The API Route Mapping

G.Kiran Kumar
Associate Professor & HOD,
MLR Institute of Technology, Hyd.

M.Rakesh
B.Tech (CSE),
MLR Institute of Technology, Hyd.

T.Sunil Sheshan
B.Tech (CSE),
MLR Institute of Technology, Hyd.

J.Nikhil
B.Tech (CSE),
MLR Institute of Technology, Hyd.

V.Venkat
B.Tech (CSE),
MLR Institute of Technology, Hyd.

B.Joshiram
B.Tech (CSE),
MLR Institute of Technology, Hyd.

Poonam Khare
Assistant Professor, Dept of CSE, MLR Institute of Technology, Hyd.

Abstract:
The API Route Mapping is used to locate the places from source to destination .In this we use "HERE MAPS" as the base to locate the places .Here we use "Quick Response (QR)Code" scanner to navigate the actual place to the user till he reach the destination i.e college. API Route Mapping project is useful for all the people who are facing problems to find the location of college. We can find the location of college from any part of the world by using this project in Map view as well as Satellite view. Quick Response (QR) codes seem to appear everywhere these days. Using the QR codes is one of the most intriguing ways of digitally connecting consumers to the internet via mobile phones since the mobile phones have become a basic necessity thing of everyone. By using this QR code user can scan the route map and it will navigate the user, till the user reaches the destination (college) along with distance and directions.

I. INTRODUCTION

The API route mapping is used to locate the places from source to destination. In this we are using the "HERE MAPS API" for route mapping. API Route mapping in Java is a set of programming interfaces that enable developers to build Web applications with feature rich, interactive Maps at their center. The API consists of libraries of classes and methods with which the functionality of an interactive application is implemented. It comes with a highly improved performance, enabled through leaner size and optimized API code, and is completely re-designed using the latest in browser and hardware technology. Additionally, it provides improved processing speed and faster loads times while enabling application development across any desktop and mobile browser environment.It allows for integration of a broad range of both consumer and enterprise features and functionalities into applications quickly, easily and at minimum cost. With the API in Java you can now create highly innovative, differentiated and customized experiences with feature rich, global and interactive Maps at their center. The HERE Maps API for Java exposes the functionality of a collection of Restful Web Services in the following five core components. Quick Response (QR) codes seem to appear everywhere these days. Using the QR codes is one of the most intriguing ways.If digitally connecting consumers to the internet via mobile phones since the mobile phones have become a basic necessity thing of everyone. In this project, we present a methodology for creating QR codes by which the users enter text into a web browser and get the QR code generated .By using this QR code user can scan the route map and it will navigate the user, till the user reaches the destination.

Purpose of project

API along with QR code helps us to navigate from the source start point(where we are) to the destination point(college).QR code, once s scanned with QR code scanner, it navigates from the location where we are to

the destination i.e., college along with direction, distance and time to reach the destination throughout the world.

Existing system

In the Route Map which already exists to our college we can only locate or find the location from particular landmarks i.e name of cities, junctions, etc. We need to drag on the map to find the particular location of college.so that user may face the problems in finding the way to reach the college.

Proposed system

We want to implement the route map to college through developing an Application Interface (API) for routing by scanning Quick Response (QR) Code or by clicking on the main junctions proposed. It will avoid problems in facing to find the location of college. Both the Map view and Satellite views of locations are provided clearly. No problems will be raised to the user in finding the location of college by using this route mapping.

Scope of the project

API for route map to college aims serving for students and parents welfare. API along with QR code helps us to navigate from the source point(where we are) to the destination point(college).QR code, once scanned with QR code scanner, it navigates from the location where we are to the destination i.e., college along with direction, distance and time to reach the destination throughout the world.

II.   REQUIREMENTS

Software requirements:

Operating System: Windows 7, 8
Programming Language: JAVA, HTML
Web Browser: Mozilla Firefox, Google chrome, Internet Explorer
Hardware requirements:
Processor: i3, i5
Hard Disk: 500GB
RAM: 2GB

UML Diagrams

Class Diagram provides an overview of the target system by describing the objects and classes inside the system and the relationships between them. It provides a wide variety of usages; from modelling the domain-specific data structure to detailed design of the target system.
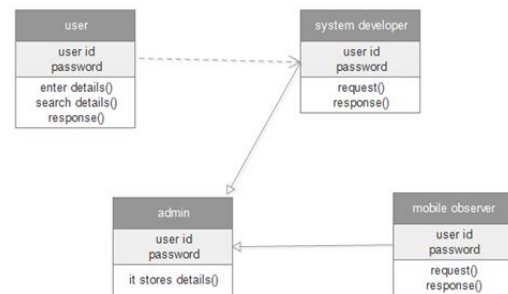

Fig 1: class diagram

2. Use case diagram is a list of action or event steps, typically defining the interactions between a role and a system, to achieve a goal. The actor can be a human, an external system, or time.
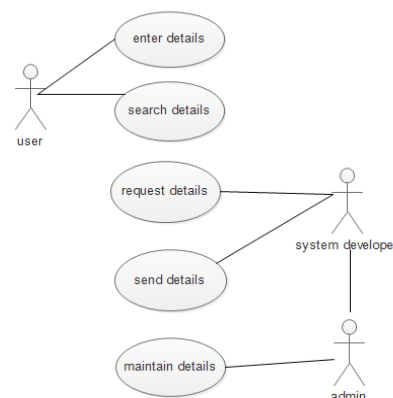

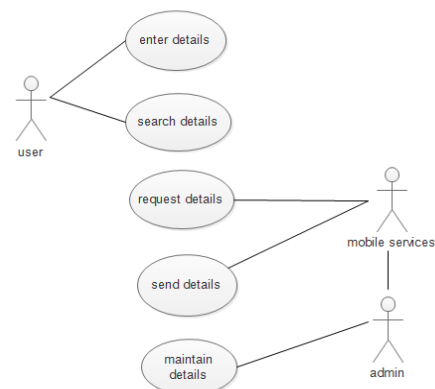**Fig 2: Use case of system developer**

Fig 3: Use case for mobile services

3. Sequence diagram is an interactiondiagram that shows how processes operate with one another and in what order. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario.
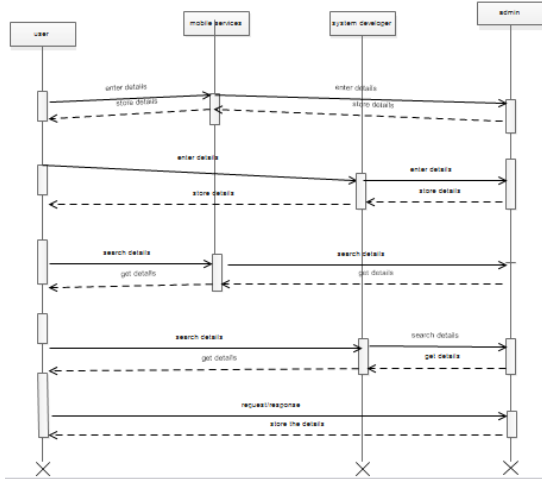

Fig 4: Sequence diagram

4. Activity diagram are graphical representations of workflows of stepwise activities and actions with support for choice, iteration and concurrency. In the Unified Modeling Language, activity diagrams are intended to model both computational and organizational processes.

5. Component diagram depicts how components are wired together to form larger components and or software systems. They are used to illustrate the structure of arbitrarily complex systems.
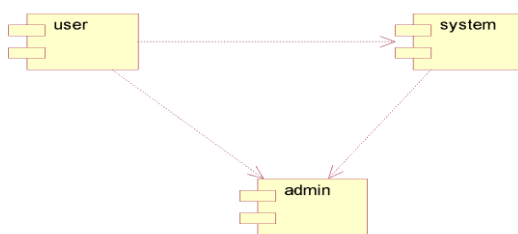

Fig 5: Component diagram

Deployment diagram specifies a set of constructs that can be used to define the execution architecture of systems that represent the assignment of software artifacts to nodes. Nodes are connected through communication paths to create network systems of arbitrary complexity.
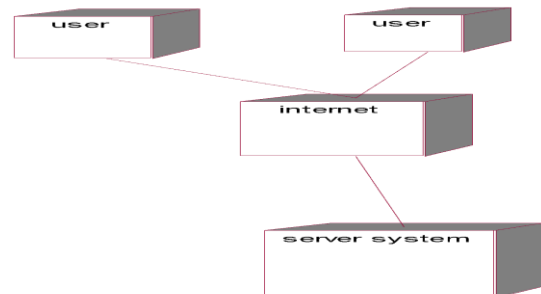

Fig 6: Deployment diagram

Data Flow Diagram
Level 0 of Data Flow diagram

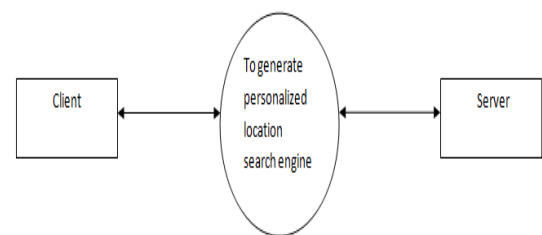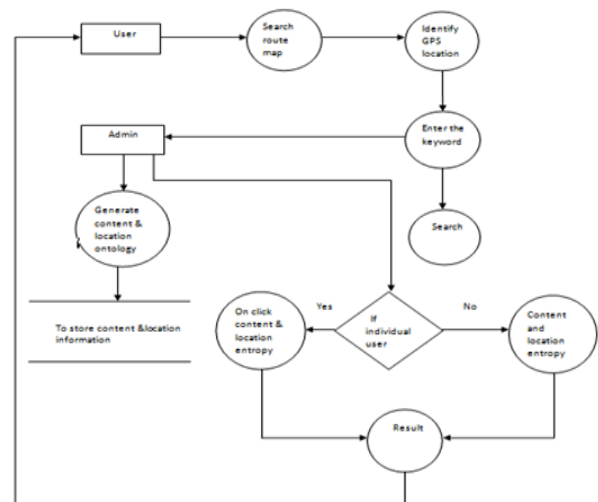

Fig 7: DFD for user

Fig 8: Dataflow diagrams

III. IMPLEMENTATION
Route Mapping
Route mapping is used to lacate the places from source to destination. It is used to locate in two types of views i.e Map view and Satellite view.

Map view

Graphical representation of procedure, process, structure, or system that depicts arrangement of and relationships among its different components, and traces flows of energy, goods, information, materials, money, personnel, etc

Satellite view

Satellite view is used to find the locations or particular places clearly i.e including clear view of roads, buildings e.t.c. through satellite. It is much useful to user in finding correct location without any confusion.

Area of interest

The area of interest (AOI) is the feature that is depicted on the product and represents the specific geographic extent of the instance. The area of interest could be based on an item in an index or any other polygon feature. There are several properties associated with an area of interest.
These properties are divided into two sections:

General

The General section includes properties such as the name, alias, description, and status of the area of interest.

AOI

The AOI section includes properties such as the map scale, the reference scale for the area of interest, and whether the existence of the AOI has been verified. When you add an area of interest to an instance, only the General properties are required. You can optionally indicate the AOI type, various scales, and whether the AOI contains data.

IV. ADDING/ MODIFYING ROAD FEATURE

Classification of road types may vary from one country to the other. In countries with a well-developed infrastructure you may classify by common knowledge, according to the icons representing a road type:

Motorway: a multi-lane, grade separated carriageway of international or national importance with alphanumeric denomination.

Main: a single-lane road or dual carriage way with crossings at grade of national or regional importance with alphanumeric denomination.

Local access: a single lane road or dual carriageway with crossings at grade without alphanumeric denomination connecting quarters and districts in a city.

Trail: paved or unpaved pathways for cycling, running and hiking. No vehicular traffic is possible, except all-terrain vehicles (4-wheel-drive). This road type may be valid unnamed. In countries with differently developed infrastructure, common sense is helpful assigning the correct road type; for example a road of national importance would then be classified as motorway, regardless it might be unpaved and single-lane with crossings at grade.

Types of shape points:

Main Shape Point: These are big, round shapes on a road that are not at its beginning or end. Sub shape Point: Small, dark points on a road. You'll find them between two main shape pointsIf you move a sub shape point to a new position, it turns into a main shape point, and new sub shape points will be created between it and other main shape points.

Node: Round shape at the beginning and end of a road, also called start point and end point.

Tip: For a straight road, don't geocode any shape points between the start and end point (to avoid wobbly geometry). For a curvy road, shape points are necessary to describe it precisely. Don't use shape points excessively in this case.

Road types

The road type describes the relevance and hierarchical classification of a road in the transport network and is used to optimize route calculations.

Criteria that will help you select the road type
Motorway: A controlled access highway with a central reservation.

Motorways:
Are outside and inside a city
Have in general higher speed and greater number of lanes
Main Road: A long road that provides a relatively fast connection between two places

Main roads:
Outside the city can be country roads with road numbers Allow a fast, direct connection to motorways or local and country locations [also to international locations] Can have separated road beds, higher speed, greater number of lanes and road numbers that can be used as indicators

Local Access: A road that provides access to shops, petrol stations and other commercial services.

Local access roads: Within a city can be streets connecting the suburbs or sub-centers to each other and provide connectivity with main roads.Outside cities connect villages with each other, providing the best connection and closing the gap between main roads [and then motorways]

Residential Road: A street in a neighborhood that provides access primarily to houses and apartment buildings.

Residential roads:
Are in neighborhoods or villages and don't need to connect cities, countries or international locations
● Have a speed limit and limited number of paved or unpaved lanes
● Have no road numbers but could have a street name

Road details:
Road name: Give the local name of the road and the language in which the name is given. It's possible to add multiple names or road numbers.

Direction of traffic: Indicate the permitted direction of travel on a road.

Structure type: Specify the structure type of a road. A tunnel is a covered passageway through or under an obstruction. A bridge is a structure that allows a road or walkway to pass over another road, railway, waterway or valley. If a road is neither on a bridge nor inside a tunnel, choose 'open road'.

Total number of lanes: Sum the number of road lanes in both directions of travel for two-way roads, or in one direction for one-way roads.

Average speed: Choose the range that best describes the average speed of vehicles driving on this road.

Toll: A toll road is one for which a fee is charged in order to use the road. These are typically motorways or freeways for which the fee varies with distance travelled. (Only for certain road types).

Paved: Choose this if most of the road surface is made of tarmac (asphalt) or other paving substance.

Poor pavement: Choose this if the road surface consists mainly of uneven or broken pavement.

Private road: Choose this when public traffic is not allowed through the road. (Only for certain road types) To get started, click 'Add new place' at the top of the screen.

Adding place: Click on the map to set the place's location

Fig 9: Set place

Type the place category and choose an option from the list, or choose one of the more popular categories

Fig 10: Choose option

Add or change place details, such as name, type, contact information, etc. Be sure to save the changes so that the changes you made can be seen by users

Fig 11: Save changes

How to edit places
You need to zoom in to start editing changes

Fig 12: Zoom option

Click on the place icon to enter the place details panel
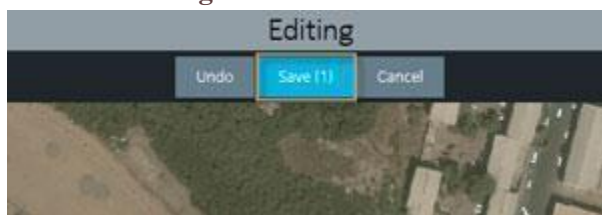

Fig 13: Enter details

Fig 14: save changes edited

Adding/modifying Roads
How to Add A Road
You need to zoom in to start adding a new road

Fig 15: Adding new roads

Add or change place details, such as name, type, contact information, etc.

Fig 16: Changing option

Be sure to save your changes so anyone can see the places you've edited.Click on the map to set the beginning of the road and to continue shaping it

Fig 17: Shaping road

To finish the road, just click on the endpoint

Fig 18: End point of road

Connect road as needed

Fig 19: Roads connection
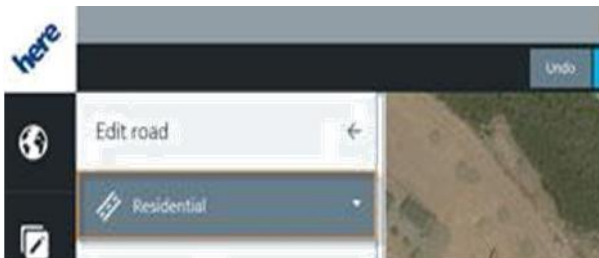
Choose the type of road

Fig 20: Type of road

Be sure to save your changes so anyone can see the roads you've added

QR Code

A QR Code (it stands for "Quick Response") is a mobile phone readable barcode that's been big in Japan forever, broke into Europe a while back, and is now getting traction in USA.In its simplest sense think "print based hypertext link" - simply encode a URL into the QR Code and then point a mobile phone (or other camera-enabled mobile) at it. If the device has had QR Code decoding software installed on it, it will fire up its browser and go straight to that URL. But it doesn't stop there - a QR Code can also contain a phone number, an SMS message, V-Card data or just plain alphanumeric text, and the scanning device will respond by opening up the correct application to handle the encoded data appropriately courtesy of the FNC1 Application Identifiers that are embedded in the encoded data.

**Fig 21: Sample Code**

What is Coding?

You've seen the craze for learning code. But what exactly is coding? Coding is what makes it possible for us to create computer software, apps and websites. Your browser, your OS, the apps on your phone, Facebook, and this website – they're all made with code.Here's a simple example of code, written in the Python language:Print 'Hello, world!'

Many coding tutorials use that command as their very first example, because it's one of the simplest examples of code you can have – it 'prints' (displays) the text 'Hello, world!' onto the screen.

Coding based on project:

Location from SECUNDERBAD bus station

```
<head>
<body><imgsrc='data:image/svg+xml;base64,PHN2Z
yB4bWxucz0iaHR0cDovL3d3dy53My5vcmcvMjAw
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gdjQ2NC0uODAzTDUuNTU3LjMzNWMtLjI1NC0u
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ZjMCAuNTEuMzYuNzIuODAzLjQ2M2w2LjUwOC
0zLjY2Y40NC4uMjU2LjQ0LS42NzMgMC0uOTI4e
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station.
</body>
</head>
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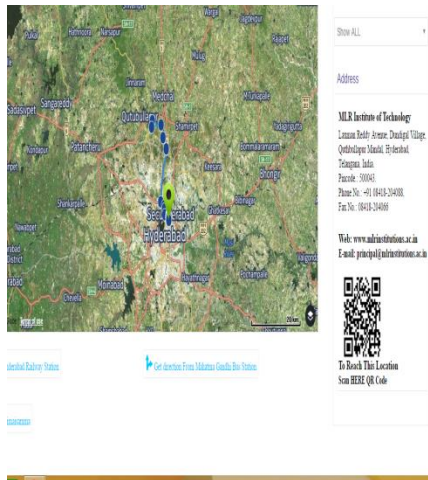
V. CONCLUSION

Conclusion of this project revolves around identifying the location i.e; college. The API developed by this project helps to navigate until we reach destination. The extra feature that this project contains is QR code scanner. It allows each and every person to reach the destination correctly. So, we hope this may help in digital India. As India is a developing country this project satisfies all the premises.

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