Advanced Rich Internet Applications

Master of Web Technologies Project

Project Title: FitApp – Fitness Monitoring Application

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Application URL: **http://vast-tundra-3435.herokuapp.com/**

GitHub Repository: **https://github.com/gfpk/aria.git**

Contents

Project Motivation

Project Scope

The objective of this project is to design and develop a web based application that will link user through their Facebook accounts in a way that will help them plan an achievable fitness regime and track their progress against a set of performance milestones and fitness objectives. Due to a limited time constraints this project will focus on a simple framework for such an application. This framework should be fully responsive so as to allow users to interact with other users of the application on their mobile devices in a real-time manner as they go from step-to-step in their personal fitness programme.

Area of Contribution

The area of contribution is in the recreation environment specifically personal fitness. The problem associated with this area is providing motivation for the individual to engage in a structured fitness program. The "FitApp" application aims to provide motivation for the individual by linking them with friends and other groups with similar interests through the popular social networking site Facebook™. The use of applications to track personal training programmes is proving to be a popular way of doing this as claimed by a recent report from mobile analytics firm Flurry[1] who's figures show the use of sports, health and fitness apps grew by 49% on iOS and Android in 2013. The "FitApp" application will enable users to construct a personal fitness programme consisting of an achievable set of pre-defined goals and objectives which are targeted at people who wish to attend public fitness events such as mini-marathons at public fun runs either for the first time or to improve performance from the last event attended. The "FittApp" application portal provides motivation to the individual by using the social accountability associated with sharing their actual recorded performance results with other users of the application.

State of the Art Review

Current RIA development methodologies:

Rich Internet Applications (RIA's) is the next evolution in web design taking web applications from the traditional flat "catalogue" web design to a more "responsive" web design, meaning that the page design can respond to the type of device being used to view the application and thus provide the best user experience possible within the context of a particular devices capabilities i.e. mobile phone, tablet or desktop screen. This new generation of RIA applications deliver an enhanced user experience through a mixture of smoother graphic content combined with more intuitive navigation tools and a rich mixture of interactive functionality. This enhanced user experience is provided through the use of web technologies based on the newer HTML5 specification in conjunction with CSS3 (Cascading Style Sheets Ver.3) frameworks and a range JavaScript libraries. A classic responsive web site example in shown in Fig 1 below:

[1] http://www.flurry.com/bid/103601/Mobile-Use-Grows-115-in-2013-Propelled-by-Messaging-Apps#.U2JdAeIvBJ0

Fig 1 Multi layered responsive design layout including interactive video:

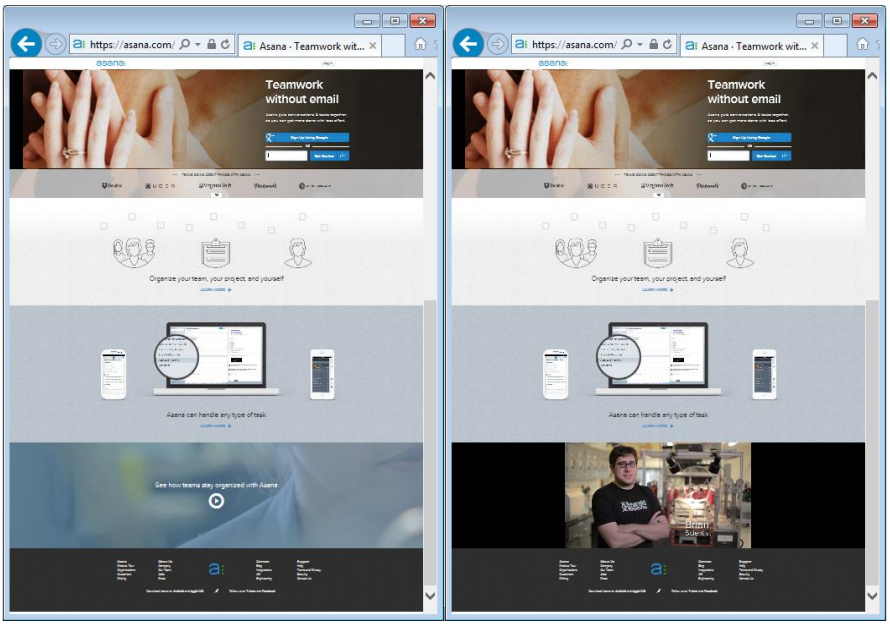


Fig 1: Source: https://asana.com/

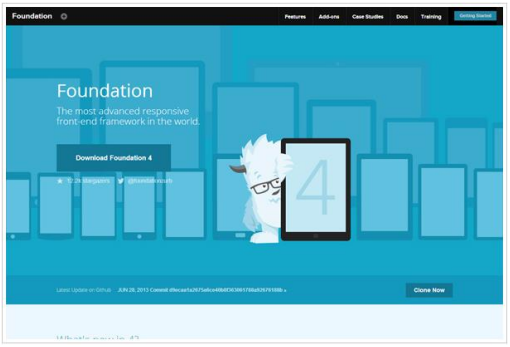
Responsive Frameworks analysis

There are numerous open source responsive frameworks available for web applications development. The most well-known responsive frameworks, boilerplates and tools for front-end web development are outlined below:

1. Twitter Bootstrap (http://getbootstrap.com/2.3.2/index.html)

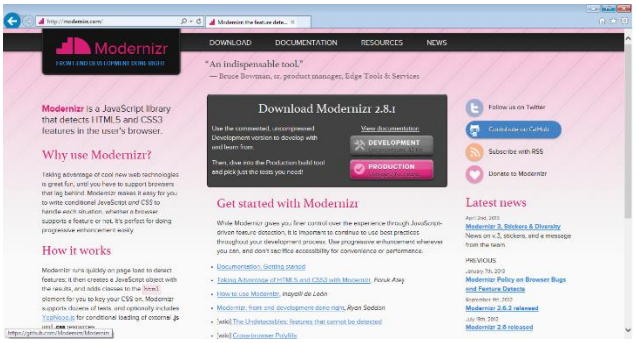
This is a modern front-end /UI development framework with a 12-grid responsive layout that uses LESS (Learner CSS) and JavaScript plugins that provide out of the box effect such as image transition effects, streamlined modals, dropdown menus and carousel slideshows as well as typography and link styling. Bootstrap can be expanded by using additional Bootstrap specific add-ons available from open source developer forums which provide additional API's, themes and interface building tools such as Jetstrap (https://jetstrap.com/).

2. Zurb's Foundation (http://foundation.zurb.com/index.html)



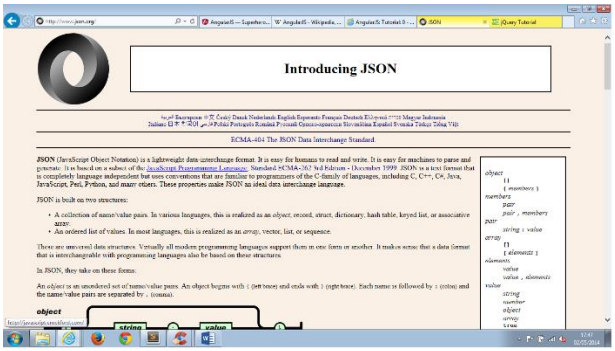
Foundation is a modern HTML5 framework, using either mobile first, or from big displays down to mobile sizes based on a flexible, 12-column grid that is easily nested and can scale to an arbitrary size. Foundation is based on Saas (Syntactically Awesome Stylesheets), a scripting language that is interpreted into CSS using the SassScript scripting language. SassScript consists of two different syntaxes to separate code blocks and lines within a block. Foundation comes with own set of development tools and templates for agile site development.

3. Modernizr (http://modernizr.com)



Modernizer is a Javascript library that detects which HTML and CSS features are available in the user browser and allows the developer to test for these features and use them in their code if supported by the browser. If the user is using an older browser which does not support a feature used in the application then Modernizer can provide fallback for these browsers via downloadable code called Polyfill's.

4. JSON (http://www.json.org/)



JSON (JavaScript Object Notation) is a text-based lightweight open-standard for defining user readable data interface. It is extensive used by sites such as Twitter and Flicker to quickly download data asynchronously, which allows the application to load data in the background and refresh a elements of the page without having to redraw the entire page.

5. AngularJS (https://docs.angularjs.org)

AngularJS is a open-source framework which extents traditional HTML to create dynamic single page application. It uses the Model-View-Controller (MVC) pattern using dependency injection to bring server-side controllers to the client-side. AngularJS uses directives to create reusable HTML tags that can handle the behaviour of page elements.

Conclusion

Bootstrap offers fluid grids with lots of UI Tools and widgets making it ideal for rapid prototyping whereas skeleton's grids are fixed and has a limited set of UI tools. Bootstrap is a mobile first designed framework and can modified using LESS to improve the default UI it's out of the box 12 column fluid grid provides a fully responsive framework which enables agile web development. Foundation also provides an out of the box fully responsive framework and newer releases provide templates which aid in faster prototyping and also additional Sass performance improvements. Bootstrap and Foundation frameworks support a wider range of desktop browsers and also the newer phone platforms such as Andriod 2.4, Windows Phone 7+ and Surface. (Source http://responsive.vermilion.com/compare.php)

Current Fitness applications

Popular fitness apps such as RunKeeper,[2] and MapMyRun[3] provide downloadable apps that allow users to track their movements through the motion sensors on their Phone or by purchasing wireless activity trackers such as Fitbit[4]. Although most sites provide a logon API's for all the popular social networking sites such as Facebook, Twitter, Pintrest etc. some sites such as MyFitnessPal[5] align themselves exclusively with the Facebook community in order leverage their existing social network.

Some newer sites such as Pact[6] use a cash rewards system where members who meet their published goals receive. Some sites such as Jawbone Up[7] even provide apps to track and evaluate your sleep patterns.

[2] http://runkeeper.com/
[3] http://www.mapmyrun.com/
[4] http://www.fitbit.com/
[5] http://www.myfitnesspal.com/
[6] https://secure.gym-pact.com/
[7] https://jawbone.com/

Our Solutions

The Project greatest constraint of only having 2 Week to design, develop and test our project greatly influenced out framework selection decision. The rapid prototyping advantages offered by using Bootstrap v3.1.1 frameworks template libraries and UI toolsets along with AngularJS v1.2.16 to provide both the MVC framework and single page dynamic content controls in conjunction with JSON providing the data interchange format for handling back-end fitness data.

Additionally as our emphasis is on a future RIA application security and performance considerations where dropped from our project scope but can be mitigated to some extent by including Facebook Authorisation API's in our application and assuming greater processing power and network access is available to the devices this application will be used on.

High Level FitApp Requirements

The high level function requirements for the FitApp Application are as follows:

1. - Users can Logon and Register using their Facebook User Name and password

2. - Users can see an overview of upcoming events in their local area

3. - Users can see all other user recommend running routes

4. - Users can construct a fitness training program from a list of predefined activities

5.- Users can track their performance metrics e.g. distances covered, calories burned, events attended

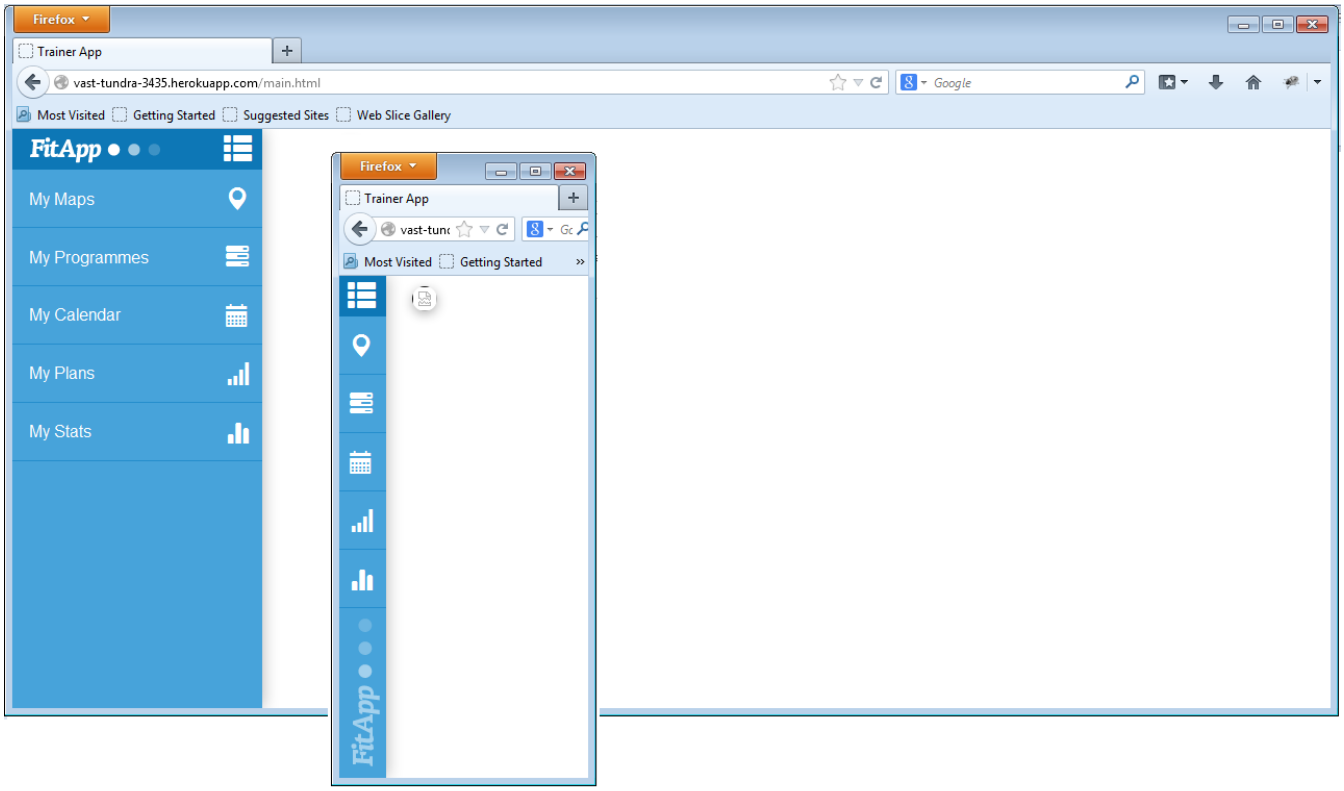
6.- Users can schedule a daily/weekly/monthly calendars of day-to-day tasks

User Interface Design

The first challenge in developing any responsive web application is constructing the menu navigations. If the menus are cumbersome or difficult to navigate then the user will be unlikely to hang around to see any of the other application content. The menu must not only be able to present the menu items themselves in a pleasing manner, the menu layout itself must be designed in such a way that users can access it from any number of devices without any issues. We approached the menu design from a mobile first point of view as we intend for the application to be used "on-the-road" as users perform their various fitness activities. Additional as the constraints implied for the smaller devices would then not prove to be an issue on the larger screen format devices when the user accesses the site from either their home or work device e.g. tablet or desktop devices.

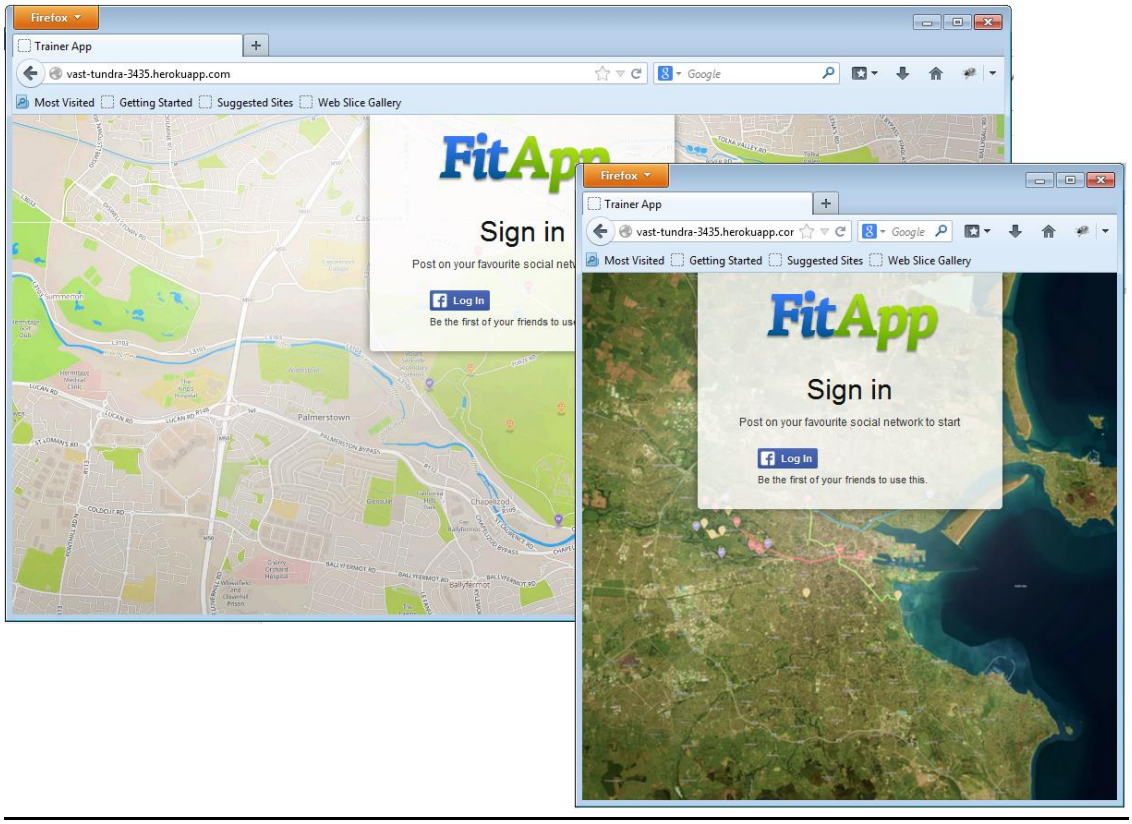
Using MapBox JavaScript API's we were able to build

FitApp Responsive Menu



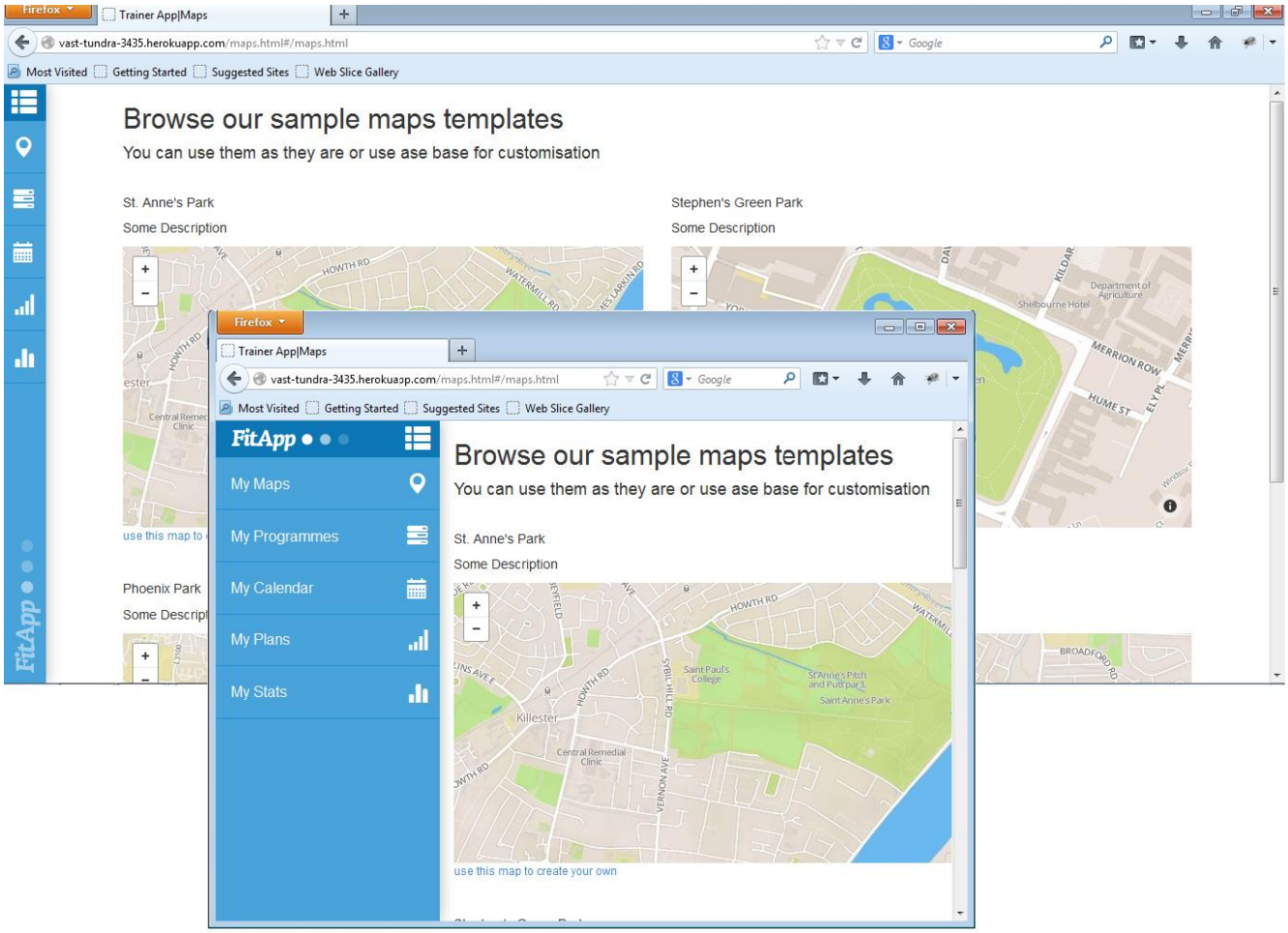
Landing Page

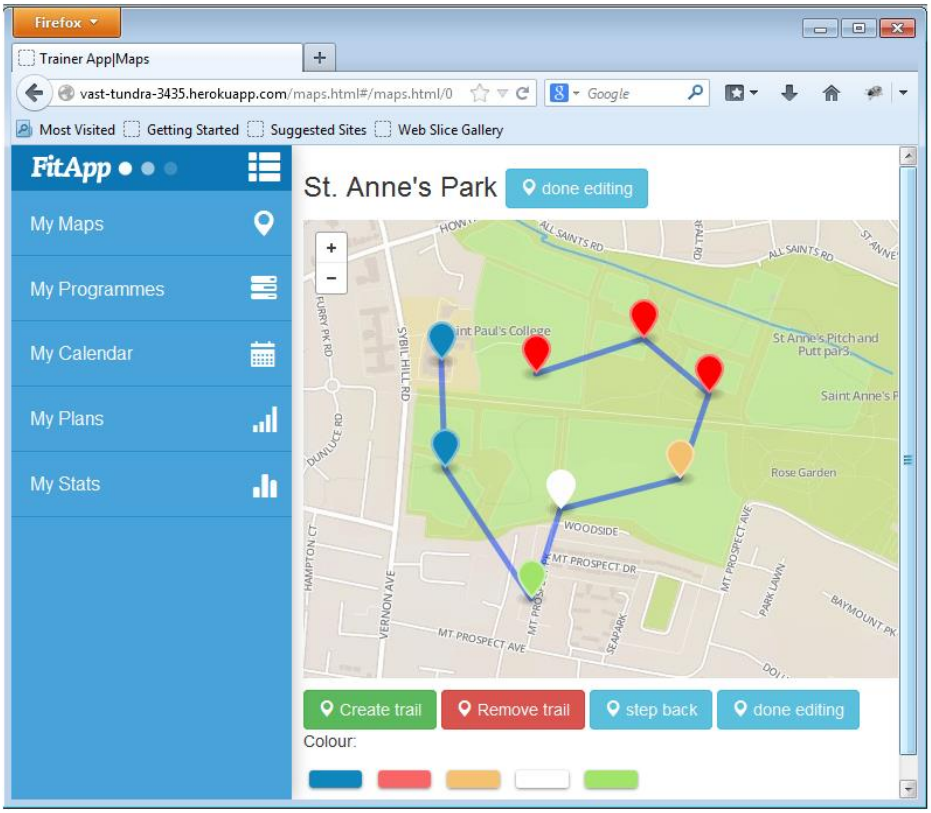
Responsive landing page including Facebook login overview of upcoming events in in the background:



Training Maps

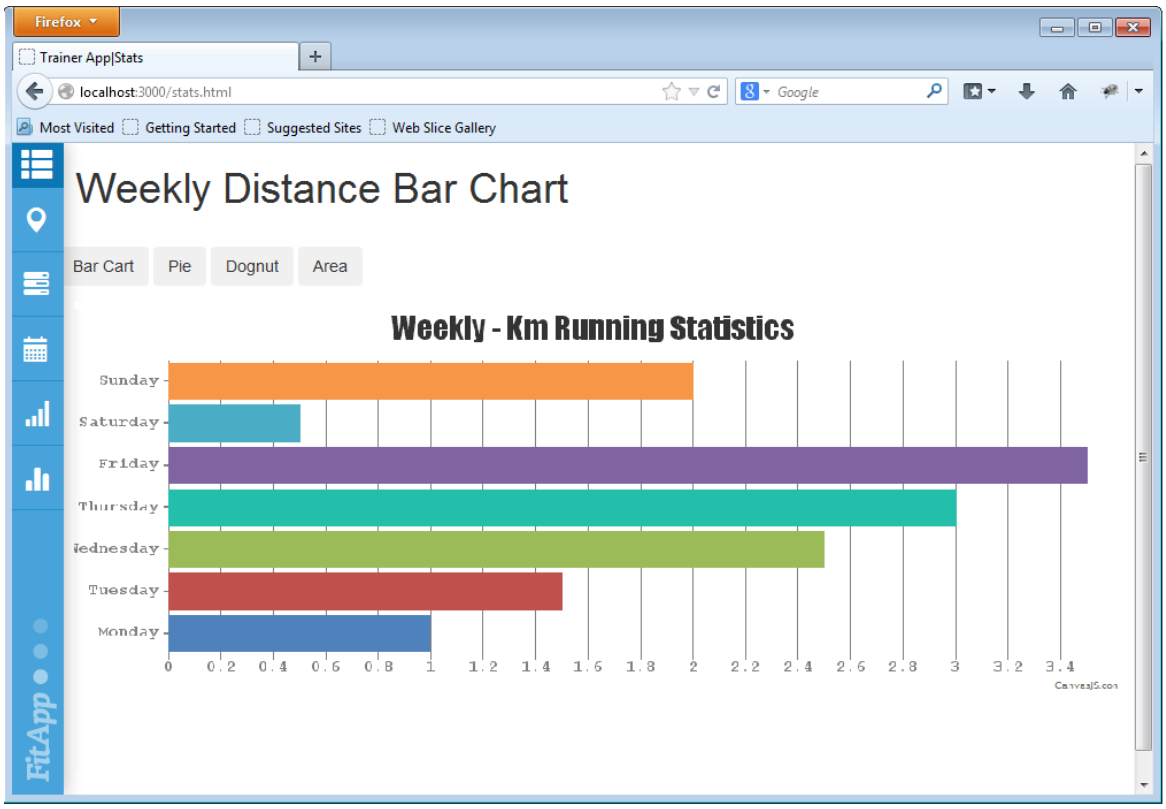
Responsive FitApp Training Maps with Trail creation:

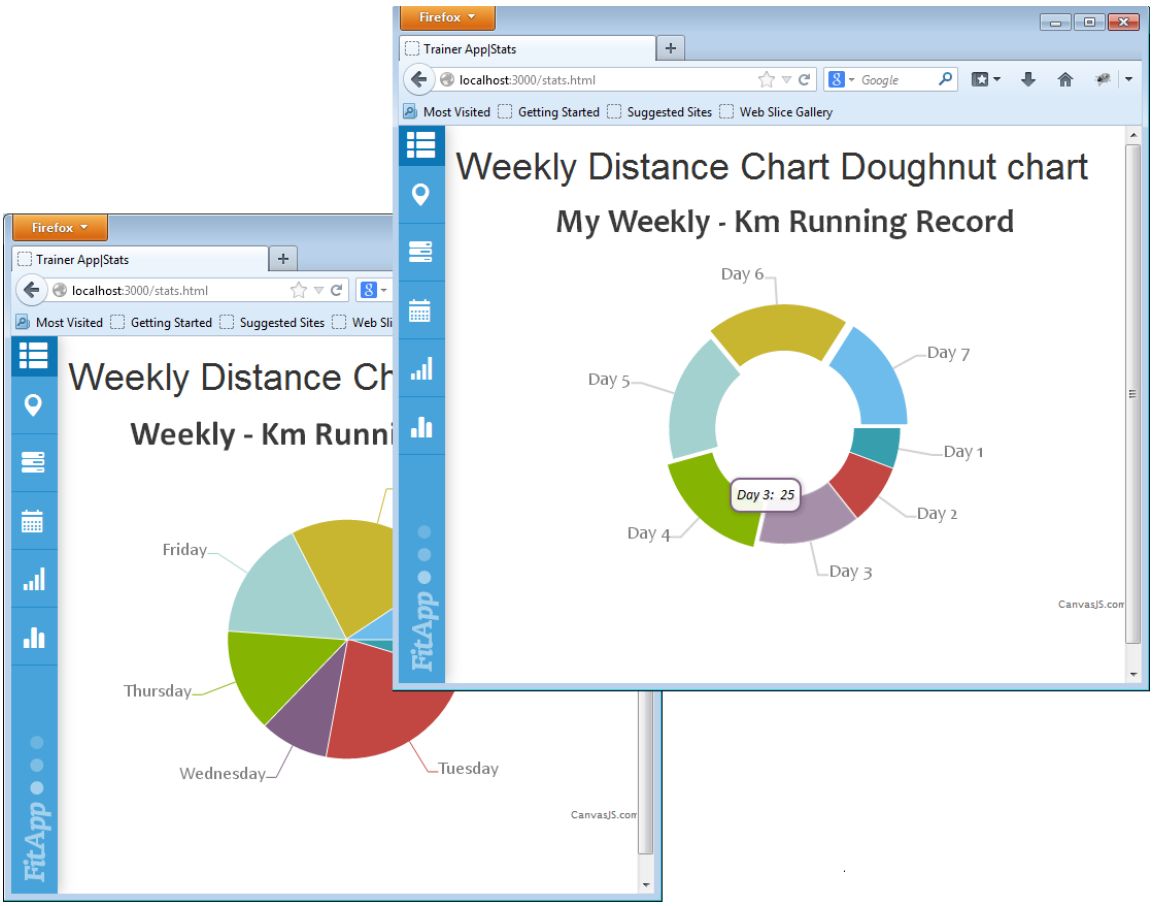




Training Maps

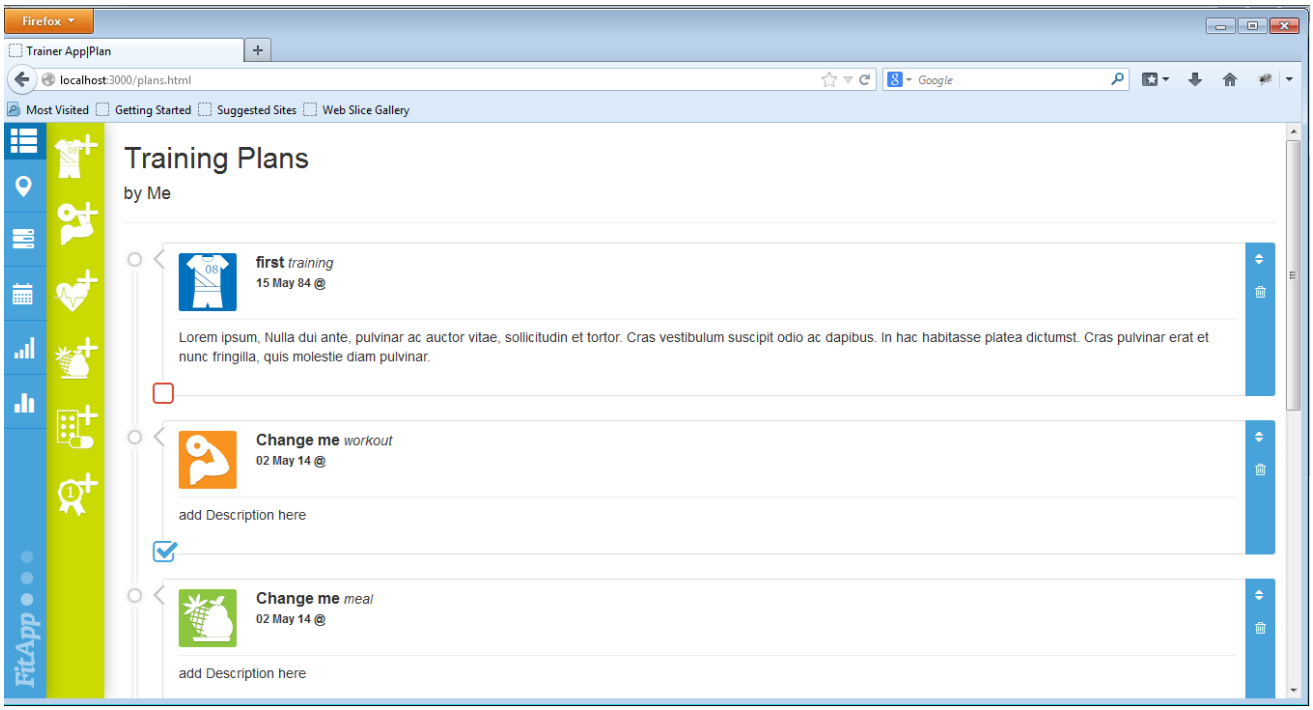
Responsive FitApp Statistics Charts:

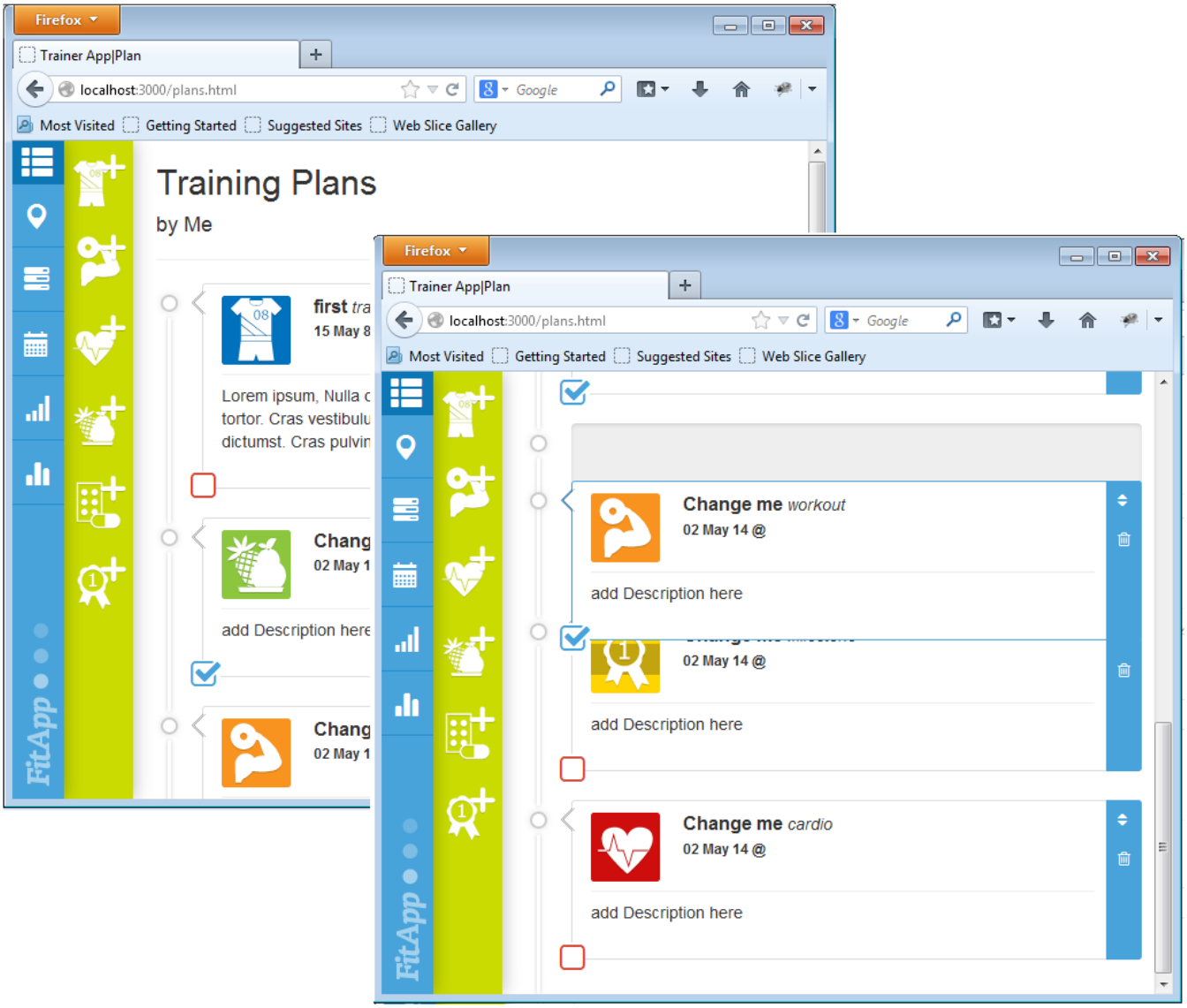




Training Plans

Responsive FitApp Training Plans with drag and drop action items:

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