Software Requirements Specifications

Scavenger Hunt Game Using BLE Beacon

Ümmügülsüm Kaşıkçı, Aslıhan Asena Şahin, and Nuri Akseli

(c1311028, c1311054, c1611653)@student.cankaya.edu.tr

Department of Computer Engineering,

Çankaya University, Turkey

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1 INTRODUCTION

1.1 Purpose

The purpose of this document is to define the application that is called the Scavenger Hunt Game Using BLE Beacon. The system is formed with a BLE Beacon device and a mobile application. This application aims to be a mobile game which is using fun and creative game dynamics in it. Collecting points by doing the specified jobs in the given task list to get the highest point is the goal of this game. This document describes the application. Requirements of the project are given in this document.

1.2 Scope

Nowadays, people's jobs are becoming monotonous and they want to have fun in their daily lives. In work life, people are may not adapt themselves to their works or workplaces. Else, their lives became boring or they just wanted to interest in other stuffs. Therefore, their work efficiency will decrease. This is same for students. Once a student is feeling bored, they do not want to do anything willingly. This mobile application will be a Scavenger Hunt Game's mobile version so this application will make people's jobs funnier. Schools and universities can use it to create teams to get done the given tasks. Or, kids can use it just for fun. This application's main goal is to make everyday life funnier and adapt people to their living space more easily.

1.3 Definitions

Term	**Definition**
Software Requirements Specification (SRS)	The description of a software system to be developed.
BLE Beacon	The device which sends low energy Bluetooth signals.
Android	Android is an operating system for mobile devices.
Database	A database is a collection of information that is organized so that it can be easily accessed, managed and updated.
Firebase	Firebase is Google's mobile application development platform that helps you build, improve, and grow your app.

1.4 References

IEEE. IEEE Std. 830 - 1998 IEEE Recommended Practice for Software Requirements Specifications. IEEE Computer Society, 1998.

1.5 Overview

In this document, we indicated the main parts of Scavenger Hunt Game. We explained the goals of our mobile application and described how the mobile application should work. We mentioned about the functionalities of the system. Both functional and non-functional requirements are mentioned in different sections.

2 OVERALL DESCRIPTION

2.1 Product Perspective

As mentioned earlier, this application is mobile version of the Scavenger Hunt Game. So, it has similar rules in this application. Users have some roles like becoming players or game creators. Game creators create areas and give some missions to their players. Then, players try to do the given missions in specific locations tagged with Bluetooth Low Energy Beacons and try to earn points to get the highest score. BLE Beacons just provide the necessary signals and with this signal the system confirms that the task has been completed. In this way, people interact with each other and they strengthen the relationships between them.

2.2 Product Functions

The main purpose of the Scavenger Hunt Game Using BLE Beacon project is to maximize work efficiency and make people happy. In this way, people's life quality can increase and people can build stronger relationships with each other. With this application people can have:

- Skill of work sharing,
- Time management,
- Easily adapt to group work,
- Competitive spirit.

For doing all of these, the application should be dynamic, it cannot be static. Also, it will have security functions to secure users' information and it will have easy to use interface to be playable by every age user.

2.3 User Characteristics

2.3.1 Players

Players must have register to the mobile application as players.

Players must know how to use the mobile application.

2.3.2 Game Creators

Game creators must have register to the mobile application as game creators.

Game creators must know how to use the mobile application.

2.2.3 Admin

Admin must have knowledge about software development life cycle.

Admin must have knowledge about Android platform.

3 SPECIFIC REQUIREMENTS

3.1 External Interface Requirements

3.1.1 User Interfaces

The user interface will be worked on mobile devices which has Android operating system version 7.0 or above.

3.1.2 Hardware Interfaces

The application will be required mobile devices with Bluetooth hardware on it because BLE Beacon is a Bluetooth technology device.

3.1.3 Software Interfaces

There are not any external software interface requirements.

3.1.4 Communications Interfaces

There are not any external communications interface requirements.

3.2 System Features

3.2.1 Login and Register Features

3.2.1.1 Introduction of Feature

This feature is about how to access to the system. All users need to register first to use the system. They also have their own authority. This authority used to perform access control in the system; and, if they use their own information correctly, they can get into the system. Admin has the ability to manage the users and their authority.

3.2.1.2 Stimulus/Response Sequence

Stimulus: A user attempts to get into the system.

Response: The system authenticates the user.

Stimulus: A user attempts to register in the system.

Response: The system checks the user whether already registered or not.

Stimulus: Admin attempts to change a user's authority as admin.

Response: The user is admin now.

3.2.1.3 Associated Functional Requirements

3.2.1.3.1 Login System

Description: In login system, all actors are able to log in to the system; and, if they gave wrong information to the system, there will be a login exception to protect system's safety. And also, all actors are able to change their passwords and logout from the system. The flowchart diagram of login system is shown in Figure 1.

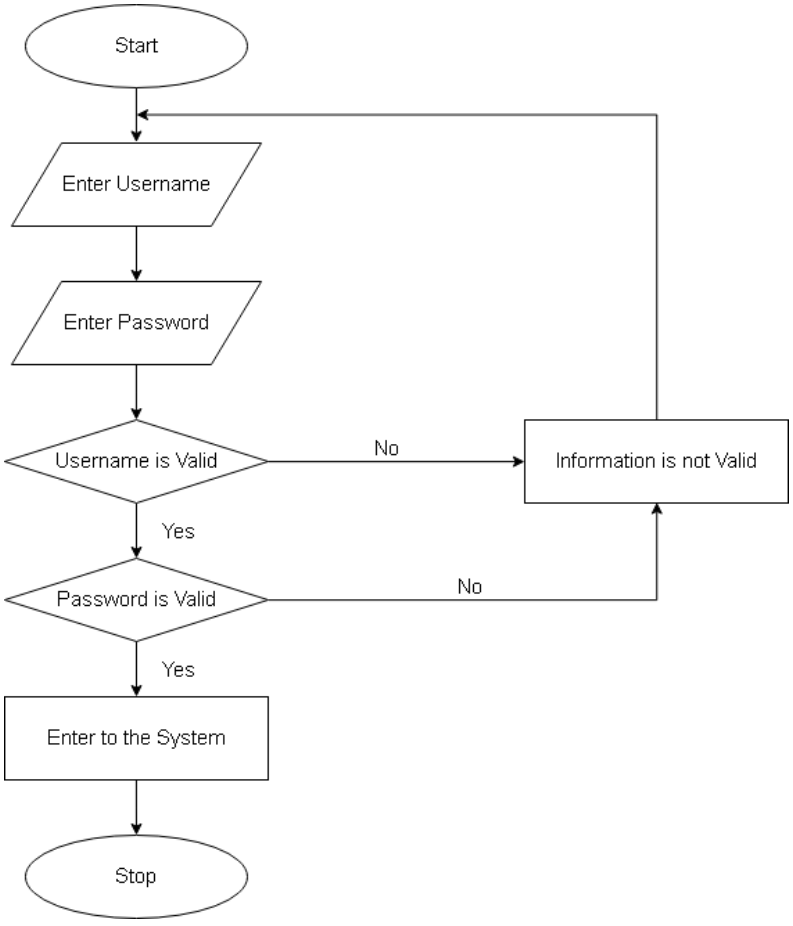

Figure 1 The flowchart diagram of login system

3.2.1.3.2 Registration System

Description: In registration system, players can register as a player or game creator; but no supervisor can register, because supervisors need to take this authority form another supervisor. The use case of registration system is shown in Figure 2.

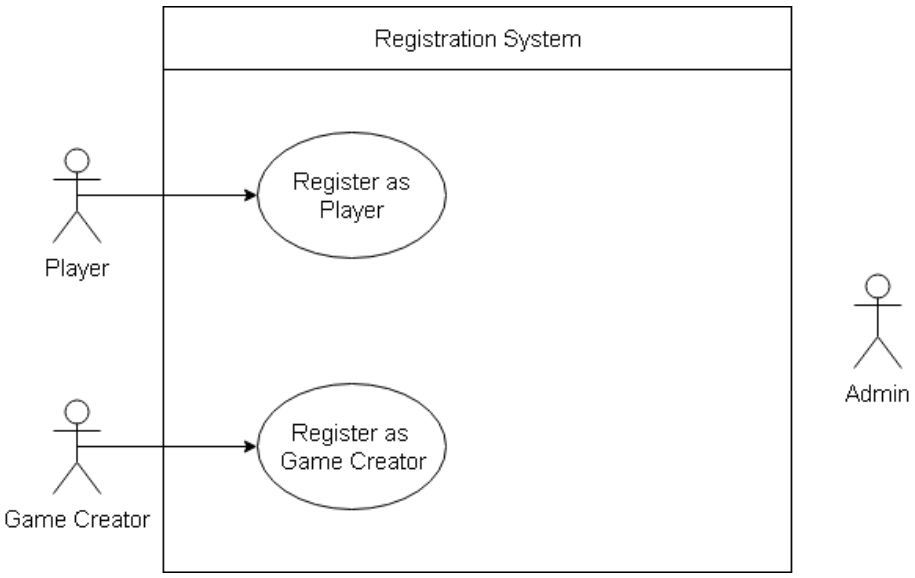

Figure 2 The use case diagram of registration system

3.2.2 Defining Games Features

3.2.2.1 Introduction of Feature

This feature can be count as basic element of the system. In this feature, game creators decide which missions will be in the game areas; and the players who are registered to a specific area will try to do the missions. If the mission is about taking a photo, game creators will control the photos and give points to players; but if game creators just want players to spend some time in somewhere, the system will determine players' time and give their points automatically.

3.2.2.2 Stimulus/Response Sequence

Stimulus: A game creator attempts to add a mission to the system.

Response: The mission is added for his/her players.

Stimulus: A player attempts to upload a photo for mission.

Response: The photo is uploaded to the system.

Stimulus: A game creator attempts to change a mission.

Response: The mission is changed.

3.2.2.3 Associated Functional Requirements

3.2.2.3.1 Game System

Description: In mission system, game creators can add a mission, change its points or change all of it, remove a mission, and players can do missions and they can earn points. The use case diagram of game system is shown in Figure 3.

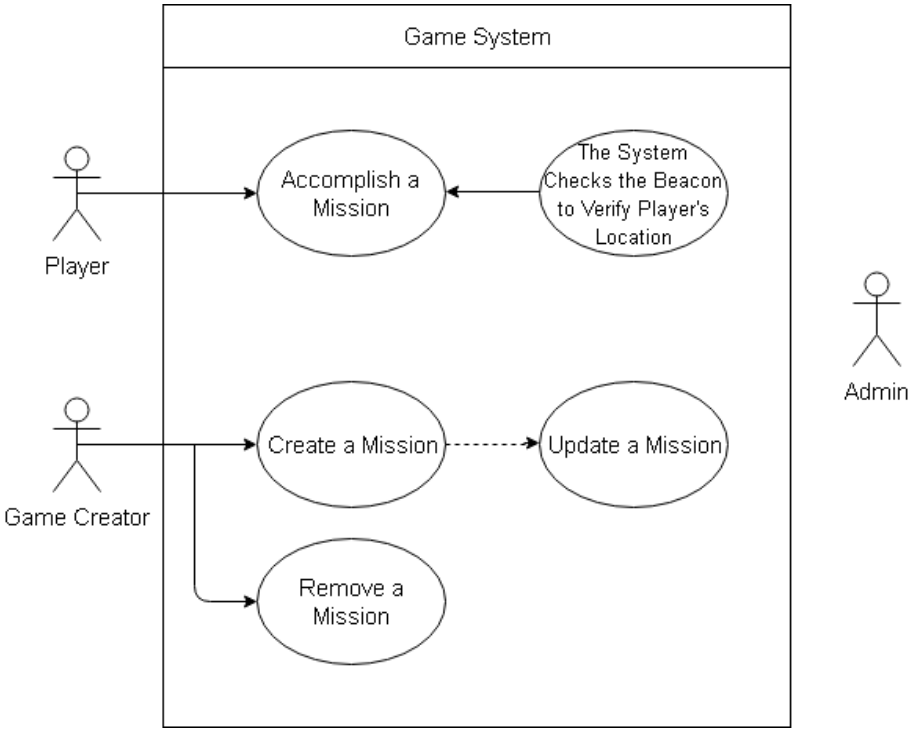

Figure 3 The use case diagram of game system

3.2.3 Scoreboard Features

3.2.3.1 Introduction of Feature

This feature can be count as the goal of the system. When players do their missions correctly, they gain mission points. This game can count as a competitive game with the scoreboard, because if a player completes all of the missions correctly, he/she gains the highest score and see himself/herself at the top of his game's scoreboard.

3.2.3.2 Stimulus/Response Sequence

Stimulus: A game creator attempts to see the scoreboard.

Response: The system shows the scoreboard that belongs to his areas to the game creator.

Stimulus: A player attempts to see the scoreboard.

Response: The system shows the scoreboard to the player.

3.2.3.3 Associated Functional Requirements

3.2.3.3.1 Scoreboard System

Description: In this feature, players can track their score and they can compare their scores with others. Also, game creators can see the scoreboard that belongs to their areas and they can see who their champion is. The use case diagram of scoreboard system is shown in Figure 4.

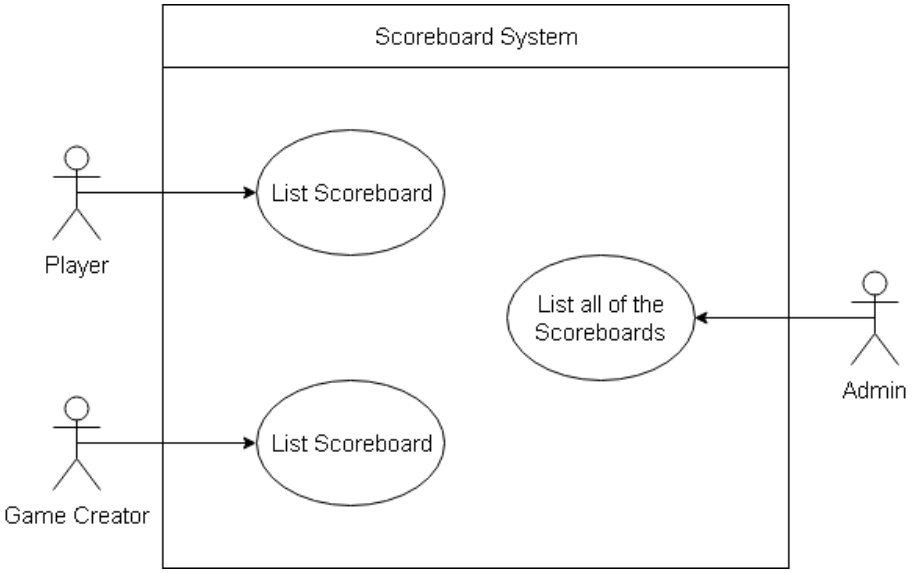

Figure 4 The use case diagram of scoreboard system

3.2.4 Beacon Operations Features

3.2.4.1 Introduction of Feature

This feature can be used to identify areas and it is used to understand the players which are in these areas during the missions. In this way, the system verifies the players' locations and it determines when players begin to their missions.

3.2.4.2 Stimulus/Response Sequence

Stimulus: A game creator attempts to add a beacon.

Response: Beacon added in to the system.

Stimulus: A player attempts to end his/her mission.

Response: The system verifies his/her location and ends his/her mission.

3.2.4.3 Associated Functional Requirements

3.2.4.3.1 Beacon Operations

Description: In the beacon system, game creators can add beacons to symbolize the areas or eject a beacon. And, players can connect them with their device's Bluetooth module. After that, when a player starts to do a mission, the system will check the player's location. The use case diagram of beacon operations is shown in Figure 5.

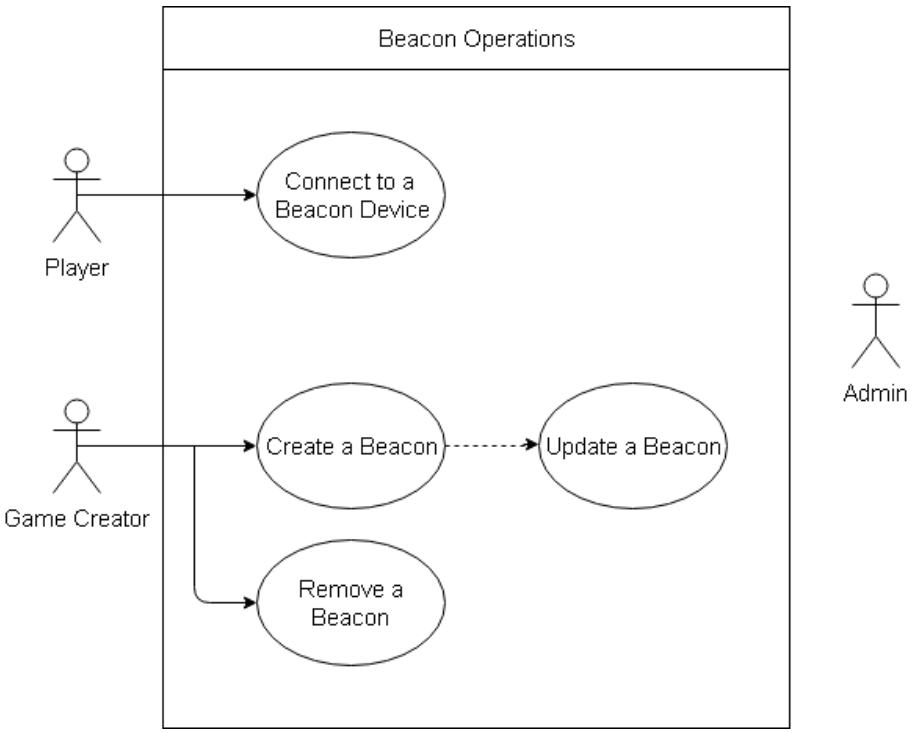

Figure 5 The use case diagram of beacon operations

3.3 Performance Requirements

For the Scavenger Hunt Game to work properly, user's device must not be on battery safe mode; because in this mode, Bluetooth module cannot work stable and Bluetooth must be always on. Also, players must be in the range of beacon device to end his/her missions. If beacon's signal is low, system may not approve the missions.

3.4 Design Constraints

3.4.1 Main Example: Scavenger Hunt Game

This game will be a mobile application of scavenger hunt game, so the rules should be similar with it.

3.4.2 Software Language

All coding parts will be done in standards of Android programming.

3.4.3 Data Management System

For database, Google's Firebase system will be used.

3.4.4 Determining Location

BLE Beacon devices used for determining location.

3.5 Software System Requirements

3.5.1 Usability

The mobile application will have easy interfaces and it will be used easily by any new user.

3.5.2 Portability

Scavenger Hunt game must work in every current Android device. It is designed for the devices with Android version 7.0 and above, so it must work properly with current version of Android platform.

3.5.3 Performance

The mobile application must open in maximum three seconds, work without freezing and respond as fast as it can.

3.5.4 Scalability

The mobile application will not need so powerful hardware, so it will work properly on standard Android devices.

3.5.5 Security

In this mobile application, users must log in to get into the system and user's information will store safely in the system. Therefore, other users cannot access it. BLE Beacon devices work in one direction, so it will not give location information to other users.