**Switch Me - A platform for exchanging objects**

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1. **Stakeholders**
   1. **End Users**  
      The end users are the primary customers of the platform and require an efficient solution for exchanging products they no longer need. They seek a user-friendly interface, a convenient user experience, and fair value assessment.
   2. **Community Interested in Sustainability and Reuse**  
      The platform promotes principles of sustainability and waste reduction, providing added value for organizations, groups, and individuals aiming to minimize the environmental impact of consumption.
   3. **Existing Competitors**  
      Competitors may take an interest in the platform's new developments to adapt their products and maintain their market position.
2. **Functional Requirements**
   1. **User Registration and Login:**
   * Ability to register via email or ID.
   * Creation of a personal profile with user information (name, phone number, location, gender, date of birth).
   * Login system with password authentication.
   1. **Product Upload:**
   * Ability to upload items including pictures, descriptions, condition of the item, and category.
   * Adding product details such as location, descriptions, and quality measures etc.
   * Option to set priority preferred categories.
   * Automatic Product Valuation via AI Algorithm:

* The system collects relevant details entered by the user about the product.
* These details are inserted into a predefined text template.
* The template is sent through an API to an AI-based valuation mechanism.
* The AI mechanism processes the input and returns a response in a fixed format, containing an estimated price range for the product.
* The system presents the estimated price range to the user, along with a recommendation to set the suggested price for better matching success. If the mechanism fails to estimate the price, the system will return a message indicating that the item cannot be valued.
  1. **Search and Match:**
  + Advanced search system with filters (category, condition, price range, location).
  + The system will display product swap suggestions based on intelligent matching algorithms that take into account the user's search history, preferred categories, age, gender, and other relevant factors.
  1. **Rating and Reviews:**
  + Ability for users to rate products and completed swaps .
  + Display of user and product reviews.
  1. **Swap Process:**
  + Transaction management system to review transaction details.
  + Option to accept or reject swap offers.
  + Ability for users to communicate for arranging swap details.
  1. **Admin Interface:**
  + **Inappropriate Product Removal:** Ability to remove products that violate platform guidelines or are deemed inappropriate.
  + **User Blocking:** Option to block users who violate the platform’s terms of service, engage in fraudulent activities, or misuse the platform in any other way.
  + **Usage Data Monitoring:** Access to platform usage data, including statistics on swaps, product uploads, and active users.

1. **Non-Functional Requirements**

#### **3.1 Performance:**

1. **Response Time:**
   * The average system response time should not exceed 3 seconds for standard actions and 9 seconds for complex actions (e.g., searches with multiple filters).
   * Real-time updates should be available within less than 2 second.
2. **Load Handling:**
   * The system should support at least 100,000 active users simultaneously without performance degradation.

During the initial pilot phase, the platform will allow a limited number of users on the local computer.

#### **3.2 Security:**

1. **Data Storage:**

Personal data will be stored securely with password protection.

#### **3.3 Reliability:**

1. **System Availability:**
   * The platform should maintain 99% availability, excluding scheduled maintenance.

#### **3.4 Usability:**

1. **User Interface:**
   * The interface should include clear feedback for user actions (e.g., success messages after uploading an item).
2. **Device Support:**
   * Initially, the platform will be compatible with the web only. If demand arises, a mobile version will be developed.

#### **3.5 Maintainability:**

1. **Future Upgrades:**
   * The codebase will be designed in a modular manner to allow easy updates and enhancements.
   * Ongoing updates will be supported without requiring system downtime.
2. **Monitoring:**
   * The system will log user activities (e.g., account creation, item uploads) and enable tracking of user operation times.
   * Automated activity reports will be generated to analyze performance and improve the system.
3. **Clear Policies:**
   * The platform will include well-defined policies for administrative actions such as blocking users and removing inappropriate items to ensure transparency and fair operation.
4. **Scalability:**
   * The system should easily scale to support a larger number of users and items as the platform grows.
5. **Architectural Requirements**

The system is a **web-based platform** with separate **backend** and **frontend** components. Below is a detailed breakdown of each component:

#### **4.1 Backend:**

* **Database**: PostgreSQL (using pgAdmin4).
* **Programming Language**: The backend will be developed using either **C#** or **Java**.
* **Functionality**:
  + Handles business logic, user authentication, and data processing.
  + Provides APIs for communication with the frontend and integration with AI mechanisms.

#### **4.2 Frontend:**

* **Frameworks**: Angular and Node.js for dynamic and efficient development.
* **Technologies**:
  + **HTML** and **CSS** for structuring and styling the application.
  + **TypeScript** for scalable code.
* **Functionality**:
  + Delivers an intuitive and responsive user interface.
  + Communicates with the backend through RESTful APIs.

#### **4.3 Additional Features:**

* **AI Integration**:
  + The system will include APIs to integrate various AI mechanisms, such as automatic product valuation, intelligent matching algorithms, and real-time notifications.