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GEZI-YORUM

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SENIOR PROJECT

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ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

API	Application Programming Interface
AWS	Amazon Web Services
CSS	Cascading Style Sheet
DBA	Database Administrator
FTP	File Transfer Protocol
GPS	Geographic Positioning System
IDE	Integrated Development Enviroment
iOS	iPhone/iPad Operating System
Js	JavaScript
JSON	Java Script Object Notation
LOOP	Location and Obsevation Platform by Microsoft
Play Store	Google Play Store
RAM	Random Access Memory
RDS	Relational Database Service
SCP	Secure - Contain - Protect
SDK	Software Development Kit
SFTP	Secure File Transfer Program
SQL	Structured Query Language
SSH	Secure Shell
STS	Spring Tool Suit
VCS	Version Control System
VNC	Virtual Network Computing

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ABSTRACT

Gezi-Yorum

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The goal of this project is to record travel routes of people's trips using mobile device location and to add and edit media on the route. A system will be developed that can be used to organize trips not only as a person but also as a team, as well as what vehicles are used for transportation. If the trip organized as a team, the users will be able to share their in-team location via the Internet so that team members can follow each other. It is intended that a route created and shared by a user or a team can be examined by other users. Other users may choose the route they are reviewing as their route and they can start trips on this route as personal or team trip. Mobile application will show chosen path on the map different from user's. The system also need to create a social media environment to increase interaction between users. Friendship and tracking system between users will be designed and also personalized news flow which includes shared trips by user's friends and popular trips, will be provided. As a result of the project, a mobile application will be developed that stores route data of a trip and media like photos, videos, audio files tagged on the route, also will provide service to interact people with shared data. Sharing trips is an additional workload for travelers. This application will offer users a practical solution to save the time spent on sharing a trip on any social media environment or on the internet. In addition, the application will generate convenience not only for travelers but also for people who want to share their daily life. It will also provide an open environment for the interaction of people as it is considered to be a social media environment within the application.

Keywords: Trip, Tracker, Advisor, Social Media, Gallery Editor

ÖZET

Tarık Nural

Murat Baki Yücel

Bilgisayar Mühendisliği Bölümü

Bitirme Projesi

Danışman: Yrd. Doç. Dr. Ahmet Tevfik İNAN

Bu projenin hedefi insanların gezilerininin mobil cihaz konum verileri kullanılarak gezi güzergâhının kaydedilmesi ve güzergâh üzerinde medya ekleyip düzenlenmesini sağlamaktır. Gezilerin sadece kişiler olarak değil, takım hâlinde de düzenlenebilmesi, ayrıca yapılacak gezilerde varsa kullanılan ulaşım araçlarının neler olduğunu algılayabilecek bir sistem geliştirilecektir. Takım olarak düzenlenen gezilerde kullanıcılar, takım üyelerinin birbirini takip etmesi amacıyla takım içi konum paylaşımını Internet bağlantısı olması şarıyla yapabilecektir. Bir kullanıcının veya takımın oluşturduğu bir güzergâhı, diğer kullanıcıların da inceleyebilmesi hedeflenmektedir. Diğer kullanıcılar inceleme yaptığı güzerâhı kendi güzergâhı olarak belirleyebilir veya bu güzergâh üzerinde takım gezisi yapmak isteyebilir. Mobil uygulama belirlenen güzergâhı, kullanıcının güzergâhından farklı olarak gösterecektir. Sistemin kullanıcılar arasında etkileşimi artırmak amacıyla bir sosyal medya ortamı oluşturması gerekecektir. Kullanıcılar arası arkadaşlık ve takip sistemi tasarlanacaktır. Ayrıca kişiye kendi çevresinden tavsiye edilender, uygulama içinde bulunan popüler güzergâhlar ve arkadaş çevresindeki geziler derlenerek özel bir haber akışı içerisinde sunulacaktır. Proje sonucunda bir gezinin rotasını, rota üzerine etiketlenen fotoğraflarını, videolarını, ses dosyalarını saklamaya imkan veren ve bunları diğer kullanıcıların etkileşimine açabilen bir mobil uygulama geliştirilecektir. Gezilerin herhangi bir sosyal medya ortamında veya Internet üzerinde paylaşılması ve paylaşmak amacıyla düzenlenmesi geziciler için ek iş yükü teşkil etmektedir. Bu uygulama, kullanıcılarına gezi sürecinin paylaşımında sarf edilen efordan tasarruf ettirecek pratik bir çözüm sunacaktır. Ayrıca uygulama sadece gezicileri değil günlük hayatını paylaşmak isteyen insanlar içinde kolaylık üretecektir. Uygulama içinde bir sosyal medya ortamının da olması düşünüldüğü için kişilerin etkileşimine açık bir

ortam sağlayacaktır.

Anahtar Kelimeler: Gezi, Takip, Öneri Sistemi, Sosyal Medya, Galeri Düzenleyici

1
Introduction

On this project our purpose is to save navigation data which collected from user's mobile device represents latitude, longitude and altitude provided by GPS of mobile device and show the route of a trip on the map. There will be a mobile application and server side application to provide some features, lets users to share trips, review trips, communicate and socialize with each others. Various media records such as photos, videos and sound records recorded from mobile device during the trip will be associated with the route. There will be a team trip option for the trips which includes more than one member. Team trip option lets every team member to see any team member's location simultaneously if there is an Internet connection. In order to determine travelling method, using the temporal data changes of the navigation data taken from the GPS, average and instant speed will calculated. As result, trip type will be labelled as vehicle trip, walking trip, running trip or cycling trip using calculated speed data. In order to provide interaction between users a social media environment will be designed. People will be able to establish their friendship here. In the news flow, there will be a timeline section. Posts which are shared by friends of users will be shown there. The trips can be liked by other users in the news flow, they can leave a comment on trip or the users can follow trips they like by downloading it on their own mobile device.

1.1   Literature Review

Our purpose to realize that project is to simplify planning, recording and sharing traveler's trips. We know that it is not easy to organize photos and media taken on a trip and later on sharing them on any social media or personal blogs. In any marketplaces including play store and appstore there are lots of applications for tracking and planning travel but most of them only saves location data and do not include media or user notes. There only a few remarkable application which saves location data, media and also provides a social media enviroment. However there is no application that provides trip tracking, organizing media, following other

person's route, sharing memories and also doing all of these with friends at the same time.

1.2   Objective of the Thesis

For travelers it is not easy to organize media and associate media with saved locations. Also if trip has been organized with more than one person it is also difficult to merge media and organize additional material prior to share on any social media enviroment or on the Internet. It's important to say that every member of team has him/her own memory which is important and it must be saved.

1.3   Hypothesis

To do that it is neccessary to store locations data, store media and associate them with their location,and store them with everthing in a trip. So that people can remember a every single detail of their trip.

2
General Information

The main purpose of this section to review projects that are already developed by others which is related with ours.

2.1   Trip Tracker (Android application)

Trip Tracker[1], a Microsoft Garage project, is a free application that automatically records your drives, runs, walks, and bike rides. This application has developed with LOOP [2]. This application can only track, store user's location and show stored data on the map.

2.2   Route Tracker (Android application)

Route Tracker [3] is a GPS application for tracking/loading routes in your android mobile phone that gives you a real time response on your location. It supports GPX tracks file import, GPX/KML/google map embedded HTML file export, sync workouts with RunKeeper account, auto-Lap for each mile/kilometer, audio reminder for auto lap time reminding, vibration for auto lap, sharing to friends, open street view for record locations, duration, distance, pace and calories indication.

2.3   Polarsteps - Travel Tracker (Android and Ios application)

Polarsteps [4] can provide tracking location of user, can show media as just photo and video on the trip path. They are claiming that it is a low power consuming application. In this application it is not possible to organize team trips. User can use this application only for their personal trips. This application also provides a social media platform. Social media enviroment could only usable for sharing trips and comment on shared content. It is not possible to download and track any shared route.

2.4 Maps (Android and Ios application)

Google Maps [5] can save user's location continuosly. In this application there is no start trip option. This application determines trip kind of trip automaticaly. This application is not developed for tracking, it is developed for navigate users. User can watch his/her activity on the menu named 'TimeLine'. On users timeline any photos and videos are shown, there is no audio or text notes support. In this application there is no social media or sharing trip option.

Gezi Yorum offers an extended trip tracking and organizing system. Gezi Yorum will include all of the feautures of the applications listed above and in addition Gezi Yorum will able to organize team trips and following member on a trip. Table 2.1 shows specifications of applications.

Table 2.1 Specifications of Applications

Specification	Trip Tracker	Route Tracker	Polarsteps	Maps	Gezi Yorum
Record trip	+	+	+	+	+
Show trip on map	+	+	+	+	+
Trip type	+	+	+	+	+
Step counting	-	-	-	-	+
Media on location	-	-	+	-	+
Social media	-	-	+	-	+
Personal trip	+	+	+	-	+
Team trip	-	-	-	-	+
Live tracking	-	-	-	-	+

3
Feasibility

This system requirements are listed below:

- This system needs real time location of a user. The mobile phones have already a GPS sensor so this system needs to run on a mobile device.

- This system must provide interaction within users. So to provide intraction of multiple mobile devices this system needs a server side application.

- In process of development to provide version controlling Git must used as VCS.

3.1 Technic Feasibility

As technical feasibility study, the software, hardware, communication, labor force, legal and economical needs for the project is defined on the following sections.

3.1.1 Software Feasibility

This project depends on web and mobile technologies.

Mobile Side Development

The tools and development environments used for mobile side development of the project are mentioned below.

• Android [6]: Android is a mobile operating system based on the Linux kernel. Its source code is licensed under open source licenses and it is developing by Google and Open Handset Alliance. The top layer of Android's architecture is called The Application Framework layer and it provides many higher-level services to applications in the form of Java classes. Android was chosen over iOS [7] because of publishing problems, restrictions and lack of design guidelines that come with iOS.

• Android Studio: Android Studio is the official IDE for Android application development, based on IntelliJ IDEA. Android Studio offers some advantages over Eclipse, such as Gradle based flexible build system, advanced layout editor, built-in

Git source control and Maven library support [8].

• Android Sqlite Database: SQLite is a opensource SQL database that stores data to a text file on a device. Android comes in with built in SQLite database implementation. SQLite supports all the relational database features [9].

• Android Emulator: Android emulator lets prototype, develop and test Android applications without using a physical device [10].

• Google Map API: Google Maps APIs give developers several ways of embedding Google Maps into web pages or retrieving data from Google Maps, and allow for either simple use or extensive customization [11].

• Operating System: An operating system in required for developing mobile application. Android Studio and Android Emulator can run on Windows, Linux or Mac OS [12]. We prefer to use Linux, because Linux needs low system properties and it's free to use.

Server Side Development

The tools and development environments used for server side development of the project are mentioned below.

• Java EE: Java EE is a collection of technologies and APIs for the Java platform designed to support "Enterprise" Applications which can generally be classed as large-scale, distributed, transactional and highly-available applications designed to support mission-critical business requirements. [13] We have chosen JAVA EE platform because it is widely used by developers, its community is larger than most of its competitors, also it is a better option to use same language which is Java for the server side and mobile side development

• Eclipse: Eclipse platform which provides the foundation for the Eclipse IDE is composed of plug-ins and is designed to be extensible using additional plug-ins. Developed using Java, the Eclipse platform can be used to develop rich client applications, integrated development environments and other tools. [14] Eclipse can be used as an IDE for any programming language for which a plug-in is available. Eclipse has support for JAVA EE and Spring projects within its marketplace there are few IDEs that have these functionalities but Eclipse is open source and free.

• Sublime Text: Sublime Text is a proprietary cross-platform source code editor with a Python API. It natively supports many programming languages and markup languages, and functions can be added by users with plugins, typically community-built and maintained under free-software licenses. [15] Sublime Text is one of the greatest text editor in the world, almost every programming language is supported, we chosen it because of its Angular JS editing skills.

• MySQL : A database is a structured collection of data. It may be anything from a simple shopping list to a picture gallery or the vast amounts of information in a corporate network. [16] MySQL is open-source and free. Developers didn't need to pay licence fee, also it gets updates regularly which makes it reliable.

• MySQL Workbench: MySQL Workbench is a unified visual tool for database architects, developers, and DBAs. MySQL Workbench provides data modelling, SQL development, and comprehensive administration tools for server configuration, user administration, backup and many more features. [17] It is best option for MySQL development platform, when we compare to others such as Apache PhpMyAdmin it contains reverse and forward engineering tools, embedded uml diagram chart drawer tools, generating tables from models without complexity.

• Bootstrap: Bootstrap is a front-end development framework that enables developers and designers to quickly build fully responsive websites. The framework contains global CSS settings with built-in components and extensible classes in the form of typography, navigation, buttons and many other html elements. [18] We have chosen bootstrap because bootstrap equals platform in dependency, by developing on Bootstrap developers are able to run their code on every size of device such as phones,tables,computers,laptops and so on.

• Angular JS: AngularJS is a MVVM platform. AngularJS is a structural framework for dynamic web applications. It lets you use HTML as your template language and lets you extend HTML's syntax to express your application's components clearly and succinctly. AngularJS's data binding and dependency injection eliminate much of the code you would otherwise have to write. [19] We have chosen Angular JS because it is officially supported and created by the Google. What that means is that it is more reliable than others. Also it has more libraries than other frameworks its community larger than others.

• Javascript : Javascript is a dynamic computer programming language. It is lightweight and most commonly used as a part of web pages, whose implementations allow client-side script to interact with the user and make dynamic pages. It is an interpreted programming language with object-oriented capabilities. [20] We have

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chosen it because it is almost only option for front end development.

• Apache Tomcat : The Apache Tomcat software is an open source implementation of the Java Servlet, Java Server Pages, Java Expression Language and Java Web Socket technologies. The Java Servlet, Java Server Pages, Java Expression Language and Java WebSocket specification are developed under the Java Community Process. [21] We have chosen Apache Tomcat because it is platform independent, we can run web server in a Linux machine.

• Spring Framework :   The Spring Framework provides a comprehensive programming and configuration model for modern Java-based enterprise applications - on any kind of deployment platform. [22] A key element of Spring is infrastructural support at the application level: Spring focuses on the "plumbing" of enterprise applications so that teams can focus on application-level business logic,without unnecessary ties to deployment environments. Spring framework makes things easy for developers, such as creating Web Services, Controllers, web pages, database integrations, query implementations and so on. It is easy because most of the trivial processes are implemented by the framework, for example you don't need to open and close database connections by yourself when you execute a query in JAVA it is done by Spring it makes code less complex.

• STS: The Spring Tool Suite is an Eclipse-based development environment that is customized for developing Spring applications. It provides a ready-to-use environment to implement,debug,run,and deploy your Spring applications,including integrations for Pivotal tc Server, Pivotal Cloud Foundry, Git, Maven, AspectJ, and comes on top of the latest Eclipse releases. [23] We have chosen STS because it has embedded Eclipse plug-in integrated, there are other options such as Spring Incubator web page, but when you use others you have to implement some extra steps to import those projects in your local computer.

• Postman : API development tool that is a plug-in which comes as a packaged application in Chrome and is used to test the API services. Users can test the JSON REST based Web Services with this and make a API for cross device applications. [24] We have chosen Postman because its perfect GUI. You can save your REST calls and look it from other computers by registering.

• Google Map API: Google Maps APIs give developers several ways of embedding Google Maps into web pages or retrieving data from Google Maps, and allow for either simple use or extensive customization [11]. We have chosen Google Map API because it is free for the first 100.000 requests.

• PuTTy : PuTTY is a Telnet and SSH terminal software for Unix and Windows platforms that enables any users to remotely access computers over the internet. [25] We have chosen PuTTy because it is platform independent and free.

• VNC : Virtual network computing (VNC) is a type of remote-control software that makes it possible to control another computer over a network connection. Keystrokes and mouse clicks are transmitted from one computer to another, allowing technical support staff to manage a desktop, server, or other networked device without being in the same physical location. [26] We have chosen TightVNC as a tool for accessing remote server. TightVNC is also free and it is recommended by the community.

• WinSCP : This program is an open source free S FTP client, FTP client, Web DAV client and SCP client for Windows. Its main function is file transfer between a local and a remote computer. [27] WinSCP is better option with its GUI for accessing remote file system.

3.1.2 Hardware Feasibility

The minimum hardware requirements for each program/IDE and a system requirement compilation for development is shown in 3.1, 3.2, 3.3 based on the requirements.

Table 3.1 Minimum System Requirement for Mobile Application Development

Software	CPU (Ghz)	RAM (MB)	Storage (GB)
Linux OS [28]	1	512	8
Android Studio [29]	1.6	3072	8 (500MB for IDE, 7.5 GB for SDK)
Android Emulator [29]	unknown	2048	1.5
Total	2.6	5632	17.5

Table 3.2 Minimum System Requirement for Server Side Application Development

Software	CPU (Ghz)	RAM (MB)	Storage (GB)
Linux OS [28]	1	512	8
Eclipse [30]	1.5GHz	1024	1
MySQL [31]	1 (2 core)	2048	0.8
MySQL Workbench[31]	unknown	4096	0.2
Total[31]	2.5 (2 core)	7168	2

Table 3.3 Android Hardware Requirements

	Minimum	Recommended
CPU (Ghz)	1	2
RAM (MB)	1024	1536
Storage (GB)	8	32

3.1.3   Communication Feasibility

Media files and path files are seperately stored on users android device. It so hard to send all of trip data one by one to one device to another without any loss. So we thought about that to compressing all files in a zip file before sending from mobile device to web server or vice versa. So we sended all data in one file. Also we will use less data bandwidth with compress all files in a zip file. The Internet is the main communication technology used in this project. The anticipated communication variables are shown in Table 3.4.

Table 3.4 Communication parameters

Description	Symbol	Values
Average Path Size	A	50 kB
Average Video Size	B	10 MB
Average Video Number Per User	C	4
Average Photo Size	D	2 MB
Average Photo Number Per User	E	20
Average Sound Record Size	F	1 MB
Average Sound Record Number Per User	G	1
Average Number Of Members in a Trip	H	2
Average Trip Data Size on Mobile(Unzipped)	I	81 MB
Average Trip Data Size on Mobile(Zipped)	J	56,7 MB
Average Trip Data Size on Web(Unzipped)	K	162 MB
Average Trip Data Size on Web(Zipped)	L	113 MB
Average Number of Upload Rate	M	1000/month
Average Number of Download and View Rate	N	7500/month
Average Size of Uploaded Trips	O	55 GB
Average Size of Downloaded Trips	P	827 GB
Supposed Number of Users	R	10000
Average Zip Compression Ratio	S	30% [32]
Server Data Rate Per Month	T	827 GB

$$I = G * F + E * D + C * B + A$$

$$K = I * H$$

$$J = I * (1 - R)$$

$$L = K * (1 - R)$$

$$O = J * M$$

$$P = L * N$$

$$T = MAX(O, P)$$

For this project we selected to rent a cloud computing system for make this project scalable. Scaleway [33] provides cloud computing services. Scaleway can provide multiple datacenters on different locations and developer tools on the machines. We selected scaleway for renting cloud server(s).

Based on the calculations above, the monthly data size will be around 827 GB. Scaleway provide 8 GB RAM and 200 GB storage with expandable options on ARM64 package shown on Table 3.5. So we have to rent at least 5 ARM64 cloud servers from Scaleway.

Table 3.5 Scaleway package options

Specification	Starter	C2	ARM64	C1
CPU	2x86 64bit	8x86 64bit	8xARMv8	4xARMv7
RAM	2GB	32GB	8GB	2GB
Storage	50GB SSD	50GB SSD	200GB SSD	50GB SSD
Number of public IPv4	1	1	1	1
Bandwidth	200Mbit/s	800Mbit/s	200Mbit/s	200Mbit/s
Price	2.99 Euro	5.99 Euro	9.99 Euro	24.99 Euro

3.2 Labor Force Feasibility

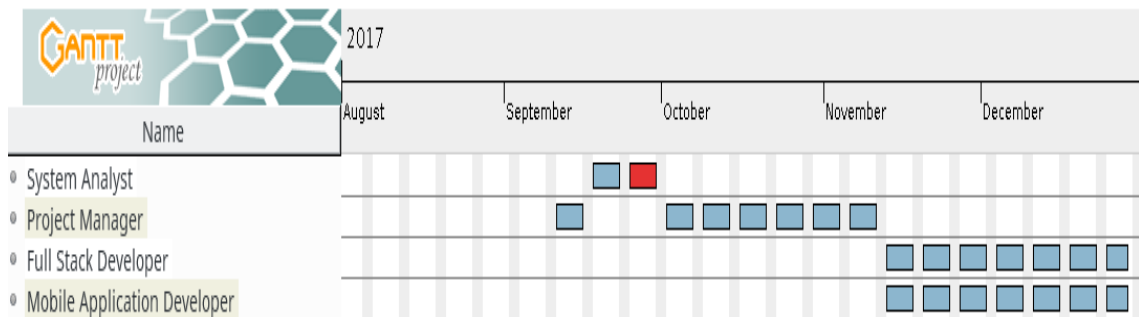The resource chart for this project shown in 3.1.

Figure 3.1 Resource Chart

3.3 Legitimate Feasibility

Software which is used within the project does not face any legal issues. All of the software used in the project contain license requirements. Users are responsible for all shared content. So any misusing of any sharing content is their risk. So sharing and publishing content is on their own risk.

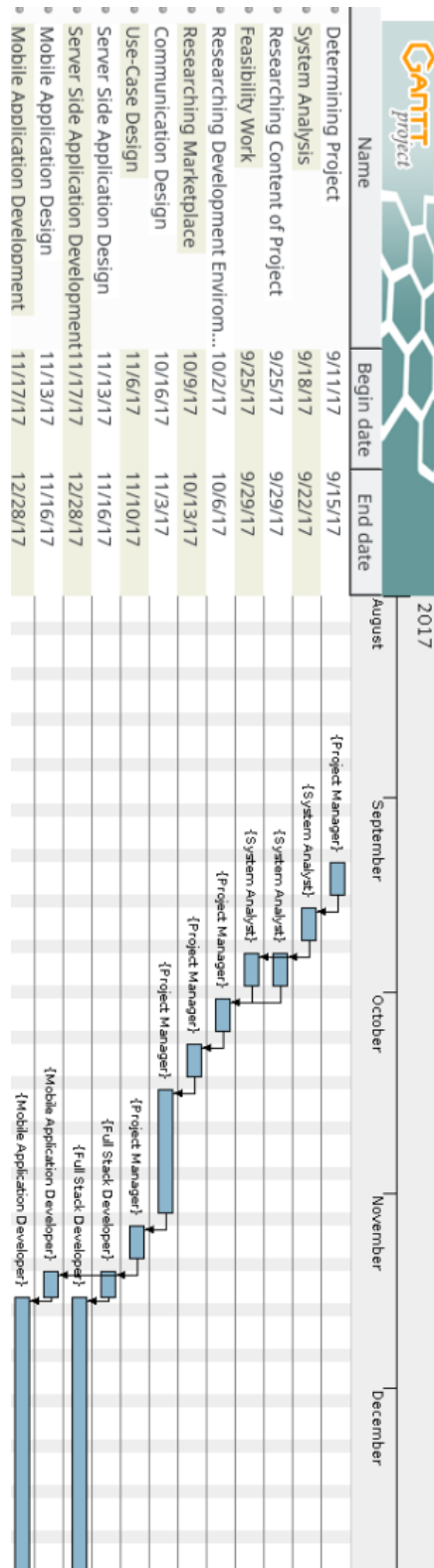## 3.4 Time Feasibility

Gannt diagram shown in Figure 3.2

Figure 3.2 Gantt Diagram Drawing

3.5 Economic Feasibility

The salary determined by the government of the Republic of Turkey for engineers is 3.500 TL [34]. In a month there are 22 work days on average so an employee's daily salary is 3500 / 22 = 159.10 TL.

Table 3.6 Personnel cost table

	Time(Day)	Price(TL/Day)	Total(TL)
System Analyst	15	159.10	2.386.5
Project Manager	35	159.10	5.568,5
Full Stack Developer	35	159.10	5.568,5
Mobile Application Developer	35	159.10	5.568,5
General Total:			19.092 TL

Table 3.7 Hardware and software used for development cost table

Components	Price
Eclipse [30]	Free
Android Studio [8]	Free
2* Dell Vostro 5468 [35]	662 TL
General Mobile GM6 [36]	375 TL
2* Github Account	Free
Scaleway Server	310,35
General Total:	1.346 TL

The cost of computers used in the development process in 3181 TL[35]. In the process 2 computer were used. A computer can be used for 2 years so 48 months in average lifetime. From here, we will find the cost of computer as 662TL. General Mobile GM6 used in the development process is 900 TL[36]. It can be used for 12 months in average lifetime. From here we will find the cost of phone as 375 TL. Mothly price of servers is 9.99 * 5 = 49,95 Euro = 227,09 TL. We need this servers after 17 November 2017 due to 28 December 2017. For this 41 days servers prive is 227,09 * (41 / 30) = 310,35 TL. Considering these expenditures, the cost of hardware and software cost is 1.409 TL. The project cost is 19.092 + 1.346 = 20438 TL.

4
System Analysis

Project details and descriptions of modules are in this section. This project will contains a mobile application which saves user location, media files and organize an event with other people, and a server side application which provides users to interact, sharing saved contents and access shared contents.

Mobile application will saved location, notes and media files also location of media files to storage when user started trip tracking feature of mobile application. Before starting a trip user can choose some of his/her friends to organize a trip with them on the both on-line and offline modes. If searching friend is not listed on offline mode, user can add friend when internet connection provided. If a person added a trip, this person will give a notification which asks user to accept joining or reject joining to trip. If user accepted invitation he/she can join trip as a member. Inviter is accepted as leader of team. During the trip all user's behavior saved separately. If location sharing feature opened any member of this team can watch other members location. But as we mentioned this feature requires internet connection. At the end of trip when user want to share his/her trip data and all of the data shared by other members will be merged. All users can select sharing data separately. As a result anyone could wants to store a picture but don't want to share.

In order to save location on background Android application will use a location saving service. Using service is a must because, Android services provides to execute a process for long time on the background. User can watch his/her location path on map during trip. If user wants to track a path which is shared from other people user can track the path by looking at map.

Modules created by project team as follows:

- User register module

- User login module

- Search module

- Location save module

- Media save module

- Feature extraction module

- Trip management module

- Notification sender module

- Trip upload module

- Trip download module

- Team trip preparing module

- Team content merging module

- Team members location tracking module

- Content complaint module

- Shared content interaction module

- Administrator module

- Users interaction module

4.1   Modules

4.1.1   User Register Module

User register module provides creating new users. This module needs user name, password and email from user to create a new account. This module runs on web application but user can use this module on mobile and web application.

4.1.2   User Login Module

User login module provides user to sing in into mobile and web application. This module needs user name and password from user to sing in. This module runs on web application but user can use this module on mobile and web application.

4.1.3 Search Module

This module provides user to search other users and shared trips by region, user, time and trip type. User can only search on trips which he/she have access rights to see. This module runs on web application but user can use this module on mobile and web application.

4.1.4 Location Save Module

This module runs as a background task on Android device and saves navigation(longitude, latitude, altitude) data provided from GPS to a CSV file. This module runs on mobile application.

4.1.5 Media Save Module

This module saves photo, video and sound record with their location data to SQLite database on Android device. This module runs on mobile application.

4.1.6 Feature Extraction Module

This module tags trips using trip path data by their country, province, distinct, members, time and trip type on the web application. This module runs on mobile application.

4.1.7 Trip Management Module

This module provides user to manage trip contents like deleting a photo or changing access privileges for contents. This module runs on mobile application.

4.1.8 Notification Sender Module

This module provides sending notifications to users about any topic. This module runs on web application but mobile application use this module as a web service.

4.1.9 Trip Upload Module

This module provides user to share trip content on social media with determined access rights. Mobile application prepares a zip file which includes all of chosen contents except chosen share option is "only me" belong to trip and upload this zip file to server side using web application.

4.1.10 Trip Download Module

This module provides user to download chosen trip which he/she can access to his/her mobile device using application. Web application prepares a zip file using chosen trip and send it to mobile application.

4.1.11 Team trip preparing module

This module provides users to send team trip requests each others. They can accept or deny these requests, if they accept they can contribute trips by sending their media. This module works on both mobile and web application.

4.1.12 Team Content Merging Module

This module provides trip members to merge trip content easily for share on social media. Web application merges all of sent contents from members in one trip. This module runs on web application.

4.1.13 Team members location tracking module

This module can only be used on team trips and requires Internet connection, provides team members to track each others locations simultaneously. This module runs on both mobile and web application.

4.1.14 Content complaint module

This module can be used both mobile device and web applications. Users can make complaint about other users, trips, comments. Created complaints are evaluated by the administrators. This module runs on server side but mobile application also interacts with it.

4.1.15 Shared content interaction module

This module can be used both on mobile application and web application. Users can like each others shared trip they can comment on those trips also can share the trips. This module runs on server side but mobile application also interacts with it.

4.1.16 Administrator module

This module can only be used on web application. Administrator of system are able to interact with it, with the module administrators can evaluate created complaints by the users. Administrators can hide a content,user or comment if he or she thinks that complained content is inappropriate. This module runs on web side application.

4.1.17 Users interaction module

This module can be used both web and mobile application. Users can interact with other users by sending friend request, if they accept it they become friends and will be able see contents of each others. This module runs on web side application but can only be used both mobile and web applications.

5
System Architecture Design

The architecture design of the project is explain in this chapter.

5.1 Database UML Diagrams

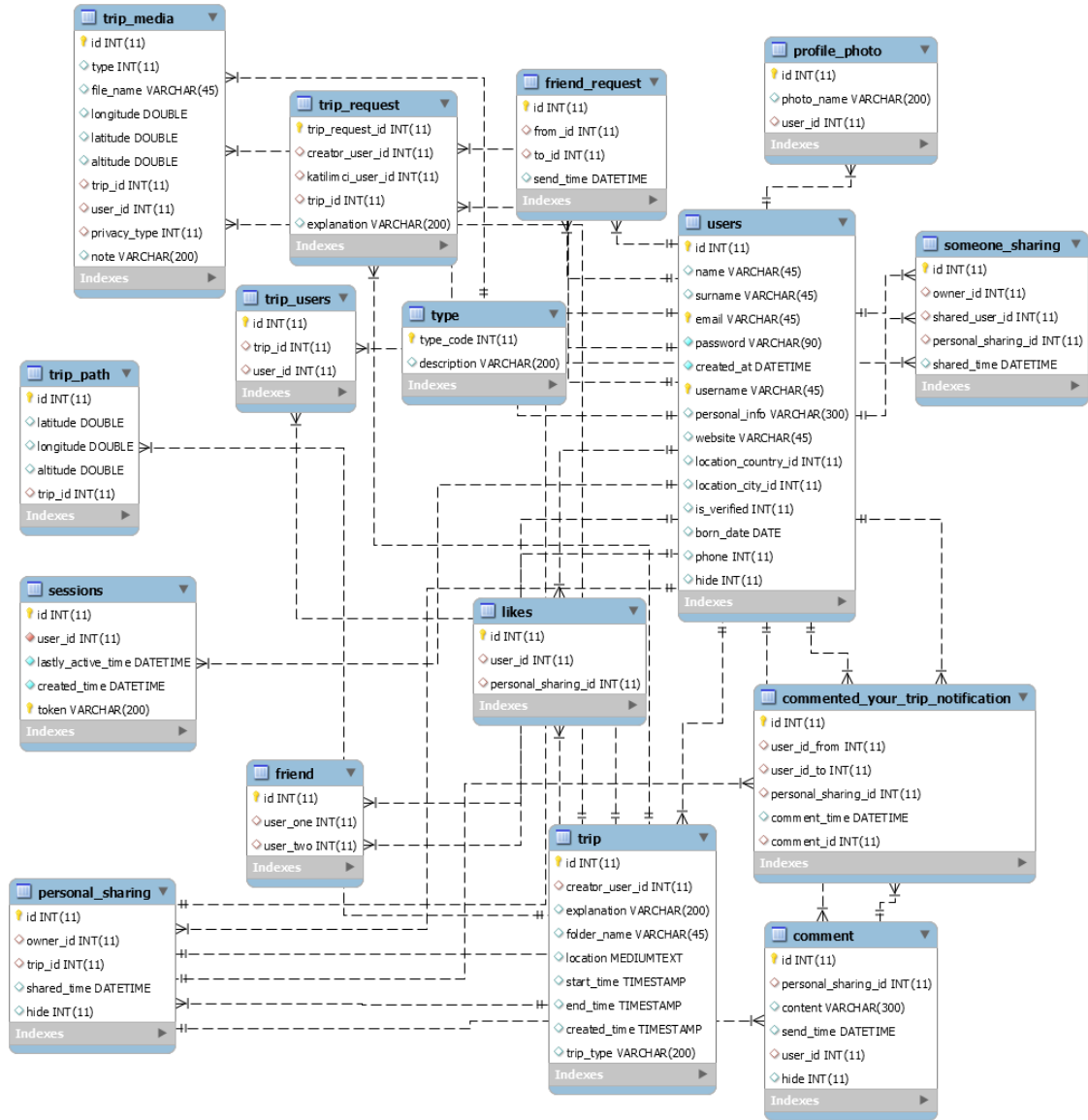The entity-relationship diagram of the database used in this project is shown in Figure 5.1

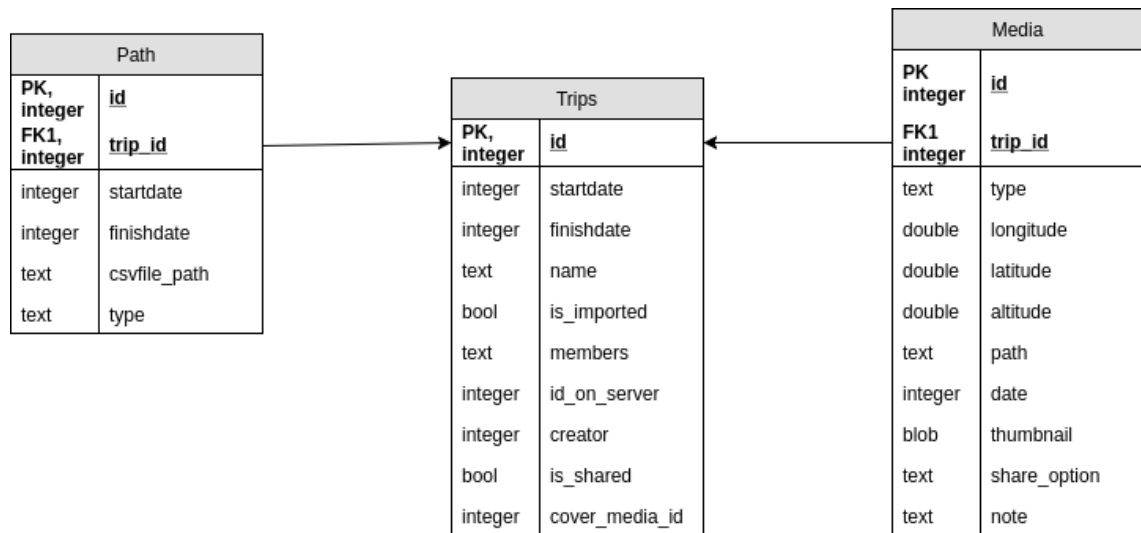**Figure 5.1** Backend Database design pattern

Figure 5.2 Mobile Application Database Diagram

5.2 Software Design

The modules used in the project and their relationship to entities is shown in Figure 5.3
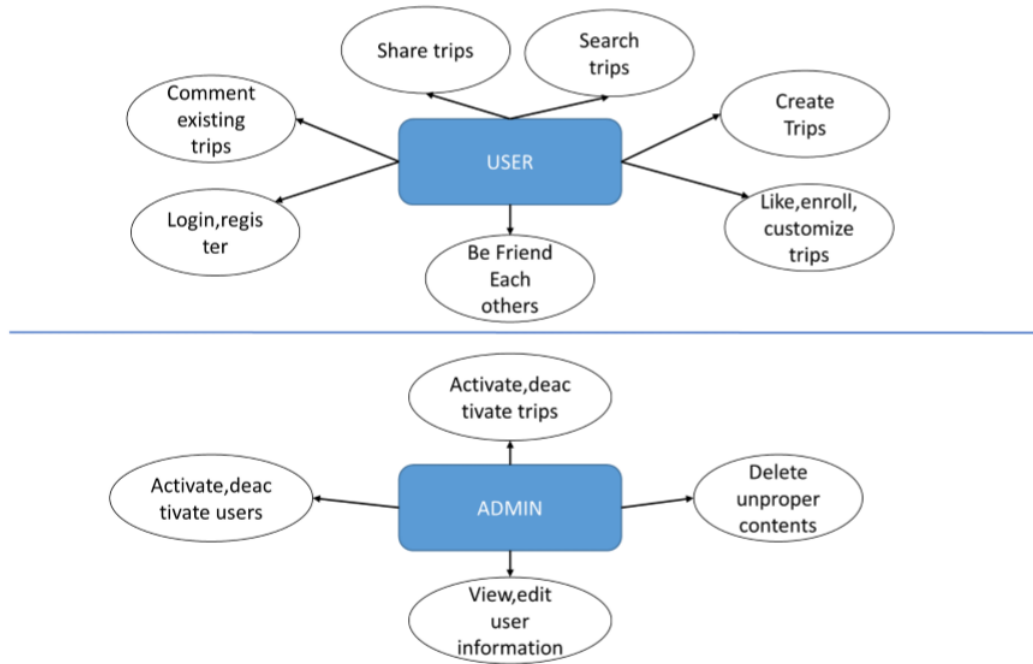

Figure 5.3 Level zero dataflow diagram

5.2.1 User Modules

Create Trips: Users can create trips by using mobile application.

Share Trips: Users can share trips with their friends or anyone who they like to see or interact with their sharings using mobile and web applications.

Search trips: Users can search trips which has been created other users using mobile and web applications.

Like,enrol,customize trip: Users can like shared trips using mobile and web applications. They can enrol them by meaning enrolling they can download trips they want in their local storage and view it whenever they want also they can modify the shared trips which lets them to see the content only they preferred.

Be each others friends: Users can be friends each other through mobile and web applicationa. By doing this they give permission the ones to see their shared trips which is only open to their friend.

Login and register: Users can log in or log out to the system using mobile and

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web applications.

Comment existing trips: Users can comment on trips that have been shared by other users, they also can attach other users to their comment using mobile and web applications.

5.2.2   Administrator Modules

Evaluate complaints: Administrators are able to hide or not hide and close complaints by looking its content on web application.

The dataflow diagrams of the system are shown in Figure 5.4, 5.5, 5.6 and 5.7. These diagrams give information about the general operation of the system.
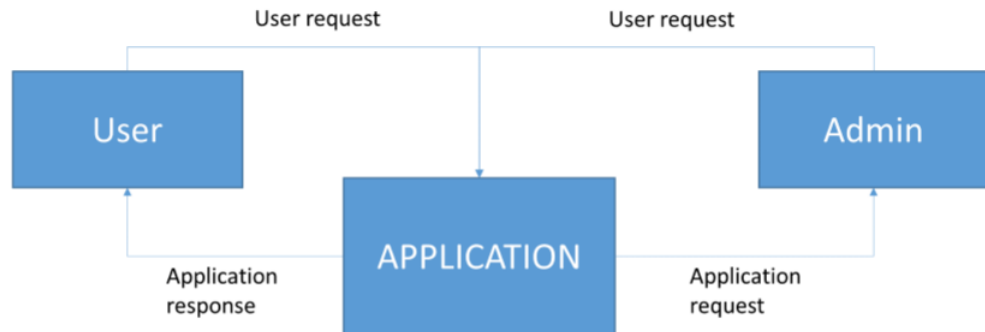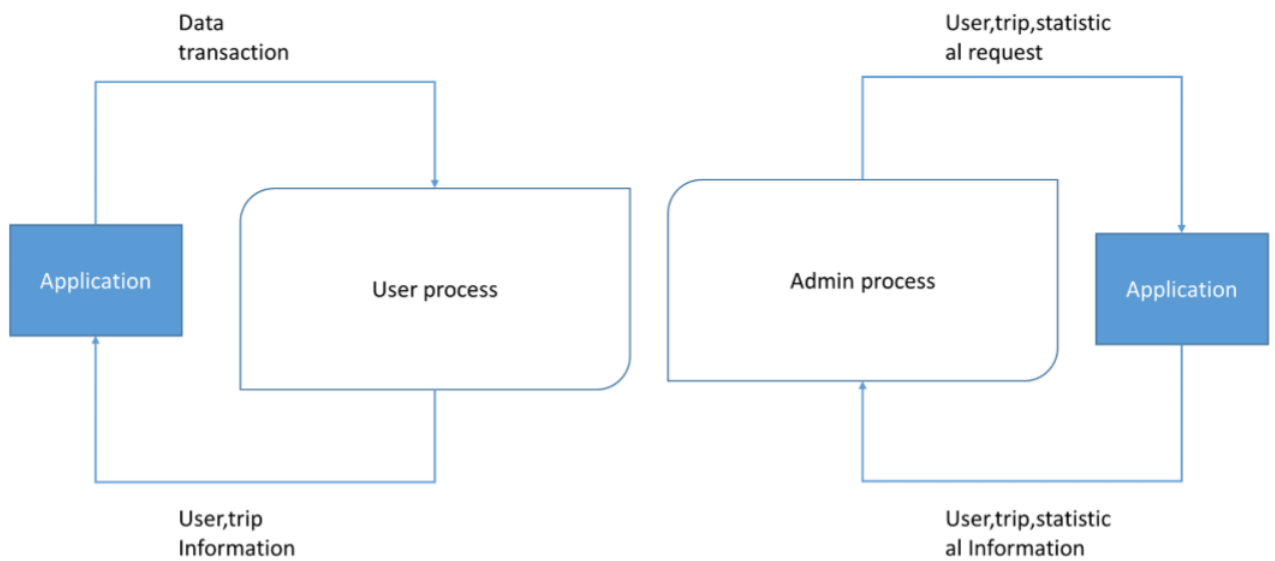

Figure 5.4 Level zero dataflow diagram
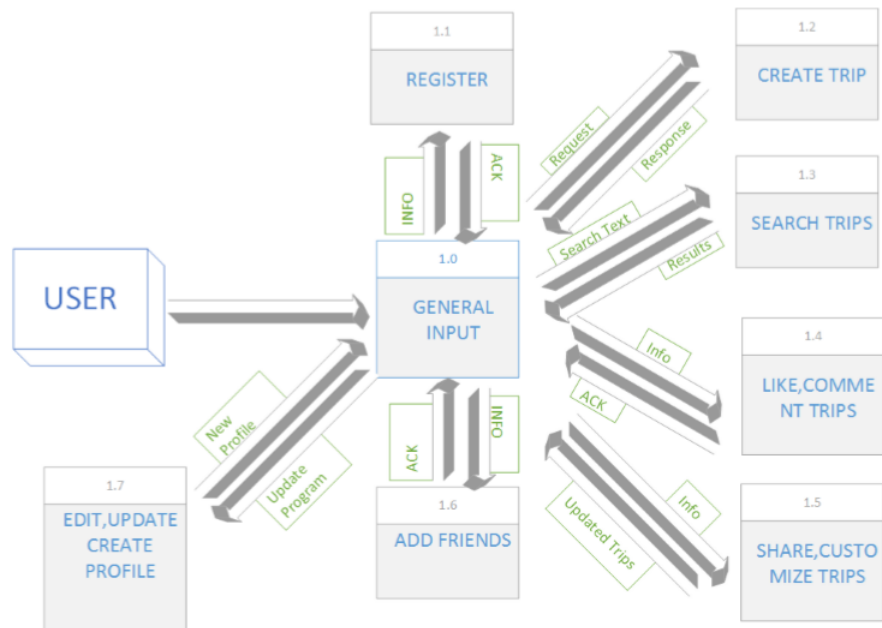

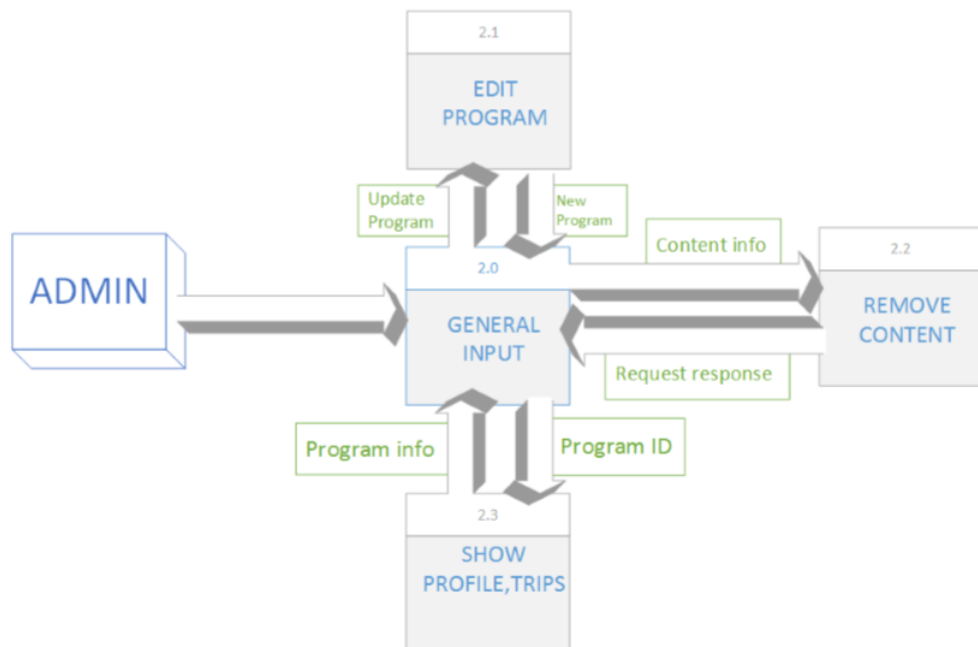**Figure 5.5** Level one dataflow diagram

Figure 5.6 Level two user dataflow diagram

Figure 5.7 Level two administrator data flow diagram

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Project System Informations
System and Software: Windows, Linux, Java, Android Studio, MySQL, Android, Spring Boot,Javascript, AngularJS, Mocha and Chai, Bootstrap, CSS, Android Emulator, Postman, JUnit, Google Map API, Mail Service, Android Phone,Git
Required RAM: 1GB-512MB
Required Disk: 512MB-2GB