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**GROUP PROJECT**

**MSc in Web Technologies**

**National College of Ireland**

**ARIA Application for a Gymnasium or Chain of Gymnasiums**

Module: Advanced Rich Internet Applications

**Report**

**Technology:**  HTML5, CSS5 and Javascript frameworks: SkelJS, AngularJS, Jasmine Testing Framework

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# 1. Introduction

# 2. Motivation [5%]

## 2.1. Poject Scope

This is a short description of why your innovation is useful and what it might achieve.

## 2.2. Area of contribution

This should describe the general problem area. For example, what is a problem in educational environments and how might they be better developed through the application of a RIA.

# 3. State of the Art Review [30%]

This section should outline a literature review of the methodologies.

Describe investigation into current practice, case studies of other rich Internet applications, and academic/industrial research that is reported in conferences and journal articles. This should include a criticial analysis of your selected approach. You must describe how you made an informed decision about both the innovation undertaken and the technologies selected.

# 4. User Interface Design [20%]

The main goal when deigning the User Interface (UI) for the project was to make the user interaction simple, intuitive and efficient. The following section describes the process employed by the team to arrive at the design of the UI.

The formulation of the UI design was influenced by a number of factors.

At the start of the project the group researched and discussed the requirements of the potential users. Due to the tight time constraints and limited budget, the project requirements were finalized based on the research, rather than a full scale functionality requirement gathering techniques such as interview or questionnaires. It was agreed that this application must be simple and functional and must deliver specific gym information to its members outside of the gym. This list included a list of gym locations nearby, class schedules, workout statistics, etc. Users tend to search for the nearby gym location when traveling, check the class schedule on the way back home, and check their own workout statistics when on the bus. This sort of content would normally be accessed by the users “on the go” and at various locations outside the gym, not only on PCs but also tablets and mobiles.

In the era of growing popularity of smart mobile devices and easy access to the Internet, the importance of a mobile-friendly design cannot be understated. Creating a number of separate applications specific to each type of device was never an option as it would not be sustainable in the long term to maintain such a large number of applications. Also due to the tight time constraints this was not possible. The chosen solution was to implement a responsive design approach that would provide a unified user experience throughout the site across multiple devices, and for a number of different screen sizes.

A responsive design can be implemented quite efficiently using one of the many JavaScript frameworks such as SkelJS or Foundation. Due to the level of skill and experience recently acquired by the members during this course module, we decided to use SkelJS.

*“SkelJS is a lightweight frontend framework (…) consisting of only a single JS file - weighing in at just 20kb as of this version.”* (Skeljs.org, 2014).

It is characterized by a sophisticated 12-column CSS [grid](http://www.jqueryscript.net/tags.php?/grid/) system which allows proportional scaling of UI elements and includes a breakpoint handler which intelligently replaces the CSS queries depending on the type of media the app is displayed on. SkelJS was very easy to implement into the app.

Another factor that influenced the UI design was the growing user-experience expectations.“*People are beginning to demand a higher standard of user experience (UX) quality from the software systems they use in their business and personal lives.”* (Anderson, McRee and Wilson, 2010). Single page applications (SPA) with desktop like behavior implemented into web based applications are rapidly growing in popularity and slowly becoming the new standard. Users no longer are required to wait for the page to reload and instead are presented with the data almost instantaneously.

In order to oblige with the current expectations the project was designed and implemented as a SPA configuration using AngularJS. AngularJS is a powerful JavaScript framework that applies the MVC structure to the project’s front-end business logic and provides a number of comprehensive features such as dependency injection, custom HTML templates, and two way binding. The implementation of this framework did not shape as much the form of the interface, as it improved the user experience. When selecting menu tabs, users are seamlessly taken from one page to another without the page load waiting time.

Based on the established requirements the team concentrated on forming the information architecture. Due to the relatively simple nature of the app, it has been decided that the navigational structure will be flat and will consist of a 5 tabs, each corresponding to a separate section. Due to the personal and confidential aspect of the workout statistics displayed on one of the pages the team decided to implement a simple authorization system. Unfortunately due to the problematic nature of back end implementation and limited time constraints this was later abandoned. The login Controls initially added to the interface were consequently removed.

One of the goals of the user interface design was to implement both usability and accessibility principles into the application. “*Usability is about designing products to be effective, efficient, and satisfying”* and its key aspect is creating positive user experience. “*The goal of web accessibility is to make the Web work well for people, specifically people with disabilities”* (W3.org, 2014). Combining both usability and accessibility meant creating both satisfying and disabled-people-friendly applications. SPA implementation was a definite step towards the improved user experience and increased usability. Additionally the graphic design was supposed to serve the purpose of enhancing both usability and accessibility.

The simplicity of the structure and design was meant to enhance both the accessibility and usability of the application. Additionally the design incorporates the following features:

### Provision of text alternatives for any non-text content

### Minimal amount of color to prevent difficulties for people with color blindness

### Use of relatively large font and use of highly contrasting colors (black and white) on the text and background to help people with poor eyesight

### Images contain the alt values (Heng, 2014)

* Consistency in the design

The team aspired to design the User interface to the best principle and standards, as well as to provide a high aesthetic appeal of the design at the same time balancing the visual and functional aspects of the system. Although the design could be further improved we feel that we have achieved some success in fulfilling these aspirations.

# 5. Architecture [25%]

## 5.1. Application Architecture

Outline the solution architecture for your application. You sould justify the approach you took, and how it supports the project scope. This means mapping back to the state of the art review when describing the features and functionality of your system.

## 5.2. Security

Evaluate industry standard error handling, and outline how you integrated these approaches within your application.

## 5.3. Toolkits and Framework

Discuss the toolkits and frameworks used and the justification for using them.

## 5.4. Data Transfer Strategies:

This section looks at the access and transporting of data to be consumed/created by the RIA.

## 5.5. Evaluation and Testing:

You must include a short description of how your application was evaluated for its audience.

Critically analyse the testing methodology employed, as well as any debugging techniques you used in building the application.

# 6. Summary [10%]

This is a short section that includes a brief summary of what was achieved so far. Evaluate the approach you took, the tools you used, and the implementation of your applications. You should describe what changes you would make or future work that would benefit your application.

# 7. References

Anderson, J., McRee, J. and Wilson, R. (2010). *Effective UI*. 1st ed. Beijing: O'Reilly.

Heng, C. (2014). *How to Improve the Accessibility of Your Website (thesitewizard.com)*. [online] Thesitewizard.com. Available at: http://www.thesitewizard.com/webdesign/improve-accessibility.shtml [Accessed 30 Apr. 2014].

Skeljs.org, (2014). *skelJS : Documentation*. [online] Available at: http://skeljs.org/docs [Accessed 28 Apr. 2014].

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