ENSE 871 Usability Research and Engineering

Project Report
For
Humanities and Engineering Interest Group

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Business Needs/Opportunity

To design and create a webpage to bridge the gap between Humanities and Engineering SIG (in Canada) members, students and educators for continual improvement in engineering education by bringing in different perspectives.

Few problems mentioned by the users were :

- Member only content - LinkedIn profile links, university profile page links, papers
- Bilingual webpages for English and French
- Public page that showcases activities, research abstract descriptions etc.
- Connection between members of different SIGs
- Connecting various SIG members based on their research interests and area of expertise (a common area of interest that maps different SIG members)
- Section for events and conferences
- Searching and finding papers with filters on locations, year, authors and topics
- Reliable and ease of maintenance

Reflection on Project Planning, Execution and Closing

Northstar Customer

Our northstar customers are existing E&H SIG members, professionals interested in collaborating with SIG members and people interested in joining E&H SIG.

Carryover Customer

Our carryover customers are members of the public who are just there for browsing and other SIG members.

Assumptions and Constraints

Few of our assumptions were:

- WordPress (Free Edition)
- Github
- StoriesOnBoard
- Figma
- Mural

Few of our constraints were:

- We had to learn and implement a solution on WordPress using its themes, and plugins within 2 months.
- After migrating to AWS lightsail, a few plugins like Elementor broke and had to be reinstalled.
- Web scraping proved to be a challenge to us as we were struggling to store the scraped data in db.
- BuddyPress (theme) had initially made our website look more like a social media than a scholar website.
- Many of the free plugins available did not work as intended, this led to many features spilling into the next sprints.

Findings from Affinity Diagram and Empathy Mapping

Affinity diagram helped us understand the depth of the problem for our customer. We used sticky notes to quickly take down what we felt as the potential problem we would solve. We then later compartmentalized these notes to understand a pattern behind their problem. We came to a conclusion that our design must contain a way members of SIG find each other and network with each other.
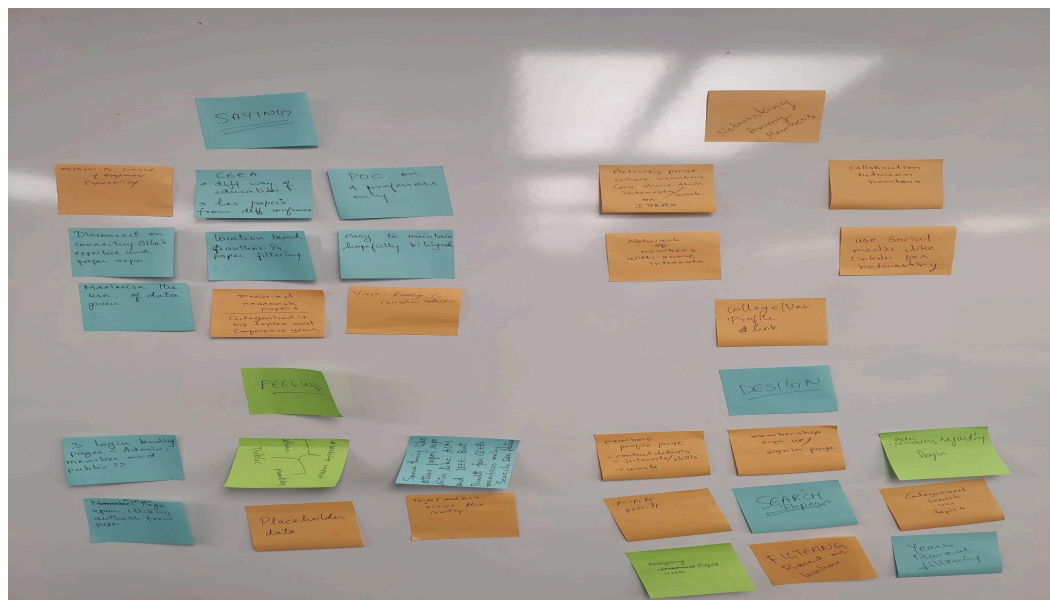
Figure 1: Affinity Diagram

The empathy mapping came in handy to understand the pain points from the customers perspective, and the requirements as well. Us designers had to really get all the answers to the questions that arise in the empathy mapping. This helped us understand the user needs, thereby helping us make better design decisions.
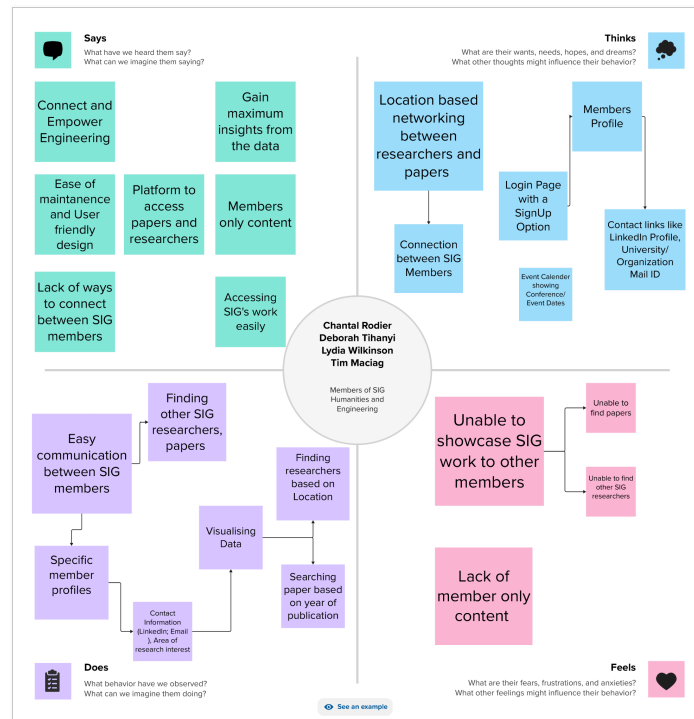

Figure 2: Empathy Mapping

User Story Mapping & Its Evolution

Every project needs a user story mapping as user story mapping helps visualize the user journey and prioritize features to deliver the most value. It was with the help of such tools we were able to focus and spend time on features that needed more time. One of the features, integrating a map to our website, needed almost two whole weeks of development. Our USM kept changing based on the feedback we received from our customers and USM helped us track the changes and progress. This made us achieve our MVP in time and successfully complete our demo.
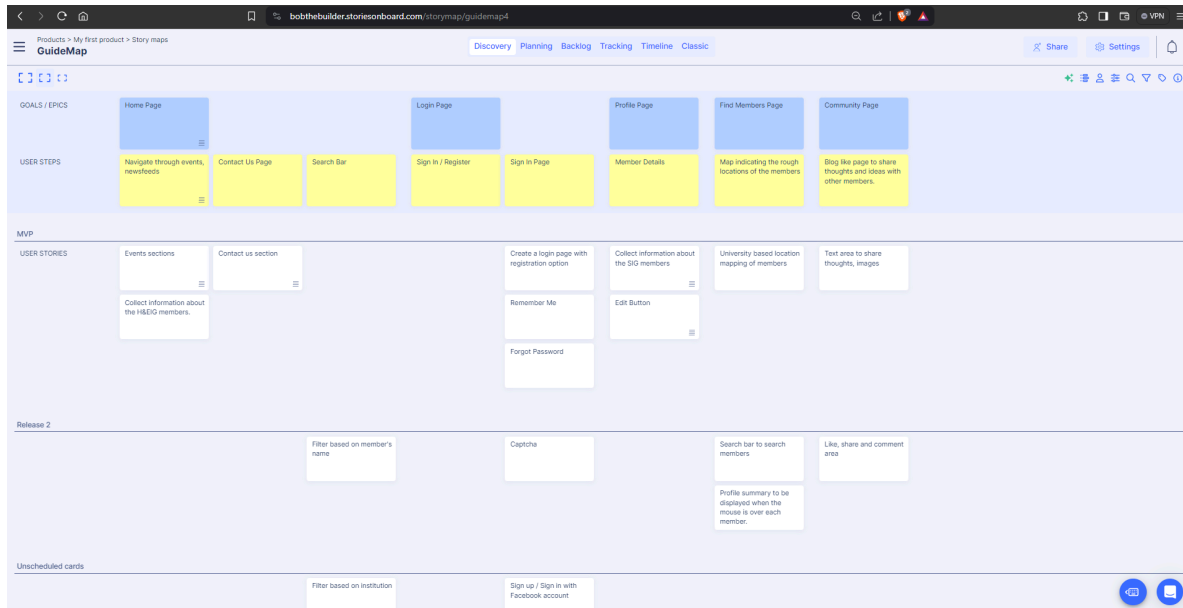
Figure 3: User Story Map - StoriesOnBoard

Prototyping and Customer Feedback

This was our transition phase in our project i.e., during prototyping we penned our thoughts into a low fidelity diagram (Mural) and later, into a high fidelity diagram (Figma).

Prototyping is an important aspect in people centered design that we learnt from our class.

During the entire process we constantly had discussions and interactions with our customers on a weekly basis. This meant our designs and functionality of our mockups were carefully understood and critiqued by the customers. We then incorporated these feedbacks into our designs and improved our prototype.

This iterative process is called **Fast Feedback Cycle**, as we learnt from our classes this is very important while developing or designing a product. Few of their feedback that helped us were, during our 2nd week of client check in, they asked us to completely remove the admin user functionality as it did not align with their requirements and needs at that time. Another one really important feedback we received was the use of interactive features that retain the users on that website. This helped us understand where we needed to focus and after implementing the feature, it had a very positive effect on the UX. After implementing this feature, it gave us the idea of designing in such a way that the users use our map to know which university or city the members are located at. We sort of guide the user to access other member's profiles via our maps, using such **Affordances**. Affordances are basically the designer's way of communicating how something should be used.
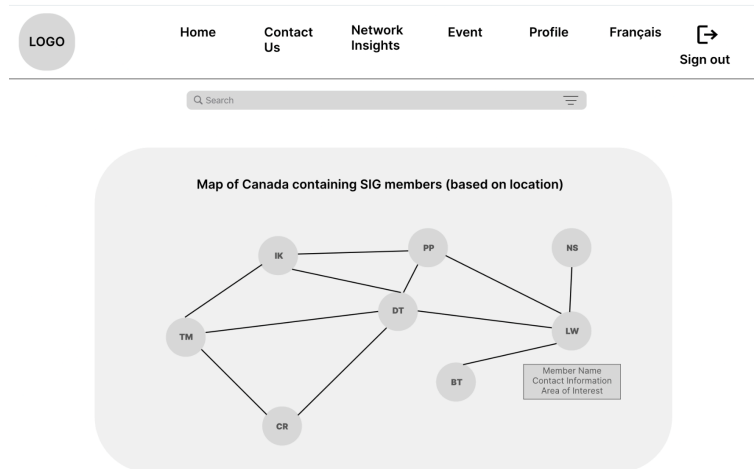
Figure 4: Build A Network Page

Figure 5: Home Page

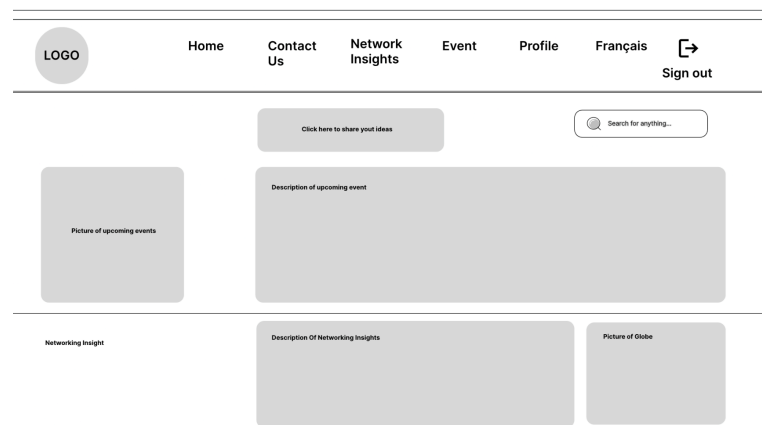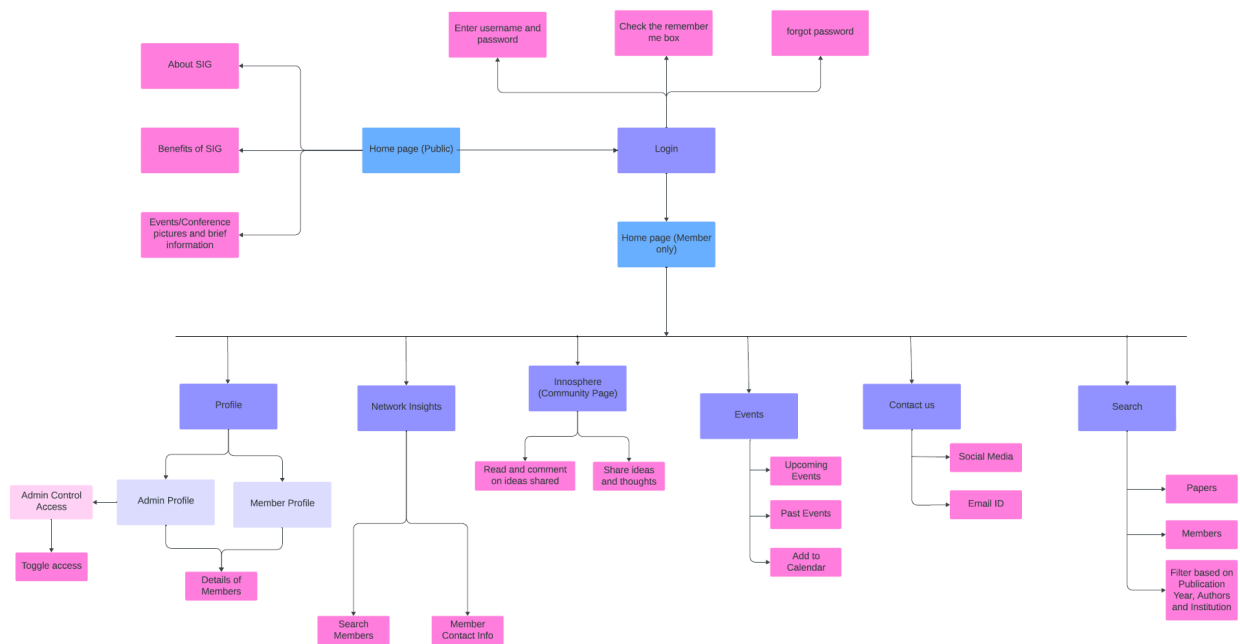**Figure 6: Project Mural**

Final Solution

We were to design our solution based on constant feedback we received from our customers and by incorporating certain design decisions that we learnt from our classes. Certain feedbacks like removing the admin specific user role gave us a lot of room to focus into other design choices like using a map to direct users to member profile pages.

Additionally, certain signifiers were criticized for being vague and did not convey the meaning we wanted it to convey. On receiving such feedback, it led us out of the **False Consensus Effect** and made us go back to our drawing board and make better designs.

Final WordPress Solution

1.   Home Page

Our home page did not change from our initial designs much. We wanted our home page to be a landing page showcasing information about our customers. Since it was our landing we wanted to integrate our build a network feature and our activity feature contained within this page.
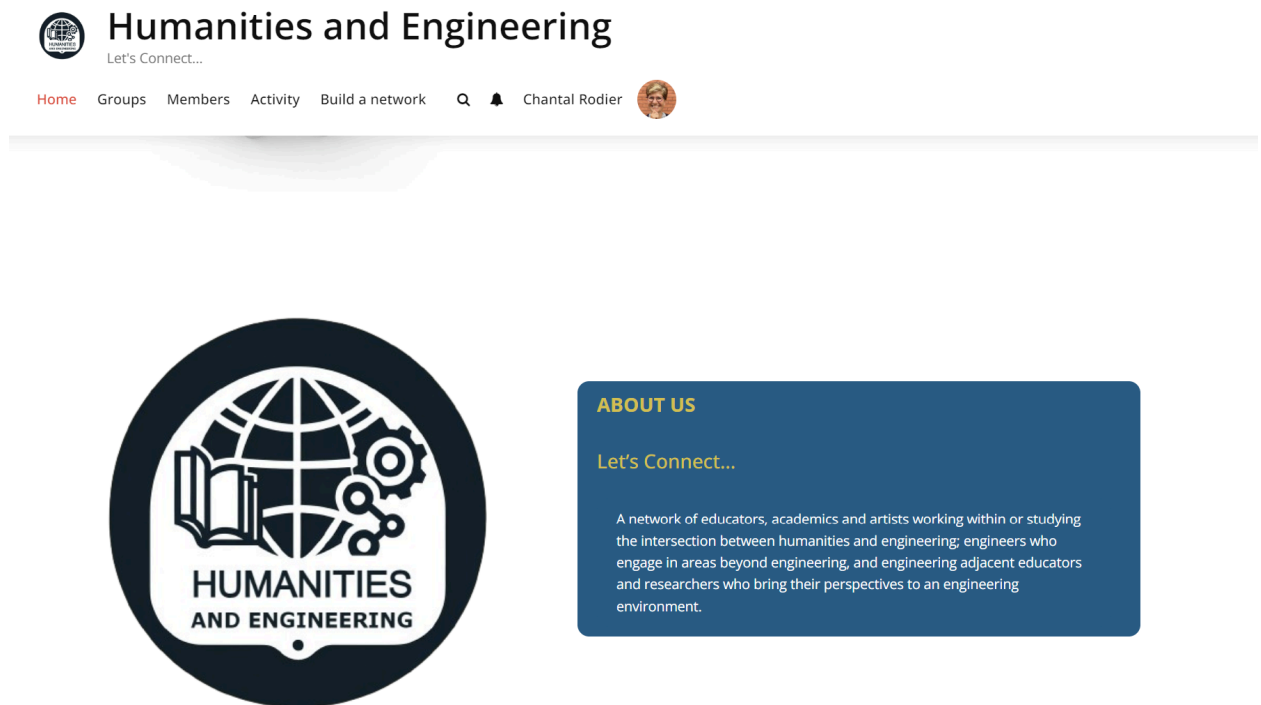

Figure 7: Home Page

2.   Build a Network Page

Similar to our home page, the design of our Build a Network page too was mostly untouched. We came up with such a design implementation because of a requirement that had been given to us. They wanted us to build a solution that would make users connecting with the SIG members easily. This made us go

in the direction of showcasing the SIG members on the map as a pin, so that when the user hovers over the pin it would show their details. We had to use custom JS code, to dynamically populate an instance of the google maps on our website via Google Map API.
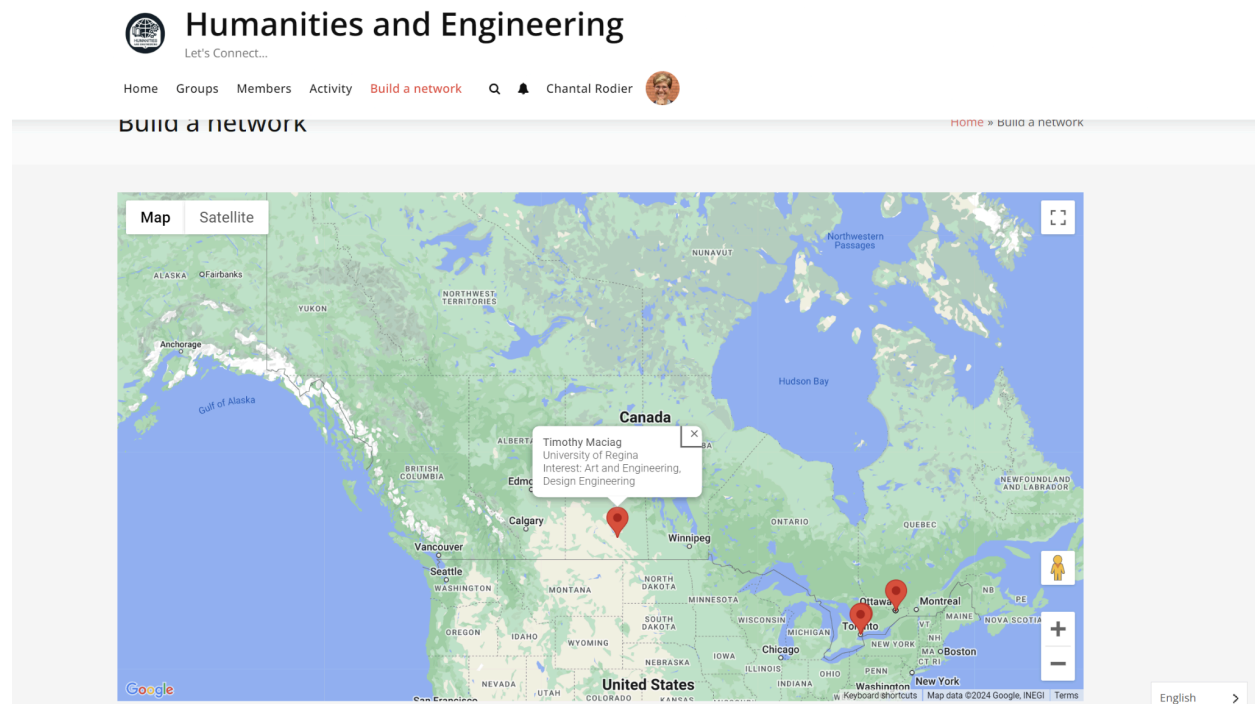
Figure 8: Build A Network Page

Reflections on Project Results

1. Our feelings about this project (likes/dislikes)

We have really put in the effort to make our customer's lives easy and to be able to complete this project. From day 1 we were pushed out of our comfort zone and that made us design better prototypes than last time. The weekly customer check-ins made our experience very close to being in a professional office setting.

2. Things that went well and that did not go well

The whole design and understanding the requirement process was a lot of fun and we as a team enjoyed doing so. Albeit things were going smoothly at this stage but getting to this stage wasn't fun. We

struggled to get the customer requirements right during the initial stages of it. At this point we were feeling pretty exhausted as it was new for us and we did not know how to divide work amongst ourselves. This resulted in doing a lot of redundant work.

3. Translating designs from prototype to reality

At the later stages into our project we realized not all the design features were feasible via WordPress, specially because we were limited to using the free edition of WordPress. Nevertheless, we managed to find a workaround with free plugins in order to successfully translate customer requirements from our prototypes into WordPress. For example, we used a plugin, Weglot, to be able to translate languages thereby allowing us to achieve bilingual support (English ⇄ French) in our solution.

4. People Centered Design Ideas

Some PCD ideas that we learnt from our classes really helped us in thinking like a designer. The use of Affordances, Signifiers and concepts like Bridging the Gulfs steered us in the right direction while we were in the design phase. Though not all PCD ideas were easy to incorporate into our WordPress solution. Ideas like avoiding the False Consensus Effect proved challenging and time consuming.

5. Future Projects

We would certainly maintain our core team. We were able to communicate effectively and criticize ideas in a constructive manner. Furthermore, we would certainly continue using our collaboration and design tools like Github, StoriesOnBoards and Mural.

The one thing we all agreed on doing differently is by going with a more open source technology like HTML, CSS and JS to implement our solution, instead of using WordPress. We feel there are so many one source designs out there which could have answered our customer's requirements better. Additionally, dynamically setting up complex functionalities are easily achieved when using an open source solution.

5. Summarize opportunity and Future Works

To summarize, if there is a requirement for a more robust yet easily maintainable website with no/low code development then using WordPress is probably the best tool in the market. It certainly does have a lot of pain points but having a tool that makes websites on the go is better to have than not. WordPress is

currently the number one platform for a no/low code solution for website development. That being said, if there were more focus on creating or importing open source plugins and themes for WordPress, then it would truly be a holistic website development tool.

APPENDIX

WordPress Plugins and Themes

In order to solve our customer's business needs and problems, we had used WordPress and its associated plugins and themes. A list of themes and plugins we used were:

1. **Buddy-X Theme**: Buddy-X theme has over <u>4000 active installations</u> and <u>over 19 users have rated 4+ out of 5</u>. It's currently on <u>version 4.6.7</u> and its latest update was released on <u>March 20, 2024</u>. It's an ideal theme for community or member based websites, and with this theme we were able to add features like, having individual member profiles, and creating groups to name a few.

2. **BuddyPress Plugin**: This plugin has over <u>100,000 active installations</u> and <u>a little under 300 users have rated it 4+ stars</u>. It's currently on <u>version 12.4.0</u> and the latest update was released on <u>March 20, 202</u>4. This plugin is automatically installed if we activate the Buddy-X theme. Users can register on to the website to create user profiles, have private conversations, make social connections, and create and interact in groups like social media.

3. **Elementor:** Elementor is rated by WordPress as the number 1 plugin for web creation. It has no code drag and drop feature and allows us designers to easily place widgets in websites. The plugin <u>powers more than 16M websites</u> and has <u>over 5 million active installations</u>. On <u>March 10th 2024</u>, they launched their new update <u>version 3.20.4</u>. This plugin has over 40 free widgets and a lot of other paid features.

4. **Insert PHP Code Snippet:** This plugin has <u>over 100k activations</u> and <u>650 user have rated it with an average of 4.5</u>. The latest update version 1.3.5 was released 2 months ago, on February 10th 2024. This plugin converts php code into shortcodes and displays it in a dropdown in the standard wordpress content editor.

5. **Weglot:** Weglot Translate is an all-in-one WordPress translation plugin, trusted by 70,000+ users worldwide. It has <u>over 60,000 activations</u> with an average of <u>4.8 ratings given by 1500+ users</u>. Its <u>latest version 4.2.6</u> was launched 4 weeks ago on <u>March 14 2024</u>. Weglot can translate over 110+ languages and go multilingual within minutes, no coding required.

Custom Codes

We have used a lot of custom CSS for our home page and Google map, here is the code

1. **Custom Code 1 - Used in Home Page**

```
/* Set background color to black and add texture */
body {
    background: url('texture.jpg') repeat; /* Replace 'texture.jpg' with the path to your texture image */
    color: #ffffff; /* Set default text color to white */
}

/* Set background color of search input and button */
.wp-block-search {
    background-color: #085C87; /* Set search bar background color */
    border-radius: 12px;
    padding: 15px;
}

/* Style the search input */
.wp-block-search input[type="search"] {
    background-color: #ffffff; /* Set input background color to white */
    color: #000000; /* Set input text color to black */
    border-radius: 0px;
    padding: 8px;
    width: calc(100% - 120px); /* Adjust width of input */
}

/* Style the search button */
.wp-block-search input[type="submit"] {
    background-color: #ffffff; /* Set button background color to white */
    color: #000000; /* Set button text color to black */
    border-radius: 12px;
    padding: 10px 20px;
    margin-left: 10px; /* Add space between input and button */
}

/* Style the map container */
.wpmapblock-map-container {
    background-color: #115599; /* Set map container background color */
    border-radius: 12px;
    overflow: hidden;
    padding: 20px;
}
```

```css
/* Style the map */
.wpmapblock-map {
    width: 100%;
    height: 300px; /* Adjust map height */
}

/* Style the heading */
.wp-block-heading {
    color: #D8C03A; /* Set heading text color */
    margin-top: 30px; /* Add space above heading */

}

/* Style the preformatted text */
.wp-block-preformatted {
    color: /*#334F68*/ #ffffff; /* Set text color to white */
    background-color: /*#0077aa #B4CACF*/ #085C87; /* Set background color */
    border-radius: 12px;
    padding: 20px;
    margin-bottom: 20px; /* Add space below preformatted text */
}

/* Style the buttons */
.wp-block-button a {
    background-color: #085C87; /* Set button background color */
    color: #ffffff; /* Set button text color to black */
    border-radius: 12px;
    padding: 10px 20px;
    margin-right: 10px; /* Add space between buttons */
}

/* Style the image */
.wp-block-image {
    border-radius: 12px;
    overflow: hidden;
    margin-bottom: 20px; /* Add space below image */
}

/* Adjust text color for better readability */
.wp-block-columns,
.wp-block-group {
    color: #000000; /* Set text color to white */
}
.wp-block-columns,
.wp-block-group,.wp-paragraph{
        color: /*#334F68*/ #830887; /* Set text color to white */
}
.has-text-align-left{
        background-color : #085C87;
        color: /*#334F68*/ #ffffff;
         border-radius: 12px;
    padding: 10px 20px;
    margin-right: 10px;
}
```

.is-vertically-aligned-center,.wp-paragraph{
*   background-color : #085C87;*
*   color: /*#334F68*/ #ffffff;*
*   border-radius: 12px;*
*   padding: 10px 20px;*
*   margin-right: 10px;*
}

Installation and Usage

In order to utilize this custom CSS we took the help of our "Insert PHP Code Snippets" plugin. This plugin gave us the ability to convert custom code to a shortcode which could be applied anywhere in our WordPress content editor.

Figure 9: Inside Insert PHP Code Snippets Plugin

2. Custom Code 2 - Used for Google Maps API

```
// Get header
get_header();
?>

<!DOCTYPE html>
<html lang="en">
<head>
   <meta charset="UTF-8">
   <meta name="viewport" content="width=device-width, initial-scale=1.0">
   <title>Member Map</title>
```

```
    <style>
      #map {
        height: 600px; /* Increased height to fit the map */
        width: 100%;
      }
      .info-window-content {
        max-width: 200px;
      }
    </style>
</head>
<body>
  <div id="map"></div>
  <script>
    // Initialize the map
    function initMap() {
      // Create a new map instance
      var map = new google.maps.Map(document.getElementById('map'), {
        center: { lat: 56.1304, lng: -106.3468 }, // Centered around Toronto
        zoom: 4 // Zoom level for closer view
      });

      // Add the first user marker (Deborah Tihanyi)
      var deborahMarker = new google.maps.Marker({
        position: { lat: 43.6629, lng: -79.3957 }, // University of Toronto coordinates
        map: map,
      });

      // Add the second user marker (Lydia Wilkinson)
      var lydiaMarker = new google.maps.Marker({
        position: { lat: 43.7, lng: -79.3 }, // Different coordinates for Lydia Wilkinson
        map: map,
      });

      // Add the third user marker (Chantal Rodier)
      var chantalMarker = new google.maps.Marker({
        position: { lat: 45.4215, lng: -75.6972 }, // University of Ottawa coordinates
        map: map,
      });

      // Add the fourth user marker (Timothy Maciag)
      var timothyMarker = new google.maps.Marker({
        position: { lat: 50.4452, lng: -104.6189 }, // University of Regina coordinates
        map: map,
      });

      // Define custom info window content
        var deborahInfoWindowContent = '<strong>Deborah Tihanyi</strong><br>University of Toronto<br>Interest:
People Centered Design, Human-Computer Interection';
        var lydiaInfoWindowContent = '<strong>Lydia Wilkinson</strong><br>University of Toronto<br>Interest: Art and
Engineering';
```

```
        var chantalInfoWindowContent = '<strong>CHANTAL RODIER</strong><br>University of Ottawa<br>Interest:
People Centered Design, Information Architecture';
        var timothyInfoWindowContent = '<strong>Timothy Maciag</strong><br>University of Regina<br>Interest: Art
and Engineering, Design Engineering';

        // Add info windows
        var deborahInfoWindow = new google.maps.InfoWindow({
          content: deborahInfoWindowContent,
          maxWidth: 200
        });

        var lydiaInfoWindow = new google.maps.InfoWindow({
          content: lydiaInfoWindowContent,
          maxWidth: 200
        });

        var chantalInfoWindow = new google.maps.InfoWindow({
          content: chantalInfoWindowContent,
          maxWidth: 200
        });

        var timothyInfoWindow = new google.maps.InfoWindow({
          content: timothyInfoWindowContent,
          maxWidth: 200
        });

        // Open info windows on marker hover
        deborahMarker.addListener('mouseover', function() {
          deborahInfoWindow.open(map, deborahMarker);
        });
        deborahMarker.addListener('mouseout', function() {
          deborahInfoWindow.close();
        });

        lydiaMarker.addListener('mouseover', function() {
          lydiaInfoWindow.open(map, lydiaMarker);
        });
        lydiaMarker.addListener('mouseout', function() {
          lydiaInfoWindow.close();
        });

        chantalMarker.addListener('mouseover', function() {
          chantalInfoWindow.open(map, chantalMarker);
        });
        chantalMarker.addListener('mouseout', function() {
          chantalInfoWindow.close();
        });

        timothyMarker.addListener('mouseover', function() {
          timothyInfoWindow.open(map, timothyMarker);
        });
        timothyMarker.addListener('mouseout', function() {
          timothyInfoWindow.close();
        });

        // Open link on marker click
```

```
        deborahMarker.addListener('click', function() {
            window.location.href = 'http://99.79.54.60/members/israr/';
        });

        lydiaMarker.addListener('click', function() {
            window.location.href = 'http://99.79.54.60/members/lydia-wilkinson/';
        });

        chantalMarker.addListener('click', function() {
            window.location.href = 'http://99.79.54.60/members/bhargav/';
        });

        timothyMarker.addListener('click', function() {
            window.location.href = 'http://99.79.54.60/members/timothy-maciag/';
        });
    }
  </script>
</body>
</html>

<?php
// Get footer
get_footer();
```

This piece of code helped us in creating an instance of a map and then set each member's location as a pin on the map. Then if the mouse cursor is hovered over the newly setup pins, the user would get the information of the member. This piece of code helped us develop our designs for Build a Network page in WordPress.

The google map api code we used currently is a free trial version, so in order to develop this into a permanent solution we must first get the paid API key from google and update it in the highlighted section of the code provided above.

(this is the part of the code that is highlighted above, by just updating the link with the latest API key will get the changes that is needed for a permanent solution in our website <script src="https://maps.googleapis.com/maps/api/js?key=AIzaSyCXyiC_igckYn7XsB7E9Mq1LnXidiXL6Q M&callback=initMap" async defer></script>)

Other than this, our other custom code solution does not need any updates and we did not find any bugs.