**Problem Definition and Functional Requirements**

**Problem Description**

Recycling rates remain low globally due to a lack of incentives, convenience, and awareness. Many individuals are unsure about proper recycling practices, and the process can feel tedious and unmotivating. Additionally, there is limited community engagement in recycling activities, making it difficult to motivate collective action. Without a system that educates, motivates, and pays people for recycling appropriately, trash buildup and environmental damage will continue to increase.

**Functional Requirements**

The Recycle Reward Game must include the following functionalities to address the problem effectively:

**Core Functionalities:**

1. **User Registration & Authentication:** Users must be allowed to register with their social media or email addresses**.**
2. **Barcode Scanning System:** To ascertain if a product is recyclable, users can manually enter the barcode or scan it**.**
3. **Recycling Information Database:** Depending on the scanned item, the app must offer recycling instructions**.**
4. **Points & Rewards System:** When users successfully recycle, they should receive points that may be used for incentives**.**
5. **Leaderboard & Community tasks:** To receive additional rewards, users should participate in both solo and group recycling tasks**.**
6. **Integration of the Local Recycling Guide:** The app needs to offer drop-off places and recycling regulations based on user location**.**
7. **Gamification & Achievements:** To keep users interested, badges, levels, and streaks should be included**.**
8. **Social Sharing & Community Engagement** – Users should be able to share achievements and challenge friends via social media.

**Prioritization of Functional Requirements**

| **Priority** | **Feature** | **Justification** |
| --- | --- | --- |
| High | User Registration & Authentication | Essential for user engagement and tracking progress. |
| High | Barcode Scanning System | Core functionality that determines recyclability. |
| High | Recycling Information Database | Helps users learn correct recycling methods. |
| High | Points & Rewards System | Encourages and incentivizes participation. |
| Medium | Local Recycling Guide Integration | Provides region-specific information. |

**Solution Proposal**

**Who Will Benefit From This System?**

1. **Individuals & Families** – They will receive guidance on proper recycling and earn rewards for sustainable behaviour.
2. **Students & Schools** – The app can be integrated into educational programs to teach recycling in an engaging way.
3. **Governments & Municipalities** – The app can help them improve local recycling efforts and waste management statistics.