BSCS FINAL PROJECT

Requirements Specification

Defense Drill



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Software Requirements Specification

Version 1

Defense Drill

Advisor: Rubab Javaid

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Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
|  |  |  |  |
|  |  |  |  |

# Abstract

Now a days due to rampant crimes in the country which have no end in sight, ordinary citizens are being caught up in situations they are not ready for. They are unable to protect themselves and those close to them because they do not have the required skillset to remain calm and act in accordance to avoid getting hurt, robbed, or killed. To counteract that we have developed an app which has courses for beginners as well as advanced users which will provide the user with the skillset to at-least defend themselves in dangerous situations.

At the end, the results that would be acquired are: provided the user with ability to defend themselves and make a citizen not so helpless in dangerous situations anyone. Intermediate users and advanced users could be eligible for a career in mixed martial arts by participating in a tournament to test their ability according to their badge levels.

# Introduction and Background

## Product (Problem Statement)

Our project solves the problem plaguing our nation i.e., people having no form of self-defense/self-preservation ability. Our app provides that skill that is obtainable even after completing the most beginner course we offer.

## Background

This Project aims to provide ordinary citizens with the knowledge and skill of self-defense. The tutors will also be able to sign up and upload their portfolios. The users will interact with the tutors through online seminar. This project provides the user beginner and if the user wishes to learn more, advanced skills which would enable the user to protect themselves and their loved ones in a dangerous situation. Complete new animations made by us to provide a visual representation of the martial arts move. The project also provides notifications of tournaments to pit users against each other according to badge/skill level. Freelance martial arts tutors can also hugely benefit from providing one-on-one lessons to confirming skill level for a fee. The app has image processing to ensure correct repetition of moves. This project has an app based designed to run efficiently on all systems with accurate responsiveness.

## Scope

We will make an mobile and web app that provides a three-course program that teaches martial arts from beginner to the advanced level. The app would contain one-to-one video call for students and tutors. An image processing module to calculate repetitions. A badge system that will award badges based on course completion. The ability to create an account for both the student and tutor. Complete new animations made by us to provide a visual representation of the martial arts move. Complete documentation and code of project

## Objective(s)/Aim(s)/Target(s)

We will make an app that provides a three-course program that teaches martial arts from beginner to the advanced level. The app would contain one-to-one video call for students and tutors. An image processing module to calculate repetitions. A badge system that will award badges based on course completion. The ability to create an account for both the student and tutor. Complete new animations made by us to provide a visual representation of the martial arts move. Complete documentation and code of project

## Challenges

The challenges we will face during the completion of this project includes designing, understanding and implementation of algorithms, collection of data for creating a perfect platform where Users (Students / Tutors) can easily interact. Implementing python-based image processing and creating animations from scratch. Learning the animation software e.g., Adobe Maya.

## Learning Outcomes

After the completion of our project, we will have learnt mobile application development, data sharing, database linking, animations, image processing and documentation. We will learn the use of adobe maya, coding in python for image processing/AI. We will learn how to create a database, how to interact with it efficiently and use it to its maximum potential. Our methodology would be a prototype modeling. We will create prototypes and make further improvements to it. It will have a version-based design I.e., alpha, beta stages to its design.

## Nature of End Product

Our product will be mobile. The first module would be the sign in/sign up screen. The sign-up screen would lead to another module where data input would be communicated with database which would help the sign in module. Another module would be course selector including beginner, intermediary and advanced. This course selector would further expand to show step-by-step workouts with their respective **self-made animations** and **videos**. One module will be tutors sign in/ sign up. This module will work like user module. One module will consist of tutor hiring where their hourly rate and qualifications will be described including reviews. One module will consist of online seminar to give a platform between user and tutor. One module will handle the camera to ensure the repetition/count of martial arts moves performed through Image processing/AI**.** One module will handle the **badge system** that enables users to progress from beginner to intermediary and further to advanced. Without a badge the bigger courses will be locked out. The last module will consist of two categories including self-defense and professional martial arts. Respective user can only take professional martial arts after clearing the self-defense course. This professional category will have the same course structure and badge system as self-defense module.

## Completeness Criteria

|  |  |  |
| --- | --- | --- |
| **S.No.** | **Criteria** | **Weightage %** |
| 1 | Mobile GUI/Content | 25 |
| 2 | Data Creation for Image Processing | 20 |
| 3 | Database | 10 |
| 4 | Online seminar | 15 |
| 5 | Repetition Count Module | 20 |
| 6 | Animations | 10 |

## Business Goals

Our main business goals are:

* To provide martial arts training who cannot afford training institutes and outdoor tuitions.
* To provide earning platform for trainers.
* To provide free courses and paid online classes for trainee.

## Related Work/ Literature Survey/ Literature Review

Our application is different based on every level. We use animations to describe martial arts moves and provide a module that through image processing/AI to count repetitions of moves. We have various levels of courses for different end users based on their skill levels. Our app is all encompassing and does not focus only on one module provides the environment of a fully functioning useful application. As told to us by the project office, a project that relates to us is some gym app. Our app teaches martial arts not gym exercises and it does not correct posture counts the repetition of martial arts moves. The applications that are like ours include:

Martial Arts - Training and workouts whichis an app like our project in a sense of organizing courses on different type of martial arts e.g., krav-maga, wing-chun.

Fighting Trainer is another martial arts app that focuses on animation to teach. However**, our app** only focuses on Mixed martial arts with these unique features and the number

of functionalities it offers which includes: Webinar for face-to-face interaction, Image-Processing to keep count of the repetitions performed through camera, Self-Made Animations with every move, Badge System to indicate whether user is eligible to use another course. The badges are provided when a tutor has a session with user, sees his skill according to the course attempted and giving the badge on successful attempt. Notifications of tournaments held and registration in accordance to badge level.

## Document Conventions

This document uses the following conventions:

|  |  |
| --- | --- |
| **DDRL** | Defense Drill |
| **Main headings** | Size 18 bold times new roman |
| **Sub headings** | Size 14 bold times new roman |
| **Headings content** | Font size 12 style Ariel |

# Overall Description

## Product Features

The major features of our application is:

* Enrollment or register
* Daily activity
* Self-made animations
* schedule for a week/month
* levels of training beginner intermediate and advanced
* Push Notifications and Reminders
* progress tracker
* score of daily activity
* badge levels
* online couching
* repetitions counter

## User Classes and Characteristics

We have 2 levels of users

* User module: This is a normal level of user who will be very few number of functionality for website and mobile application.
* Administration module: This user is an admin type who has full rights on the system

## Operating Environment

|  |  |
| --- | --- |
| **Desktop** | shall operate in all popular browsers e.g. internet explorer, google chrome, uc browser, Firefox with flash player and java script |
| **Mobile** | smart phones over android 6.0 and IOS operating systems for its application. |

## Design and Implementation Constraints

* The information of all users like schedule, activity and self-made animations must be

stored in database that is accessible by the website and mobile application.

* SQ lite will be used as database.
* User may access its web from any computer that has internet browsing capabilities

and an internet connections and on smart phones mobile app must be installed.

* Smart phone memory should be above 2 gb for smooth running of Defense drill

Application.

* Camera specs must be above 8 megapixel for repetition counting without any error.
* Users must have their correct usernames and passwords to enter into their online

profile and do actions.

* Language requirements: software must be multilingual, including the following

Languages: English, urdu and Hindi.

* This app must be able to access the devices GPS to offer location based couching

facilities

## Assumptions and Dependencies

* If no internet connection is available, users will be unable to log in or access any

functionality of the app.

* This project needs the following third party product

SQ lite database for storing data

* Unregistered users will have no access to the app.
* Users will only be permitted to register and gain access to the app once they agree to

the terms of service agreement.

# Functional Requirements

Functional requirements are written bellow:

## Enrolment and registered

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-1 | |
| **Purpose** | | Get registered and enrolled to access courses and activities | |
| **Priority** | | High | |
| **Pre-conditions** | | User has been enrolled in the app | |
| **Post-conditions** | | user get access to the app | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will enter email | | System have verified the email and request to set password |
| **2** | User will enter password in password field | | System check password format and shows valid password. |
| **3** | User will select fb login or gmail login instead of set email and password | | System will get permission from user. |
| **4** | User will press sign up button to complete enrollment | | System will login |
| **Alternate Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1a** | User will enter email | | System will show invalid email or shows its already exist. |
| **2a** | User will enter wrong password format in password field | | System will check password format and shows invalid password or show weak password. |

**Table 1: UC-1**

## Training routine

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-2 | |
| **Purpose** | | Get routine of training activity according to user | |
| **Priority** | | Low | |
| **Pre-conditions** | | User get routine of training | |
| **Post-conditions** | | set daily routine | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will select training tab | | System will shows different training routines |
| **2** | User will choose routine and set timing | | System will save the selected routine and shows routine daily |
| **3** | User will on the notification of routine which is selected by them | | System will shows notification and remind user by sending notification |
| **Alternate Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **3a** | User will on the notification of routine which is selected by them | | System will not shows notifications |

**Table 2: UC-2**

## Self-made animations:

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-3 | |
| **Purpose** | | Check the steps with help of animations | |
| **Priority** | | Medium | |
| **Pre-conditions** | | User gets to know proper steps with the help of video etc. | |
| **Post-conditions** | | User gets self-made animation of martial arts steps | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will login | | System will check user name and password and get access to courses and trainings |
| **2** | User will search activity name of step | | System will show activity that is searched by user. |
| **3** | User select the animation of particular activity | | System will show the proper steps with proper detailing by animations |

**Table 3: UC-3**

## levels of traning

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-4 | |
| **Purpose** | | Choose training level basic intermediate or advanced | |
| **Priority** | | Medium | |
| **Pre-conditions** | | User select training level basic intermediate or advanced | |
| **Post-conditions** | | User get training courses according to level | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will login | | System will check user name and password and get access to courses and trainings |
| **2** | User will select training level | | System will get training courses according to user request |

**Table 4: UC-4**

## progress tracker

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-5 | |
| **Purpose** | | Get to know the traning progress | |
| **Priority** | | Low | |
| **Pre-conditions** | | User select progress mode of day,week or month | |
| **Post-conditions** | | System shows progress info | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will click on profile tab | | System will show tab menu |
| **2** | User will select tracker tab | | System will show all record or progress which is done by trainee |
| **3** | User select mode like day month week | | System will shows information regarding mode of progress |

**Table 5: UC-5**

### Book and Schedule Classes

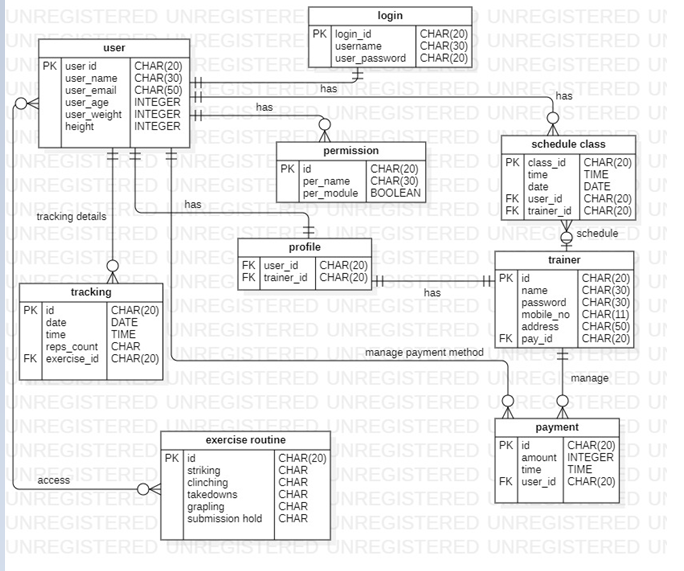
|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-1 | |
| **Purpose** | | Booking couch or trainer to get online classes | |
| **Priority** | | Medium | |
| **Pre-conditions** | | User will book tranier and get online classes | |
| **Post-**  **conditions** | | Book trainer and schadule classes | |
|  | |  | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will select online classes | | System will shows traners and with charges |
| **2** | User will filter trainer and charges | | System will shows filtered data of trainner |
| **3** | User will select trainer and schedule | | System will show schadule and trainer details |
| **Alternate Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **2a** | User will filter trainer and charges | | System will not show any data |

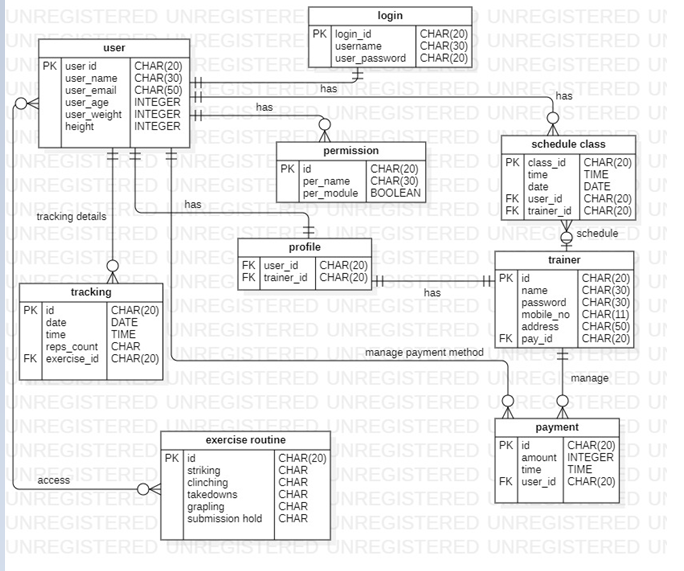
**Table 1: UC-1**

## repetition counter

|  |  |  |  |
| --- | --- | --- | --- |
| **Identifier** | | UC-1 | |
| **Purpose** | | Get to know the repitition done by trainee | |
| **Priority** | | High | |
| **Pre-conditions** | | User will on the mode of repition counter | |
| **Post-conditions** | | System counts repitition | |
| **Typical Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **1** | User will start traning | | System will start it according to user traning choice |
| **2** | User will select reps counting mode. | | System will get permission by user to allow camera |
| **3** | User will allow camera | | System will open camera and detect reps. |
| **Alternate Course of Action** | | | |
| **S#** | **Actor Action** | | **System Response** |
| **3a** | User will unallow camera | | System will not open reps counter mode. |

**Table 1: UC-1**





## Requirements Analysis and Modeling

**ER Diagram:**

# 

**Use Case Diagram:**

# 

**Abstract Class Diagram**

# 

**Sequence Diagram:**

# 

# Nonfunctional Requirements

## Performance Requirements

* System should be able to handle multiple users at a time using any of the web browsers.

## Safety Requirements

* The system should not operate for 1 hour if user enter 6 times wrong PIN
* The system should not operate when vpn in ON.
* The system should not operate when app requirements will not meet up with device.

## Security Requirements

* the user must log in with their user id which is provided by the system and by PIN which is set by user.
* System must verify the user by email during first time registration.
* User can reset its PIN by registered email.

## Software Quality Attributes

**Availability:**

* system will be available when user needs.

**Adaptability:**

* system will be run on any browser on desktop.

**Flexibility:**

* Our system is flexible user can easily understand completely user friendly interface

Reliability:

**Usability:**

* Easy for new or infrequent users to learn to use the system.

# Other Requirements

No other Requirements

# Revised Project Plan

# References

## [1] <https://krazytech.com/projects>

* [2][App Development 101 - Software Requirements Specification | Altamira Developers](https://www.altamira.ai/blog/app-development-software-requirements-specification/)

Appendix B: IV & V Report

**(Independent verification & validation)**

**IV & V Resource**

Name Signature

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **S#** | **Defect Description** | **Origin Stage** | **Status** | **Fix Time** | |
| **Hours** | **Minutes** |
| 1 |  |  |  |  |  |
| 2 |  |  |  |  |  |
| 3 |  |  |  |  |  |
| … |  |  |  |  |  |

**Table 3: List of non-trivial defects**