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SENIOR PROJECT

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Tarık Nural
Murat Baki Yücel

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LIST OF ABBREVIATIONS

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

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

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 internet aracılığı ile 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. 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

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 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, storing 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 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 everthing in a 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]. 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 continuosly. In this application there is no start trip option. This application determines trip kind automaticaly. 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.

3 Feasibility

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 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

In this section there are descriptions about software feasibility and hardware feasibility.

3.1.1 Software Feasibility

In this subsection there are descriptions about choosing database system, web server system, development language and development enviroment. As a result of feasibility workings we decided to do server side programming with Java programming language. Because of two of developers working of this project knows Java well, Java is object oriented language, Android can be programming with Java natively, sources about Java can be found easily and Java can run both Android and server. We don't choosen any cross platform tools for mobile development. Because mobile application must require low power consuption, so that development must be native. Mobile application will be written for only Android because of anyone in our team doesn't have a MacBook to develop for iOS.

3.1.2 Hardware Feasibility

For a small number of users like 1 to 100 it is enough to use 1 GB RAM and 100 GB disk. But for astronomical number of users there must be a cloud storage and

powerful servers. For a solution for this scaling problem server side of this project will be setting on AWS.

For the requirements mentioned above the computer which the project is to be developed should be at a level that meets the minimum system requirements mentioned below separeted by mobile and server side.

For Server Side Development:

- JDK 1.8
- Spring Tool Suit, Spring Boot
- Eclipse, Java IDE
- Sublime text, gedit etc. text editor
- Apache Tomcat or Glassfish
- Access key to use Google Maps API
- A Browser to render HTML and Javascript
- 8 GB RAM minimum, 16 GB RAM recommended
- Minimum 250GB Free Disk Space
- Linux or Windows Operating System.
- Git

For Mobile Application Development:

- JDK 1.8
- Android Studio
- Android SDK
- Android Emulator
- Android System Images
- Access key to use Google Maps API
- 8 GB RAM and 8 GB swap area minimum, 16 GB RAM recommended

- Minimum 250GB Free Disk Space
- Linux or Windows Operating System.
- Git

3.2 Labor Force Feasibility

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

3.3 Time Feasibility

Gannt diagram shown below.

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	Feasibilty work	27.09.2017	28.09.2017	2g
4	System Analysis work	28.09.2017	29.09.2017	2g
5	Researching development enviroments	2.10.2017	4.10.2017	3g
6	Developing project	4.10.2017	27.10.2017	3h 3g
7	Determining and fixing bugs	4.10.2017	27.10.2017	3h 3g
8	Reporting	19.10.2017	27.10.2017	1h 2g

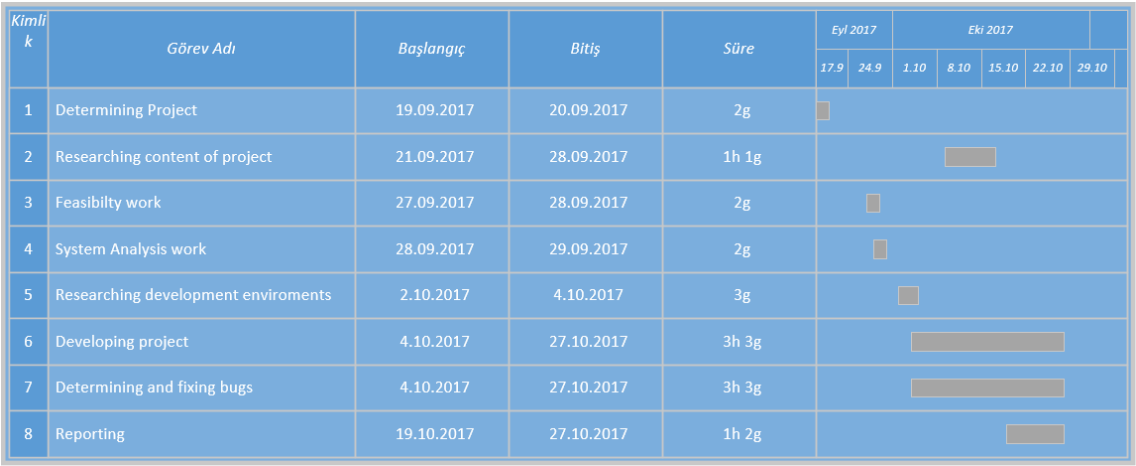

Figure 3.1 Gantt Diyagramı Zaman Çizelgesi

3.4 Legitimate Feasibility

There are no patent infringements as the software components to be used in the development phase of the project are open source and free of charge. Users are responsible for the legal problems that may arise due to the shares they have made according to Article 8 of Law No. 5651 and Article 125 of the Turkish Penal Code.

3.5 Economic Feasibility

There is no charge for software components to be used during application development. The hourly working fee of the person who will develop the project is 25 TL per person. The total cost determined for the project during the project development period stated in the Gantt Chart is 8000 TL. The price of a computer

Table 3.1 Total Cost Table For Gezi-Yorum

Cost	**TL**
Hardware	5.000,00 TL
Project Team	16.000,00 TL
Google Map API	15,00 TL
AWS	60,00 TL
Toplam	**21.075,00 TL**

with minimum system requirements stated in the title of hardware feasibility which costs currently between 1500 and 2500 TL. Price of Google Map API is 4$ and 15 TL per month. Price of AWS is 15$ and 60 TL per month.

4
System Analysis

Project details and descriptions of modules 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 serves 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 online 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. Invitor is accepted as leader of team. During the trip all user's behavior saved seperately. 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 seperately. 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 and login module
  - User login module
  - User register module

- Trip search module
- Timeline preparing module
- Location and media save module
- Feature extraction module
- Trip management module
- Notification sender module
- Trip upload and download module
- Team data merging module

4.1 Backend UML and Database Diagrams

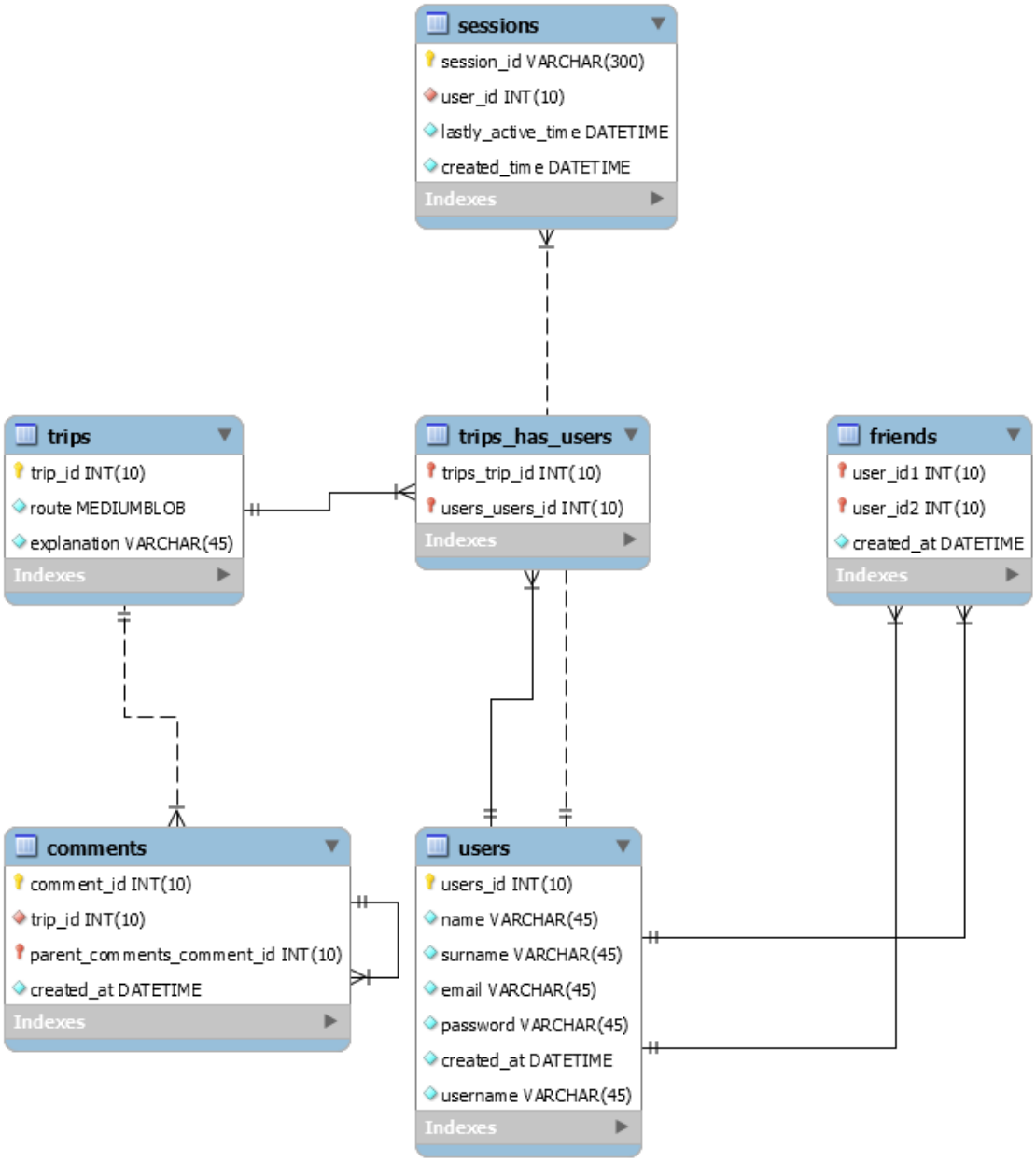

Figure 4.1 Database design pattern

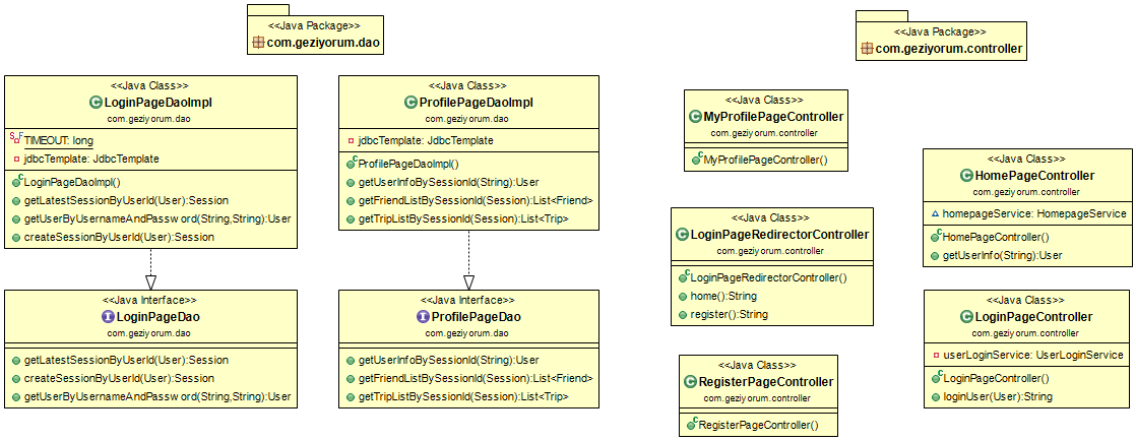

Figure 4.2 Backend implementation MVC UML-1

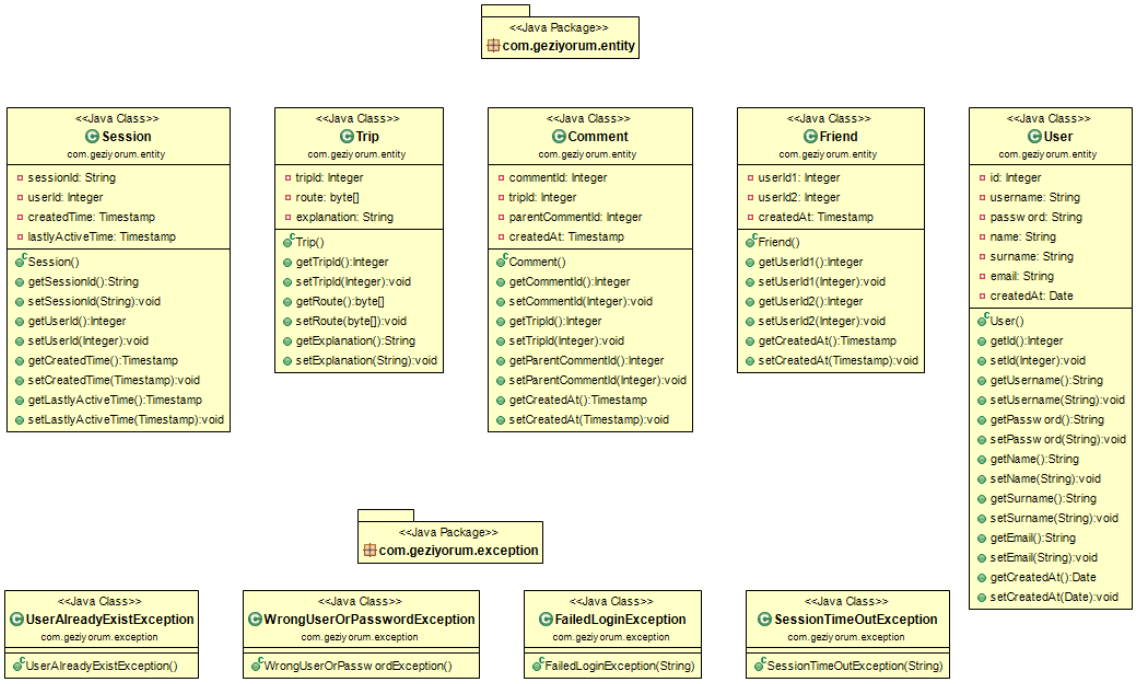

Figure 4.3 Backend implementation MVC UML-2

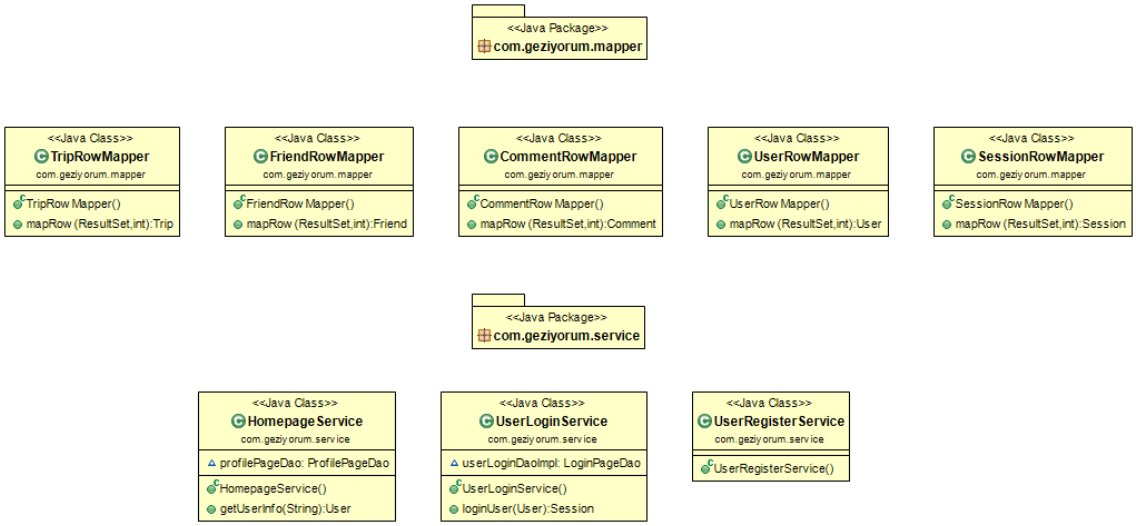

Figure 4.4 Backend implementation MVC UML-3

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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