Software Requirements Specification

for

<Solar Controller>

Version 1.0 approved

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Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| SRS | 10/04/2019 | First publish draft | 1.0 |
|  |  |  |  |

# Introduction

## Purpose

The purpose of this document is to create SRS for an android application that will control a solar panel using a mobile device. The main purpose of the APP will be: reading how much power the solar panel currently harvesting, controlling the solar panels position which depends on the suns position from the solar panel, and monitoring the current state of the solar panel.

## Product Scope

Our software is being implemented to display the reading to the user.  Additionally, offer a GUI for the user to navigate through the screens the hardware included is a small-scale solar panel, And a sense along with a controller to control the panels movements.  Our objective is to create and app that monitors the solar energy gained from a small-scale solar panel. The benefit being able to track the amount of power and other information that the panel outputs.

## Intended Audience and Reading Suggestions

This project is a prototype that is intended for our professors, collaborators, and fellow developers. This has been created using the guidance of our college professor. This project will be useful for everyone who would like to create a solar panel system and will have the ability of controlling the position and monitoring its state.

## References

Software Requirements Specification document with example

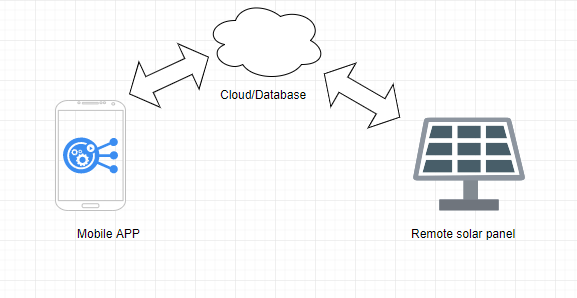
By Ravi Bandakkanavar | August 2, 2017

<https://krazytech.com/projects/sample-software-requirements-specificationsrs-report-airline-database>

# Overall Description

## Product Perspective

This app will be a single unit system that has a remote function for the solar panel. APP users will have a remote access to their solar panels and a capability of controlling the panel’s positioning.



## Product Functions

A solar controller will have the ability of monitoring

* solar panels readings
* assisting weather
* controlling the panels for optimizing solar harvesting

All this via a remote mobile app.

## User Classes and Characteristics

Users can have their solar panels in their hands as they can monitor and control the panel using the mobile app. They should be able to check the status of the panels. If the panel is not in the best position with reference to the sun, users will have the ability to control the panels with the GUI within the app. The app will be able to adjust 2 values such as rotation and the panels tilt. Users will have access to all the data collected from the solar panel through the database and display of the mobile app. User’s can login to keep their personal data such as power harvested within the month/yearly separated only for them.

## Operating Environment

The mobile app will run and access data from database. Using the database information, the users can monitor their panels activity as well as control it. The control will be from the mobile app which will be sent into the database then through the cloud the command will be pass into the panel for it to move. A PLC will be implemented in the panel to control 2 kind of motors that will rotate the panel and tilt it.

## Design and Implementation Constraints

The mobile app will consist of multiple screens: Home screen, Settings, Control, Readings, and more. We will be developing this using Android Studio with Firebase as database for the system. The app will have 2 languages: English and French. Maintenance will be conducted every month that will fix various bugs found in the system. Both the panel and APP will be connected in the same database and will use similar data accordingly.

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## User Documentation

* Online help
* Tutorials
* Customer Service

All this documentation will help the user on using and understanding on how to use the app in union with their solar panel.

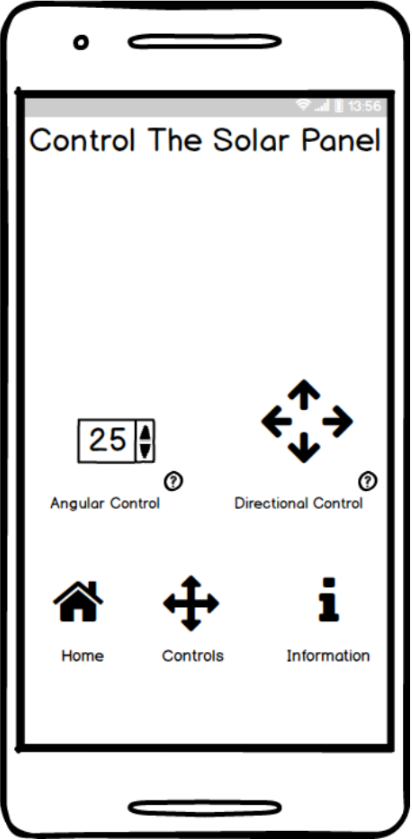
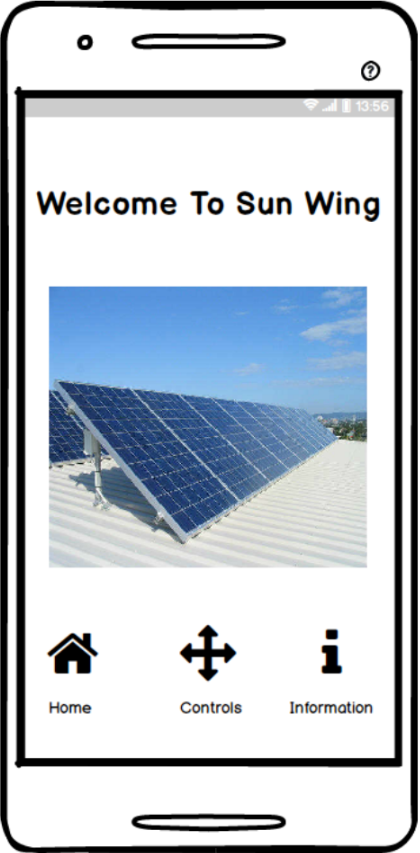
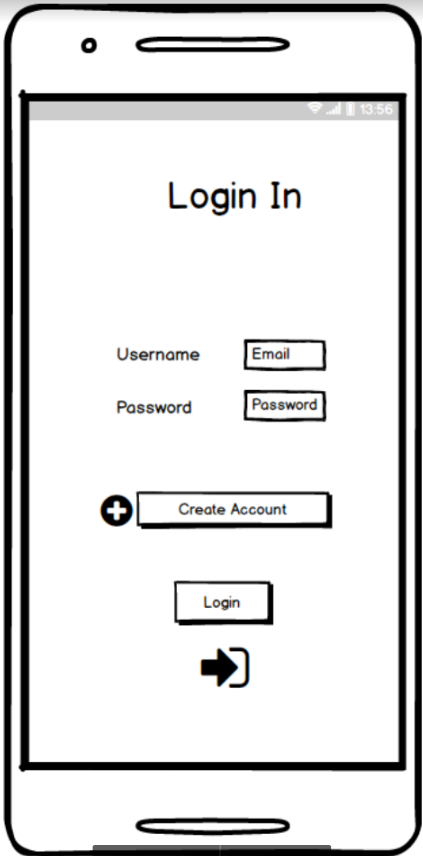
## Assumptions and Dependencies

Our app is dependent on the use of the sensor. Our group will try and use some of the BME280 sensor code that was used in previous projects.  It will be implemented into our project to obtain output readings. Use of STM32 and Nucleo package for controlling the panel might not function harmoniously to the mobile app.

# External Interface Requirements

## User Interfaces

Login Screen will contain labels that show the user where to login with a username and password.  There will buttons that allow the user to login in or take them to a new interface that enables them to create an account.  Main Interface: will contain a greeting to our app and will have Buttons to redirect the user to the other interfaces. Control Interface: This will be the main area to control the solar panel.  User inputs can be made to the angular and directional control of the panel. Information interface: This will include reading about the panel, such a power and energy gained.



## Hardware Interfaces

The mobile App will be used to control the panel as well as display its readings. Motors will be control using the app while readings from the panels will be displayed in the mobile app. This communication will use internet protocols and access to the database to perform actions.

## Communications Interfaces

Our project support Android version 5.0(Lollipop and above.

# System Features

## Remote Panel Control

4.1.1 Description and Priority

The user will be able to remotely move the Solar Panel from the app.  System feature is a high priority.

|  |  |
| --- | --- |
| Component | Rating |
| Benefit |  |
| Penalty |  |
| Cost |  |
| Risk |  |

4.1.2 Stimulus/Response Sequences

* Control the Solar panel.
* Display reading information (current reading, yearly, monthly)

4.1.3 Functional Requirements

REQ-1: Android APP

REQ-2: Database Connection

REQ-3: Panel is connected to the database

# Other Nonfunctional Requirements

## Performance Requirements

Our app will update the user with information every minute.  This information will include energy collected and a weather update.

## Safety Requirements

Product should always be set on a sturdy surface and should be kept clear of any liquids such as water.  The Solar panel part of our product should be cleared and have no weight on it. Additional the panel should manually move when the system is turned on.

## Security Requirements

The user will have to sign in or create an account.  This is to ensure each users information is private.

## Software Quality Attributes

**AVAILABILITY:** The information from  the database is always available

**MAINTAINABILITY:** The user will have up to date readings on the panel.

**CORRECTNESS:** The user login will ensure personalized readings.

## Business Rules

Only administrators will have the capability of updating the mobile app. No user will be at an administrator level permission for the app.

# Other Requirements

Database requirements:

* Android support
* Access and availability
* Up-to-date information
* Offline update function