1. Software Requirements Specification

1.1 Introduction

1.1.1 Purpose

The main purpose of this document is to give a elaborate explanation of the requirements for the “AppDermis” app. It will define the purpose and fulfil representation for the progress of system. It will additionally clarify system limitations, interfaces. This document is mainly designed to be proposed to the stakeholders and the developers of the system.

1.1.2 Scope of Project

This app will provide help for a people who have suspicious of melanoma. AppDermis intends to give a struggle towards one of the most mortal illness, skin cancer. The application will scan the lesion and tell if the situation is in risky or not. Nevertheless , users can create their own records in the application thus, it will notify the difference among the current and the previous situation of mole, it will make comparisons. The app classes each photo as either high or low risk. However, AppDermis is not a diagnostic tool and shall not be taken as the final judgment, as pointed out by the disclaimer at the end of every skin spot evaluation.

Furthermore, the app needs Internet connection for fetch and display results. Whole system information is maintained in a database, which is located on a cloud.The application also has the detailed information about the what is melanoma.

1.1.3 Glossary

Term	Definition
User	Person interacting with the app.
Database	Gathering all the information to be used in the application
Application	A mobile application, most referred to as an app, is a type of application software designed to run on a mobile device, such as a smartphone or tablet computer.[18]
Software Requirements Specification	A document that entirely defines whole functions of a proposed system and the limitations under which it must operate. Of an example, this document.
Stakeholder	Any person with an interest for the project.
GLCM	Gray Level Co-occurrence Matrix (GLCM) and associated texture property computations are image analysis techniques. GLCM is a chart of how often different combinations of gray levels occur in an image or image section, given an image of pixels with each density (a specific gray level).[19]

▪

1.1.4 Overview of Document

The rest of this document contains two chapters. The second part of this document, the General Description section, provides a roundup of the functionality of the application. It describes unofficial necessities and is used to create a context for the technical requirements description in this section. The third part of this document, the Requirement Specification section, was written primarily for developers and describes the details of the application's functionality in technical statements.

1.2 Overall Description

1.2.1 Product Perspective

Appdermis project is a mobile application aimed at early detection of skin cancer. Users can get information about skin cancer risk by taking a picture of their moles or adding pictures from the gallery.

3.2.1.1 User Interfaces

This mobile application is developed for everyone who want use. Users can download mobile application from mobile application store. After downloading the mobile application, users should be register to the system. After login to the mobile application, the main menu appears. The main menu is divided into sub-parts such as adding a new mole picture, adding mole picture from the gallery, updating personal information.

3.2.1.2 Hardware Interfaces

The application will work on mobile devices.

3.2.1.3 Software Interfaces

The application will work on Android, hence there will be no need another software interfaces.

3.2.1.4 Communication Interfaces

There is an internet connection is required to run this software.

3.2.1.5 Memory

Our application's minimum system requirements: 50 Mb or more memory 1.4 GHz Cpu – Quad Core or above 2 GB or more RAM Android 6.0 (Marshmallow) or above Operating System Stable Internet Connection.

1.2.2 Development Methodology

We will be using agile development methodology, scrum method. There will be daily scrum meetings and 1-4 weeks sprint meetings.

1.2.3 Product Functions

3.2.3.1 Sign-up

Sign-up: People who want to use this application, have to give information to agree to become involved. These informations are name, surname, e-mail, password, date of birth and skin color.

3.2.3.2 Sign In

Sign In: After user completes his/her registration to system, they can enter by e-mail and password.

3.2.3.3 Sign Out

Sign Out: If a user wants to sign out from system. They can do this operation by clicking the sign out button.

3.2.3.4 Take a Photo of Lesion:

Took Photo of Lesion: User clicks camera button and takes a photo of suspicious lesions. Photo analyzed for skin cancer risk and saved in the album.

3.2.3.5 Add Photo to Album

User clicks gallery button and add new photo from gallery for analyzing skin cancer risk. Every lesion has its own album to analyze and compare.

3.2.3.6 Edit Profile

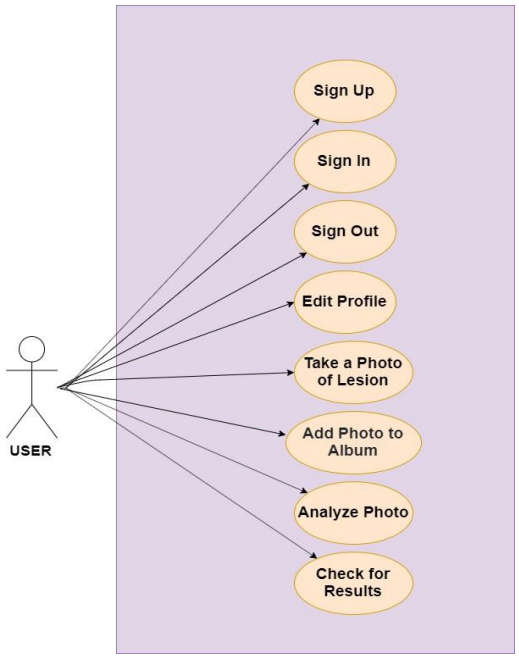
User clicks his/her profile and can change the informations.

3.2.3.7 Analyze

User clicks the analyze tab. The user chooses an album to analyze the improvement of the lesion. Or the user can analyze the only one lesion.

3.2.3.8 Check for results

User clicks the results tab. The user chooses an results to see. Results will be shown in graphs and diagrams. Also there will be a written detailed report about results. And if there is a risky situation application will send a notification to the user.



1.2.4 Constraints

Appdermis mobile application has some constraints such as reliability, safety and security. Wrong risk analyze due to wrong taking photo is an important constraint for Appdermis Mobile Application. In addition to this, since the user information is stored in a database and this database can be hacked and user information will be no longer private to the user. So this is an important constraints for security.

1.2.5 Assumptions and Dependencies

During the use of the application, user add or take a picture with obeying the rules. The mobile application with the android operating system correctly analyzes the skin cancer according to the picture and sends it to the application. The mobile application algorithm works correctly and displays rate of skin cancer risk's.

3.3 Requirements Specification

3.3.1 External Interface Requirements

3.3.1.1 User interfaces

This mobile application is developed for everyone who want use. Users can download mobile application from mobile application store. After downloading the mobile application, users should be register to the system. After login to the mobile application, the main menu appears. The main

menu is divided into sub-parts such as adding a new mole picture, adding mole picture from the gallery, updating personal information.

3.3.1.2 Hardware interfaces

The application will work on mobile devices.

3.3.1.3 Software interfaces

The application will work on Android, hence there will be no need another software interfaces.

3.3.1.4 Communications interfaces

There is an internet connection is required to run this software.

3.3.2 Functional Requirements

3.3.2.1 Sign Up

Use Case Name	**Sign Up**
Trigger	User enters the application and pushes the sign up button.

Precondition	No preconditions
Basic Path	1.User enters the application. 2. User pushes the sign up button. 3. User enters his/her informations. 4. User saves the informations.
Post Condition	No post conditions.
Alternative Path	1. The user enters an invalid email form or leaves a blank space in form. 2. The application gives an error.
Other	None.

3.3.2.2 Sign In

Use Case Name	**Sign In Use Case**
Trigger	User assesses the application with sign in button.
Precondition	User has signed up system.
Basic Path	1. User enters email and password to login to the system. 2. If the password is valid for the user email, user enters the system. Otherwise user should re-login.
Post Condition	After a successful login operation user is directed to the Main Menu.
Other	None.

3.3.2.3 Sign Out

Use Case Name	**Sign Out Use Case**
Trigger	User exits system with sign out button.
Precondition	User has signed in the system.
Basic Path	1. User clicks sign out button and exits from the system.
Post Condition	No post conditions.
Other	None.

3.3.2.4 Edit Profile

Use Case Name	**Edit Profile**
Trigger	User enters the profile tab.
Precondition	User must sign in before trying to edit his/her profile.
Basic Path	1. User will sign in to the system. 2. User shall enter his/her profile. 3.User will change the profile info. 4. User will enter 'Edit Profile' button.
Post Condition	No post conditions.
Other	None.

3.3.2.5 Take Photo of Lesion

Use Case Name	**Take Photo of Lesion Case**
Trigger	User takes a picture of lesion with camera.
Precondition	The user has accessed the camera with main screen.
Basic Path	1. User clicks button and camera opens. 2.The user takes a photo of suspicious lesions. 3.Photo is saved in the album. 4. System calculates the cancer risk of the lesion.
Post Condition	The database is updated and rate of risk is showed.
Other	None.

3.3.2.6 Add Photo to Album

Use Case Name	**Add Photo to Album**
Trigger	User assesses with camera.
Precondition	User has taken picture of lesion with camera.
Basic Path	1. User clicks button and camera opens. 2.The user takes a photo of suspicious lesions. 3.Photo is saved in the album. 4. System calculates the cancer risk of the lesion.

Post Condition	The database is updated and photo is added album part.
Other	None.

3.3.2.7 Analyze Lesion

Use Case Name	**Analyze Lesions**
Trigger	User enters the analyze tab and selects an album to analyze or the moment user user takes the photo, analyzes the photo.
Precondition	User must have an account and must sign in. If user wants to make a comparison, user must have previous photos of the lesion in the album or must take a photo to analyze.
Basic Path	1.User sign in. 2. User enters analyze tab. 3. User chooses an album to analyze. 4. User pushes the analyze button. 5.Analyze results will be saved to albums tab for each album.
Alternative Path	1.User enters the camera. 2. User takes a photo. 3. User can analyze the photo at that moment.
Post Condition	No post conditions.
Other	None.

3.3.2.8 Check For Results

Use Case Name	**Check For Results**
Trigger	User enters the check for results tab.
Precondition	The user must have more than one results of photos.
Basic Path	1. User selects check for results tab. 2. The system compares other results. 3. The result is showed on screen.
Post Condition	No post condition.
Other	None.

3.3.3 Performance Requirements

Our application appDermis will be working on android mobile devices. In normal workload, appDermis will use less than %30 of the CPU. Changing between pages will take 1 second.

3.3.4 Non-functional Requirements

appDermis will be on a mobil application server with high speed internet capability. The speed of the user's connection will depend on the hardware. appDermis will run on the user's smart phone and android operating system. The only one user uses the system at a time so there is no scalability requirement.