# Smart Grocery Expiry Management System

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## Problem Definition

A significant portion of grocery items in both households and retail environments is wasted due to the lack of efficient expiry tracking. Manual monitoring methods are error-prone and time-consuming, leading to food wastage, financial losses, and negative environmental consequences. The absence of an intelligent and user-friendly automated solution for tracking grocery expiry dates results in forgotten timelines, unhealthy consumption, and unnecessary disposal of food.

## Problem Background

The problem of food wastage has grown over time due to increased grocery consumption and poor expiry management. Traditional tracking methods, such as manual logs or visual checks, fail to keep pace with the volume and variety of items stored. Consumers and retailers often overlook expiry dates, resulting in either consumption of expired products or premature disposal. This situation not only impacts household budgets and retail profitability but also contributes significantly to global food waste, a critical environmental concern.

## Problem Scope

Included:

* - Automated expiry date detection using barcode, RFID, or QR codes
* - Real-time expiry alerts through push notifications or email
* - Mobile and web-based inventory management platform
* - Analytics dashboard for usage and expiry trends
* - Recipe suggestions based on soon-to-expire items

Excluded:

* - Physical supply chain management
* - Integration with third-party logistics providers
* - Automatic replenishment or purchase of grocery items
* -Extensive support in regions with limited digital literacy

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| **Current or Potential Impact** |
| |  |  |  | | --- | --- | --- | | Area of Impact | Description of Impact | Quantitative or Qualitative Metrics | | Financial | Reduction of food wastage and unnecessary spending | Reduced wastage cost (₹), improved savings | | Operational Efficiency | Time saved from manual tracking | Hours saved in inventory management | | Environmental Impact | Lower contribution to food waste | % decrease in disposed grocery items | | User Satisfaction | Enhanced convenience and improved usability | User satisfaction ratings, app adoption | |

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| **Affected Stakeholders** |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Name | Role | Power | Interest | Contact Information | | Household Users | End-users for tracking groceries | Medium | High | — | | Retailers & Supermarkets | Large-scale inventory users | High | High | — | | Grocery Delivery Platforms | Integration partners | Medium | Medium | — | | Food NGOs | Partners for food redistribution | Low | Medium | — | |

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| Stakeholders Map:- |
| High | | Keep Satisfied | | Keep Satisfied | | | Manage Closely | |
| Medium | | Monitor | | Keep Satisfied | | | Keep Informed | |
| Low | | Monitor | | Monitor | | | Keep Informed | |
|  | | Monitor | | | | | Keep Informed | |
|  | | Low | | | Medium |  | | High |
|  | | | Level of Interest | | | | | |

## Problem Timeframe

The issue has been persistent for several years and is worsening due to increasing food consumption and inadequate expiry tracking mechanisms. This has led to a steady rise in food waste, prompting an urgent need for a scalable automated solution.

## Problem Location

This problem affects households, grocery retailers, supermarkets, and food NGOs across both urban and semi-urban regions.

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| Gap Analysis |
| |  |  |  | | --- | --- | --- | | Current State | Desired State | Required Actions | | Manual expiry tracking | Automated expiry tracking system | Implement barcode/RFID integration | | High food wastage | Reduced wastage and optimized food usage | Enable real-time expiry alerts | | Lack of actionable insights | Data-driven analytics and recipe suggestions | Develop analytics dashboard | |

## Root Cause of the Problem

* - Lack of automated expiry tracking tools
* - Dependence on manual monitoring by consumers and retailers
* - Inadequate integration between inventory systems and expiry alerts
* - Limited digital literacy in certain user segments

## Supporting Data, Evidence and Attachments

• Food wastage statistics from government and research reports  
• Cost analysis of food waste in retail and household sectors  
• Prototype designs for automated expiry tracking solutions  
• Sample data of grocery inventory and associated wastage

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