SUNWAY UNIVERSITY

Web Fundamentals

ATOMICVEIN

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Abstract

This report is constructed for the final assignment of Web Fundamentals subject. The topic of the project is "Web planning, Design, and Implementation". With the rise of cryptocurrency, NFT was introduced into the ecosystem for three years only, and it has been the talk of the century amongst crypto investors nowadays. NFT is the new wave of digital art that allows owners of NFT to show off how much cryptocurrency they spend. The core idea of this paper is to draft, develop and build a working and improved e-commerce website based on the guidelines. The website's goal is to buy/ sell NFTs and introduce a social system into the ecosystem to allow for a more inviting community. The website will be implemented in 2 stages. The first stage is to set up the pages that are easily accessible to users and list all the NFTs on the website for browsing. During this stage, the overall quality of life and smoothness of the website flow is tested to see if there are too much resources to load and if it will clog the user's cache. The second stage is to implement the functions of the website, such as the buy, list, offer, and posting functions of the website. All of these are implemented to ensure that the website will be a step up from all the current competitors in the market.

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1.0 Introduction to Website

1.0.1 The Ecommerce that we have chosen.

The e-commerce that our group has chosen for our website is a marketplace for Non-Fungible Token or more known as NFT on the web. So, what is an NFT? NFTs are "one-of-a-kind" assets in the digital world that can be bought and sold like any other piece of property, but which have no tangible form of their own. [1] These assets can be represented by many forms, like art, music, videos, and other types of digital files as unique items, and utilize blockchain technology to establish a verified and public proof of ownership on the blockchain network. This has allowed artists to publish their works on the internet with concrete ownership on the blockchain, which has provided opportunities for artists and collectors alike to join the e-commerce field by tokenizing their collections or works. Therefore, our project aims to create a website that serves as a marketplace for these NFTs to operate as a platform where users can sell, auction, or trade their NFTs with other users across the globe with a seamless experience.

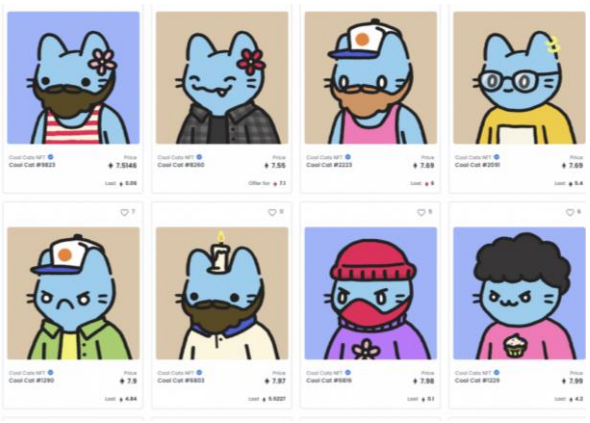


Figure 1: Examples of NFTs

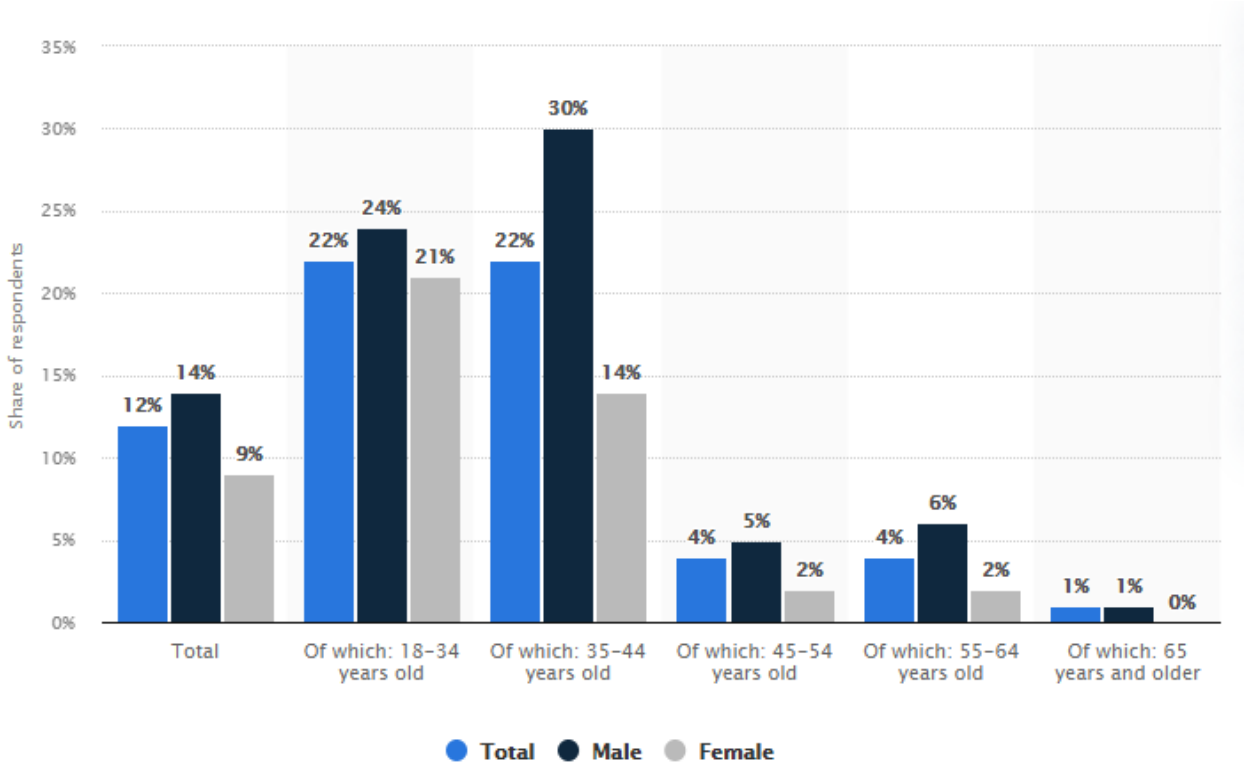
1.0.2 Project Goal of AtomicVein

Thus, we will be introducing AtomicVein, the name for the NFT Marketplace that we have created for this project. Our team has chosen the name AtomicVein to represent the fact NFTs are the digital Gold Rush of the modern era, and golds are mined from the “Vein” of rocks. In addition, the word atomic comes from AtomicWallet, which will be our go-to crypto wallet for our marketplace for reasons that will be stated later. The primary goal of AtomicVein is to provide a seamless and intuitive interface and a better user experience compared to other alternatives. What sets AtomicVein apart from other NFTs marketplace like OpenSeas and Solanart is that we aim to develop our community by designing our website to encourage social interactions. By fostering connections, AtomicVein will help artists, collectors, and users build a community. The personal collections of NFTs of each user will also be displayed in their profile, assisting them in finding and connecting with like-minded artists or other users. Another factor that AtomicVein is different from other marketplaces is that we are not limited to only one cryptocurrency. By implementing AtomicWallet, users can exchange their tokens like Ethereum to Bitcoin. This feature has allowed our marketplace to enable users to list their NFTs in their preferred cryptocurrency. By adding social elements to our website, we hope it will help shape the future of NFTs by sharing passions, birthing new collaboration, and firing up the imagination.

Figure 2: Logo of AtomicVein

1.1 Target Market

Figure 3: Statistics of NFT users



The demographics for AtomicVein will be segmented into four essential parts that identify the target market. AtomicVein aims to have a more effective marketing result. The age, gender, Reasons to use NFTs, and which type of countries they are from are essential as it explains the kind of people using our e-commerce site. Based on the survey results for NFT owners in 2021, most of their age falls between 18-34 and 35-44. Another survey published by a crypto website shows that 61% of the respondents are millennials or younger, while 32% were Gen X or older. And as evident, a more considerable portion of the user base is male, which is 54%, but the female has their fair share with a solid 35%. Both age range, however, has a solid 22% average between both genders. A significant percentage of NFT holders are from developed countries with a solid 67% compared to developing countries with 29%. And the main reason NFT holders use NFTs is to split between 2 big majorities and smaller segments. The leading cause with 49% of NFT holders buying and using NFTs are for financial gains, while 45% only have interest in the technology as a society move forward into the future. The remaining percentage move in the order of" Fun and entertainment," Following trends," I am an NFT collector," and" Don't know."

1.2 Problem Statement

The rationale behind our website is to address the issue of newcomers and having a proper community around buying and selling NFTs. As of 2021 March, the most common NFT marketplace is just a website that allows users to register, buy, and sell NFT without integrating a chatbox or a forum place at the bare minimum to let new newcomers and users discuss ask for insights or guides. From a newcomer's perspective, it feels a little bit overwhelming to register an account and spend thousands of USD on Ethereum on an item that they know nothing about. There is no sense of connection between the buyer and the seller where it feels like a big hole where people purchase what they want without knowing if what they bought will hike in price or if the NFT they purchased will have a more significant project moving forward, such as a website or a game developed where they can use their NFT purchased as an asset with the developers. And the majority of the buyers will feel lost as to which NFT will be trending or the next "Big Project."

Our target market of age range between 18-34 and 35-44 are people that fall in the age range of worker bees where a majority of them barely have the time to do their research and having a community to discuss with can help them regarding which is the best NFT to purchase. The website's overall theme will be dark with a tinge of orange highlight to give off a prestigious feel. The whole theme of the website will be pretty dark as the majority of users in 2021 prefer to scroll to a website that has a dark mode or have a darker background as it is not as blinding. The orange used is not the brightest orange from the pallet but a medium to dark type orange to create a highlight to single out important information for users to read easily. The strong contrast between these two colors creates depth in the website, making it feel like two layers.

2.0 Requirements of the website

Simple outline of AtomicVein

- Overall colour scheme is kept to 3 colours #252422 #CCC5B9 #EB5E28
- Website is to have 6 pages (Home, Marketplace, Rankings, Profile, Project Information, Item)
- Home will have the overview and summary of everything. (Such as top 3 projects, spending's etc)
- Marketplace is a scrollable page with all the project listings.
- Rankings will have the Top NFT's (Highest price)
- Profile will be the user profile. (User stats, NFTs owned / minted, projects following)
- Project information page will have all the information regarding that certain project. IT DOES NOT have the item information, but it explains the SELLERS PROJECT as a whole. (The page has direct links from Marketplace and Rankings.)
- Item or Item information is the last page which will have information on the SPECIFIC NFT that you are viewing. It will explain the item directly and the price of it in Ethereum.
- THE MOST IMPORTANT function which is the community chat box will be implemented in the top of the homepage where it is the first thing the user sees when the land on the home page. This will allow the users to chat with the current members viewing the website.

Based on the simple outline of our first draft of the website's requirements, some improvements have to be made to break down further what is functional and non-functional. Based on the requirement specification label, the conditions can be broken down into two components: the applicable requirement and the non-functional requirement. Operational requirements, in other words, require the website to perform a particular function. And because it's a functional requirement, it means the website SHOULD be doing those core functions. It is the component that includes all the core functions of the website. In comparison, the non-functional requirements are not what the website should do, but instead what the website CAN have to improvise its usability. Convenience or simplicity is also part of non-functional requirements to ensure the users enjoy the experience.

Functional requirements of AtomicVein

- The website should allow customers to see social information and rankings. (Such as top ranking NFTs and Top NFT holders. Followers and Followings. The core social function of AtomicVein)
- The website should allow users to register for an account. (Fields of the form MUST INCLUDE, username, password, email, and phone number)
- When users browse the website without logging in, it will prompt the users to sign up or login for an account. (Secured purchasing)
- The forgot my password button should send the user and email with a temporary password for them to login with to change to a new password.
- The marketplace, rankings, project will be linked between each other as though they are one entity. (The items listed, or the projects listed in each page will be redirected to their respective landing page to allow the users to easily reach their destination page)
- The website must have the core payment method which is use the Ethereum wallet.

Non-Functional requirements of AtomicVein

- AtomicVein needs to be secured. (Profile page may display the users basic surface level information ONLY. The sensitive information is hidden in their profile page where it is only accessible to the account owner only. In 2021 every user care for their privacy which is why AtomicVein has to prioritise each user's sensitive information as there are a lot of money involved in the NFT world.)
- Easy to use UI and navigation. AtomicVein's goal is to get as many people into NFT as possible even those that does not have experience in the crypto/NFT world. Which is why the website will be simplified to avoid any confusion and to be as easily navigational as possible.
- The website will be functional 24/7 as they say in the crypto world. Crypto never sleeps. Same goes for NFT.
- The website is to be responsive and to not have any dead links. As a user the satisfaction comes from content loading fast and responsive almost to an instant as nobody likes to wait. The website also should not have any dead links where it either goes to nowhere or a non-responsive click. (Each click-able item should go to a page)
- The colours chosen for the website also has to be less strenuous on the eyes for long-term viewing. Which is why the colours we have chosen will ease the eyes when scrolling but choose out the important information to be processed by the user.

2.1 Use Case-Identification

The main usages for AtomicVein for Users

- **Serve as a Marketplace for NFTs to the Users**
  AtomicVein allow users to trade, buy, sell, and bid their NFTs all within the space of the website. This is all down through the usage of cryptocurrency, like Ethereum, Bitcoin, etc. Users are able to list their NFTs for sale in AtomicVein, and other users can either purchase it directly or bid on it depending on the type of listing that the seller have provided.

- **Serve as a Informational Hub of NFTs to the Users**
  AtomicVein provides many informational content to the users to better understand NFTs itself and discover new NFTs projects through the usage of the website. Users are able to view the stats such as past history charts and timeline of each NFT projects in the Project page of the NFT itself, and also discover new or top grossing project through the Explore page and Stats Page. Many educational materials are listed in a easily accessed area at the home page to encourage newcomers to better understand NFTs.

- **Serve as a Community Space of NFTs to the Users**

  AtomicVein serve as a community space for users to interact with each other and foster connections. Users are able to post their thoughts in the social posting feature of the homepage, and other users are able to view and interact with these postings. Users are also able to personalized their profile, like listing their

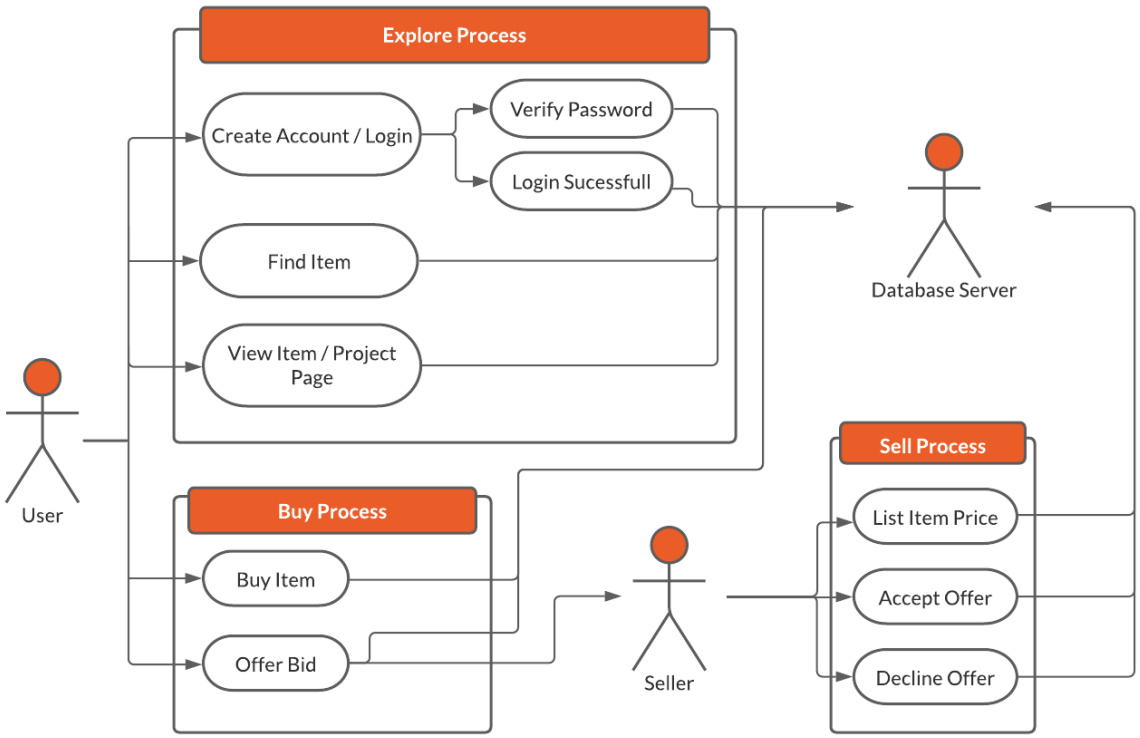


Figure 4: Colour Scheme of AtomicVein

favourite NFTs in their profile. All these social features help the users in finding and connecting with other like-minded users, and helps them to build a community of their own all within the website.

2.2 Color Theory

By going with a minimal approach, it reduces the complexity of creating a clean, professional website. Many websites overwhelm the visitor with information and animation, thinking that they would appeal to them. However, it does the opposite, which makes the user not want to interact with the website.

We went with a minimal approach to appeal to a broader audience and simple coherence throughout the website. Despite our theme being minimal, there is a lot to consider too. For example, the use of whitespace is vital; too much would make the webpage look odd, whereas too little would make it seem crowded. Typography is another crucial factor to a minimal design; we used the font 'Lato' as it is a sans serif font, making it minimal.

Figure 5: Colour Scheme of AtomicVein

Figure 6: Colour Wheel

The colors are based on our brand, AtomicVein, to appeal to our users. We went for a three-color palette theme, #252422 being our background color, #CCC5B9 for the primary color, and #EB5E28 as our accent color. The colors compliment each other, shown by using the color wheel; picking a color from the opposite side would complement each other. #252422 and #CCC5B9 being neutral colors would compliment most of the colors in the color scheme. #EB5E28 (or orange) is a warm color that creates feelings of happiness, optimism, and energy. It also has an attention-grabbing effect that encourages users to take action, such as on signs.

During the discussion for AtomicVein, we decided to go with orange for our accent color as orange is associated with atomic. We then find two suitable colors to match our theme for the website: dark grey (#252422) and grey (#CCC5B9). We picked those two colors as they are easier on the eyes than brighter colors like white.

3.0 Story Board

3.0.1 General Flowchart

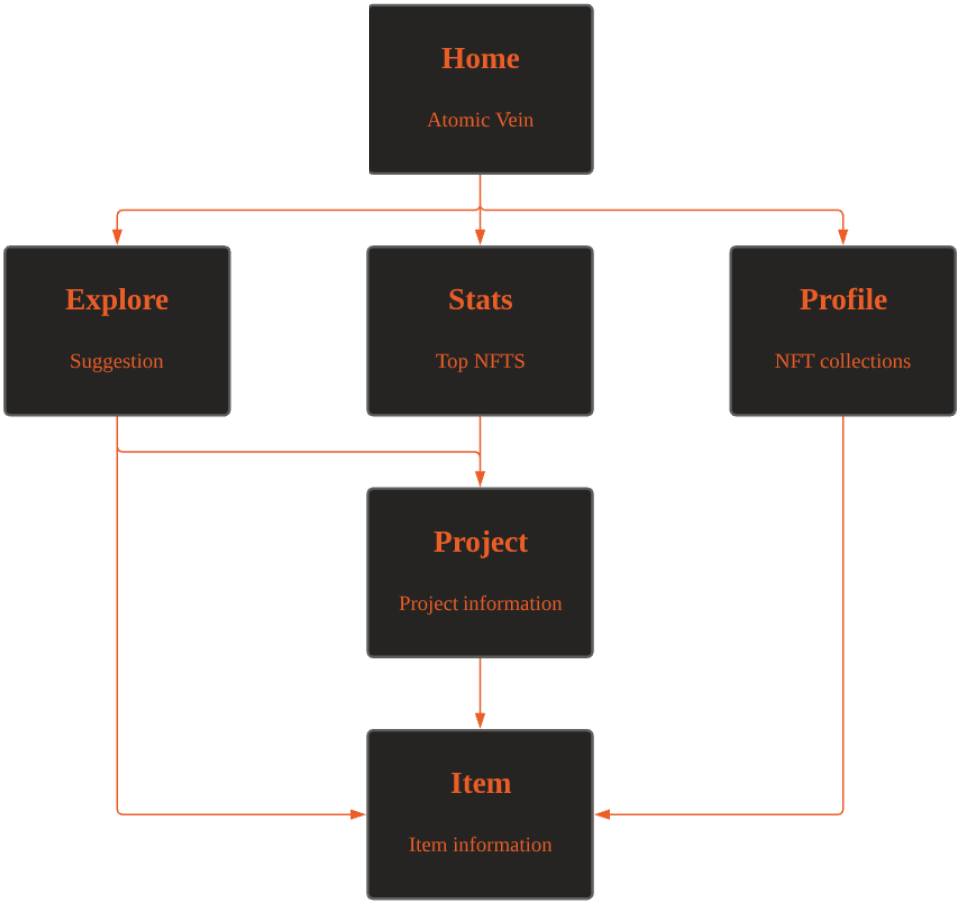


Figure 7: Flowchart of Colour Scheme

Explanation

The image above is a representation of the general flow of the AtomicVein website. So, if the user is a newcomer and has never visited AtomicVein prior, the Login Page will appear first. The login page will then prompt the user to enter their AtomicWallet details to access the website. Then the users will be directed to the home page. From here, the user will have three options to go, the Explore Page, Stats Page, and most importantly, the Profile Page. The Explore Page allows the user to discover NFTs projects and trending NFTs items, and users can navigate to the Project Page and Item Page all within the same page. Next, the Stats Page serves a similar purpose as the Explore Page, but they showcase the ranking of NFT Projects instead. The users can access only the Project Page on the page. And lastly, the Profile Page allows user to showcase their collections. Only the Item Page will be accessed through this page. There are multiple versions of the Project and Item Page depending on what the user clicks on as it is unique to each of the NFTs project and items showcased

3.0.2 Header & Footer

Figure 7: Mockup of Header

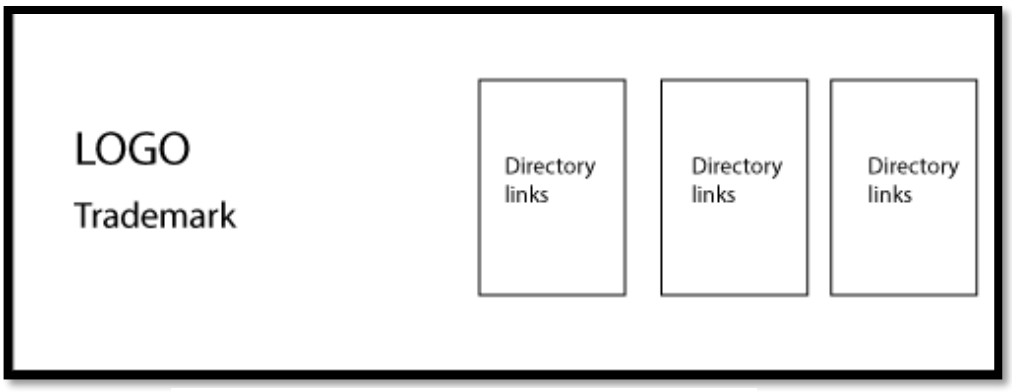


Figure 9: Mockup of Footer

The Main Features of Header & Footer

Header

- **Logo**
  Serve as a Navigational Button to the Home Page, as well as showing the user that they are in AtomicVein.
- **Search Bar**
  Allow User to find specify Users or NFT Projects.
- **Explore**
  Serve as a Navigational Button to the Explore Page.
- **Stats**
  Serve as a Navigational Button to the Stats Page.
- **User**
  Serve as a Navigational Button to the Profile Page.

Footer

- **Logo & Trademark**
  It just serve as a view to company's mission and vision to the users, it does not have any functions.
- **Directory Links**
  Display links to our company's terms and condition as well as social media pages.

3.0.3 Home Page

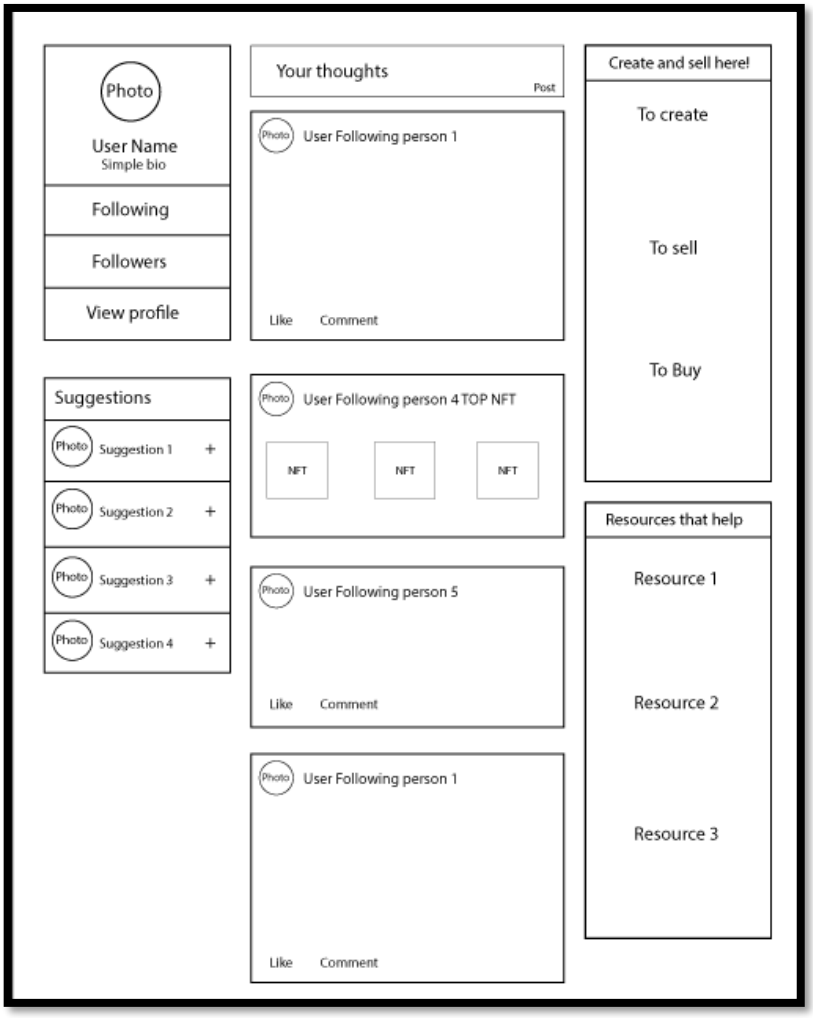


Figure 10: Mockup of Home Page

The Main Features of Home Page

- **Profile**
  Display the User's username, following count, follower count, and a button to profile page.
- **Posting**
  Allows User to post their thoughts, and view other users' postings.
- **Suggestions**
  Serve as suggestion for new NFT items for users according to their preference.
- **Create and Sell**
  Serve as area where Users can list their NFTs and sell them.
- **Resource that Helps**
  Display informational links related to NFTs so that new Users are able to educate themselves better.

3.0.4 Explore Page

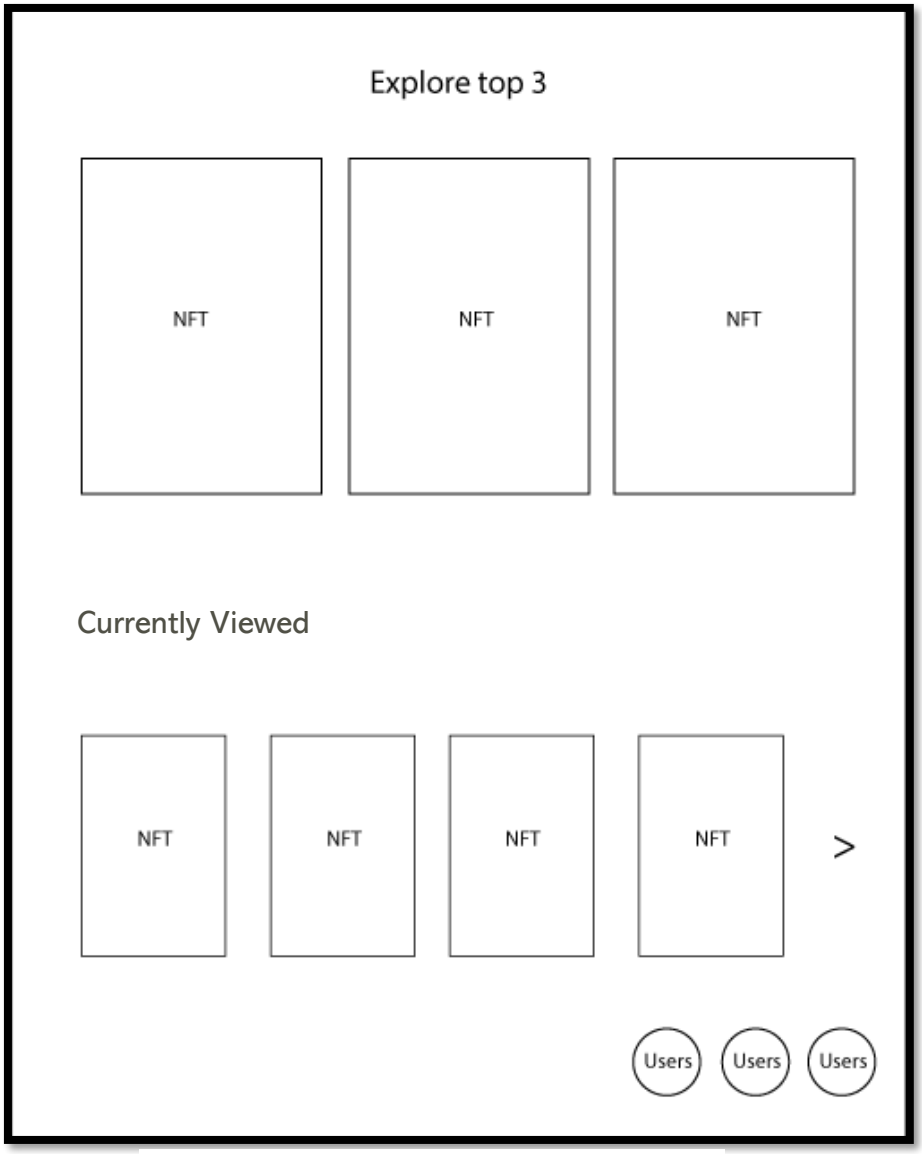


Figure 11: Mockup of Explore Page

The Main Features of Explore Page

- **Explore Top 3**
  Displays the current trending Top 3 NFT Projects. Navigate Users to the NFT project when clicked.

- **Currently Viewed**
  Display the NFTs that are currently viewed by Users of the website. Includes a carousel feature that allows user to click the button on the right to view more NFTs. Navigate Users to the NFT item when clicked.

3.0.5 Stats Page

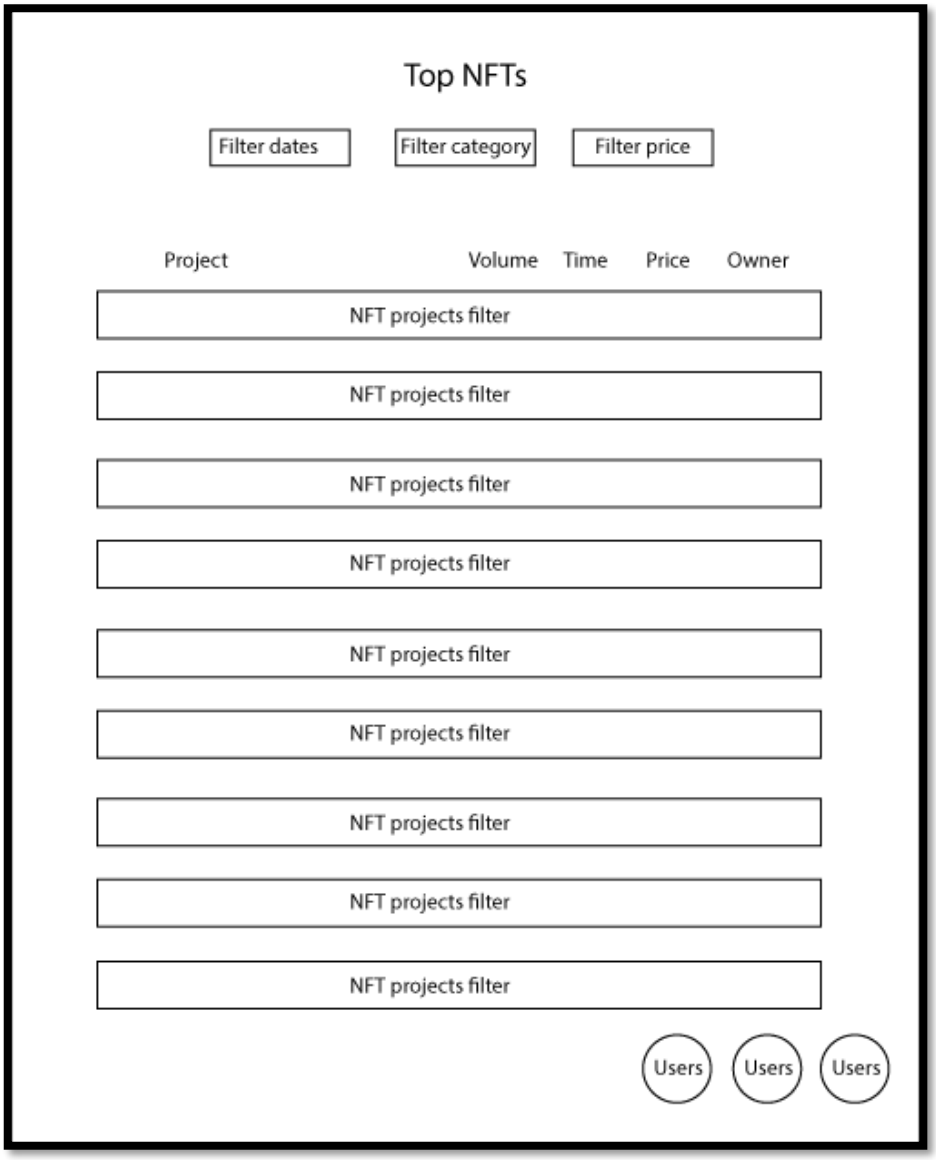


Figure 12: Mockup of Stats Page

The Main Features of Stats Page

- **Filters**
  Allows Users to choose the date, category, and price for the type of ranking for NFTs Projects. Doing so will change the ranking underneath.

- **Ranking**
  Display the ranking of NFT Project based on the filter chosen, defaults at most volume and price. It will show the top 10 ranking NFT Projects according to filter chosen, and the name of the project, time, price, and owner will be displayed in the ranking. Clicking on the Project name will navigate the user to the Project Page of that particular Project.

3.0.6 Profile Page

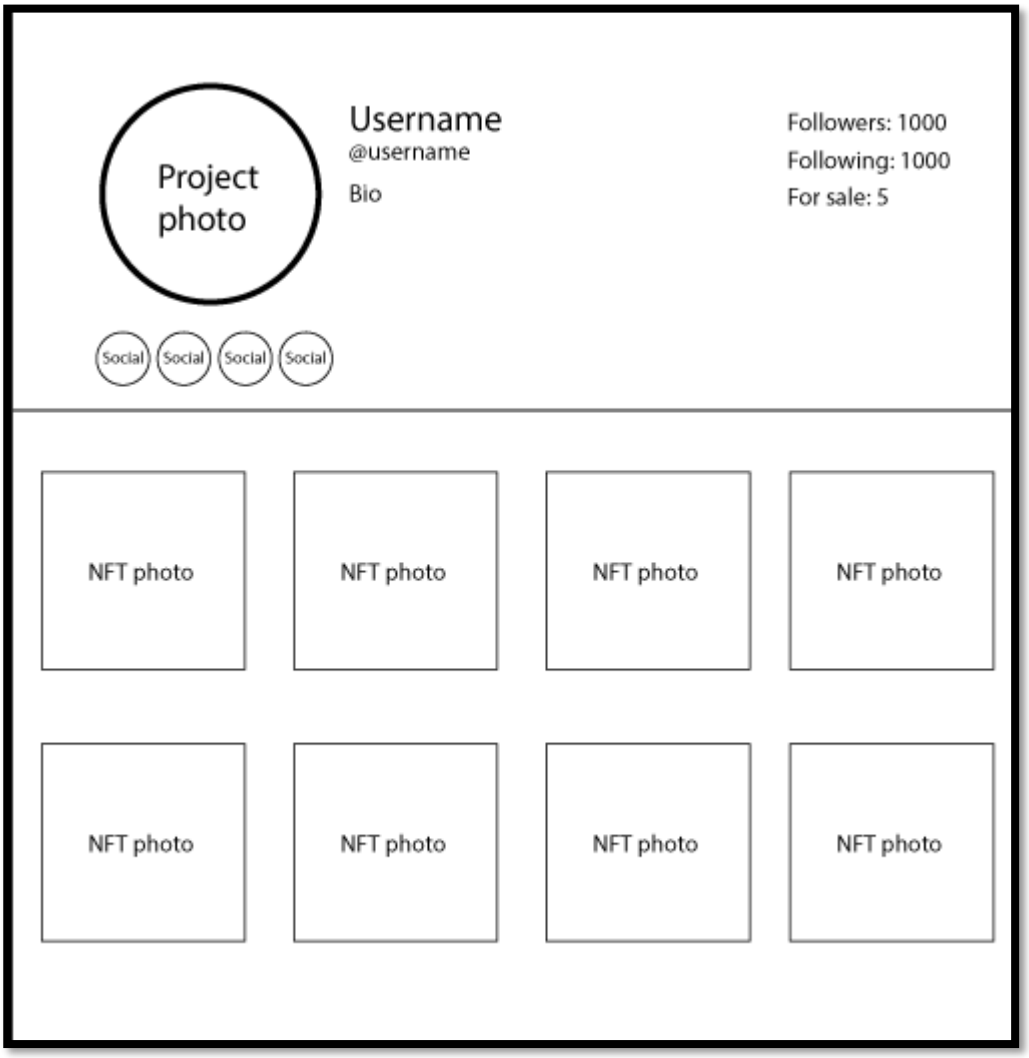


Figure 13: Mockup of Profile Page

The Main Features of Profile Page

- **User Profile**
  Displays the User's profile photo, username, bio, follower counts, following count, amount of item listed, and finally their socials. The socials will acts a button to navigate to the User's actual socials like Twitter.

- **NFT Display**
  Displays all the User's NFT Collection, clicking on the NFT will prompt the User to the item page of that particular NFT

3.0.7 Project Page

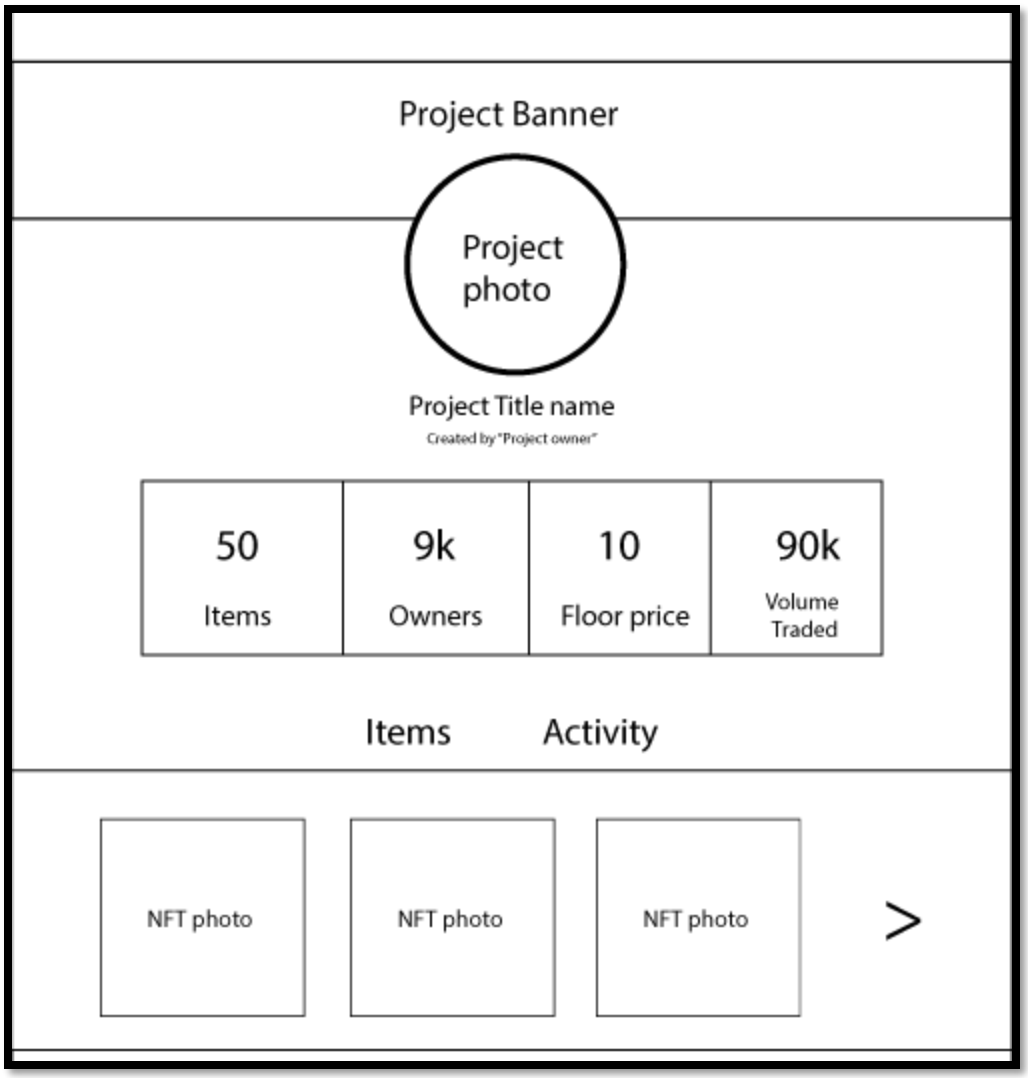


Figure 14: Mockup of Project Page

The Main Features of Project Page

- **Project Profile**
  Displays the Project's photo, banner, title name, creator name, amount of items available, number of owners, the floor price, and volume traded.

- **Item Display**
  When clicked, displays all the Project's items that are popular or available to sell. Includes a carousel feature to click for more display of items. Clicking on these items will navigate the User to that particular item page.

- **Activity Display**
  When clicked, displays all the Project's statistic such as floor price and volume through the usage of bar chart with trending lines to offer informations about this particular project to the User.

3.0.8 Item Page

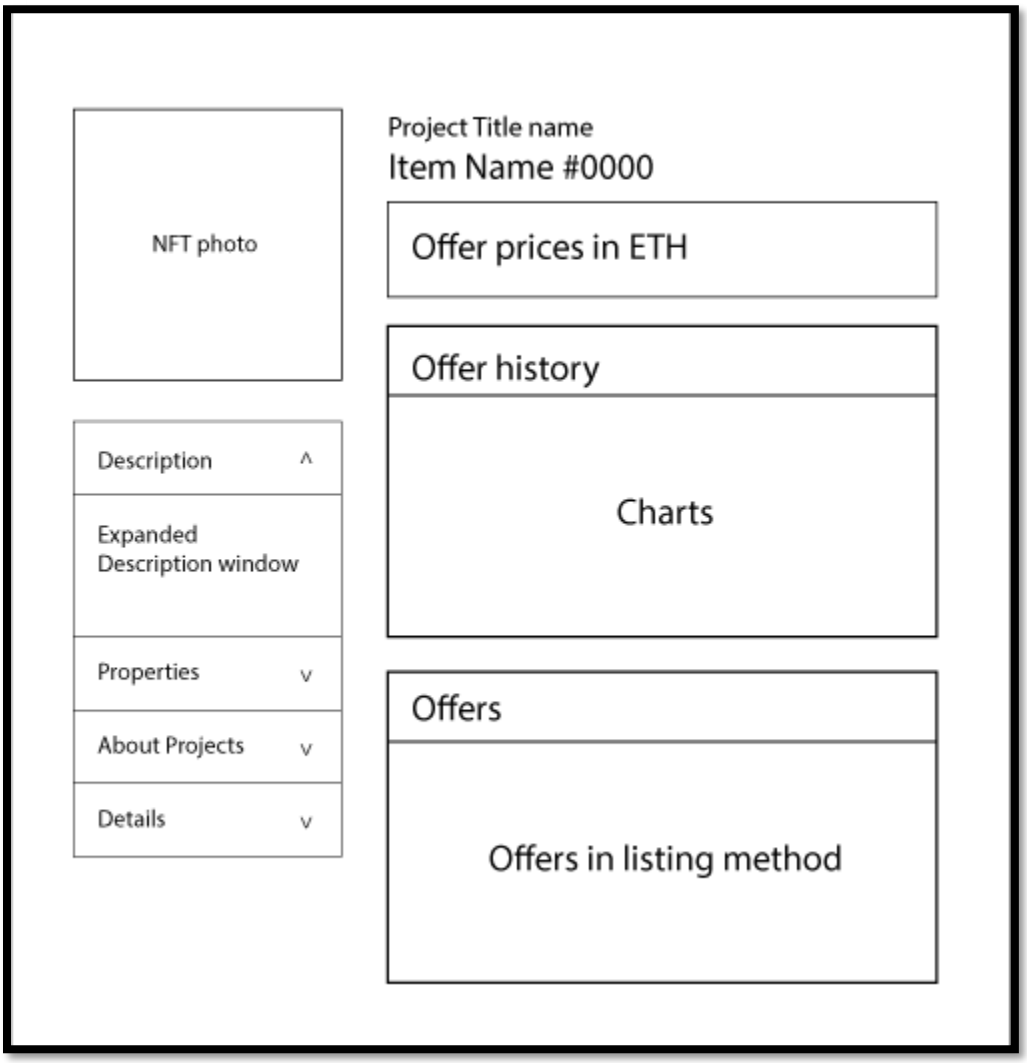


Figure 15: Mockup of Item Page

<u>The Main Features of Item Page</u>

- **Item Profile**
  Display the photo of the NFT Item, the project name the item belongs, and the name of the Item. Clicking on the project name will navigate the user to the Project Page that item belongs to.

- **Description**
  The description of the item includes the properties, details, description, and project informations. This will be done through expanded windows where at default nothing will be displayed at first.

- **Offer History**
  Shows the current selling price of the item in ETH, bottom will show the price history of the item in the past 6 months in barcharts with trending line and shows all the users that have bidded or offered for the item.

3.1 System Requirements

3.1.1 System Architecture

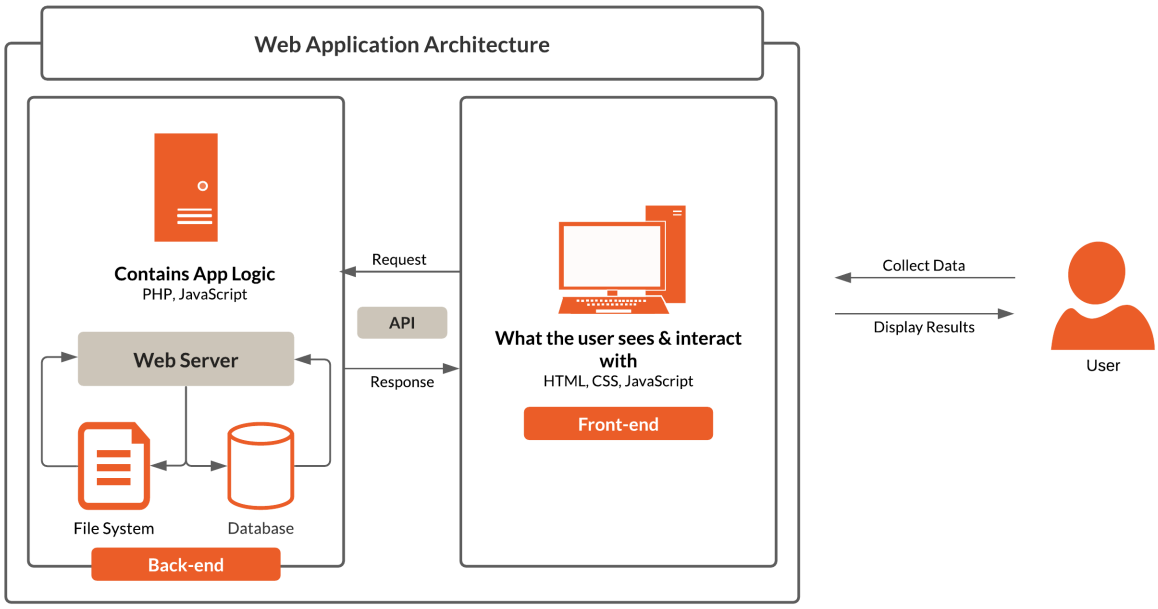


Figure 16: System Architecture Graph

3.1.2 Supported System

AtomicVein does not require a lot of desktop resources to run as it is just a website. As long as it has a simple operating system (Windows / MAC) with a resolution of 1920x1080 the website can already display and function as designed. The website however is not made to run on mobile devices where displays are smaller and in vertical mode. It is designed to run and display smoothly on desktops. Below is table of the requirements to run AtomicVein smoothly.

	Windows Requirements	MAC requirements
OS	Windows 8 or later	MacOS 10 and up
Resolution	1920x1080 and up	
Internet Requirement	Required	
XAMPP Requirement	Required	

4.0 Methodology

4.0.1 Header & Footer

- **Header**

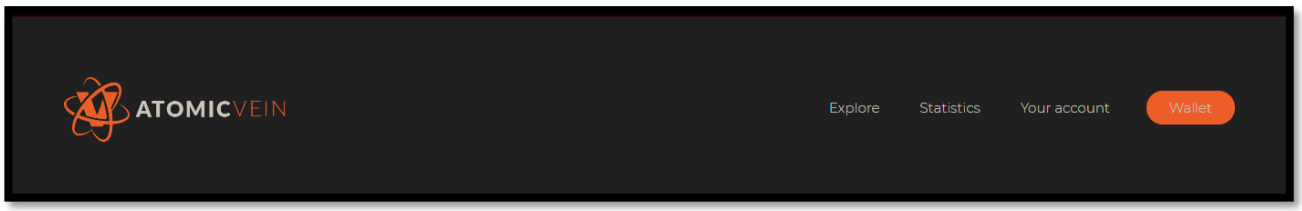


Figure 17: Image of Header

- **Footer**

Figure 18: Image of Footer

- **Wallet Function**

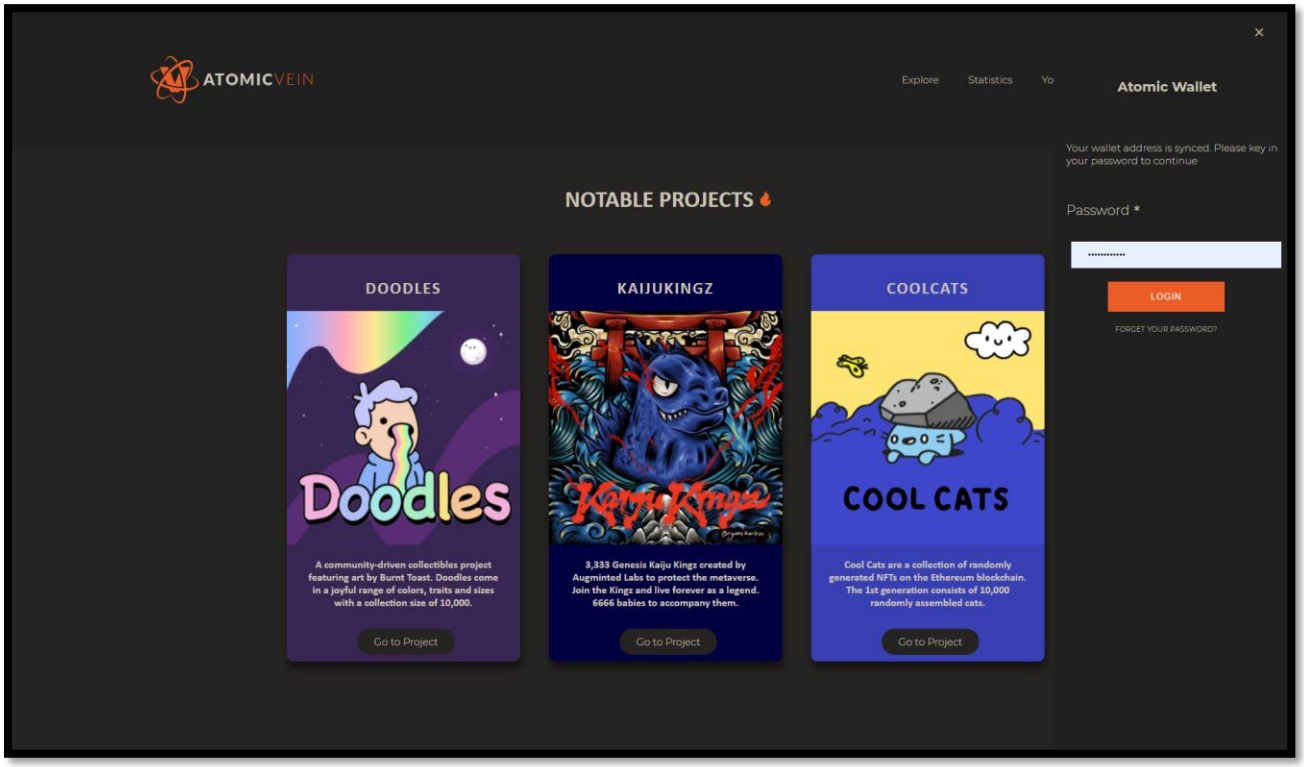


Figure 19: Image of Wallet Function

Planning of Header & Footer

The initial plan for the header was to implement it through the <header> element. The <header> element represents a container for introductory content or a set of navigational links. For this case, we will have four navigational links, which include the AtomicVein logo, which links to the Home Page, “Explore” for the Explore Page, “Statistic” for the Statistic Page, and “Your Account” for the Profile Page. Additionally, the header will have a wallet button that prompts a Side Menu for users to log in to their wallet. The reason why there is no login page is due to the fact that NFT marketplaces do not require users to create an account for the website. Instead, they will ask the users to log in to their wallet, akin to the process of logging in to a website using their social media accounts.

As for the footer, it is more of the same as the header but implemented through the <footer> element. The <footer> element typically contains related documents and contact informations. In this scenario, the footer will be implemented mostly the same as the header, but with additional links to NFT related documents and all the social media pages for the websites.

Implementation of Header & Footer

For the implementation of the header, all elements mostly went according to the initial plan. All the elements were able to fit into the header element except for the wallet function. The logo was implemented by using <img> element to import the image and wrapped in an <a> element to be redirected to Home Page HTML. Similarly, for the other three navigational links, <a> element was used to direct the user to the corresponding HTML Additionally, a hover effect that highlights the text was implemented for these links to show interactivity and responsiveness for the website. As for the wallet function, two functions was created for it which are the openFunction() and closeFunction(). The openFunction() will open up a side menu for the wallet user to log in to their crypto wallet. It uses a javascript onClick with part of the functions in the CSS file, which will make the menu appear or collapse. The close function comes with an X icon on the top right of the side menu that will use the closeFunction() to close the side menu when the user clicks it. The password field in the wallet side menu cannot be submitted as an empty field. If the field is left empty and the submit button is clicked, it will prompt an error saying that the field requires an entry.

The footer is implemented as planned, having all contents fit inside the <footer> element. The footer is broken down into three columns. The first column is labeled as exploring, with all the header links down there to make it more accessible. The second column is the developer's tab with links to important documents pertaining to the NFTs and cryptos transactions in AtomicVein. The third column is labeled as contact, where all the links will direct the user to the social media or mediums to reach out or keep up to date with AtomicVein news using the . Similarly, with the header, a hover effect that highlights the text was implemented for these links to show interactivity and responsiveness for the website. The footer also has the standard logo as most footer does to keep the branding and page design consistent.

4.0.2 Home Page

- **Home**

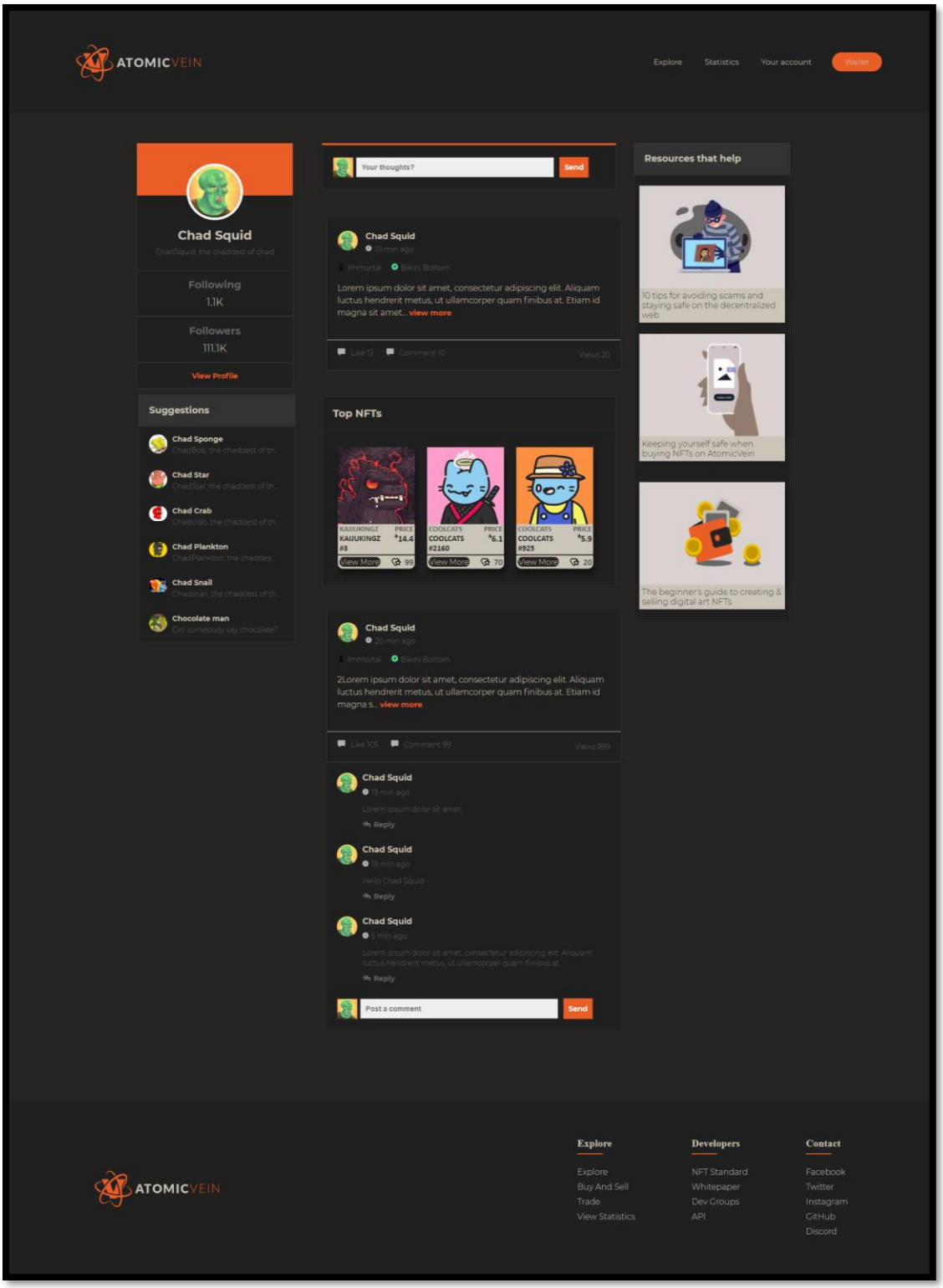


Figure 20: Image of Home Page

- **Posting Function**

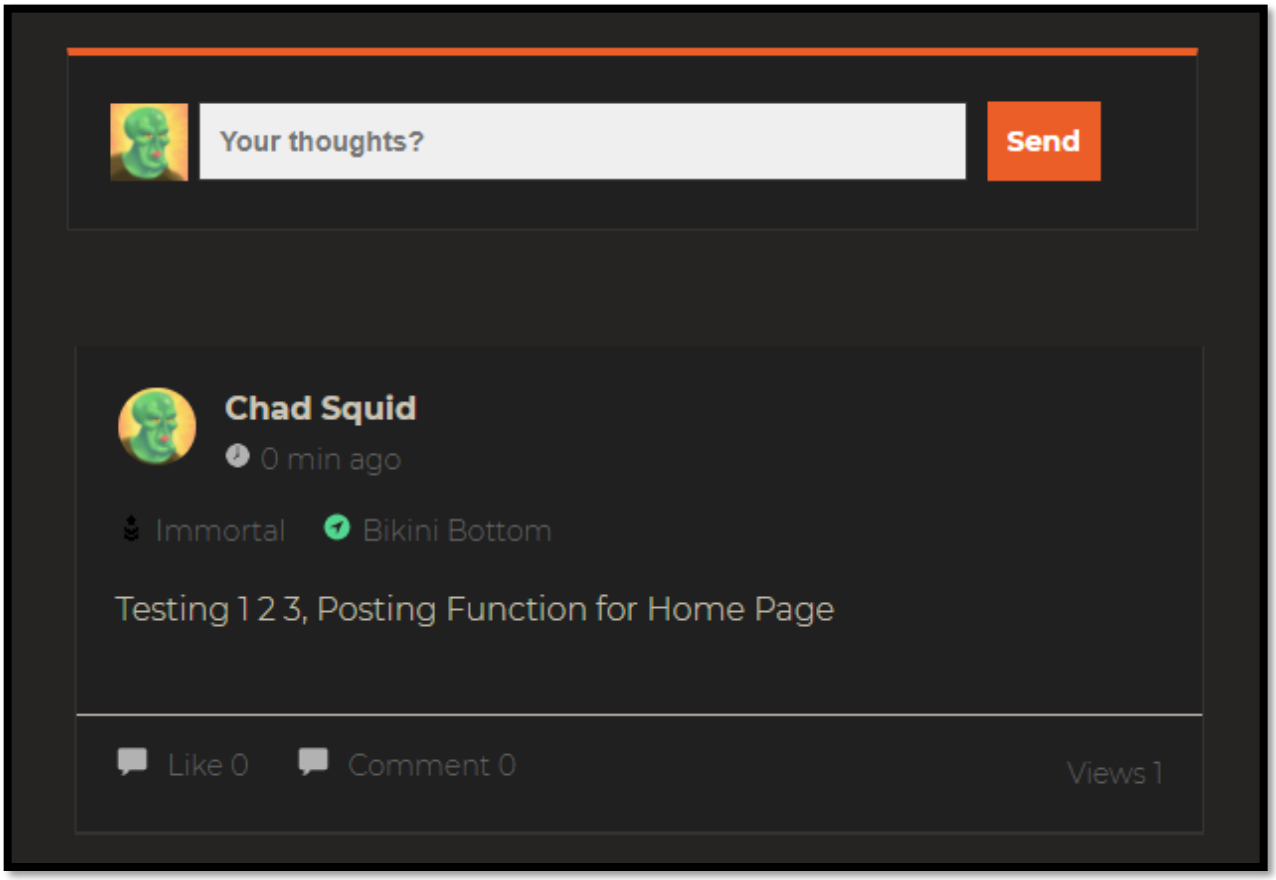


Figure 21: Image of Posting Function

- **Reply Function**

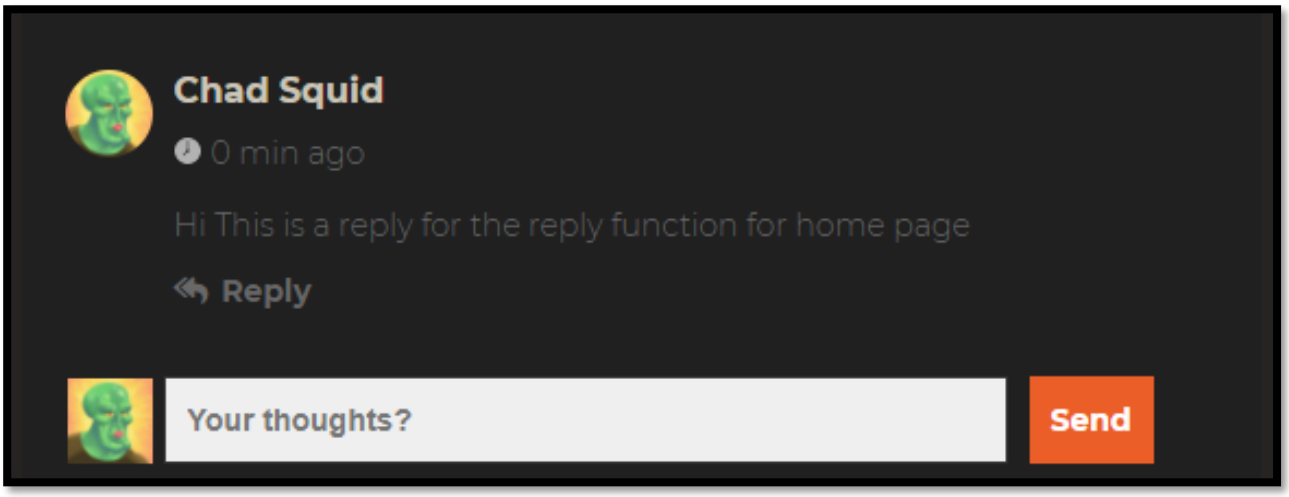


Figure 22: Image of Reply Function

Planning of Home Page

The initial plan for the home page is to serve as a hub of information and social interaction to the users. Thus, this page was designed to provide as much education and information materials to the user while providing suggestions on upcoming NFTs and similar-minded users. There will be three columns for the page, the user column, posting column, and resource column. Firstly, the purpose of the user column is to provide information to the user about themselves, such as their current username, the following count, and followers count. And underneath the user information card is the suggestion card which showcases the names, profile photos, and short description of users that was recommended based on your interest.

Moving on, the posting section will be where most of the social interactions will happen. The column's top section will allow users to enter their thoughts and post them for others to see. While scrolling down, posts from other users will be visible, and the user can interact with these posts by replying to them. Once in a while, while scrolling through the page, suggestions for top NFT items and projects based on the user's preference will appear, giving them more opportunities to discover new NFTs that they may be interested in.

The last column is the resource column, which will provide educational resources to the users. These resources will appear as cards that the user can click on, and it will redirect the user to the selected article that they have clicked. This function is to help users better understand NFTs and further their knowledge to be more knowledgeable about NFTs.

Implementation of Home Page

For the implementation of the Home Page, most of the ideas for the page were able to be fulfilled. The user column consists of two sections made with the element, the user profile section and the user suggestion section. The user profile section was implemented using multiple which consist of the user detail (i.e., username, following, follower) that was implemented using <p> element with their respective CSS style. Subsequently, the profile picture of the user was inserted using the <img> element. For the user suggestion section, it is one that has multiple layers of smaller that displays the information of other suggested users. Finally, the <img> of the suggested users were wrapped in <a> to redirect the users to the respective profile.

Moving on to the posting column, the file type of the page had to be changed to PHP in order to implement the chat posting system. The first section of the column will be the writing a post section, which consists of a <form> that has a <input> type of “text”, name of “thoughts” and the method of “Post”, when the user writes their thoughts and hit send. The inputs will be echoed in the exact PHP due to the use of $_SERVER[‘PHP_SELF’], which leads to an if statement that had the condition of $_POST = “thoughts” in the area of the code which outputs the text of the post. This statement hides the original post on the page and replaces it with a new one consisting of the user details and the input that the user has given previously. The reply feature works fundamentally the same but without hiding a post as it is under a post instead. Next, the Top NFT section is created with one that consists of unlisted three NFTs cards created using the element. Clicking on these NFTs will redirect you to the respective page.

Finally, the source page was implemented successfully with no issue. It is made of one with three resource cards, similarly to the Top NFT section, but instead of rows, it is columns. These resource cards are wrapped in <a> and, when clicked, redirect the user to the respective article that the resource cards were showing.

4.0.3 Explore Page

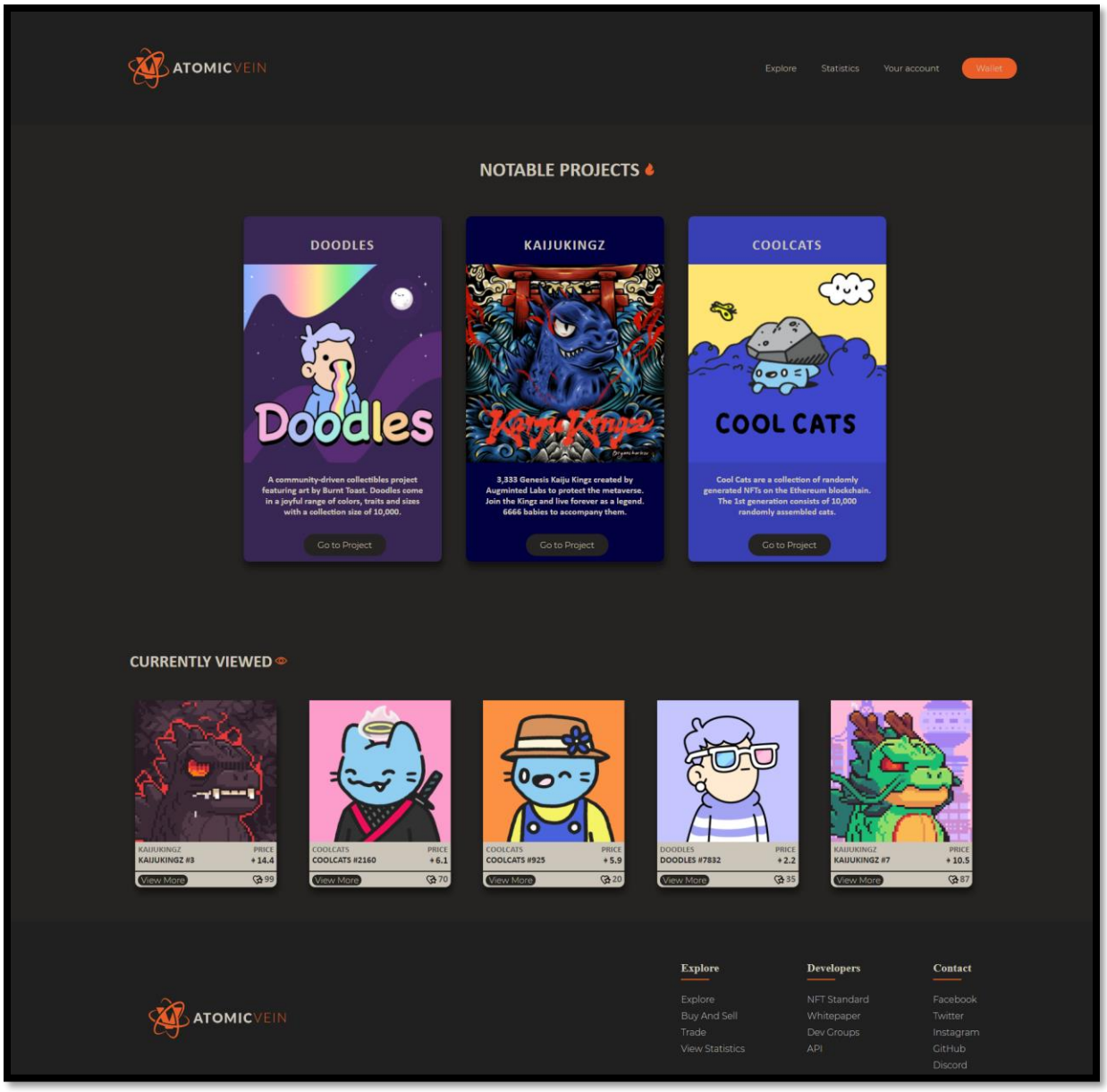


Figure 23: Image of Explore Page

Planning of Explore Page

The plan of the explore page is to have it as a landing page for users that are visiting the page that displays the projects that are currently trending so that new users can go straight into it and take a look at what is trending and potentially jump on the hype. Below the notable projects will have the last viewed NFTS from the projects to ensure the user can easily hop back to the NFT they were looking for and consider if they are planning to buy it. Each item's view more is linked directly to the NFTs page. The cards of the projects are seemingly more significant than the cards of the NFTs because the project cards introduce the whole NFT project of the publisher to give the users an idea of who they are and what their NFTs will be. At the same time, the tiny NFT cards are just individual items from the project that has the price directly listed with their unique name and link.

Implementation of Explore Page

The implementation of the website is as planned, with the three big project cards displayed in a container format. The cards each have a button linked to their respective project page that will explain what the project is about and all the NFTs they have created. The smaller NFTs are listed in the same container format but smaller to stand out from the project cards. The cards are individually linked to their specific item page, displaying the current price, past offers, and more details about that particular NFT. The explore page is kept simple as not to over clutter and blast the users landing with too much info, which will occasionally put some new visitors off. It is a simple to use and straightforward UI that will direct you to the trend that's currently running amongst the NFT investors. The header and footer are kept the same across all pages, which allows for easy browsing.

4.0.4 Stats Page

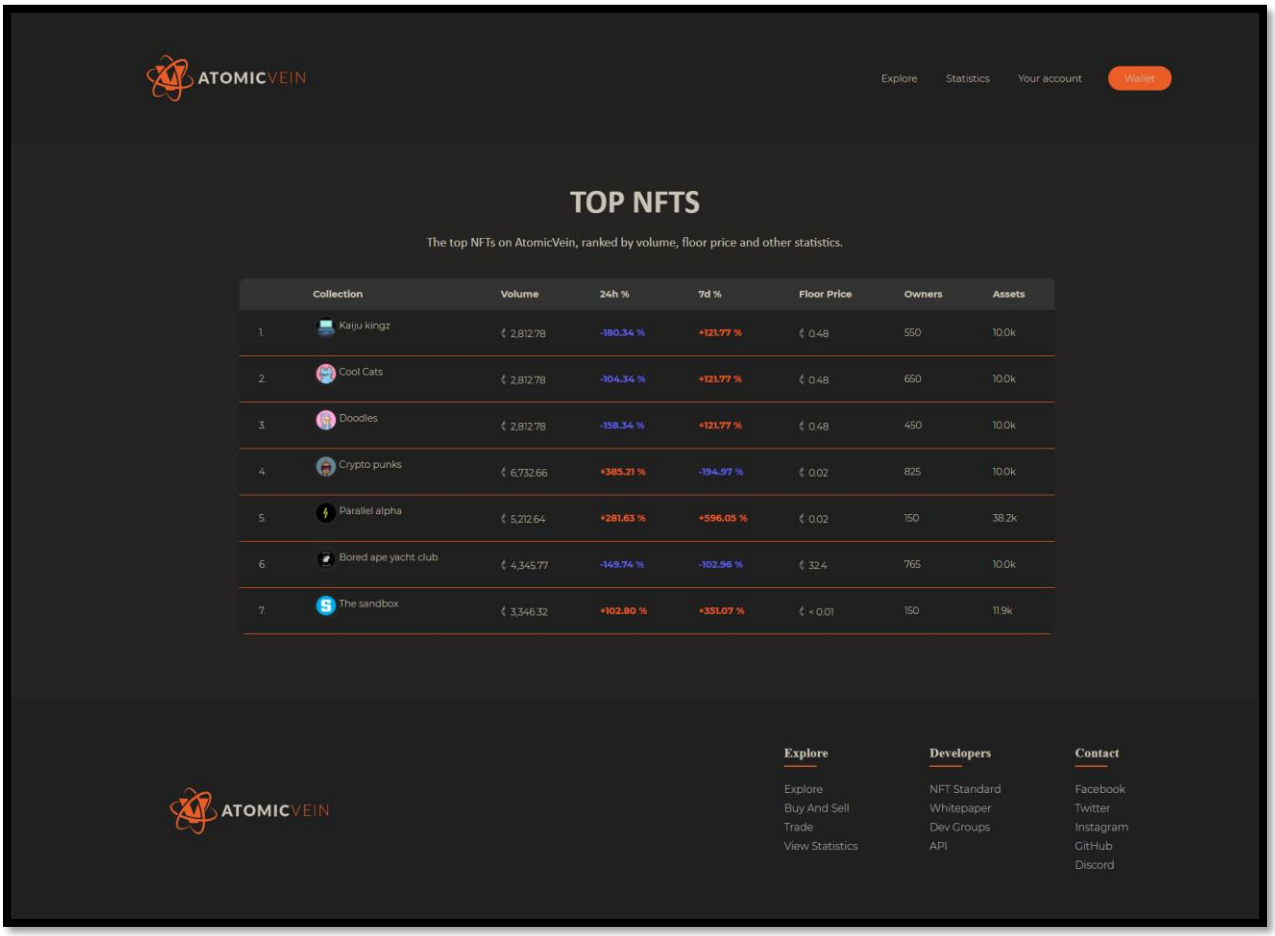


Figure 24: Image of Stats Page

Planning of Stats Page

The initial plan for the stats page is to have three filter buttons on the top of the data table with a drop-down menu that will filter the table according to the chosen filter requirements. The first button would range from the last 24 hours, Last 7 Days, Last 30 Days, and All time. The second drop-down filter would have categories of the NFTs filtered out, such as Art, Music, Virtual worlds, and much more. The third drop-down filter would have the types of crypto used, such as Ethereum, Polygon, Klaytn, and All chain. These filters would create an in-depth query of the data in the table to easily filter and sort data for research purposes for users' convenience. The drop-down menu would be implemented with the <select class = "#"> function, and the subsequent selections will be using the <option value = "#"></option> to create the drop-down menu, and the data will be queried from a table in a database to display according to the condition.

Implemetation of Stats Page

For the implementation of the stats page, the design went differently than planned as the drop-down menu has too many filter values, but we do not have that much data to be queried to make it a viable design. Initially, the drop-down menu has already been designed with functional on-Clicks, but it has since been commented out, and an alternative sorting has been introduced instead. The drop-down menu function is still kept inside the code as a backup function in case of a re-visit to this function. The table now uses a simple javascript that sorts the table either in ascending or descending order by clicking the table's header. The first part of the javascript adds an event listener that responds to on-click. The second part of the script then returns the event listener, which will be passed to the main component of the script, which is to call the sort table function to compare the entries of the table. A while loop reaches each row and breaks on specific conditions such as more significant than or smaller depending on the header's current orientation. If the header of the table is currently in ascending order, clicking on it again will sort the data in descending order, which will have the script compare each row with lesser than the function that will switch the values of each row (if needed) according to biggest to the smallest. The same happens with ascending, except the comparison criteria are more prominent and swaps the rows from smallest to biggest.

4.0.5 Profile Page

- **Main Profile**

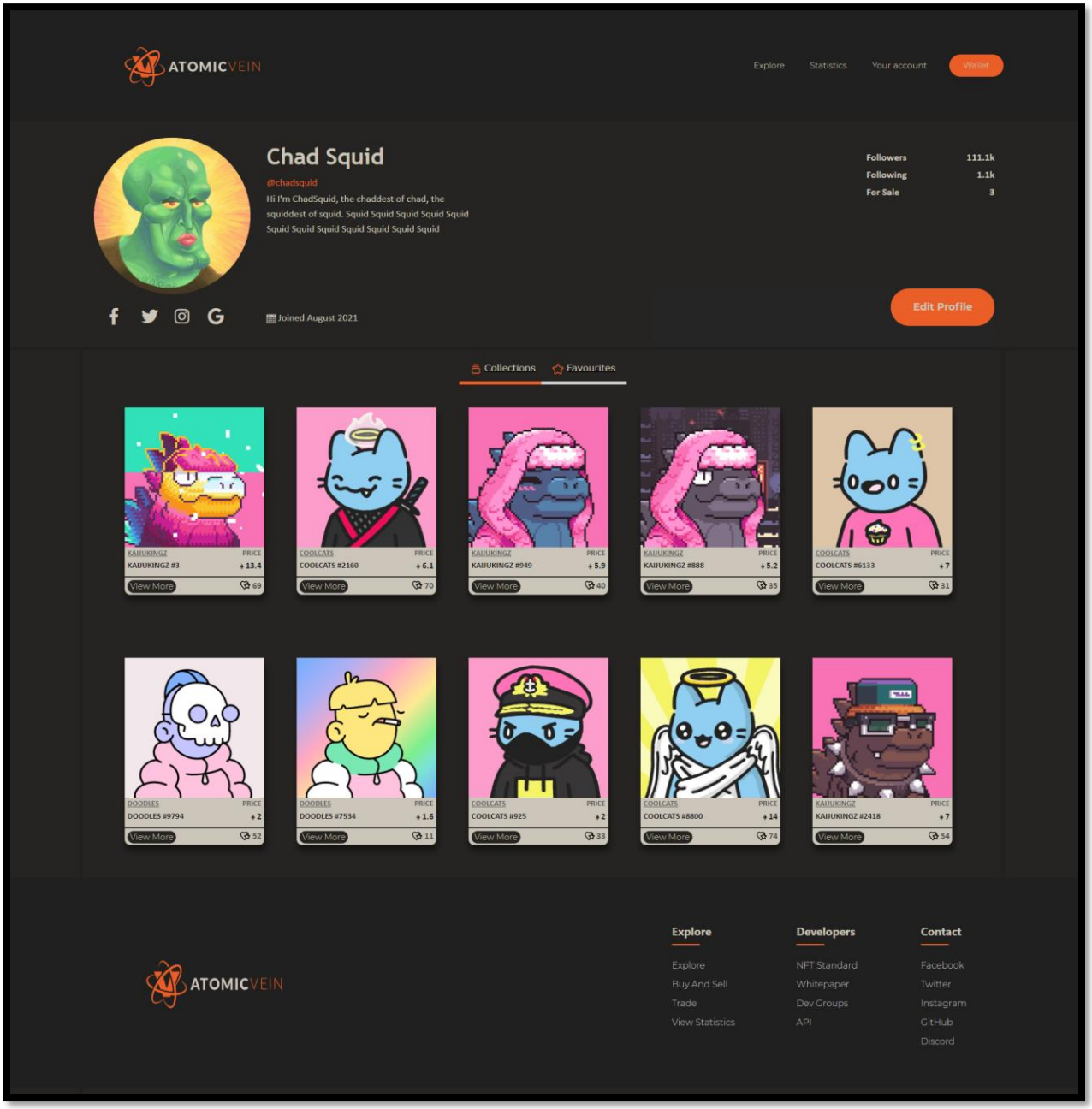


Figure 25: Image of Profile Page

➢ **Tab Function**

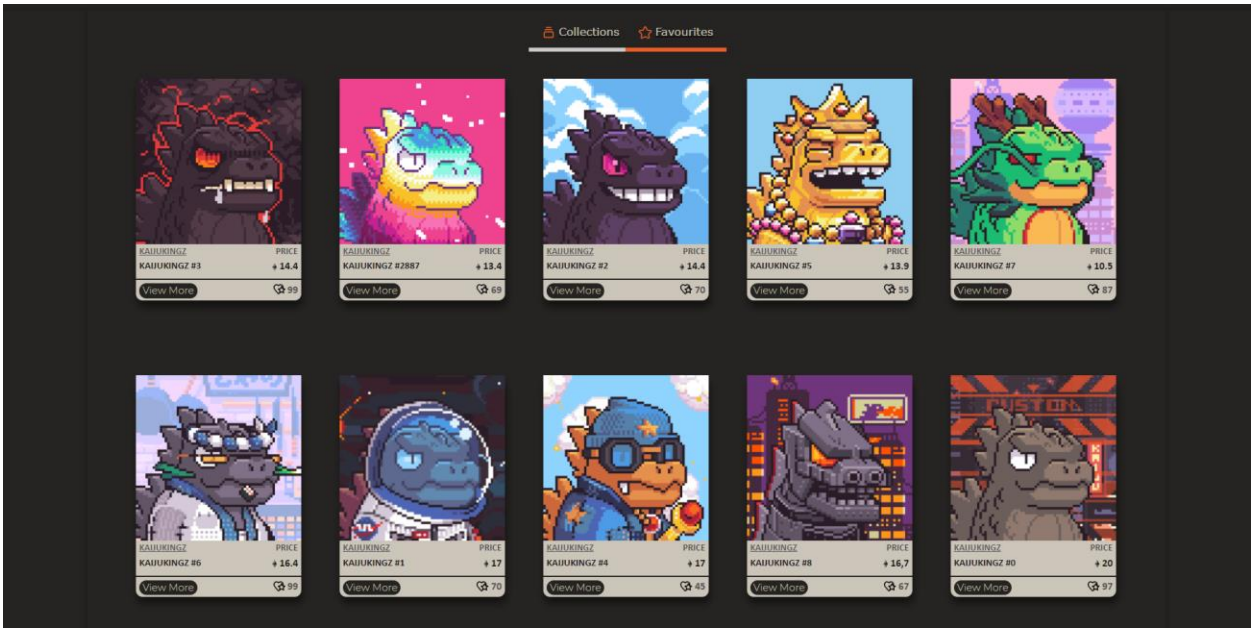


Figure 26: Image of Tab Function

➢ **Edit Profile Function**

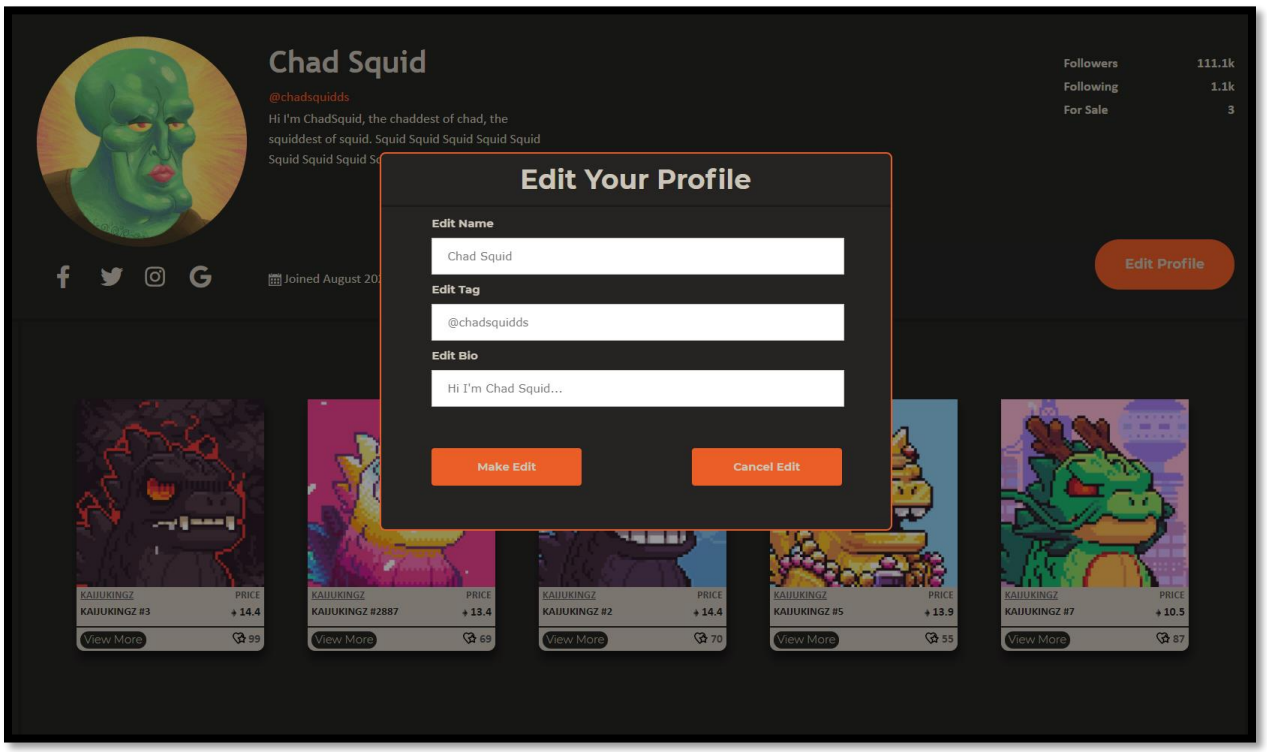


Figure 27: Image of Edit Profile Function

Planning of Profile Page

The initial plan for the profile page is to have two sections, the information section and the collection section. The primary purpose of the information section is to display the social details of the user. Thus, information like user bio, name, tag, and following detail will be displayed in a manner that is easy to read and understand. Additionally, there will be buttons with images of famous social media logos like Facebook, Twitter, etc. When clicked, these buttons will redirect the user to the respective social media profiles of the profile. Furthermore, an edit profile function will be implemented in this section for the user to edit their profile. For example, there will be an edit profile button in the information section that is easily spotted, and when clicked, will prompt out a menu that allows the user to edit their user name, tag, and bio.

For the collection section, this section aims to showcase the collection of NFTs that the user currently owns and show what NFTs they like. This section will display all the NFTs that the user owns presently or favorited. The plan is to have a tab system that switches two divisions when pressed; in this example, it will be “Collection” for NFTs that the user owns and “Likes” for NFTS that the user likes. The NFTs will be displayed as cards containing all the information of the NFT and can redirect the user to the respective item page.

Implementation of Profile Page

For the implementation of the Profile Page, most of the initial ideas for the page went according to plan. The Information section is a huge element that takes out 30% of the top side of the page, and inside are more elements for each of the user details arranged in a manner that is easy to read and pleasing to the eyes. Components like the following section (i.e., followers, following, for sale) and user detail section (i.e., name, tag, bio) were implemented using <p> element with their respective CSS styles. Subsequently, the profile picture of the user is implemented using the <img> element as planned.

However, the social media buttons had deviated from the original plan. So, instead of using the <img> element to import these logos, a unique font style was imported instead, with symbols of the social media logos as characters. This is done to prevent scaling problems of raster images, which were noticed during the coding phase of the page. Additionally, this allows hover effects to be implemented where the logos change color when hovered to highlight it, which can’t be done through the <img> element method.

Notably, a significant change had to be made for the page, which is to convert the file type of the page from HTML to PHP. This was done to implement the edit profile function. An edit profile button was created with <button> element, and when clicked, will prompt a modal in the form of element to be displayed at the middle of the screen. The logic behind this is that the modal, when idle, have a display of none, which hides it from the page. However, when clicked, the edit profile button will change the modal's display to block, which allows it to appear on the screen. The cancel edit button will change the display back to none and hide the modal.

When the modal pops out, there will be three fields to fill in for the respective detail. This is done through the <form> element, and the fields are <input> elements with the "text" type and unique names for differentiation purposes. This form has a method of "Post" and the action of echoing the inputs into the same PHP using $_SERVER['PHP_SELF']. So when the form is filled in and submitted, the inputs will be echoed in the exact PHP, and several if-else statements nested at the codes of the user details will catch these inputs with if the condition of user of $_POST = "names of the input". This allows the website to change the output for the user details to what the user has inputted.

Moving on to the collection section. The plan for the tab system function was successfully implemented through the use of javascript. The general concept for the tab system function is similar to the pop-up modal function that was mentioned before. There are two tab sections, one for “Collection” and then another for “Like” and one of them is will always be hidden with the display: hidden style, and the other will be displayed normally. When the tab button is selected on the top, the current section will be hidden, and the hidden section will be displayed normally. This is all done through the openTab function, which is part of a javascript implemented for this function. The script first detects how many elements has class name “tab” and assign that as x, then finds how many tab sections are thereby the condition (i = 0; i < x.length; i++). Then it changes all the “I” which represent each tab section to display: none. Then it sets up a condition of when the button of the respective tab is clicked; the display style will be changed to block. One of the tab sections is assigned the ID = defaultOpen, which automatically triggers the click function mentioned before, thus allowing it to be displayed as default when the page is loaded. Lastly, the “Collection” tab sections will include all the NFTs cards used in previous pages that the user currently owns, while the “Like” tab section will include all the NFTs cards that the user has favorited.

4.0.6 Project Page

- **Project**

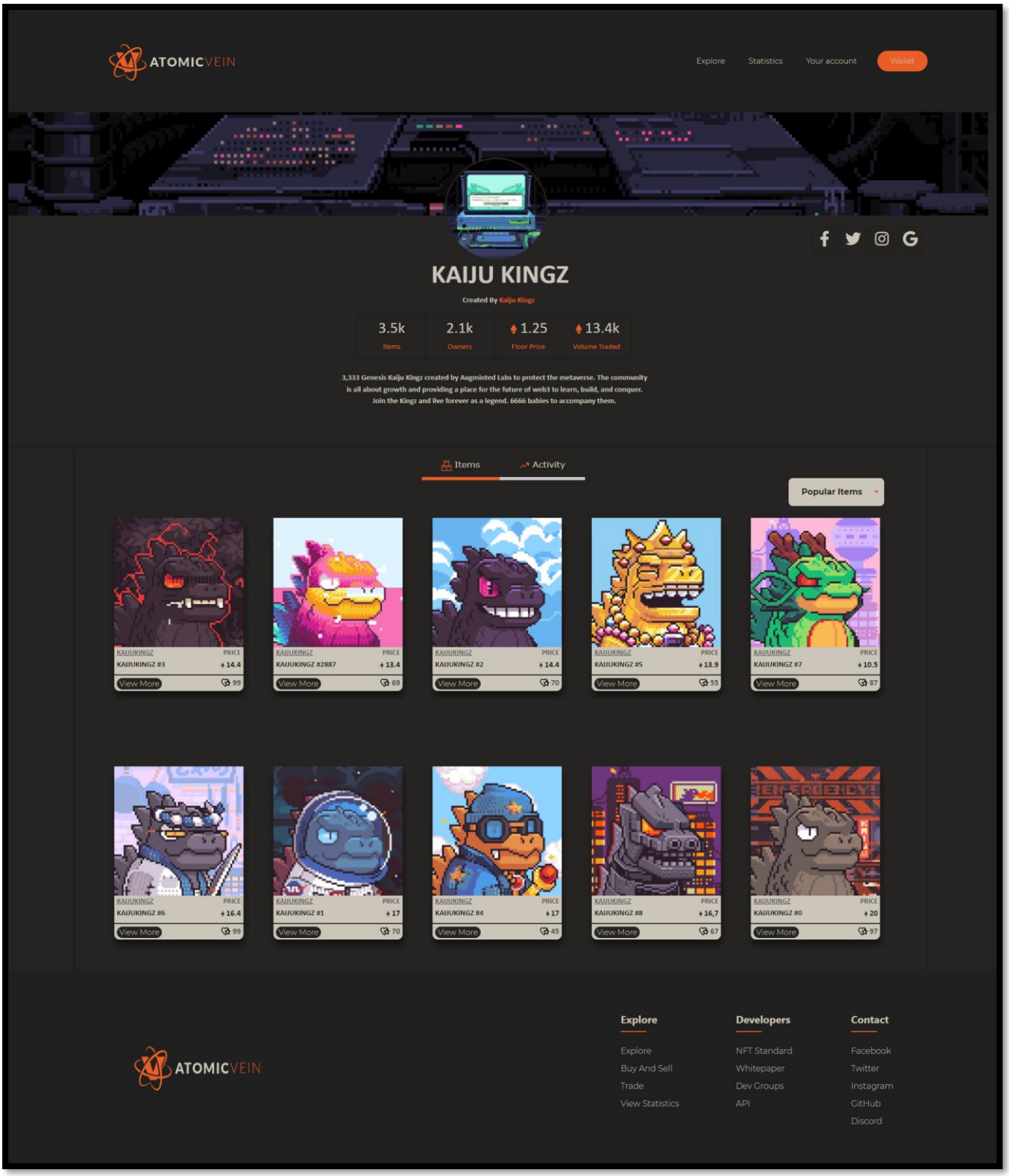


Figure 28: Image of Project Page

➢ **Sorting Function**

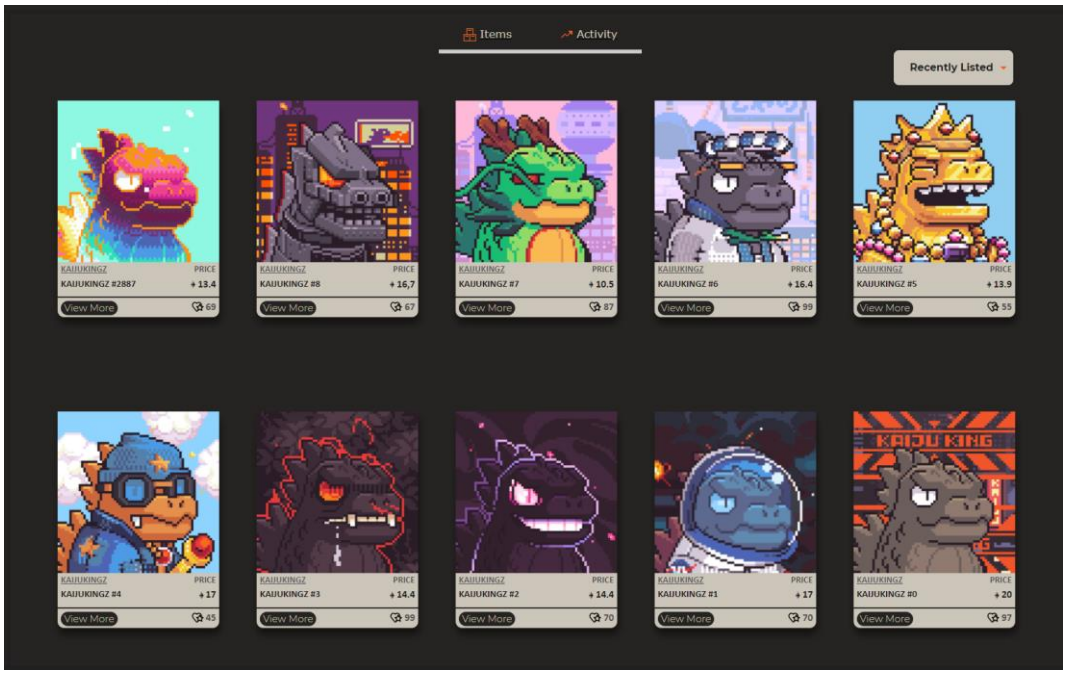


Figure 29: Image of Sorting Function

➢ **Activity Tab Function**

Figure 30: Image of Activity Tab Function

Planning of Project Page

The initial plan for the project page is similar to the profile page, where there are two sections: the project section and the item section. The project section is very similar to the information section of the profile in that both sections display information relating to the page, which in this case is the project. This section aims to display information like the number of items, number of owners, floor price, and volume traded for the project. Similarly, with the profile page, there will be social media buttons that redirect the user to the respective social media profiles for the project.

For the item section, its purpose is similar to the collection section of the profile page but with an addition of an activity tab section that shows cases of all the transactions and graphs relating to the project. This section will use the same tab system that was implemented in the profile section. In addition, at both tab sections, there will be a drop-down menu that provides options for the user to choose from. For example, the drop-down menu in the item section will sort the NFTs according to the option selected. Examples of these options are “Recently Listed”, “Popular Items”, etc.

Implementation of Project Page

For implementing the project page, most of the ideas that were part of the profile page went according to plan as expected. The project section consists of many <divs> elements that contain the detail of the project, which are arranged in a manner that is easy to read and understand. Word-based information is all coded with the <p> elements. For the item price and volume traded, an SVG file of the Ethereum logo was inserted using the <img> element next to numbers to indicate that the number is calculated in Ethereum. The banner and icon of displayed in the middle using the <img> element to personalized and differentiate itself from other pages with different projects. The social media buttons work the same as the profile page, which means it inserts the logo as a character instead of an image.

As for the item section, the tab system function from the profile page was successfully implemented into the project page according to plan. The only difference for the first tab section compared to the profile section is that it includes a drop-down menu that uses a similar mechanism as the tab system for sorting purposes. This is implemented through the <select> element and the options are included using <option> element. When the value is changed to another, it triggers the onChange condition, which runs the "openTab" function. This openTab function is the same as the javascript function for the tab system function. This function is also included in a new javascript that was created for the select element as it does not function the same as the button element in terms of onClick. This script includes an eventListener that runs the code with the openTab function, which is openTab(event, 'Collection'). This hides the original list of NFT cards and shows the predetermined sorted NFTs list instead.

For the activity tab, it uses simple javascript to display a chart that charts out the project's overall sales for the year. The drop-down menu goes from Last 24 hours, seven days, 30 days, and all-time, which has a maximum time frame of a year. The javascript has an X and Y graph axis which are plotted out using the var yValues. Below the graph is a table with all the data of the NFTs that have been previously sold. The price, buyer, and seller are all listed in the table to show users' true transparency and track who currently owns which specific NFT. The table and chart are displayed across all the NFTs.

4.0.7 Item Page

- **Item Details**

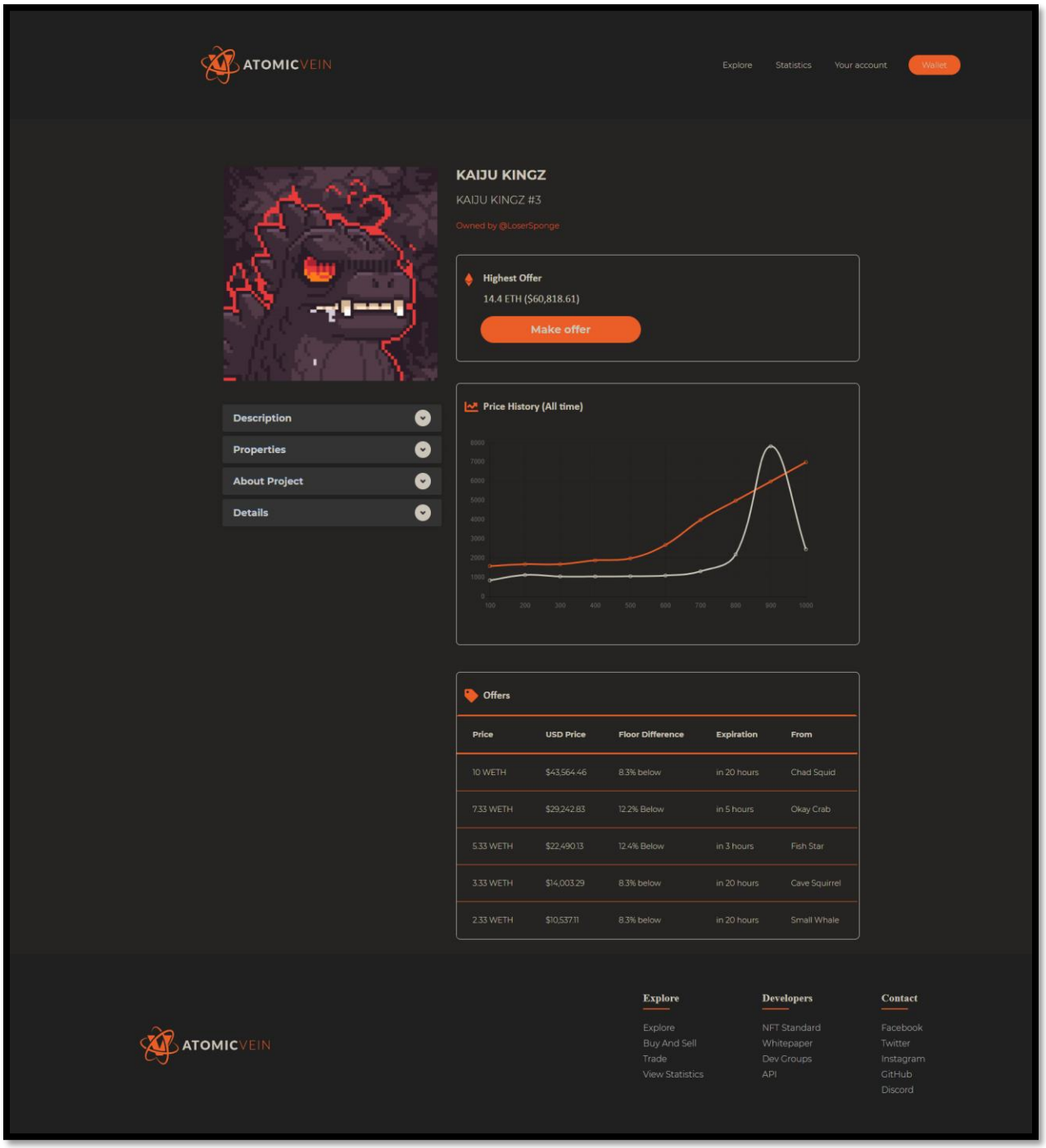


Figure 31: Image of Item Page

- **Make offer Function**

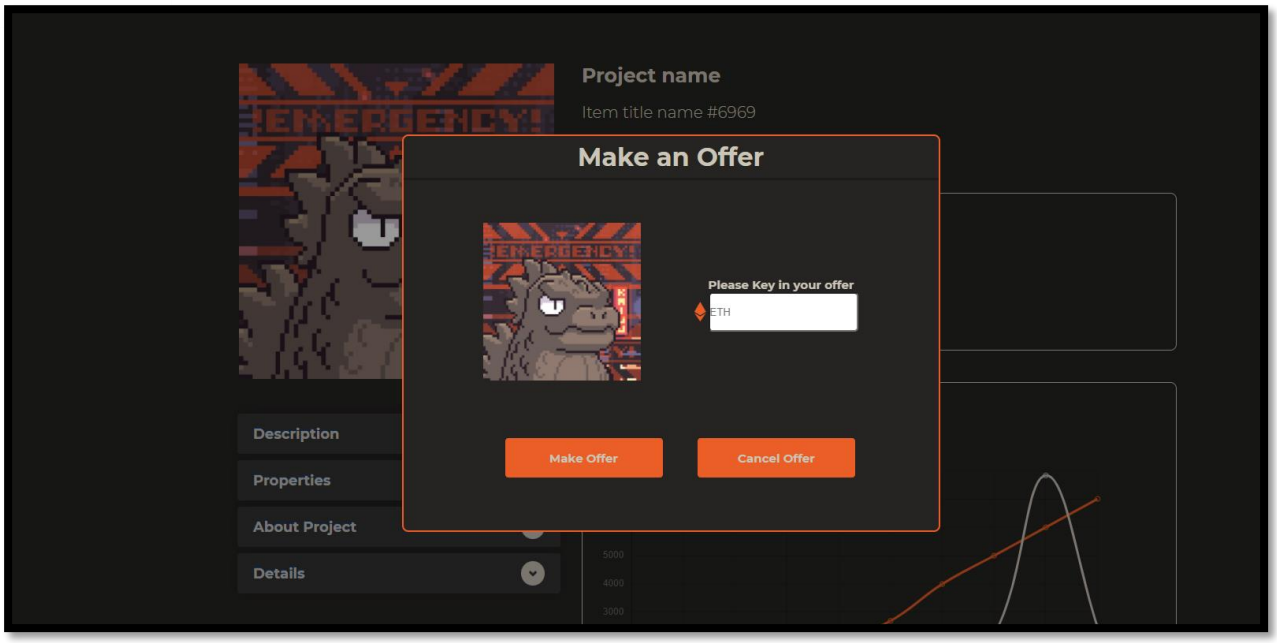


Figure 32: Image of Make Offer Function

- **Offer List**

Figure 33: Image of Offer List

➢ **Buy Result**

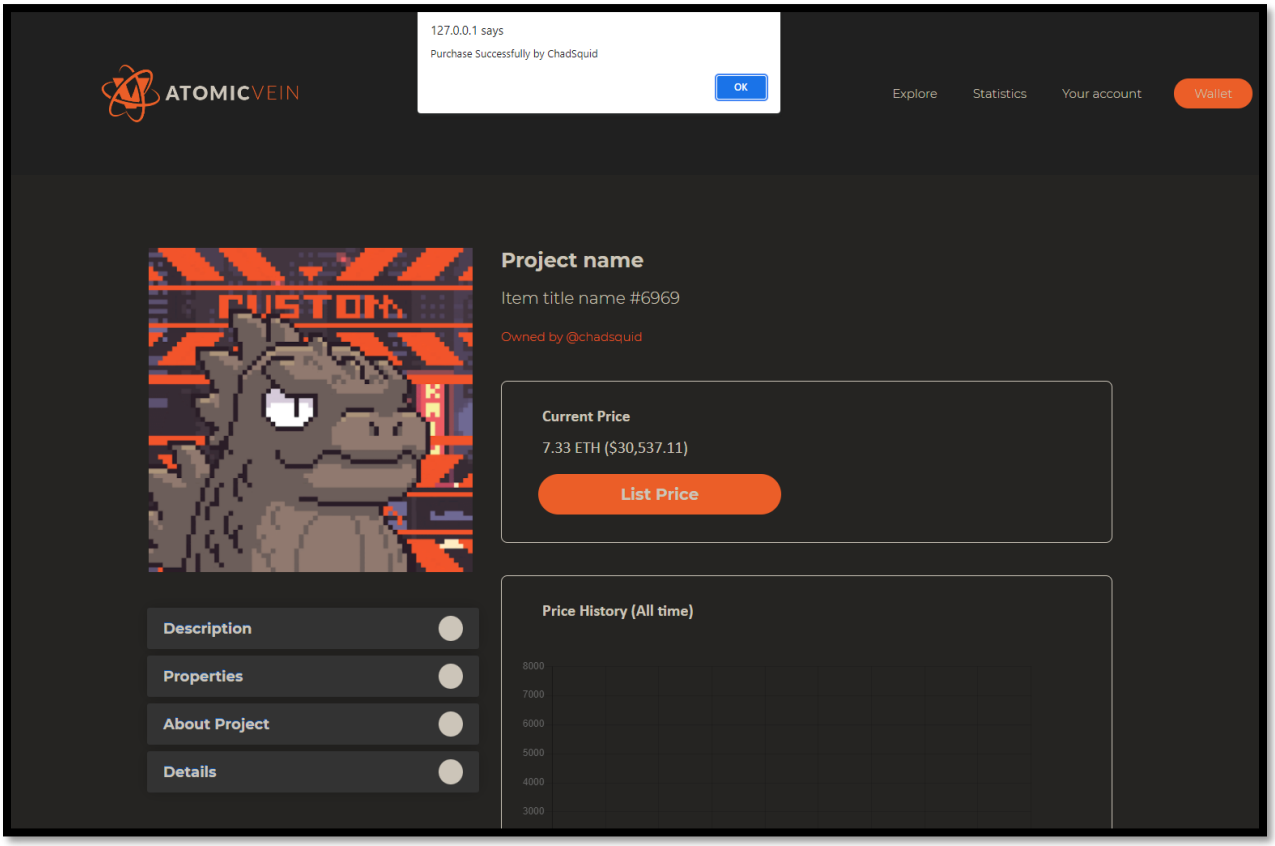


Figure 34: Image of Buy Result

➢ **List Price Function**

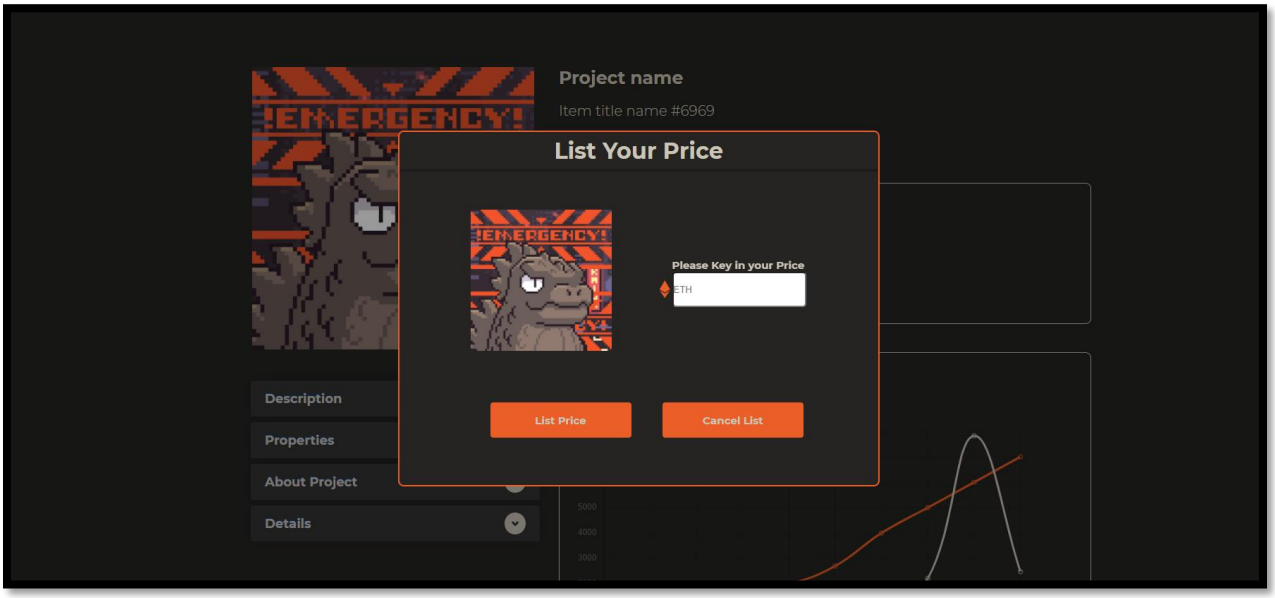


Figure 35: Image of List Price Function

Planning of Item Page

The item page is meant to be a simple page for potential buyers to offer or instantly buy out their wanted NFTs. The UI is simple with the image of the NFT on the side with all the information about that specific NFT below it with a drop-down menu. The current price shows the price the NFT is currently being offered, and the button will change according to the ownership status of the NFT. If it's not the users, they can make offers, and their offers will be recorded. If their offer is higher than the current offer, they will instantly buy out that specific NFT which will change the button to List price, allowing the user to set the new price they want to sell it and start receiving offers.

Implementation of Item Page

The implementation of the page went a little similar to the planning, where a majority of the design is as planned. The extra added info pertaining to that specific NFT is done using an Accordian style CSS. Upon clicking, the bar will drop down with the information of that particular NFT inside it. Clicking it again will hide the extra pop-up bar. The clicks that pop them are using the checkbox function. By default, the accordions are unchecked, which is why they are hidden; upon clicking means, the checkbox is ticked, which allows the menu to flow down, and clicking it again will uncheck it again. This specific site utilizes a backend database to display the data in a table format at the bottom of the chart. The table only shows offers that are below the current listing price. IF the user offers higher than the current listing price, they will immediately purchase the NFT, which will prompt a drop-down menu from the top of the browser saying that they have successfully bought it. And the owner's name of that specific NFT will change to the user that bought it. Once they have owned it, the button will change to listing price, which will allow the user to list a new listing price to enable other users to send in their offers or buy it, and the cycle repeats where lower than listing price will be recorded in the table.

The table uses a simple PHP function to connect to the database using XAMPP and displays the rows of each data. The table is instantly created upon the user clicking make an offer. The make offer button is a $_POST PHP function which leads to another PHP file that will connect to the XAMPP database using the default login to create a table and use the SQL Query of INSERT INTO to insert the data in the pre-determined fields of the table. The connecting PHP file has a check connection condition. If the connection fails to establish, it will throw the connection error prompt out, letting the user know that it has a problem establishing a link to the local server. There is an IF statement in the PHP itself where if the offer is more than the listing price, it will echo, “You have successfully purchased this NFT.” The other IF statement is for offers lower than the listing price. It will just insert the data into the table that it has created from the top. The original PHP website page will use the SQL query SELECT * FROM and display what data is stored inside that specific database. The if statement for lesser than listing price has a few other conditions listed inside it where the price in USD is calculated using the offer multiplied by 4000, which will estimate the price of the ETH offered in USD. The offer is then divided by the listing price to determine if it is more or less than the previous offers and lists them accordingly. The percentage is rounded to 2 decimal points as some numbers divided amongst others will have an infinite decimal place. At the end of the PHP, it closes the connection by ending the session.

4.1 Function Test

4.1.1 Testing and results (Technical)

Testing has been done to the website to ensure that the fields that are not meant to be empty will alert the user telling them to fill in the blank and to make sure all the clickables are functional

Case 1: Empty fields for important forms

I) If user clicks login without typing in a password, will they get through?

No, it will prompt an alert asking the user to please fill in the field with the required password.

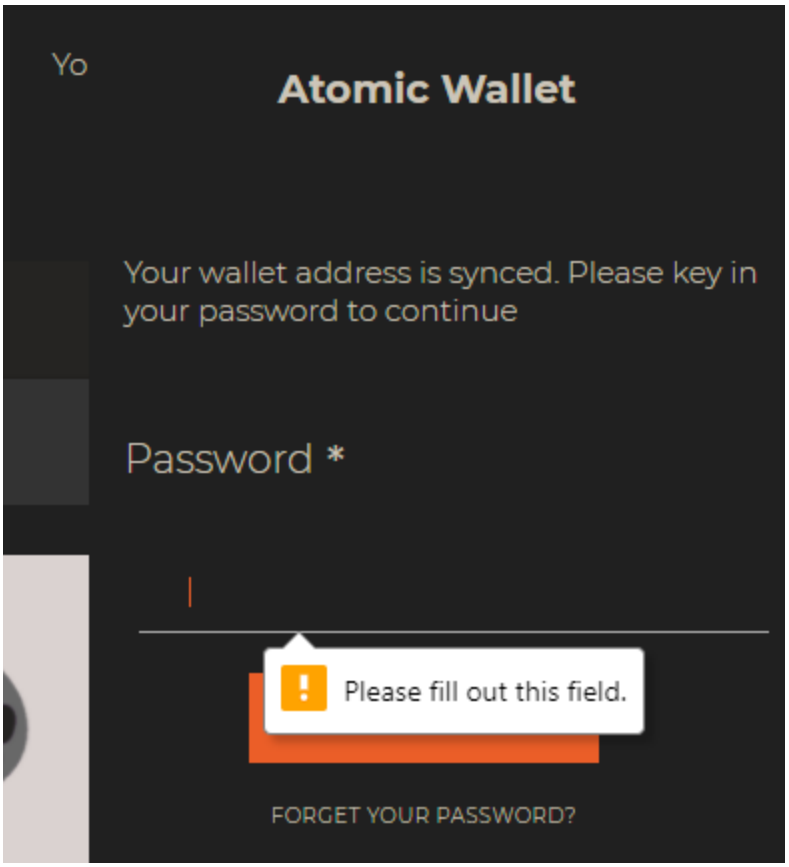


Figure 36: Required field for Password

ii) If user clicks "make offer" without entering any offer will it record the empty field?

No, the offer field requires a minimum number of 0.01 or else and error will appear asking them to please fill in a value. The value in that field can only be numbers as there is a constraint check.

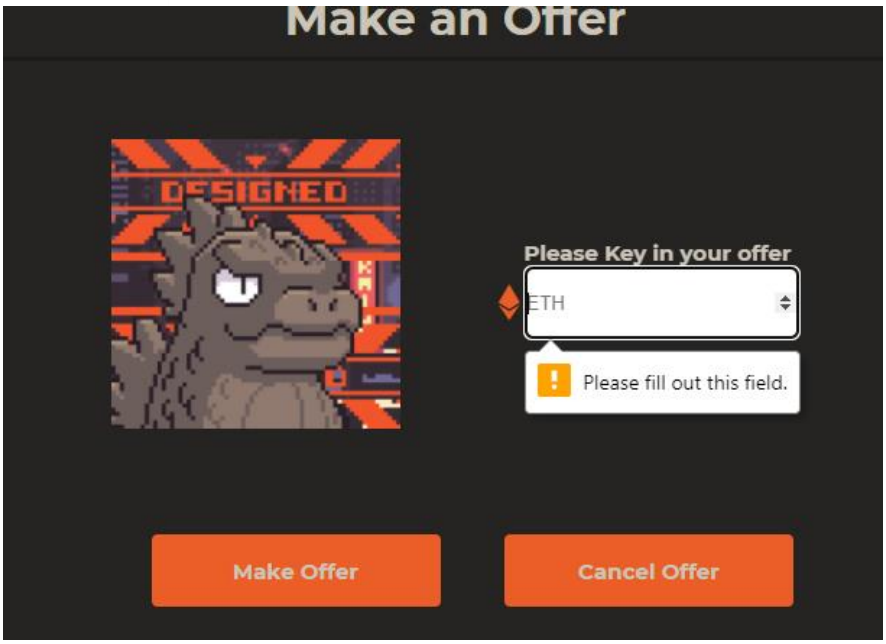


Figure 37: Required field for Key in Offer

ii) If user clicks edit profile without entering any data into any of the 3 fields, will it allow the profiled data to be changed?

No, the Edit profile section requires all 3 fields to have data inside it before the user can change the information. It does not allow users to change a single piece of information only. All 3 has to be updated at the same time. If one field is keyed in, and the second one is not field in, it will prompt and error asking the user to fill in the second field.

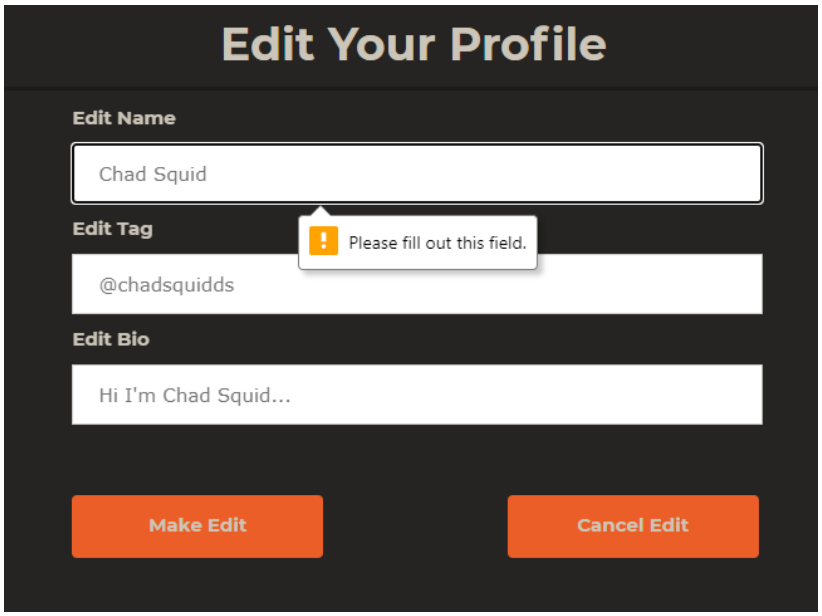


Figure 38: Required field for Name

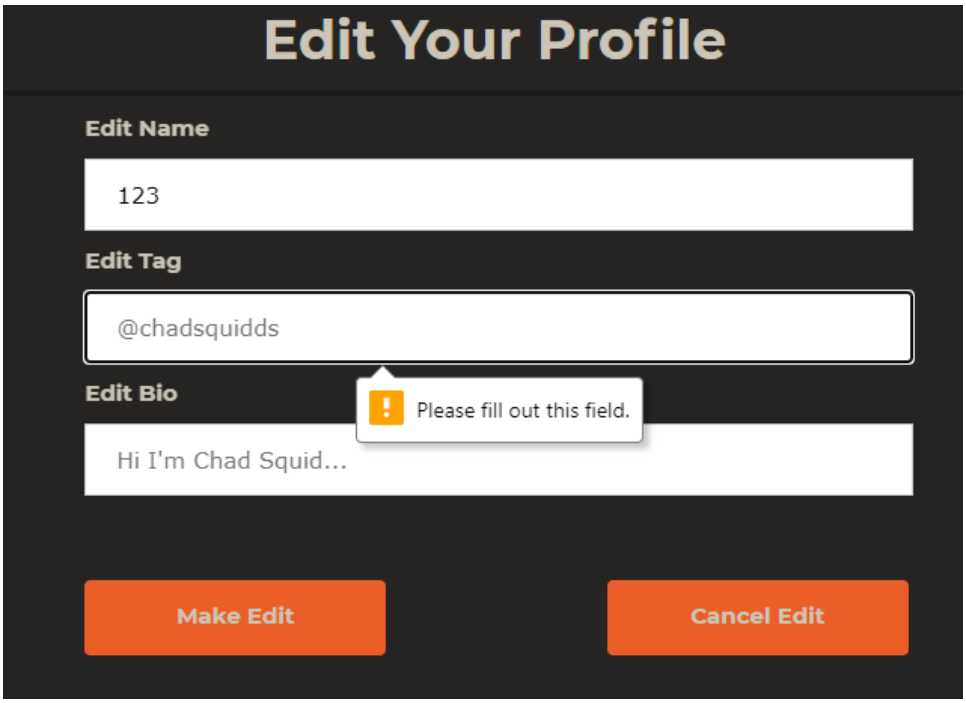


Figure 39: Required field for Tag

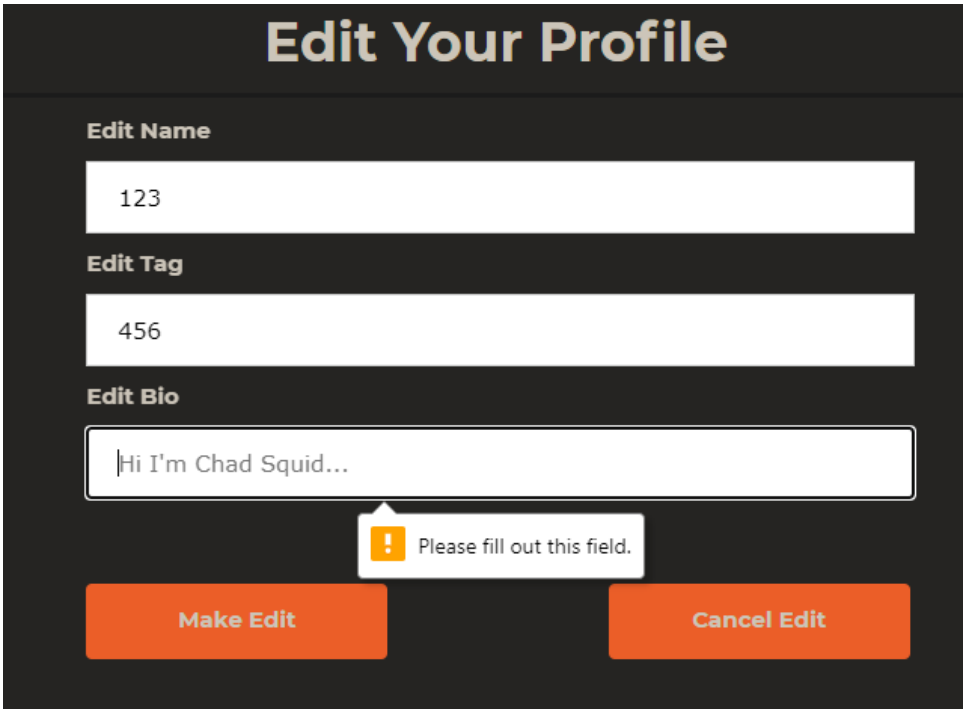


Figure 40: Required field for Bio

Case 2: Testing offers and buyout function

I) What happens when user offers lower than the current listed price?

It will be recorded in the table below the chart to see the current offers that are below the current listing price.

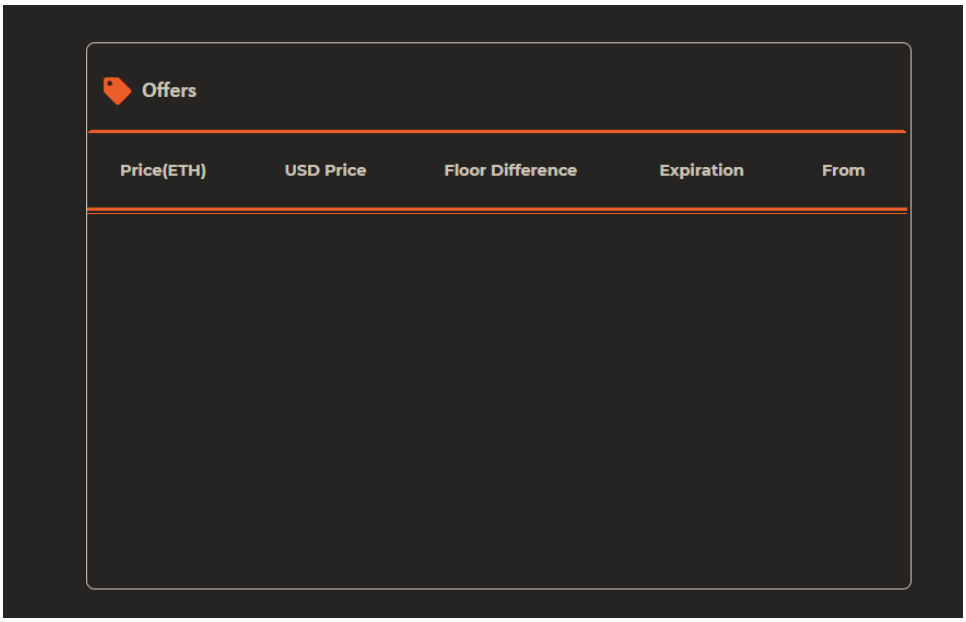


Figure 41: Offer Table

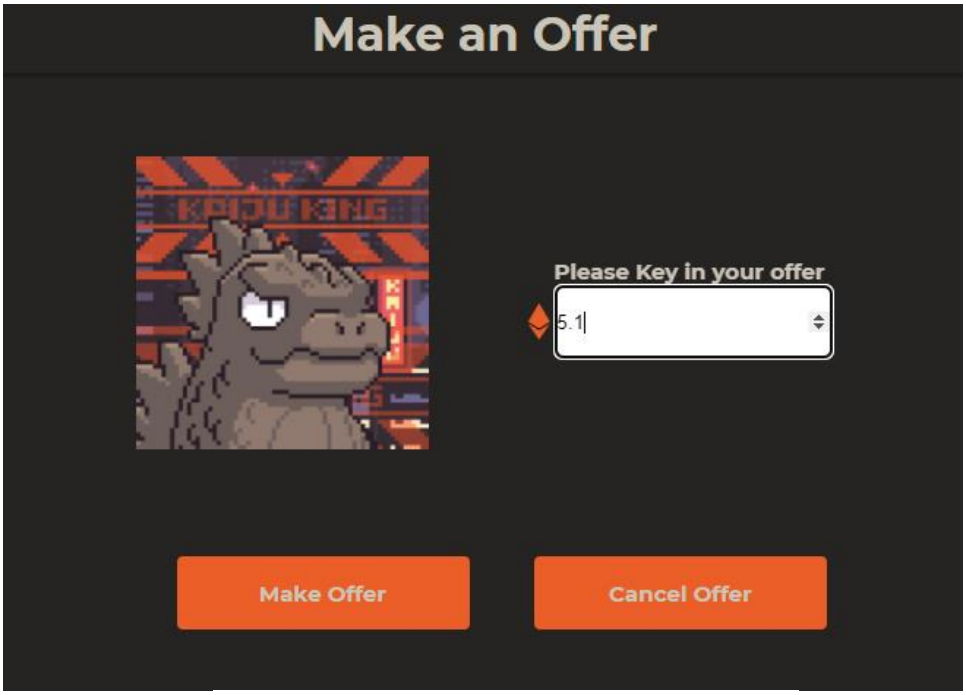


Figure 42: Offer lower than price

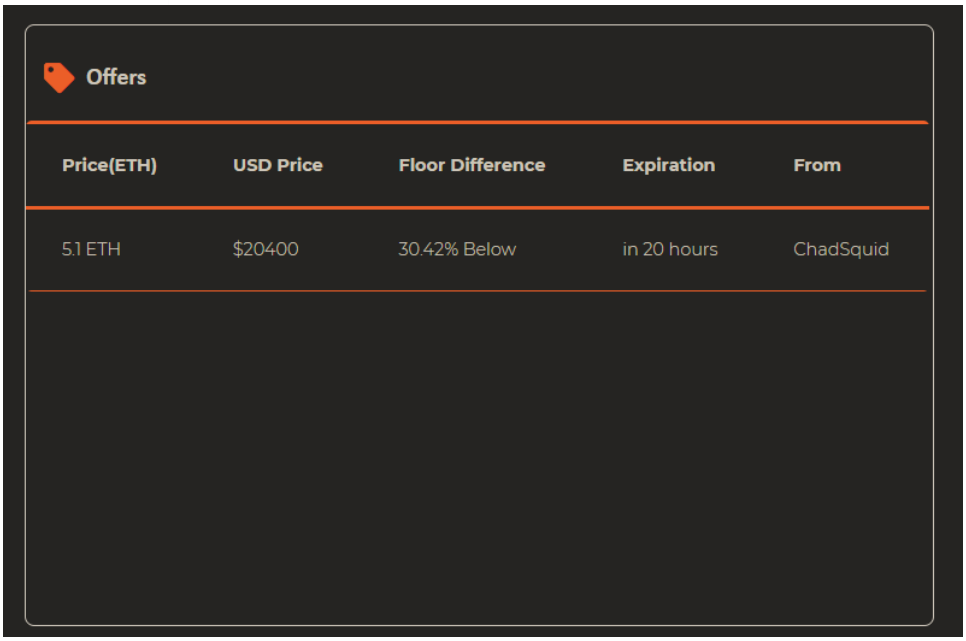


Figure 43: Table show the offer inputed

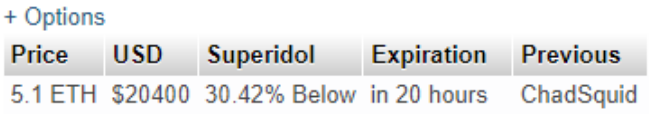


Figure 44: Stored Data

ii) What happens when user offers higher than the current listed price?

It will buy out the NFT instantly and change the owner's name to the user's name. There will be a message prompt that will appear from the top telling the user that they have successfully bought the NFT. The button will change from make offer to list price.

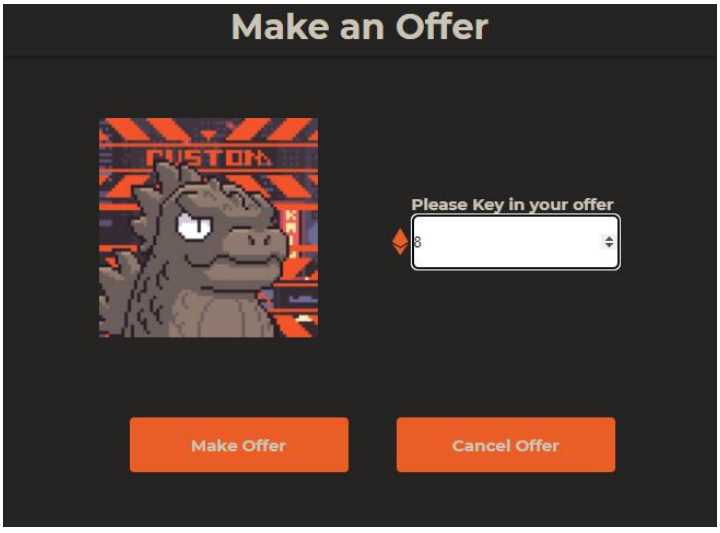


Figure 45: Offer higher than price

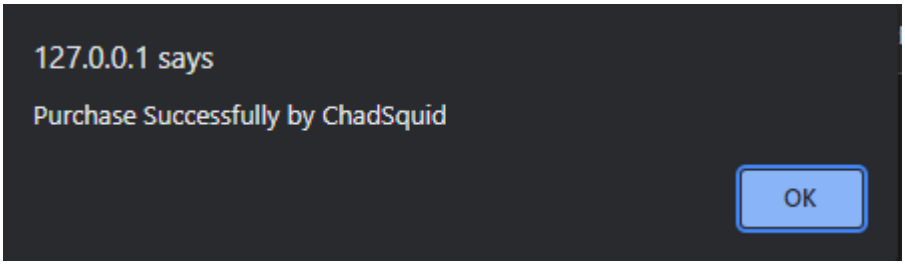


Figure 46: Purchase Successful Message

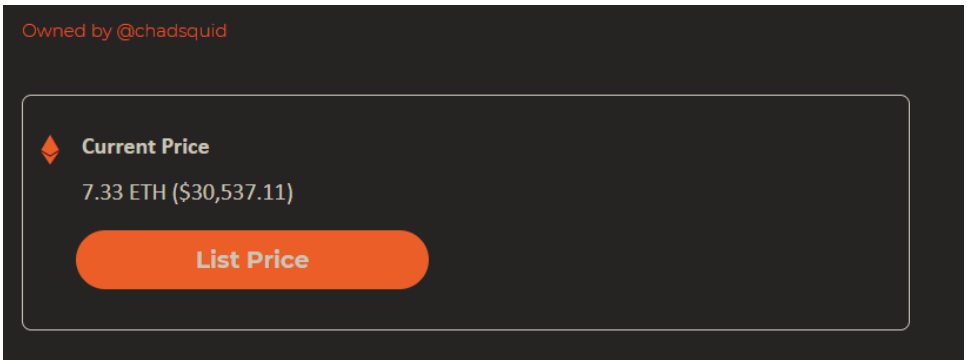


Figure 47: List Price Function

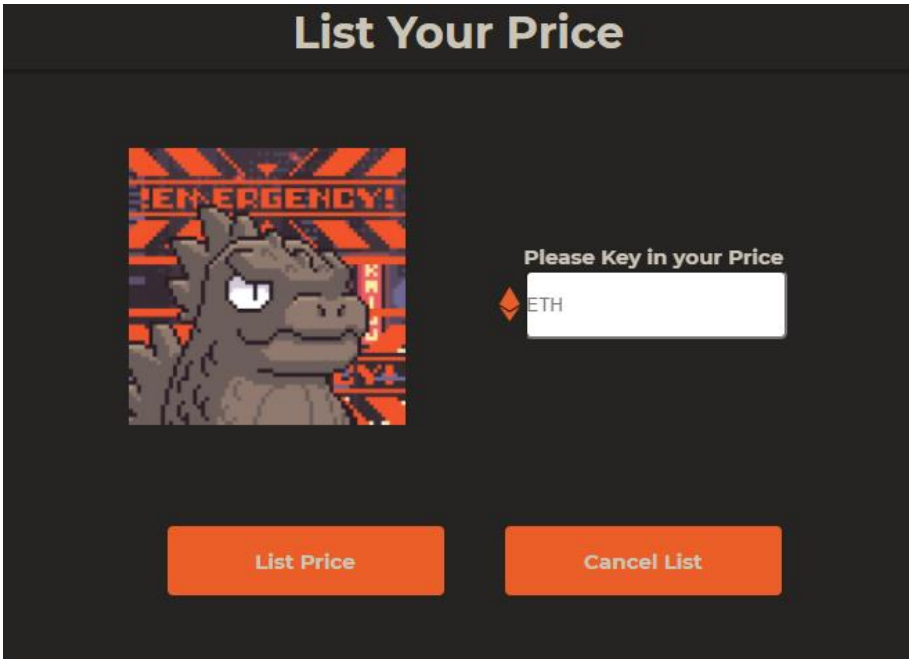


Figure 48: List Price Pop Up

Case 3: Testing the social post and reply function

I) What happens when a user posts on the homepage. Will the post appear on top?

Yes, it will appear on the top, and it will save what the user posts.

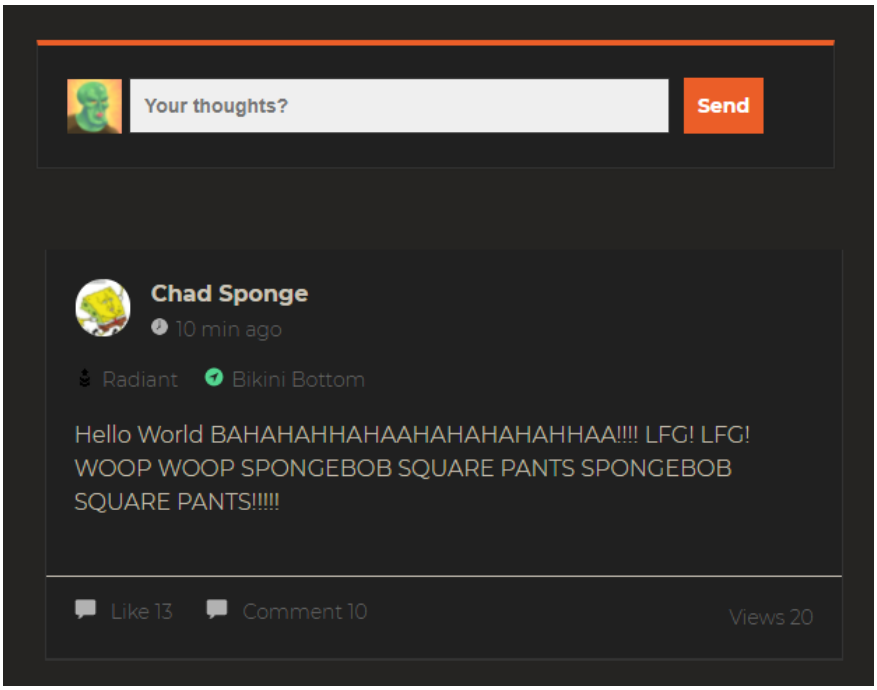


Figure 49: Original Post

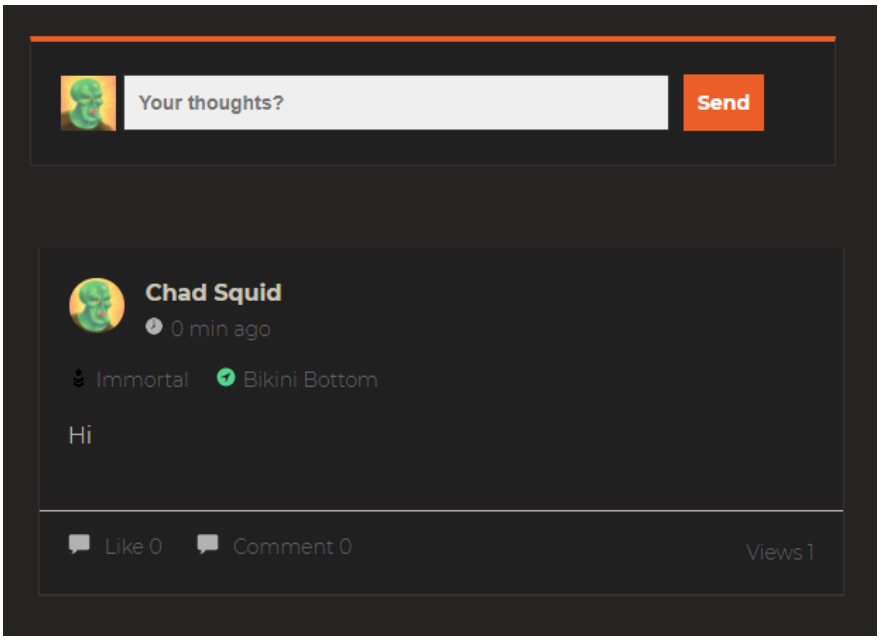


Figure 50: Post with Inputted Text

ii) Can a user reply using the comment function to reply to a post posted by someone?

Yes, the reply function will post the reply comment in the comment section of the post.

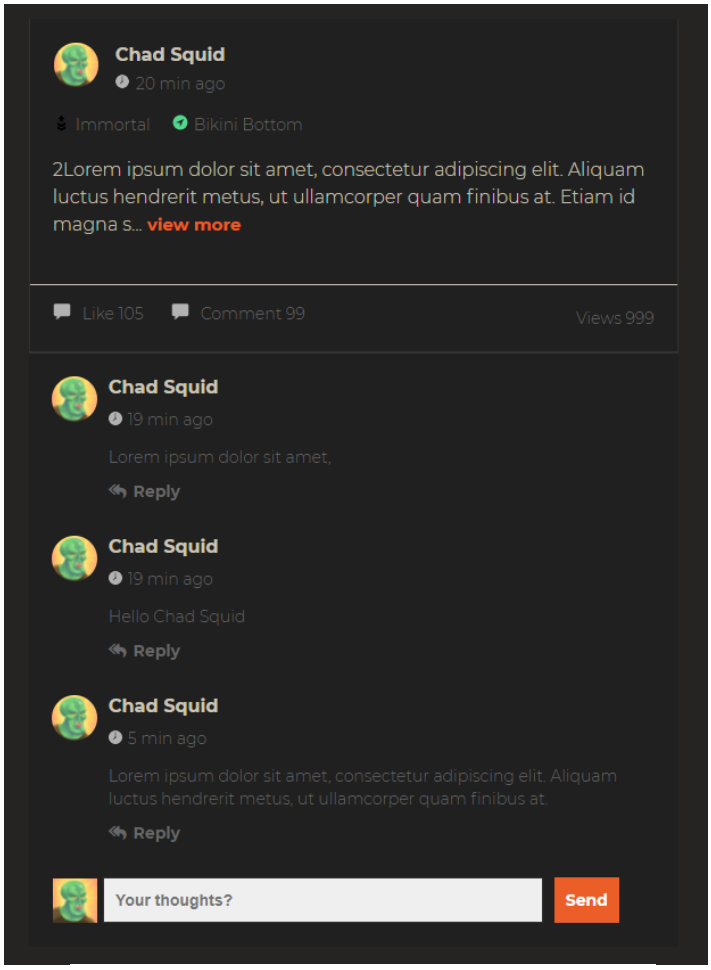


Figure 51: Post with Replies

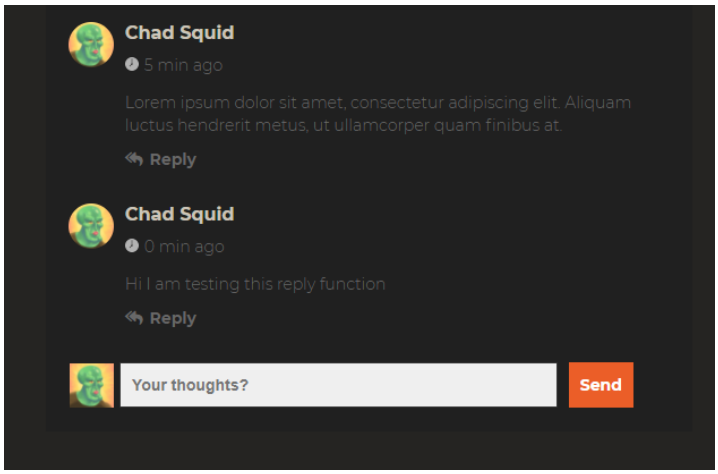


Figure 52: Reply with Inputted Value

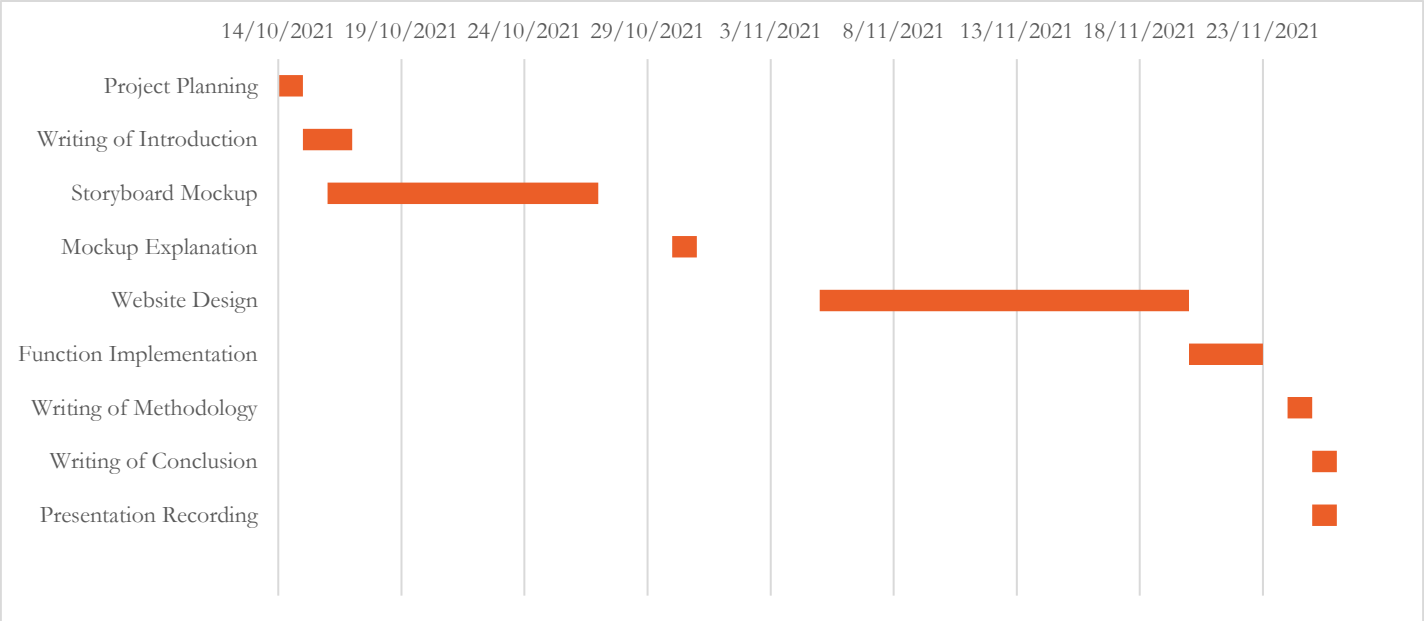
4.1.1 Testing and results (non-Technical)

Case 1: Websites overall UI and flow

I) Is the website smooth, in terms of buttons allowing the user to hop from page to page to get to what they need?

Yes, each page has head and footer buttons to allow the user to go from page to page and the projects are labelled in detail to allow users to click into their respective pages to get the needed information. The pages load times are within 1 –2 seconds with an instant response time as there aren't a lot of resources to load.

The UI is kept clean and minimal to ensure the users do not get overcluttered with information and get lost or confused as to what they are looking at.



5.0 Conclusion of Project

Conclusion

The entire websites design and UI is done according to our storyboard and we kept it similar to ensure that it remains minimal and stay true to our branding colors. Majority of the functions on the website works according to our plan except for certain filter functions that has been adapted to a different method due to our lack of understanding in PHP and JavaScript to make the filter run efficiently. Although everything is designed close to our plan there are some improvements that could be made to further improve user experience to help improve user's experience.

Future work

Future improvements include:

- A more refined filter function for larger data size.
- Improve chart system to reflect time frame further than 1 year.
- Allow users to change only one field of their profile instead of all 3.
- A nicer pop-up message with a proper UI for the “successfully purchased” message.

A more refined filter function to allow for more refined sorting and filtering for larger data size for the statistics page. At the moment the statistics page does not have enough data to utilize such refined filter and sorting. With more data in the table, the filter should allow the users to filter and sort per column. The filter will remove unwanted data to display what the users want to see.

Currently majority of the chart on the website only displays a time frame of 1 year max. Moving forward it would really improve buyers experience if they can see custom time frame, potentially up to the start of the NFTs first ever listing price to allow buyers to see an overview of NFTs whole price lifespan. It would also

improve the buyers experience if the users can filter the time frame of the charts to reflect a specific time frame they would like to view.

At the moment, the edit profile function in the profile page only allows user to change their profile if they are willing to change all 3 fields at one go instead of specific fields only which is an inconvenience to some people as some users might only want to update their bio only and leave their name and alias the same. It would greatly improve user experience and enjoyability if they are allowed to change a single field only to let them have full control of the profile customization function.

The final improvement to improve the overall quality of life of the item page for users doing a purchase is to have a custom pop-up message that fits the theme of AtomicVein to congratulate the user on successfully purchasing the specific NFT. Currently the message pop up is a custom message from the browser system that is plain and simple. A custom message with AtomicVeins theme would greatly improve the overall look of the page and make the buyer feel like they are fully immersed on our site.

6.0 References

[1] News.yahoo.com. 2021. *Yahoo is now a part of Verizon Media*. [online] Available at: <https://news.yahoo.com/nfts-why-worth-millions-121252765.html> [Accessed 16 October 2021].

https://www.statista.com/statistics/1265821/us-nft-user-demographics/

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6.0 Work Acknowledgement

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