

## Abstract

WMD detector technology is advancing at an unprecedented pace. As a result, there are often gaps in an end user's ability to track and obtain the latest chemical, biological and radiological detection equipment.

The WMDDetectorSelector website was established to bridge the gap between emergent technologies and end users who are unsure of the latest technological breakthroughs. The website indexes detectors by a variety of categories to facilitate user navigation as they browse detectors. Our goal was to promote the WMDDetectorSelector website to a different audience.

Through our creation of a cross-platform mobile application, we were able to bring the WMDDetectorSelector web indexing service to small devices such as iPhones and Android devices. The application includes many of the most often used search index parameters to allow users to filter the vast library of detectors available today. The application includes preset and custom filtering options, and will display lists of detectors that meet the desired criteria. It shows key data about each detector including from where it can be acquired.

This mobile application was intended to portray the skills of students from the University of Washington – Tacoma. Working in conjunction with Edgewood, we were able to meet this goal. It is our intention to use this project as a stepping stone to bring more complex and demanding projects to UWT and its student body.

## Evaluation of Existing Service

In order to adequately replicate the WMDDetectorSelector website service on mobile devices, an evaluation of the existing service was required. The breakdown of essential functions is as follows:

1. Allow the user to browse detectors according to predesignated scenarios



2. Allow the user to filter detector results according to Detector Type



3. Display pertinent detector details and specifications for any detector



The mobile application framework is developed using this breakdown of three essential functions. Any mobile application is required to include these functions.

## Application Planning & Development

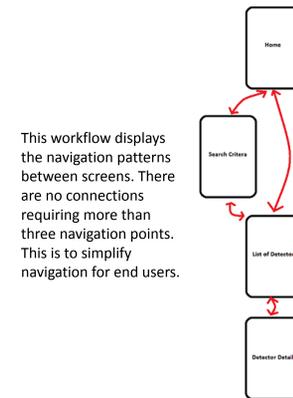
Using the minimal application requirements previously evaluated, a framework for the application was generated. A general workflow shows the transition between application windows.

After establishing the workflow through the application, work was able to begin on development of each individual screen.

In order to facilitate development and layout, general designs were generated for each screen. These layouts served as loose guidelines for the developer to follow when building the front end of each screen.



These are the basic layout designs for the individual screens. Note that these layouts are general guidelines for development and differ slightly from the final implementation.



This workflow displays the navigation patterns between screens. There are no connections requiring more than three navigation points. This is to simplify navigation for end users.

## Technical Obstacles

It was determined that the most appropriate way to implement this application was by generating dynamic pages and filling them based on user input. The easiest way to do this was by storing all detectors in JSON format and generating detector lists based on the attributes of each JSON object.

AngularJS affords the ability to filter JSON objects based on some arbitrary key/value field. By filtering the list according to user input, the detector list will reflect only those detectors which meet the criteria set by the user.

```

    if (usrScen === 'field') {
      detsList = $filter('orderBy')(detsList, ["bioFieldTier", "chemFieldTier", "radFieldTier"]);
    }
    else if (usrScen === 'mobile') {
      detsList = $filter('orderBy')(detsList, ["bioMobTier", "chemMobTier", "radMobTier"]);
    }
  
```

An example of an AngularJS filter applied to the detector list. The filter takes user input and returns only those detectors which match the desired criteria.

The filter system is integral to the functionality of the application. It affords the app the ability to generate custom lists of detectors according to selected criteria.

Moreover, this filter has also been customized to enable users to type keywords into the application and return detector results based on very narrow criteria. This robust search and filter system is the hallmark of the application.

## Implementation

User is presented with a choice on home screen. Browse preset scenarios, or set up a custom search.

Upon choosing a preset scenario search, the user is prompted to select the desired scenario or application.

After selecting the desired search criteria, the application displays a list of all detectors which meet the defined criteria. Each detector is accompanied by icons to give quick information on detector type and scenario at a glance.

If the user chooses a custom search, they are prompted to enter all the custom criteria they desire.

If the user finds a detector that they want to investigate further, they can tap it to delve into specific detector details.

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