Cycle Shops in Bristol: Web Application

NAME
STUDENT NUMBER

Planning: Business Case

Problem statement

Bristol has a thriving cycling community, but finding reliable and comprehensive information on bike shops, their services, and locations can be challenging. Cyclists often need a one-stop resource to locate shops for buying, hiring, repairing bikes, or bike-related services. The lack of an integrated directory makes it difficult for users to make informed decisions about where to go for their cycling needs.

Business benefits

The Bristol Cycle Shops Directory introduces a user-centric web application to streamline the search for bike-related services across Bristol. Key benefits include:

Convenience: Centralized resource for finding bike shops, saving time and effort for cyclists.

Enhanced User Experience: Interactive map and detailed table provide a user-friendly interface for exploring bike shop options.

Support for Local Businesses: Promotes local bike shops by increasing visibility and providing easy access to their services.

Data Utilization: Leverages open data from Bristol to create a valuable community resource.

Encouragement of Cycling: Makes it easier to find bike-related services, encouraging more people to cycle and contributing to a healthier community.

Options Considered

Before the Bristol Cycle Shops Directory, traditional resources like printed directories, Google Maps, Yelp, and TripAdvisor offered limited and often outdated information for cyclists in Bristol. These platforms lacked the interactivity and specialization necessary for providing comprehensive details about bike shops and their services. The new directory addresses this gap by using open data to create a user-friendly, centralized platform that enhances the search for bike-related services across the city. It offers up-to-date, detailed information, and interactivity that traditional directories and general online platforms fail to provide.

Expected Risks

Despite its potential benefits, the Bristol Cycle Shops Directory faces several risks. Data accuracy is a concern, as information sourced from the Bristol Open Data website may not always be current or entirely accurate, potentially leading to misinformation. Technical challenges in integrating interactive map features and maintaining website functionality could impact user experience. Additionally, there is a risk that the website may struggle to attract users if awareness is low or if existing solutions are perceived as sufficient. Addressing these risks proactively will be essential to ensuring the directory's effectiveness and user satisfaction.

Data Accuracy: The information from the Bristol Open Data website might not always be current or accurate, leading to potential misinformation.

Technical Issues: Integrating the interactive map and maintaining the website might present technical challenges.

User Adoption: The website might struggle to attract users if they are unaware of its existence or do not find it significantly more useful than existing solutions.

Project Scope

The Bristol Cycle Shops Directory is a focused project aimed at creating a centralized web platform for discovering bike-related services across Bristol. It integrates an interactive map powered by ArcGIS, displaying precise locations of bike shops with clickable icons that reveal detailed shop information. This includes essential details sourced from Bristol Open Data, such as shop names, addresses, websites, and services offered. The directory prioritizes user experience with intuitive navigation through dedicated sections like Home, Table, Map, and Overview, ensuring seamless exploration of shop listings. With a robust search functionality, users can easily find specific shops or services, enhancing the usability and utility of the platform for cyclists and promoting local businesses within the community.

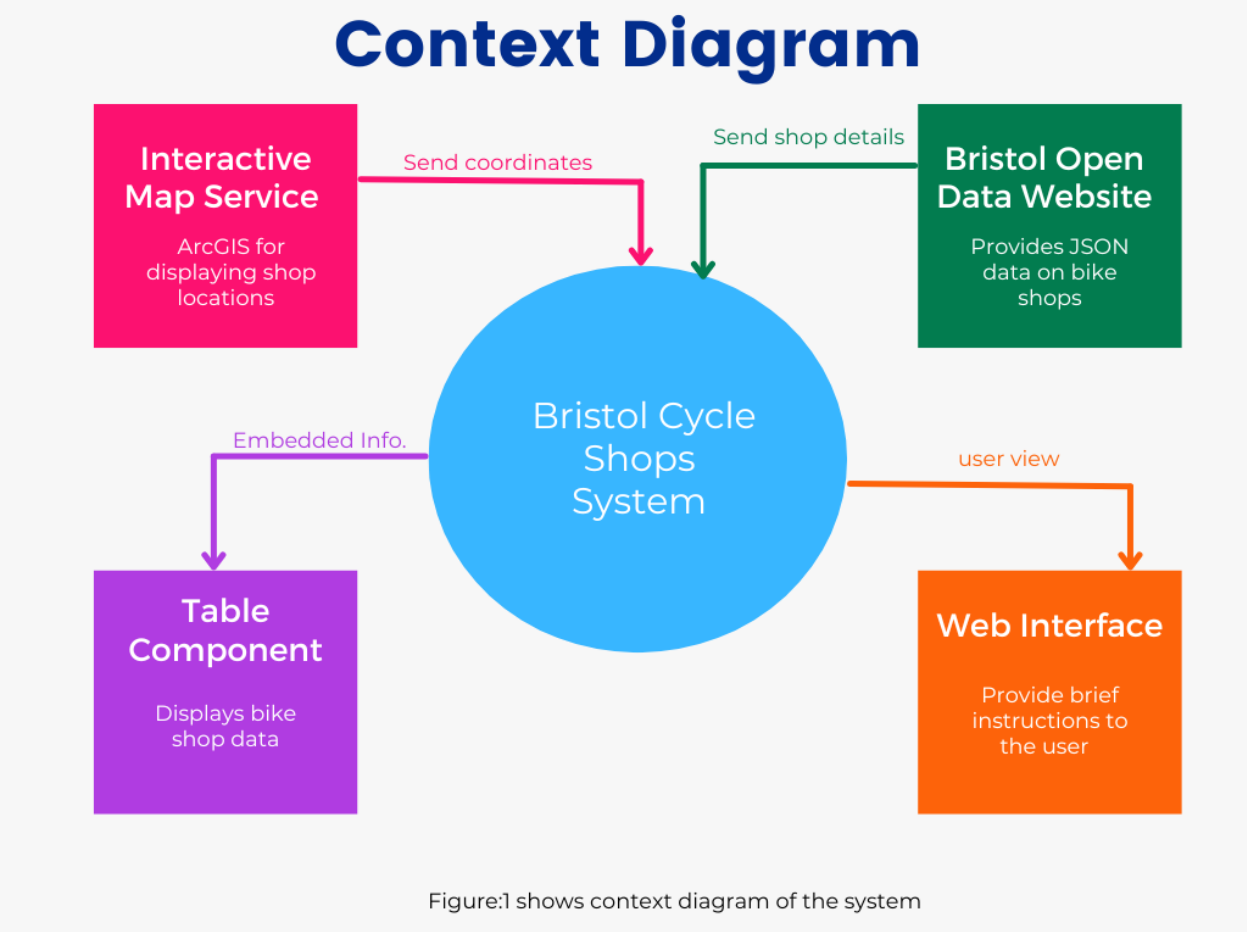

Figure:1 shows context diagram of the system

This figure demonstrate Bristol Cycle Shops Directory system utilizes an Interactive Map Service powered by ArcGIS to display bike shop locations in Bristol. Data is sourced from the Bristol Open Data Website, providing comprehensive information about each shop. Users benefit from a seamless experience with the Map Component for visual exploration and the Table Component for detailed shop listings, enhancing accessibility and decision-making for cyclists in Bristol.

Requirements

User stories

As a cyclist, I want to find the nearest bike shop so that I can quickly get my bike repaired.
As a new bike owner, I want to see a list of shops that sell accessories so that I can purchase necessary items.
As a bike enthusiast, I want to explore different bike hire options so that I can rent a bike for my weekend trips.

Actors

Cyclist: Regular bike users who need repair and maintenance services in Bristol.
New Bike Owner: Individuals who have recently purchased a bike and need accessories or initial services.
Bike Enthusiast: People interested in biking for leisure or sport, looking for hire options or new/used bikes.

Use Cases

UC1	Locate Nearest Bike Shop
Description	Goal to find the nearest bike shop for repairs.
Actors	Cyclist
Assumptions	User has access to the website and can use the map functionality.
Steps	1. User navigates to the Map section. 2. User uses the search function to find the nearest shop. 3. User clicks on the shop icon to view details. 4. User notes the address and contact details.
Variations	User may search by specific services instead of proximity.
Non-functional	The map must load quickly and accurately display shop locations.
Issues	Ensuring data accuracy for shop locations.

UC2	Search for Shops Selling Accessories
Description	Goal to find shops that sell bike accessories.
Actors	New Bike Owner
Assumptions	User knows what type of accessories they need.
Steps	1. User navigates to the Table section. 2. User uses the filter function to find shops offering accessories. 3. User clicks on shop names to view details. 4. User visits the shop's website or contacts the shop directly.
Variations	User may use the map for location-based searches.
Non-functional	The table should allow easy filtering and sorting.
Issues	Ensuring all relevant shops are listed and data is up-to-date.

UC3	Locate Nearest Bike Shop
Description	Goal to explore different bike hire options.
Actors	Bike Enthusiast
Assumptions	User is looking for bike hire services.
Steps	1. User navigates to the Table section. 2. User reviews the list and clicks on shop names for more details. 3. User contacts the shop to inquire about hire options.
Variations	User may use the map for a visual overview of hire locations.
Non-functional	The system should handle multiple filter criteria efficiently.
Issues	Accuracy of shop services information.

UC4	Find Maintenance Services
Description	Goal to find shops offering bike maintenance services.
Actors	Commuter
Assumptions	User needs regular maintenance services.
Steps	1.User navigates to the Table section. 2. User reviews the list and clicks on shop names for more details. 3. User contacts the shop for maintenance appointments.
Variations	User may use the map for a visual representation of regions.
Non-functional	The system should provide quick access to maintenance service details.
Issues	Ensuring all relevant shops are included.

Use Cases Diagram

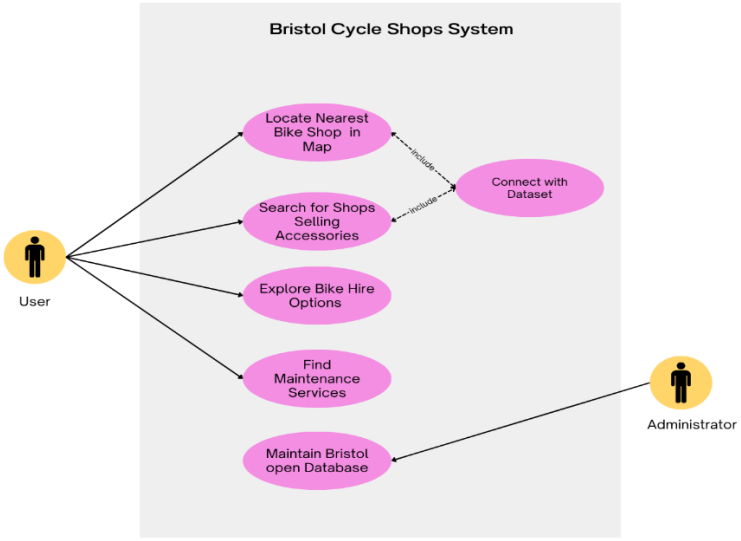

Figure 2:Use case Diagram

The use case diagram for the Bristol Bike Shops Directory system highlights the interactions between two main actors: "Users" and "Administrators." Users interact with the system to perform various actions such as locating bike shops, searching for specific services, and exploring bike hire options. Additionally, the "Administrator" actor is responsible for maintaining and updating the Bristol Open Data, ensuring the system has accurate and up-to-date information. This diagram provides a comprehensive view of the system's functionalities and the roles involved in its operation.

Software Requirements Specification

Functional requirements

The functional requirements of the Bristol Cycle Shops Directory focus on delivering essential features that enhance user interaction and accessibility. These include displaying bike shop locations on an interactive map, allowing users to search for shops by specific services, providing detailed information about each shop, and enabling users to access detailed shop information by clicking on map icons.

FR1: Display Bike Shop Locations on Interactive Map
The system aims to enhance user experience by providing an interactive map displaying the locations of bike shops across Bristol.
Requirement: The system shall display bike shop locations on an interactive map.
Associated UCs:UC1

FR2: Search for Bike Shops by Specific Services
To meet user needs effectively, the system allows searching for bike shops based on specific services offered, ensuring tailored results.
Requirement: The system shall allow users to search for bike shops by specific services.
Associated UCs:UC2,UC3

FR3: Provide Detailed Information about Each Bike Shop
Users benefit from comprehensive information about each bike shop, including contact details and services offered, enabling informed decisions.
Requirement: The system shall provide detailed information about each bike shop, including name, address, description, website, phone number, and services provided.
Associated UCs: UC1,UC2,UC3,UC4

FR4: Click on Shop Icons on the Map to View Detailed Information
Enhancing usability, users can access detailed information about bike shops by clicking on map icons, streamlining the exploration process.
Requirement: The system shall allow users to click on shop icons on the map to view detailed information.
Associated UCs: UC1

Non-Functional Requirements

non-functional requirements ensure the system's performance, usability, and reliability. These include loading the interactive map and table quickly, ensuring compatibility across major browsers and mobile devices, maintaining data accuracy through regular updates, and optimizing the user interface for intuitive navigation and user engagement. Together, these requirements aim to create a comprehensive and user-friendly platform that meets the diverse needs of Bristol's cycling community effectively.

NFR1: Performance
Requirement: The system shall load the interactive map within 3 seconds.
This ensures that users experience fast and responsive map interactions, enhancing usability and satisfaction.

NFR2: Performance
Requirement: The system shall allow filtering and sorting of the table within 2 seconds.
Quick response times for table interactions improve user efficiency, making information retrieval smooth and effective.

NFR3: Compatibility
Requirement: The system shall be compatible with major browsers (Chrome, Firefox, Safari, Edge).
Ensuring compatibility across popular browsers ensures a broad user base can access and utilize the application without technical obstacles.

NFR4: Accessibility
Requirement: The system shall be accessible on mobile devices.
Supporting mobile access enables users to conveniently access bike shop information on the go, catering to modern user expectations for mobility and convenience.

NFR5: Data Integrity
Requirement: The system shall ensure data accuracy and be updated at least monthly.
Regular updates and data accuracy are critical to maintaining the reliability of information provided, ensuring users make informed decisions based on current and reliable data.

Design

User Interface design

Wireframe-01

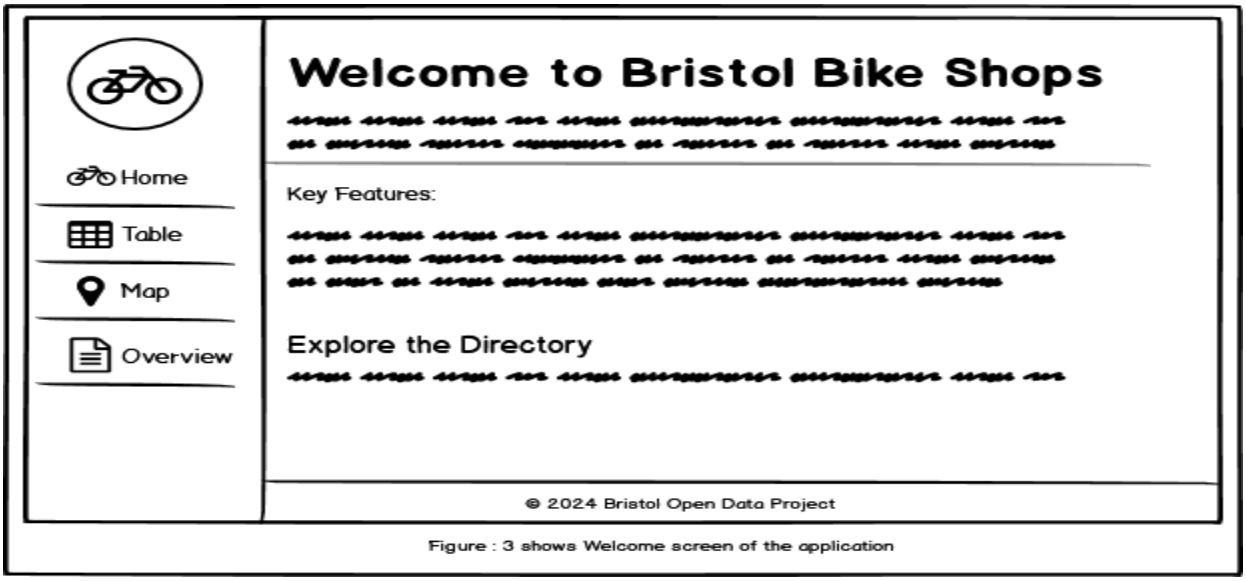

Figure : 3 shows Welcome screen of the application

The wireframe showcases a Bristol Bike Shops website with a structured layout. It features a left-side navigation bar with a logo and links to sections like Home, Table, Map, and Overview. The main section introduces users with a welcoming header, detailing the website's purpose and key features such as an interactive map and detailed shop information. A footer provides copyright information, completing the clear and informative design aimed at enhancing user navigation and engagement.

Wireframe-02

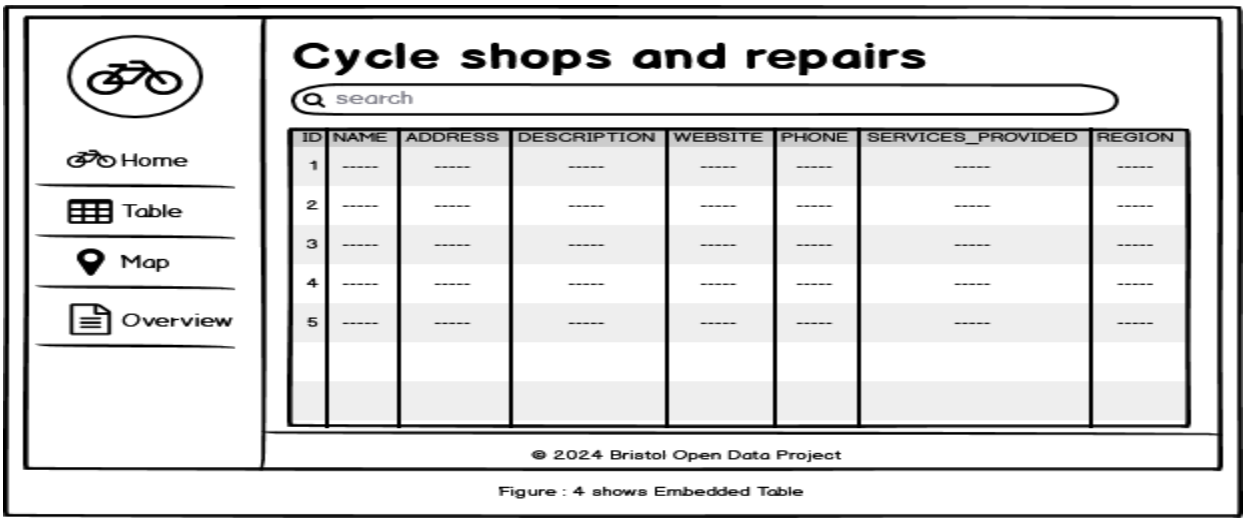

Figure : 4 shows Embedded Table

The table page of the Bristol Bike Shops website presents a comprehensive and organized display of shop information. It features a search bar at the top for easy filtering, followed by a table that includes columns for OBJECTID, NAME, ADDRESS, DESCRIPTION, WEBSITE, PHONE, SERVICES_PROVIDED, and REGION. Each column provides specific details about the bike shops, allowing users to find the information they need quickly and efficiently. This structured layout ensures users can easily navigate through the data, enhancing their ability to locate and contact the desired bike shops in Bristol.

Wireframe-03

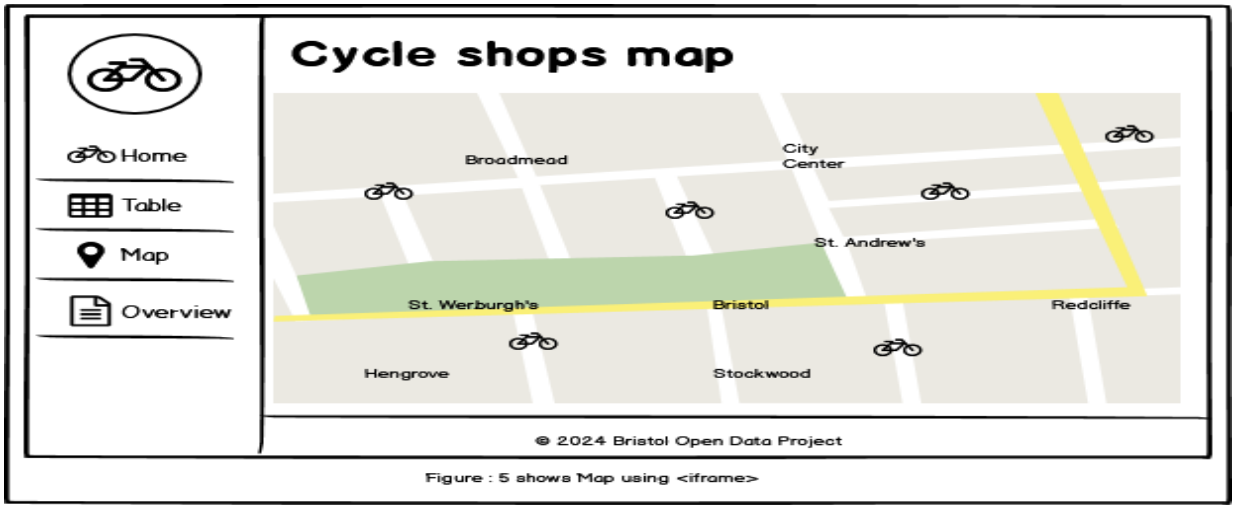

Figure : 5 shows Map using <iframe>

The map section of the Bristol Bike Shops website features an interactive map centered on Bristol, enhanced with custom cycle icons for easy identification of bike shops. Utilizing OpenStreetMap tiles and Leaflet.js, it dynamically loads and displays GeoJSON data representing cycle shop locations. Each shop is marked with a customized icon and includes a pop-up window with detailed information, such as services offered. This integration provides users with a visually intuitive way to explore and discover bike shops across Bristol.

Wireframe-04

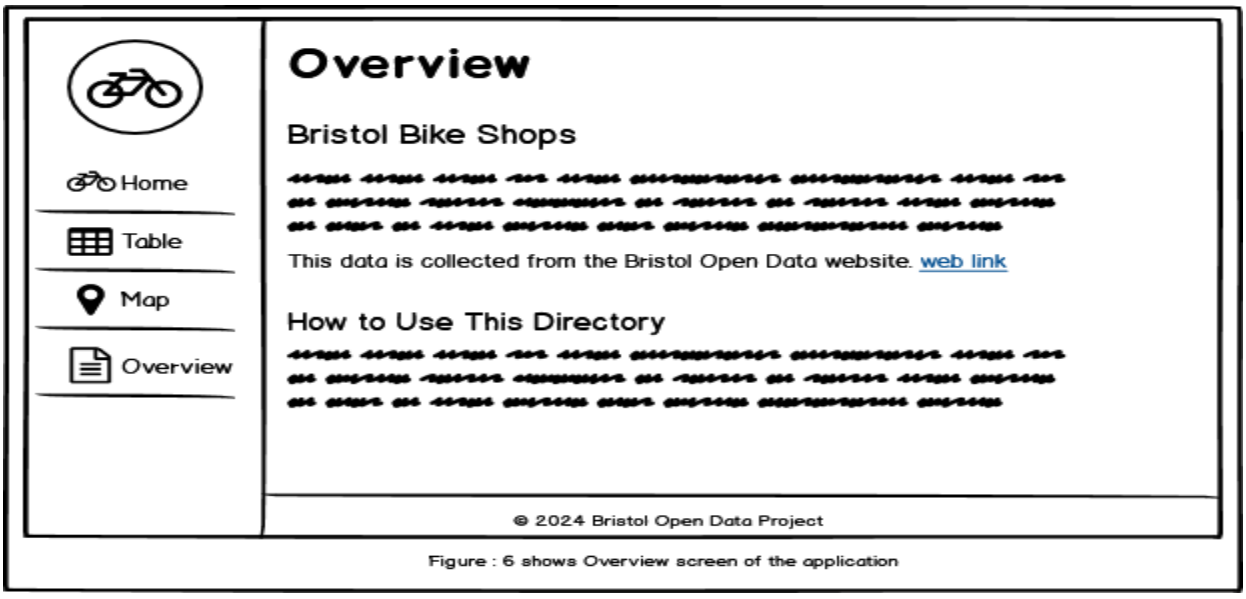

Figure : 6 shows Overview screen of the application

The Overview Section of the Bristol Bike Shops website provides users with a comprehensive guide to utilizing the directory. It includes a detailed introduction about the directory's purpose and sources of data, collected from the Bristol Open Data website. The section offers step-by-step instructions for exploring the interactive map, browsing the detailed table of shops, and directly contacting the shops for more information or services. A navigation sidebar with links to Home, Table, Map, and Overview ensures easy access to different parts of the site, while a footer notes the copyright information.