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A location based web application to plan and record travel experiences

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Abstract

Social networks enable people to share status, photos and locations with friends. However, application that focuses on travel experience sharing does not exist. Study has shown that map-interface is more interactive than browsing photos by locations and it shows the itinerary. Therefore, the application implemented in this project will enable people to share travel experiences on a map.

Before travelling, people usually search for the places they plan to go. Current travel guides provide recommendations based on popularity of everyone using the service. However, getting recommendation based on the experience of friends is not easy. It is shown that recommendation from friends is more trustworthy. Hence, the application will also allow users to plan their routes based on where they friends have been to.

The literature reviews on social media, travel guide and visualization, requirements and design have been done. Implementation, testing and evaluation will be conducted in the next stage.

Content

1. Introduction

Social networks with different purposes and functions have been developed in recent years, enabling people to share photos, videos or locations with friends easily. However, sharing travel experiences can only be represented as photo albums or check-ins on maps. There is not a good way to share and visualize travel experiences with friends. Study has suggested that map interface is more interactive than browsing photos by locations and the itinerary can be shown clearly on a map (Viana, Filho, Gensel, Oliver, & Martin, 2007). Therefore, one of the objectives of this project is to visualize travel experiences such as status updates, photos and check-ins on a map.

Because sharing travel experiences between friends on social networks is not easy, people can only rely on reviews from strangers when they plan for their journey. However, social networks such as Facebook provide up-to-date and diverse information (Walden, Carlsson, & Papageorgiou, 2011). In addition, information from friends is more reliable than information from recommender systems (Sinha & Swearingen, 2001). Thus, the second objective of this project is to allow users to plan their travel routes based on places their friends have been to.

This report presents the literature review of social media, travel guide and visualization in the second section. Then in section three, requirements for the project are extracted from the problems presented in the literature review. Based on the requirements, the design of the application is produced in section four. Work done so far is described in section five. The next stage of the project is to implement the application and then conduct an evaluation, which is in section six.

2. Literature Review

This section presents the literature review of the top three related areas to this project. Social media is one of the key topics as this application gets data from existing social networks and users can interact with friends in this application. Travel guide is also studied because this application enables users to plan their travel routes based on where their friends have been to. Visualization of data from social networks is equally important because good visualization will enhance user experience.

2.1.   Social media

As social networks get so popular, many researches have been conducted and lots of ideas of social networks have been implemented. This part provides an overview of social networks and then moves on to location-based social networks which are related to the project.

The prevalence of social networks makes sharing easy. People are able to shares status updates, photos and locations with their friends and family using social networks such as Facebook and Twitter. Keenan and Shiri (2009) analysed how social networks enable users to socialize online. Facebook, with over one billion users (BloombergBusinessweek, 2012), virtualizes existing friendships and makes the sharing of updates, photos and videos easy through simple, intuitive and user-friendly interface (Keenan & Shiri, 2009). Twitter is simple and quick, allowing easy updates even from mobile phones(Keenan & Shiri, 2009).

Sharing locations is also getting popular with the popularity of phones with embedded GPS devices. A study of Foursquare (Lindqvist, Cranshaw, Wiese, Hong, & Zimmerman, 2011), one of the most popular location sharing applications, found that people share their location with friends to socialize with them, to meet new people who have been to the same place or to keep a record of the places they have been to (Lindqvist et al., 2011). This study also found that restaurants and bars are the common places to check-in (Lindqvist et al., 2011). This study clearly shows that people are interested in sharing information about where they are and have been to.

Then geo-tagging is invented to enable people to tag their updates, photos and videos with geographical information. Geo-tagging makes it easy for people to view images of a specific location and binding time and location to photos makes them natural for viewers (Luo, Joshi, Yu, & Gallagher, 2010). With geo-tagging, information can be easily displayed on a map.

Previous work that organizes geo-tagged photos and displays them on a map has been done before including Google Panoramio (Panoramio, 2012) and Flickr Map (Flickr, 2012). Users can zoom in and click on photos they want to see. However, Google Panoramio is mainly used for exploring places and does not

involve people. Flickr map shows photos of all users and it is difficult to find photos of friends. Also, neither of them links photos and forms routes.

In 2007, researchers developed an application called PhotoMap, which allows users to upload photos and then the system will automatically organize them based on time and geographical information and display the photos and tracks on a map-based interface (Viana et al., 2007). In this project, they also argue that map-based interface is more interactive and can easily show the itineraries (Viana et al., 2007). However, their project was focused on automatic annotation of photos.

Therefore, based on the literature review of social media, this application will focus on displaying status updates, photos and check-ins on a map and displaying the route.

2.2. Travel guide

In the area of traveling, with the development of technology and globalisation, more people travel around the world for variety of reasons such as business cooperation or experiencing different cultures.

Before traveling, people tend to search for their destination and plan their journey online. In a study about the search for travel information, Walden, Carlsson and Papageorgiou (2011) found that almost 28% of search resuilts on Google.com are from social media. Social media includes sites such as TripAdvisor providing consumer review, virtual community, blogs, etc. However, results from mainstream social media like Facebook are not a lot. Possible reasons are that travel marketers do not use them, the sites are successful without them or users simply do not use them (Walden et al., 2011). However, the authors argue that information from social media sites is up-to-date and diverse and thus social media cannot be ignored among all travel information (Walden et al., 2011).

A case study of TripAdvisor showed that the way people share information is being shifted form business-to-customer to peer-to-peer, which means that people rely more on the content generated by others who have travelled to the same destinations (Miguéns, Baggio, & Costa, 2008).

In 2011, a paper about personalized location-based system written by four researchers in Korea proposed a geographical context service, which is based on locality, social relations, user created content and knowledge to make recommendations based on both user profile and social relationships (Lee, Kim, & Lee, 2011). These studies show that user generated contents from social networks are becoming important when people choose where to travel.

While studying the impact of social media on travel experience, Tussyadiah and Fesenmaier (2009) found that multimedia features such as text, images, videos

or blogs enhances the experience of travelers (Tussyadiah & Fesenmaier, 2009).

These studies show that user generated contents play a key role in the travelling of other people. However, what kinds of user generated contents are suitable for travel guide? After the analysis of travelogues with tagged photos, researchers from Microsoft Research Asia and Tianjin University in China (2009) state that purely textual information is not efficient to express what the use means (Lu, Pang, Hao, & Zhang, 2009).

Moreover, an earlier study which compares recommendations from friends and recommender systems suggested that people prefer the former (Sinha & Swearingen, 2001). However, such system that recommends places to visit based on the places their friends have been to rarely exist.

Therefore, because recommendation from friends is preferred to recommender systems, this application will recommend places to users based on the places their friends have been to.

2.3. Visualisation

The researchers for the PhotoMap project mentioned earlier states that map is more interactive and shows the itinerary (Viana et al., 2007). The application visualizes the itinerary on a map by showing the icons of photos on a map and the track the user takes (Viana et al., 2007). However, the route is live logged and how to generate route given set of photos is not known.

To represent popularity of places, heat map can be used. Previous work on visualizing popularity on a map has been done by Microsoft Research. They collected data from maps.live.com from which areas each user has viewed are recorded. The popularity of areas is shown on a map with color ranging from white to red (Fisher, 2007). Google Map also provides ways to represent popularity. Tools such as heatmap are used to represent secondary information, in this case, popularity of places (GoogleMapAPI, 2012).

2.4. Conclusion

People can share status updates, photos and locations on social networks but application for sharing travel experience rarely exists. Before travelling, people search for the places they plan to go. Currently, most results are from travel guide that provides general information and reviews from everyone. Route planning based on where friends have been to is difficult. This application will focus on solving these two problems.

3. Requirements

Requirements are drawn from the literature review, which raises the problems in the current social media and travel guide and provides the guideline for social network design.

Requirements are usually consisted of not only functional requirements but also non-functional requirements. Functional requirements define what the software does and non-functional requirements define the quality of the software, which is as important as functional requirements.

In each category, MoSCoW method is used to prioritize the requirements (Coley Consulting, nd). Prioritizing the requirements is important because of the time constraint of the project. High priority requirements need to be met first because they are the problems presented in the literature review. Solving these problem will lead to the success of the project.

3.1. Functional Requirements

Based on problems presented in the literature review, functional requirements are described below.

3.1.1. Must have

3.1.1.1.   Existing social networks integration

Users are able to link their social network accounts to the application. Research by Yeung et al. (2006) suggested that users are not usually willing to change applications and migrate data to other social network because they are tired of registering and adding friends to the new application. Therefore, using the data from existing social network instead of users signing up to a completely new application is plausible. Facebook, the most popular general purpose social network allowing people to share status updates, photos, videos and location check-ins with friends, has more than one billion registered users (BloombergBusinessweek, 2012). Thus, this project will allow users to login using their Facebook accounts and use the data from Facebook. Twitter is also integrated for quick updates.

3.1.1.2.   Display updates, photos, check-ins and routes on a map

Users are able to view routes with updates, photos and check-ins on a map. Study by Viana et al. (2007) has shown that map-based interface is more interactive and can easily show the itineraries. Therefore with all items located on the routes, it is clearer for their friends to know where they have been to and what they have done.

3.1.1.3.   Suggest places to go

Users are able to plan their routes based on where their friends have been to and which places are popular. Study suggests that people prefers recommendation from friends to recommender system (Sinha & Swearingen, 2001). However, most current travel guides give recommendations by showing the number of people who have been there and reviews for strangers. Thus, this project will

mainly show the routes of friends and allow users to plan their journey based on the experience of their friends.

3.1.2. Should have
3.1.2.1.   Integrate more social networks

If possible, the application should integrate more social networks because people may use different applications to share updates, photos or check-ins.

3.1.3. Could have
3.1.3.1.   Invite friends to the application:

Users can invite their friends from existing social networks to use this application. Because this application recommends places based on routes of friends, more friends using the application will make the experience better.

3.1.4. Won't have
3.1.4.1.   Live logging

Recording where people are in real time will not be implemented because the privacy concerns of live logging. It can be implemented in the future but requires huge amount of research and effort.

3.1.4.2.   Comment on routes:

Friends can comment on routes or the whole travel experience.

3.2.   Non-functional requirements
3.2.1. Must have
3.2.1.1.   Scalability

As this is a web application, it must support the increase or decrease of the number of users. Therefore, this application is hosted on Google App Engine, which uses Google's high performance infrastructure and scales applications automatically (Google App Engine, 2012).

3.2.1.2.   Privacy settings

This application must allow users to controls what other people can see. The study of Foursquare shows that privacy concerns prevent people from checking in (Lindqvist et al., 2011). As this application reveals the location of users, privacy setting is crucial.

3.2.1.3.   Intuitive interface

This application must provide intuitive interface. An intuitive interface for privacy settings can also solve privacy concerns (Akcora & Ferrari, n.d.).

3.2.1.4.   Use on mobile phone

Users can access their planned routes on their phones.

3.2.2. Should have
3.2.2.1.   Cache users' data from social network

Because data are retrieved from existing social networks, the application will not store updates, photos and check-ins in the Google App Engine. Therefore, caching may be required if users view a route frequently. This will improve the

performance of the application.

3.2.3. Won't have
3.2.3.1. Choose username

Users can pick a username, so strangers may see their routes but will not know who they are. As this application will associate with more than one existing social networks, users can either use the existing one or choose a new one.

3.2.3.2. Print or export travel route

Users can print out the travel plan or export as PDF format so when they do not have internet access, they can still see their routes.

4. Design

Unified Modeling Language (UML) is used to model application structure, behavior and architecture and to help the developer to understand the system. UML provides many types of diagrams, for example, use case diagram which reflects functional requirements, sequence diagram which shows actions in temporal order, class diagram which shows the static elements of the system.
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4.1. Use Case Diagram

Figure 1 shows the use case diagram for the system. It is derived from functional requirements.
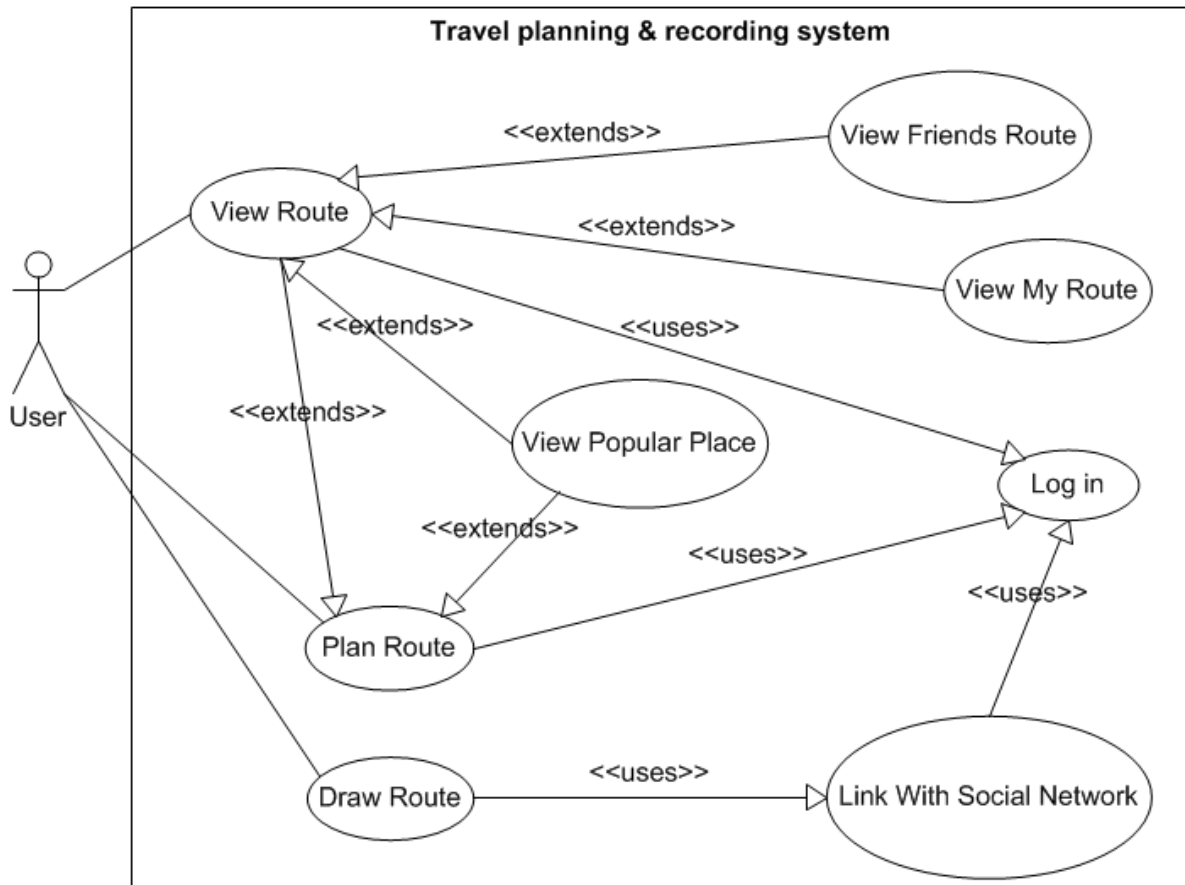
Figure 1. use case diagram for the whole system

4.2. Deployment Diagram

Because the web application needs to be scalable, it will be hosted on Google App Engine. The database will store users' information including users IDs, names, linked social networks with photo, update and check-in IDs, and routes information. The PopularPlaceSchema will store the information about all the places that all users in the database have been to and the number of times each place has been visited
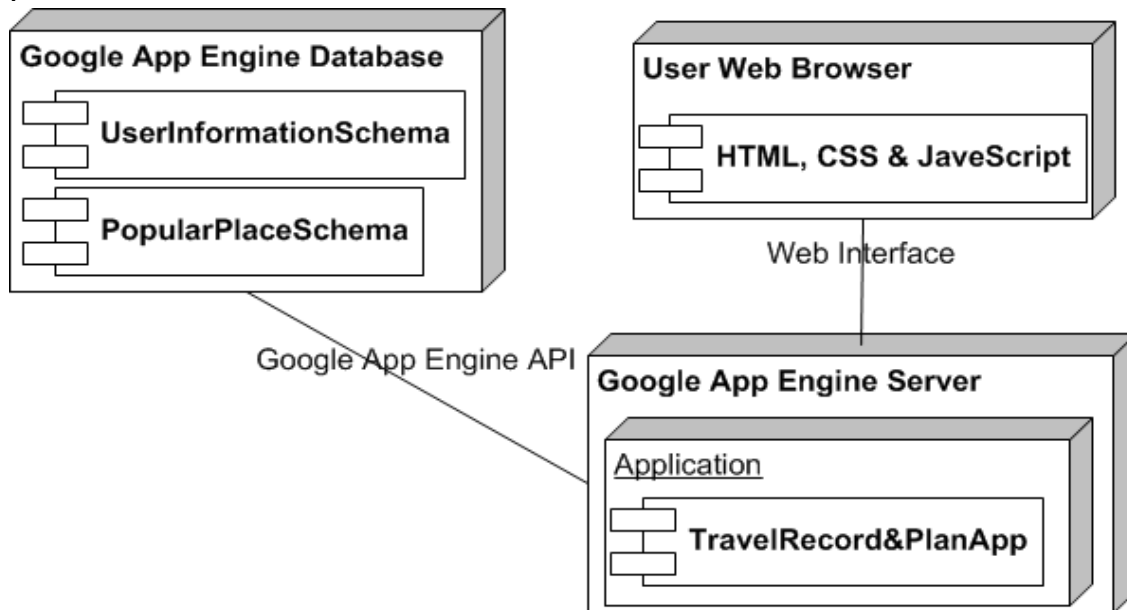.

Figure 2. Deployment diagram

4.3. Sequence Diagram

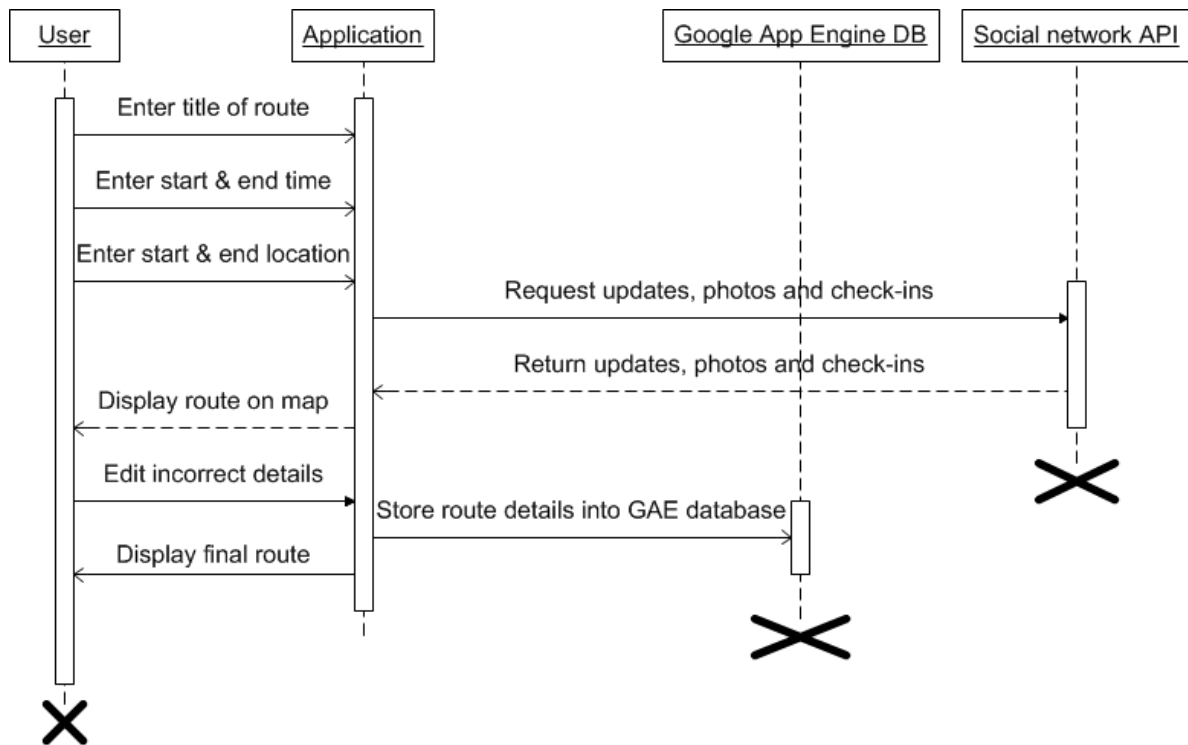The two sequence diagrams shows the actions for drawing route and planning route.
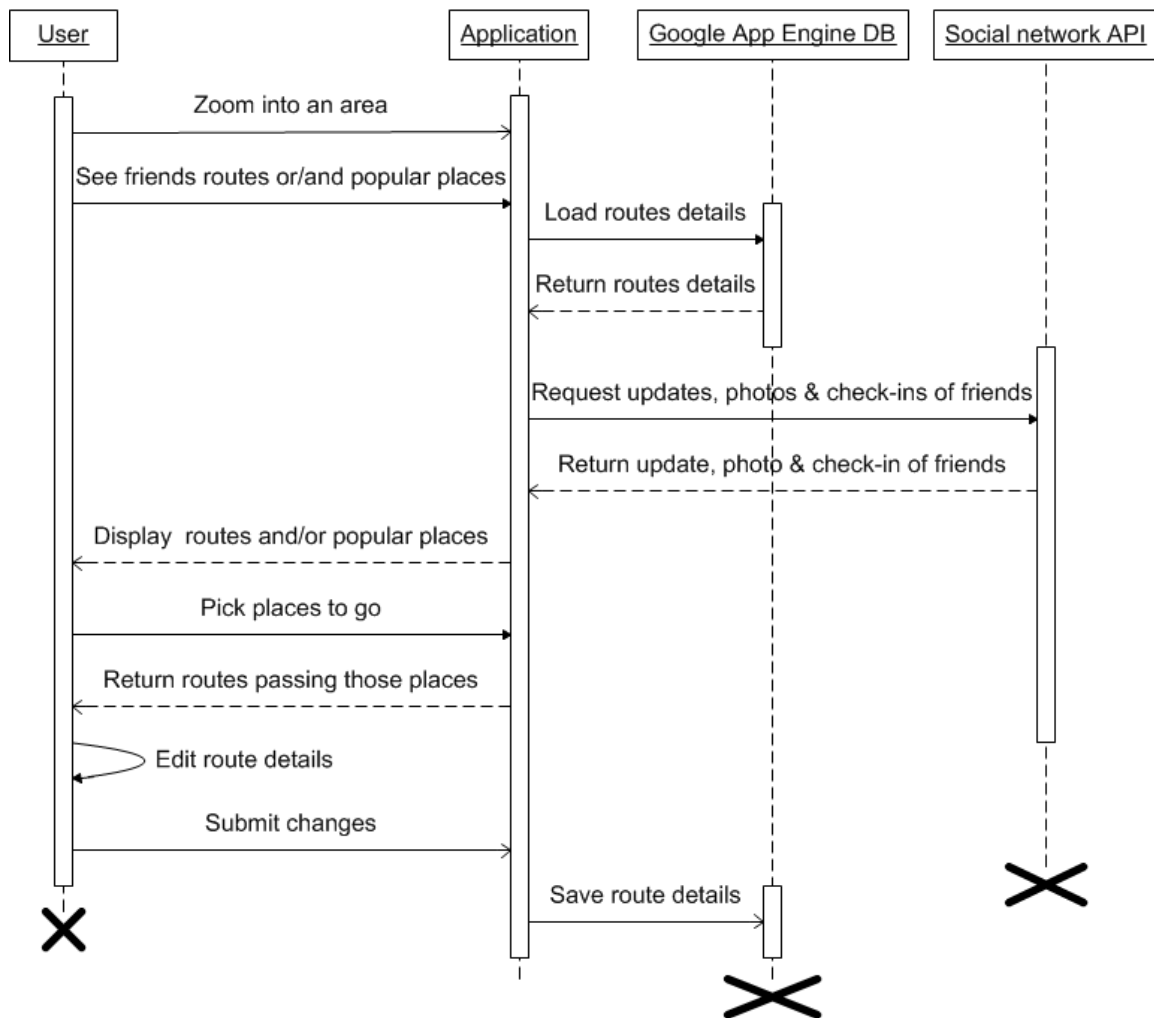

Figure 3. Sequence Diagram for drawing route

Figure 4. Sequence diagram for planning route

4.4. Class Diagram

Two class diagrams are produced. The first one is for server side and the second one is for client side.

VisitedPoint is the class for the location that people have been to. It records the geographical location and the number of times that the place has been visited, which includes updates sent from there, photos taken of that place and check-ins of that place. This information will be displayed as popular places when users are planning their routes.
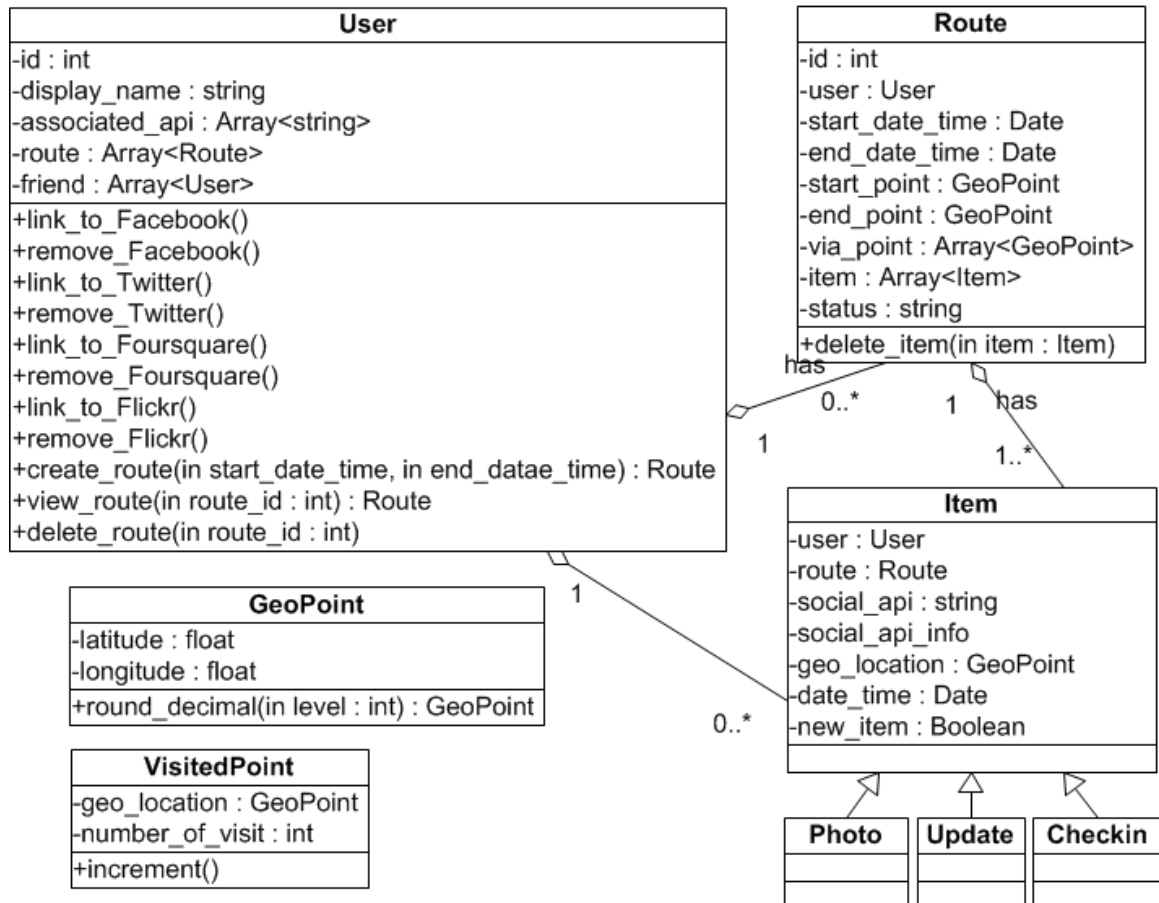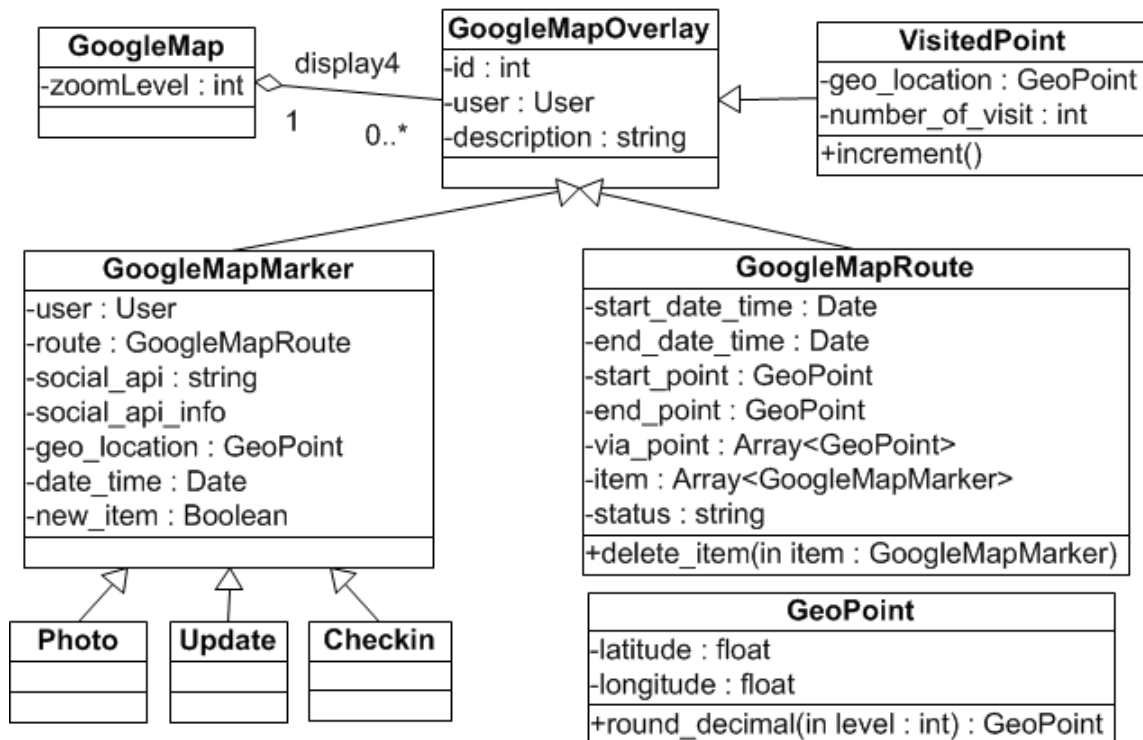

Figure 5. Class diagram for server side

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Figure 6. class diagram for client side

5. Work done
The project idea was first presented to the supervisor and then three areas that are related to this project were identified – social media, travel guide and visualization. Then, literature review for these three areas is being done throughout the first semester. In mid-November, requirements started being extracted from the problems presented by the literature review. In the end of November and the start of December, the system design was produced.

6. Plan of remaining work
The implementation of the design is planned to start after the hand-in of progress report. It will finish by the end of February. Testing will take place throughout the development process but thorough testing of the system will start in March and last for three weeks. Then, the system will be evaluated by users, which will lasts three weeks. The last two weeks of April will be used to write the final report.
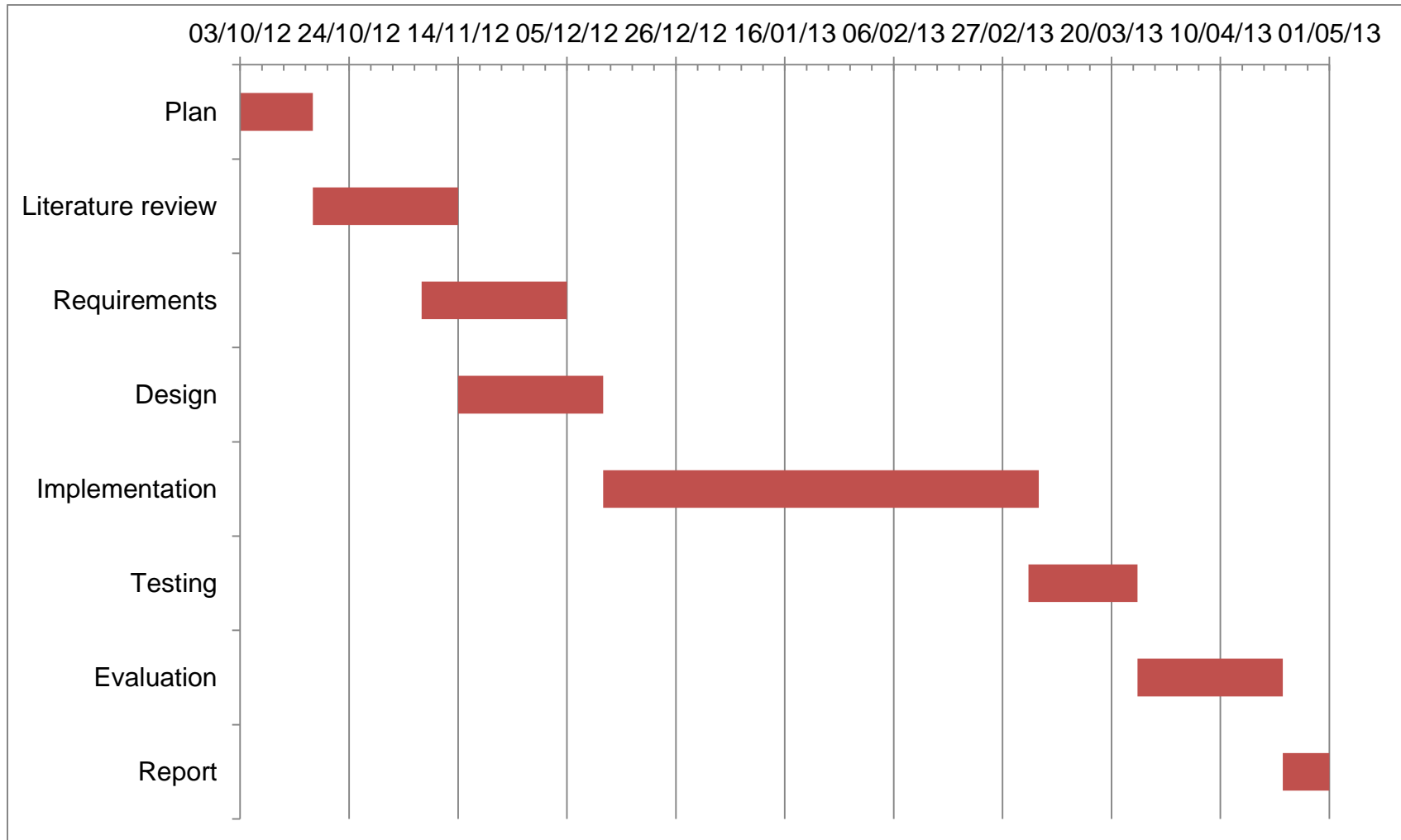
7. Gantt Chart

Figure 8. Gantt chart

8. Reference

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