

Building a Frontend User Interface of a Crypto Website by Utilizing React



Bachelor thesis

Degree Programme in
Computer Applications
fall, 2022

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Year 2022

Subject Building a Frontend User Interface of a Crypto Website by Utilizing React

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ABSTRACT

The goal of the thesis was to examine the requirements for a cryptocurrency blog website. Figma was used to test and design the website prototype. React was used to create the front-end user interface. The thesis focuses on how to improve a website's accessibility to reach a wider audience.

Blockchain, its essential components, and adoption rate were discussed in the theoretical section of the thesis. The section that follows describes the crypto website prerequisites and general accessibility features. The practical portion of the thesis consists of the Figma design prototype of the blog, as well as the installation of the required environment and dependencies for the front-end website prototype using React.

The thesis work conducted extensive literature review and market research of top crypto currency websites to analyze the most sought-after crypto blog's feature requirements. According to the findings, react is an excellent framework for developing blog websites, whereas Figma is a user-friendly UI/UX prototyping tool for designing. The content of the thesis will also help readers better understand the features and accessibility requirements of the crypto website, as well as guide them thoroughly through the practical implementation part.

Keywords Blockchain, React, Blog, Crypto

Pages 30 pages

Glossary

HTML	Hypertext Markup Language
NPM	Node Package Manager
NPX	Node Package Execute

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1 Introduction

Blockchain is currently among the most disruptive technological revolutions, with tremendous promise in a variety of applications such as enhanced security, cost savings, and greater transparency. Businesses are looking for alternative applications of blockchain in a variety of industries, notably healthcare, gaming, and information security. Compared to traditional networks, it provides greater security, visibility, information untraceability, and usability. (Baker, 2021)

The thesis seeks to raise awareness about blockchain to regular consumers by developing a prototype cryptocurrency blog website with latest news and content related to crypto. At the beginning of the thesis, proper research will be conducted by analyzing the most popular cryptocurrency blogs and websites to understand the current market prerequisites.

Visual and language accessibility features for the website will be investigated to ensure that programs and functionality are accessible to the widest possible range of users, including those with disabilities. Figma, an end-to-end web-based prototyping tool will be used for the website prototype concept, while the react framework will be used to create an example website prototype. Due to time constraints, the front-end website prototype will have limited features. It will still tend to develop after the thesis is completed.

The area of the research and practice work will be limited to the user interface (Frontend) functionality. The following three research questions will be answered throughout the thesis to ensure a realistic execution of this research:

- What are the prerequisites of a cryptocurrency blog website?
- How to create a crypto news website prototype using react framework?
- How can the accessibility of a react website be improved?

2 Blockchain & Adoption

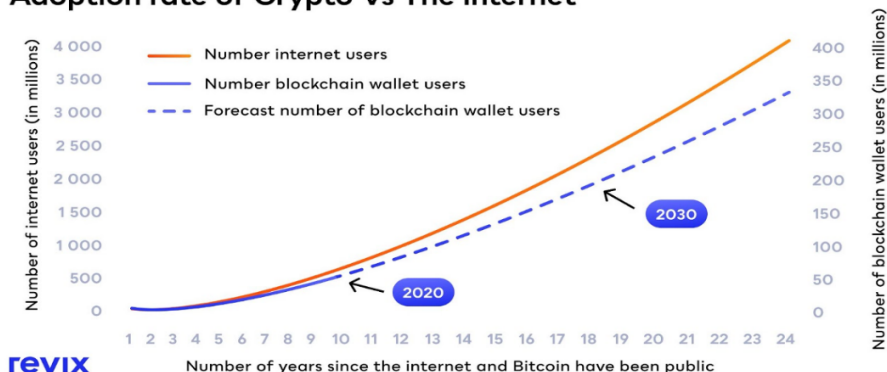
A blockchain is a decentralized ledger that is shared across computer network nodes. A blockchain acts as a database, storing information in electronic form. Blockchains are well known for their crucial role in keeping a reliable and distributed record of the transaction in cryptocurrency systems like Bitcoin. The blockchain's importance reflects the fact that it ensures the accuracy and security of a data record while also generating trust without disclosing any user information to a third party (Investopedia, 2022).

According to the research team at markets and markets, the Blockchain industry in 2021 is expected to grow from \$4.9 billion in 2021 to \$67.4 billion in 2026. This reflects a Compound Annual Increase of 68.4 percent during the projected timeline. (MARKETSANDMARKETS, 2021) Blockchain users are increasing at a rate of over 100% per year far outpacing the internet's adoption rate in the 1990s and early 2000s (Business Tech, 2022). Davey (2022) claims that even if adoption begins to slow to 80%, cryptocurrency will still have one billion users by 2024. It means one out of every eight people on the planet will engage with or use cryptocurrency in some form.

As shown in Figure 1, the number of internet users after a decade of public use was 500 million, whereas, in crypto, there were 50 million blockchain wallet users in the first ten years of public use. The internet and cryptocurrency adoption rates were the same in the first ten years of their public availability. Nonetheless, the projected number of blockchain wallet users from 2020 to 2030 corresponds to internet adoption.

Figure 1 Picture of crypto and blockchain adoption rate (Hope, 2022)

Adoption rate of Crypto Vs The internet



2.1 Key elements of blockchain

The blockchain architecture is comprised of different components such as peer networks, smart contracts, events, ledgers, system integration, wallets, and so on. The following list summarizes some of the key elements used in blockchain technology.

2.1.1 Distributed Ledger technology

Distributed ledger technology is a standard for documenting capital transactions, requiring the transactions and their associated details to be recorded simultaneously in multiple locations. DLT enables the secure and efficient storage of all information through cryptography. When information is stored, it becomes an immutable collection of data entirely controlled by network rules. (Troy & Pratt, 2021)

Distributed ledgers rely on multiple computers (called nodes) to store, exchange, and synchronize transactions with their own computerized ledger accounts in contrast to a traditional ledger, where data is centralized, the distributed database and its irreversible record of transactions are accessible to all involved parties. Transactions are only entered once on this shared ledger, preventing the duplication of work that is common in traditional commercial networks. (IBM, 2022)

Figure 2 Example picture of Distributed ledger (Corporate Finance Institute, 2022)

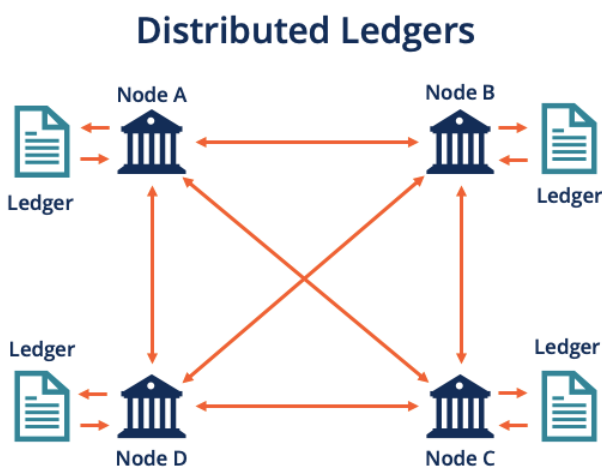


Figure 2 shows a node representing the computer and servers where the ledger data is stored. Each existing node can view, modify, or verify the ledger. All existing nodes are linked to one another and are constantly exchanging new information, ensuring that all nodes are up to date. Based on previously registered transactions, the nodes can either accept or reject new transactions after verifying it in all the nodes to prevent fraud or duplication.

2.1.2 **Immutable records**

An immutable record is a blockchain ledger's ability to remain unchanged, unaltered, and irreversible. Each information block, such as facts or transaction data is carried out using a cryptographic concept or a hash function. This hash function contains an alphanumeric string generated by each block separately. Each block contains a hash value or digital signature for itself as well as the previous one. (Dass, 2021)

No participant can edit or manipulate a transaction once it has been registered to the public ledger. If an error is discovered in a transaction record, a new transaction must be entered to correct the error, and both blockchain transactions are then viewable by anyone on the blockchain. (IBM, 2022)

2.1.3 **Smart contracts**

A smart contract is a self-executing contract in which the terms of the buyer-seller agreement are written directly into lines of code to speed up the transactions. The code and the agreements it contain are distributed and decentralized across a blockchain network. (Frankfield, 2022) Smart contracts can automatically run with the protection of blockchain, eliminating the need for identifying and managing risk. All that is required is a computer program that is set up to recognize an event and execute it (Santander, 2022). A smart contract can specify the requirements for corporate debt transfers, as well as payment terms for transactions (IBM, 2022).

2.1.4 Incentive mechanism

Miners are the people who solve mathematical puzzles to add new blocks to the blockchain. A miner uses customized computers, also known as nodes, to validate blockchain transactions for a specific cryptocurrency in exchange for a mining reward for their computational effort (GOBankingRates, 2022). An Incentive Pool is established by a group of miners so that they can build blocks jointly for verifying transactions and then split the rewards equally among all the miners. When a Pool Miner discovers the block header's solution, the miner is unable to alter the transaction without eliminating the validation. Therefore, incentives to Blockchain miners serve as a reward for successfully processing the transaction as well as encouragement for future transactions. It is also beneficial to the miners as well as the decentralized system's Blockchain technology. (GeeksforGeeks, 2021)

3 Prerequisites for crypto website

A thorough literature review of cryptocurrency related research papers and blogs has been conducted to determine the requirements for a cryptocurrency blog, including accessibility and major features such as markets and news. A detailed market research was conducted, which included a comparison of the most prominent blockchain-based blog websites to determine the market requirements for a crypto/blockchain blog website in terms of knowledge base, technology, and software requirements, as well as features. The following material is intended for many audiences and covers the most important and desired functional aspects.

3.1 Knowledge base

Cryptocurrency blogs have become more popular at the time of writing (2022) with several new readers just starting out in the crypto community. There are individuals looking for new perspectives and good advice from experienced investors and developers looking for a new place to share their thoughts. (The blockchain writer, n.d.)

To start a successful blog, one needs to have knowledge of the rapidly evolving and expanding blockchain industry. It is challenging to keep up with trends and advancements because more information is available than ever. While cryptocurrency is important, bloggers should consider how they might assist investors looking for good advice. To select a specific audience, one must choose a topic which they are genuinely enthusiastic about and at least educated on. (Staci, 2022)

Bloggers must be good at writing and possess a variety of skills. As a result, a new blog possibility has emerged for individuals ready to put in the effort to expose and educate the public. Staci (2021) and the blockchain writer (2022) argues that some of the essential skills required to become a blockchain content writer include:

- understanding the Blockchain
- finding your niche
- practicing different types of writing styles
- understanding of cryptography and securities
- acknowledge how smart contracts work

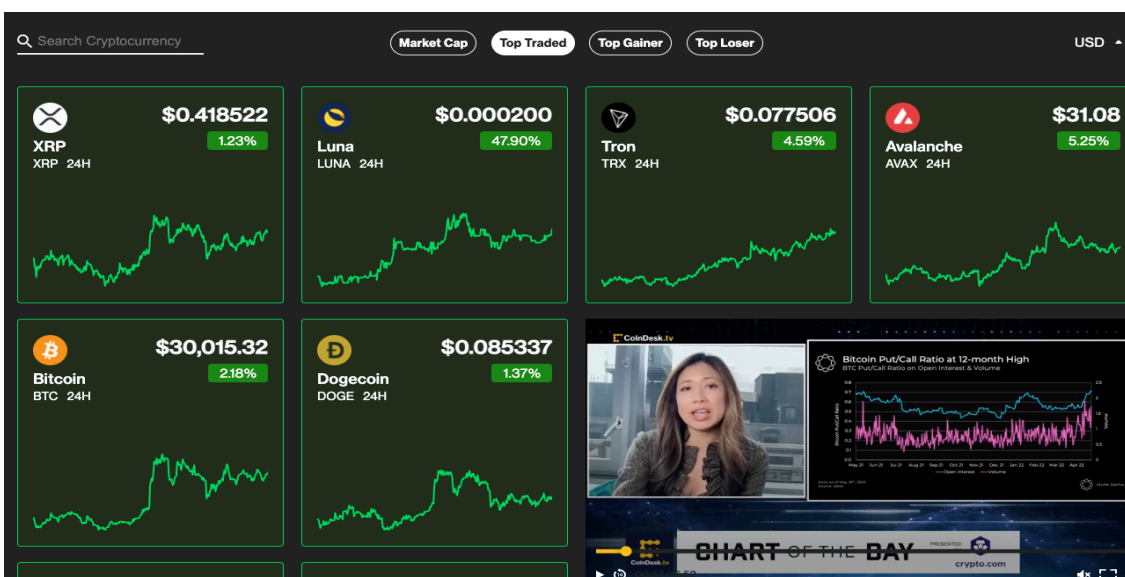
- discover legal regulations and reporting requirements
- due diligence about ICOs, news, and startup projects in the cryptocurrency world on a regular basis

3.2 Feature prerequisites

3.2.1 Market Cap

Market capitalization is the total market price of a company's stock shares. In cryptocurrency, market cap is determined by multiplying the total number of coins in circulation by the current price of one coin. (Haar, 2022) Markets page in exchanges includes the live cryptocurrency prices based on the categories market capitalization, Top traded, gainers and losers respectively which can be extracted through free-to-use API provided by different crypto exchange and major websites. It is one of the most important and must have feature on a blockchain site. In addition, it contains latest market analysis and news articles. In Figure 3, attached is an example of live crypto price from Coin telegraph blog website where coins are filtered based on market capitalization, most traded, top gainers, and losers.

Figure 3 Example picture of Live crypto prices based on different categories (Coin telegraph, n.d.)

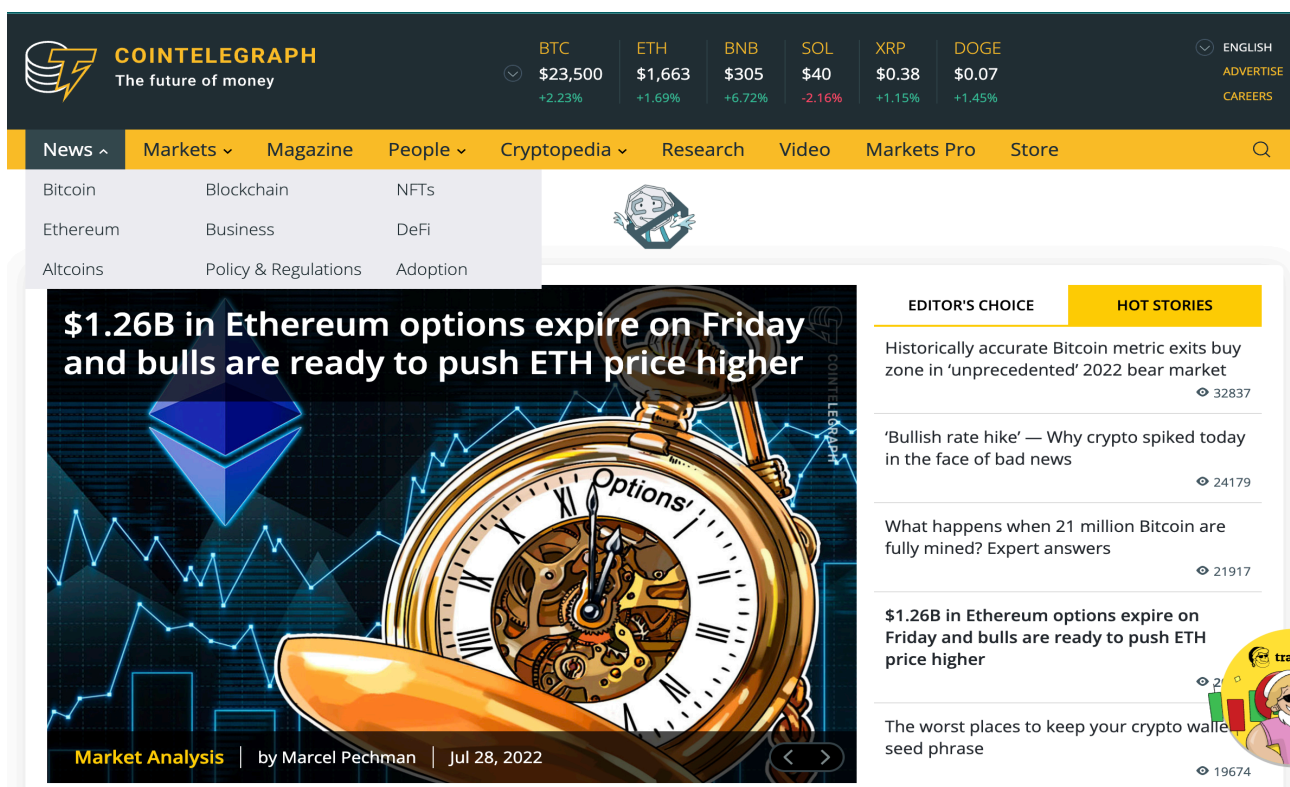


3.2.2 News section

A news section is a segment of the website where individuals can display an unlimited number of separate articles about the company, typically used to keep customers up to date. Each blog has a distinct page and is a full-fledged independent article. (Inventis Website Design, 2020). The news section of the top ten crypto blog website of 2022 were analyzed, and Coin telegraph offered a wide range of categories with qualitative content and up-to-date information. Coin telegraph is an independent publisher focusing on cryptocurrency, blockchain, decentralized applications, and the next-generation web. They deliver the most recent news, prices, breakthroughs, and analysis from the cryptocurrency community, emphasizing expert opinion and analysis. It had a total of 10.6 million visits in July 2022 (Similarweb, n.d.).

Figure 4 Example picture of News page from Coin Telegraph’s website. The crypto blog news section comprises the most recent crypto news, organized by specific coins and specialized tech & business section that highlights the evolving role of blockchain in business and technology, including the most recent updates regarding government policy and regulation around cryptocurrency, via blog articles. (Coin Telegraph, n.d.)

Figure 4 Example picture of News page from Coin Telegraph



3.2.3 **Newsletter**

A newsletter is a tool that companies and groups use to share important and useful knowledge with their range of clients and subscribers. Newsletters allow to share interactive content and drive traffic to your website by giving access to your audience's inbox. Newsletters are a must-have feature since they keep consumers up to date whether it's about the newest trends and information on a variety of topics or any new policy or regulation. It will be accessible with just a tap of a button on the email app. (Brafton, 2021) 64% of small businesses use email marketing to reach customers. (Campaign Monitor, 2021)

CoinSnacks is an email newsletter that provides bite-sized news emphasizing the most recent crypto asset news, pricing metrics, and trending stories. It is one of the best newsletters covering the cryptocurrency industry due to its high content quality. It is organized into sections such as must-reads, deep dives, regulatory front, and tweet of the week. It has over 62,000 subscribers.

3.2.4 **Portfolio tracker**

A portfolio tracker is a software or service that enables you to track the growth of your investment portfolios. Users can view how the current allocation compares to one's long-term goals and how their portfolio is performing in comparison to the rest of the market. Portfolio tracker is a popular and dependable function offered by certain paid and free websites that allows consumers to establish several portfolios to keep track of all their assets. (Lovas, 2021)

Most intermediate crypto investors use different exchanges and hold several wallets for different purposes, making tracking all assets an awful experience. CoinStats is a portfolio tracker that lets users connect an unlimited number of wallets, including the most popular exchanges such as Binance and MetaMask.

4 Accessibility features

The Web is built to function for everyone, regardless of their technology, software, language, location, or aptitude. When the Web achieves this goal, it will be usable by persons with a wide variety of hearing, movement, vision, and intellectual functioning (Lawton Henry, 2022).

Accessibility features are designed to make it easier for persons with disabilities to use technology. For persons with poor vision, a text-to-speech tool may read content out loud, while a speech-recognition feature allows users with limited movement to manage the computer using their voice. (Computer Basics: Using Accessibility Features, n.d.). Education, employment, governance, business, health care, pleasure, and many other areas of life are becoming increasingly dependent on the Internet. It is critical that the Internet be accessible to offer people of all capabilities with universal access and opportunities. The United Nations Convention on the Rights of Persons with Disabilities defines access to information and communication technology, including the Internet, as a basic human right (UN CRPD, n.d.).

There are obstacles to cryptocurrency accessibility, such as financial education and technological resources. It is crucial to ensure that Applications are compliant to provide opportunity for success and financial freedom to those who use Assistive Technologies (such as screen readers, voice recognition software, and so on). (Smart Cities Library, 2018)

People with disabilities, as well as others, benefit from accessibility, which includes:

- the elderly
- residents of rural areas
- individuals living in emerging nations

It is the owner's responsibility to make the websites as accessible as possible while not discriminating against any users. Henry Lawton has created the checklist below to ensure that basic accessibility is addressed in the website prototype. (Lawton, 2022)

- There are no graphically intensive components such as moving or flashing photos, themes, or background on the blog, and it uses muted colors with lots of contrast.
- The usage of headers and navigation bars ensures that people can quickly navigate the website.
- The content is precise and straightforward when using link texts to avoid using difficult vocabulary.

5 Aim and purpose of the development work

The development project aims to create a front-end blog website application prototype using React library. According to the prerequisites, the website will include pages such as markets to check live trading price of crypto, and blog posts that includes various news categories. To address the visual accessibility of the website, the colour contrast for both text and background will be checked, and there will not be any moving or flashy images. Images will have alt text for accessibility and SEO. The purpose of the blog website is to educate and raise awareness about blockchain and cryptocurrency to the public.

6 Technologies and tools for the blog

6.1 React

React is a UI development library based on JavaScript. It is maintained by Facebook and an open-source developer community. React is widely utilized in web development, even though it is a library instead of a language. The library debuted in May 2013 and has since become one of the most popular frontend libraries for web development. (Simplilearn, 2022)

The capability of React to split down complex UI that enables developers to work on individual components is what distinguishes it from other frameworks. These components are also reusable. This means that a component only needs to be defined once and can be reused several times. This makes developing a large-scale website faster, more convenient, and easier for developers. React Projects provides learners with limitless possibilities.

6.2 Figma

Figma is a browser-based, cloud-hosted platform that makes collaborating and usability easy for UX designers, programmers, and anybody else on a team. Figma's versatile styles allows to modify how text, grids, and other elements appear across a project. Figma's capabilities is enhanced by several useful plugins, including Autoflow for demonstrating user flows, Fig motion for making animations, and plenty of others (Cardello, 2021). The design of the crypto blog website, including

the final prototype design, was created in Figma. It has several layout options and an easy-to-use user interface, which did not require prior knowledge in the development phase of this thesis.

6.3 Visual studio code

Visual Studio Code is a compact yet capable source code editor for Windows, macOS, and Linux that runs on a desktop. It has built-in support for JavaScript, TypeScript, and Node.js, as well as a large ecosystem of extensions for multiple languages and runtimes (such as C++, C#, Java, Python, PHP, and Go) (such as .NET and Unity).

Visual Studio Code is built on a lightning-fast source code editor that is ideal for everyday use. Syntax highlighting, bracket matching, auto-indentation, box selection, snippets, and more are all available in VS Code, which supports hundreds of languages. For the real implementation of the blog, it is preferable due to the prior experience with Visual Studio Code.

7 Design and Blog Implementation

Web design is the practice of generating ideas, planning, designing, and delivering interactive digital content through the web in the form of technologies (including mark languages) that can be interpreted and displayed by a web browser or other web-based graphical user interfaces.

(Interaction design foundation, n.d.)

The goal of the web design and blog implementation in the thesis is to develop a user interface website that provides crypto content to the end customer in the form of web pages.

7.1 Accessibility

There are no graphically intensive components such as moving or flashing photos, themes, or background on the prototype blog website to tackle problems with visual accessibility, and it uses muted colors with lots of contrast. Prototype color contrast for light and dark mode was considered before beginning development of the blog website.

Figure 5 and Figure 6 show the contrast check for color schemes used in the website's background and foreground in both light and dark modes. The tests were carried out using the website web aim contrast checker. All the test cases for normal text, large text and graphical objects and user interface passed the test for the blog website.

Figure 5 Checking the contrast for visual accessibility of website (WebAIM: Contrast Checker, n.d.)

Contrast Checker
[Home](#) > [Resources](#) > Contrast Checker

Foreground Color
#000000
Lightness

Background Color
#00A6D2
Lightness

Contrast Ratio
7.38:1
[permalink](#)

Normal Text
WCAG AA: **Pass**
WCAG AAA: **Pass**
The five boxing wizards jump quickly.

Large Text
WCAG AA: **Pass**
WCAG AAA: **Pass**
The five boxing wizards jump quickly.

Graphical Objects and User Interface Components
WCAG AA: **Pass**
Text Input

Related Resources

- [Contrast and Color Accessibility](#)
- [Quick Reference: Testing Web Content for Accessibility](#)
- [Web Accessibility for Designers](#)
- [Link Contrast Checker](#)

Figure 6 Checking the contrast for accessibility in dark mode (WebAIM: Contrast Checker, n.d.)

Contrast Checker
[Home](#) > [Resources](#) > Contrast Checker

Foreground Color
#B4B0A4
Lightness

Background Color
#2D2C29
Lightness

Contrast Ratio
6.44:1
[permalink](#)

Normal Text
WCAG AA: **Pass**
WCAG AAA: **Fail**
The five boxing wizards jump quickly.

Large Text
WCAG AA: **Pass**
WCAG AAA: **Pass**
The five boxing wizards jump quickly.

Graphical Objects and User Interface Components
WCAG AA: **Pass**
Text Input

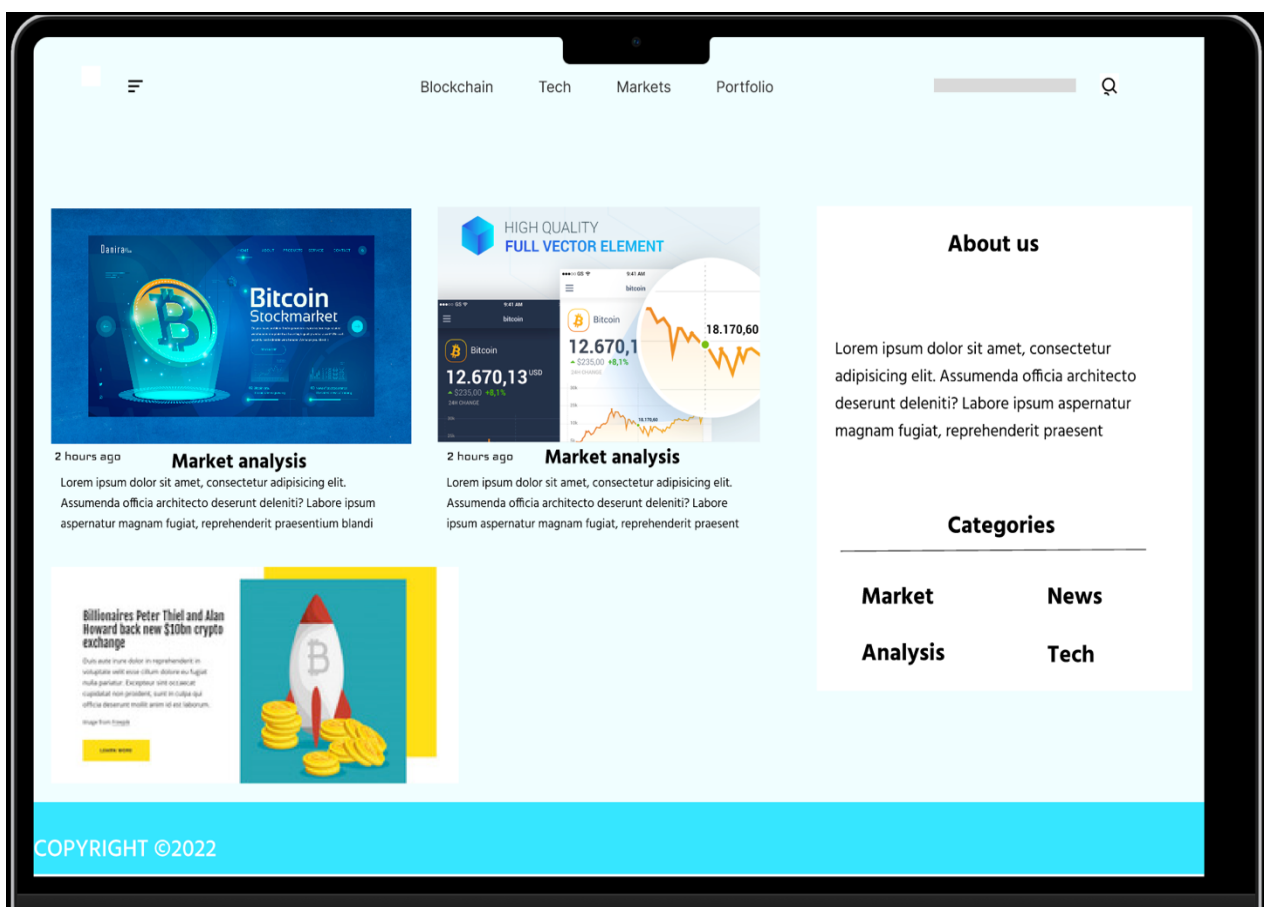
Related Resources

- [Contrast and Color Accessibility](#)
- [Quick Reference: Testing Web Content for Accessibility](#)
- [Web Accessibility for Designers](#)
- [Link Contrast Checker](#)

7.2 Figma Design prototype

Before starting to code, the idea was first implemented and designed in Figma to have a clear idea of how the website is supposed to look. The home page will consist of a navbar at the top with links to various pages, including the search bar (figure 7). To make navigation easier, there are blog posts on the left side of the page and a sidebar on the right which enables the user to switch between different categories seamlessly.

Figure 7 Figma Design prototype of homepage



Tech page as in **Error! Not a valid bookmark self-reference.** has the same fixed header and footer and contains different blog posts related to crypto.

Figure 8 Figma Design prototype of tech blog page

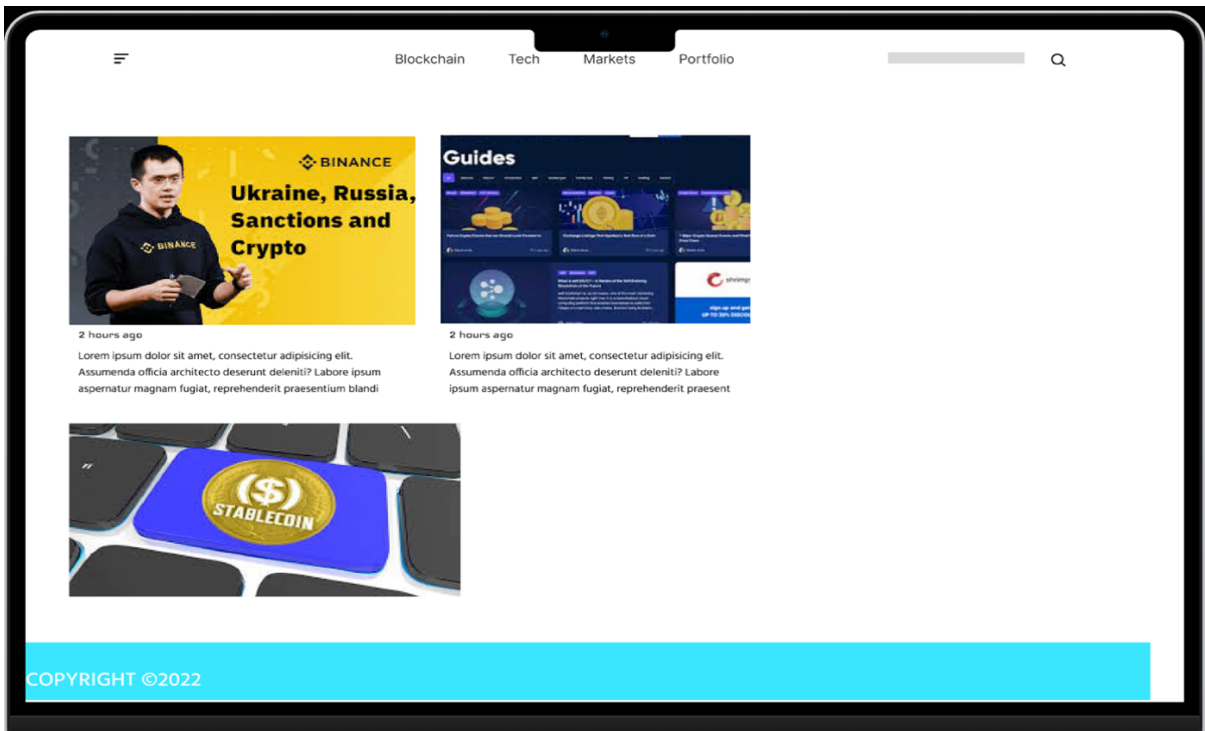


Figure 9 Picture of design prototype of contact us page

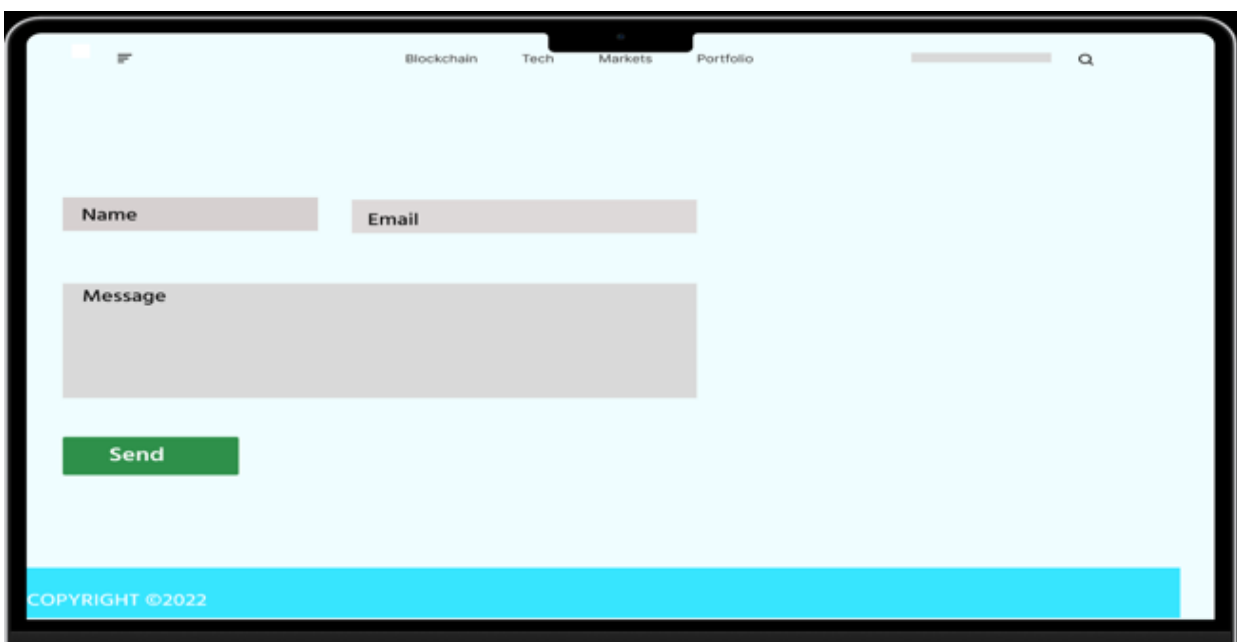


Figure 9 illustrates the design of a simple contact us page which contains input fields for details of the user and message, client-side form validation properties is planned for input fields. Therefore, no random blank submissions can be made in the name, email & message.

7.3 Prototype Application Structure

7.3.1 Create react project

To create a react project, open the terminal in the code editor or the command line on the computer. It is a must to have the recent version of NPM to ensure that the latest recent version of the project command create-react-app is used. After running command 1 in the terminal and installing all the required dependencies, it will create a new project blog-app. it is necessary to change directories and navigate to the main folder using command 2.

Command 1 command for creating a project name and installing all necessary packages

```
npx create-react-app blog-app
```

Command 2 command to change directories and navigate to the main folder blog-app

```
Cd blog-app
```

In program code 1 'App.js' is the application's access point, where the CSS file is imported, while import react is generated using NPM (Node Package Manager).

Program code 1 'App.js' application's access point

```
src > JS App.js > App
You, 3 hours ago | 1 author (You)
1  import Layout from "./components/pages/Layout"
2  import NoPage from "./components/pages/NoPage"
3  import Home from "./components/pages/Home"
4  import Contact from "./components/pages/Contact"
5  import Tech from "./components/pages/Tech"
6  import Markets from "./components/pages/Markets"
7  import Footer from "./components/footer/Footer"
8  import Post from "./components/pages/Blog/Post"
9  import {
10     BrowserRouter,
11     Routes,
12     Route } from "react-router-dom";
13
14
15
16  function App() {
17
18     return (
19
```

After changing the directory to the main folder run the following command 3 in the terminal to run the app:

Command 3 command to run our blog app

```
npm run start
```

The app will be launched on port 3000 and it can be navigated from the URL <http://localhost:3000>

The running project can be stopped by typing Ctr + Z on the terminal.

7.3.2 Directory Structures

As in Figure 10 the folder and file structure represent React with the blog web application, react uses JSX to render data inside HTML

Figure 10 File structure of the app



Following is the content of the file structure:

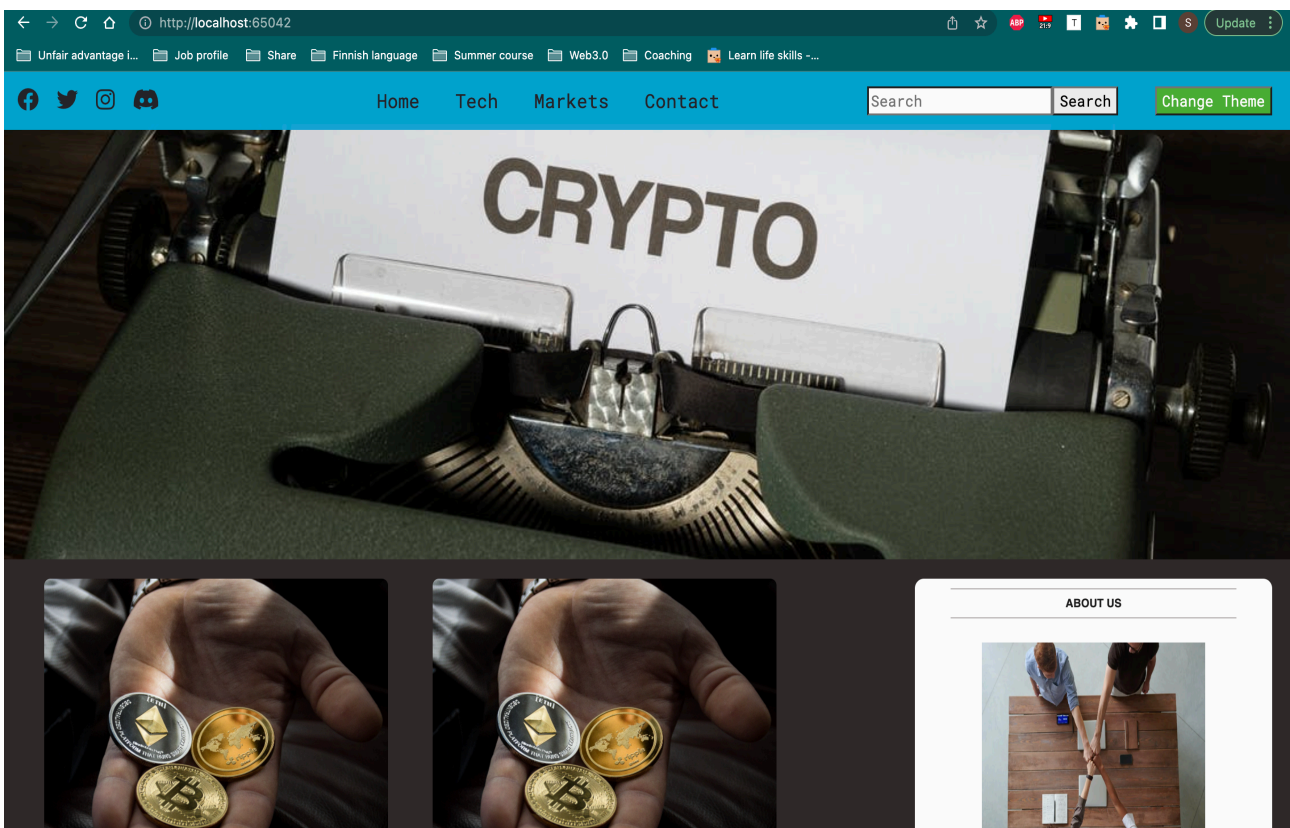
- App Js is the application's access point.

- There is a node modules folder that contains all the necessary open-source packages for our project. Based on related functionality, it communicates with an external application.
- The folder named pages contains all the app pages in our program, such as blog post, home page, Tech page, and contact us page
- Aside from those, the app includes header, navbar, and sidebar files that are used on the website's homepage.
- Finally, there is a theme file which exports the color set for light and dark theme of the page and a global CSS file that applies to all pages and components.

7.4 Homepage

7.4.1 Navigation Bar and footer

Figure 11 Screenshot of Homepage



As illustrated in Figure 11 the navigation bar at the top of the website allows users to switch between the various pages and links available. The navigation provides access to the home page, contact us page, search bar, and links to social media profiles, also a toggle to switch to dark mode.

The footer contains a newsletter signup form as well as the website's copyright (Figure 12).

Figure 12 Screenshot of footer



7.4.2 React router Dom

To connect all the navigation bar pages, the React Router Dom is used, which allows for dynamic routing in a web app. It enables component-based routing based on the needs of the app and web service. Command 4 will install React Router Dom and its required dependencies.

Command 4 command for installing React Router Dom

```
npm install react-router-dom
```

The components in program code 2 are required within our main app app.js. It is possible to use it to define multiple routes in a web app.

Program code 2 'React-router-Dom' components

```
import {  
  BrowserRouter,  
  Routes,  
  Route } from "react-router-dom";
```

In program code 4 inside the app function the route is rendering the UI component based on the URL set inside it, to navigate between navbar pages, while Browser Router keeps the UI in sync with the URL.

Seamlessly modification of link elements is possible by using Link component in the navbar file as in program code 3.

Program code 3 Link elements for navbar navigation

```
<Link to="/" style={{textDecoration:"none", color:"inherit"}}>Home</Link></li>
<Link to="/tech" style={{textDecoration:"none", color:"inherit"}}>Tech</Link></li>
<Link to="/portfolio" style={{textDecoration:"none", color:"inherit"}}>Portfolio</Link></li>
<Link to="/contact" style={{textDecoration:"none", color:"inherit"}}>Contact</Link></li>
```

Program code 4 Function App route for Navigation using URL

```
function App() {
  return (
    <BrowserRouter>
      <Routes>
        <Route path="/" element={<Layout />}>
          <Route index element={<Home />} />
          <Route path="tech" element={<Tech />} />
          <Route path="contact" element={<Contact />} />
          <Route path="portfolio" element={<Portfolio />} />
          <Route path="contact" element={<Post />} />
          <Route path="*" element={<NoPage />} />
        </Route>
      </Routes>
      <Footer />
    </BrowserRouter>
  );
}

export default App;
```

7.4.3 Dark theme

The color scheme of any interface which displays bright content and UI elements on top of a darker background is known as dark mode. It is intended to supplement the standard light mode. Dark mode dims the brightness of the screen, making it easier to see in low-light situations such as late at night or early in the morning. (BEARD, 2021)

According to BUREAU OF INTERNET ACCESSIBILITY (2021) for some user's dark modes have numerous advantages:

- Dark backgrounds can help to reduce flickering on a screen.
- Photophobia is less likely to be triggered by dark themes (sensitivity to light).
- Light-colored text on a dark background may be easier to read over time.
- Dark themes can make it easier to use screens in low-light situations.

Program code 5 Theme export declaration in 'Theme.js'

```
src > JS theme.js > ...
 1   import { createGlobalStyle } from "styled-components";
 2
 3   export const lightTheme = {
 4     body: "#FFDFA",
 5     fontColor: "#0000",
 6   };
 7
 8   export const darkTheme = {
 9     body: "#2d2c29",
10     fontColor: "#fff",
11   };
12
13   export const GlobalStyles = createGlobalStyle`
14
15     body {
16
17       background-color: ${(props) => props.theme.body};
18
19     }
20
21 `;
```

As in Program code 5 the styles components package was installed to create the dark mode toggle. It enables the use of component-level styles in the website application. To create dark mode, styled component package is installed using command 5

Command 5 command for installing style components package

```
npm install styled-components
```

In program code 5 theme.js, the export const declaration is exporting the declaration of theme colors which is imported in the navbar file as illustrated in program code 6. There is the possibility to create various themes with distinct colors for the whole website with the use of export const.

Program code 6 'Theme.js' import statement in 'navbar.js'

```
src > components > NavBar.jsx > NavBar
1  import { lightTheme, darkTheme, GlobalStyles } from "../theme.js";
```

Program code 7 Dark theme toggler functional component

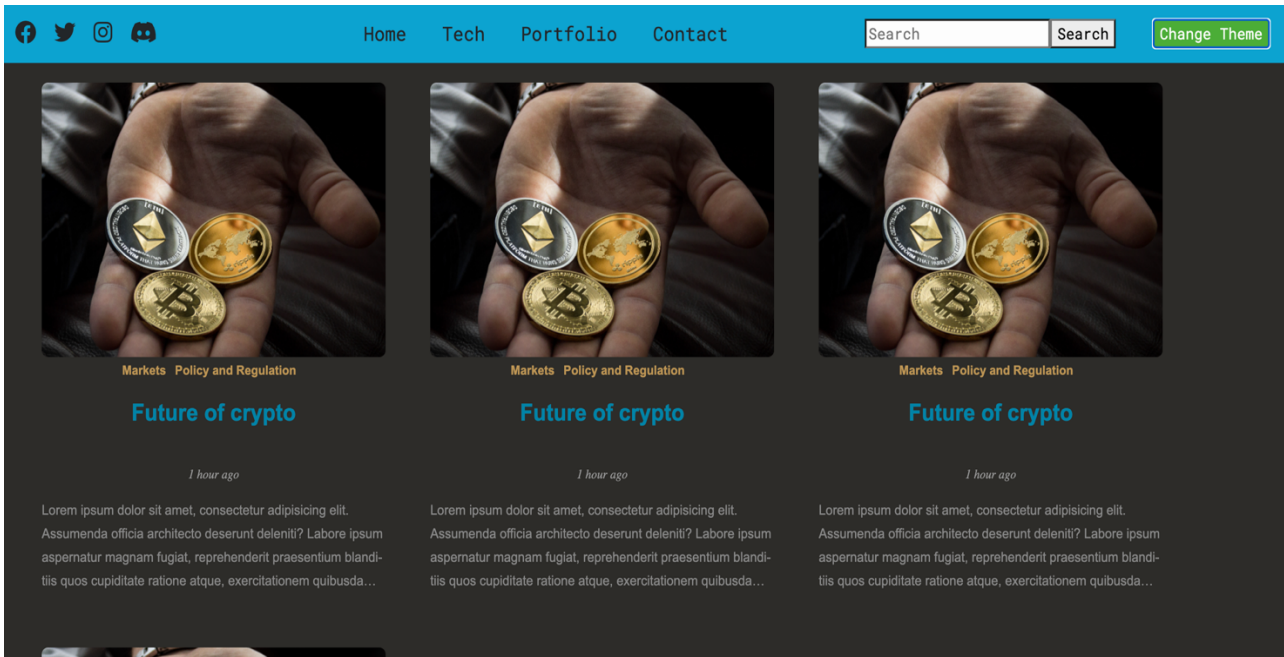
```
6
7  const StyledApp = styled.div`
8    color: ${(props) => props.theme.fontColor};
9  `;
10 function NavBar() {
11   const [checked] = React.useState(false);
12
13   const [theme, setTheme] = useState("light");
14
15   const themeToggler = () => {
16     theme === "light" ? setTheme("dark") : setTheme("light");
17   };
18
19   return (
```

In program code 7 there is a state (use State) in the navbar (Navbar.js) file for the component to track which theme the page is on. It also consists of a theme toggler function that can be used from anywhere to switch between light and dark themes from the Navigation bar.

As illustrated in Figure 13 the react website application is in Dark mode. People with dyslexia may have difficulty reading in dark mode, while those with astigmatism may have difficulty focusing.

Dark backgrounds may help reduce eye strain, and some users prefer the look. Dark modes can improve accessibility when developers pay attention to contrast ratios. (BUREAU OF INTERNET ACCESSIBILITY, 2021)

Figure 13 Screenshot of page after dark mode enabled



7.5 Markets Page

Axios is a Node.js and browser-based HTTP client. It allows to quickly export adaptive HTTP requests to REST APIs using Axios, and conduct configure, read, refresh, and remove processes. It is a GitHub-hosted open-source collaboration project. (GeeksforGeeks, 2021). It can be imported in pure JavaScript with any appropriate library.

Opensource API from coin stats is used to fetch the latest cryptocurrency price. Axios is used to make a request to the API in program code 8. After rendering, use Effect hook is fetching data from the opensource API link and it runs on every render whenever the count variable changes i.e. (Coins). The response object is made up of the following elements:

- the information reverted by the server

- the HTTP response code brought back by the server
- the server's HTTP status code.
- headers received from the server
- the request's initial structure.
- the object of the request

Program code 8 Array Function to extract live crypto price from opensource API

```

2  import {useEffect, useState} from "react";
3  import Axios from 'axios';
4  import Coin from '../components/coins';
5
6  function Markets() {
7    const [listOfCoins, setListOfCoins] = useState([])
8    const [searchWord, setSearchWord] = useState("")
9
10   useEffect(() => {
11     Axios.get("https://api.coinstats.app/public/v1/coins?skip=0").then(
12       (response) => {
13         setListOfCoins(response.data.coins);
14       }
15     )
16   }, []);

```

A state variable inside the function is created in program code 8 with the help of the use State () hook. It is returning a two-valued array:

- the first value it is returning is the state variable's initial value.
- the second one is guiding the function which is being used to refresh the variable list of coins itself.

Whenever the use State () hook is called, the state variable's values are transformed, and the variable is saved in a cell on the stack.

To render the list of coins filter method is used in program code 9. Filter method is filtering the list to print out information about only the coins that I want.

Program code 9 Filter method

```
8   const filteredCoins = listOfCoins.filter((coin) => {
9     |   return coin.name.toLowerCase().includes(searchWord.toLowerCase());
10  |   })
```

Program code 10 Method to print coins

```
<div className='cryptoDisplay'>
  {filteredCoins.map((coin) => {
    |   return <Coin name={coin.name} icon={coin.icon} price={coin.price} symbol={coin.symbol} key={coin.id}
    |   })}
  </div>
```

As in program code 10 Map method is going through a list of items and just printing out each one with the help of arrow which is a one-line function.

Figure 14 Screenshot of Markets page

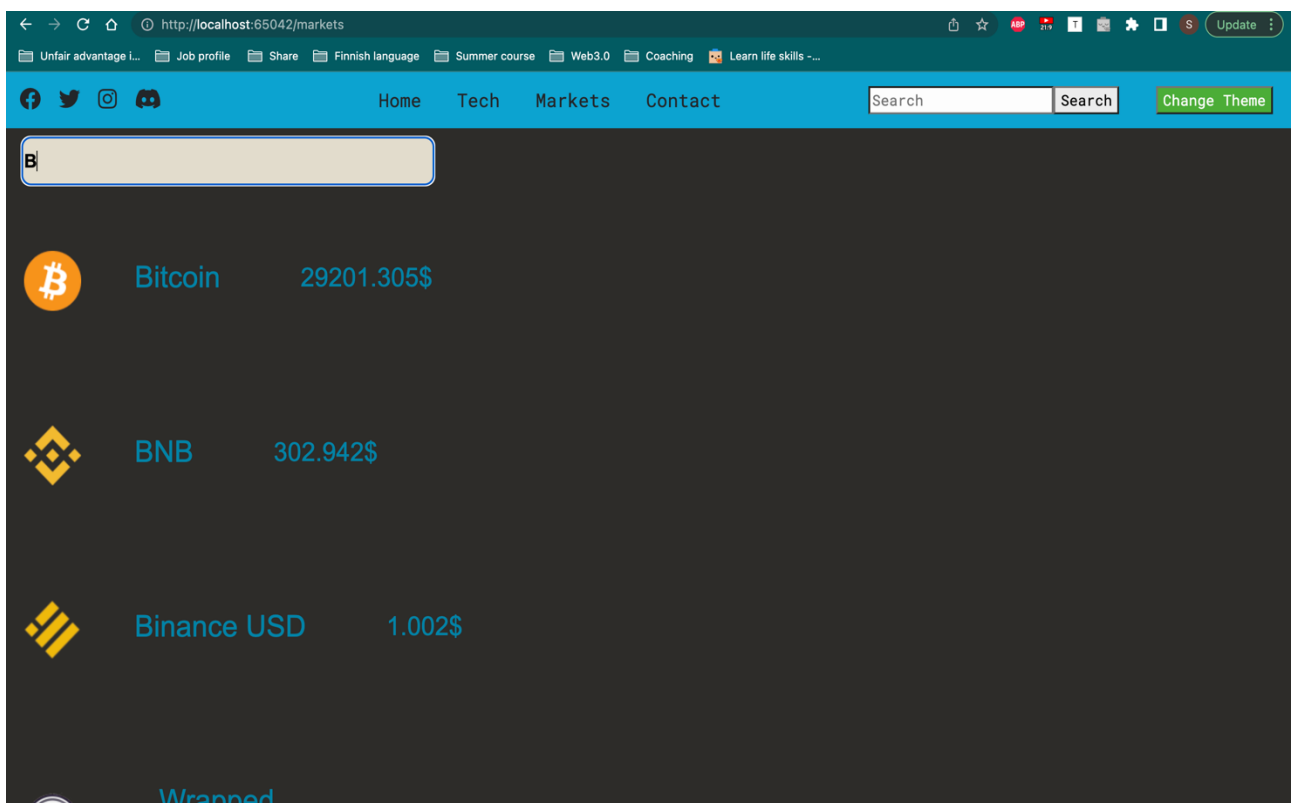
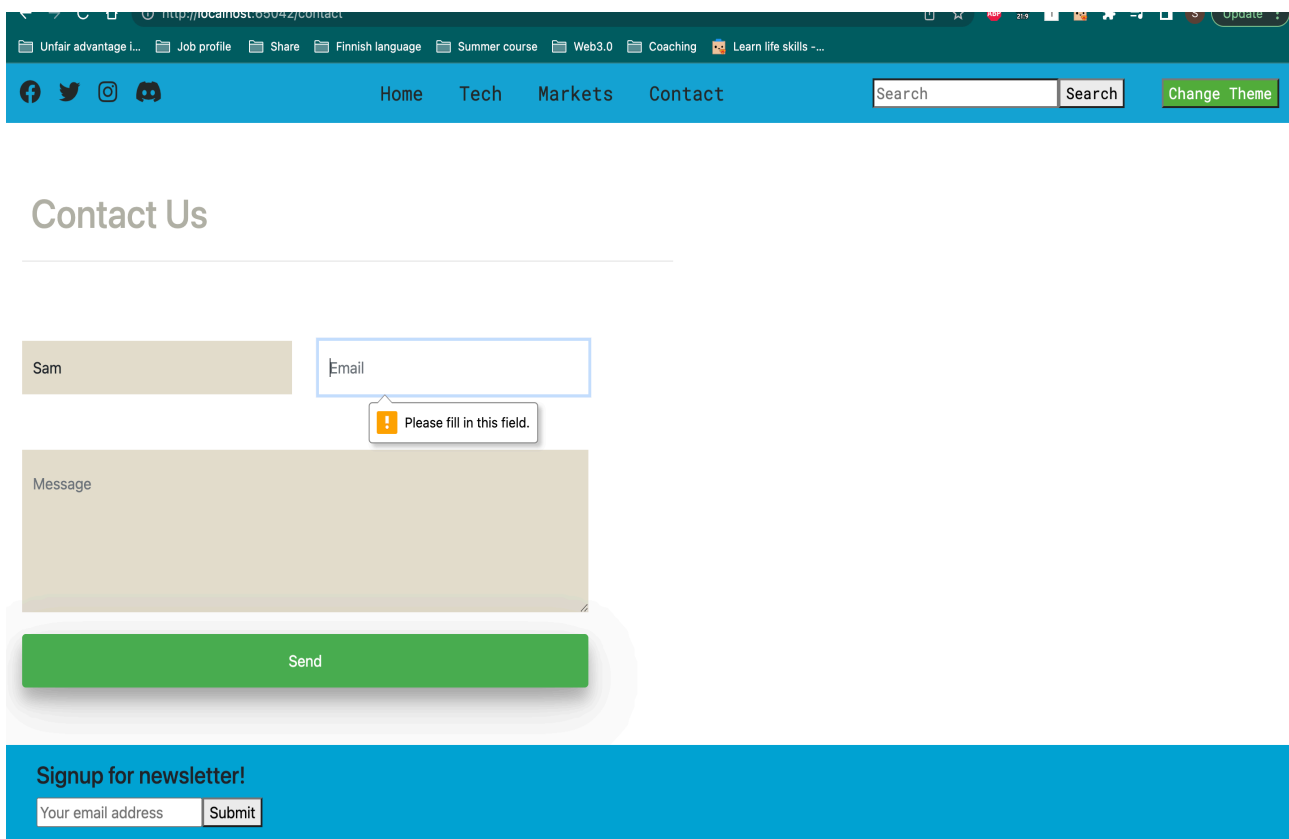


Figure 14 illustrates the markets page which consists of Navbar at the top and a search box to check live prices of cryptocurrency.

7.6 Contact page

Figure 15 illustrates the design of a simple contact us page which contains navbar at the top with links and search feature including dark mode toggle. Client-side form validation properties are implemented for input fields. Therefore, no random submissions can be made in the name, email & message input fields.

Figure 15 Screenshot of contact page



The screenshot shows a web browser window with a contact page. The browser's address bar shows the URL `http://localhost:65042/contact`. The page has a blue header with a navigation menu containing links for Home, Tech, Markets, and Contact. There is also a search bar with a 'Search' button and a 'Change Theme' button. Below the header, the main content area is titled 'Contact Us'. It features a form with three input fields: a name field containing 'Sam', an email field with a validation error message 'Please fill in this field.', and a message field. A green 'Send' button is positioned below the message field. At the bottom of the page, there is a blue footer section titled 'Signup for newsletter!' with a text input field for 'Your email address' and a 'Submit' button.

8 Results

The thesis answers the research questions and can be utilized as a guide for developers or anyone else interested in learning more about creating a cryptocurrency website. The knowledge base assists in understanding the most desired and highly regarded important aspects in a cryptocurrency website these days among consumers. The thesis contributes to a better understanding of how to make the website accessible to a broad range of audiences and how it can have a significant impact on people with visual disabilities.

Figma is a powerful web prototyping tool that works with any browser or operating system, and offline projects are available to download as files. It was extremely useful during the design phase of the prototype website's practical implementation section. React, with its reusable components, was used during programming the website's user interface. The framework's core provided a virtual DOM program and server-side rendering, allowing complex apps to run extremely quickly. One of the major significant advantages of using React JS is the ability to reuse components. It saves developers time because they don't have to write multiple codes for identical features.

The website's dark mode toggle has been successfully implemented, and it is customizable, which means the export function component makes it possible to create different themes with distinct colors for the entire website. People with dyslexia and astigmatism may have difficulty reading and focusing on dark mode but dark modes can improve accessibility when developers pay attention to contrast ratios.

This result of the thesis is a front-end prototype blog website hosted on a local server. The back end is yet to be developed for the website to be fully functional. Following the completion of the thesis, additional development for the user interface, particularly the back end, will be carried out. The demo app is available in the following GitHub repository:

<https://github.com/Samyog2312/CryptoBlog.git>

9 Summary

Blockchain has long been a fascinating topic for me, which is why I wanted to write my thesis on something related to cryptocurrency. Due to widespread adoption, the demand for blockchain-based content is currently on the rise. I was genuinely interested in starting a blog website of my own, I turned that idea into my thesis. The research questions were addressed by examining the requirements of a modern-day crypto blog website, including some essential accessibility features. In the implementation phase, the practical development of the blog user interface using react was resolved.

During the thesis writing process, I had the opportunity to conduct extensive research on a topic of great interest to me. The prototype implementation assisted me in better understanding the process of utilizing open-source APIs with the assistance of the React framework. Working on new features such as dark mode was a great benefit for me. I'm excited to keep working on the project and finish it for my portfolio and as a hobby.

This thesis will most likely serve as a future reference for those who want to learn about cryptocurrency or how to set up a blog user interface using react.

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