

**Project Title:** Infrared Wall Chart Application**Authors:** Blake Husserl, Rafal Wojciek, Jose Vasquez, Metehan Ozten, Ahmad Bayonis**Team:** Team Enigma**Revision History:**

- (1/26/15) Document created
- (1/28/15) First Draft finished, Intro, Glossary, System Architecture, Requirements
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**Introduction:**

The purpose of this document is to detail the requirements of the application, hereafter known as the Infrared Wall Chart Application. Specifically the Infrared Wall Chart Application is a mobile application that will have two primary purposes. The first function is to serve as an educational or reference tool. It will have the ability to present users with the different figures and graphs that are present on the Infrared Wall Chart. The second function of the application is similar to that of a catalogue. It will help users search through a selection of Raytheon products using a selected range on the electromagnetic spectrum.

**Glossary of Terms:**

- Infrared Wall Chart - a chart developed by Raytheon that contains many helpful tools for working with and developing technologies that span the electromagnetic spectrum.  
<http://www.randfoo.com/wp-content/uploads/2010/01/The-IR-Wall-Chart.pdf>
- EM - Electromagnetic

**System Architecture Overview:**

The system will be implemented on mobile platform. Specifically iOS and Android. The application itself will grab data from a database we are building ourselves, using amazon rds, to store the information that the users will be searching for. These are the two main components of the system and will be interacting with each other to perform the catalogue like tasks.

**Requirements:****Use Case:** Loading Welcome Screen**Actors:** User**Precondition:** The user has just finished logging in. This would be the front/welcome screen**Postcondition:** The application is loaded successfully and responsive to user interactions**Flow of Events:**

1. The top half of the screen is a picture (or alternating album) of Raytheon product(s).
2. The bottom part of the screen would have the EM spectrum.

**Exceptional Cases:** If the app does not load or is non responsive it should produce an error, shutdown the application, and restart it.

**Use Case:** Transition from welcome screen to EM Spectrum Screen

**Actors:** User, Application

**Precondition:** The user is on the welcome screen and has selected the picture of the EM spectrum.

**Postcondition:** The user is on the EM Spectrum Screen

**Flow of Events:**

1. The system has registered that the user has selected the EM spectrum.
2. It takes the user to a new screen (in landscape now as opposed to portrait)
3. This screen has a picture of the EM spectrum broken into sub sections, which are all buttons the user can select.

**Exceptional Cases:** If for some reason it fails to transition/load the EM screen it should remain on the welcome screen and produce an error.

**Use Case:** Transition from EM Spectrum Screen to Sliders Screen

**Actors:** User, Database

**Precondition:** The user is at the EM spectrum screen and clicked on a specific region of the EM Spectrum (IR, UV, etc)

**Postcondition:** The slider screen is fully loaded and responsive

**Flow of Events:**

1. The user is transitioned into a new window
2. The new window has a slider bar with two endpoints.
3. The user is asked to specify a range within the Sub-EM spectrum by choosing the endpoints.

**Exceptional Cases:** If it is unable to load the slider screen then it should produce an error and remain on the EM spectrum screen.

**Use Case:** Selecting a Range in the Sliders Screen

**Actors:** User, Database

**Precondition:** The user is in the sliders screen, and has been asked to specify a range.

**Postcondition:** The sliders have been moved to the areas that the user desires.

**Flow of Events:**

1. By dragging the two sliders, the user can specify a range on the EM spectrum they're interested in.
2. When done adjusting the range the user can select the done button to be taken to a list of matched products.

**Exceptional Cases:** If the sliders are not responding the application should produce an error message and restart the application.

**Use Case:** Selecting a Range in the Sliders Screen (Via pre-created ranges)

**Actors:** User, Database

**Precondition:** The user is in the sliders screen, and has been asked to specify a range.

**Postcondition:** The user has switched from a slider mode to a region mode.

**Flow of Events:**

1. Switch selection from slider to region select via button
2. Select one of the pre-created regions
3. When done selecting the region the user can select the done button to be taken to a list of matched products.

**Exceptional Cases:** If unable to switch it should produce an error and restart the application

**Use Case:** Receiving Slider Results (User point of view)

**Actors:** User, Application, Database system

**Precondition:** The user has specified a frequency or range of frequencies they are interested in and submitted.

**Postcondition:** The results are on the display for the user to see

**Flow of Events:**

1. The request will be sent to the database
2. After processing the user will be redirected to a new window where the results of the query will be displayed.

**Exceptional Cases:** If the results are unable to be received then it should display an error message and then ask for them to submit the search again.

**Use Case:** Sorting Results from User EM Spectrum Range Query

**Actors:** User, Application

**Precondition:** The user is on the screen with the results from his recent query.

**Postcondition:** The results are now sorted in the way that the user specified.

**Flow of Events:**

1. The user should be able to sort the results by certain key characteristics such as material, platform type, power output, etc.

**Exceptional Cases:** If it is unable to sort how the user requested it will just show the unsorted results and display a message similar to "unable to sort as requested".

**Use Case:** Log In/Register (Stretch Goal)

**Actors:** User, User Database

**Precondition:** Application has been opened

**Postcondition:** User will have successfully logged in and be moved to the

**Flow of Events:**

1. Log in will only let authorized users use the application
2. If the user has a registered account, log in as usual. Otherwise register a new account.

**Exceptional Cases:**

**Use Case:** Selecting Technology specific PDF (user perspective)

**Actors:** User, Application

**Precondition:** The user is on the screen with the results from his recent query.

**Postcondition:** User is now viewing a PDF that they selected

**Flow of Events:**

1. Specific Technology is selected from the sorted result of last query
2. RSA Key Exchange(see below)
3. PDF is opened utilizing default viewing program on the phone

**Exceptional Cases:** If the PDF is not available an appropriate message will be displayed

**Use Case:** RSA Key Exchange (Stretch Goal) (system perspective)

**Actors:** Application, File Database

**Precondition:** PDF has been selected to download

**Postcondition:** System has successfully and securely sent the requested data

**Flow of Events:**

1. Application encrypts key
2. Application sends key to File Database
3. File Database decrypts and verifies key
4. File Database sends back desired PDF

**Exceptional Cases:** If any errors occur while attempting the RSA key exchange, the system will display an appropriate message error message.

**Use Case:** Mobile App Startup

**Actors:** User, Application

**Precondition:** The user is on the local mobile OS and is able to find the Raytheon Infrared Wall Chart App.

**Postcondition:** Application is loaded and the user is prompted with login

**Flow of Events:**

1. User selects application icon
2. Application is launched
3. Application takes control of input and output devices of platform.

**Exceptional Cases:** If the application is unable to load the system should prompt the user with an "Unable to load application" message.

**Use Case:** Reference chart selection

**Actors:** User, Application

**Precondition:** The user is at the reference chart page.

**Postcondition:** The reference chart is open on the screen

**Flow of Events:**

1. Selecting a button with the chart's name will open up that specific chart in a new window (all of these charts are taken from the Infrared Wall Chart).

**Exceptional Cases:** If the system is unable to open the reference chart it will display a message saying it is unable to do so.

**Use Case:** Advanced search interface

**Actors:** User, Database

**Precondition:** The user is in an advanced search screen to find specific information

**Postcondition:** Results of the advanced search are displayed

**Flow of Events:**

1. The user is allowed to use drop menus or something similar to specify certain categories to search in
2. There is a field to add the user's own keyword for the search

**Exceptional Cases:** If the advanced search is unable to be performed the system will notify the user and ask them to try changing their parameters.

**Prototyping Code and Test Cases:**

<https://github.com/BlakeHusserl/RaytheonCapstone>

**System Models:****Appendices:**