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**SENIOR PROJECT**

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Tarık Nural  
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## LIST OF ABBREVIATIONS

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STS	Spring Tool Suit
JSON	Java Script Object Notation
AWS	Amazon Web Services
RDS	Relational Database Service
Js	JavaScript
LOOP	Microsoft's Location and Obsevation Platform
Play Store	Google Play Store
GPS	Geographic Positioning System
VCS	Version Control System
AWS	Amazon Web Services

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## ABSTRACT

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### Gezi-Yorum

Tarık Nural

Murat Baki Yücel

Department of Computer Engineering

Senior Project

Advisor: Assist. Prof. Dr. Ahmet Tevfik İNAN

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 transport 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 trip or as a team trip. The system to be designed will be guidance in this case. The system will need to create a social media environment to increase interaction between users. Friendship and tracking system between users will be designed. In addition personalized news flow which includes shared trips by user's friends and popular trips, will be provided. The person will be provided with a customized news flow that will be compiled around the person, compiled on popular routes and in the circle around friends. 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 spent time 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

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Tarık Nural  
Murat Baki Yücel

Bilgisayar Mühendisliği Bölümü  
Bitirme Projesi

Danışman: Yrd. Doç. Dr. Ahmet Tevfik İNAN

Bu projenin hedefi insanların gezilerinin 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 internet aracılığı ile yapabilecektir. Bir kullanıcının veya takımın oluşturduğu bir güzergâhı, diğer kullanıcıların da inceleyebilmesi hedeflenmektedir. Diğer kullanıcılar inceleme yaptığı güzergâhı kendi güzergâhı olarak belirleyebilir veya bu güzergâh üzerinde takım gezisi yapmak isteyebilir. Tasarlanacak sistem bu durumda belirlenen güzergâhı târif edici olacaktır. 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. Ayrıca 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

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On this project our purpose is to save navigation data which represents latitude, longitude and altitude provided by GPS of users 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 shown on 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 satellite, average and instant speed will be calculated. As result, trip type will be labelled as vehicle trip, walking trip, running trip or cycling trip using calculated speed data. If the system is operating in the guiding mode, the route that the user or team wants to go will be described by system to user. 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, it can be saved for future review, it can be suggested for other friends to visit, or the users can follow trips they like from its content 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 of a trip for traveler. We know that it is not easy to organize photos and media taken on a trip and sharing them on Facebook. In any marketplaces including play store and appstore there are a lot of applications for tracking and travel planning but most of them only saves location data and do not include media or user notes. There are only a few remarkable application which saving location data, media and also providing 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 environment 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 necessary to store locations data, store media and associate them with their location, and store them with everything in a trip. So that people can remember everything in a trip.

## 2 General Information

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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]. Without that feature this application can only track, save user's location and show saved 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. This application could only track, save user's location and show saved data on the map.

### 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 claim to low power consumption. 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 plataform could only usable for sharig 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 continuously. In this application there is no start trip option. This application determines trip kind automatically. In purpose this application not developed for tracking, developed for navigate users. User can wath his/her activity on the menu named 'TimeLine' (in Turkish 'Zaman Çizelgesi'). On users timeline media such as photos and videos shown not audio or any othe medias. 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 on below 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	-	-	-	-	+
Location sharing	-	-	-	-	+



# 3

## Feasibility

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This system needs requirements listed below:

- This system needs real time location of user. So this system needs to run on mobile devices.
- This system must provide interaction within users. So to provide interaction of multiple mobile devices this system needs a server side application.
- In process of development to provide version controlling Git must be used as VCS.

### 3.1 Technic Feasibility

As technical feasibility study, the software and hardware needs for the project is defined on the following sections.

#### 3.1.1 Software Feasibility

In this project a web and a mobile application will be developed. The following software technologies will be used.

##### Mobile Side Development

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

- **Android:** Android is a mobile operating system based on the Linux kernel. Its source code is licensed under open source licenses and it is developed 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 because of publishing problems, restrictions and lack of design guidelines that come with iOS[6].
- **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[7].

- **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[8].
- **Android Emulator:** Android emulator lets prototype, develop and test Android applications without using a physical device[9].
- **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[10].

## **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. **javaEETanim** 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. **eclipseTanim** 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 application programming interface (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. **sublimeTanim** 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. **mySQLTanim** 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. **mySQLWorkTanim** 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.**BootstrapTanim** 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.**AngularJSTanim** 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.**JavascriptTanim** We have 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.**TomcatTanim** 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. **SpringFrameTanim** 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. **STSTanim** 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. **PostmanTanim** 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[10]. 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.

**PuttyTanim** 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. **VNCTanim** 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. **WinSCPTanim** WinSCP is better option with its GUI for accessing remote file system.

### 3.1.2 Hardware Feasibility

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

For this project we selected to rent a cloud computing system for make this project scalable. Scaleway[11] 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). Starter package is enough for this project at startup.

**Table 3.1** 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

**Table 3.2** Minimum System Requirement for Mobile Application Development

Software	CPU	RAM	Storage
Linux OS[12]	1GHz	512 MB	8 GB
Android Studio[13]	1.6GHz	3 GB RAM	8GB(500MB for IDE, 7.5 GB for SDK)
Android Emulator[13]	unknown	1GB	1.5 GB

**Table 3.3** Minimum System Requirement for Server Side Application Development

Software	CPU	RAM	Storage
Windows OS[14]	1GHz	2 MB	20 GB
Eclipse[13]	1.5GHz	1 GB RAM	1 GB
MySQL[15]	2 core	2GB	800 MB
MySQL Workbench[15]	unknown	4GB	200 MB

**Table 3.4** Android Hardware Requirements

	Minimum	Recommended
CPU	1 Ghz	2 Ghz
RAM	512 MB	2 GB
Storage	2 GB	8 GB

### 3.1.3 Communication Feasibility

Media files and path files are separately 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 3.5.

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

$$J = I * H$$

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

$$N = I * L$$

$$O = J * M$$

$$S = O + N$$

Based on the calculations above, the monthly data size will be around 10 GB. Scaleway provide 2 GB ram and 50 GB storage with expandable options. As a result these properties are sufficient.

## 3.2 Labor Force Feasibility

There are two people needed for developing mobile and server side of system concurrently.

**Table 3.5** Communication parameters

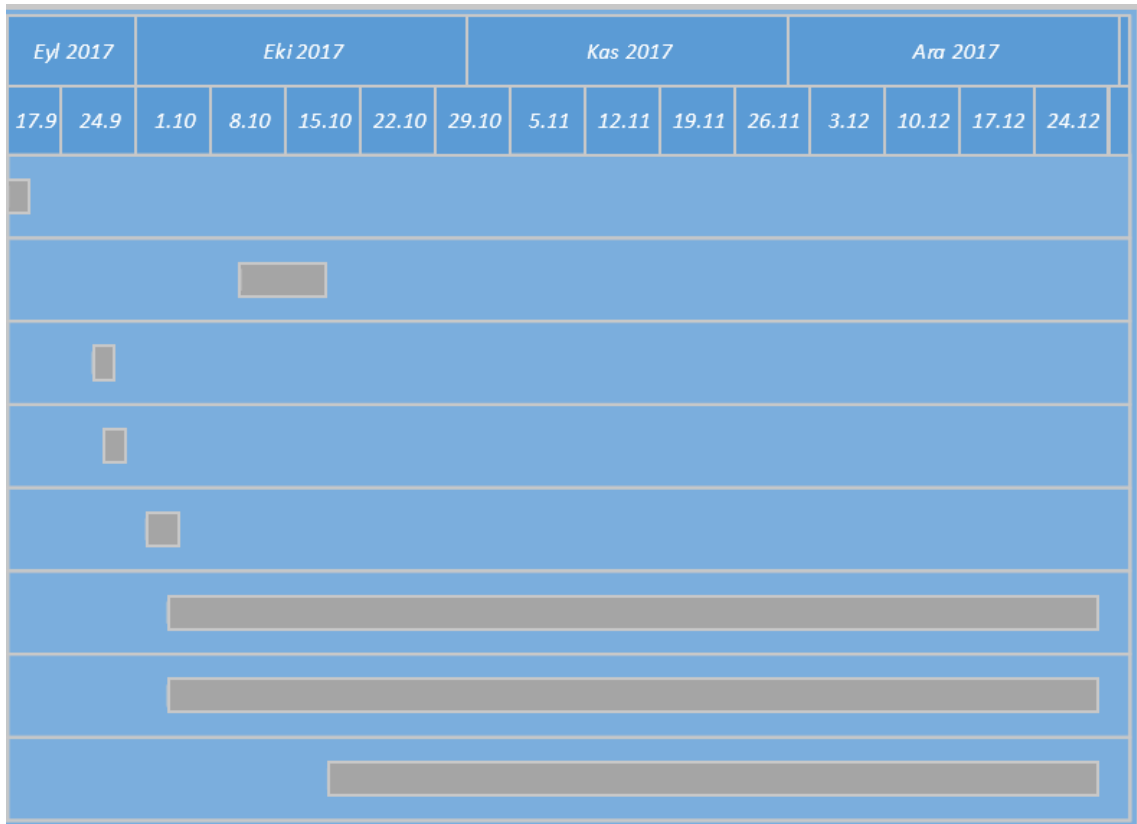
Description	Symbol	Values
Average Path Size	A	50 kB
Average Video Size	B	10 MB
Average Video Number Per User	C	4
Average Photo Size	D	2 MB
Average Photo Number Per User	E	20
Average Sound Record Size	F	1 MB
Average Sound Record Number Per User	G	1
Average Number Of Members in Trip	H	2
Average Trip Data Size on Mobile(Unzipped)	I	81 MB
Average Trip Data Size on Web(Unzipped)	J	162 MB
Average Trip Data Size on Mobile(Zipped)	K	113 MB
Average Number of Upload Rate	L	25/month
Average Number of Download Rate	M	50/month
Average Size of Uploaded Trips	N	2 GB
Average Size of Downloaded Trips	O	8 GB
Supposed Number of Users	P	100
Average Zip Compression Ratio	R	30%[16]
Server Data Rate Per Month	S	10 GB

### 3.3 Time Feasibility

Gannt diagram shown in Figure 3.1 3.2

Kimlik	Görev Adı	Başlangıç	Bitiş	Süre
1	Determining Project	19.09.2017	20.09.2017	2g
2	Researching content of project	21.09.2017	28.09.2017	1h 1g
3	Feasibility work	27.09.2017	28.09.2017	2g
4	System Analysis work	28.09.2017	29.09.2017	2g
5	Researching development environments	2.10.2017	4.10.2017	3g
6	Developing project	4.10.2017	29.12.2017	12h 3g
7	Determining and fixing bugs	4.10.2017	29.12.2017	12h 3g
8	Reporting	19.10.2017	29.12.2017	10h 2g

**Figure 3.1** Gantt Diagram Drawing



**Figure 3.2** Gantt Diagram Drawing



### 3.4 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. The users are responsible of their well being. So any misusing of any sharing content is their risk. So sharing and publishing content is on their own risk.

### 3.5 Economic Feasibility

The salary determined by the government of the Republic of Turkey for engineers is 3.500 TL[17]. The amount of assumed work days in a month is 21 days. The individual and general cost of the personnel and features the cost of hardware and software used for development are shown below.

**Table 3.6** Personnel cost table

	Time(Day)	Price(TL/Day)	Total(TL)
System Programmer	37	170 TL	6.290 TL
System Analyst	29	170 TL	4.930 TL
System Designer	10	170 TL	1.700 TL
Project Coordinator	4	170 TL	680,TL
General Total:			13.600 TL

**Table 3.7** Hardware and software used for development cost table

Components	Price
Eclipse [18]	Free
Android Studio [7]	Free
2* Dell Vostro 5468	662 TL
General Mobile GM6 [19]	375 TL
2* Github Account	Free
Scaleway Server	15TL/monthly
General Total:	1.112 TL

The cost of computers used in the development process in 3181 TL[20]. 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[19]. It can be used for 12 months in average lifetime. From here we will find the cost of phone as 375 TL. Considering these expenditures, the cost of development of our project is X TL.

# 4

## System Analysis

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Project details and descriptions of modules are in this section. This project will contain a mobile application which saves user location, media files and organizes 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 save location, notes and media files also location of media files to storage when user starts 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 both on-line and offline modes. If searching friend is not listed on offline mode, user can add friend when internet connection is provided. If a person adds 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 is saved separately. If location sharing feature is 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 wants 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 want 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 provide 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

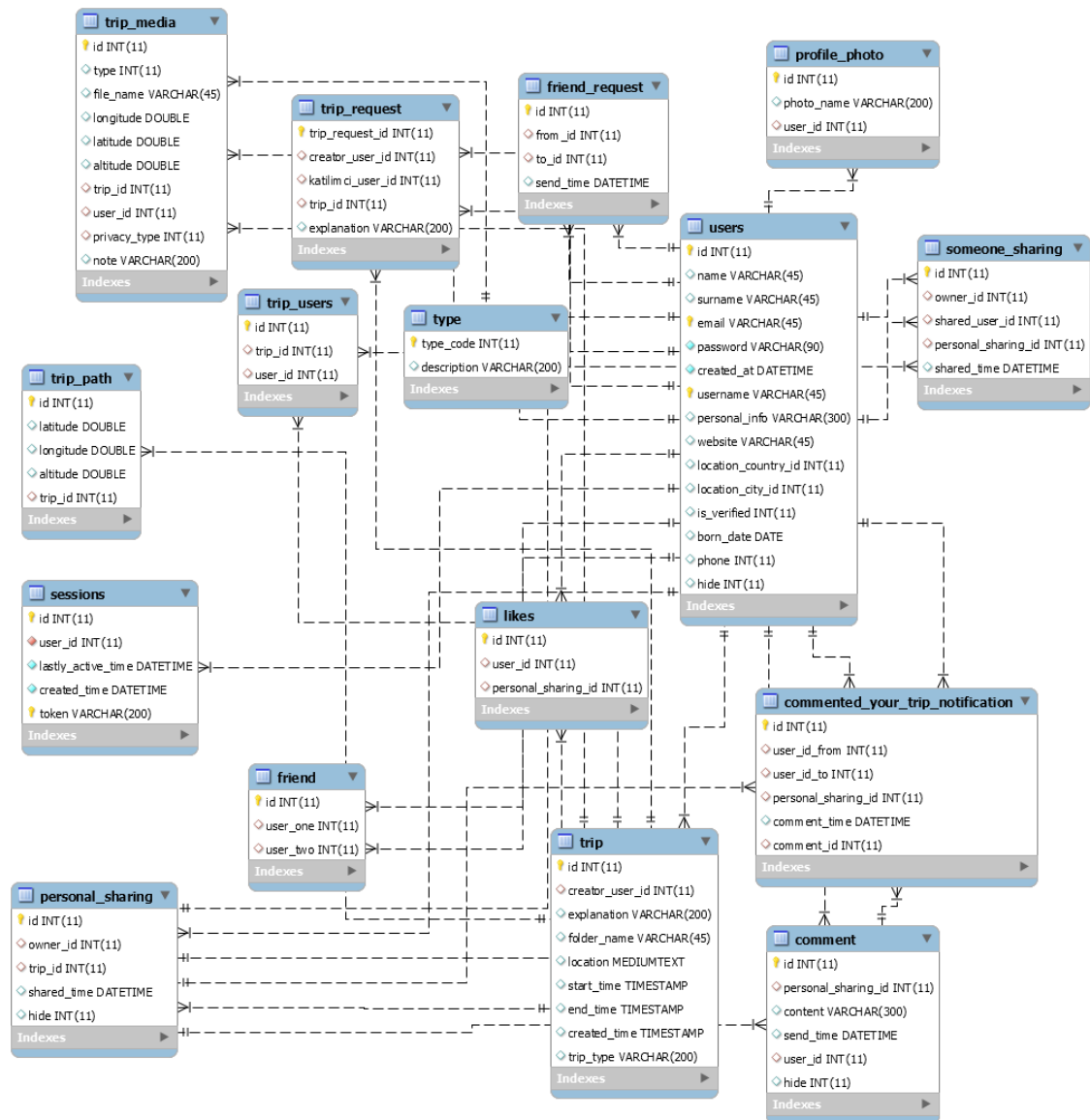
## System Architecture Design

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

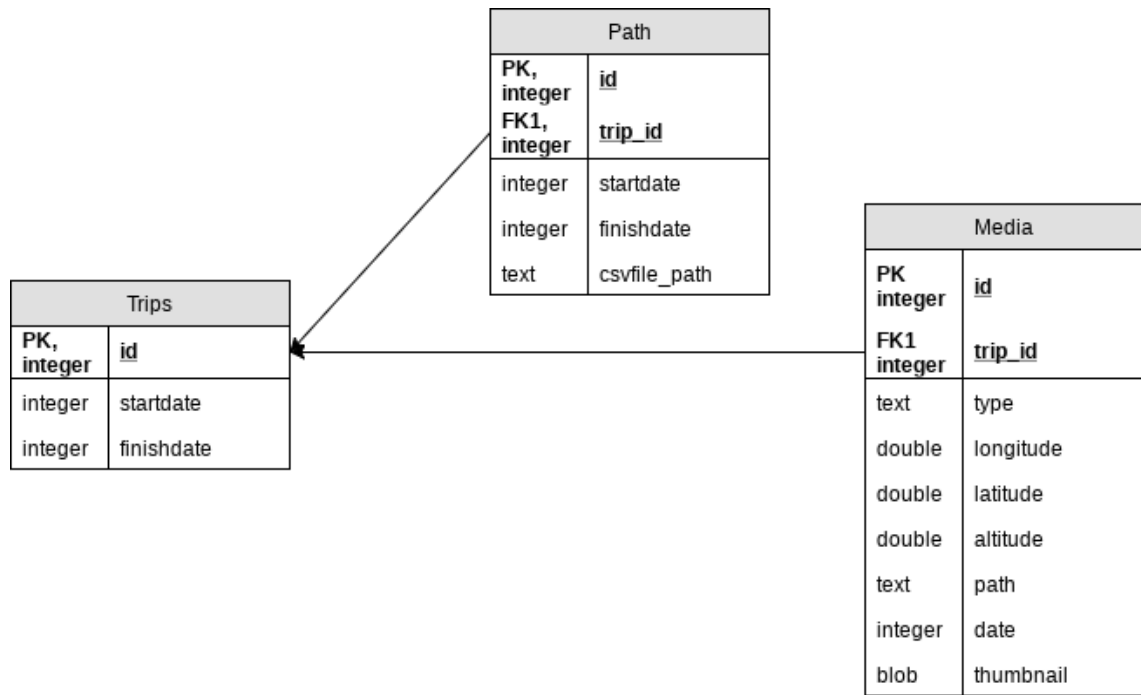
## 5.1 Database UML Diagrams

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

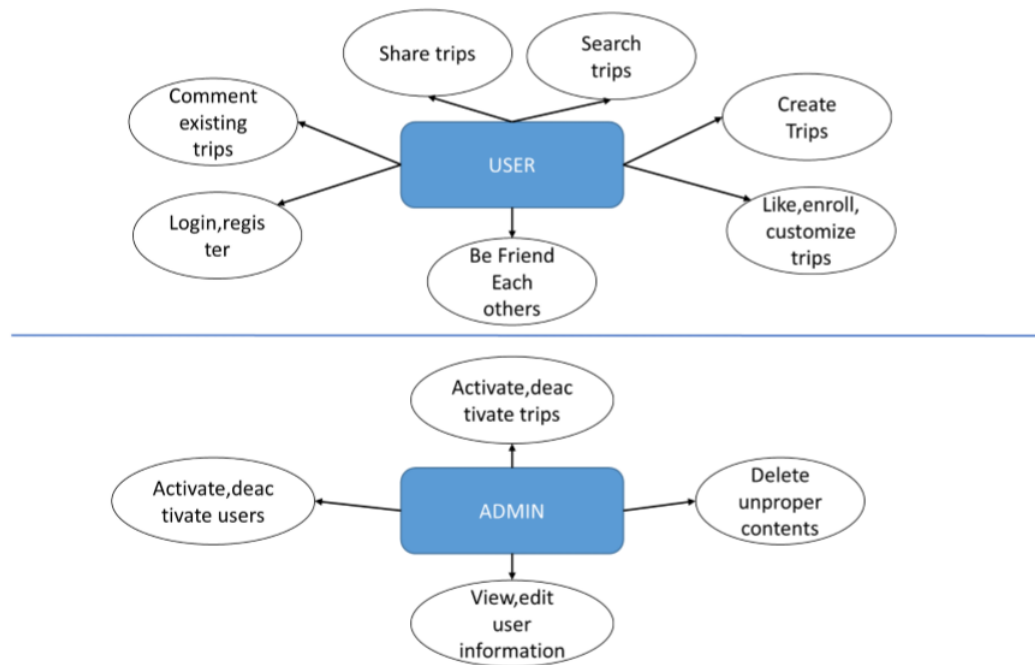


Figure 5.3 Level zero dataflow diagram

### 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.

**Search trips:** Users can search trips which has been created other users.

**Like,enrol,customize trip:** Users can like shared trips. 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 web site and mobile application. By doing this they give permission the ones to see their shared trips which is only open to their friend

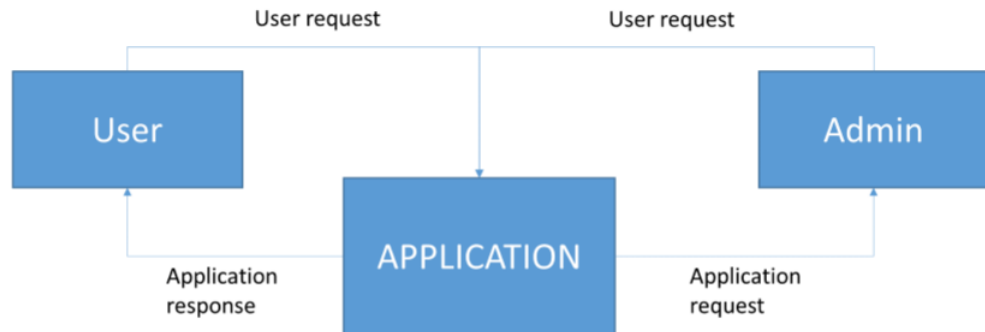
**Login and register:** Users can log in or log out to the system.

**Comment existing trips:** Users can comment on trips that have been shared by other users, they also can attach other users to their comment.

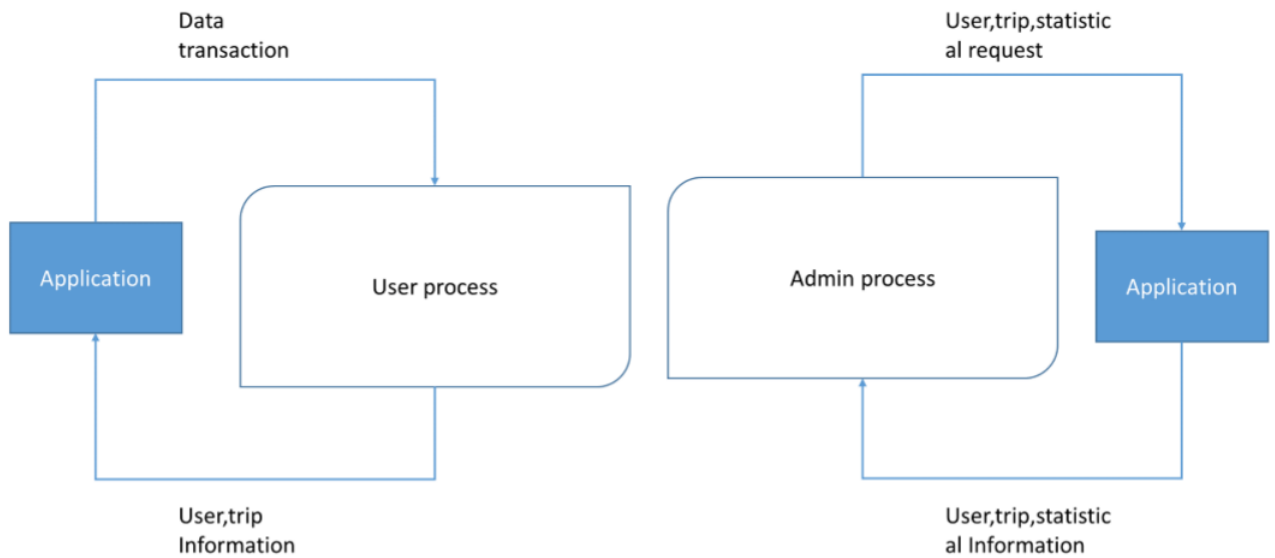
### **5.2.2 Administrator Modules**

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

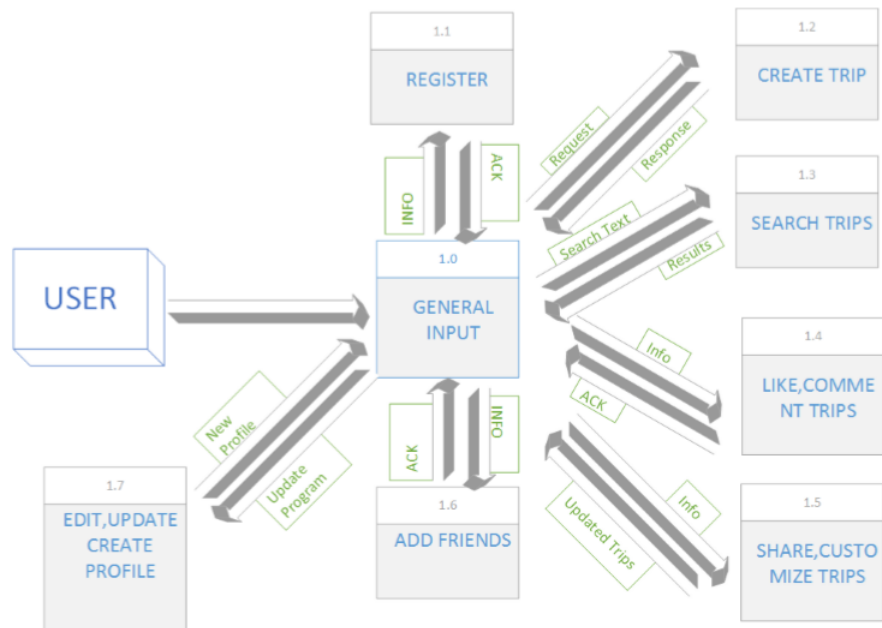
The dataflow diagrams of the system are shown in Figure 5.4, 5.5, 5.6 and 5.7. These diagrams give information about the general operation of the system.



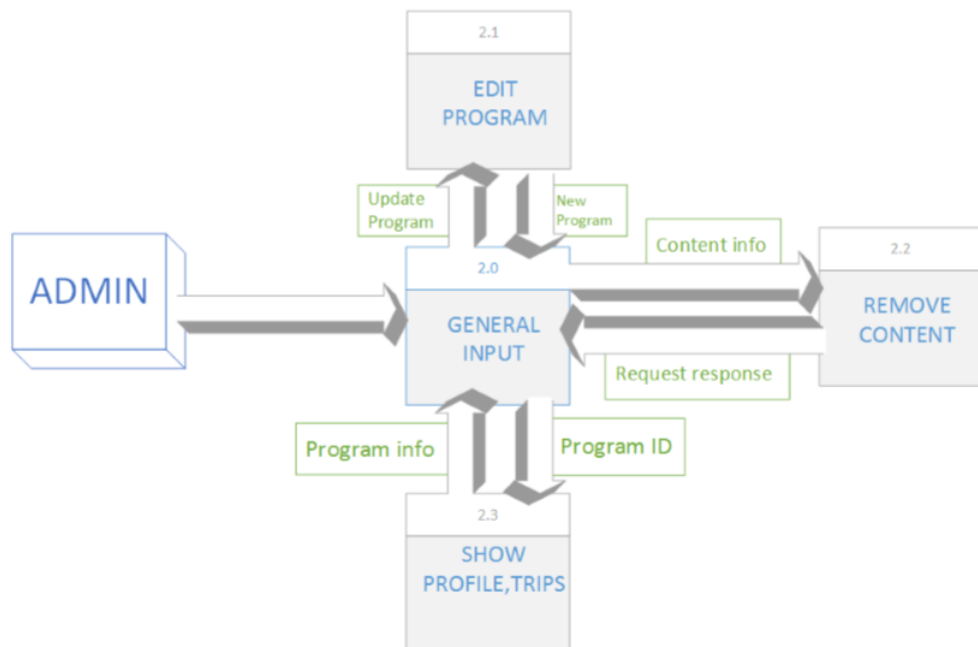
**Figure 5.4** Level zero dataflow diagram



**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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## Curriculum Vitae

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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