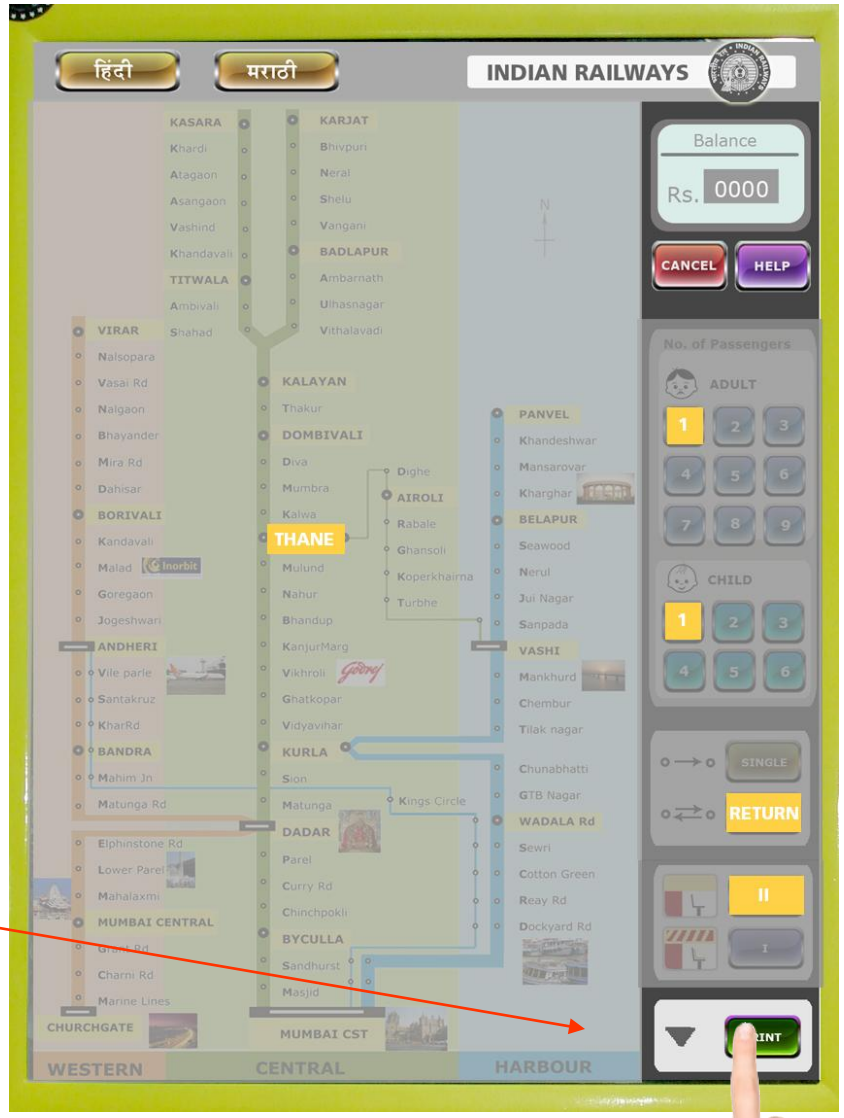


Final concept

FINAL INTERFACE

PRESS PRINT

12

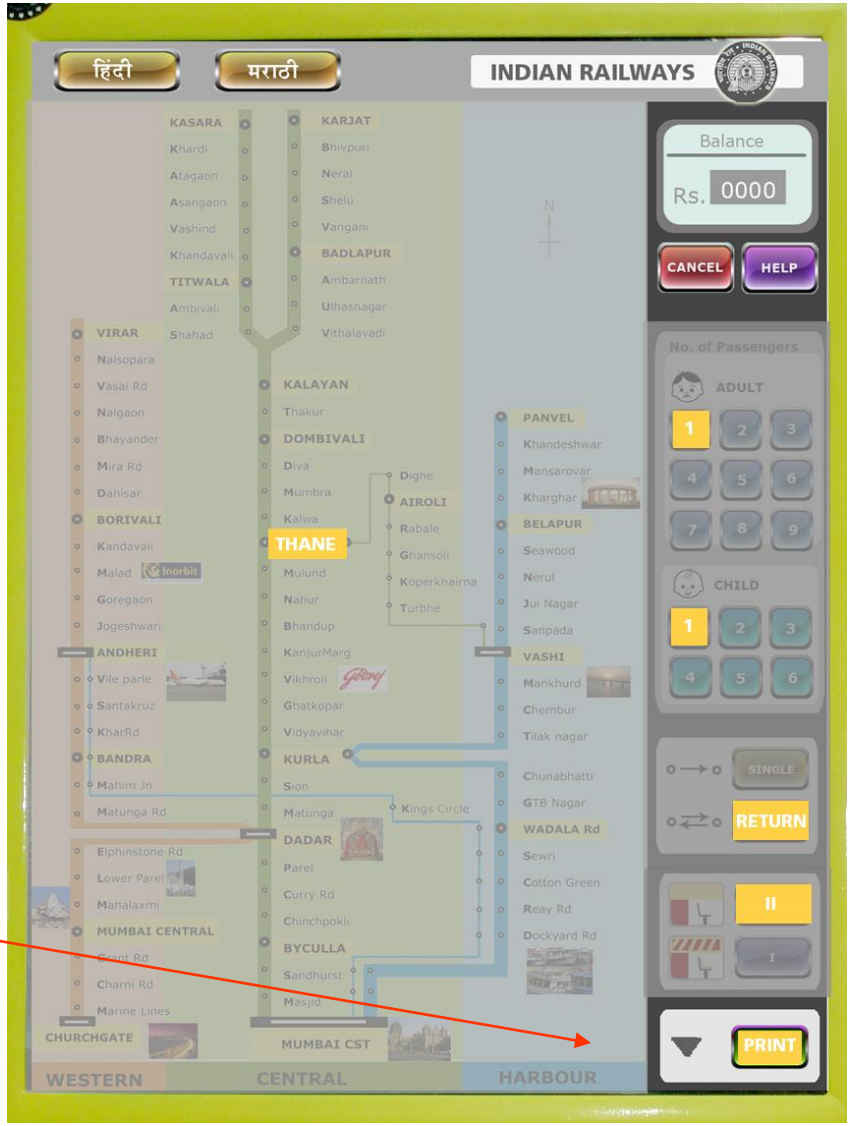


Final concept

FINAL INTERFACE

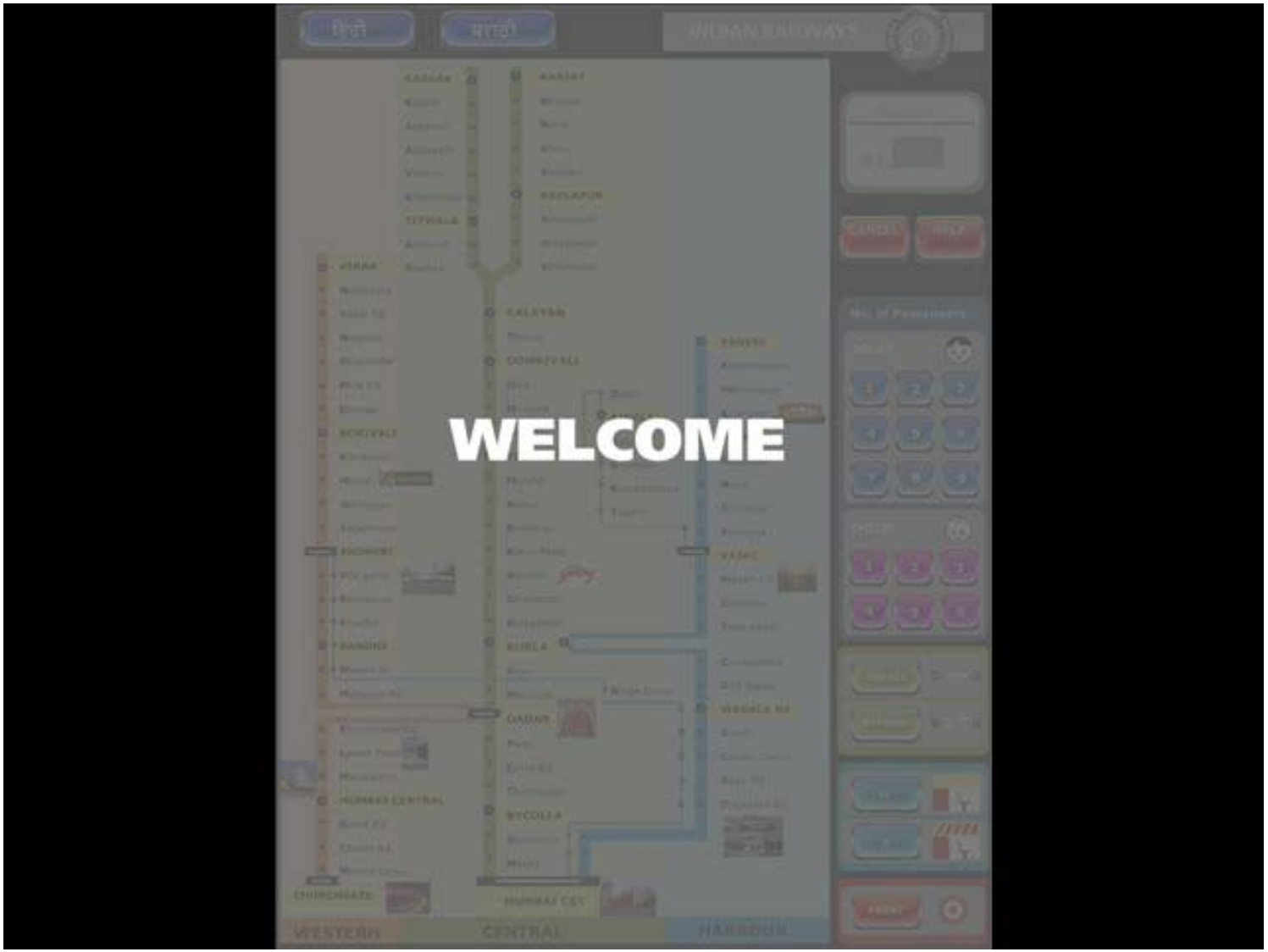
PRINT

13



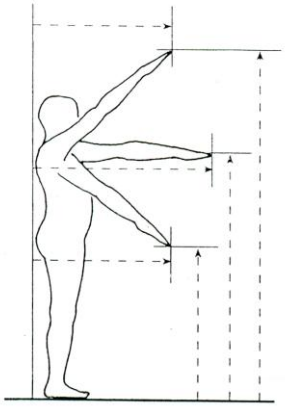
Final concept

FINAL INTERFACE



Final concept

FORM STUDY

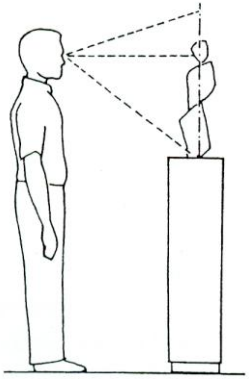


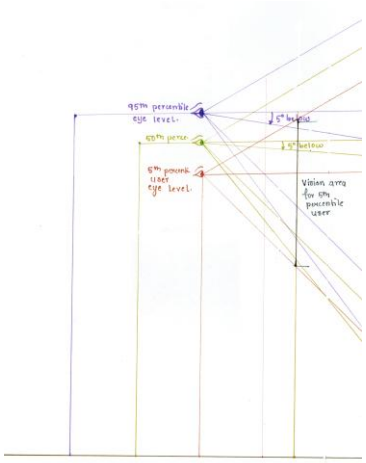
Ergonomic :

Lower position length male 5th percentile – 419mm

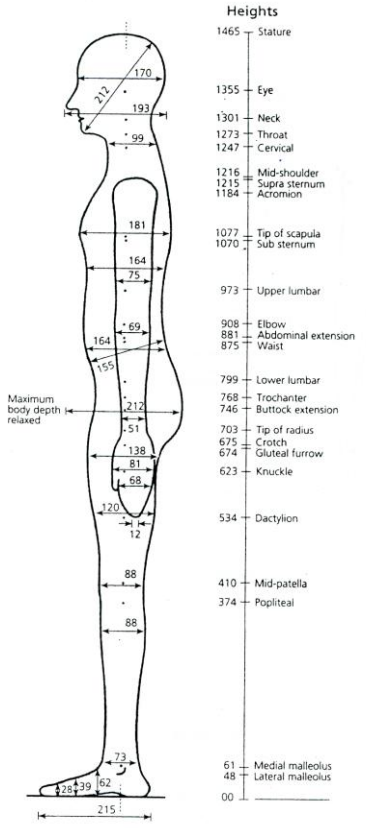
Lower position height 5th percentile female – 619mm

Forward mid position 5th percentile female - 619





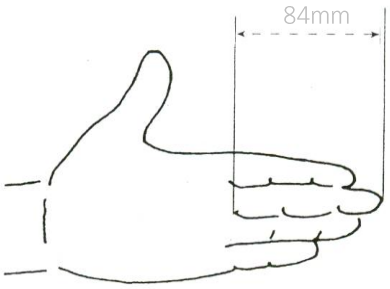
Eye level height 5th percentile user



For masses 50th percentile elbow height – 1022mm

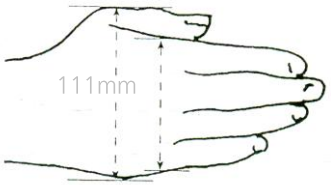
Final concept

FORM STUDY



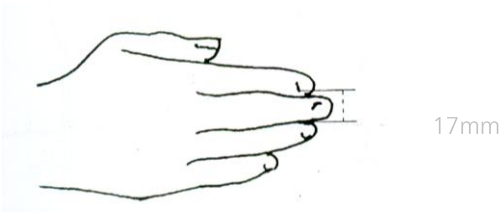
Ergonomics :

For 95th percentile user - 84mm



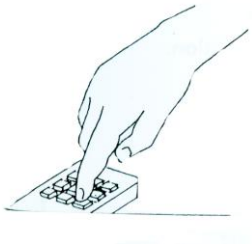
Hand breadth with thumb for 95th percentile user - 111mm

Hand depth at thumb base for 95th percentile user - 50mm



Finger tip breadth for 95th percentile user - 17mm

Distance between two buttons is ¼ of finger tip breadth.



Final concept

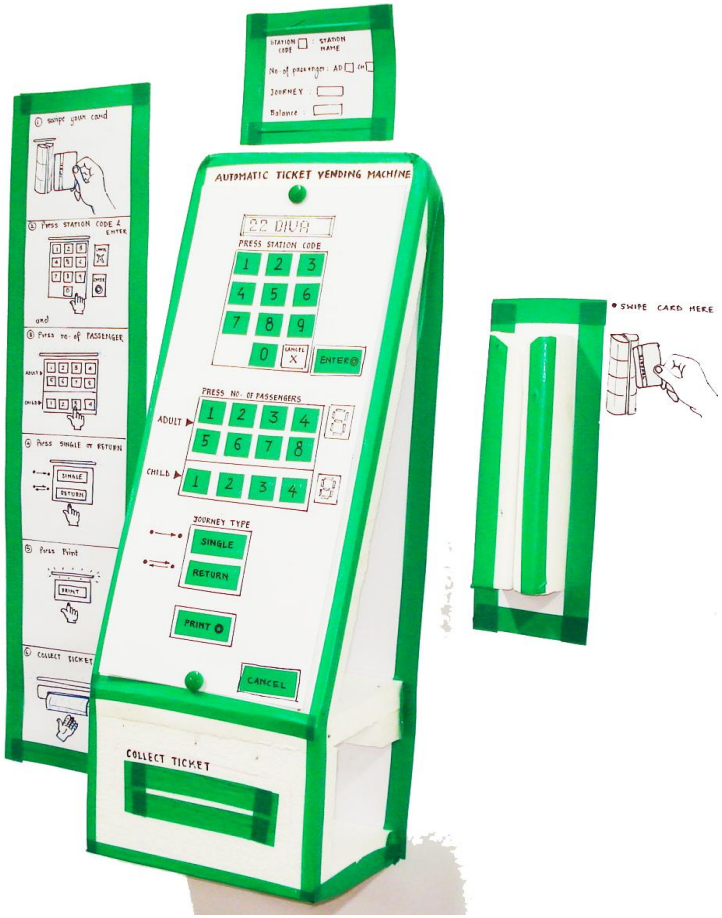
FORM STUDY

95th percentile user

75th percentile user

5th percentile user

Mockup model 1: Ergonomic testing of model



Final concept

FORM STUDY

Mockup model 2: Ergonomic testing of model

95th percentile user

75th percentile user

5th percentile user

Final concept

FORM STUDY

FORM FINALISATION :

From observations and user feedback

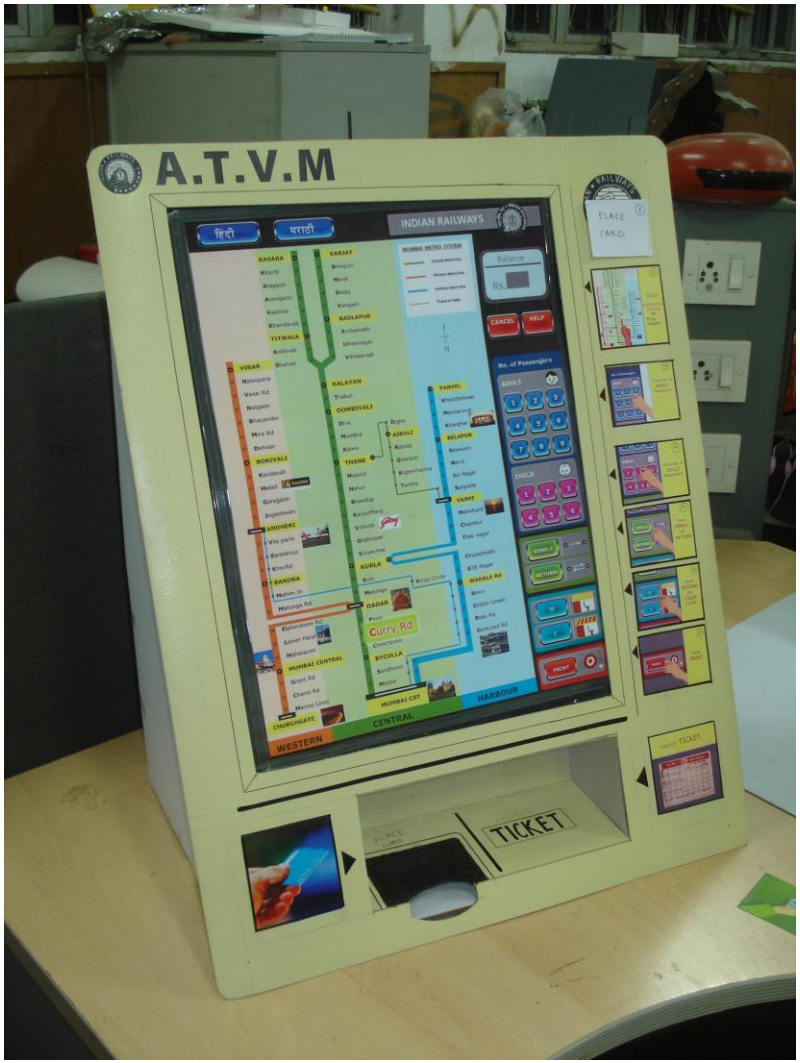
- dust problem with model 2

- user have to bent neck more than the other model which is not ergonomically good.

so model 1 is finalized.

Final concept

FORM STUDY



Mockup model

Final concept

User testing and feedback

After completing user testing I
got some valuable feedbacks

- Confusion where to place card.
- Number the instructions.
- Confusion because of the line parting ticket slot and card
- Placing card instruction .should be placed in sequence with other instructions
- Colors of button too bright.

Final concept

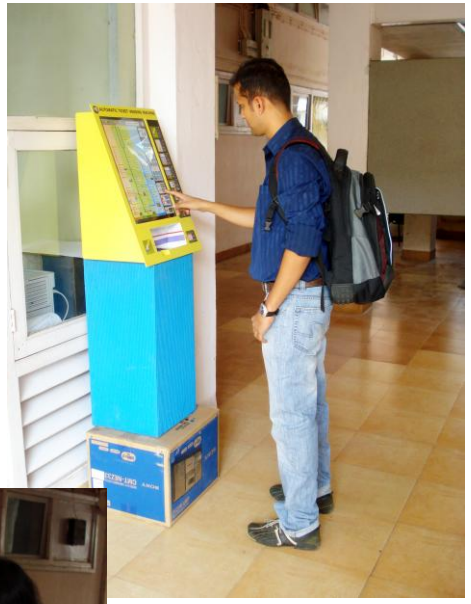
3D model

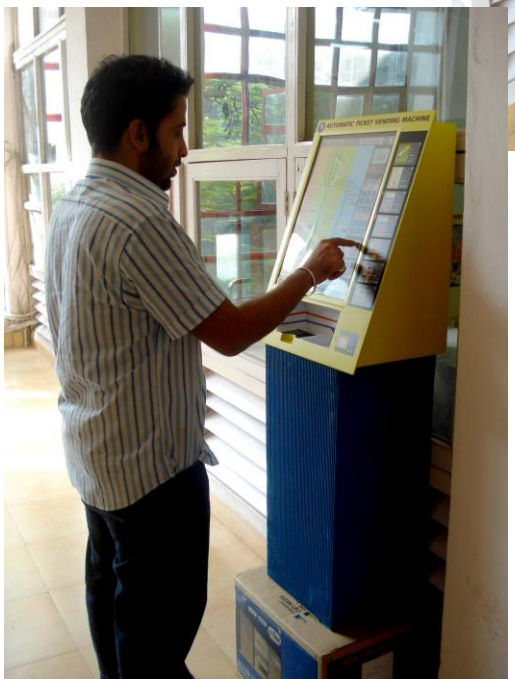
Final concept

Final prototype

Final concept

Final prototype





Final concept

Smart Card with Map

References

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- *Indian Anthropometric Dimensions*
  for Ergonomic Design Practice- Debkumar Chakrabarti,NID

- *Fitting the task to the Man*
  An ergonomic approach- E.Grandjean

Thank you