**Product Requirements Document: Web-Based HVAC Selection Software**

1. Introduction:

The purpose of this document is to outline the product requirements for a web-based HVAC (Heating, Ventilation, and Air Conditioning) selection software. This software aims to assist professionals in the HVAC industry by providing them with a user-friendly tool to select appropriate HVAC equipment for different applications. The software will utilize a web-based platform, accessible through standard web browsers, ensuring easy access and compatibility across various devices.

2. User Requirements:

2.1 User Roles:

 a) HVAC Professionals: These users will be the primary users of the software, including HVAC engineers, contractors, and technicians.

 b) Administrators: These users will have administrative privileges to manage user accounts, access rights, and software configurations.

2.2 User Features:

 a) User Registration and Authentication: Users should be able to create accounts and log in securely.

 b) User Dashboard: Provide a personalized dashboard for each user, displaying their saved projects, equipment selections, and previous calculations.

 c) Project Management: Users should be able to create, manage, and save multiple projects for different clients or applications.

 d) Equipment Selection: Users should be able to select HVAC equipment based on various criteria such as capacity, efficiency, type, and application.

 e) System Design: Provide tools to design HVAC systems, including equipment layout, ductwork, and piping.

 f) Load Calculations: Offer the ability to perform load calculations to determine the heating and cooling requirements for a given space.

 g) Energy Efficiency Analysis: Include features to analyze and compare the energy efficiency of different equipment options.

 h) Reporting: Generate comprehensive reports summarizing the selected equipment, system design, load calculations, and energy efficiency analysis.

 i) Collaboration: Enable users to collaborate and share projects with team members or clients, allowing for real-time collaboration and feedback.

3. Functional Requirements:

 a) Compatibility: The software should be compatible with commonly used web browsers (e.g., Chrome, Firefox, Safari).

 b) Responsive Design: The interface should be responsive and optimized for use on desktops, laptops, tablets, and smartphones.

 c) Database Management: Implement a robust database system to store user data, project information, and equipment specifications.

 d) Equipment Database: Maintain an up-to-date database of HVAC equipment, including technical specifications, performance data, and manufacturer information.

 e) Calculation Engine: Develop a calculation engine to perform load calculations, energy efficiency analysis, and system design calculations.

 f) Integration: Provide APIs or integration capabilities to connect with external systems or data sources (e.g., HVAC manufacturer databases, weather data).

 g) Security: Implement appropriate security measures to protect user data, including encryption, secure authentication, and role-based access control.

4. Non-Functional Requirements:

 a) Performance: The software should be responsive and provide quick calculations and data retrieval even with large data sets.

 b) Scalability: The system should be able to handle a growing number of users, projects, and equipment options without significant performance degradation.

 c) Usability: The interface should be intuitive, user-friendly, and require minimal training for users to navigate and perform tasks.

 d) Reliability: The software should be reliable, with minimal downtime and data loss.

 e) Accessibility: Ensure the software meets accessibility standards, allowing users with disabilities to access and use the software effectively.

 f) Localization: Support multiple languages and regional preferences to cater to a global user base.

5. Technical Requirements:

 a) Technology Stack: Specify the preferred programming languages, frameworks, and tools to develop the software.

 b) Hosting and Infrastructure: Define the hosting environment and infrastructure requirements to ensure optimal performance and availability.

 c) Data