SRS DOCUMENTATION OF RECYCLING MACHINE:

**1. Introduction**

**1.1 Purpose**

The purpose of this SRS document is to describe the functional and non-functional requirements of the Recycling Machine System. The system automatically detects, sorts, and stores recyclable items inserted by the user, providing confirmation upon successful processing.

**1.2 Scope**

The Recycling Machine System is an automated system designed to identify recyclable items using sensors, classify them according to type, and store them in designated storage units. The system also displays confirmation messages to users after successful recycling.

**1.3 Definitions, Acronyms, and Abbreviations**

* **Sensor** – Device used to detect the item type.
* **Sorting Unit** – Mechanism that routes items based on type.
* **Storage** – Compartment where items are stored after classification.
* **Display** – Screen that shows confirmation messages to the user.

**1.4 References**

* IEEE Std 830-1998: IEEE Recommended Practice for Software Requirements Specifications.
* Project documentation on Recycling Machine Automation.

**1.5 Overview**

This document provides a detailed overview of the system’s structure, features, and performance expectations. It describes user interactions, data flow, and system responses.

**2. Overall Description**

**2.1 Product Perspective**

The Recycling Machine System is a standalone automated device. It interacts with users through an input slot, sensors, and display unit. The system internally coordinates between modules (Sensor, Sorting Unit, Storage, and Display) to process items.

**2.2 Product Functions**

* Accepts recyclable items from the user.
* Detects item type using a sensor.
* Routes the item to the appropriate storage compartment.
* Displays confirmation and appreciation messages.

**2.3 User Characteristics**

Users are general public individuals with no technical knowledge required. The interface is designed to be intuitive and user-friendly.

**2.4 Constraints**

* The system depends on accurate sensor detection.
* Limited storage capacity for each item type.
* Requires continuous power supply for operation.

**2.5 Assumptions and Dependencies**

* The system assumes all inserted items are recyclable.
* Depends on reliable sensor calibration for item detection accuracy.

**3. Specific Requirements**

**3.1 Functional Requirements**

1. The user inserts an item into the machine.
2. The sensor detects the item type.
3. The system classifies the item based on sensor data.
4. The sorting unit routes the item to the correct storage.
5. The storage compartment receives and stores the item.
6. The display shows a confirmation message.
7. The system confirms successful recycling to the user.

**3.2 System Features**

* **Automatic Detection:** Sensor identifies item type (plastic, glass, metal, etc.).
* **Smart Sorting:** Sorting unit directs items based on classification.
* **Feedback Display:** Confirms acceptance and displays thank-you message.
* **Storage Management:** Organizes items efficiently by type.

**3.3 Interface Requirements**

* **User Interface:** Display screen for user confirmation.
* **Hardware Interface:** Connection between Sensor, Sorting Unit, and Storage.
* **Software Interface:** Internal program controlling detection and sorting logic.

**4. Non-Functional Requirements**

**4.1 Performance Requirements**

* The system must detect and classify items within 3 seconds.
* Sorting and storing should complete within 5 seconds per item.

**4.2 Security Requirements**

* System should prevent unauthorized access to internal mechanisms.
* Secure data handling for operational logs.

**4.3 Reliability**

* The system must operate continuously with 95% uptime.
* Sensor accuracy must exceed 90% for proper classification.

**4.4 Maintainability**

* The system should allow easy maintenance for sensor cleaning and storage replacement.

**5. Other Supporting Information**

**5.1 Appendices**

Appendix A: Sequence Diagram (Recycling Process)  
Appendix B: Hardware Component List

**5.2 Index**

* User Interaction Flow
* Sensor Detection Process
* Sorting and Storage Logic