UNIVERSITY of BRADFORD

Faculty of Engineering and Informatics
Department of Computer Science

Software Requirements Specifications

For

P2. Web Interface to Interact with "Assets"

Contents

1 Introduction

1.1 Project Overview

This project aims to develop a web-based platform – The Bradford Council Data Management and Mapping Website – that allows council staff and users to register, upload geospatial datasets in CSV format, visualize assets on a map, and manage data securely. Administrators will have additional control over user accounts, datasets, and system configurations.

1.2 Collaborators

A team of seven members is working collaboratively on this project, each contributing to different aspects of development and implementation. The team consists of Mustafa Kamran, Subhaan Khurram, Talhah Farooq, Sahil Kayani, Hitesh Lad, Walid Muhammad Aslam, and Luqkman Khan. With diverse skill sets and shared responsibilities, they ensure the successful design, development, and deployment of the system.

1.3 City Of Bradford Metropolitan District Council

The City of Bradford Metropolitan Council is the local authority responsible for governing the metropolitan district of Bradford, located in West Yorkshire, England. It serves a diverse population and oversees various public services, including education, transport, housing, social care, environmental policies, and economic development. As one of the largest metropolitan councils in the UK, it plays a crucial role in shaping the city's infrastructure and community well-being. Bradford is known for its rich cultural heritage, thriving business sector, and commitment to urban regeneration, with the council actively working towards sustainable growth and digital transformation to improve public services.

1.4 Project Specification

The system is designed to provide users with a seamless platform for uploading, managing, and visualizing geospatial datasets through an interactive map. Users will be able to register, upload CSV files, and view mapped datasets, while administrators will have the authority to approve or reject user registrations, manage datasets, and assign departments. It will feature a secure authentication mechanism and administrative tools for managing user permissions and data integrity. Additionally, the system will adhere to web accessibility best practices and follow the council's branding guidelines, including its colour scheme and logo.

The key stakeholders include council staff, who will upload and view datasets; administrators, responsible for managing users, datasets, and permissions; and the IT team, ensuring security and maintaining the system infrastructure for seamless operation and risk mitigation.

2 Functional s Non-Functional Requirements

2.1 Functional Requirements

This section outlines the key functional requirements that the system must fulfil as part of this project. A more detailed breakdown of the functional requirements, along with their priorities, is provided in Table 1, while the key system interactions and relationships are visually represented in the system context diagram in Figure 1

ID	Description	Priority Level
FR1	The system shall allow the users to register with the following fields: **FR1.1:** Name, Email, Password, Confirm Password, and Department	High
FR2	The security features will include encryption for stored data, data logs for auditing all transactions and changes, and validation checks to reject invalid or duplicate entries. Additionally, the system will comply with internal security policies, and if required, additional security reviews may be conducted to ensure full compliance.	High
FR3	An admin system must be implemented which should allow: **FR3.1:** The admin to receive an email saying the user wants to get registered and the admin must be able to approve/reject user registrations. (User Permissions and Access Control)	High

	FR3.2: The ability to manage datasets (add, delete, C amend) and assign departments to other users (if required). **FR3.3:** The ability to view logs of user activity and data operations. **FR3.4:** The ability to receive alerts/notifications for pending user approvals ensuring timely management of user requests.	
FR4	The system will integrate Google Maps to display datasets with the ability to overlay multiple data layers. Category types will be assigned to datasets for improved organisation and management. This integration is confirmed, ensuring that data visualisation performance remains within acceptable limits.	High
FR5	The user will have the ability to reset their password. In such cases, a password reset email will be sent to the user's registered email address. For security purposes, the reset link will remain valid for 15 minutes.	High
FR6	The system shall support multiple layers of data (Data Layering) to be overlaid on the map, allowing users to apply filtering options to customise the displayed information.	High
FR7	The system shall display key information in a tooltip or pop-up when users hover over datasets on the map, providing a quick and interactive data preview.	High

FR8	The system shall allow users to manually enter data in addition to bulk CSV uploads, providing flexibility for data input and updates.	Medium
FRG	A search and filtering system should be included which will include: **FRG.1:** The ability to search datasets and assets based on location, asset type, and data uploaded. **FRG.2:** Search results that should be interactive (e.g. filter results dynamically). **FRG.3:** The ability to filter through displayed datasets. **FRG.4:** The system's real-time filtering performance will be rigorously tested under expected user loads before deployment to ensure seamless interaction, responsiveness, and efficiency.	Medium
FR10	The datasets will be in CSV format and will include longitude, latitude, and asset details. The system will validate CSV files for duplicates and format errors as part of its error-handling mechanism. Additionally, if a CSV file upload fails or there is a format error or any missing relevant columns from the CSV file, an automated error report will be generated to inform users of the issue.	Medium
FR11	The system may include multi-factor authentication (MFA) (Optional) / two-factor authentication (2FA) (Optional)	Low

FR12	Accessibility features include the users to be able to adjust font sizes and include colour contrast options for better readability.	Low

Table 1 Functional Requirements for the web interface for interacting with assets

2.2 Non-Functional Requirements

In addition to the functional requirements described in the previous section, there are non-functional requirements that need to be considered as part of the system design and development. These non-functional requirements not only imply the various system characteristics that are critical to the general use of the software but also identify the very important legislative and regulatory requirements that need to be kept in mind while developing enterprise-level software.

1) Performance Requirements

Description: The system must be capable of handling high volumes of data efficiently while ensuring fast processing speeds for large datasets. Specifically, CSV file uploads should be processed within 10 seconds per file (for typical data sizes), and data retrieval must be optimized for seamless user interaction. Performance benchmarking tests will be conducted to validate compliance with this requirement.

Motivation: A high-performance system ensures that users experience minimal delays when working with large datasets, thereby improving productivity and efficiency. Fast processing is particularly crucial for administrators managing large-scale geospatial data uploads.

Acceptance Criteria: The system must process and validate CSV uploads within 10 seconds for standard dataset sizes. Performance benchmarking reports must be generated during testing to ensure system compliance with processing targets. Data retrieval queries should be optimized using indexing to ensure fast access to datasets without performance bottlenecks.

2) Usability Requirements

Description: The system must provide an intuitive UI/UX that follows best design practices and complies with the -Web Content Accessibility Guidelines (WCAG) 2.1-. It should include clear notifications and feedback messages to guide user actions and provide an optimal experience.

Motivation: A well-designed user interface ensures that both council staff and administrators can efficiently interact with the system without extensive training. Ensuring WCAG 2.1 compliance will make the system accessible to all users, including those with disabilities.

Acceptance Criteria: The system should implement consistent UI elements, intuitive navigation, and real-time feedback mechanisms for user actions such as form submissions, data uploads, and search queries. User testing must be conducted to verify compliance with WCAG 2.1 accessibility standards. The user interface must also support keyboard navigation and screen readers for accessibility.

3) Compliance s Security

Description: The system must adhere to strict security policies to protect user data and prevent unauthorized access. It must implement encryption for database storage, enforce role-based access control (RBAC) to restrict user permissions, and be hosted on a locally managed or council-approved server. Additionally, the system must comply with the General Data Protection Regulation (GDPR) to safeguard personal data.

Motivation: With sensitive data such as user credentials, geospatial information, and administrative logs being stored, implementing robust security measures is crucial to prevent data breaches. Ensuring GDPR compliance guarantees that personal data is protected under regulatory standards. Formal documentation confirming GDPR compliance and RBAC implementation must be provided before deployment.

Acceptance Criteria: The system must enforce password encryption, restrict administrative permissions via role-based access control, and log all user interactions for security monitoring. Hosting should be on a secure, council-approved infrastructure,

ensuring compliance with local data protection regulations. A compliance review will be conducted, and documentation must be submitted to confirm adherence to GDPR and RBAC security policies before deployment.

4) Branding s Aesthetics

Description: The system must maintain a consistent visual identity by adhering to the council's branding guidelines, including official colour schemes, logos, and UI styling. The user interface should be clean, professional, and intuitive.

Motivation: A consistent brand identity enhances user trust and recognizability, ensuring that the system aligns with council-wide digital standards. A visually appealing and user-friendly interface improves engagement and usability. Before implementation, UI mock-ups must be reviewed and approved by the client to ensure adherence to branding expectations.

Acceptance Criteria: The system must implement the official council logo and colour palette across all UI components. Fonts, spacing, and iconography should align with established branding guidelines, ensuring a professional and cohesive design. UI mock-ups will be submitted to the client for final approval before the development phase begins.

5) Meeting Frequency s Project Planning

Description: To ensure clear communication and progress tracking, a structured meeting schedule will be established. The supplier will provide regular updates and key milestones in the project plan.

Motivation: Regular updates will help maintain alignment between the development team and the client, ensuring any issues are identified early and resolved efficiently.

Acceptance Criteria: Weekly progress updates will be shared with the client via email. A mid-review meeting will be scheduled to address any concerns and ensure project alignment. A high-level project roadmap will be created, detailing key milestones, major development phases, and expected completion dates.

3 UML Use Case Diagram for The Website

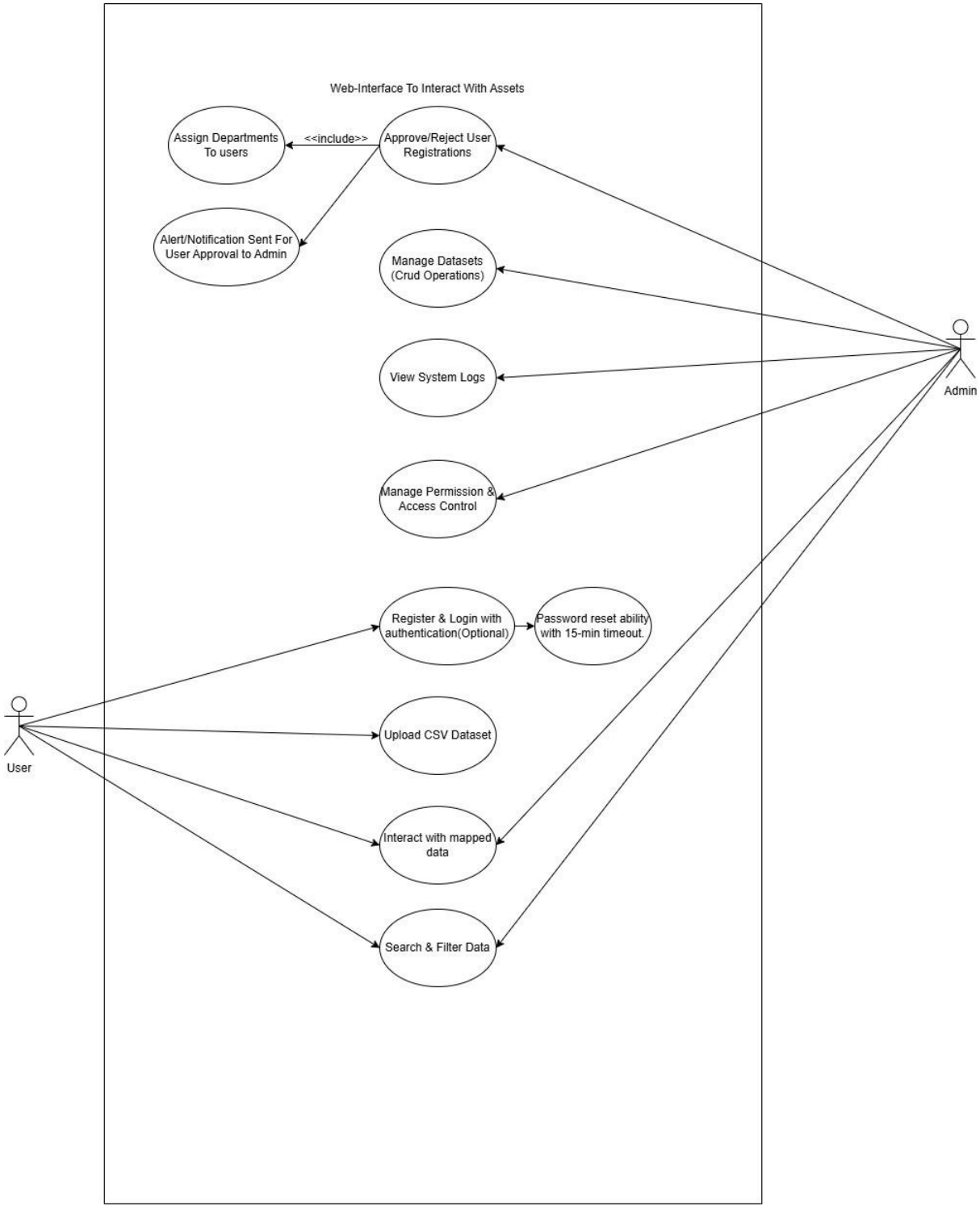

Figure 1: Use Case Diagram

4 Deliverables and Deadlines

The project deliverables and key milestones have been structured to ensure clarity, alignment with client expectations, and smooth progress tracking. The Specification Document is due by the end of the week for client sign-off, incorporating all requested updates. A Mid-Review Meeting in week 7 will be scheduled virtually via Microsoft Teams to discuss functional and non-functional clarifications, project status, and any remaining concerns. A High-Level Project Plan has been included in the SRS document, outlining major development phases, expected completion dates, and key testing and review checkpoints. Once the Specification Document is approved, the Development Phase will commence, with weekly progress updates provided via email to ensure alignment with project goals. Additionally, weekly Microsoft Teams meetings will discuss questions, concerns, or changes and ensure continuous collaboration. A Security C Compliance Review will take place before deployment, covering GDPR compliance documentation, Role-Based Access Control (RBAC) validation, and internal security policy confirmation. Before development begins, client approval of UI mockups will be required to ensure adherence to branding and design expectations. The next steps include confirming the Mid-Review Meeting date, submitting the updated Specification Document for approval, and proceeding with weekly progress updates and scheduled Teams meetings.

5 High-Level Plan s Milestones

The High-Level Plan C Milestones provides a structured timeline outlining the key phases of the project, including development, testing, and deployment. It defines major deliverables, expected completion dates, and critical review points to ensure alignment with project goals. This plan serves as a roadmap to track progress, manage dependencies, and ensure timely completion while allowing flexibility for any necessary adjustments.

#	Task	Estimated Duration (8 weeks)	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
1	*Requirements Analysis & Specification*	1 week								
1.1	Understand the project context and business needs for the review analytics system; Identify key stakeholders	7 days								
1.2	Write project specification identifying key strategic objectives of the project									
1.3	Gather user and system requirements									
1.4	Interview key stakeholders									
1.5	Document functional requirements									
1.6	Document non-functional requirement; identify key system constraints									
1.7	Validate and sign specification									
2	*UI/UX Design & Mock-ups*	Week 2								
2.1	Develop initial UI Designs	7 days								
2.2	Present UI/UX mockups to stakeholders for review					*Mid-Semester Review*				
2.3	Incorporate feedback, finalise UI design, and get client approval									
3	*Development & Testing*	Week 3 - Week 6								
3.1	Identify the features to be delivered for phase 1 (Prototype for Mid-review meeting) and phase 2 (end of April)	1 day								
3.2	Implement phase 1 and demo the progress to relevant	6 days								
3.3	Review the progress of phase 1 with industrial supervisor									
3.4	Document the feedback provided and build this into the next									
3.5	Implement phase 2 and demo the progress to relevant	14 days								
3.6	Review the progress of phase 2 with industrial supervisor									
4	Security & Compliance	Week 7								
4.1	Enforce role-based access control (RBAC), encryption, and GDPR Compliance.	4 days								Final Handover
4.2	Conduct penetration testing, access control validation, and data protection checks.	3 days								
5	*Documentation Handover*	Week 8								
4.1	Prepare system architecture, API references, and user manuals	5 days								
4.2	Share documentation with stakeholders for feedback and make necessary adjustments for clarity and completeness.	1 day								
4.3	Deliver finalized technical documentation, user guides, and compliance reports to the client for future maintenance and reference.	1 day								

Figure 2: Gantt Chart to propose the project plan

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