



# Impressive Navigation

Client: Data Verity

Client Representative: David Flammer

Team: Jerrod Crook, Kelton Hislop, Tim Ross

# Introduction

## Client Description

Data Verity is a “Business Intelligence Solution” company. They create tools to help businesses do business! They have already created web based tools to help with: sales tracking, customer relationship management, predictive sales analytics, quality management, and much more.

## Product Vision

Do you feel that websites are too linear for the technology we have available today? Do you wish that you could explore a website instead of only viewing webpage after webpage? Impressive Navigation will allow anyone to easily create more interesting websites by using a GUI to place webpages on a canvas and create a 3-dimensional website. With this product, even people with little to no programming experience will be able to create a website that will engage and entertain all its visitors.

# Requirements

## Description

In the past few decades, our computer technology and its applications have dramatically increased in complexity and quality, yet our way of presenting our websites has not changed from the traditional page to page style. Our project is to create a new way of presenting websites in a more dynamic environment. Based on current software, like Prezi and impress.js, we hope to focus on compatibility with the user allowing them to create web pages and string them together in new and interesting ways. The project will be a WordPress plugin, one of the most popular frameworks for creating websites without coding. This will allow widespread and easy use to users not in the computer field.

## Functional requirements

- Create a impress.js-like website implementation
  - Rotate pages in all three dimensions
  - Change depth
  - Change width and height
  - Change the scale of the page
  - Animate transitions
  - Interesting camera movement
  - Ability to click icons and links

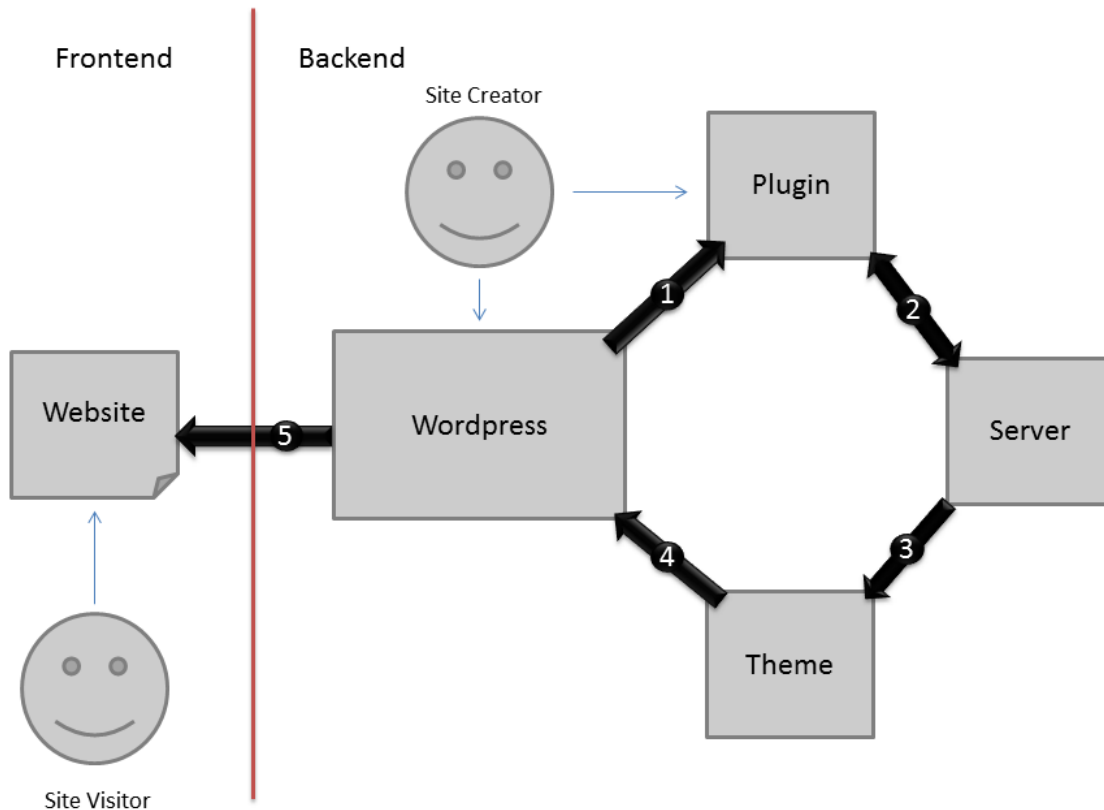
- o Ability to “de-linearize” the site by adding easy ways to navigate other than simply next and back.
- o Navigation menu to allow for easy access across the site
- o The option of an overview page that displays the major pages of the site
- o Add in a background image or pattern
- Create a UI for the WordPress plugin allowing the user to easily create a 3d canvas website.
  - o A visual list of pages not used in the presentation
  - o A visual list of pages used in the presentation
  - o A preview window to get a basic idea of what the presentation should look like
  - o The ability to drag pages on and off the canvas, and drag them into a position on the canvas
  - o Display panel for the position and rotation of the selected page, and boxes to enter custom values
  - o Some way to order the pages in the impress.js framework.
  - o Custom ID's that the user can give to a page allowing them to link to them and add html
  - o A text box for the user to add HTML and CSS elements directly to their site
  - o A save functionality (and load) that will keep their data from when they return to the menu, and allow for the front end to create impress.js div's to specification.

### Non-Functional requirements

- Needs to be easy to use by the average non programmer
  - o WordPress is often the most common choice for non-programmers to create high quality websites. By creating a WordPress plugin, we can add functionality to user's sites
  - o Because of this, we need to assume that many of our users will be inexperienced web programmers and designers, and we need to make tools that make the technical process of creating impress style websites easy and intuitive.
  - o Because WordPress supports custom menus for plugins, we will create a menu with all the tools a user should need;
- Needs to be created using web languages such as php, JavaScript, html, and css, all within WordPress
  - o WordPress is an already fully developed framework, and we have to design and integrate an application that modifies WordPress's functionality and works seamlessly with the already existing code

# System Architecture

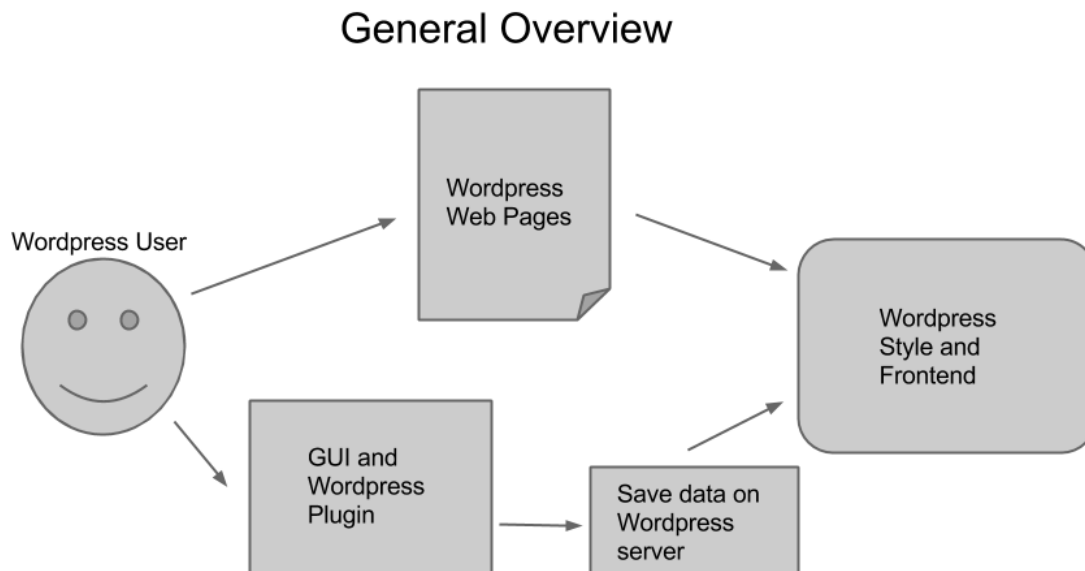
## Overview



The site creator interacts with the built in WordPress tools to create pages and then uses the plugin to arrange and edit properties of the pages. The plugin receives page data from WordPress (1). Once the user has saved his changes, the data is sent to the server (2). The plugin also loads this save data for when the user returns to the page (2). The theme accesses the save data from the server (3) and relays that data through WordPress (4) to create the site (5).

## Back-end Development

Our backend architectures consists of two components. The plugin component that handled the user interface and the server, and the theme component that handles what the front end website looks like.



The plugin component is made up of two major parts, the UI and the server. The UI is what communicates with the user and is in the form of a WordPress menu. In this menu the user can change the attributes of page in relation to the canvas. This information together with the pages created in WordPress is what generates the site. After the user finishes creating what their site layout should be in the UI it can be saved and will be stored on the server using AJAX.

The theme is the part that does the heavy lifting. It takes all of the page data saved from the UI and the pages created in WordPress, and makes the actual code that produces the site.

## Front-end Development

The front-end site is associated with WordPress which gives it easy access to necessary information, such as pages titles and content. Using AJAX, the site gets the

plugin's saved data from the server and reads it to actually build the site. The saved data from the plugin is used to build every element on the web page and the data from WordPress is used to populate each element with the correct content.

## Technical Design

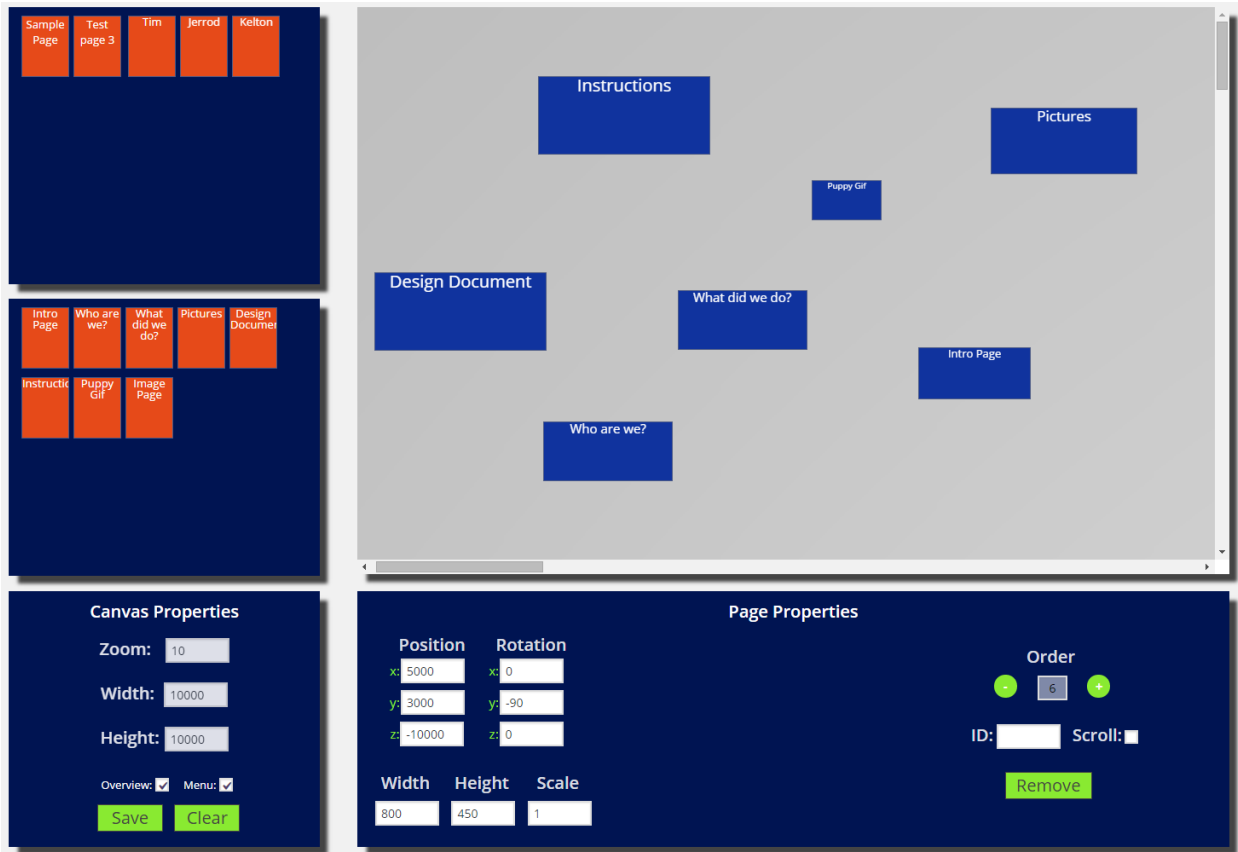
The user-interface of the plugin had to be simple to use, but also had to have multiple features. A screenshot of the plugin page is shown below to help visualize how it works.

**Canvas:** The user can drag and drop web pages onto the canvas to place them in the website. The canvas is a div tag within a div tag, the outer div is a window the size of what the user actually sees, while the inner div tag is much bigger and can be scrolled by the outer div. The inside div is also re-sizeable by the user via text boxes. This allows the user to place the web pages on an "infinite" canvas, giving them much more freedom in where the web pages lie within the site.

**Zoom:** The zoom feature allows users to zoom the canvas out or in and be able to see more within the preview window. This feature is necessary for this product to be enjoyable to use. Before the zoom feature was functional dragging the pages around within the canvas was frustrating because the canvas would have to be scrolled multiple times to get to the desired position. This feature works by scaling each box representing pages within the canvas while making the canvas smaller. However, the values shown to the user remain as the unscaled values.

**ID and custom CSS:** The user is given a text field where they can set the id attribute of each page which allows them to give each page its own style on the front-end site. There is also a text box at the bottom of the page (not shown on below screenshot) that allows the user to insert their own html code into the front-end site. Obviously, a user with no knowledge of html or css cannot properly use this field, but a user with at least little knowledge would be able to use this to change the background of the site or add css styling to a specific page or all pages.

**Order:** Unlike many other websites, the websites created with this plugin have a set order with the pages. On the front-end site, the order will progress forward or backwards with certain keystrokes, for example: the right arrow key will progress to the next page in the order, and the left arrow key will progress to the previous page in the order. On the plugin side, the order of each page is represented as a number in the "Order" field and the lower list of pages on the left is shown in order. The order can be easily changed by selecting a page to be edited and clicking the "+" and "-" minus buttons next to the "Order" field.



The front-end site created by this plugin, due to the nature of the JavaScript library `impress.js`, can often be hard to navigate. To solve this problem we created a menu at the top of the site which displays the name of each page and contains a link to the corresponding page. The menu makes navigating through Impressive Navigation websites much easier, especially more complicated sites. Although, for simple sites the menu may not be needed or wanted, which is why there is a checkbox on the plugin page to disable or enable the menu.

Another feature on the front-end site is the overview page. The overview page is a built-in functionality in the `impress.js` library and is useful to see the website as a whole. This is a page where ideally the camera is zoomed out to see every page on the site. Although, if pages are stacked up or extremely far apart the overview page is not helpful. The overview, like the menu, can be turned off within the plugin.

# Design and Implementation Decisions

## Decisions

### PowerPoint or PDF to HTML

Upon the initial meeting with the client he suggested functionality that would take a PowerPoint or PDF (something anyone can make) and export that as html which could then be edited with web based transitions.

As a team we spent several days and searched through the deep areas of the internet to find possible tools, libraries or software that could do this. But the only possible solution was software that exceeded \$2000 for the proper licenses. All the forms suggested the task was impossible without the third party software. Due to our research and the time limit of field session we had to cut this functionality altogether from our project. The client, although saddened, understood and gave us new ideas.

### Presentation Software vs Website Editor

Data variety had mixed feelings about what kind of software they wanted from the get-go. Their first idea was to have a web application that created presentations in html, css and JavaScript. The web app would be easy to use so that anyone could build a sleek looking presentation without any knowledge of web design. An important feature of the presentation software was going to be uploading a PowerPoint or pdf and being able to incorporate that into the presentation. Unfortunately, the converter from PowerPoint or pdf to html did not work, the presentation software was not as appealing as before.

After talking with our client contact, he decided to contact the rest of the company, and after a long conversation, they decided that they may want to change directions. The company decided that instead of simply creating presentation software, it would be much more interesting to create a whole website that was navigated on a single canvas, much like impress.js.



## Using Impress.js or Making our own JavaScript Library

The initial plan for this project was to make our own library that mimics impress.js so as to avoid any kind of legal conflict. Upon further research, we found that the impress.js library is much more complex than originally thought.

Considering our groups lack in experience with JavaScript, it would have been very difficult to create a similar library. Additionally we had to consider the functionality of impress.js and if it was worth building a new script that was exactly to our specifications. We decided that impress.js was close enough to what we wanted that it made more sense to adapt it than create an entirely new application. After checking the license on impress.js and seeing that it is usable, we decided to implement impress.js.

## Lessons Learned

- Create small goals when learning new technology to make sure you stay on pace and that you are learning relevant information. As a group, we took on this project having very little of the necessary skill set. This project consisted of creating and designing a web UI, implementing an already existing script, integrating everything into a fully functional WordPress framework, designing a way to store and load data from the server, and creating our own scripts to manage the plugin. Going into the project only one of us even had much experience in basic HTML and CSS. Over the course of field session, all three of our members learned a variety of languages and techniques: HTML, CSS, JavaScript, PHP, JQuery, WordPress API, and AJAX. The learning and research phase of this project was slow and took longer than we would have liked. If we had made small goals our research and learning would have been more focused and completed with greater sense of urgency.
- Plan team working time schedule in advance. In the first few weeks of our project, we would only plan a day or two in advance. This led to many instances of our schedules not lining up, misunderstandings, and cancellations. About half way through we realized that if we planned a full week ahead, we had a much better idea of what we had to do when, and had no trouble with scheduling issues at all.

- Plan meetings in advance or have a set weekly meeting time with client or anyone else. Through much of our six weeks, we did not have very many set meeting dates with the client, and would have to contact him last minute if anything came up. There were multiple occasions where we needed to have an in depth conversation with the client about an important design decision, and couldn't move on without it. Luckily for us, our client was often times on campus and could accommodate our last minute meetings, but all three of our group members realized very quickly that planning consistent meetings would be beneficial. After we started meeting the client more regularly, we could get his constant input on the product. It also gave us deadlines, we wanted to show the client something new each meeting, keeping our output consistent.

## Results

### Overview

Our project is a WordPress plugin that allows the user to create websites in the form of impress.js (similar to Prezi). They can create WordPress pages and put them together on a giant 3D canvas with different positions, rotations, depths and sizes. The project will have full impress.js capabilities and an easy to use interface on the backend.

From the backend user interface, the user is able to drag and drop pages onto a canvas and position them on said canvas. The user is also able to change the display properties of the page such as the rotation in x, y, and z directions, as well as the width and height of the page. The order to go between the pages can also be changed by the user.

This information will then be saved and transferred to the front-end site which implements impress.js. All attributes of the page the user was able to change on the backend take effect on the front-end.

### Implemented functionality

- WordPress plugin with custom menu
- User interface with a site preview
- Ability to change position, depth, rotation, and size of every individual page
- Ability to change the order of the pages and the transition time between them
- Fully animated camera moves from one page to the other on the canvas
- Plugin state saved in the plugin's files
- Optional overview page
- Navigation menu

### **Not implemented due to time constraints**

- Custom transitions
- WordPress database storage
- Full 3D preview with page images

## **Appendices**

### Libraries Used:

- jQuery & jQuery UI
  - <https://jquery.com/>
  - <https://jqueryui.com/>
- Impress.js
  - Link: <http://bartaz.github.io/impress.js/>
  - License: MIT
- WordPress

### Learning Tools:

- WordPress Codex
  - <https://codex.wordpress.org/>
- CodeAcademy
  - <https://www.codecademy.com/>
- Treehouse
  - <https://teamtreehouse.com/>
- Stack Overflow

## **Instructions and how our application works**

### **Browser support**

Creation: Best usage if found using Google Chrome. Internet Explorer functions correctly but some UI styling is not supported. Mozilla Firefox is usable, however there are a few glitches.

Viewing: Works flawlessly in Chrome and Mozilla Firefox. Site is not viewable in Internet Explorer for IE does not support 3D canvases.

Our advice: Use Google Chrome :)

### **Plugin and Theme**

Both the Impressive Navigation plugin AND the Impressive Navigation theme must be installed and activated for the plugin to work.

## **Pages**

Impressive Navigation uses pre created WordPress pages from the pages tab on the left toolbar.

## **User Interface**

All of the user options are under the Impressive Navigation tab on the left toolbar. From this menu, the user will first drag a page from the list of unused pages section in the top left into the canvas on the right. From here, the menu below the canvas will contain all of the page options (specified in more detail below). The user can drag additional pages from the unused pages section, and can put them back by either dragging them back, or by clicking the remove button in page properties. Every page has its own page properties. You can view any page's properties by clicking on the page in the canvas, or in the used pages section at the center left of the page. Any pages added in the pages tab on the left toolbar will automatically be added to the unused pages section in the impress menu. If you have lost your page, clicking on it in the used pages section will focus the canvas camera on that page. Take note that pages rotated 90 degrees will appear to be completely invisible, though they are fully functional and can be removed from the canvas and added to the unused pages section by clicking the remove button if desired. The preview canvas in the menu should only be used as a simple guide, and does not have the functionality of the full site. It is advised that when creating an Impressive Navigation site, the user checks the front of the site often (this can be done by clicking the title of your site in the upper left corner of the screen) to get a better idea of the impact each change is making. Remember to save before leaving the impress menu however. The site will not update until it is saved in the impress menu, and leaving the menu without saving will reverse all changes done since the last save.

## **Edit Panels**

There are 2 edit panels for this plugin: "Page Properties" which is detailed in the "Page Options" section of the readme, and the "Canvas Properties" which is detailed in the "Canvas Properties" section. All changes made to the contents of the text fields or any button clicks will have an effect either on the plugin page or the front-end site. If you are unsure about what a text field or button does, be sure to read the section about it in this read me BEFORE playing with it (especially the SAVE and CLEAR buttons!). All text field content (except the "Order" text field) can be changed by selecting the field and typing new information. In order to change the content in the "Order" text field, you must click the adjacent "-" or "+" button. In order for a change in a text field to take effect after changing it, you must either press "Enter" on the keyboard or click somewhere else on the page.

## Page Options

\*Position- These are the x, y and z position of the page. 0,0,0 is located at the top left of the canvas. NOTICE - the z position will not appear to change on the canvas, but will still change on the website.

\*Rotation- These are the x, y, and z positions of the page. 0,0,0 will direct the front of the page directly out of the screen. Increasing the rotation past 360 will add additional revolution when transitioning to that slide.

\*Width and Height (page properties)- The width and height of the screen in pixels.

\*Scale- This will be the scale of the page relative to the other pages. Changing this value will not change the look of the page, but will change the size of it when transitioning.

\*Order- This will change the order in which your website is displayed. When visiting an Impressive Navigation website, the user will be presented with the page with an order value of 1, and can use the arrow keys to navigate in order. This is not the only way to navigate and it is suggested that you use links between pages for a less linear feel.

\*Scroll- Checking this will make that page a "Scroll" page. These pages will always start from the top of the screen, and will have a scroll bar (if the page is larger than the screen). It is recommended that you only use these for pages that are too large to fit in the normal view.

\*Remove- This will remove the page from the canvas and return it to the unused pages section.

\*ID- This will give the page a custom HTML id. This should only be used by experienced HTML and CSS programmers. NOTICE - DO NOT USE THIS IF YOU DON'T KNOW WHAT YOU ARE DOING. Incorrectly specifying an ID (for instance having a space in it or starting it with number) can break your site. If your site stops working, check that your pages do not have a specified ID.

## Canvas Options

\*Zoom- changing the number in this field will change the zoom of the canvas. Enter a bigger number to zoom out to see more pages and display the pages smaller. Enter a smaller number to zoom in to see less pages and display the pages bigger. Note that this will not change the actual size of the pages in any way on the front of your site.

\*Width- Changing the number in this field will change the width of the canvas, this will make the bottom scroll bar smaller and allow you to scroll farther to the right.

\*Height- Changing the number in this field will change the height of the canvas, this will make the side scroll bar smaller and allow you to scroll farther up the preview.

\*Save- Clicking this button will save the data to a file. The file will be automatically loaded anytime you visit the plugin page so you pick up where you left off. This file will also be what the front-end site is made from, so if you want a change in the plugin page to affect the front-end site be sure to save it.

\*Clear- Clicking this button will clear the saved data and reset anything on the canvas. This will set every value on every page to its default values within the plugin. This will not change the content on any page. CLEARING THE SAVE DATA IS NOT REVERSIBLE. After clicking this button and confirmation box will appear on the page asking if you are sure you want to delete the save data: clicking “OK” will delete the save data and reset any values on the pages, clicking “Cancel” will have no effect and you will be able to continue with the current saved data.

## Links

In order to write link to another page in an Impressive Navigation site, the link URL must be to the Impressive Navigation web page and not the WordPress page. A link to another WordPress page must be in the form “Site\_URL/#/ID” where the leading Site\_URL is the URL to the site and the ID is the id of the page. The id of the page will be displayed in the “ID:” text field on the plugin site, on the “Page Properties” edit panel. If the “ID:” text field is blank, the ID in the link should be “step-N” where N is the order of the page. The order of page is the number in the text field directly under the word “Order” in the “Page Properties” edit panel on the plugin page.

An example link URL to a page on “thisIsMyWebSite.example” with the id of “About\_This\_Site” is be as follows:

[http://thisIsMyWebSite.example/#/About\\_This\\_Site](http://thisIsMyWebSite.example/#/About_This_Site)

An example link URL to a page on “thisIsMyWebSite.example” without an id and with an order of 3 is be as follows:

<http://thisIsMyWebSite.example/#/step-3>

\*Note, the ID text field will set the HTML id tag for the page, and can be used by experienced HTML and CSS programmers in the custom head HTML section.

## Custom Head HTML

Warning! - This should only be used by experienced HTML and CSS programmers. Entering anything into this field without knowing what you are doing can and most likely will break your site. If your site does break, check to make sure this field is empty, and if not, clear all text out of it and save.

This field will allow you to interact directly with the page HTML. It is fully functional and supports anything HTML should (for instance <script> tags). The contents of this folder will be included at the end of the head portion of the HTML. Any style attributes specified should overrule current ones, allowing you the freedom to style the site. Take note that the ID field of each page will specify the HTML id of that page, and may be referenced in this section.