ARCLAB

# Arclab.space

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December 2022

**Key Findings**

1. With the in-depth development of Internet technology, people rely on the Internet to find services and solutions.

2. An excellent webpage is crucial for enterprises. It is a critical marketing channel which can enhance the company's exposure and influence. High-quality websites can deliver company value to customers more clearly and are also an essential source of customers' first impressions.

3. Displaying existing project outcomes for various clients is necessary. We integrate the company's latest achievements so that customers can quickly grasp the company's dynamics and increase marketing opportunities for Arclab.

4. Compared with keeping customer loyalty with E-mail. Establishing exclusive files and services for each customer on the system will give them convenience and make them believe that the service provider is professional.

**Introduction**

Arclab is an advanced 3D surveying and mapping company. Currently, the company's website only has a simple company profile and service project introduction. Thus, the main communication channel with customers is limited to e-mail, and existing deliverables are issued as links to customers by e-mail.

We aim to build an online platform called Arclab.space that will enable the Arclab team and external clients to access our existing online deliverables from a single domain. The links to the online deliverables are currently contained within a single e-mail. These connect to other webGL platforms for 3D site data visualisation. The platform will permit embedding these links as iframe alongside other, more standard visual content (JPG images, PDFs). The platform will facilitate wider team and consultant access to our deliverables. It will also include the capability to hyperlink Dropbox links for centralised file access. To improve user experiences, we expect to set up a user login page allowing customers to view and check all deliverables correspondingly.

Meanwhile, the functionalities of downloading and sharing visual content are also essential, improving the user experiences and promoting Arclab's publicity. Arclab.space would also be

used to display the company's existing achievement documents on the homepage to attract the interest of potential customers. On the other hand, the project should consider the user interface and design of the platform, as well as the Arclab branding profiles.

Nowadays, with the in-depth development of Internet technology, people rely on the Internet to find services and solutions. In the Internet era, the traditional marketing channel has struggled to support the company's continuous business growth and has gradually been marginalised. Therefore, an excellent webpage is crucial for enterprises. It is a critical marketing channel which can enhance the company's exposure and influence. High-quality websites can deliver company value to customers more clearly and are also an essential source of customers' first impressions. Without a website, it isn't easy to let customers know the company's brand and service because people can't find any reliable information about the company. In particular, those deliverables from Arclab are large-scale 3D scanning and documentation, so professional ways of displaying project outcomes for various clients are necessary. Therefore, the platform we plan to develop will integrate the company's latest achievements so that customers can quickly grasp the company's dynamics and increase marketing opportunities.

## Methodology

### ***Design Guidelines***

Following the project plan, we first created a design guideline for this project, in which we mainly focused on the design of pages and corresponding features for each page. Building up the design guideline helps our team work more efficiently with an estimated timeline; therefore, we can reduce delays or misunderstandings and ensure a smooth workflow while trying to make outcomes close to realistic goals. We choose to design pages logically for the whole picture of design guidelines, which means the user experiences and interactions in the Arclab.space are fully considered. In this way, we'll discuss the ideas about page design based on the various features of each page in the following sections.

***Figma***

In addition, choosing the Figma platform is the best solution to visually display what our UI/UX design for Arclab.space looks like. With the robust design features, we take advantage of it to implement a flat design for Arclab.space and set up a more efficient workflow for the entire design guideline. At the same time, the majority of functionalities for each page can be demonstrated by Figma after we link pages together, which also makes a good foundation for further software development and improves the inclusivity of the team.

***Flat Design***

Flat design is committed to reducing 3D effect image elements, including shadows, gradients and textures, to focus on using images with redundant information removed, typesetting and solid colour effects. Since the advent of windows 8 and ios 7, flat design has become mainstream, improving information processing efficiency. The flat interface can better realise the image size transformation on electronic devices with different screen sizes.

We adopted the black colour as the background consistent with the existing enterprise portal and following the flat design. Compared with the exquisite Flash animation and quasi-physical design style, the flat design can ensure a smooth user access experience. Deluxe web design will have more strict server requirements, leading to higher website operating costs. Otherwise, it will cause some page loading problems, seriously affecting the user experience. A study shows that when users wait after 15 to 20 seconds, if they still cannot view all content, they will lose patience and leave the website, thus making enterprises lose the opportunity to display their products and achievements. Since Arclab is in the initial stage of creating its portal website and may not have enough capital investment budget for website construction, the simple webpage can save server resources to display 3D achievement files avoiding lagging. In addition, Arclab's primary delivery resource is 3D mapping files. Suppose 3D effect elements such as shadow, perspective, texture, and gradient are applied to page design; the page hierarchy will be confused, harming the interactive experience.

***Type of data source and their display methods***

1. DWG & PDF - CAD topographical survey plan (including drone orthophoto)

A CAD topographical survey plan records the height, depth, size and location of features and contours in elevation (Definition Surveying Limited, 2021). The information is saved in .dwg and .pdf file formats. These file formats can be displayed as a preview on the web platform. The cadviewer package from npm can be installed and used to embed .dwg files directly into the platform, whereas the react-pdf package from npm can be installed and used to preview .pdf files.

2. TIF - Drone Aerial Orthophoto (GeoTIFF)

A GeoTIFF is a file that stores high-quality satellite and aerial photography imagery and additional geographic information (Propeller Aero, 2020). To accurately display the preview of a GeoTIFF file in the web platform, installing and utilising the geotiff.js library is essential.

3. JPG - Site photography

Site photography imagery is saved in .jpg files. Therefore, no additional packages or libraries are required to display the images.

4. RCS - 3D Point Cloud

Currently, no known packages or libraries can be used to display files with the .rcs extension directly on the web platform. Therefore, we would hyperlink the element directly to the visualisation on the Point Share + website.

5. RVT - Revit

Revit is a commercial building information modelling software used to create, edit, and display detailed 3D models (Microsol Resources, 2021). To display previews of .rvt files directly on the web platform, installing the Revit-family-web-viewer package from npm is essential.

**Solutions**

***Features***

1. Home Page (Display of existing achievements and company profile of Arclab)

2. Customer Management (Login, Register, Account Information Management)

3. Project Management (Create Project, Upload Files, Leave Customer Feedback)

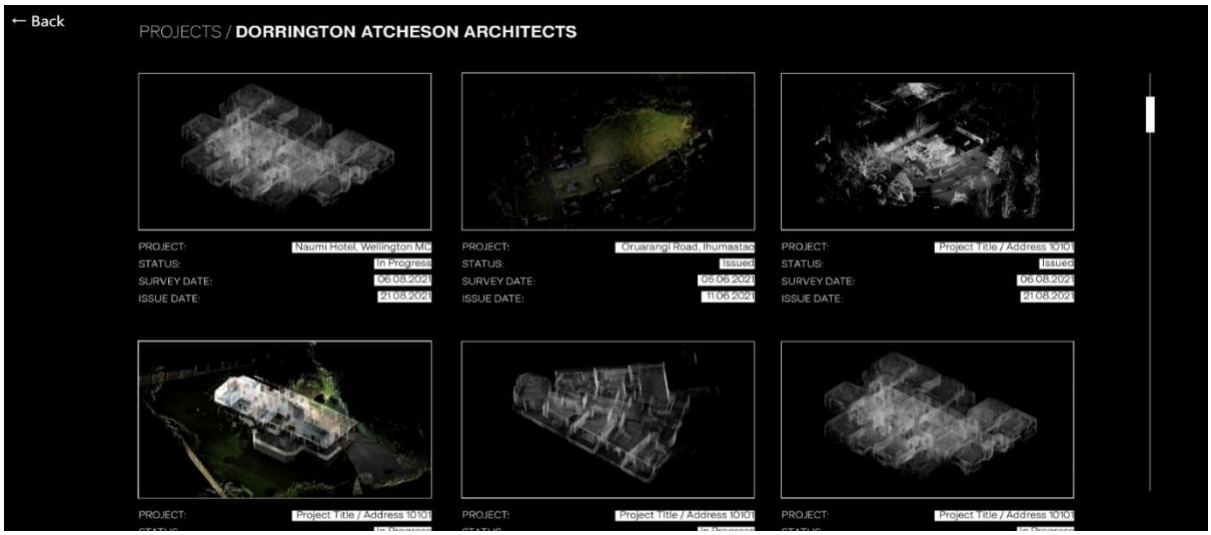
***Technology Stack***

In this project, our technology stack includes HTML, CSS, Javascript, NodeJS, Express, Handler and SQLite. We have realised the three core functions through the application of these technologies. We successfully deployed the project from the local machine to Vultr (a virtual private server provider) to achieve remote access and upload our coding on GitHub. Furthermore, we have adopted a responsive design to facilitate customers to view and comment on delivery documents at any time on portable devices.

***User Journey***

1. Home Page (Login/ Register/ About us)

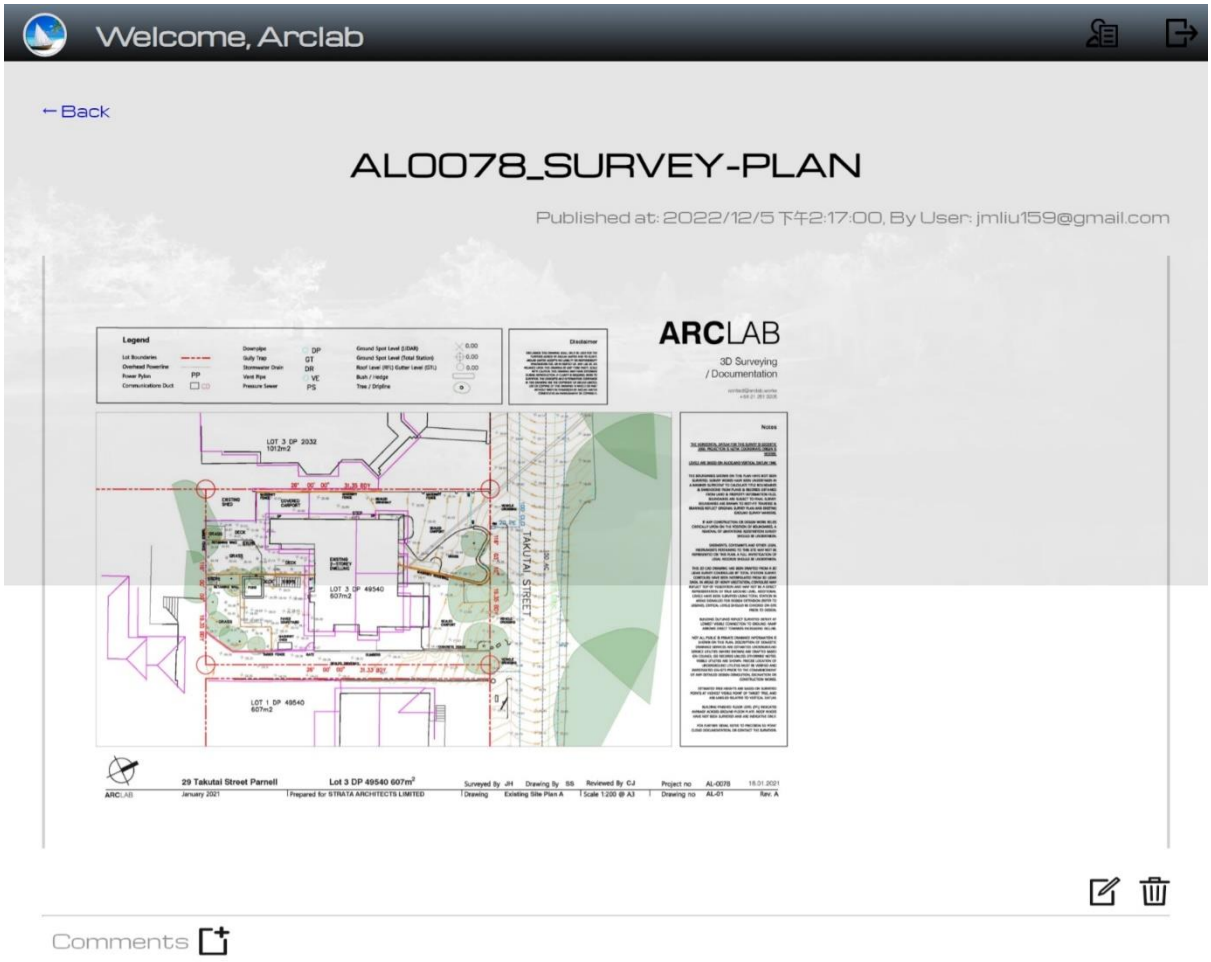


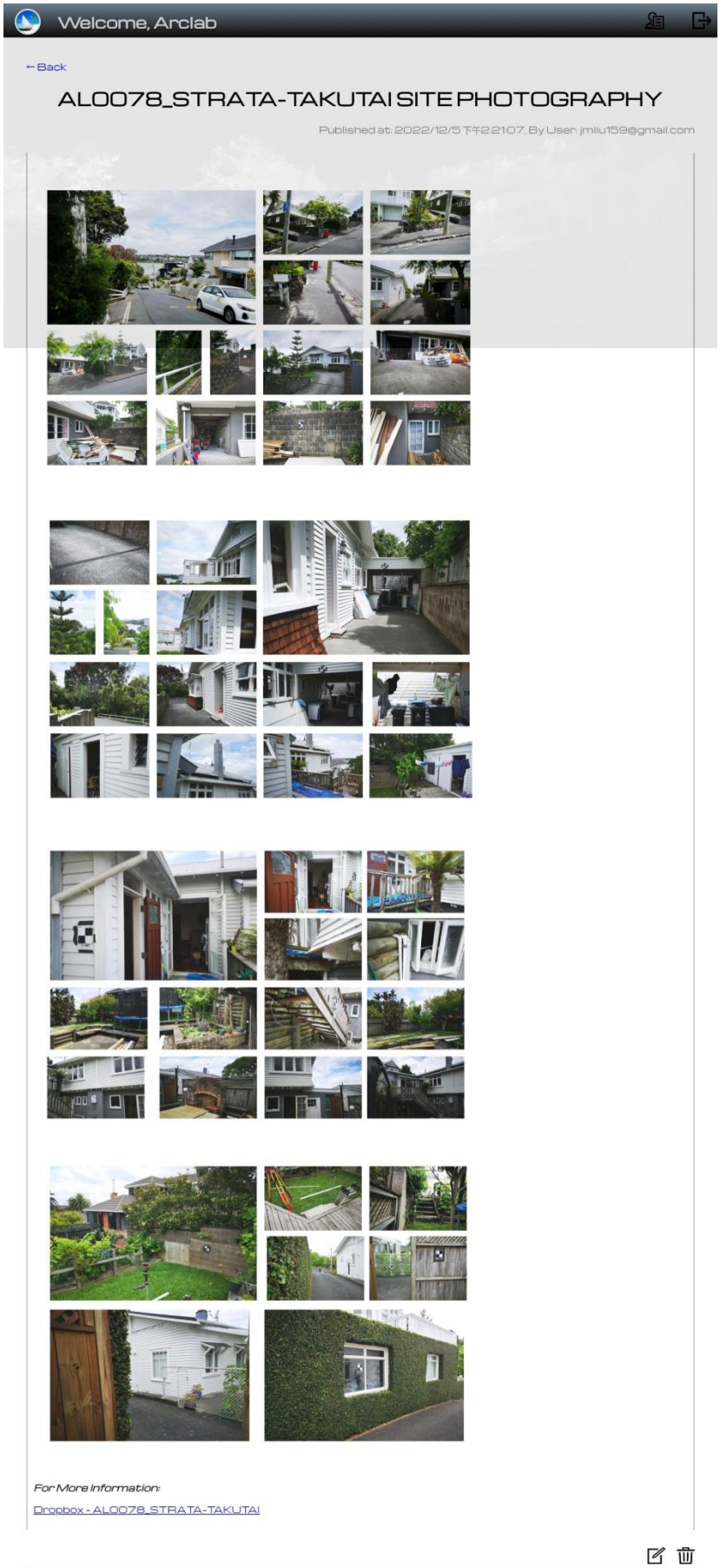


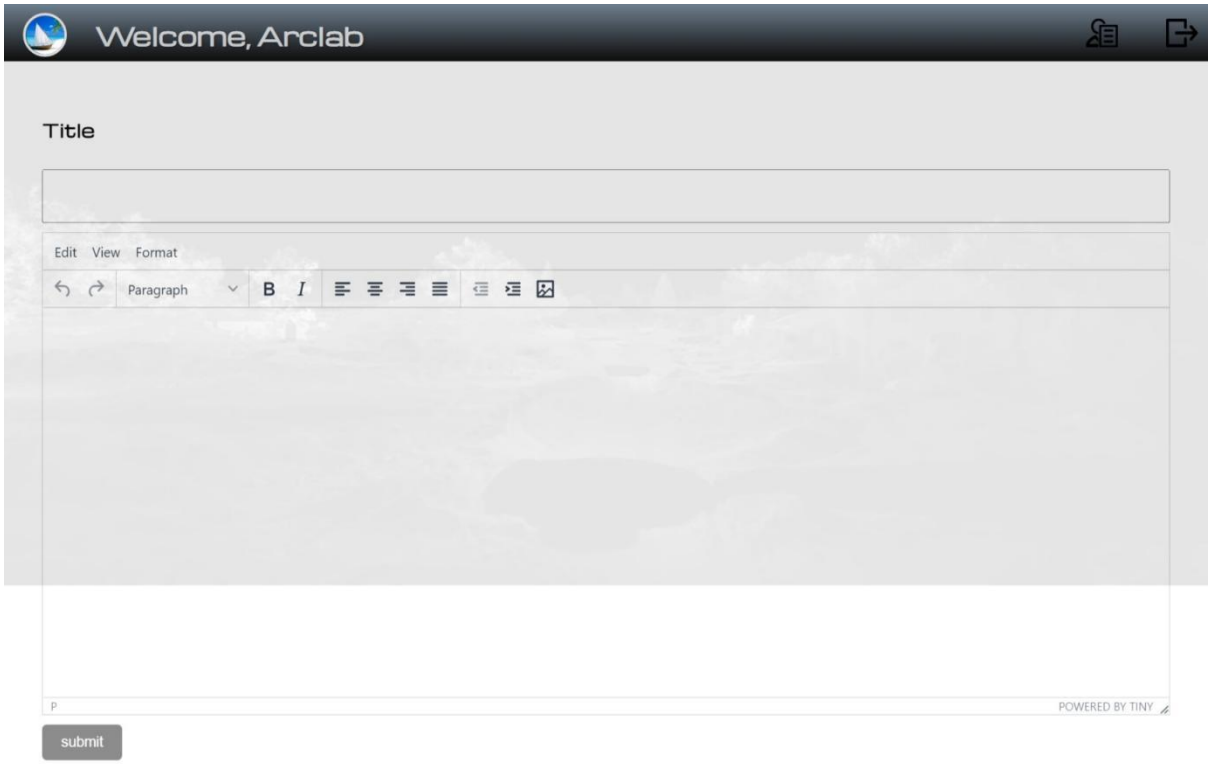
Users can see the company profile when they visit the website to know what services Arclab can provide. Thus, attracting potential customers with relevant business needs for Arclab. On the right side of the homepage, we designed a login box to allow customers to access their exclusive files, including the delivered work. If the customer is new to the website, Arclab must create accounts for each customer so that Arclab can issue the work to the customer's account.

On the homepage, users can also click the "about us" button on the navigation bar. Then they will be directed to the page which shows Arclab's latest achievements so that the customer can quickly grasp the company's dynamics and increase marketing opportunities for Arclab.

2. Customer Page (Create Project/ Project Display/ Customers Feedbacks)


Welcome, Arclab
←Back
AL0078_STRATA-TAKUTAI SITE PHOTOGRAPHY
Published at: 2022/12/5 下午2:21:07, By User: jmliu159@gmail.com
For More Information:
Dropbox - AL0078_STRATA-TAKUTAI
Comments




When a customer successfully login, they will be directed to the customer page. On this page, they can find their project which has been delivered and can sort projects by date or title. The displaying method of the project is opening a document containing types of words, images and URL links to an external website. Meanwhile, Arclab can create a project for its customers on this page.

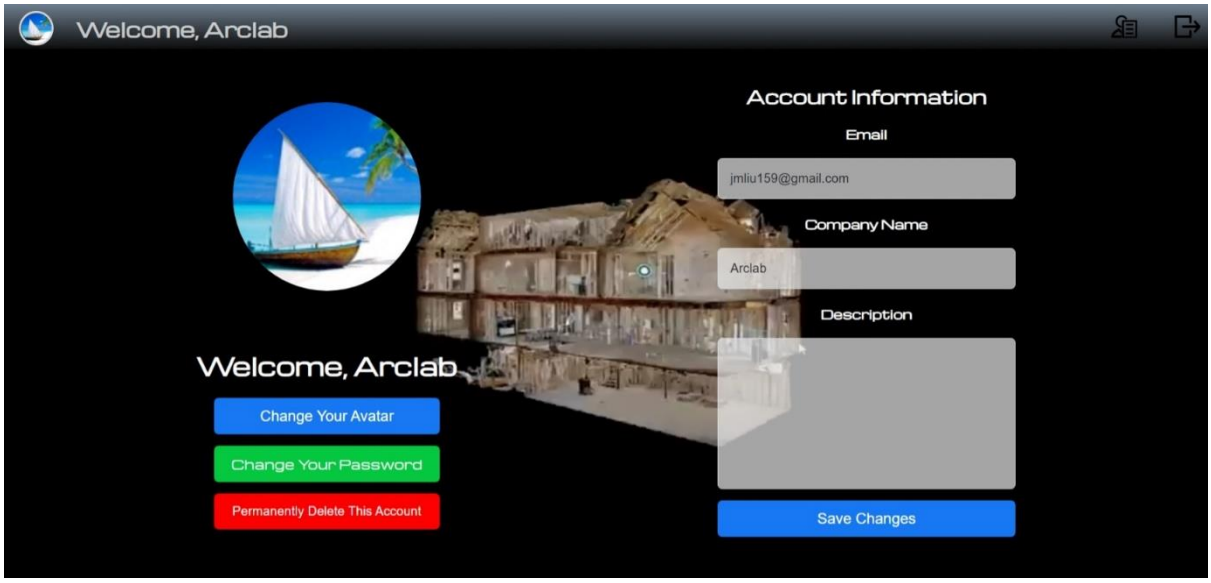
Furthermore, the platform also integrates the feedback function. Compared with traditional e-mail communication, this function enables customers to transmit their ideas and opinions to Arclab in a timely and more flexible. For e-commerce, the user feedback system is the critical basic supporting service. A sound user feedback system can improve user satisfaction and make communication more efficient.

We think this page can make some improvements to make the page looks more professional. Due to the time limit, some of our ideas have not been realised. However, we have created a template to illustrate our concepts.


Firstly, we can allocate an administrator account for Arclab so that they can deliver project results for customers through this account. Meanwhile, the account should also realise the global management of existing customers.

Secondly, we would like to rearrange the page layout to make it look more professional. For instance, we can visualise 3D site data by connecting other webGL platforms on the right side of the page. The platform will allow these links to be embedded into other, more standard visual content (JPG images, PDF) as iFrames. On the left side of the page, users can see detailed information regarding the current work, such as some crucial parameters.

3. Account Information Page (Customer Profile, Account Management)




This page is mainly used to facilitate Arclab to manage customer information easier. On this page, we use the Flex layout. Users will be directed to the account management page when they click the avatar on the navigation bar. Users can change their account password and avatar (enterprise logo), delete the account, and edit their enterprise description on this page.

## Conclusion

The design of a relevant web application was the only way to solve the single communication between Arclab and its users and achieve better user interaction. Firstly, Figma was used to create a good development base for Arclab's web application and to provide a visual UI/UX design. Secondly, the technology stack was used to implement the three core technologies of Home Page, Customer Management and Project Management using NodeJS, Express, Handler and SQLite to enable users to utilise the web application. Finally, the human-computer interaction design on the Home Page, Customer Management and Project Management is used to solve different types of data output regarding Arclab's project profiles or industrial data, modelling, etc.

## Further Development Recommendation

Due to the limited timeframe, we could only develop using the aforementioned technology stack. To develop a reliable, scalable website with extensive features, we recommend

developing the front-end of the website using React and Typescript, and the back-end of the website using Javascript, NestJS, Sequelize and PostgreSQL. Furthermore, installing the packages such as cadviewer and Revit-family-web-viewer, and utilising the geotiff.js library is essential. These dependencies would only add 2570.6 kilobytes to the website, thus the speed of loading the website should not be affected.

## References

[1] Definition Surveying Limited. (2021). Defining the Topographical Survey. Definition Surveying. Retrieved November 30, 2022, from https://www.definition.nz/topographical-survey

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