**Project Proposal: Carbon Emission Reporting Solution for SMEs**

**Project Description**: This project aims to develop a solution that enables small and medium-sized enterprises (SMEs) to accurately report their carbon emissions as part of their sustainability efforts. The solution will allow companies to upload their invoices as PDFs, from which data will be extracted about the items purchased and their quantities. This data will then be used to calculate the total carbon emissions based on predefined emission factors for each item. The results will be summarized in a comprehensive report.

**General Scope**: The product to be developed is a web-based application designed to automate the process of carbon emission reporting for SMEs. Users will upload their invoices in PDF format, and the application will use optical character recognition (OCR) technology to extract relevant data, such as the items purchased and their quantities. This data will be stored in a secure database. The application will then apply predefined emission factors to each item to calculate the total carbon emissions. For example, if an invoice shows the purchase of 1 liter of gas, the application will use the known emission factor for gas to calculate the corresponding CO2 emissions. The final output will be a detailed report summarizing the company’s carbon emissions over a specified period. The application will feature a user-friendly interface for uploading invoices and viewing reports, as well as a backend system for data extraction, processing, and report generation.

**Target Customers and Users**: The primary users of this solution are SMEs that need to comply with new regulations requiring transparent carbon emission reporting. The target customers include business owners, sustainability officers, and financial managers who are responsible for environmental reporting and compliance.

**Constraints and Assumptions**: The solution assumes that the uploaded invoices are in a readable PDF format and that the emission factors for various items are accurate and up-to-date. It also assumes that users have the necessary permissions to upload and process invoice data.

**Business Requirements for Software Solution**

**Part 1: Solution for Reading Invoices in PDF Format and Extracting Data**

1. **Upload Functionality**
   * **Requirement 1.1**: The system shall allow users to upload one or multiple PDF documents simultaneously.
   * **Requirement 1.2**: The system shall support drag-and-drop functionality for uploading PDF documents.
   * **Requirement 1.3**: The system shall validate the uploaded files to ensure they are in PDF format.
2. **Data Extraction**
   * **Requirement 2.1**: The system shall extract all relevant data from the uploaded PDF invoices, including but not limited to invoice number, date, supplier details, line items, quantities, prices, and totals.
   * **Requirement 2.2**: The system shall use Optical Character Recognition (OCR) technology to accurately extract text from the PDF documents.
   * **Requirement 2.3**: The system shall handle various invoice formats and layouts.
3. **Data Storage**
   * **Requirement 3.1**: The system shall store the extracted data in a structured format as a separate file.
4. **Data Filtering and Adjustment Interface**
   * **Requirement 4.1**: The system shall provide an interface for users to filter the extracted data based on various criteria (e.g., date range, supplier).
   * **Requirement 4.2**: The system shall allow users to manually add new data or rows to the extracted data.
   * **Requirement 4.3**: The system shall allow users to amend existing data, including editing, deleting, or updating entries.
5. **Output File Generation**
   * **Requirement 5.1**: The system shall generate an output file containing the filtered and adjusted data.
   * **Requirement 5.2**: The system shall allow users to download the generated CSV file.

**Part 2: Solution for Assessing Carbon Footprint Based on Invoices**

1. **File Upload**
   * **Requirement 1.1**: The system shall automatically upload the output file generated from Part 1.
   * **Requirement 1.2**: The system shall allow manual upload of files in case of integration issues.
2. **Carbon Footprint Estimates Database**
   * **Requirement 2.1**: The system shall maintain a database of carbon footprint estimates for various items (e.g., liters of diesel, kilograms of paper).
   * **Requirement 2.2**: The system shall allow users to add new items and their carbon footprint estimates to the database.
   * **Requirement 2.3**: The system shall allow users to adjust and refine existing carbon footprint estimates.
3. **Carbon Footprint Calculation**
   * **Requirement 3.1**: The system shall calculate the total carbon footprint based on the input data and the estimates in the database.
   * **Requirement 3.2**: The system shall handle cases where an item in the input file is not present in the estimates database by selecting the closest estimate.
   * **Requirement 3.3**: The system shall provide detailed logs of the calculation process for auditing purposes.
4. **Results Output**
   * **Requirement 4.1**: The system shall produce a results file in a format suitable for sustainability reports (e.g., PDF, Excel).
   * **Requirement 4.2**: The results file shall include total carbon footprint, breakdown by category (e.g., fuel, materials), and timeline analysis.
   * **Requirement 4.3**: The system shall generate a dashboard displaying the same data as the results file, with interactive charts and graphs.
   * **Requirement 4.4**: The dashboard shall allow users to filter and drill down into specific data points.
5. **Additional Requirements -** User Account Creation and Management

* Requirement 1.1: The system shall allow users to create individual accounts with unique usernames and passwords.
* Requirement 1.2: The system shall require email verification during the account creation process to ensure the validity of the email address.
* Requirement 1.3: The system shall support password recovery and reset functionality via email.