Introduction

This project is about creating a high-fidelity prototype for a web-based tourism website. The target users are tourists and hobbyists who have interest in the German Markets of Birmingham. It should give them an informative experience that is also engaging, allowing interaction with key features and information. The goal in mind when designing this project was to make it more accessible and attractive for people visiting or interested in these markets by letting users virtually explore all the different vendors present there, finding out what each one offers so they can plan their visit accordingly along with getting involved with market's festive activities. The main user requirements for this project are easy navigation, detailed and easily accessible information about vendors and events, as well as interactive features that improve the user's experience.

Prototype functionality

The login/register system is a necessary and usual feature. It lets users make their own accounts to use features that are personalized, such as the possible community page (to put up comments and feedback about vendors) or getting event alerts through email. When needed, there's also guest mode so people can look around without making an account. There is also the implementation of form validation to make sure that the user enters valid data, which would then redirect them to the home page after they successfully sign in.

The virtual vendor tour map is an interesting feature that promotes user involvement with its interactive nature. On this map, the Birmingham area shows vendor icons, and the users can click on any one of them to get access to information about that specific vendor. This includes what they have available for sale as well as a randomly generated star rating (which will be replaced by a user-driven rating system in upcoming versions). This method of interaction makes it more engaging than just showing static text, which overall enhances the user’s experience.

Background technologies

For better design and functioning of this website, multiple CSS frameworks and JavaScript libraries were applied:

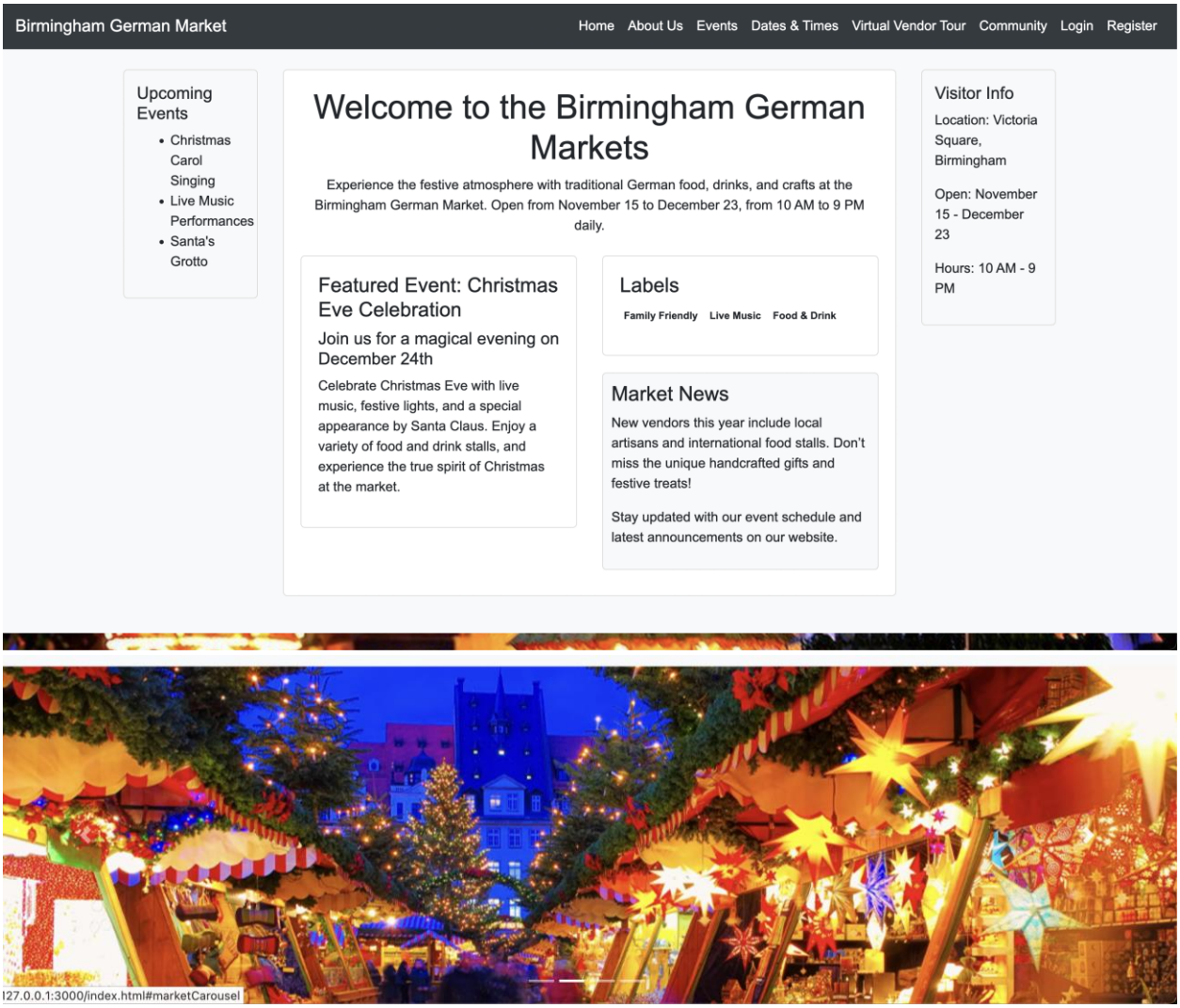
To make sure the website feels responsive and looks the same on all pages, Bootstrap was utilized. Its grid system and pre-designed components helped in quicker development with simple customization features. Overall, Bootstrap played a key role in maintaining a professional look and uniformity throughout the site; it also allows the website to be opened on various devices and screen sizes.

This project also utilized jQuery for simplifying JavaScript tasks like managing events and DOM manipulation. This made incorporating interactive features, including form validation and dynamic content updating, much easier. In general, the simplicity in using this library along with its many plugins decreased coding requirements. This resulted in a prototype that was more organized and simpler to design.

Lastly, this project used JavaScript elements of Bootstrap, which were brought in to increase interactivity. They include carousels and modals, among others. A carousel was utilized for showing rotating images of the market, while modals offered an easy method for displaying vendor icons and information on the virtual tour map. The selection of these components was based on their ability to adapt and integrate well with the Bootstrap framework, guaranteeing a uniform user experience.

Screenshot walkthroughs

Image 1: Dashboard page (index.html)



This first screenshot is of the main dashboard page. The purpose of this page is to act as the homepage or the landing page for the user when they first visit this site. Its primary function is to provide an overview of the market and offer easy access to information.

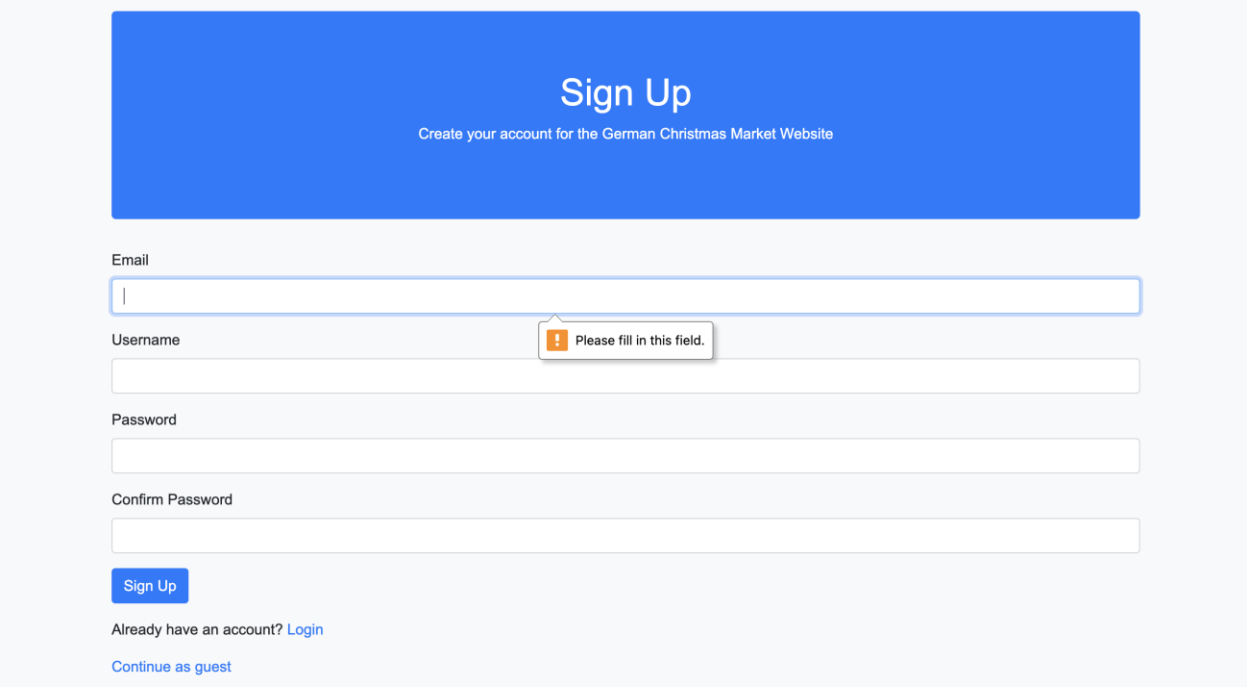
At the top, there is a navigation bar that has multiple links to different sections of the website. The Virtual Vendor Tour link redirects the user to an interactive map, the Login page allows the user to access their account, and the Register link redirects the user to a

page that lets them create an account. Furthermore, hovering over the links at the top of the page will cause them to glow in yellow, which is for better user accessibility

Currently, this page displays various information to the user, such as various news, the location, upcoming events, etc. There is a large heading welcoming the user to the website, to provide a brief introduction and set the festive tone of the website. It also has a carousel of images of the markets at the bottom of the page for the user to preview what they will see if they visit, which increases the user's engagement. One accessibility feature is that images are set to a consistent height for uniformity, and the carousel has controls to scroll through the images.

Overall, there are multiple accessibility considerations on this page. Navigation links change color to yellow on hover, improving visibility for users with visual impairments. The layout is designed to be clean and intuitive, with clearly labeled sections and easy-to-read text. The use of Bootstrap ensures that the website is mobile-friendly and accessible on various devices and screen sizes. Lastly, all images in the carousel and other sections include alternative text to aid users who rely on screen readers.

Image 2: Register page (signup.html)



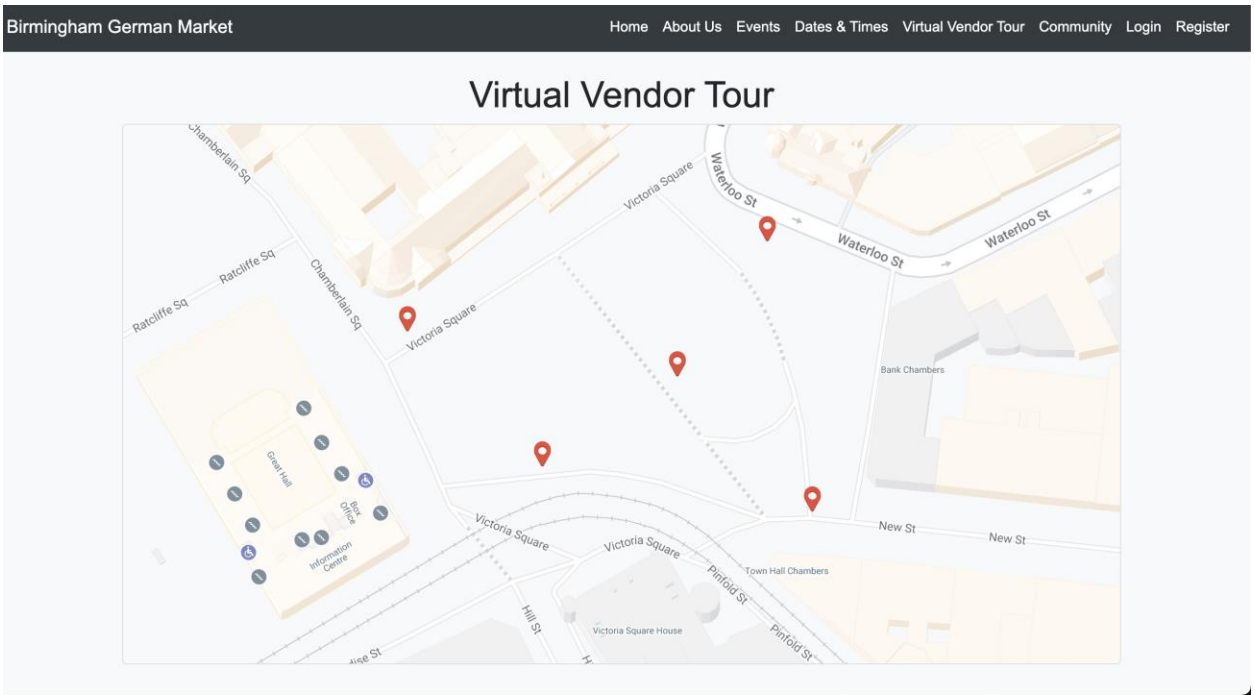
This page allows users to make a new account and can be accessed via the navigation bar from any of the other pages. It has a clear heading at the top of the page, to provide a clear

prompt to the user for creating an account. It consists of a form with 4 fields to be filled in, with the requirements of each field being checked by jQuery, which has a popup under any field that is blank. Furthermore, it only accepts emails with a proper format, and so users must enter a valid email address. There is also some JavaScript code to check that the two passwords that the user gives match. If all of these are true, then when the user clicks Sign Up, it creates an account for them and takes them back to the dashboard page.

This page also has different options for users that either already have an account, or want to just continue as guest, which can be seen at the bottom of the page. This is for better accessibility, as it allows for easy navigation between pages for the user, as well as flexibility for if they do not want to create an account.

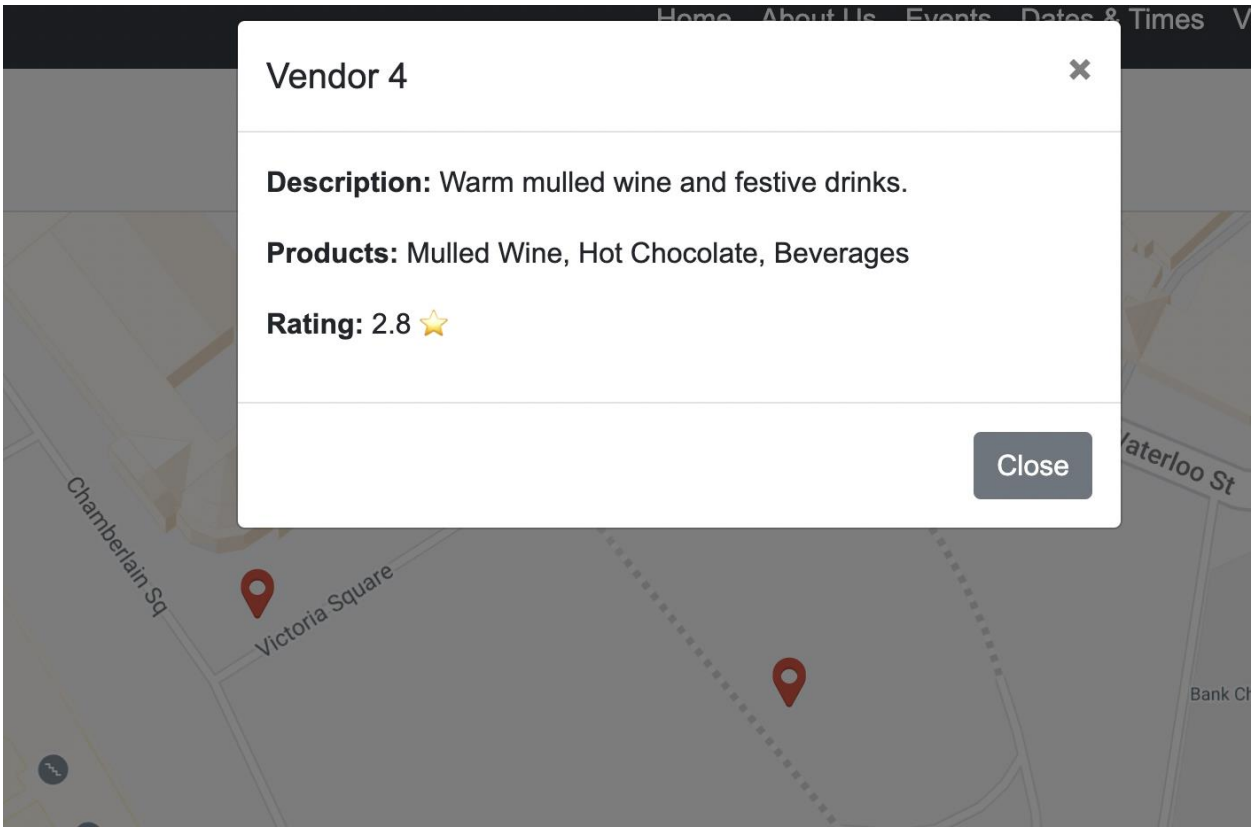
Overall, this page has multiple accessibility considerations. This includes the fact that the form provides instant feedback to the user about any parts of the form that they need to fill in again, or if the passwords don't match, which enhances their experience and prevents errors. The bright blue header is for colour contrast and visibility, as it makes sure that the signup section is easily noticeable. This form is generally straightforward, with clear labels and instructions for everything to make it as clear as possible for the user. Furthermore, the use of Bootstrap makes this page accessible on various devices and screen sizes, and the page supports keyboard shortcuts which allows the user to navigate through the form fields and buttons with their keyboard.

Image 3: Virtual vendor tour map (virtual-tour.html)



The last image to cover is the map tour page. This consists of an image of a map of the surrounding Birmingham area, with markers to locate the different stands. The markers are scattered around the map and can be clicked on by the user to display information about the vendors. The user can navigate to this page by clicking on the Virtual Vendor Tour link in the navigation bar from any of the other pages.

The markers use a bright red icon to stand out from the white page in the background. This is to increase the accessibility for users with impaired vision. The user can click on the markers to open a modal with the detailed information about each vendor, like this:



This shows the user information about the vendor number, their description, products sold, and a star rating. Overall, the page has a simple layout with the basic street names surrounding the area, and the icons are the only other stand-out component on the page to reduce clutter and improve visibility for the reader. The icons also have alternative text for screen reader support. The popup has a clear button to close the popup, as well as the 'x' in the upper right corner which would naturally be the close button for all pages, which is intuitive for the user and therefore improves accessibility.

Heuristic evaluation and Usability testing results

Nielsen's 10 Heuristics Evaluation

This is the document that I gave out to peers to test out my prototype. I asked them to fill out these 10 heuristics and evaluate them with a severity ranking between 0 and 4. There are also some usability tests for them to complete as well, after which they state if they could successfully complete it and any comments they may have.

Heuristics Evaluation

H1. Visibility of System Status: The system should always keep users informed about what is going on, through appropriate feedback within a reasonable time. (0-4)

H2. Match Between System and the Real World: The system should speak the users' language, with words, phrases, and concepts familiar to the user. (0-4)

H3. User Control and Freedom: Users often choose system functions by mistake and need a clearly marked "emergency exit" to leave the unwanted state. (0-4)

H4. Consistency and Standards: Users should not have to wonder whether different words, situations, or actions mean the same thing. (0-4)

H5. Error Prevention: Even better than good error messages is a careful design which prevents a problem from occurring in the first place. (0-4)

H6. Recognition Rather Than Recall: Minimize the user's memory load by making objects, actions, and options visible. (0-4)

H7. Flexibility and Efficiency of Use: The system should cater to both inexperienced and experienced users, allowing them to tailor frequent actions. (0-4)

H8. Aesthetic and Minimalist Design: Dialogues should not contain information that is irrelevant or rarely needed. (0-4)

H9. Help Users Recognize, Diagnose, and Recover from Errors: Error messages should be expressed in plain language. (0-4)

H10. Help and Documentation: Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. (0-4)

Usability Testing Tasks

T1: Register a New Account

Did you encounter any difficulties? [Yes / No]

Comments:

T2: Login to the Website

Did you encounter any difficulties? [Yes / No]

Comments:

T3: Navigate to the Virtual Vendor Tour

Did you encounter any difficulties? [Yes / No]

Comments:

T4: Explore a Vendor on the Map

Did you encounter any difficulties? [Yes / No]

Comments:

T5: View the Image Carousel

Did you encounter any difficulties? [Yes / No]

Comments:

The results are as follows:

Severity ranking description:

0 - Not a Usability Problem: There is no issue.

1 - Cosmetic Problem Only: Does not need to be fixed unless extra time is available.

2 - Minor Usability Problem: Fixing this should be given low priority.

3 - Major Usability Problem: Important to fix, should be given high priority.

4 - Usability Catastrophe: Imperative to fix this before the product can be released.

Test evaluated	User 1	User 2	User 3	User 4	User 5
H1	1	2	2	1	2
H2	0	1	1	0	1
H3	1	1	2	1	2
H4	0	0	0	0	0
H5	2	2	2	1	2
H6	1	0	1	0	1
H7	0	0	1	0	1
H8	0	2	2	0	0
H9	1	2	2	1	2
H10	0	1	1	0	1
T1	No difficulties	No difficulties	No difficulties	No difficulties	No difficulties
T2	No difficulties	No difficulties	No difficulties	No difficulties	No difficulties
T3	No difficulties	No difficulties	No difficulties	No difficulties	No difficulties
T4	No difficulties	No difficulties	No difficulties	No difficulties	No difficulties
T5	No difficulties	No difficulties	No difficulties	No difficulties	No difficulties

Comments, feedback and discussion

User 3 said that they had a delay after login/signup, which was a bit too long. This delay was intentionally implemented to show the successful sign in message, however perhaps the delay is too long at 1.5s and should be reduced to maybe 1s. However, this is up for debate as making the time too short will mean that users will not be able to read the success message in time, and no other users saw this as an issue. Almost all of the users stated that the map icons are too small, so this could also be adjusted to increase the size scale of the icons. Navigating to the Virtual Vendor Tour was mostly seamless, but one user found it initially difficult to locate the link. Enhancing the visibility of the navigation link could improve user accessibility and ease of navigation. This could be done by using a font that perhaps stands out more or having less text or links in general in the navigation bar. Lastly, users 2,3 and 5 noticed that the images in the carousel could be better optimised to showcase the markets better, as currently the images have been resized to all have the same height, and so those images affected have had the bottom cut off, which leads to the images showing mostly the sky rather than the markets themselves. Overall, none of the

users had any major issues, and all the usability tests were passed by all the users successfully. I would also like to add some more colour, images and develop the amount of information on the website, to give it a more festive feel for the user, which users 2 and 3 noticed could be a major area for improvement with some more development time. Lastly, one of the users mentioned to me that they would like to be able to move around on the map, such as on Google Maps, to see nearby landmarks and maybe even plan trips directly from the website. This would be quite difficult to implement and would definitely be a lower priority feature to be attempted if there was time left for development at the end of the project, though this would help for user accessibility. This is because most users would be already familiar with how Google Maps works, and so this familiarity would allow them to easily use this feature were it to be added.

Conclusion

In summary, this high-fidelity prototype of a website for the Birmingham German Markets was successful in implementing my original ideas, with my unique feature being implemented successfully, allowing the user to click on various icons on a map to show information about vendors. The prototype was designed with a focus on user accessibility and engagement, which I believe was implemented well. The website is clear, and informative, the forms make sure to give the user clear instructions with form validation, and the user is presented with a simple and easy navigation system. The next steps would be to implement a backend system with a database to store user information, and then to begin adding user-dependent features, such as adding emailing lists, proper reviews, and a community tab. To add to this, better password security should be added, by giving the user specific requirements for passwords (8+ characters, at least one number, etc.). There are also minor improvements to implement from the user feedback that was covered earlier. Overall, this foundation provides a robust starting point for creating a fully functional and user-friendly tourism website.