

## **Business Requirements Document (BRD)**

**Project Title:** Employee Purchase System via Access Card and Self-Service Vending Machines

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### **1. Project Overview:**

The goal of this project is to automate employee purchases from self-service vending machines located at the workplace using their employee access cards (NFC or RFID). The purchase process uses a virtual daily balance managed automatically through a centralized admin panel.

The system does not rely on real money but rather on daily allocated points based on employee classification. The project includes the development of a robust backend, integration with card readers, vending machines, and a management panel with role-based access control.

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### **2. Objectives:**

- Enable secure and seamless employee purchases from vending machines.
  - Enforce internal policies regarding daily entitlements.
  - Reduce waste and provide accurate consumption reports.
  - Offer an easy and centralized platform for managing employee purchases.
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### **3. Target Audience:**

- All company employees (Managers, Regular Staff, Technicians, etc.).
- HR, Administration, and IT departments managing the system.

## 4. Core Business Processes:

### 4.1 Purchase Workflow:

1. The employee selects a product from the vending machine.
2. The employee taps their access card on the reader.
3. The machine sends the following data to the backend via API:
  - Employee Card Number (User ID).
  - Slot Number (Slot ID).
  - Machine ID.
  - Product Price.
4. The backend validates:
  - Whether the card is linked to a valid employee.
  - Whether the employee is within their daily quota.
  - Whether the product category (juice/meal/snack) is allowed.
  - Whether sufficient balance is available.
5. The system responds:
  - **Success:** Dispense the product and deduct points.
  - **Failure:** Reject the transaction and return a reason (e.g., quota exceeded, unauthorized product type, insufficient balance).

### 4.2 Data Sent to Backend:

Field	Description
User ID	Employee card identifier
Machine ID	Identifier of the vending machine
Slot Number	Slot ID chosen inside the machine
Product Price	Price in points
Timestamp	Time of request

## 5. Daily Balance Management:

### Option 1: Single Daily Recharge Based on Classification

- Balance is automatically recharged at 12:00 AM.
- Balance is reset to zero before each recharge.
- Example:
  - **Manager:** 500 points/day.
  - **Regular Employee:** 300 points/day.
- Rules are applied automatically by a rule engine.

### Option 2: Dual Period Recharge (Breakfast + Lunch)

- The day is divided into two time slots:
  - **Breakfast Period** (e.g., 7:00 – 10:00 AM): Points are added.
  - **Lunch Period** (e.g., 12:00 – 3:00 PM): Points are added again.
- Balance is reset before each period.
- Example:
  - Regular employee: 150 points for breakfast + 150 points for lunch.

## 6. Purchase Rules by Classification:

Classification	Daily Limits
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Regular Employee	1 Juice + 1 Meal + 1 Snack
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Manager	3 Juices + 2 Meals + 2 Snacks
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- Every transaction is logged.
- Attempts that exceed the quota are rejected.

## 7. Slot Category Mapping:

Slot Range	Category
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1 - 10	Juices
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11 - 30	Meals
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31 - 40	Snacks
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## 8. Admin Panel Modules:

### 8.1 Employee Management

- Add/Edit/Delete employee profiles.
- View individual purchase history.

Field	Type	Description
EmployeeID	Primary Key	Unique identifier for the employee
FullName	String	Full name of the employee
CardNumber	String (Unique)	Access card number (NFC/RFID)
ClassificationID	Foreign Key	Reference to employee type
Status	Enum (Active/Inactive)	Whether the employee is active

### 8.2 Classification Management

- Define classifications (Manager, Employee, Supervisor...)
- Set daily balance per classification.
- Configure product access rules.

Field	Type	Description
ClassificationID	Primary Key	Unique identifier
Name	String	e.g., Manager, Regular Employee
DailyJuiceLimit	Integer	Max juices per day
DailyMealLimit	Integer	Max meals per day
DailySnackLimit	Integer	Max snacks per day
DailyPointLimit	Integer	Total points per day (optional override)

### 8.3 Balance & Recharge Settings

- Choose recharge mode (daily or by period).
- View current balances.
- Set recharge timings.

### 8.4 Vending Machine Management

- Register vending machines and their locations.

Field	Type	Description
MachineID	Primary Key	Unique ID of the machine
Location	String	Physical location of the machine
Status	Enum	Active or Inactive

### 8.5 Slot Category Management

- Classify each slot number.
- Map slots to product categories (juice, meal, snack).

Field	Type	Description
SlotID	Primary Key	Unique slot identifier
MachineID	Foreign Key	The vending machine this slot belongs to
Category	Enum (Juice, Meal, Snack)	Type of item
Price	Integer	Cost in points

## 8.6 Reports & Analytics

- Daily/Weekly/Monthly Reports:
  - Transactions per employee.
  - Most consumed products.
  - Balance usage.
  - Rejection reasons and statistics.

Field	Type	Description
TransactionID	Primary Key	Unique transaction ID
EmployeeID	Foreign Key	Employee who initiated the transaction
MachineID	Foreign Key	Vending machine used
SlotID	Foreign Key	Specific slot (product) selected
PointsDeducted	Integer	Number of points deducted
TransactionTime	Timestamp	Date & time of transaction
Status	Enum (Success/Failure)	Transaction outcome
FailureReason	String (nullable)	Reason for failure (if any)