



RouteBay
wayfinding in India

P2 Project | Naveen Singh Rawat

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wayfinding in India

Semester III Project

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Interaction Design

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Industrial Design Centre

Indian Institute of Technology Bombay

Semester III Project Report

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Declaration

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I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission.

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November 25,2016

Approval Sheet

The project titled RouteBay - wayfinding in India by Naveen Singh Rawat is approved for partial fulfilment of the requirement for the degree of 'Master of Design' in Interaction Design at Industrial Design Centre, IIT Bombay.

Guide:



Chairperson:



Internal Examiner:



External Examiner:



Date: 29-11-2016

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My family for all their love, support, patience and encouragement.

Naveen Singh Rawat

Nov 2016

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Abstract

Wayfinding relates to the decision process while going from one place to another and making important decisions on the way that help to traverse the path. We constantly confirm our position while approaching destination or a nearby location. This is an integral part of day to day lives.

Indian cities are laid out in very different way than grid like structure of western cities. We have an organic growth of infrastructure in most of the cities. The reliance on maps for navigation has always been less rather asking around is the norm. What makes us comfortable with this way of navigation? One of the reason is cultural. People are not used to maps. Giving directions in India is an idiomatic art, well-rehearsed and rarely done following formal strictures.

Nobody says, “head south.” Rather than oral directions using series of routes and familiar

landmarks with additional information in the vicinity of the landmark to guide user better.

Using this knowledge , a hypothesis was created revolving around the concept that if the existing way of people is used, rather than pushing a solution that works well in grid based cities, a simple yet familiar concept of way finding can be created with focus on landmarks and the spatial distances between them.

The final concept focuses on implementing subjective wayfinding. Simply understand users mental model and offer meaningful understanding of the environment that can be easily comprehended. This combines context aware information about local landmarks with simple schematic maps imitating user behaviours in real life.

Each upcoming landmark in the journey is combined with sound, image and other data that makes the process more



subjective and identifying and remembering landmarks becomes easier. The solution helps user to utilise local information that is available within a community and finally create a shared database of familiar routes

In a simple schematic map landmarks are used as guiding points from one checkpoint to another. Landmark are points where a user can get oriented through visual and audio help. Each landmark has corresponding image and other data associated with them.

Users create routes and share them in the community. This collective effect makes available a larger depository of simple to follow maps that anyone can use and update.

For evaluation users will be asked to reach destination on selected routes using the design and other existing solution.

The aim is to know how comfortable users are in finding destinations with the given interface and in identifying landmarks to take turns and routing decisions. How easily one can remember the route and create their own landmarks.

The design gives way to future work including more rich data which can be kept up to date changing environment. Such design can leverage our existing way of problem solving and enhance that with technological intervention. We don't need to change what already works well, rather find a technological solution that can coexist and complement what we already have.

Introduction

Indian cities are laid out in a heterogeneous way. Few urban pockets are laid out in a grid. They're filled with winding, narrow roads prone to sudden turns and stops. Addresses are often out of order or sight. Streets pop up, change names and add new commercial inhabitants all the time. With several languages, dialects and social compositions the task of wayfinding is very complicated. Although there are solutions but they are inclined towards usage of map or signage as a solution.

We always have a preference to ask others for route info. Use of physical map is almost none except for tourists. Learning curves for online maps is high. Even when private cabs companies are pushing navigation solutions, drivers seldom adhere to them and rather find it annoying.

Wayfinding can be taken as the cognitive

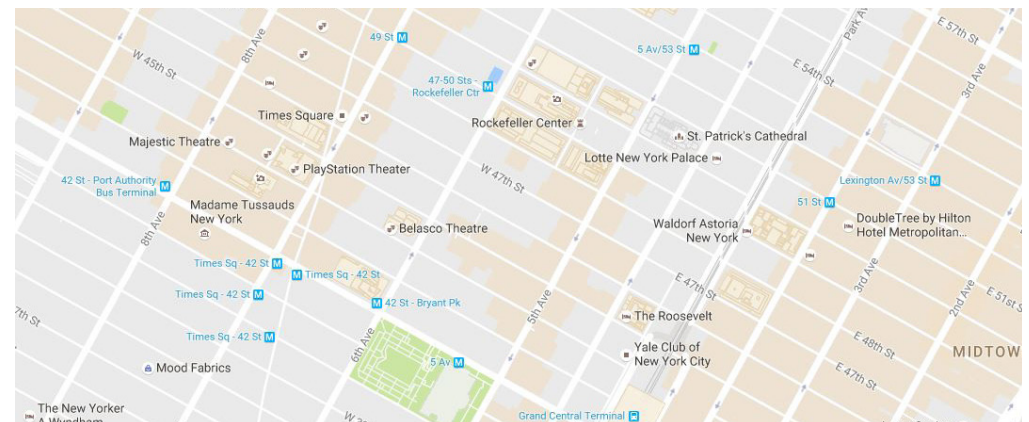
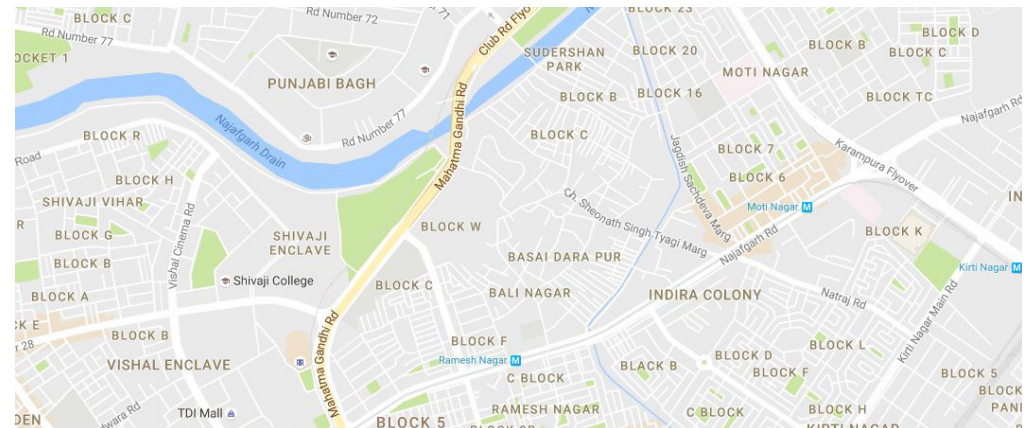
Most Indian cities have organic infrastructure.

Top : Kanpur, Organic layout

Middle : Delhi, Radial layout

Bottom : New York City, Grid layout

Source: Google Maps



element of navigation. In other words its the mental map that one makes to reach a destination with outside help.

Current GPS navigation solutions are based on aerial view of maps In India we traditionally don't use map which further limits the use of digital maps.

The form of aerial online maps are used in very less amount with the physical maps almost non existent in day to day life. To navigate in city is generally based on asking other people. We among over selves guide and direct each other to the desired route in the colloquial habitual manner.

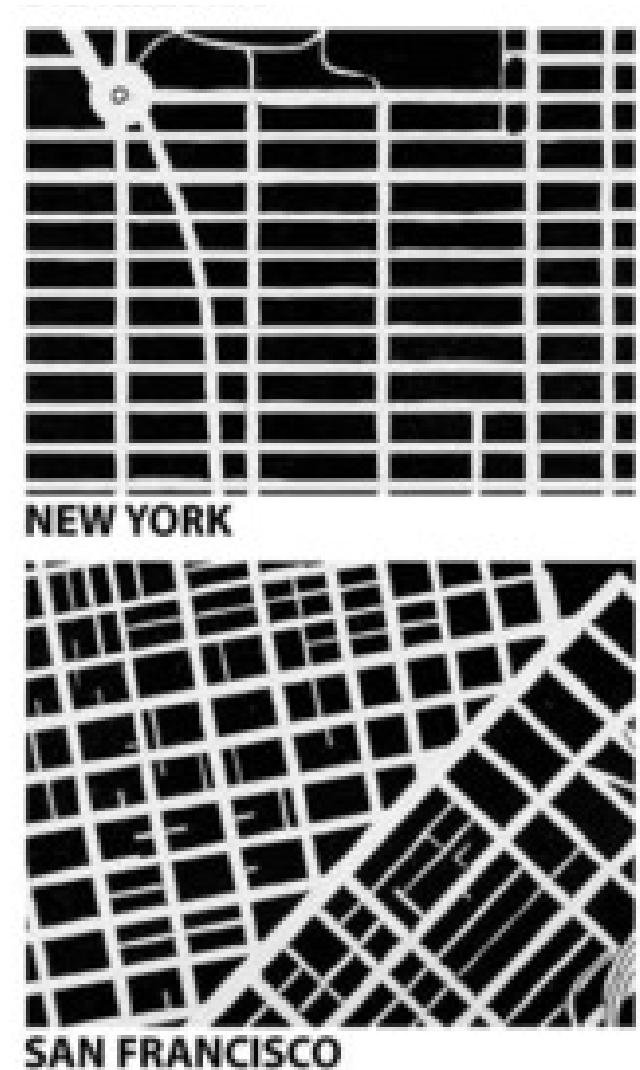
Non reliance on maps gave rise to habit of remembering routes by landmarks as they are easy to recall from memory being more visual and with characteristic. As people aren't used to maps and can't recall the names of roads and streets, out of necessity

landmark based way-finding has become integral part of our day to day lives.

Wayfinding from a common man point of view is how to reach the destination, rather than knowing the entire way up to that point. The maps and online solutions are based on aerial maps which are hardly used and understood by common people.

Cab drives such as in Ola and Uber have got GPS navigation device available to them. But they are seldom used by the drivers. Drivers say it confuses them and they prefer their own remembered route and with help from people of roads they reach their destination eventually. This actually happens many times.

Wayfinding is affecting by the way cities are laid out. Its no surprise that Indian cities have grown organically with a very less part actually planned out keeping in mind about the pedestrian or any avenues.



Grid like structure of Newyork and San Francisco. See how familiar the routes become when there is redundancy in exploring the city.



Road side tea shop in Varanasi

Source : athikhoms blog



Garbage strewn around

Source: The Hindu

Very less Indian commuters actually recall or tell about routes citing streets or road names but rather any establishment or a recognizable element that can help in giving directions.

Any object can become a landmark. Road side Teas shop, banners, vendors, temporary events like ongoing Durga Puja¹, piles of garbage. It doesn't matter if its inanimate or living, if it helps in directing someone, it is considered as an important point in the route, and people can easily remember this rather than road or street names.

In grid like structure, finding way through crossing sections which are identical comes as easy and less cognitive load. In organic environment one is able to find many routes to the same destination which vary in distances.

Literature study revolving wayfinding and navigation gave an understanding of what actually is influencing daily commuting since the rise of mobile technology and internet.

The main focus of this project was understand how people are utilising available solutions, what are their usage behaviour and to introduce technology in a more familiar way. How can we make wayfinding less objective and more subjective. During interviews with people many times a pattern emerged where they smartphone with an internet connection was available but still user preferred it only for knowing the total distance from the destination rather than user it for navigation.

Interesting opportunities were presented based on researching prior work and available solutions.

¹ Durga Puja is a 10 days long festival in India.

Design process

After analysing the background, prior work and current solutions, a hypothesis was formed which was tested with users.

The steps followed are as follows :

Background and Secondary Research

Prevailing literature surrounding wayfinding were studied. Online maps and design utilising this feature such as transit applications were studied. The studies revolved around getting to know about navigation and other domains related to it. This led to form a basis to start user study and go into user context to observe how people deal with wayfinding in day to day lives.

User studies

The studies were based on Indian context. User interviews were conducted both in field to get a hold of their behaviour through observing and asking questions while they were in the process of finding about their routes. Observation and insights were generated and helped to push the project further.

Ideation

Multiple concepts were created based on secondary and primary research observations and insights. The concept was subjective wayfinding with different users contributing landmark info was taken further for more exploration.

Final Design

The design involved interface displaying how user will go through various scenarios and utilize the landmark info to reach destination.

Evaluation

Plan aimed that understanding how easy it was to recall and remember the landmarks and create easy routes with the designed interface.

Secondary Research

Daily commuting is a big part of our day to day lives. In cities such as Mumbai, 88% daily commuters use public transport. BEST buses cater to 40 lakh commuters daily while the suburban trains on all three lines ferry close to 75 lakh passengers a day.

This indicates that people wayfind on a daily basis inside the city. So there is a huge portion of population that faces the issues related to commuting, getting late, getting confused by inaccurate wayfinding systems, increased commute time etc.

There are popular solutions existing such as Google Maps, City mapper, Here maps, Nokia city lens etc.

A crowded road and crossing outside ITT Gate.



*Delhi aerial view, notice
how there is a wide
network of streets*

Wayfinding is the cognitive element of navigation. There are two types of information to be encoded :

1. Landmarks

2. Spatial Relationships between them

The basic process of wayfinding involves four stages:

-Orientation - the attempt to determine one's location, in relation to objects that may be nearby and the desired destination.

-Route decision - the selection of a course of direction to the destination.

-Route monitoring- checking to make sure that the selected route is heading towards to the destination.

-Destination recognition - when the destination is recognized[1].

These stages are governed by factors such as environment, background, intellect, culture,

technology etc. The way cities are designed or evolve is also a major factor.

Most of Indian cities have evolved over the decades in an organic way, an exception being Chandigarh. With economic boom, more people started migrating and coming to cities from villages in search of jobs and livelihood. Most locations in Indian are named in local languages so it becomes a challenge for people who are non residents of that location to deduce that information.

Also in absence in maps as we are less inclined to using maps, oral directions become a norm based on local landmarks. As not all streets or roads are named people learned to communicate through verbal direction which became part of culture of asking around for directions. Navigation service guide user through instruction based on geometric data from the streets network which is typically the only dataset existing[2].



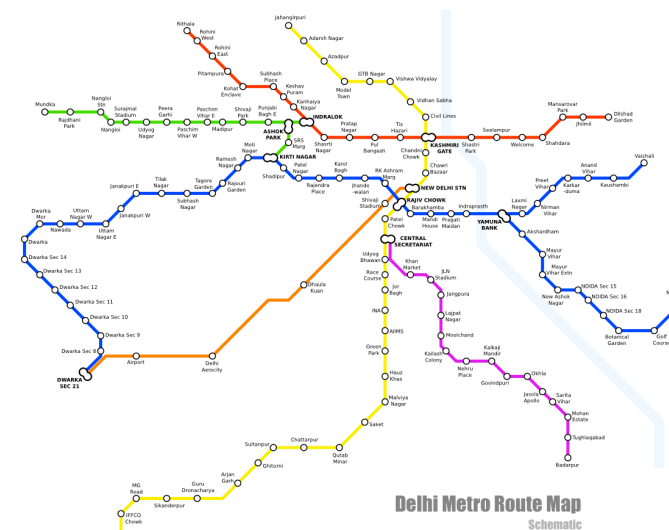
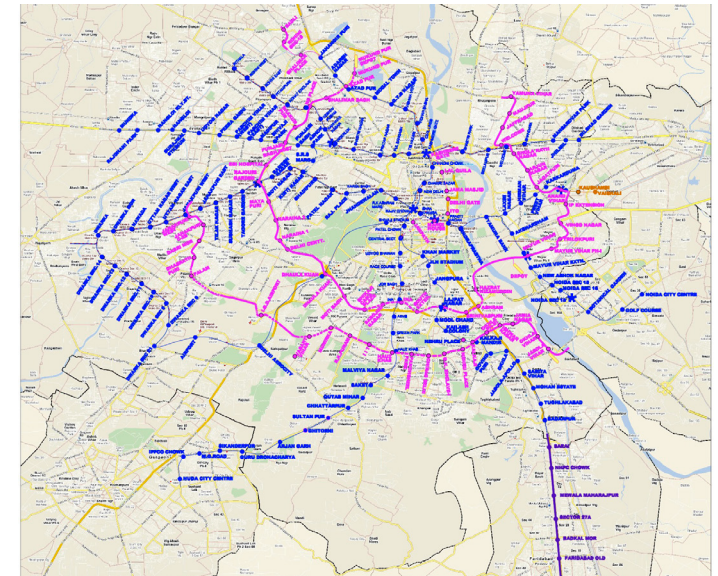
Design of a wayfinding solution is also affected by the way one percepts the environment. While consuming oral directions the instructions are subjective depending upon the information giver and his own experiences.

Each person has its own mental model of the route. Following aerial maps with instructions cuts this process of mental model creation and directs user concentration over following the map. This leads to difficulty in recalling the route again.

Interviews with Drivers and Autowallahs revealed that concentrating on the GPS system makes them forget the route later. They try to make a mental model of the route using stand out checkpoints throughout the journey.

Along with these, schematic maps that emphasis relevant data and de emphasize what is not needed(Casakil H.,2000).

This form of assistance lead to a better Although the map provides much less information, such time of maps with only crucial spacial information proved to be better in test[3].



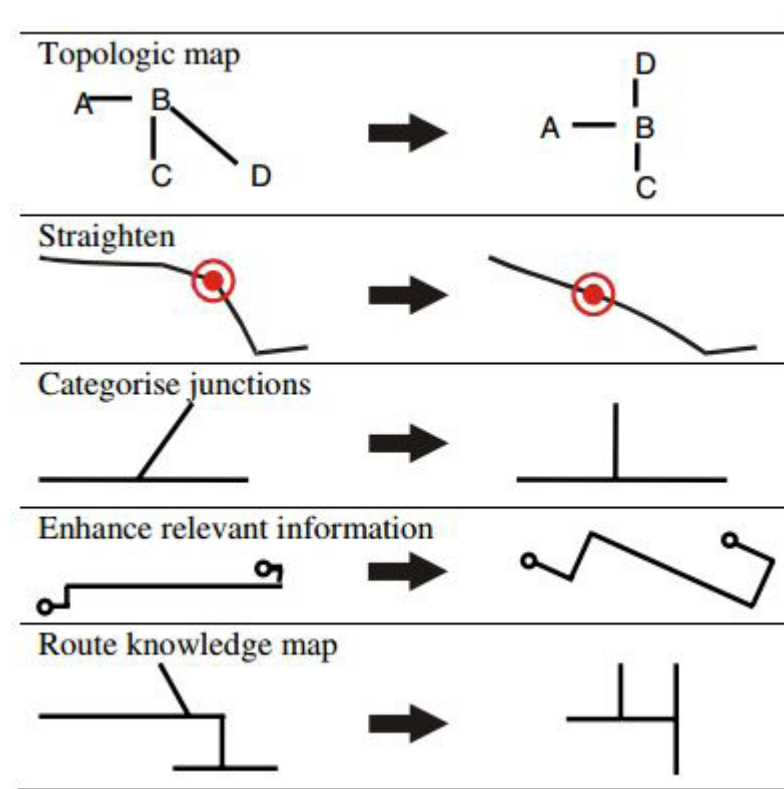
Top : Map of Delhi showing various metro lines

Bottom : Schematic map of the same.

Simplification of routes

Simplifying the routes reduces the cognitive load and helps in faster information processing and becoming aware of the surrounding as our brain only needs to focus on the most important information. As proposed by Meilinger et al. “Providing less than standard information like in a highly schematic map can lead to better performance. We conclude that providing unambiguous turning information (route knowledge) rather than survey knowledge is most crucial for wayfinding in unknown environments [4].”

Challenge come when there is more complex features on the maps such as multiple nodes with curves. As streets in India are majorly conjesed an there are routes and shortcuts on mapped as official data , in such case additional information has to be provided.



Route map approach. Schematized map from a topographic map. The map is simplified and stress is on the intersections. (Meilinger, 2007)

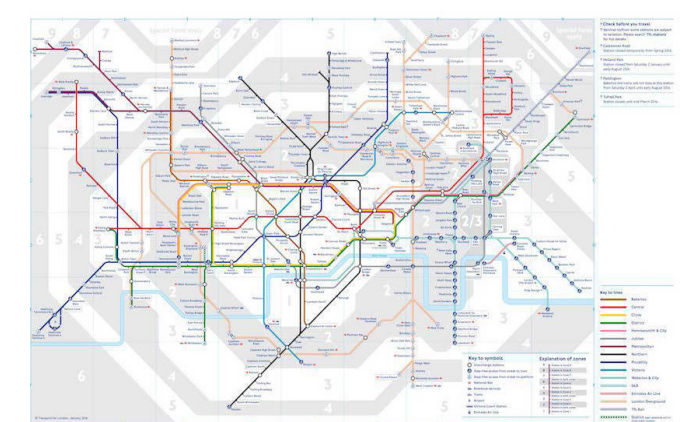
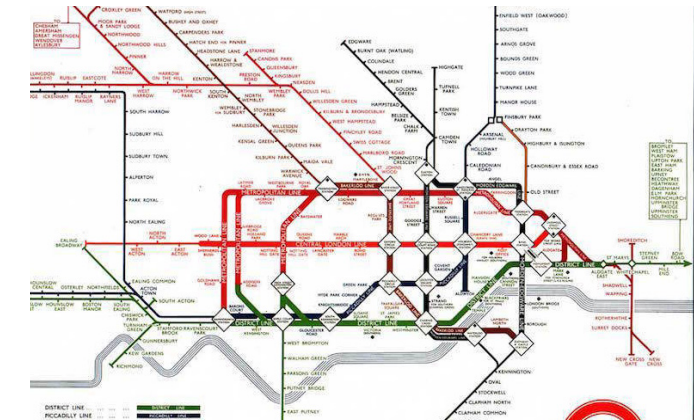
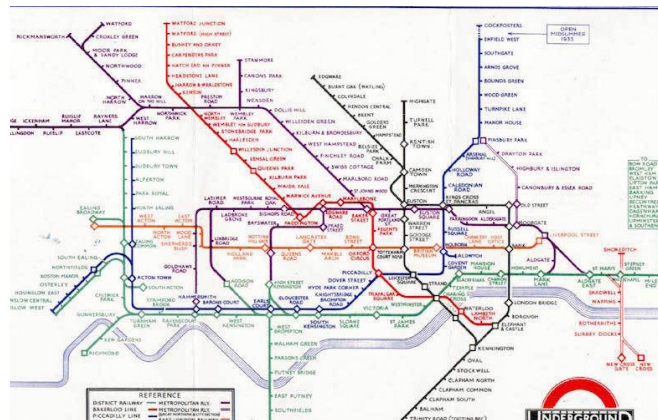
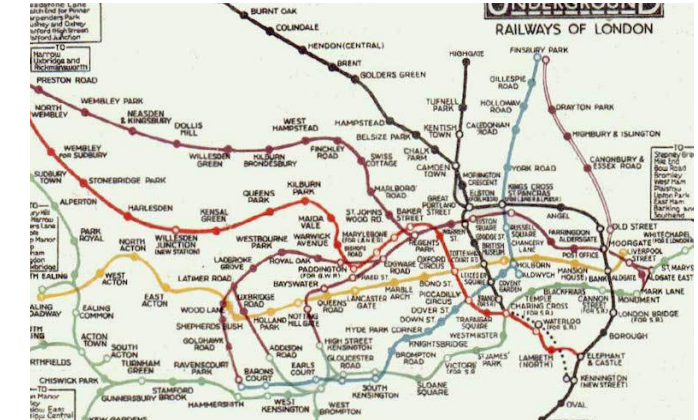
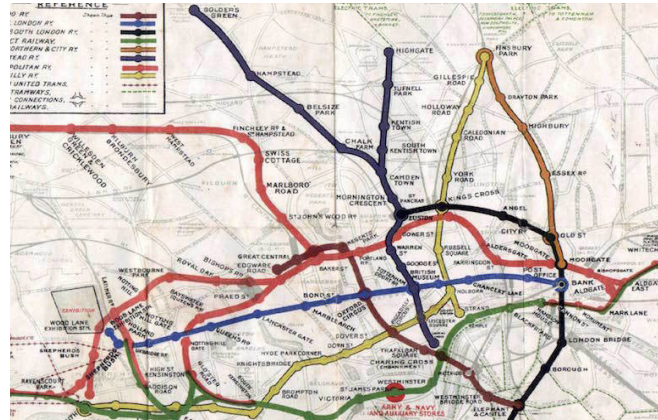
Underground map London

The tube map doesn't reflect the real geography of London at all accurately, but its clear, colour-coded lines and friendly curves makes it easy to visualise the information. See how to design evolved and it became easier to grasp with each iteration[5].

The focus at each iteration were to stress topology . The relative position of station using vertical lines and turns at 45 and 90 degrees.

Such schematic abstraction is heavily used in transit systems and can be utilised to solve wayfinding issues in contexts where the location is congested and needs simplification to better guide users.

Clockwise from top left :
1908 , 1926, 1933, 1935, 1962, 1981
Source : londonist.com



Existing solutions

Maps

Printed maps are being used for a long time for wayfinding. If used too they can prove very useful. But their use is limited to static ways as it takes longer time to locate yourself. Also they are not scalable to every road and street in a scenario of Indian cities which evolve organically.

To understand it one has also to keep in mind that the amount of data is restricted in a map that can result in confusion over current location. Maps have lots of legends and other assisting data to figure out the information.

See how in the adjacent map of IIT Bombay, the whole area is squeezed into a small section and only major routes are visible with landmarks that can be understood with legends.



Online Maps

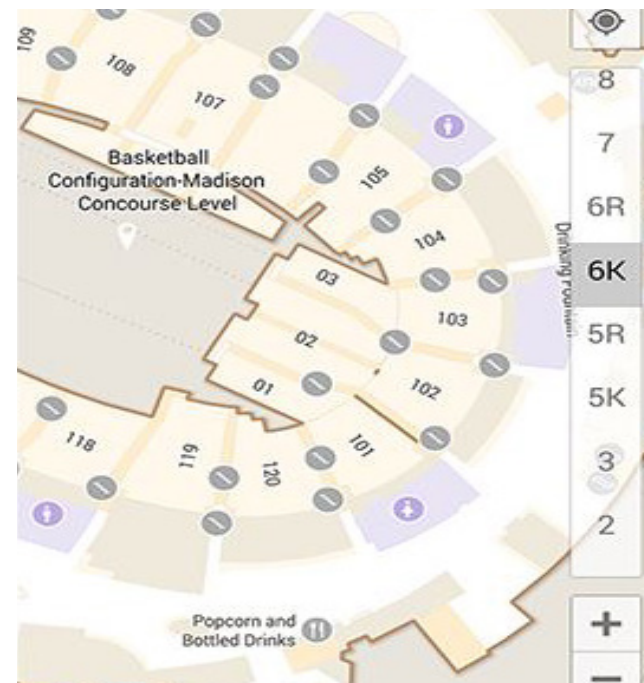
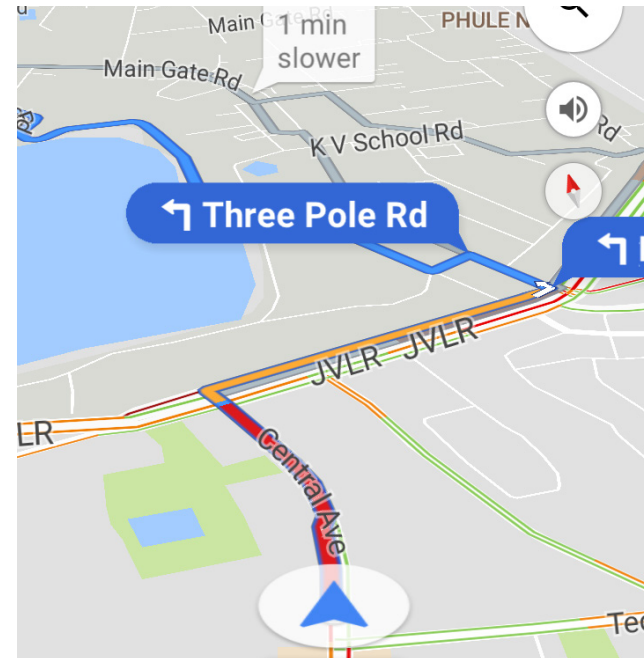
Maps such as Nokia Here maps, Google Maps, GPS maps in cabs etc. provide navigation from point to point directions as well as search of specific areas. But when we drill down to congested streets and areas with sudden turns, dead ends and numerous local names, they become ineffective. It also came into understanding that though increasing number of commuters own smartphone nowadays the use of advanced apps like using maps in very less. Reasons being not used to the concept, lingo, instructions and the aerial view. Most people are used to the point of view from the ground while wayfinding.

Indoor navigation

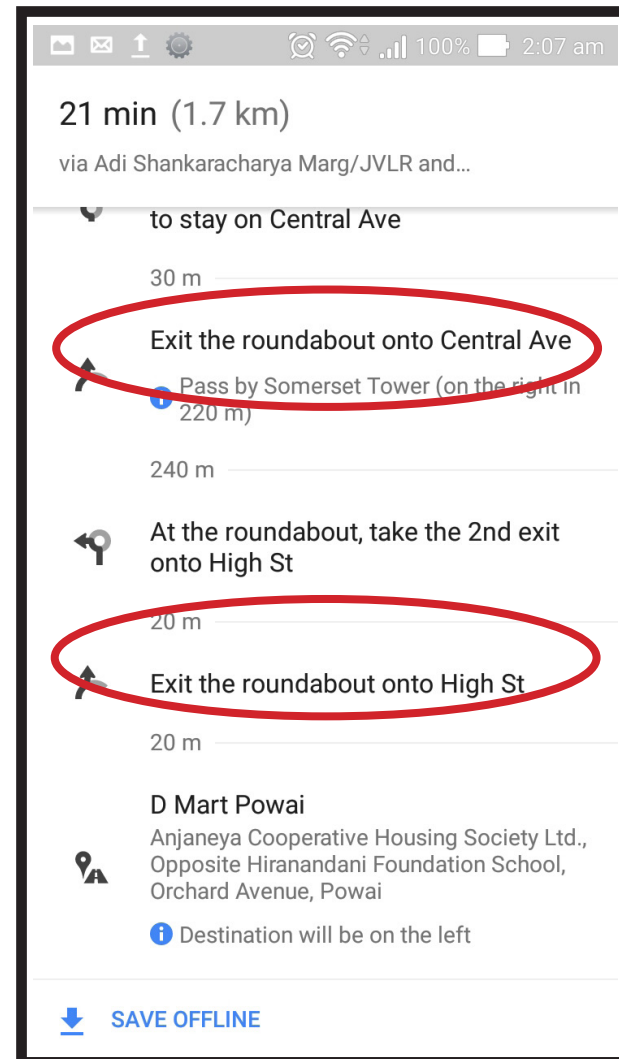
Using transmitting beacons user pinpoints its location and other places around. This is mostly useful for closed infrastructure such as malls, hospitals, airports. It requires manual intervention as mapping is to be done and uploaded into the system.

Top : Google Maps

Bottom : Indoor navigation uses bluetooth beacons to navigate inside buildings



The language used in giving directions in apps such as Google maps is not something indians are used to, thus its not easily understood and confuses the commuter more than helping. The terms such as roundabout, walk south-west, second exit, High st. etc. doesn't resonates with average commuter.



Nokia city lens

By bringing up landmark data upfront Nokia city lens displays a list of nearby places based on selected category in the live camera view.

However it only worked to see nearby areas sorted by categories. There was just projection of location tiles on the screen and not the exact location to assist in wayfinding.

Nearby places are projected on to the camera view

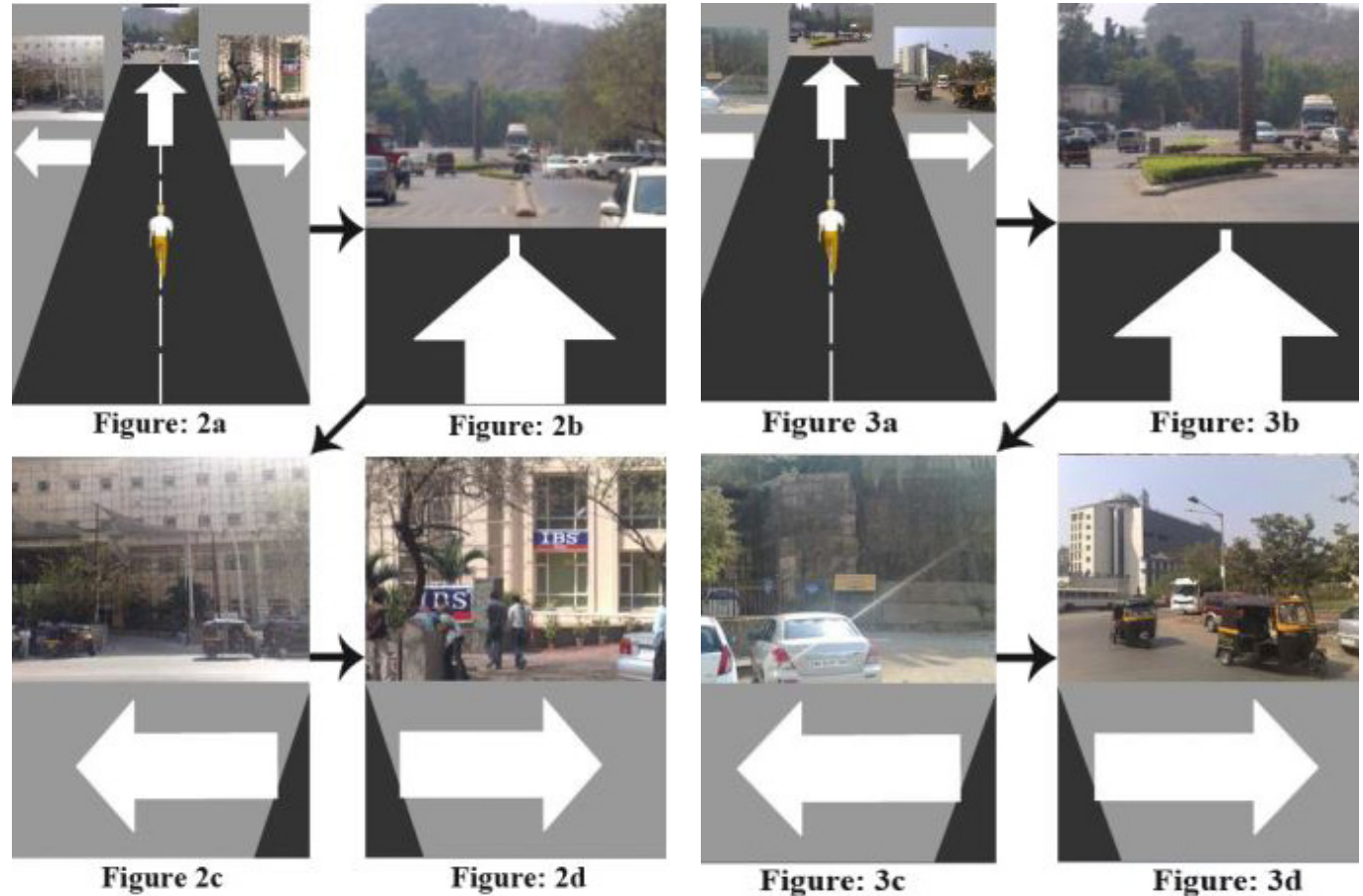


Landmark image based navigation

Prototype based on audio visual interface to guide user was tested by Joshi et al. in their paper for understanding how cultural complexion can be turned to an advantage through comparative evaluation.

The study was aimed at less education users who can't read maps or use advanced online mobile based maps to navigate.

On the mobile interface when user reached a landmark, shown as an image, he has to press a button and next direction instruction were provided via audio. The results indicated that landmark based navigation is better than traditional map base navigation and it gives user higher chances of reaching the destination.



The user is shown multiple photographs when a location is reached, User confirms the location by pressing a number; receives the next location instructions and moves on. The arrows tell the direction of landmarks

User Study

The studies were conducted to observe and understand how an average commuter or a person travelling from point A to B in Indian cities finds the correct route to reach destination and what are the issues faced and under what circumstances.

Indian cities vary from carefully planned like Chandigarh to organically evolving cities like Hyderabad. This creates a difference in challenges faced in finding addresses from place to place.

Areas such as bus stops and local stations where there are lots of commuters at a given time were chosen to get more input and information.

The attempt was to explore user behaviour and gather insights to find design opportunities.

Approach

Users who regularly commute daily either on familiar routes or new and unknown ones. For example – factory workers, IT professionals, college students etc.

Some people were using existing solutions and were asked about their usage behaviour. To get more diverse input people taking both private and public commute were interviewed.

Total 25 people were interviewed with age group ranging from 15 to 35 and from students to office goers and factory workers. Interview was based on predefined questions but at the field the communication was conversation based and each question followed the previous answer.

Some user were asked to sketch thier daily route to understand how to perceive their environment and what makes them take decision during following a route.

Findings

Users simply prefer to ask others for routes related info which is mostly verbal.

It was observed that at bus stops asking the conductor and other commuters is the most preferred way to get info about directions or routes. People know bus numbers but not the timings. Info boards at stops are useless. People trust such sources such as the conductor and confirm with them even when they have some idea of the route.

As they cant remember road names, people remember the landmarks on the route and it helps in deciding when to get down of the bus or to orient themselves at a given time. Some users had latest route info and navigaiton apps installed but the usage was limited to knowing the time table of buses.

Less inclination towards usage of internet navigation apps

There was an indifference towards online maps. Users seem to not indulge in finding destinations by using Google maps. We are very less inclined towards using maps in our day to day lives and when encountered with a decision making point while navigating we only prefer some trusted sources to get information and then move on till we again feel a need to orient and situate ourselves.

Drivers said the maps doesn't complete with what knowledge they already have about the routes and find the navigation systems confusing.

So the already prevailing unfamiliarity towards aerial maps coupled by less knowledge of the advanced apps leads to indifference towards maps. We are a society

that doesn't prefers online maps. One user said he keeps away from smartphones as they cause 'time waste' and only uses it for calling and messaging. For such user constantly using the device is taken as unproductive.

User statements

“Age left leke ek mandir ata hai, waha pe ek bus stop hai .“

“ Huma cinema se right cut jana, station samne he hai. “

“When you reach a big white glass building, ask anyone there, where is Doctor Sharma's clinic, they will tell you.”

This colloquial way of telling directions is understood by all as very few urban areas are laid out in a grid in India, contrary to major cities in the west. We don't name all of our streets and roads and building blocks.

This way is just understood very fast and easy and thus has stood against time and tide.

There are narrow roads taking sudden turns and stops and also road or street names are out of sight or hardly there. Cities growing organically, a landmark today is not there after few weeks, street names are only on maps and hardly there are signboards. When you ask someone for a route information the reply is always in the form of a local landmark based route and its easy to remember too.

landmark information with character

The direction given by people are not just restricted to the name of the landmark but also additional information that helps in remembering better. If you receive the directions such as, “after the hospital you will need to take a right towards traffic signal,” then extra information is added to help you in getting more ahead from that point.

.For example - “At the gate of the Hospital there will be an old man selling toys, ask him and he will tell you exactly where you want to go.” In this way the landmark information comes as more rich from local people.

Subjective landmarks

As we are not much used to maps our wayfinding is assisting by landmarks which are at ones disposal. The route told by one person is different with another person's. This is because we identify landmarks as it suits to us depending upon the time of the day, the environment and need.

Anything can be a suitable landmark, prominent landmarks such as hospitals, temples, office buildings, malls etc are there but road side vendors, temporary events, garbage bins, shops boards, parks, old tree,

street performer, typical characters at traffic lights, taxi stands etc. day to day scenes that catch the eye of people are referenced as landmarks.



Even road side vendors are referenced as landmarks while giving verbal directions

Thus we can realise this pattern of dependence over landmarks for wayfinding. for ideation thus must be a key point. In traditional aerial maps the information is mostly objective. But the meaningful way is to provide subjective landmark info which not only is more suitable for different user groups but also simpler to understand.

People are an integral part of wayfinding

There is a hesitation involved in asking anyone on route for directions. People look for trustworthy people to ask for directions. This is a constant occurrence while on route. Till the destination is reached user keeps on verifying and validating the route information and landmarks by consulting multiple people. Thus there is constant help from outside to orient oneself.

This will be an important key factor in the final solution. People expert in local information can guide others more easily and effectively.

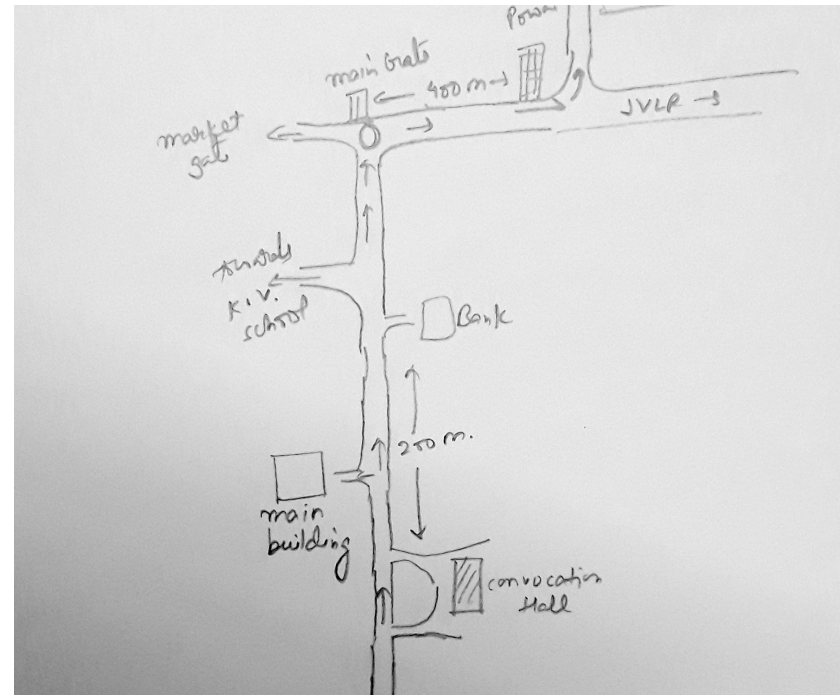
A ticket checker at bus stop surrounded by commuters getting route information



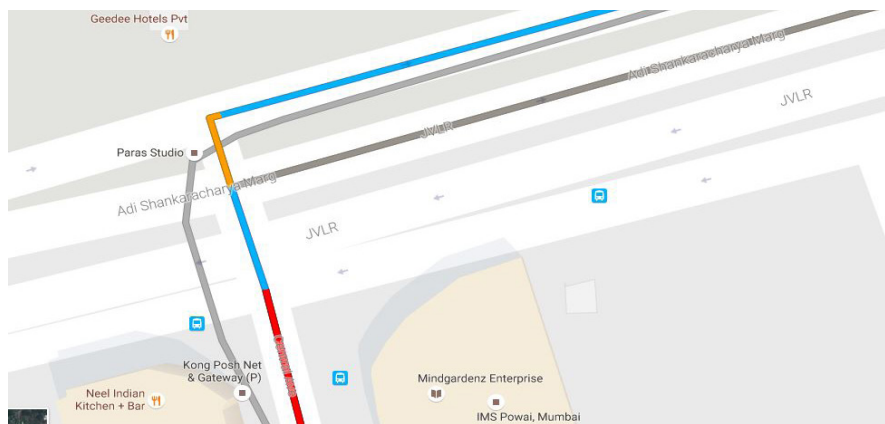
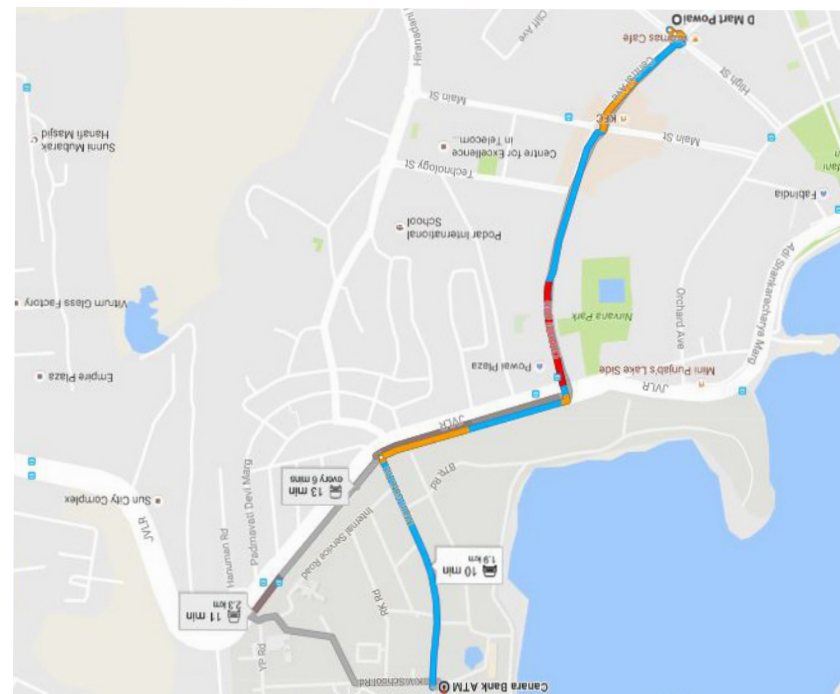
Routes are remembered as a collection of decision points with landmarks

Some users were asked to sketch the way they recall their last route travelled. The results were no surprise.

Our brain removes the unnecessary info and only focuses on what is important. By simplifying our route we achieve destination faster and easier. The remaining info only consists of what actions have to be taken and at what point.



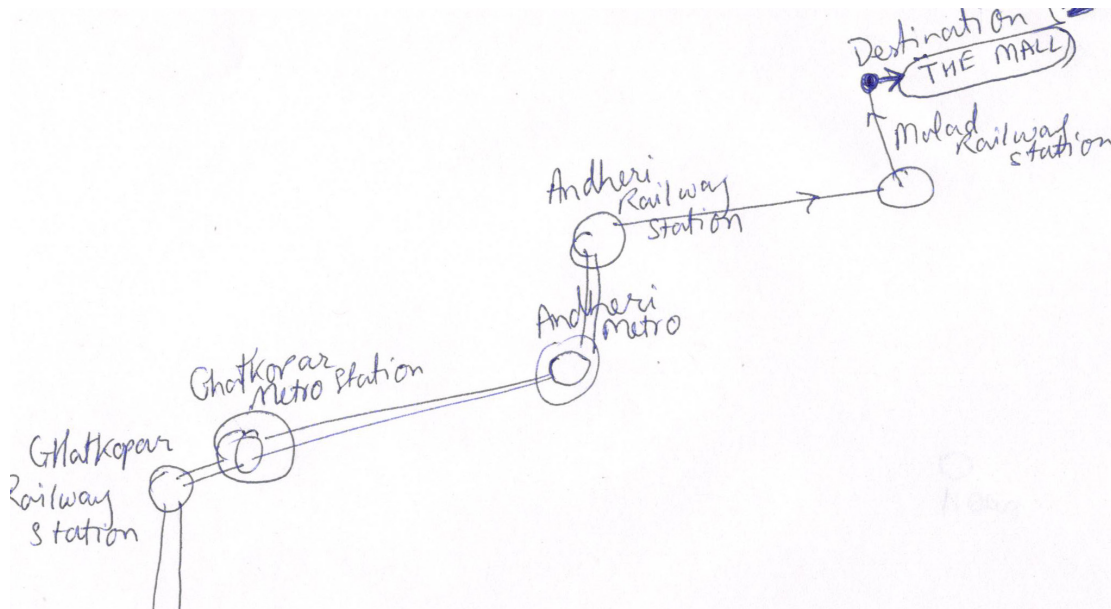
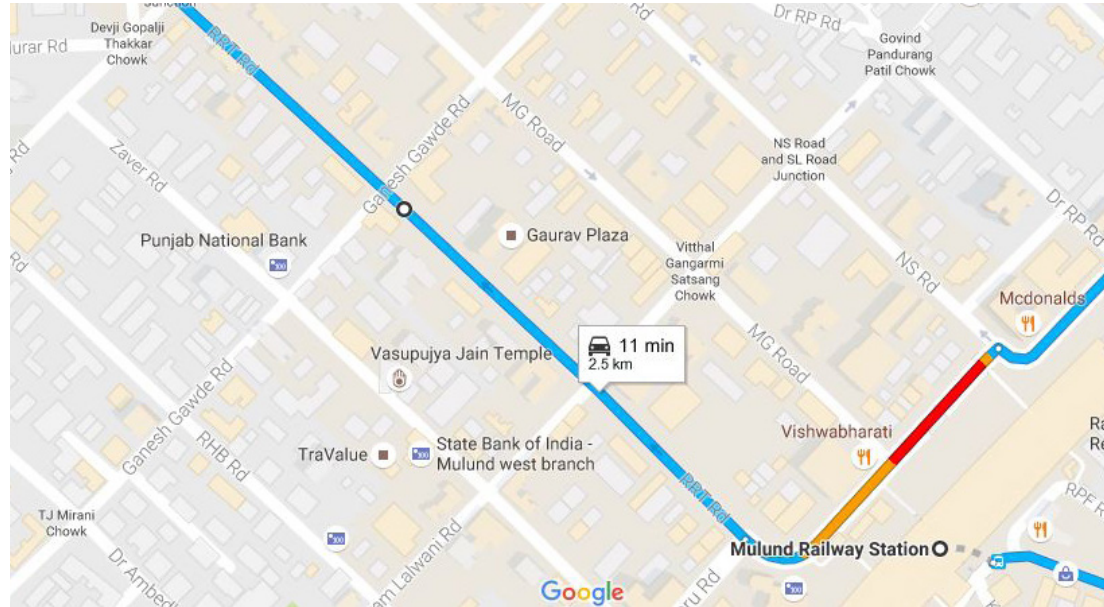
Top: User created route from memory, notice how it contains only main decision areas and not other info that is not useful to navigate. Middle : The same route in Google Maps. Bottom left : The zoomed in part of the route.



Top: Google maps route from Panch raasta to Mulund railway station. Bottom : User perception of the route.

Such simplified data can be utilized to create simple maps that cater to user in a way which suits to the mental mode. In such case brain will have to do less calculations and will be guided by memory.

This aspect is an important factor that should contribute to the solution.



Ideation

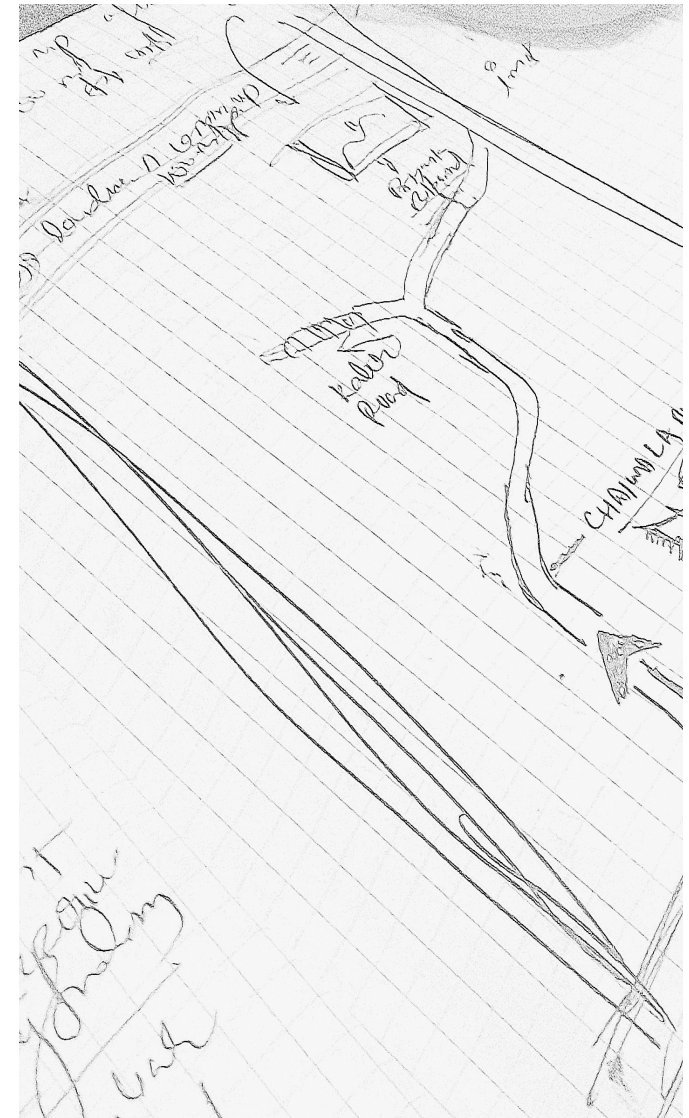
It is clearly observed that the importance of local knowledge in searching addresses cannot be superseded by any kind of mapping system.

Till now we have generated enough insights to realise that local landmark information is rich and contributes in effective an easy wayfinding. Coupled with schematic maps which remove complexity of complexion in maps, this leads to our ideation face.

We established people are integral part of wayfinding in India. They provide each other meaningful information and together contribute in creating formal or informal landmarks for the routes.

With all the studies showing that simplifying maps contrubutes in a great way in solving wayfinding problems(Casakin et al. 2000), incorporating semantic wayfinding and enriching wayfinding instructions with local landmarks (Raubal et al. 2002) leads to a less cluttered and user centric solution to wayfinding.

Taking learnings from above, the aim is to create wayfinding solutions with rich landmark info and easy to recall maps.



Concept 1

In this concept the interface is kept very simple with wayfinding instructions consumed in a text based support. The existing method of text based turn to turn instructions are used but with focus on landmarks and easy instructions.

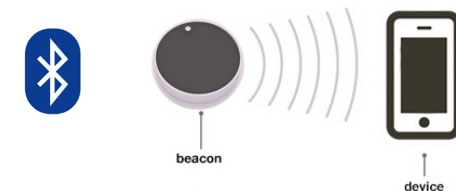
The interaction is simple. Requests are sent to the server and received each time with menu option to select from. This will work offline through SMS and USSD¹ channel.

User will type in their location and destination. Will receive a list of nearby landmarks and routes. User can choose the most nearest and familiar one and will be guided from there by already populated data in the server. To help user orient bluetooth beacons can be used



Simple interface to receive text based landmarks info from server through SMS

Bluetooth beacons can be used to orient users on route. This will work offline and without any complexity.



1. USSD stands for Unstructured Supplementary Services Data. A gateway is the collection of hardware and software required to interconnect two or more disparate networks, including performing protocol conversion.

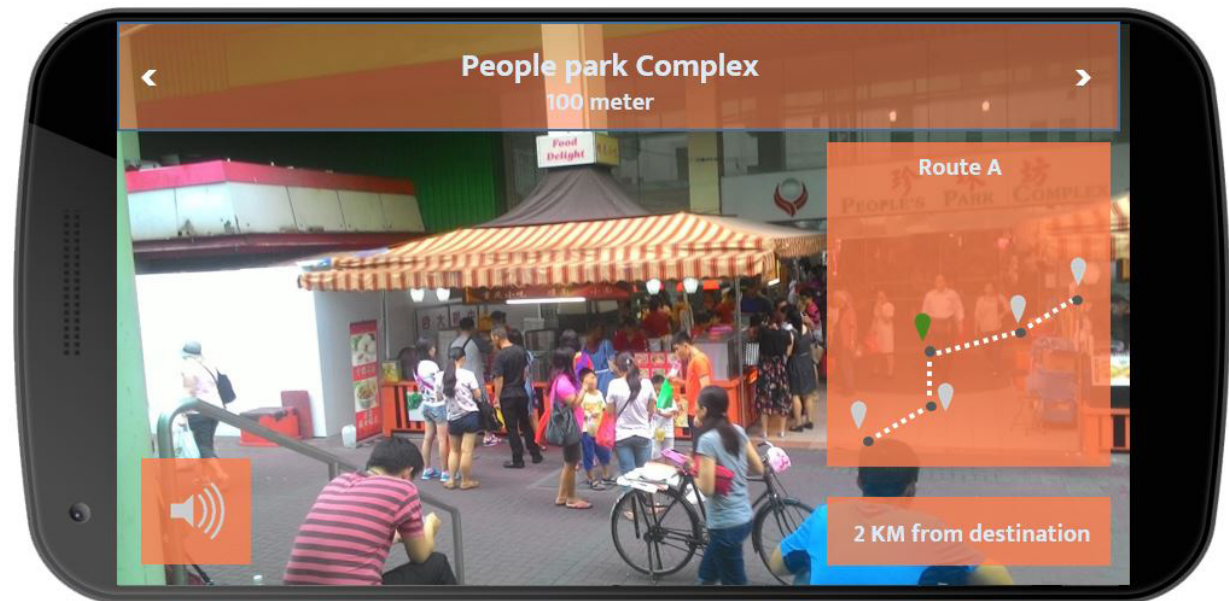
Concept 2

Location aware tool for wayfinding using audio and visual aid.

In this concept, landmark image is displayed when user approaches a location. Enabling the audio gives location aware information thus guiding the user. The audio can be recorded and geo tagged by user who have been to that location. This will give the landmark more character and thus will assist in easy remembrance and recall.

User studies and secondary research showed that landmarks with more rich information simplify wayfinding. User can audio and image file to this landmark to give it more character which in-turn benefits other users.

The nearest landmarks are represented as nodes and blink green when are about to be approached.



The images pop up when user approaches the landmark. This confirms users location and orientation.

Concept 3

This concept focuses in generating local landmark data and also identifying and verifying them. Images, audio files submitted by users are sourced and maintained .

Each user can upload thier own landmarks along the route and tag them accordingly. Someone using that route will have access to this rich dataset all the time.

Users will contribute their own maps of the location and based on ratings and other user contribution in the platform the route will be available to all.

Such landmarks will be plotted in the simple schematic maps and interactions will be very simple and void be be unnecessary data.

Form top left to bottom right- displays some screens ragrding tasks. Finding a route to editing and creating a route will all contribute in building a communty for wayfinding. Navigation will be assited by rich landmark data.



Hypothesis

With available local landmark data, coupled with more characteristic data such as location audio etc., and tagged on a simple schematic map, a simple and efficient wayfinding strategy can be achieved while not compromising with details of the route. The map will be stripped of non related info and only focus on what is required.

This will lead to unambiguous decisions at nodal points with landmarks that determine the right direction and also prevent any error by user in understanding the route.

Using much less information a highly schematic map can lead to better wayfinding performance (Meilinger et al. 2007). Only providing with right data at the right time or node, landmarks at decision points.

Landmarks can be any structure, organic or inanimate. As long as it serves the purpose of providing user crucial info on the route.

Wayfinding instructions will consist of following entities -

1. A route will contain nodes and arms.
2. User will move from node to node through the arms.
3. There will be landmarks at each node that will help in aligning the user at each decision point or a node.
4. Each landmark will contain additional info to aid in orientation.
5. Turning instructions will be based on the users current direction.
6. User will travel from node to node through arms. There will be landmarks at arms to let user confirm if he is on right path.

Final Design

The final idea uses local landmark information coupled with simple abstract schematic maps populated with data set generated by a community of local people.

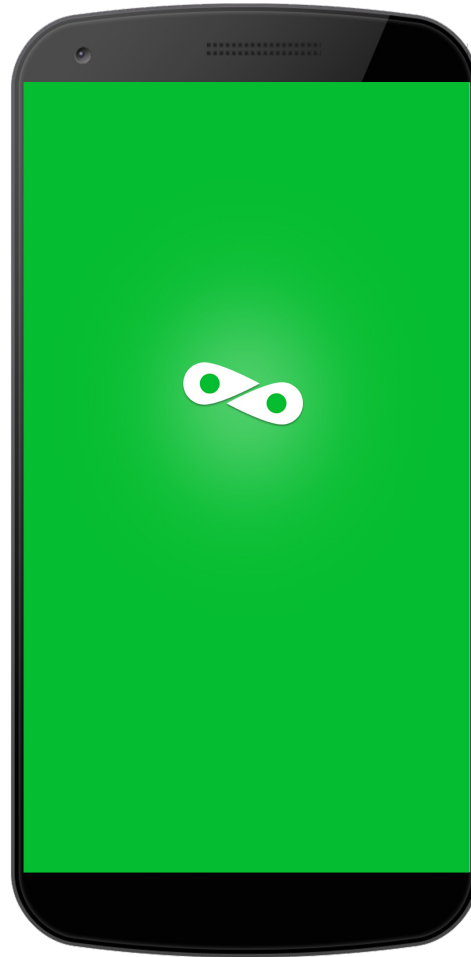
Chief focus is on how user will generate and consumes this data and make effective decision out of them.

The map will contain simple map with direction info and landmark plots. User will orient himself using the landmarks at nodes (landmarks that help in making a turn) and along the arm(distance between two nodes).

The map will be kept fairly simple with focus on less ambiguous choices. The main decision will be aided by rich landmark info backed by user generated content, audio geo tags, images with key description and properties that makes the landmark stand out.

Along any route users will be able to plot landmarks an add to the map. Thus crowd-sourcing such data from users will lead to a community that will validate such that through periodic verification among route creators and other contributors.

RouteBay

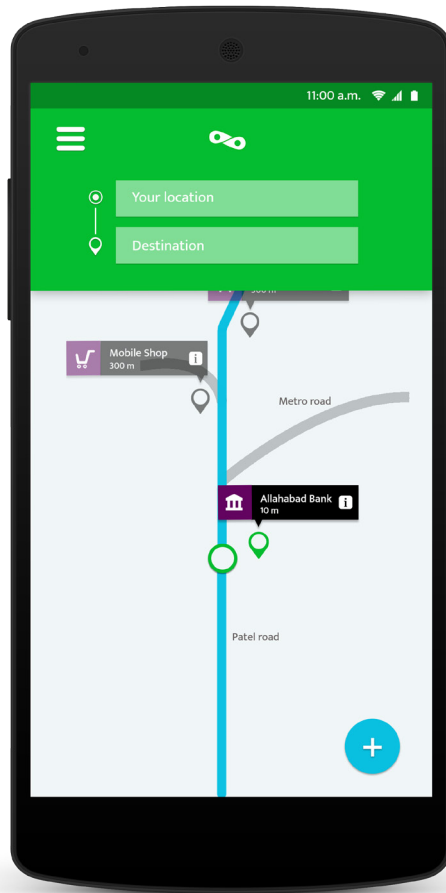


RouteBay



**Making navigation easy and familiar
by crowdsourcing landmark info,
user generated routes and an easy
to follow map.**

Scenario 1 Navigating



The navigation interface consists of main schematic map part that displays landmarks at nodes and arms.

Upper part is used to displays status and data input.

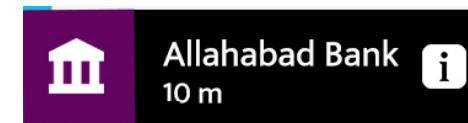
The blue plus icon expands to screens specific actions.



*Displays current location.
The icon turned to an arrow when navigation commences to show direction.*



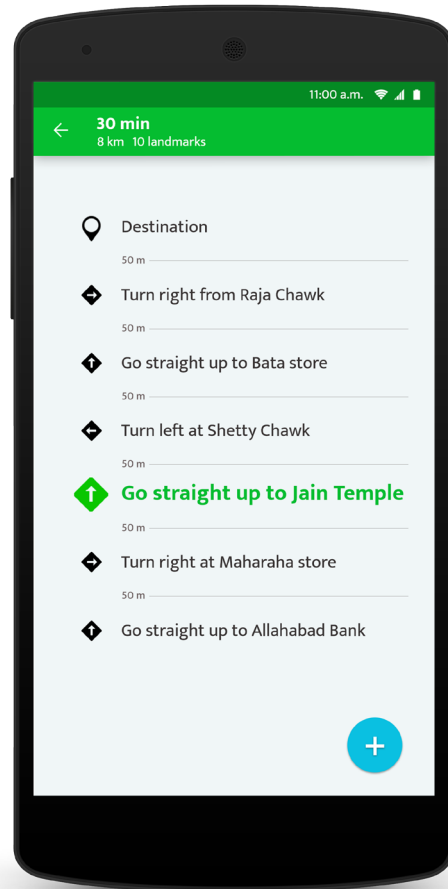
Landmark pin, turns green when user approaches near.



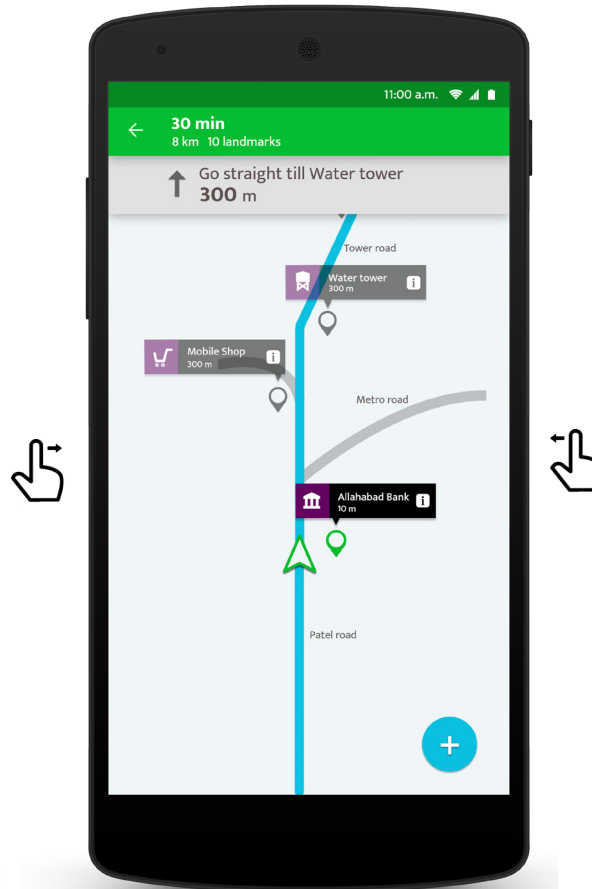
Each landmark icon can pack further helpful info such as other local terms for the that landmark or if there is any recent change related to the landmark.

Users contribute this landmark info so there is always data coming in,

Scenario 1 Navigating

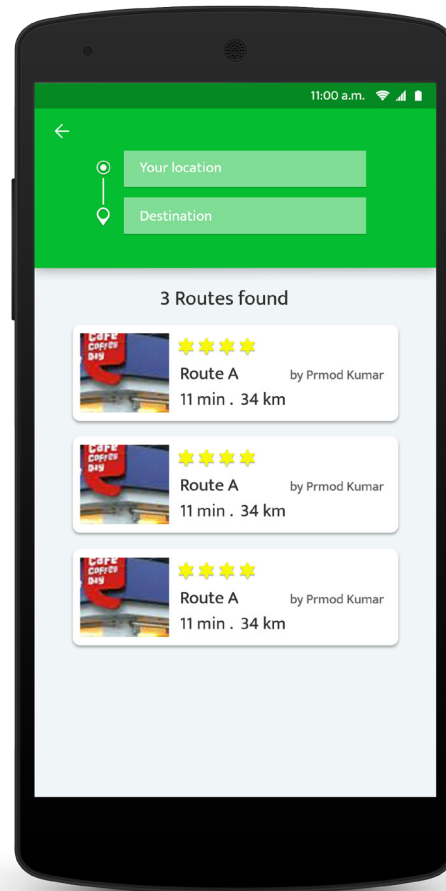


Swiping right from main screen displays the text based directions



Swiping left from main screen displays the landmark information. If a landmark icon is tapped this screen is displayed.

Scenario 1 Navigating - Find routes



User will enter source and destination and related routes with descending order of rating will be displayed. User can select the most favourable. With time this feature will become more intuitive as more activity will help to narrow down user's wayfinding behaviour.

Route tile contains route rating and creator info.

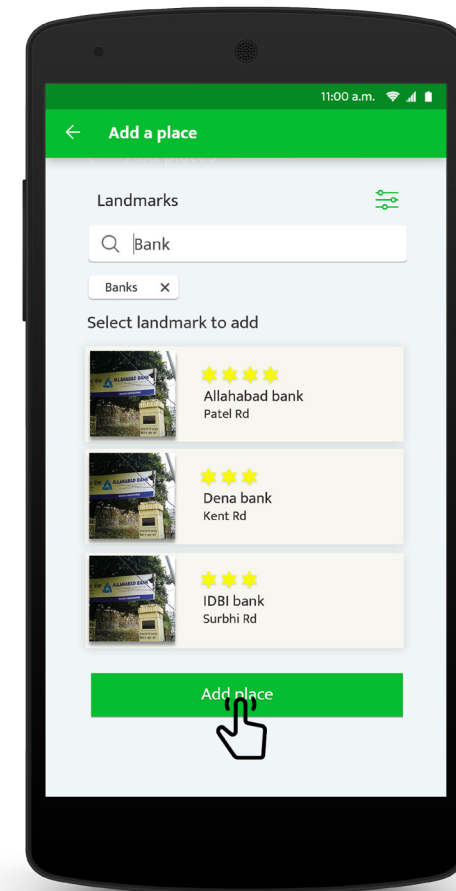
Scenario 2 Editing route

Tapping on the blue plus icon and it further expands into more options. The add option will directly take to add a place screen.

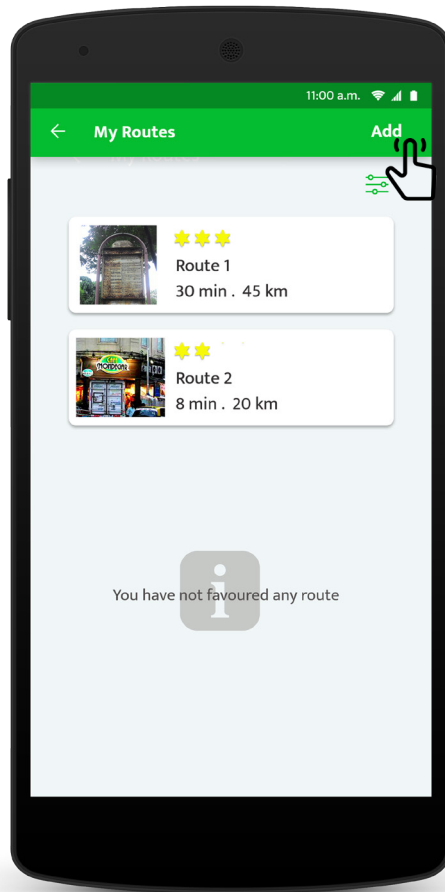
User can add a new place or search for existing info in the COMMUNITY DATABASE based on many categories such as bank, restaurant, mall etc.

Each info is given a rating in the system which validates the credibility of that info, thus the system crowd-sources the verification and validation.

User can filter the results based on categories such as banks, hospital etc.

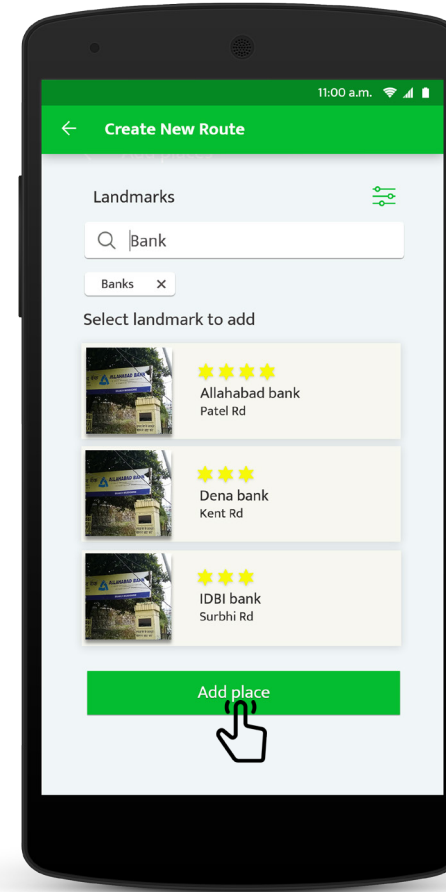


Scenario 1 Routes



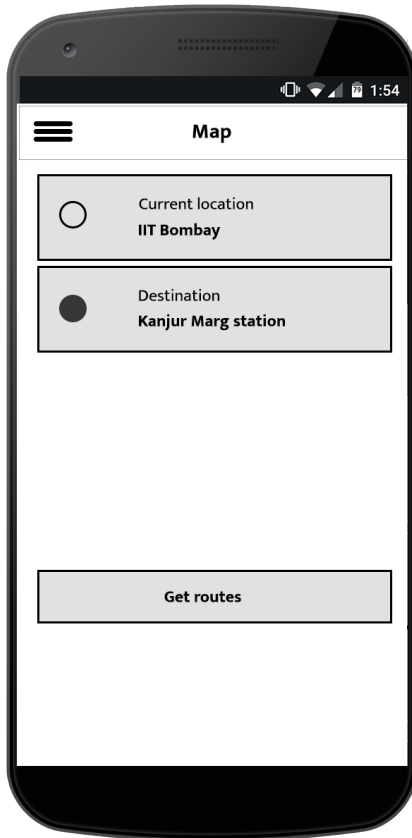
Users can create routes to suit oneself and also favorite routes created by others, thus increasing the credibility of those routes or users in the community

This page shows the routes created by user and other details such as how many users have rated his route and what are the new changes if any in the routes created or saved by user;

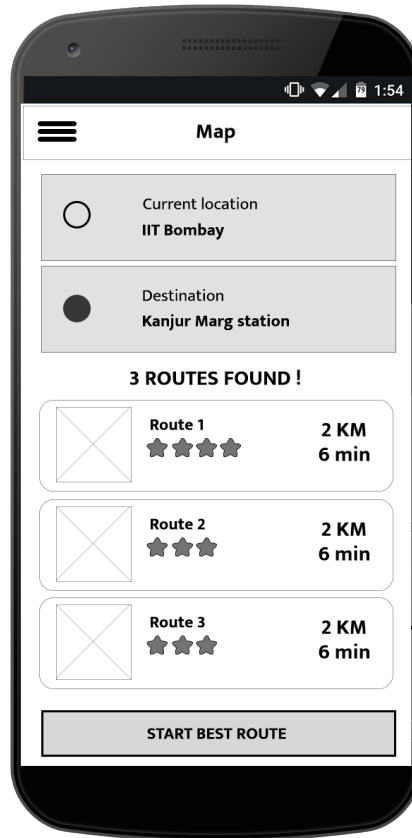


User will enter source and destination and related routes with descending order of rating will be displayed. User can select

Initial Wireframes



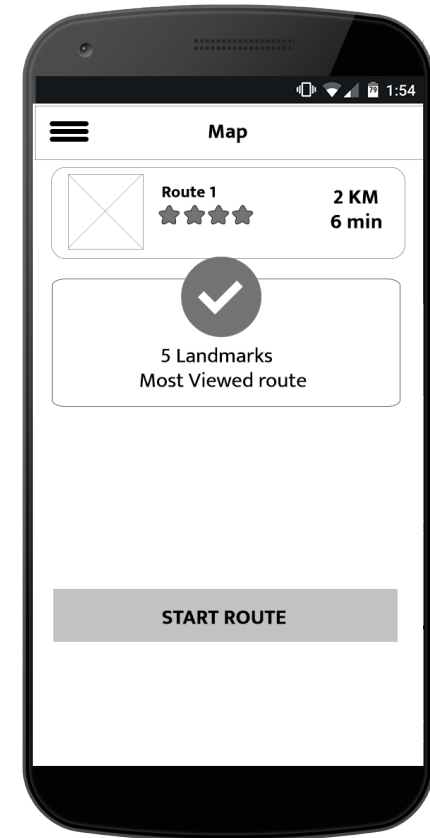
Initial screen to search and input the starting and ending points of the journey.



List of routes as search result sorted by rating

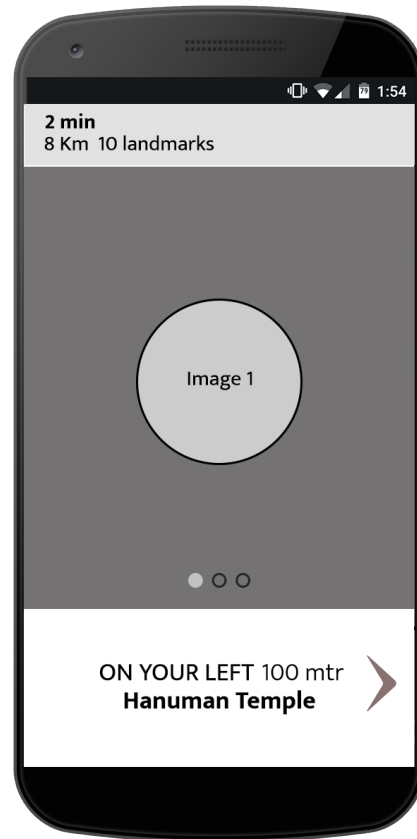


Selecting routes before commencing navigation

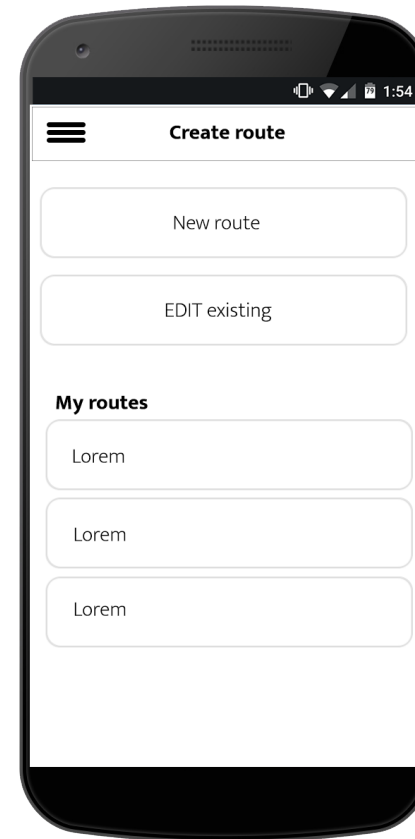


Start navigation

Initial Wireframes



Screen displaying landmark info



Here user task is to manage his routes and also create new by selecting landmarks from the database or adding new landmarks etc.

Evaluation

User criteria-

Basic knowledge of using apps on smartphones. No education criteria.

Age : 20 years and above

English proficiency : Average

Route for evaluation-

1. IIT Bombay Hostel 12 to Kanjur Marg station.

-- The route has Enough number of turns and curves in the road to pose a wayfinding challenge.

2. IIT Bombay main gate to Deloitte Consulting Pvt. Ltd, Hiranandani

-- To test the design in more congested environment with more exrternal factors.

Users will be asked to reach destination on both the routes using the app and other

existing solution such as Google maps.

The aim is to know how comfortable users are in finding destinations with the given interface and in identifying landmarks to take turns. How easily they can remember the route and create their own landmarks.

Also focus is to understand user behaviour with minimal data and just enough information to reach the destination.

Design Limitations

The concept will not get traction among users if there is not enough motivation. The design has to bring forth the positive side of crowd-sourcing of landmark info.

More thought has to be put in making the design more personal to gain user trust. This would help in forming strong local communities.

The enormous amount of data needs to be verified and maintained continuously. As crowd-sourcing is the focus, the design has to be motivating enough for user to be a part of the community.

Misuse of this freedom also needs to be checked as data can be manipulated easily which can result in complications and user frustration.

Overall the concept is driven by its users, for the users.

User input and feedback is very crucial for this model of wayfinding.

For future augmented reality can be introduced to put user in the location and thus spatial relationship will be more easy to understand and the experience can be much richer with immersive ambient sounds.

References

- [1] <https://en.wikipedia.org/wiki/Wayfinding>
- [2] Martin Raubal, Stephan Winter. 2002. Enriching Wayfinding Instructions with Local landmarks
- [3] Casakil H., 2000. Schematic Maps as Wayfinding Aids¹ - the Cognitive Systems Group
- [4] [5] Tobias Meilinger^{1,2}, Christoph Hölscher¹, Simon J. Büchner¹, and Martin Brösamle¹ How Much Information Do You Need? Schematic Maps in Wayfinding and Self Localisation
- [6] <http://londonist.com/2016/05/the-history-of-the-tube-map>

