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FACULTY OF ENGINEERING
COMPUTER ENGINEERING DEPARTMENT

Project Report

Version 1

CENG 407

Innovative System Design and Development I

Mega Reji

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Abstract

In these days, technology is using in several areas of individuals' daily life. In addition to usage of technology in daily life, people need some tools in order to make easier their work life. For this reason, we are planning design an application called as Mega Reji in order to usage of film production company. Mega Reji is a gamified applicatoin which is compatible with both website and mobile devices. The main purpose of this project is to improve the performance of a film production teams (e.g. managing their time effectively). Mega Reji provides an environment to members of film production company in order to access the system easily by using their mobile devices or their computers. In conclusion, this document consist of Literature Reivew, Software Requirements Specification and Software Design Document.

Key words:

Database, Software Engineering, Gamification

Özet:

Son günlerde teknoloji bireylerin günlük yaşamının bir çok alanında kullanılmaktadır. Teknolojinin günlük yaşamda kullanılmasına ek olarak, insanlar iş yaşamlarını kolaylaştırmak için bazı araçlara ihtiyaç duyarlar. Bu nedenle, film yapım şirketinin kullanmasına yönelik Mega Reji adında bir uygulama tasarlamayı planlıyoruz. Mega Reji, hem websitesi ile hem de mobil cihazlara uyumlu oyunlaştırılmış bir uygulamadır. Bu projenin temel amacı film yapım şirketi takımlarının performansını, örneğin zamanlarını daha verimli kullanmalarını sağlayarak artırmaktır. Mega Reji film yapım şirketi üyelerine, mobil cihazlarından ve bilgisayarlarından kolaylıkla ulaşabilecekleri bir ortam sağlar. Sonuç olarak bu doküman Literatür Araştırması, Yazılım Gereksinim Dokümanı ve Yazılım Tasarım Dokümanını içerir.

Anahtar Kelimeler:

Veri Tabanı, Yazılım Mühendisliği, Oyunlaştı

1. Literature Search

1.1 Abstract

Today, technology is preferred instead of traditional methods in many areas of work life. In this study, we review the review to highlight many perspectives for our project Mega Reji. Mega Reji is a gamified application that will be used by a film production company. Mega Reji gives users chance of communication with each other, planning their schedules, arranging preproduction process, production process and post production process. The goal of this project is, improve the performance of a film production team by enhancing their activities (e.g. managing their time effectively). To this end, we investigate the notion of gamification and state of art for movie production systems. To evaluate our system design we conduct Monte Carlo Simulation.

1.2 Introduction

In these days lots of companies are using technological tools in order to do their work easily and finish it in short time. Gamification which means the use of game elements in non-gaming practices becomes a latest subject in software development processes [1]. In addition, many companies start using gamification embeded in their applications in order to motivate the employees. According to Zichermann and Cunningham [2] gamification is helpful technique which is powerful in terms of applicability to many problems solved by individuals through effecting their motivation due to the fact that human factors are one of the most crucial factors for success [3]. Nowadays, in film production area, teams are starting to work with production applications. There are several applications for stage-management by companies including but not limited to Virtual Callboard [4], Yamdu [5], Edictive [6], Setkick [7], Studio Binder [8]. These applications have similar features, but not enough for all work in stage-management. We aim with our senior project Mega Reji, combine all features of these applications at one application in order to make all team members' work easier and lead to work them cooperatively. On the other hand, Mega Reji has a gamified system which incentives for team members to use Mega Reji application while doing their work. Besides, in this paper, we will convey our research about Monte Carlo Simulation Techniques for evaluation and related work such as Virtual Callboard, Yamdu, Edictive, Setkick and Studio Binder as we mentioned before.

1.3 Gamification

1.3.1 Reward System

Developing technology and workplace competition circumstances require more effort in terms of managers and employees. However, this situation leads intense work pressure on employees because of difficulty of competing with their rivals. For this reason, managers sometimes need to follow supportive paths such as reward systems in order to encourage the employees to work effectively. According to Wilson, one of the unique features of reward system is its capability of continue employees to focus on work, and encourage them to find new paths in order to reach their goals. In this way, employees are able to cope with negative situations while they are working on a project [9].

1.3.2 Gamified Systems

Gamification is becoming a popular and significant technological progress in work life. Gamification is the using game design items in non-game environment [10]. Gamification helps to solve problem with game component entertainingly. The presence of entertainment in the gamification makes it possible for boring events to reach more mass. This technology does not mean that users will be constantly being play games. There are more than 7 billion mobile phones in the world [11]. People interact with their smartphones frequently throughout the day and play games. Research shows that people enjoying themselves while spending time in the game. These behaviors of people who play games are very important for the formation of the concept of gamification. Gamification can have multiple uses in different projects. It is difficult to put gamification in a certain mold and formulate it. For each project has a special gamification can be provided for that project, and in this way the project users gain some advntageous behavior for their work life. It is ensured that the users are better adhered to the project due to the presence of entertainment elements and that these users are more loyal to the projects. If there is entertainment in any job or duty, the time and the success that people will want to spend will increase. Even the most tedious projects can be brought to an entertaining state with gamification. The interest of people in games, and the ease with which various media can be presented to the user gamification. Games are used not only for leisure but also by industries like defence, education, scientific exploration, health care, emergency management, cityplanning, engineering, religion, and politics. They are also called serious games and their main purpose is to train, investigate, or advertise [12]. For instance, educator can use it to make students learn more easily and quickly. Companies can use gamification to raise morale of their employees and establish more sustainable relationships or to increase their sales. Gamification has certain well-known properties. all

or none of which may be used or a different method. The major properties are virtual money, award, score, rank and progress rank. These are can use to increase competition and loyalty of the project.

1.3.3 Gamified System Examples

The research shows that there are various gamified mobile and web applications are used by companies or individuals. Some examples of these gamified applications are Foursquare [13], Nike + [14], BanaBak [15], ScrumKnowsy [16] and Visual Studio Achievements [17].

1.3.3.1 Foursquare and Swarm

Foursquare and Swarm are popular and frequently used mobile application. Foursquare and Swarm interact with each other. With Foursquare people can see other people's advices about places and they can get inform about places' features like opening and closing times, prices, etc. On the other hand with Swarm people get some points and rewards by checking in from their mobile devices. Depending on how often he/ she visit a place, it is possible to have different status names. They can make gifts or discounts depending on how much you check in restaurants and cafés. Based on the features of this application, it is possible to see places your friends are looking and liking. The playing elements increase the number of users to check in and visit more places.

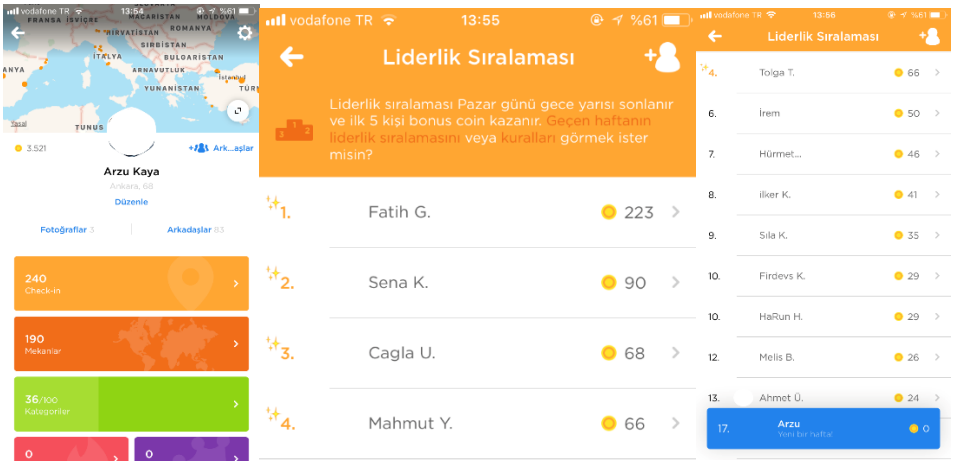

Figure 1: Swarm reward system

1.3.3.2 Nike +

Nike has developed a special system for some of its products. This system has been expanded with the elements of play. With this system, people liked and liked to play sports. Users can be included in this ecosystem by purchasing Nike + products and installing the Nike + app on smartphones or smartphones. Sensors on Nike + products communicate with intelligent devices to increase the number of steps, distance, speed, By integrating data with Nike + application, users are encouraging

spores. The fact that the Nike + application, which features gaming, helps users to target by giving them prizes, increasing the brand's commitment to users. The used play items create a fun mutualist situation between Nike and the users. Nike sells more products, and users have fun while buying and using the product.

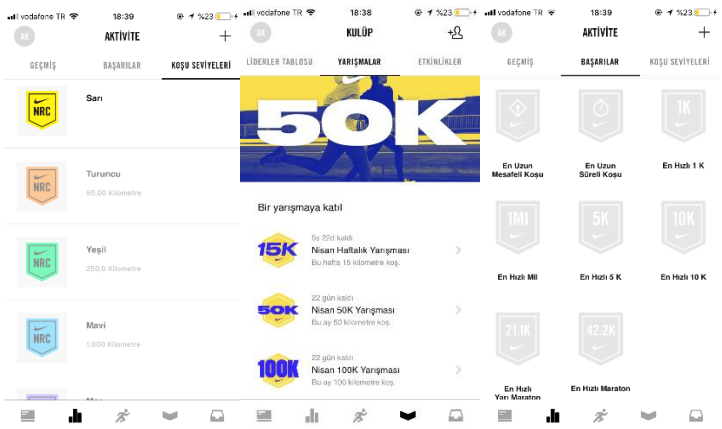

Figure 2: Nike+ Run Reward System

1.3.3.3 Bana Bak

The Bana Bak application is an application put on the market by the world famous P&G company. This application is only an example of plaything involving university students. In this application, users answer the questions, check in at the places where P&G products are found, and earn coins by proving that they buy P&G products. It is possible to spend these coins with certain options. Users can plant a sapling with these coins, photographic machine, bag, P&G products. Because it is the leader table, the users are allowed to enter the race with their surroundings. P&G offers the opportunity to use this product to increase awareness and add juvenile traits to its products.

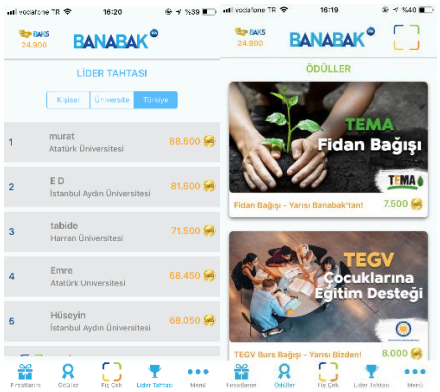

Figure 3: BanaBak Reward System

1.3.3.4 ScrumKnowsy

The ScrumKnowsy application is an application that uses the gamified system to improve the Scrum information of people or teams. This application contains specific questions and answers. Each question in the question has a different rating. Users and teams can develop scrum capabilities using this application.

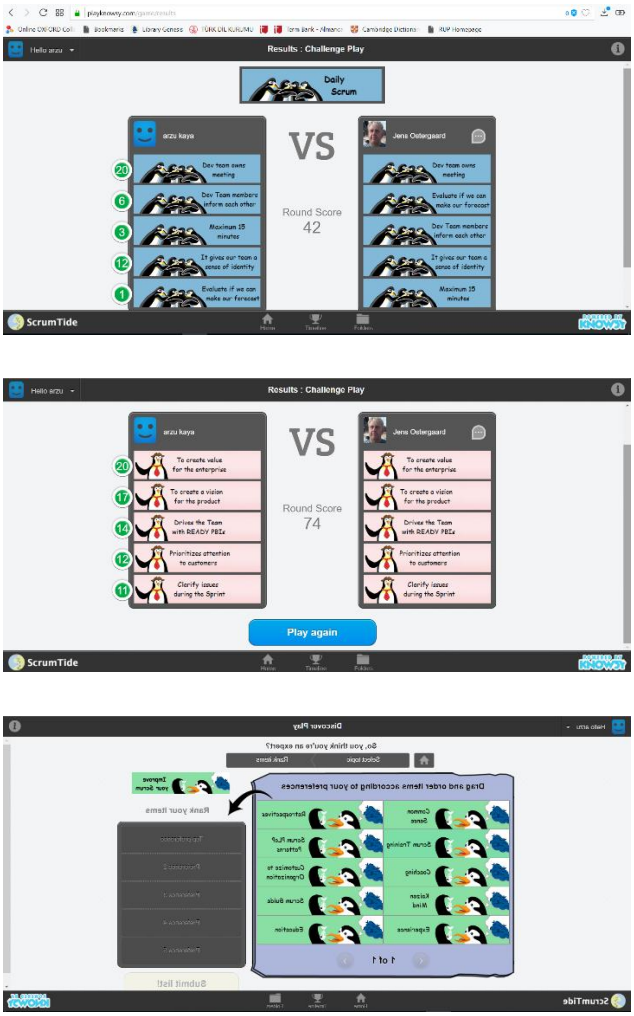

Figure 4: ScrumKnowsy Reward System

1.3.3.5 Visual Studio Achievements

Visual Studio Achievements is an add-on that is equipped with the gamifaction elements loaded into visual studio. The purpose of this extension is to remove the tedium of writing code. With this add-on, users can reach a certain level according to the codes they write. They can share this level with their friends. It can be seen how many people have written the code. With this add-on, Microsoft creates a special page where users can share their levels to make them feel more specific. With this add-on, I was encouraged to write code by collecting different badges. In this application, it is desired

that the platform is more used and used while the Microsoft is added to the actual playground to be more fun than other programming environments and programming languages.

1.4 Monte Carlo Simulation Technique

Monte Carlo simulation (i.e. statistical sampling) techniques is used to mimic the operations of complex systems and ultimately produce distributions of possible outcome values that relies on repeated random sampling to obtain numerical results. Computer simulation is an important part of software development process, because test and evaluation of a project are a guidance for software developer. For this reason, we choose Monte Carlo Simulation Technique in order to evaluate our project.

The term Monte Carlo Simulation Technique was introduced by Amelin in his paper as a class of methods to figure out a mathematical problems by using random samples [18]. Therefore, the most important part of simulation study is statistical results of data acquired from simulation model [19]. The term Monte Carlo was used by Von Neumann and Ulam in World War II as a secret term for a problem related with atomic bomb. This study included simulation of random neutron diffusion in nuclear materials [20].Monte Carlo Simulation Method is widely used in some areas such as finance, engineering, project and management etc.

1.5 Applications in Film Productions

There are several applications for film production by companies including but not limited to Virtual Callboard, Yamdu, Edictive, Setkick, Studio Binder. These applications provide some features to the users. For instance, CallSheets, Script Import, Sheet Breakdowns, Crew Management, Location, Calender, File Sharing, Shooting Schedule, Contact List, Announcements, Messaging, Financing and Post Production some of these features.

1.5.1 Features

1.5.1.1 Call Sheets

Digital calls sheet is a daily plan for all crew, people can be adapt to the schedule.

1.5.1.2 Script Import

Script import feature provides importing the script in PDF format.

1.5.1.3 Breakdowns

This feature provides to users complete set of breakdown and strip-boarding tools built right inside their browser with sheet breakdown.

1.5.1.4 Crew Management

This feature provides accessing cast and crew contact information easily.

1.5.1.5 Calendar

Schedule, then allocate tasks and milestones for your crew and colleagues on the project. Visually track progress.

1.5.1.6 File Sharing

User can share file with entire production or departments, also user can create folders in order to organize the files.

1.5.1.7 Shooting Schedule

Scheduling with scene numbers, roles, short synopsis, estimated shooting time, etc. Also, users are able to connect their shooting schedule.

1.5.1.8 Contact List

Users can manage and send messages to talent, crew, vendors, clients and more.

1.5.1.9 Announcement

Coordinators create announcement for all crew in order to inform them.

1.5.1.10 Messaging

Users can collaborate effortlessly with their crew, stakeholders easily.

1.5.1.11 Track Attendance

Managers can calculate the number of hours worked by each person in a given week.

1.5.1.12 Financing

Accountant can easily create unlimited financing scenarios, keep track on deadlines for fundings, and manage contracts and deliverables for their partners.

1.5.1.13 Post Production

Film production team be informed about post production periods.

1.5.2 Applications

1.5.2.1 Setkick

Firstly, Setkick is the least detailed stage production application we have encountered. Setkick provides users digital Call Sheets, Script Import, Sheet Breakdown, Crew Management and Location features. Digital calls sheet is a daily plan for all crew, people can be adapt to the schedule. Script

import feature provides importing the script in PDF format. Setkick provides to users complete set of breakdown and strip-boarding tools built right inside their browser with sheet breakdown. The another feature of Setkick is Crew Management. This feature provides accessing cast and crew contact information easily. The last service of Setkick is Location, users can access a map in order to choose set location.

1.5.2.2 Studio Binder

In addition to Setkick application, Studio Binder provides Calendar, File Sharing, Shooting Schedule and contact list. Users are able to share the files with their colleagues and access the colleagues' files by using file sharing platform. Shooting schedule is a significant and useful feature for crew in terms of getting information about shooting process.

1.5.2.3 Virtual Callboard

Virtual Callboard is a more developed application compared with Setkick and Studio Binder. In Virtual Callboard, there is an Announcement, Email, Forum, Track Attendance and Multi- Production Management parts. Managers can calculate the number of hours worked by each person in a given week by using Track Attendance part.

1.5.2.4 Yamdu

Yamdu is similar application with Virtual Callboard but it has some different features. For instance; Financing which managers easily create unlimited financing scenarios, keep track on deadlines for fundings, and manage contracts and deliverables for their partners. Breakdowns, each department should know needs and contributes the breakdowns part. Post Production, Yamdu provides accessing another application called ARRI Webgate, and crew uses this application for post-production by using Yamdu. In addition to these features, Yamdu provides Costume, Makeup and Prop Management organizations.

1.5.2.5 Edictive

The last application that we mention in this report is Edictive. There is a Dashboard which is visually track the project and individual work. There is a messaging platform which allows internal and external messaging different from email system. Also, script writer can write scenario and link to his/her production cast, crew, locations etc.

In conclusion all these applications have their own special features, but some features can be developed (please see Table 1).

	Announcements	Call Sheets	Messaging	Task Scheduling	File Sharing	Calender	Shooting Scheduling	Breakdowns	Financing	Contact List	Crew Management	Post Production
Virtual Callboard	✓		✓		✓	✓		✓		✓	✓	
Yamdu	✓	✓		✓	✓	✓	✓	✓	✓		✓	
Edictive	✓	✓	✓	✓		✓		✓	✓			
Setkick		✓			✓			✓			✓	
Studio Bİnder		✓		✓	✓		✓	✓		✓	✓	✓

Table 1: Existing Production Applications

1.6 Conclusion

In conclusion, Mega Reji is a film production software which will be used by film production teams. Gamification is a popular and common system in software era which means using game concept in software applications. Software developers aim motivate users by simple reward systems in terms of usage the application effectively and regularly. The main goal of this project is making gamified application in order to encourage and focus the production team members on their work. As we mentioned in this study before, there are several gamified applications in order to train employees and encourage users to work effectively. Furthermore, this literature review contains explanation about evaluation method of Mega Reji application. We are planning to evaluate our project with Monte Carlo Simulation Technique. Monte Carlo Simulation is a technique for computation of possibilites with data from project. Finally, there are several film production management applications in software sector, such as Yamdu, Setkick, Edict, ect. However, these applications do not fulfil all needs of film production teams. We are planning to unite all features of these applications in one application. Therefore, our literature review is concentrate on previous work related with our project and how to improve and gamified them clearly.

2. Software Requirements Specification

2.1 Introduction

2.1.1 Purpose

The purpose of this document is describing the project which is called Mega Reji: A Gamified Mobile Application Framework for Film Production System. This project aims to improve the performance of a film production team by enhancing their activities (e.g. managing their time effectively). This

document contains detailed information about requirements of the Mega Reji project. These requirements demonstrates constraints and recommended functions. Additionally, this SRS document explains how the users interact with Mega Reji, and explains how concerns of the stakeholders are met.

2.1.2 Scope of Project

In film production process, production director and general coordinator finish the whole work, which will be completed at the live stage, before the live stage and after the live stage. If this work is completed without any problem, the organization will be transferred person at the end of the cycle without any problem. However this organization tends to be complex. The main purpose of Mega Reji application is providing a coordinated atmosphere for all production team members and motivate them with a gamified system. The other purpose of this application is providing an easily accessible application for users. Therefore, this application is compatible with both website and mobile devices such as phone and tablet.

Mega Reji are planned to have several features that needs to function. In preproduction part, scenario writers are able to write scenario by using the Mega Reji application, then actors are able to see a report is prepared by application, and also the other part of crew can access the report partially. Lastly, the schedule will be create and whole crew can access it by using their computers, smart phones or tablets. In Production part, the production director works with location map in addition to location photo. By this way, the entire team will be able to reach distance and time information, where to get the services, where to refresh the make-up, the sound level of the environment, the food menu information at any time. In post-production part, whole crew or authorized people can access the which phase of post-production is working. Production team does not work on application. General coordinator links the application and real life and controls the system. In addition to previous applications, cast crew is able to sign their unavailable times to schedule, and then application calculates statistics of total unavailable times for each person, so time management is more efficient for shooting. Addition to cast crew, movie extras can be added the application. Production director confirms the information that comes from each person in the crew. Image group comments on the location photos that are added before the application. By this way, the camera assistant can see where the camera vehicle can park the in outdoor shooting according to the reports of the production group, and report that the cards have been delivered to the post-production assistant. Light group can see what materials they need in outdoors and who they need from the set team, they can transfer their requests to the set supervisor. The art group can offer their views to director and take requests from production group. Set group does every type of work.

2.1.3 Glossary

Term	Definition
Participant	A person interacts with the Mega Reji application such as producer, scenarist.
Stakeholder	A person who has interest or concern in the project.
Scrum	Scrum is an iterative and incremental agile software development framework for managing product development. [1]
Agile Development	Agile software development is a conceptual framework for undertaking software engineering projects which is used in order to minimize the risks. [2]
Software Management	Software management is the method used to develop the project in the best way.
Gamification	Gamification is application of reward system into software applications.

2.1.4 Overview of the Document

The second part of this SRS explains functionalities of the Mega Reji: A Gamified Mobile Application Framework for Film Production System. Informal requirements are described and it is a context for technical requirement specification in the Requirement Specification chapter. Requirement Specification chapter is written for software developers and details of the functionality of the simulation are described in technical terms.

2.2 OVERALL DESCRIPTION

2.2.1 Product Perspective

Mega Reji: A Gamified Mobile Application Framework for Film Production System is a film production application that involves gamified system for whole film production team. Mega Reji provides some

specialities for group members such as communication with each other, writing scenario, scheduling etc.

Mega Reji is compatible not only with website but also with mobile devices. In this way, users can contact with each other instantly and make arrangements on he schedule according to these instant changes. On the other hand, Mega Reji has some constraints for some teams in terms of usage of application. For instance, Sound Group can not has same authorizations with the Production Group on Mega Reji application.

2.2.1.1 Development Methodology

While developing this project, we are planning to use scrum. The projects to be managed by the scrum method are separated into the sections called sprints. The sprints can be run for 30 days. these sprint times are predetermined. Teams make short meetings every day; what to do the day before, what to do on that day, risks are discussed. each project member has knowledge of what other project members do, and the project is rigid. At the end of each sprint run a sprint report appears. With scrum, the success of the project increases and it becomes easier to find and return errors.

2.2.2 User Classes and Characteristics

This application is designed for usage of Producer, Production Group, Director Group, Post Production Group, Scenarist Group, Stage Group, Actors/Actress' and Other Groups in a film production company, Therefore, these users shall know how to use mobile device and computer. Additionally, these devices shall connected to internet.

2.3 REQUIREMENT SPECIFICATION

2.3.1 External Interface Requirements

2.3.1.1 User Interfaces

The use interface will be worked on website and mobile devices.

2.3.1.2 Hardware Interfaces

The application will work on website, mobile devices and tablets.

2.3.2 Functional Requirements

2.3.2.1 Pre- Production Use Case

Use Case:

EnterActorInformation

ApproveActor

ApprovePlace

SendNotification

OfferPlace

OfferActor

WriteScenario

MakeAPlan

Diagram:

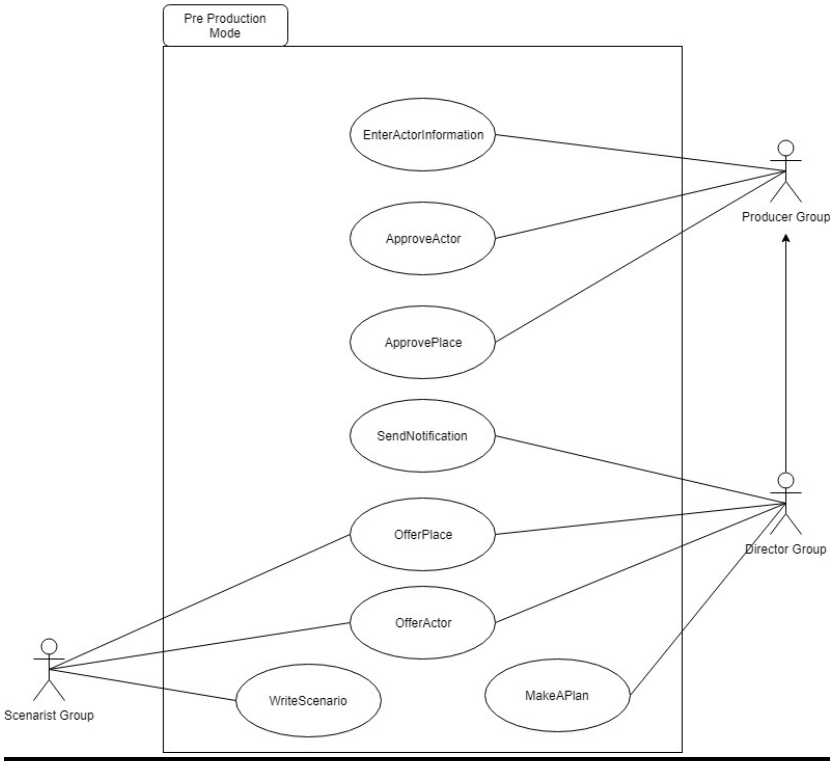

Figure 1: Pre-Production Mode

Brief Description:

Figure 1 is Pre-Production use case diagram, In this use case diagram, Scenarist, Director and Producer Groups can access this mode. This use case is the stage of preparation for production. the Scenarist Group at this stage writes the script through this platform and adds the necessary information with the help of software. Actor/Actress can be selected through the Actor/Actress database that is entered

into the system. Suggestions are made by photographs of the places and these are approved. The Director Group creates this report in line with this information and informs other users through the software.

Initial Step by Step Description:

1. When Scenarist Group enter the system, Scenarist Group shall write script.

2. Scenarist Group can add photo for scenario's place.

3. Scenarist Group can attach which of actor/actress can act better performance in scenario's parts and they can offer it.

4. When Producer and Director Groups enter the system, they shall enter actor/actress information about actor's physical features, history of acting and fee schedules .

5. Producer and Director Groups can see scenario which is writing from Scenarist Group

6. Producer and Director Groups can offer place with uploading photo and shall approve place which is offered from Scenarist, Director and Producer Groups.

7. Producer and Director Groups can offer an actor/actress and shall approve actor/actress with given offer.

8. Director Group shall make a plan for actor/actress, Sound Group, Light Group, Display Group, Art Group, Production Group and Stage Group.

9. Director Group shall send notification about plan all member of production.

2.3.2.2 Production Use Case

Use Case:

CreateRequestReport

ViewLocationReport

ViewAllRequestReport

MakeAPlan

Send Notification

Diagram:

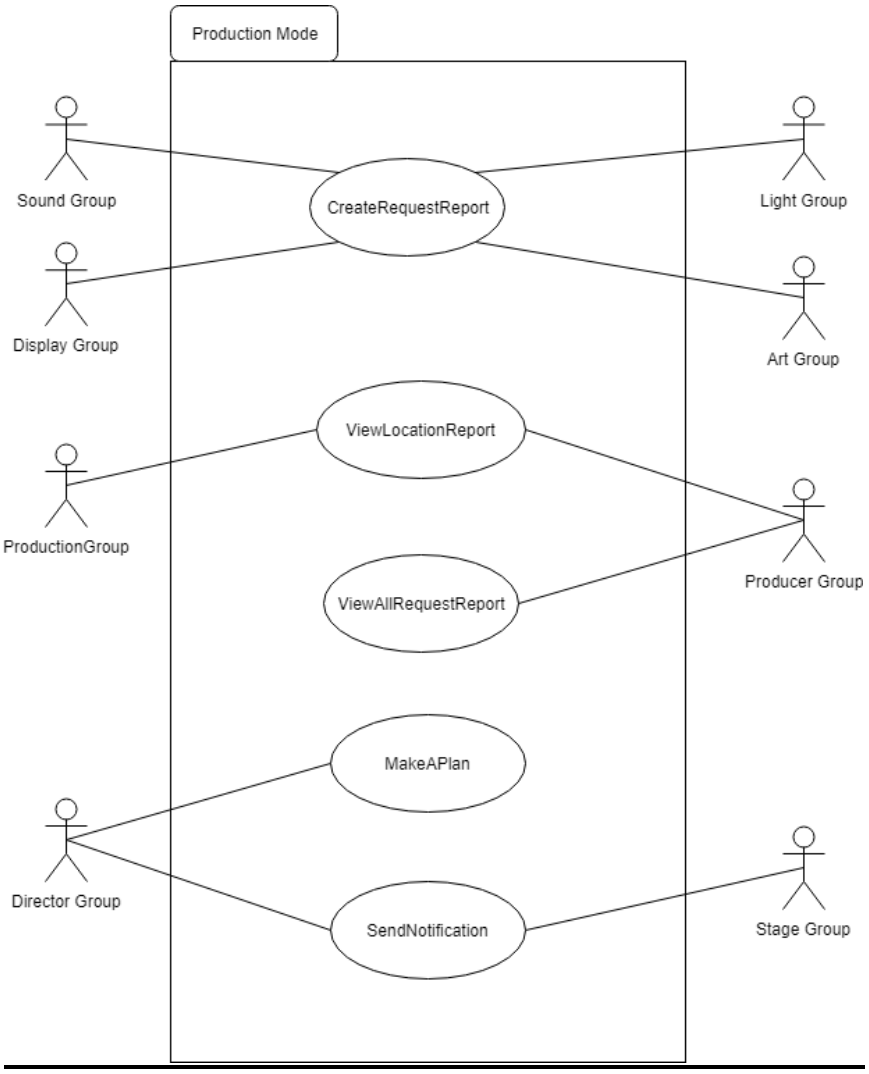
Production Mode
Sound Group
Display Group
ProductionGroup
Director Group
CreateRequestReport
ViewLocationReport
ViewAllRequestReport
MakeAPlan
SendNotification
Light Group
Art Group
Producer Group
Stage Group

Figure 2: Production Mode

Brief Description:

Figure 2 is Production use case diagram, In this use case diagram, Sound, Display Light, Art, Production, Producer, Director and Stage Groups can access this mode. This mode is the section where camera shots begin. Users are expected to create some reports to ensure coordination. These reports will help solve the business more easily.

Initial Step by Step Description:

1. The equipment that the Sound Group will use can be requested via software.
2. Display Group establishes a report by specifying notifications of what materials are needed about display.
3. Light Group create request report for the completion of the missing equipment.
4. Art Group can present their report with photo and can get feedback from who shows their request report.
5. Producer Group can view all request report and location report. So they follow the process.
6. Production Group can see location report and they will make their production works such as purchases, transportation, food, stationery more productive.
7. Stage Group will be able to send a notification that starts the countdown. this countdown tells you when the shots start.
8. Director Group shall make a plan and inform the person.

2.3.2.3 Post Production Use Case

Use Case:

CreatePostProductionReport

Diagram:

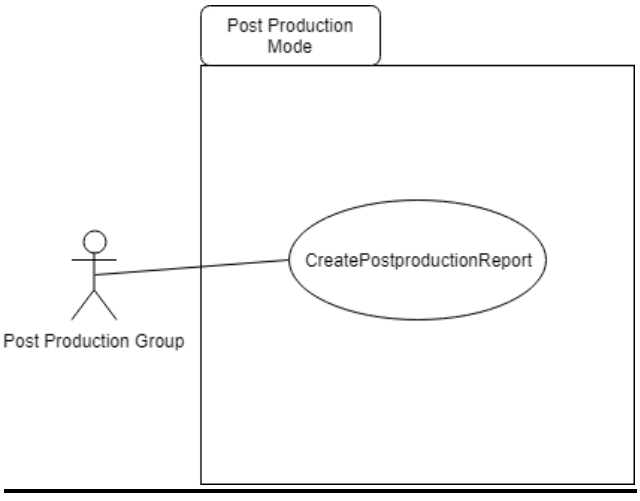

Figure 3: Post Production Mode

Brief Description:

Figure 2 is Post Production use case diagram, In this use case diagram Post Production Group can access this mode. This mode about the section in which the section is reported after the shootings are over.

Initial Step by Step Description:

1. Post Production Group shall report which parts of the images are rendered, how much time is left to finish rendering and color correction about the images or videos.

2.3.3 Software System Attributes

2.3.3.1 Portability

Mega Reji is designed for mobile devices/tablets and website. Users are able to access the application by using their both their mobile devices and PCs.

2.3.3.2 Performance

This system shall response in real time, any operation on the stored information, shall complete in less than 10 seconds.

2.3.3.3 Usability

This system is designed for all film production team members. For this reason, each member can use this application easily with a simple user interface. In addition, new team members can adapt to the system easily.

2.3.3.4 Adaptability

The system is adaptable to Android, iOS and Windows.

2.3.3.5 Security

There are not too many confidental data in the system. On the other hand messaging between people and their personal information will be preverved.

3. Software Design Description

3.1 Introduction

3.1.1 Purpose

The purpose of this Software Design Document is providing the details of project titled as “Mega Reji: A Gamified Mobile Application Framework for Film Production System”.

The target audience is members of film production team. Mega Reji application provides a coordinated work environment for film production team members with a gamified system.

The purpose of Mega Reji project is creating an environment in order to make easier synchronization and communication between film production team members. In film prduction process, sometimes conflict can occur in team members in terms of decision making phase. Therefore, Mega Reji assures that all members from each department of film production company will get rid of possible problems while pre- production, production and post production phases. Mega Reji has three main modes: Pre-Production, Production and Post Production. Participants login to the system according to their roles in film production team, and then use the system according to constraints which are determined by admin. Pre-Production mode consists of Producer Group, Director Group and Scenarist Group. In this mode, Scenarist Group writes the script by using Mega Reji application, offers actor for appropriate role, and offer a place to shouting. Producer Group approves the information which comes from Scenarist Group and then Director Group makes a plan according to information which is approved by Producer Group and send notification to all team members about plan. Production mode consists of Stage Group, Producer Group, Director Group, Production Group and Art, Display, Sound, and Light Groups. In Production Mode, Art, Light, Display and Sound Groups create request reports according to their needs, Producer and Production Groups view reports relevant to location and requests, and then Stage Group sends notification about schedule to film production team members according to created plan by Director Group. Lastly, Post Production mode consists of only Post Production Group. In this mode, Post Production Group creates report about how is going on post production phase.

Mega Reji project is designed as an application which is compatible with web, mobile phones and tablets. By this way, all members in film production company can access the application whenever they need.

In order to provide more detailed information about flow of Mega Reji Project, this SDD includes several diagrams such as UML diagram and Activity diagram and explanation about sequences.

3.1.2 Scope

This document contains a complete description of the design of Mega Reji for Film production system.

The JSP extension is Java Server Pages. JSP technology allows you to easily create web content, both static and dynamic pieces. It allows HTML and server-based Java programs to work together.

Android is an operating system developed by Google and used by millions of people. Android operating systems are available on mobile phones and tablets. Linux operating system kernel is used. It builds the Android base structure. Apk supports the extension. Android-based phones are useful devices in many ways. Especially being a Java supporter is becoming one of the most noticeable features of phone and tablet users. Every Android-based phone and tablet allows many applications to run and use very easily.

The Android operating system consists of five parts.

- The kernel: The kernel is the Linux kernel. It includes security, memory management, process management, network stacks, and driver models.
- Android Runtime: Virtual machine.
- Libraries: Includes database libraries, web browser libraries, graphics and interface libraries.
- Application Framework: It is the part that provides a broad platform for application developers.
- Applications: Includes applications developed directly in the Java programming language.

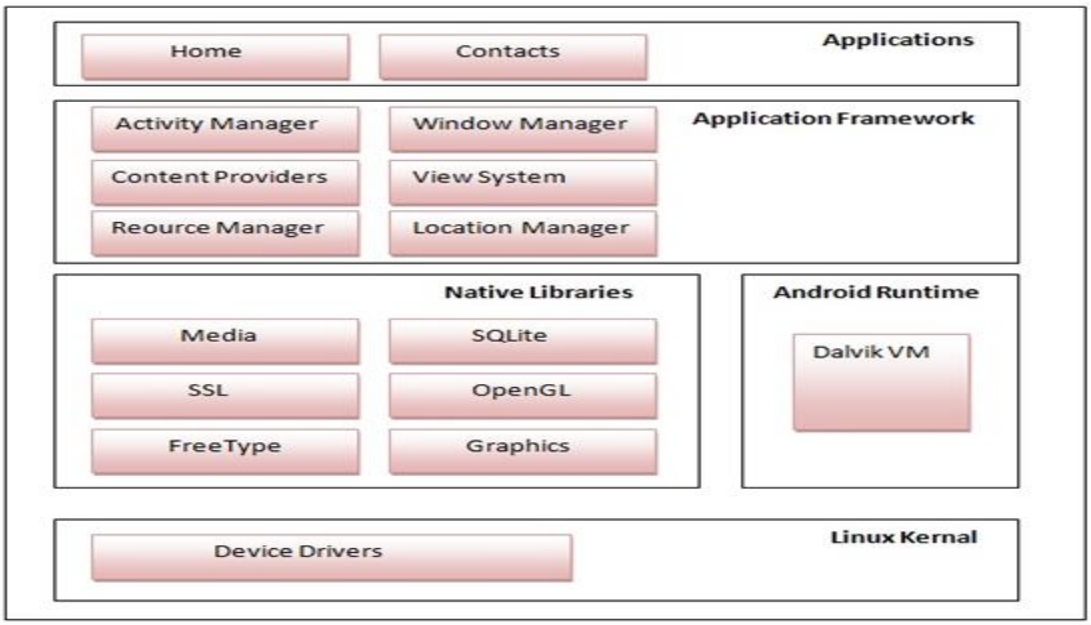

Figure 1: Android architecture

Scripting part of the project is occurred using java in mobile application which is developed for Android and web application. Java is open source code, object oriented,platform-independent, high-performance, multi-functional, high-level, an interpreted language. We chose the Java programming language because of rich resources and libraries.

3.1.3 Glossary

Term	Definition
BLOCK DIAGRAM	A type of diagram which demonstrates the interaction between subsystems.
PARTICIPANT	The user who interacts with the Mega Reji system such as producer, or member of Director group.
SDD	Software Design Document.
UML DIAGRAM	A type of diagram which demonstrates interaction between classes and their functions in the system.
GANTT CHART	It can be expressed briefly as a business plan chart. In this work plan chart, which work is done and when dependent and independent jobs are defined.

3.1.4 Overview of Document

The remaining part of this document consist of three parts. Section 2 is Architectural Design which describes the project development phases and class diagram of the system and architecture design of Mega Reji application which describes actors, exceptions, basic sequences, priorities, pre-conditions and post conditions. In addition to project development phases and class diagram in section 2, there is an activity diagram. Section 3 is Use Case Realization which includes block diagram of the system. This block diagram is designed according to use cases in SRS document. Section 4 is related to user interface design. In this section we have shown some sample screenshots from Mega Reji application.

3.1.5 Motivation

We are a group of senior students in computer engineering department who are interested in gamification and mobile platform. As a group, we have taken the course of java programming for a better understanding object oriented programming. We aimed to combine the fields of education, web programming, mobile programming and gamification in this project. When we are researching about gamification, we find out this technology is so popular but nobody knows it is a gamification.it affect on secretly people's behaviour. Our aim is combining gamification element with web and mobile platform.

3.2 ARCHITECTURE DESIGN

3.2.1 Architecture Design Approach

In software engineering, during a project is developing, division of labor and working iteratively is crucial in terms of interfere the problems instantly. Because of this, we have planned to use Scrum in our project. In scrum, project proceeds incrementally and iteratively. The projects divided into small sections that is called sprints by Scrum method. Team members make short daily meetings in order to discuss the general situation and new requirements. There are several advantages of Scrum, for instance, developers can adapt easily to changes in requirements. Other advantage of Scrum is convenience for fast improvement. Sprints provide coding, testing and correcting the errors, and taking feedback from the customer and response his/her requests instantly, due to the fact that working with small chunks prevents disruption.

In Gantt chart shown in Figure (, represents working phases and durations of our senior project. By using Gannt chart we divided our tasks into small pieces and we visualize flow of our project.

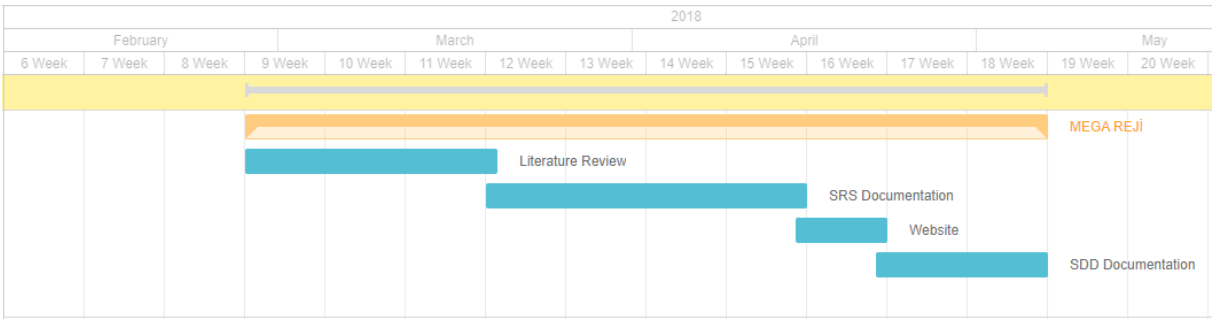

Figure 2: Gantt Chart

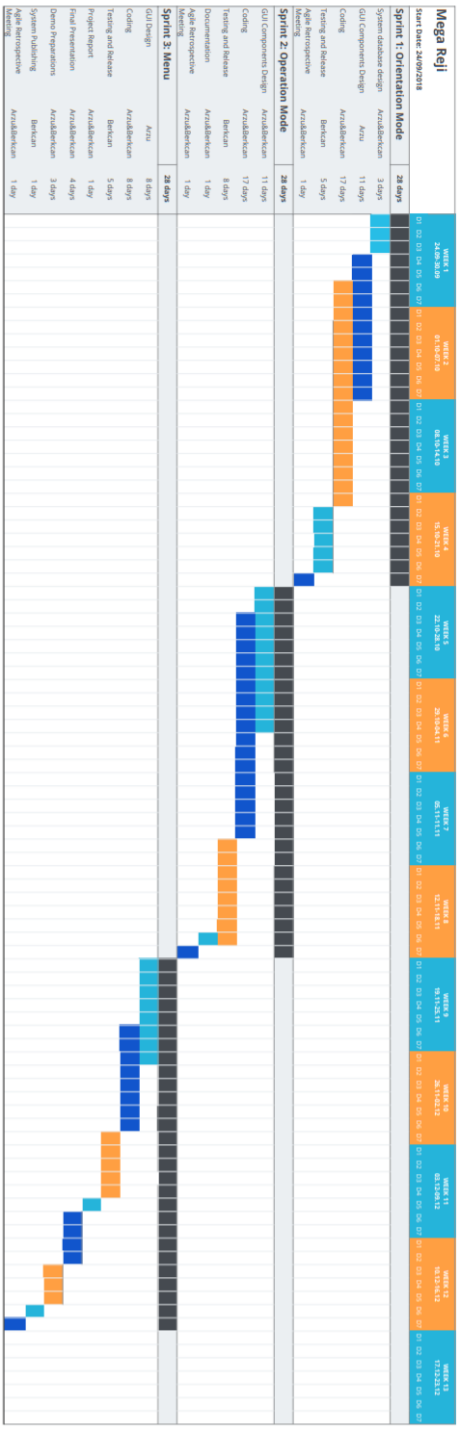

Figure 3: Our planned Gannt Chart

3.2.2 Class Diagram

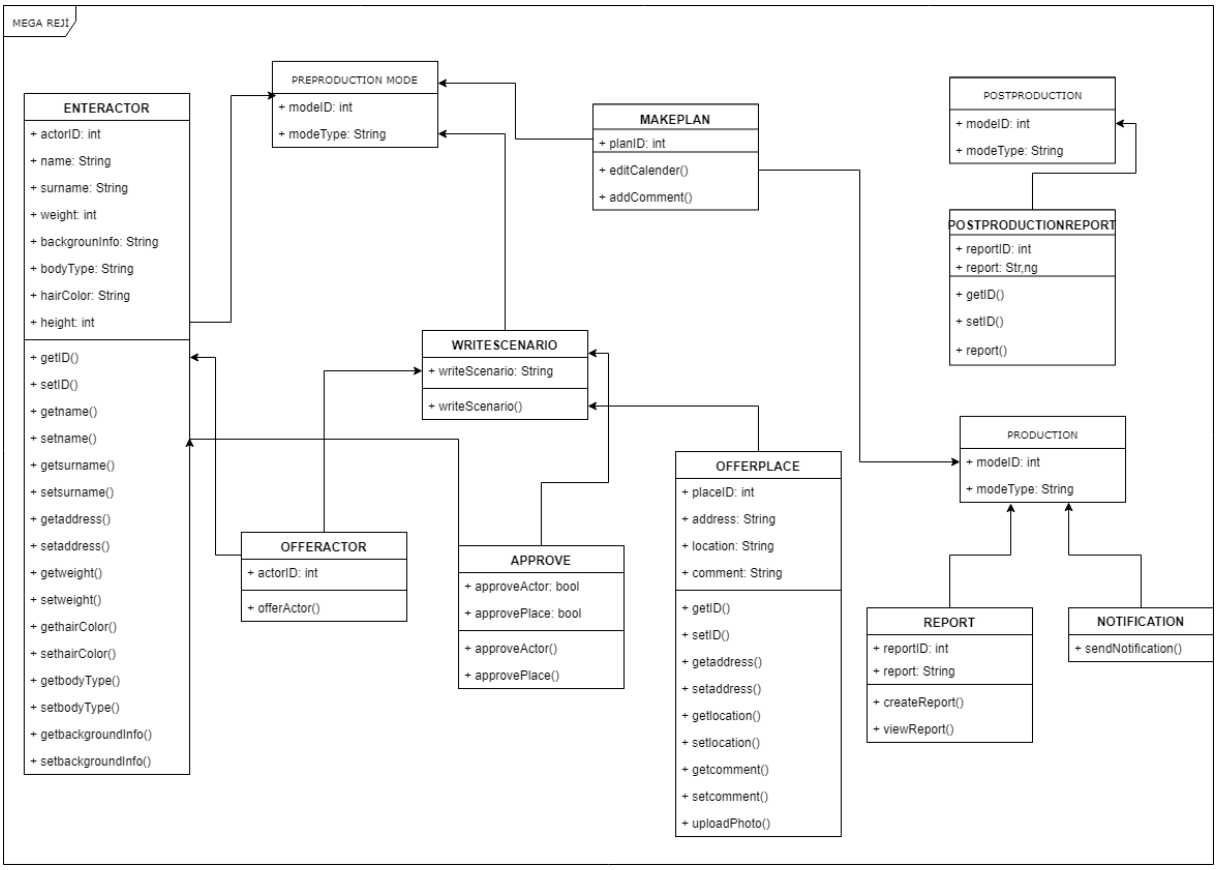

Figure 4: Class Diagram of Mega Reji Project

Figure 4, shows that information about connection between the systems within Mega Reji. There are three main systems which consist of Pre-Production, Production and Post Production. Pre-Production system includes EnterActor, WriteScenario, MakePlan, OfferActor, Approve, OfferPlace functions. Production System includes MakeAPlan, SendNotification, ViewAllRequestReport, ViewLocationReport and CreateRequestReport functions. MakeAPlan and SendNotification functions are used by both Pre-Production and Production Classes. In PostProduction class there is an function which is callled CreatePostProductionReport.

3.2.3 Architecture Design of Software

3.2.3.1 Profile Management System

Summary: This system used by participant and admin. Members of film production company, register the system with their name, role, user name and password. Then, login to system with their user name and password. Each type of the participants has different control page because of the contraints.

Actor: Film production company member, admin

Precondition: User must run the program.

Basic Sequence:

1. User shall register if he/she doesn't have an account.

2. User shall login to the system by entering his/her username and password.

3. User can update his/her personal information by selecting update button

4. from user menu.

5. Admin can delete a user account by selecting delete button from admin menu.

6. Admin can approve a user account which is registered recently by selecting approve from admin menu..

7. User can exit from the system by selecting exit button.

Post Conditions: None

Priority: Low

3.2.3.2 Pre-Production Mode

Summary: In this mode, members of each groups can make changes in the direction of contraints and obligations.

Actor: Producer Group, Scenarist Group, Director Group

Precondition: Participants shall login to the system and Director and Producer Group shall choose Pre-Production Mode.

Basic Sequence:

1. Scenarist group can write script.

2. Producer and Director Groups shall enter actor/actress information.

3. Producer and Director Groups shall approve place.

4. Producer and Director Groups shall approve actor/actress.

5. Director Group shall make a plan for actor/actress, Sound Group, Light Group, Display Group, Art Group, Production Group and Stage Group.

6. Director Group shall send notification about plan to each members of company.

Post Conditions: Production

Priority: Medium

3.2.3.3 Production Mode

Summary: In this mode, members can create request reports, view some part of reports, make a plan or send notidicaiton accordin to their obligations in Mega Reji application.

Actor: Sound, Light, Art and Display Groups, Production Group, Producer Group, Director Group and Stage Group

Precondition: Participants shall login to the system and Director and Production Groups shall choose Production Mode.

Basic Sequence:

1. Sound, Light, Art and Display Groups can create a request report.

2. Production and Producer Group can view location reports.

3. Producer Group can view all request reports.

4. Director Group can make a plan.

5. Director and Stage Group can send notification about remaining time to other members of film production company.

Exception: Database connection can be failed.

Post Conditions: Post Production

Priority: High

3.2.3.4 Post Production Mode

Summary: In this mode group members creates report abour post production.

Actor: Post Production Group

Precondition: Participants shall login to the system.

Basic Sequence:

1. Post Production Group members can create report about post production in order to inform other members.

Exception: Database connection can be failed.

Post Conditions: None

Priority: High

3.2.4 Activity Diagram

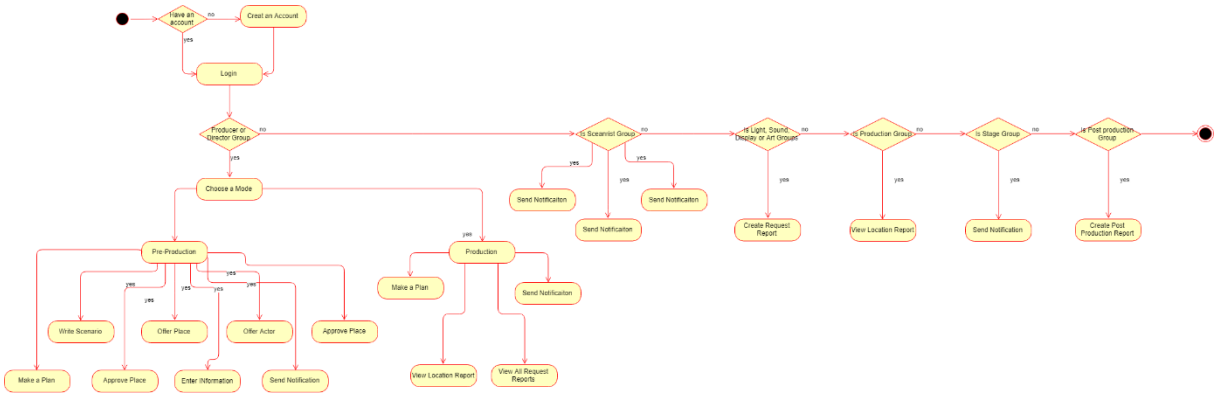

Figure 5: Activity Diagram of Mega Reji Project

Figure 5 shows the interaction between the system and users. Members of film production company shall login to system. If the user is a member of Producer or Direction Group, they shall choose Pre-Production or Production mode. If the user is not a member of Producer or Direction Group, they do not have to choose a mode, then they work on their own pages.

3.3 USE CASE REALIZATIONS

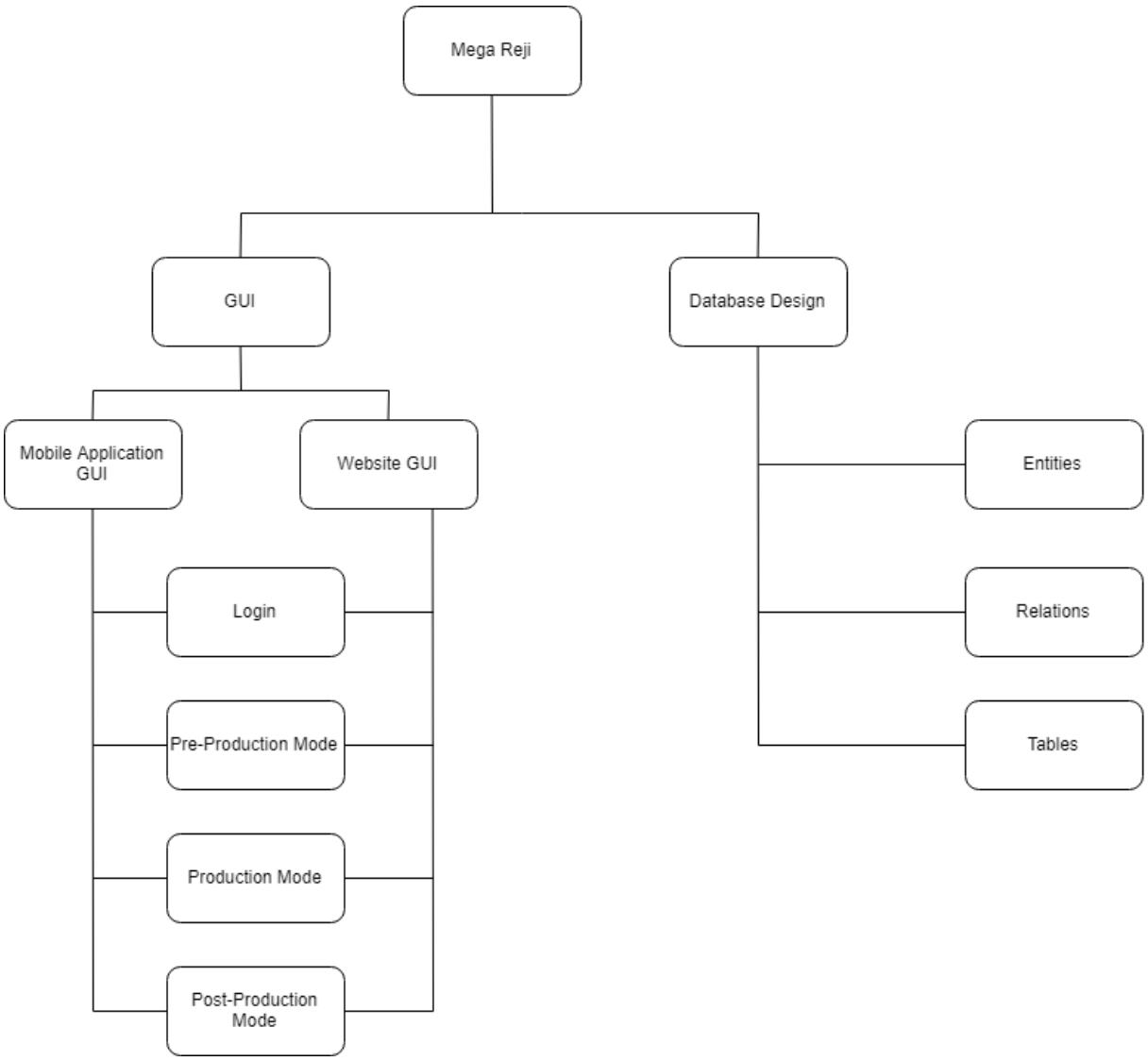

Figure 6: Project Components of Mega Reji Project

3.3.1 Brief Description of Block Diagram

In Figure 6, components of the Mega Reji Project are shown. There are two main components of the project, and Graphical User Interface part has two sub systems in terms of Mobile Application and Website. The other main component Database Design has three sub systems.

3.3.1.1 GUI

GUI design is responsible for interaction between producer group, director group, scenarist group, sound group, sight group, display group, art group,production group, stage group and post-production group. There are three sub-system in this design which are Mobile Application GUI and Website GUI. These two sub-system are divided into other sub-system. These sub-system consist of Login, Pre-

Production Mode, Production Mode and Post-Production Mode. GUI design includes ease of use and simplicity. Also it contains gamification features.

3.3.1.2 Database Design

Database design is responsible for managing data which read and write from the system. There are three type of Database in the system which are Entitites, Relations and Tables. These are about design features. In database, communication information of all members of film production company, physical features and communitcaiton information of actors/actress', place information, time information will be kept.

3.4 GRAPHICAL INTERFACE DESIGN

3.4.1 Profile Management System

In Profile Management System, user enter the system, and login into system with his/her user name and password, if the user has not an account he/she shall create an account. In order to direct the user to register page, there is a register button in main page. After direction of register page, user shall enter his/her name, surname, email address, user name and password.

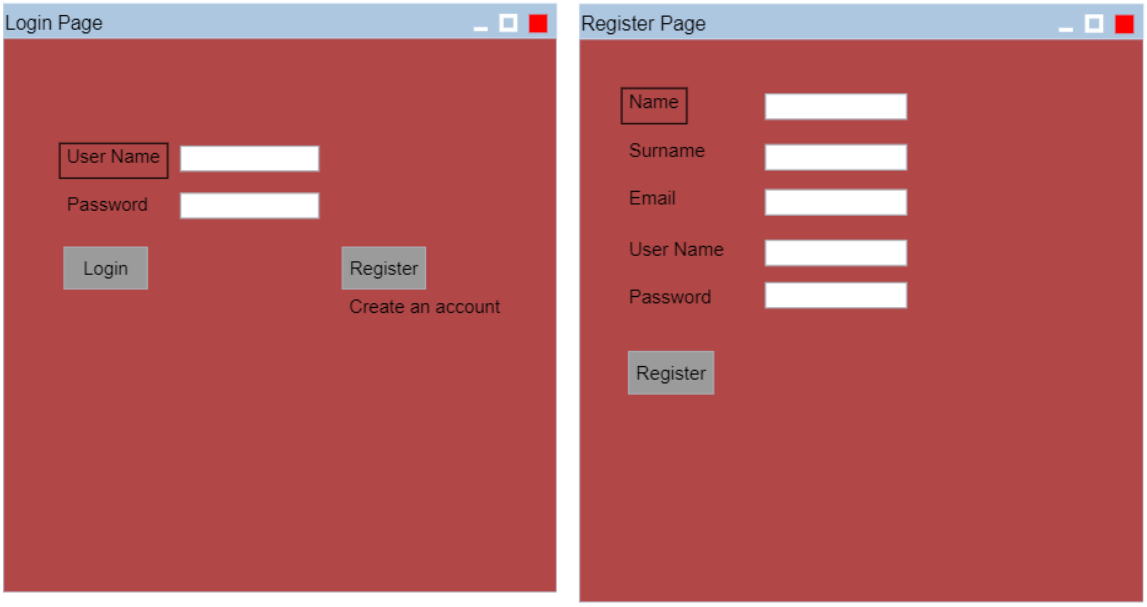

Figure 7-8: Login and Register Pages

3.4.2 Producer and Director Pages

In this mode user is directed to his/her own page according to his/her role in the film production system. There is an exception for Direction and Producer Groups as it shown in Figure 8 and 9 which needs to choose a mode after the login phase.

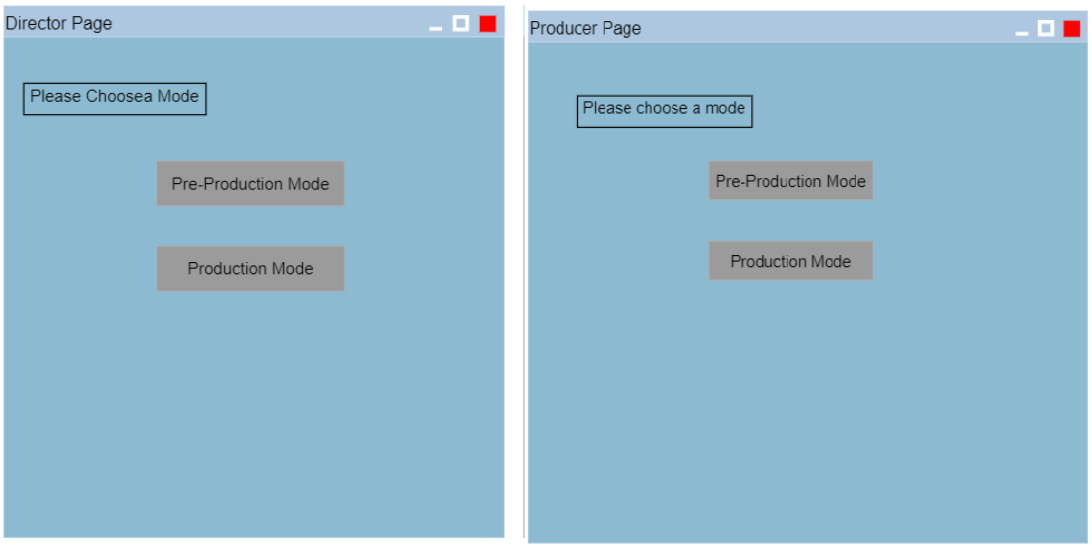

Figure 8-10: Director and Producer Page

3.4.3 Pre- Production Mode

In this mode Direction, Scenarist and Producer Groups are directed thier own pages.

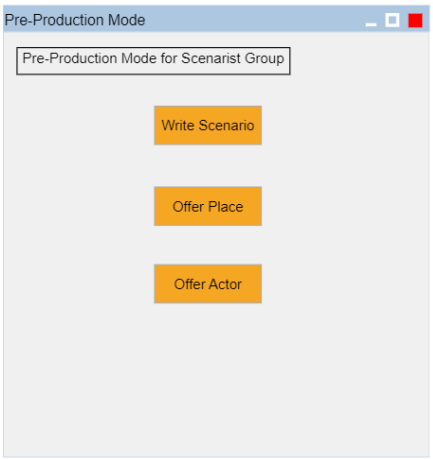

Figure 11: Pre-Production Mode for Scenarist Group

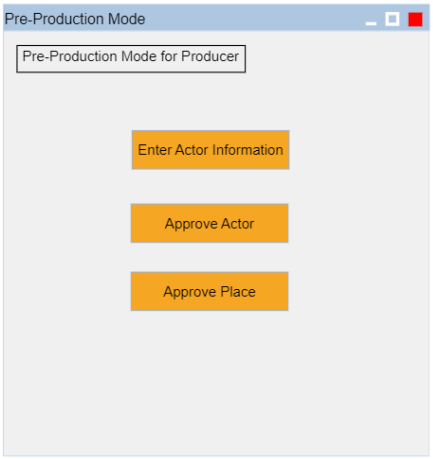

Figure 12: Pre-Production Mode for Producer Group

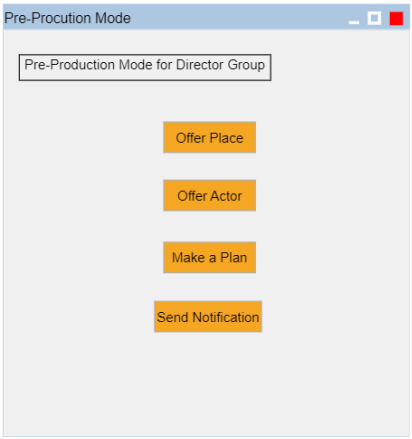

Figure 13: Pre-Production Mode for Director Group

3.4.4 Production Mode

In this mode Production Group, Stage Group, Producer Group, Director Group, Art, Design, Light and Display Groups take part. Production Group page has a button for view location report, Producer Group page has view location report and view all request reports buttons(Figure 14 and 15), Director Group page has a button for making a plan and sending notification, Art,Display,Light and Sound Groups page has a button for creating a request report (Figure 16 and 17). Stage Group page has send notification button (Figure 17).

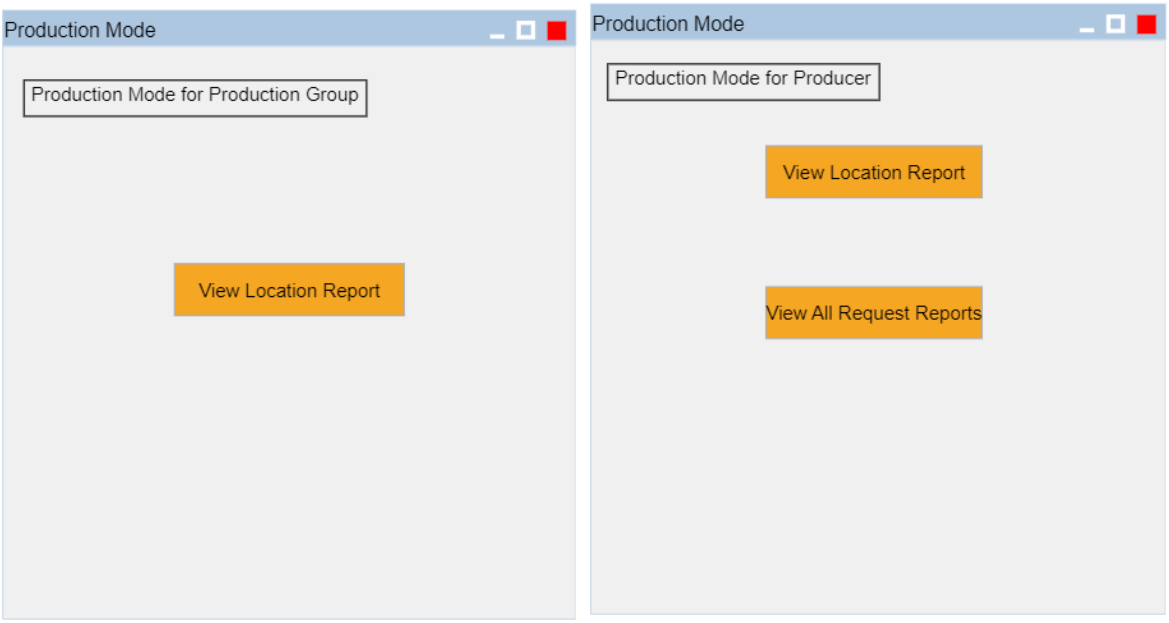

Figure 14 and 15: Production Mode for Production and Producer Groups

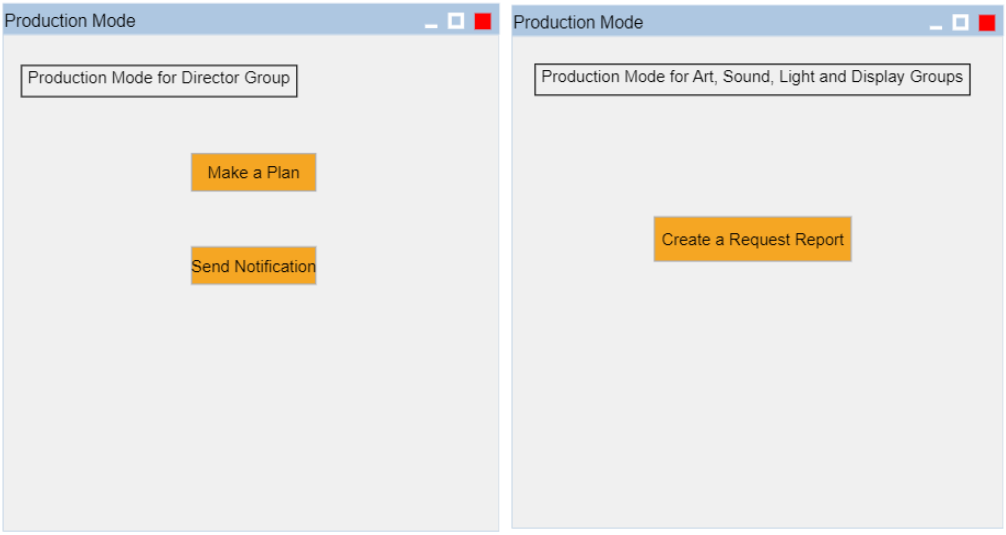

Figure 16 and 17: Production Mode for Director and Art,Display,Light and Sound Groups

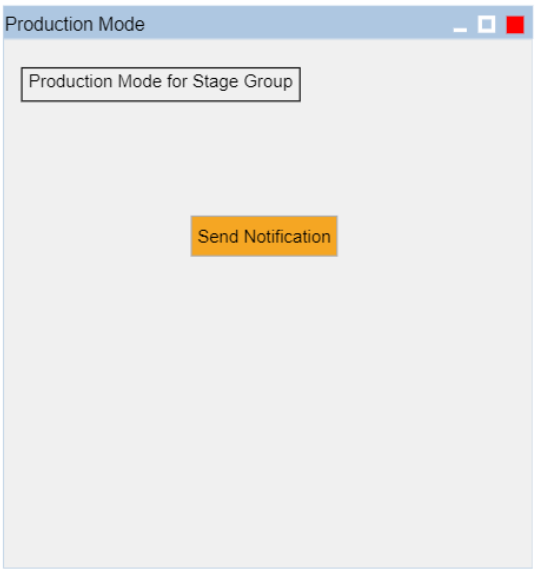

Figure 18: Production Mode for Stage Group

3.4.5 Post Production Mode

In this mode is able to access by only Post Production Group members. There is a button for creating a post production report in order to inform other members of film production company.

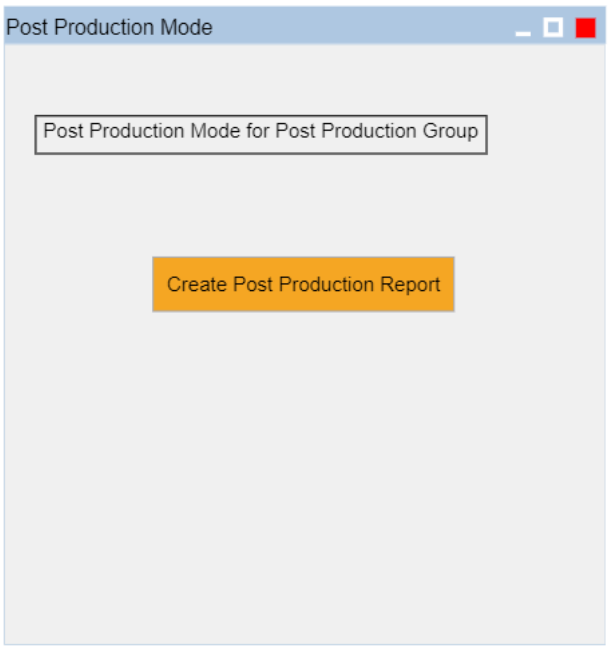

Figure 19: Post Production Mode for Post Production Group

4. Conclusion

The aim of the present document was to examine Literature Research, Software Requirements Specification and Software Design Document of Mega Reji: A gamified mobile

application framework for stage management system. Mega Reji is an application for usage of film production company members. We have planned to use Android Studio for mobile devices, Netbeans in order to script in Java and MySQL in order to store data of film production company.

Our main purpose with this project is to initiate an interactive environment to film production company members in order to enhance their performance. Because of this, to design this project we have done some research about film production process, some deficiency which is encountered by film production company members while they work, roles in a film production company and related work which have been done before. In addition to these we have done resarch about Spring Framework, so in this document we do not mention about Spring Framework, but if we adapt Spring Framework to our project, we are planning to use it and we are planing to update our documents. According to these research we recognized that we are enthusiastic to develop this project.

5. Acknowledgement

We would like to express our deep and sincere gratitude to our project supervisor, Dr. Murat YILMAZ, for giving us to the opportunity to do project and providing invaluable guidance and advices throughout this project. His vision, sincerity, wisdom and motivaiton have deeply inspired us. We are also greateful to Ali BERKMAN in UTRLAB because of providing an opportunity to work together.

References

Appendices