

Cost Based Navigation

Prof. Mahendra Patil¹, Kiran Roy², Bhakti Tigdi³, Amit Kumar Yadav⁴

Lecturer, Computer, Atharva College of Engineering, Mumbai, India¹

Student, Computer, Atharva College of Engineering, Mumbai, India^{2,3,4}

Abstract: Cost-to-go Map is an application used for navigation with cost facility. The project aims at building an application which will be useful to masses. The application includes route guides with cost feature. This application aims to provide approximate travel cost by all modes of transportation from a source to destination. In this application we also include the existing features that includes duration of travel, traffic updates and various path between the source and destination. Besides, it also includes public transit schedules along with fare charts.

Keywords: Cost, distance, time, navigation.

I. INTRODUCTION

Cost Based Navigation is a map-based mobile application currently developed for the Android Operating system only for Mumbai. It provides information like duration of travel, traffic updates, various paths and the most important feature is to provide the optimum cost of transportation between the source and destination using Google Maps API. Cost Based Navigation provides a route planner under "Get Directions" feature. The available modes of transportation depending on the area are driving, public transit and walking. It gives the optimum cost of transportation based on the mode selected by user.

This application considers the traffic conditions and mileage of the car or vehicle the user is travelling by and gives the costs of all possible routes.

Features provided in the application:

- Cost of Transportation from source to destination
- Street View
- Fare of auto, taxi, buses and trains
- Public transit schedules

II. LITERATURE SURVEY

The application is based on mobile applications Google Maps and m-Indicator.

A. Google Map Navigation:

The Google Maps application for Android based devices makes navigating your world faster and easier. It allows to find the best locations in town and the information needed to get there.



Fig1: Google Maps.

- Comprehensive, accurate maps in 220 countries and territories
- Get driving, public transit and walking directions
- Transit directions and maps for over 15,000 towns and cities

- Live incident reports, traffic conditions, and automatic rerouting to find the best route
- Detailed information on more than 100 million places

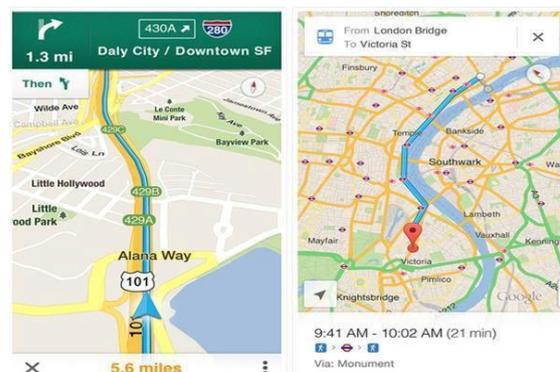


Fig2: Google Maps Navigation.

- Street View and Satellite view
- Get turn-by-turn navigation
- See your location on the map
- Find local places
- Sign in to customize your map
- View maps offline
- search for specific locations
- find useful information about places

B. m-Indicator:

It is a mobile application that has the following features:



Fig3: m-Indicator

1. Mumbai Local, Mail & Express train timetable.

It includes Central, Western, Neral-Matheran, Mono Diva-Roha, Virar-Dahanu Shuttle, Metro schedules along with starting train platform no. at Borivali, Virar and Kalyan. From source to destination it finds connected routes (changing line routes) and plan the journey. The application also includes Rail Map.



2. Bus Routes

It consists of BEST, NMMT, TMT, KDMT, MBMT, VVMT, KMT schedules. It allows to get route by bus number. Also it search buses between source and destination / connected routes.

3. Offline Mail and Express trains timings, halts, Current position It allows to check PNR status.

4. It includes auto and taxi fares

5. Classifieds section: Jobs and Properties from Mumbai are listed.

6. Drama and Movies

You can get daily schedule of Marathi, Gujarati, Hindi Drama. It also provides theater wise list of latest movie shows in Mumbai.

7. Travel news & alerts

Gives weekly updated information of railway mega blocks on Sundays

8. Emergency Telephone nos.

The application provides Casualty Hospitals, Financial Medical Help, Electricity Issue, Fire Brigade, Ambulances, Railway, Blood Banks, Air Lines.

Services, Roadway Enquiries, Tourist Enquires, Important Medical Messages.

9. Picnic Spots

It provides category wise list of picnic spots example: beaches, Hill stations, Forts, Resorts, Lakes . It also provides distance wise list of various picnic spots in Mumbai.

10. Women Safety

It also provides an unique woman safety application .It does not require GPS or internet and sends automatic alert SMS.

III.PROPOSED SYSTEM

Cost Based Navigation is an application used for navigation with cost facility. This application aims to provide approximate travel cost by all modes of transportation from a source to destination. [3]In this application we also include the existing features of Google Map that includes duration of travel, traffic updates and various path between the source and destination.

Features provided in the application:

- Minimum Cost of Transportation
- Turn by turn Navigation
- Traffic view
- Search along route
- Satellite view
- Street View
- All routes and timings of local trains and Metro
- Fair of auto, taxi, buses and trains..

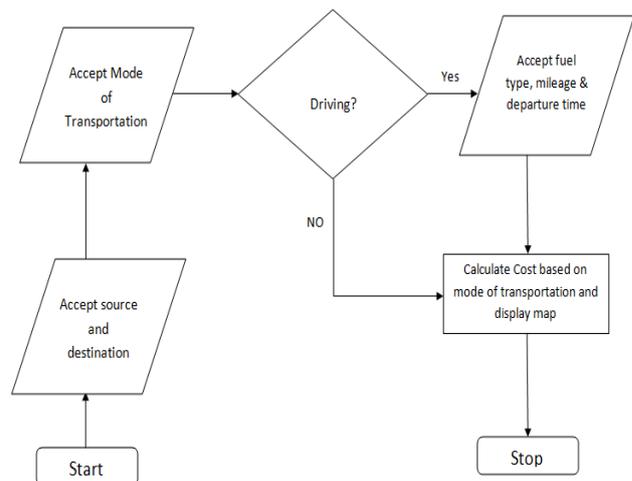


Fig 5: Flow Diagram

Cost Based Navigation checks for the traffic conditions and varying costs are provided to the user based on the traffic conditions of current time. It gives Cost on the basis of fuel consumption by the user’s vehicle. Four different types of fuels are given as option to the user i.e. Petrol, Diesel, Auto gas, CNG.

This application uses Google API for maps and routing details, Rail API for the fare cost of Local Trains of Mumbai and BEST.

IV.METHODOLOGY

To get the optimum cost of transportation between source and destination, the user has to go through few steps of selection and giving inputs. The user will first have to provide with the source as per his requirement. The source can be fetched from his current location or accepted as an input by the user. The user will then provide with the destination to be reached. After providing the destination the user will then select the mode of transportation as per his need. The modes of transportation provided in the application are driving, auto, train, bus, taxi. So basically these can be divided into driving and public transit for simplicity.

If the selected mode of transportation is driving then user will provide with the mileage of the vehicle he'll be driving. This app also provides an option for the user to select fuel type for his vehicle out of Diesel, Petrol, Auto Gas and CNG. The distance between source and destination is accepted from Google map API and Google Direction Matrix API. After getting distance and mileage of user's vehicle these data is passed to a method where a calculation is performed to calculate the cost of transportation. After the calculation is done the user is provided with the information like cost of transportation , duration, time.

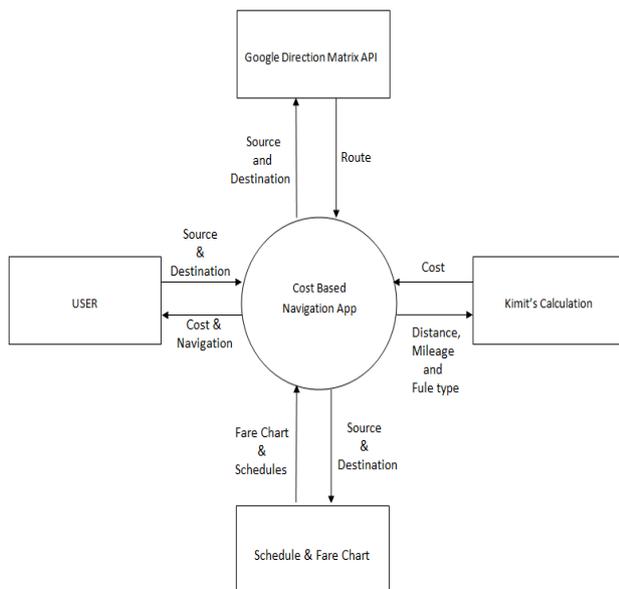


Fig 6: Context level Diagram

For driving mode user also has an option to provide with information of his departure time, traffic conditions at the departure are taken into consideration and more accurate result is displayed. Heavy moderate and low traffic taken as three possible traffic conditions at the time of departure and on the basis of which addition of some extra cost in the original cost is done.

If the selected mode of transportation by the user is public transit then based on the current fare of every public transport, cost is calculated for all possible routes. Four types of public transports are available i.e. Auto, Bus, Taxi and Train. User can select the path with minimum cost or a path with minimum time duration required to commute. Fare Chart of these public transports can also be checked out by the user. By retrieving data lists for trains the user is also provided with the timetable and schedules of Mumbai Local Trains. For calculating cost of the route by driving or public transports calculations are done taking into consideration the distance, traffic conditions and mileage of the user's vehicle.

V. CONCLUSION

Our cost based navigation system provides approximate travel cost by all modes of transportation from a source to destination. This application uses Google Map API for all the information about root, traffic and road conditions. For

successful navigation user has to select source and destination as well as the mode of transportation.

ACKNOWLEDGMENT

We would like to thank our project guide and HOD **Prof. Mahendra Patil** for his enormous co-operation and guidance. We have no words to express our gratitude for a person who wholeheartedly supported the project and gave freely of her valuable time while making this project. All the inputs given by him have found a place in the project. The technical guidance provided by him was more than useful and made the project successful. He has always been a source of inspiration for us. It was a memorable experience learning under such a highly innovative, enthusiastic and hard working teacher. We are also thankful to our Principal **Dr. S.P. Kallurkar**, our Project co-ordinator **Prof. Deepali Maste** and all the staff members of the Computer department who have provided us various facilities and guided us to develop a very good project idea .Finally, we would also like to thank teachers of our college and friends who guided and helped us while working on the project.

REFERENCES

- [1] "An Approximate of the Cost-To-Go Mapon Rough Terrains", IEEE Conference Paper,2013
- [2] The Study and Implementation of Mobile GPS Navigation System Based on Google Maps, International Conferenceon Computer and Information Application, ICCIA2010
- [3] A. TahirovicandG.Magnani,"A Roughness- based RRT for Mobile Robot Navigation Planning",In Proc. of the 18th IFAC WorldCongress,Milan,Italy,2011.
- [4] Y.Kuwata, L.Blackmore, M.Wolf, N.Fathpour, C.Newman, and A.Elfe,"Decomposition Algorithm for Global Reachability Analysis on a Time-varying Graph with an Application to Planetary Exploration,"IEEE/RSJ International Conference on Intelligent Robotics and Systems, October,2009.
- [5] J.Carsten, A.Rankin, D.Ferguson, and T.Stentz,"Global planning on the Mars Exploration Rovers:Software integration and surface testing",Journal of Field Robotics, Vol.26,No.4,2009.