4th Year Project

Research Document

Christopher Newell
X00084900

Detailed discussion

For my fourth year project I have proposed a mobile application which will offer a user an easy way of scheduling group and individual activities such as: social events, business meetings, appointments etc.

The application should support multiple users each having their own private events which cannot be viewed or accessed by other users of the application. On top of this, the application should provide the ability for users to invite other people to take part in events and to make specific events visible and accessible for other users to access and modify with their own comments, which will be visible to each user that is currently taking part in that event.

The application will require user validation in order to ensure that the correct people are accessing the correct events. there are a few methods of handling user validation; making a registration and log in system with the necessary security to ensure user data isn't susceptible to virtual threats and theft, Utilising login providers such as Facebook, Google+, Twitter and other social media platforms.

In order to provide this functionality, The application should consist of:

- A timetable to display the events the user had scheduled.
- Functionality to allow multiple users to have their own events separated from everyone else's events.
- Functionality to provide users a way to invite other users to view information on private events.
- Functionality to allow users to securely log in to the application to keep track of what events they have access to.
- A database to store the data pertaining to the events remotely (i.e. web server database).
- A web hosting provider to maintain and run the database for the application.
- A web API to service requests made by the application to the database and return request result from the database to the application.
- Functionality to provide to the user a map interface whereby they can place markers for whatever venue they have in mind for their event.
- A way to store this venue information and make it available for other users of the app to view.
- A method for users to comment on events they have been invited to and provide communication between users.

Existing Applications in this domain

App Name: Schedule Planner

Location: Google Play Store

Category: Productivity

This mobile app is a good representation of how an app designed to showcase a user's schedule should look and behave. The user interface this application uses is a good example of how to make the most use of the limited screen space of a mobile device while displaying as much relevant information to the user as possible.

This application shares some obvious similarities with my proposed project in that it has a timetable of events the user can create and have displayed to them in a schedule format.

Some differences however are; this app does not have the group event scheduling functionality, this app does not support the sharing of data between users regarding shared events. This app also does not have any kind of mapping functionality integrated into its timetable data where the app planned for the project will show the user the location of the event on a map.

App Name: Timetable

Location: Google Play

Category: Education

This app is another example of a lightweight, focused activity scheduling app with a focus on educational activities such as study planning and time management. this app's user interface has much less visual noise than the Schedule planner app and makes more use of the white space between Interface elements to convey the data it presents to the user.

This application is another good example of how to present a timetable application on a mobile device and it shares much of the functionality planned for my fourth year project in regards to organising and displaying data to users. However, it does not share the mapping or group vent scheduling and coordination functionality planned for the fourth year project.

App Name: Meetup

Location: Google Play

Category: Social

Meetup is a mobile application which allows users to view and attend organized social events such as hikes, book clubs, language lessons etc. This application makes finds exactly where you are located in the world depending on GPS data and is used to present the user nearby social happenings organized through Meetup.

A couple of this apps features are quite similar to what is planned for the fourth year project, with group event scheduling that people using the same app can organise and schedule events with one another with map support pinpointing exactly where the venue for the event is located. This application does not feature any timetabling functionality for scheduling events and organising them in a timetable format.

App Name: Yelp

Location: Google Play

Category: Travel & Local

Yelp is a mobile application which allows a user to search for shops, restaurants and services near their location. The app allows users to rank these venues from 1 to 5 stars as well as write a short review on the venue. This app features map functionality to present to the user the location of their desired venue.

This app is quite different in scope to the fourth year project however some of its key features can be considered similar to the project.

Platform, Technology and Libraries

Platform: Android, Windows Azure, ASP .NET MVC

Android

The mobile application portion of the project will be built using the Android SDK using the Android Studio development environment. Android suits the needs of this project well because there is plenty of built-in libraries to service http GET/PUT/POST/DELETE requests sent out over the internet and also plenty of methods of retrieving the data in different formats such as JSON or XML and parsing them into usable data.

Android also has good support for building the kind of Graphical User Interface we require for this project. Utilising XML files we can precisely specify how we want the User Interface to look and operate.

Windows Azure

Regarding web hosting, for this project we require a means of hosting a server that will serve as a meeting point for mobile device web clients to access the database which contains their schedule information

Windows Azure provides a web hosting service and platform for developing web based applications which can include a website, remote database, or a web API to service requests made to and from a web client. Windows Azure is very flexible because it supports any operating system, language, tool or framework which is very valuable for future scalability for the project. Windows Azure also is reliable, It offers a 99.95% SLA each month which roughly equates to about 5 minutes of downtime per month. This web service solution suits the needs of the project quite well and is made available for free using student licenses which is an added bonus.

ASP .NET MVC Web API

The mobile application requires a way to access and send data to be stored on the web server. To accomplish this we will implement a RESTful web API to handle http requests sent from our mobile application running on a phone or tablet. This API will be responsible for sending queries to our database on behalf of the mobile device and returning a result. The web API will be built using ASP .NET MVC and written in C#

Technology: Java, C#, JSON, MySQL, Entity Framework

Java

The mobile application will be built on the Android platform using the base Android SDK and using the Java programming language. XML will also be used alongside our Java code to build our app's user interface.

C#

The web API will be written in C# using ASP .NET

JSON

JSON will be the technology for transmitting data between our web server and our mobile application.

MySQL

A MySQL database will facilitate our data persistence because it is included in a Windows Azure web server and has support to easily maintain database tables and relationships between them through a User Interface built into the platform.

Entity Framework

Entity Framework is an Object-Relational Mapper which translates our model written in C# to SQL tables for our database.

Libraries: Google maps Android API, Android Native Libraries

Google Maps Android API

The Google Maps Android API will be how we will embed maps into our android activities. It will provide us with features such as 3D maps, location marking and longitude and latitude translation.

Risks to the project

Some Risks involved with developing this project include:

Libraries:

We are relying on Google Maps Android API support to facilitate the mapping functionality of the Application. This API will be our only means of displaying to the user the location of where events are taking place.

Windows Azure:

We are relying on Windows Azure to provide our web service to our application. Windows Azure offer a 99.95% SLA for uptime of its server's being available for use. However if it is not available for our mobile app to retrieve data then the application will be unable to support the group event scheduling and timetabling functionality.

We are relying on Windows Azure to also manage our data persistence using a MySQL database. if for any reason the web server should be unavailable then our app will not be able to communicate with the database and retrieve and store data.

Database:

Our data will be stored on a single database for this project. This is a rather large risk because if for any reason the database suffers from a fatal error which results in loss of our data, then the data the user's need for the app to function in regards to group event scheduling will be lost as well.

Android:

We are relying on the Android platform for this project to be built on. if there are any issues with versioning on older devices then it will require extra resources in order to correct the issue.