

AugReality

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I. Introduction

The paper 'AugReality' introduces the technology of augmented reality for Android phones. This application is useful when the user is in a strange location. The system provides a user friendly environment with the location specific details.

Augmented Reality (AR) is a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics or GPS data. It is related to a more general concept called reality. In which the view of reality is modified (possibly even diminished rather than augmented) by a computer. As a result, the technology functions by enhancing one's current perception of reality. By contrast, virtual reality replaces the real world with a simulated one. Augmentation is conventionally in real-time and in semantic context with environmental elements. With the help of advanced AR technology (e.g. adding computer vision and object recognition) the information about the surrounding real world of the user becomes interactive. Artificial information about the environment and its objects can be overlaid on the real world.

The 'AugReality' introduces the technology of augmented reality for Android phones. This application is useful when the user is in a strange location. The system provides a user friendly environment with the location specific details. This idea combines many functionalities like identifying the current location, finding common tags that a user wants to know (like hospitals, bus stand etc.), information about the current/upcoming events the city, guide the user to find the distance of the desired places along with route map. The system also provides the user with the provision of adding new tags (like new hospitals, hotels etc.) and events through a web application. For that the user need to be registered.

The paper 'AugReality' is developed for the normal users who like to travel to unknown places. This application can be used to get the data about the current location and details about what's going around them. For installing the mobile application they only need a good smart phone. Without any registration anyone can use this application. So this application helps the user to search for the places related to his current location. For a user in an unknown location the major places he wants to know are taxi stands, auto stands, bus stands, hospitals etc. The application helps the user to locate those places in the landed city. This application also helps the user to know about the famous places like hotels, auditoriums etc... in the city. In journey a person may want to get the distance to be travelled to reach a desired destination. In the mobile application the user can get the shortest distance between his current location and his destination, also he can view the path which he should use to reach the destination. This route map is displayed with the help of Google Maps. This helps the user to choose the necessary mode of vehicle. For example for small distance user can choose auto, for long distances user can either travel by bus or by taxi, so that the application helps the user to get to the respective vehicle's stand.

One of the major attractive of this application is that the user can view the minimum fare that he needs to pay to reach his destination. The minimum fare is calculated with the distance calculated and the minimum fare details from the server. The user may choose any of the three modes of transport. So the application will calculate the minimum fare for all the three modes and shown to the user.

The user can search for the events happening in the city. So upon insertion of the events the users have to insert an image and details like phone no and website. So from the 'AugReality' mobile application the normal users can view the image about the event. The mobile no and web address are also displayed. The user can make the call to that no from the application itself and he can browse to the web address from the application.

The 'AugReality' paper has an android application and a web application. The web application is used by the registered users and the admin. Users add their own events in the web application. For that the guest

users have to be registered to the web application. The web application is used by the admin to approve the users and approve the events registered by the users. Minimum fare details are inserted by the admin. The web application is developed in Java platform with MySQL as backend. The Apache Tomcat is used as the web server. Java SE 1.7, NetBeans IDE 7.3, MySQL Front are the major tools used for developing this web application.

SYSTEM ENVIRONMENT

System environment specifies the hardware and software configuration of the new system. Regardless of how the requirement phase proceeds, it ultimately ends with the software requirement specification. A good SRS should establish the basis for agreement between the customers and suppliers on what the software specified in the SRS will assist the potential users to determine if the software specified meets their needs or how the software must be modified to meet their needs.

The software for the development has been selected based on several factors such as

- ❖ Support and stability
- ❖ Cost Effectiveness
- ❖ Development Speed
- ❖ Ability to create robust application least time

SOFTWARE ENVIRONMENT:

- ❖ Operating system : Windows 8, Android
- ❖ Technologies Used : JAVA,MySQL, ANDROID
- ❖ Application Server : Apache Tomcat
- ❖ Back End : MySQL
- ❖ Designing Tool : NetBeans IDE 7.3, Eclipse Juno

HARDWARE ENVIRONMENT:

- Hard disk capacity : 500 GB
- Ram : 4 GB
- Processor : Intel Core i3
- Display : 1024 * 768 Resolution Color Monitor

SYSTEM ANALYSIS

System analysis is a detailed study of the various operations performed by a system and their relationships within and outside of the system. System analysis is the process of gathering and interpreting facts, diagnosing problems and using the facts to improve the system. Here the key question is what all problems exist in the present system, what must be done to solve those problems? Analysis begins when a user or manager begins a study of the problem using existing system.

EXISTING SYSTEM

The existing system only provides less functionality. The GPS system only helps the user to locate the current location information. The user's search for information is very limited. There is no provision for the user to know the occurrence of the events happening in the city. Using existing system, it is difficult to get the shortest distance between source and destination. In the existing system, there is no provision for user to get the precise information of various facilities such as hospitals, hotels, bus stand, and taxi stand of the particular city. Existing GPS functionality cannot locate the co-ordinates of event; hence the user was not able to find the information of the events happening in the city.

PROPOSED SYSTEM

The proposed system includes both a web application as well as a mobile application. It is basically developed as an android application with augmented reality for android smart phones to increase convenience. The Proposed system aims at improving the current applications of GPS by adding necessary modules to ensure a happy journey. In addition to the information of user's current location, the system helps the user to identify the current locations and also helps the user to locate to the nearest vehicle's stand (auto, car, bus). Using this application user can find the distance between two places that he desired to travel. By finding the distance, user can choose the necessary mode of vehicles that he wish. For eg: for small distance user can choose auto, etc. so that the application helps the user to get to the respective vehicle's stand. And also user is provided with facility for getting the nearest places (hospitals, hotels, historic places) in the city and also gets information about the nearby events happening in the city. The system also includes additional functionalities for finding the famous places in the city like famous museums, places, bus stand, hotels, hospitals etc. The system also provides the user about the current events and the latest updates of the city. In the web there are two actors; the admin and the user. Admin is granted with all permissions over the system; admin can add & search for information. Users

also having a login for web application and can have facility for adding their own information along with other updates of the city. It will be later checked and updated by the administrator.

FEASIBILITY STUDY

One of the important outcomes of preliminary investigation is feasibility study. The objective of feasibility study is not only to solve problem but also to acquire a sense of its scope. During the study, the problem defined is crystallized and aspects of the problem to be included in the system are determined. Consequently, costs and benefits are estimated with greater accuracy at this stage. It is a list of proposals according to system viability, its impact on the users, ability to meet user needs, and effective use of resources. Generally feasibility studies are undertaken within right time constraints. It should be conducted completely and no fundamental errors of judgments are made. If compatible social and technical systems can be devised then the system must be tested for economic feasibility.

It is very important to evaluate the feasibility of a paper at the earliest possible time. Feasibility study and risk analysis are related in many ways. If the paper risk is great, the feasibility of producing quality software is reduced.

The key factors considered during feasibility study are:

- ❖ Technical Feasibility
- ❖ Economic Feasibility
- ❖ Operational Feasibility
- ❖ Behavioral Feasibility

TECHNICAL FEASIBILITY

Technical feasibility refers to the ability of the process to take advantage of the current state of the technology in pursuing further improvement. The technical capability of the personnel as well as the capability of the available technology should be considered. Implementation of the 'AugReality' system does not require changing of the existing configuration of the system.

The proposed system is

- ❖ To view place details in augmented point of view.
- ❖ To identify nearest places and events happening in the city.
- ❖ To provide minimal travel rates and additional information.
- ❖ Functionally easy to handle.

The existing internet facilities and computers are sufficient to implement the AugReality paper. AugReality Web application can be accessed by common browsers and AugReality android application by the JellyBean version. The JellyBean version android devices commonly has internet connectivity, compass, camera and GPS. There will not be much difficulty in getting required resources for the development and maintenance. All the resources needed for the development of the system as well as maintenance of the same is available. Here we are using only the already available resources. Therefore the system is technically feasible. The webserver used Apache is available to all users.

ECONOMIC FEASIBILITY

Economic analysis is the most frequently used method for comparing the cost with the benefit or income that is expected from developed system. The AugReality system provides a cost-effective way for viewing things in a different angle. The proposed system incurs very low cost for the development and implementation. For the development of the AugReality application we are using NetBeans IDE and Eclipse. Both are available at free of cost. The system can work on systems with a configuration and connectivity which causes no excessive cost for implementation or usage. The AugReality web application will work in every browser with an internet connection and the AugReality android application will work on existing android smartphone with JellyBean version and corresponding configurations.

This system, if developed and installed will be good benefit to the user. The system will be developed and operated in the existing hardware and software infrastructure. There is no need of additional hardware and software for the system, hence economically feasible.

OPERATIONAL FEASIBILITY:

This is necessary to know whether the system is operationally feasible. That is, it checks whether the system is flexible for the user to use and whether all the operations are working correctly and effectively. It is user-friendly and flexible application for the user to do all his activities in an effective manner.

BEHAVIORAL FEASIBILITY:

It is easy to comprehend and hence should be feasible for various types of users who interact with it. Hence behavioral feasibility is tested such a way that it is feasible to all kind of users. People are inherently resistant to change and computer has known to facilitate change. The GUI forms used are well user supportive and direct user to accomplish his task.

LIST OF ACTORS AND THEIR ROLES

Administrator: Administrator can control over the system. Apart from using the basic task, they have full control over the user management and event management.

User: They can register to the web to add their own events and they can use android smart phone to get an augmented view of events and places

All users of the system are expected to have basic knowledge of using a computer and basic knowledge in English language.

Administrator

The major roles of the administrator in this application includes

- ❖ Approve user registration
- ❖ Add events
- ❖ Approve events added by registered user
- ❖ Cost update
- ❖ Edit Profile

User

The major roles of the user in this application includes

- ❖ Registration
- ❖ Add Events [view Edit Delete]

BUSINESS RULES

Use-cases are scenarios for understanding system requirements. A use-case model can be instrumental in development, planning, and documentation of systems requirements.

- ❖ Admin and User have web interface and Android interface.
- ❖ Guests can register in the website to become users.
- ❖ Users must have a valid email id, mobile no.
- ❖ Login:

Admin and User needed to login to website. The user uses username and password to log in to the. The login credentials goes to the server, it is validated and accordingly access is given to the client.

- ❖ Admin approves User registration and new Events added by Users.
- ❖ Admin can add Events and view events in web interface.
- ❖ Admin should include an image with new event details.
- ❖ Admin have to include minimum fare details in web interface.
- ❖ Only Registered users can add events in AugReality web interface.
- ❖ User can enter details about their event with an image.
- ❖ Event Text Constraints :
 - Content
 - Size : size appropriated for uploading
 - Type (Plain Text)
- ❖ Event Image Constraints :
 - User Selects the Image File
 - Size : size appropriated for uploading
 - Type : .jpg/ .jpeg only.
- ❖ All the details are stored in the database.
- ❖ The Users must use a GPS enabled phone.
- ❖ The Camera in the phone should be properly working.
- ❖ Also a good Compass should be enabled in the phone.
- ❖ The Android version should be above 2.2

4.5.2 USE CASES

AUGMENTED VIEW

In this use case we can get location information such as nearest hospitals, restaurants, major events, taxi stands and movie theatres...etc, in a augmented way. The augmented way of representation helps the users to retrieve information in a different and simple manner.

The location information gathered from the GPS or by A-GPS. The location is identified by the latitude and longitude values extracted from the GPS signal. Then the values are located on the map and the location is shown to the user. This helps the user to know about the place, if he lands at a strange location.

The information plot on the augmented screen is retrieves from the application database and it is managed by an admin.

MAP VIEW

This use case deals with the identification of the current location, other locations and plotting it on the map.

This module identifies the location that the user is currently in. Then the values are located on the map and the location is shown to the user. This helps the user to know about the place, if he lands at a strange location. The GPS coordinates help to locate the user's current geo co-ordinates.

GPS is also used for searching and locating other places on the map. If a user wants to travel from the current location to any other location he wants to set the location on the map. The coordinates of that location is extracted from the map and thus the route is calculated. If a user searches for a place then it searches the places in the database and if found it is shown on the map. Each place is stored in the map as coordinates for exact identification.

PLACE IDENTIFICATION

Our application helps the user to search for the places related to his current location. For a user in an unknown location the major places he wants to know are taxi stands, auto stands, bus stands, hospitals etc... This module helps the user to locate those places in the landed city. This module also helps the user to know about the famous places like hotels, hospitals, auditoriums etc... in the city.

User can search based on several categories. For example user can only search for hospitals related to the current city. If he selects a place then a small description about that place can be seen on the map as a popup.

EVENT IDENTIFICATION

This module includes information about the current happening events in the city. This notifies the user about the upcoming event details of the landed city. Users can also the view the various events happening in the various part of the landed district. If any event is occurring currently then the user can go to the location where the event is happening by the help of this application.

FARE CALCULATION

This module helps the user to calculate the fares of various modes of transport. This module calculates the fare based on the distance travelled with the minimum fare details. This module provides the user with the approximate cost of travel by buses and taxies in the city. The fare calculation module of the system enables the user to view the fares of various modes of transport and also helps in the calculation of fares based on the fixed rates information set by the government of the state.

If a user selects the source and destination for a route, the he can calculate fares of various modes of transport by selecting the fare calculate option of the application. By this he can take a decision about the mode of traversal.

REGISTRATION

This module helps the user to register into the application. A registered user is provided with a unique username and password with which they can login into the system. Using this username and password, user can add information like new hospital, hotels etc. or any events in the city.

Admin also has a login username and password with which he can login to the system. He can then view the requests from the users (requests for registration, adding new hospitals, hotels or events) and according to the reliability of the information the admin can approve or reject the requests.

Admin controls the whole system. Admin has got all the privileges to maintain the application. Admin can also delete users if the user's activity is not good, for example the user adds events which are not real so many times.

ADD PLACE & EVENTS

The admin is provided with the facility for adding the place details, event details, place tag (hotels, hospitals etc.), minimum fares for buses & taxis in the city in the database by using the web application. If an event is added then it will be shown in application.

The user is provided with the provision for adding places & events for which user has to be registered. It will be later checked and updated by the administrator. Administrator will only add an event or a place which a user added if and only if the admin verifies it as valid. And for plotting places or events the system uses the service of Google Map.

SEARCH PLACE & EVENTS

The admin and the users are provided with the facility for searching the place details, event details. The admin gets the minimum fares for buses & taxis in the city. The normal user is provided with the provision for only searching information and adding places & events for which user has to be registered. It will be later checked and updated by the administrator. And for plotting places or events the system uses the service of Google Map.

BUSINESS PROCESS MODEL

Business process model is used to model the entire business process. In a business process model states are activities representing the performance of operation and the transitions are triggered by the completion of the operations. Purpose of this model is to provide a view of flows and what is going on inside a use case or among several classes. It can also be used to represent class's method implementation.

INTERACTION OF PROCESSES

There are two main applications that are being developed: AugReality android application and AugReality web application. Admin user uploads the APK's of the android application in the web server. The User should register in to the server in order to use the web application. User registers to the web server initially through the AugReality web application. The User must give his proper details in the provided registration form. The Registration of user is approved by the Admin after verification.

Registered users can login into the Web application by providing the login credentials. He can then insert his own events and places in the web. For that he should include details such as Event name, description, location, phone no, email and web address. One image should be uploaded with the details. The Admin should approve this event also. After admin approves the event, user can view own events and other events at the place.

Admin can login into Web application using his credentials. Then he should verify user registration details and either approve or reject the user. Events added by users are also approved by the admin. Admin can add his own events and events happening in the city. Then he can view and edit event details. Admin should regularly update minimum fare of the state. The minimum fare details of various modes transport are to be inserted. The fare details of auto, bus and taxi are inserted by the admin.

The Android application can be downloaded by the users. No registration is required for using the android application. With the android application the users can either view nearby locations or search for events happening in the city. For that the GPS, Camera and Compass of the phone are to be working properly. The phone should have internet connectivity.

The application first prompts the user to turn on the GPS if the GPS is not working. Then it will get the current location of the user from the GPS data. Then the user can select what he wishes to search, that is either he can select Search Nearby option or he can select Today's Events. If the user selects Search Nearby option then he is directed to a page to select what he wants to search from the list. The list contains items like ATM, airport, bank, busstation, church etc. If the user selects the Today's Events option then he has to select the district. Both the above pages are redirected to the augmented screen in which the user can view the details. Here we obtain augmented reality with the help of camera and compass. So both the camera and compass should be working fine. The direction of camera is obtained with the help of compass and the events and place details of in that direction are loaded from the server into the camera. The user can select one event from the popup box and then the details of that event are loaded from server. So the user can view the shortest path between his location and the destination. Also can view the image of the event, contact details etc. He can also view the minimum cost to reach the destination by various modes of transport.

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