Smart ATM Cash Forecasting & Real-Time Refill System

User Stories

1. ATM Cash Monitoring Module:

US-01: View ATM Cash Levels

As an ATM Operations Manager
I want to view real-time cash levels for all ATMs
So that I can monitor which ATMs are running low

Acceptance Criteria:

- System must show ATM ID, location, cash %, and status

- Status must show Normal / Warning / Critical

- Data must refresh every 5 minutes

US-02: View Last Refill Timestamp

As an Operations Manager
I want to see when each ATM was last refilled
So that I understand refill patterns and delays

Acceptance Criteria:

- Last refill timestamp must be visible

- Must show date + exact time

- Must update automatically after each refill

2. Forecasting Module:

US-03: Predict Daily Cash Requirement

As a Forecasting Engine
I want to calculate the next 24 hours cash usage
So that the bank avoids cash-out situations

Acceptance Criteria:

- System must process last 90 days of withdrawal data

- Must display "Predicted Cash Needed" per ATM

- Adjust prediction based on weekdays, salary days, festivals

- Forecast accuracy must be calculated

US-04: Predict Hourly Withdrawal Pattern

As an Operations Manager
I want to view the hourly usage prediction
So that I can schedule refill timing accurately

Acceptance Criteria:

- Must show hourly graph

- Must refresh every 24 hours

- Must reflect event-based demand changes

3. Alerting Module:

US-05: Receive Low-Cash Alerts

As an Operations Manager
I want to receive alerts when ATM cash is below 20%
So that I can initiate refill orders immediately

Acceptance Criteria:

- Alert must contain ATM ID, location, current cash, forecast

- Alerts must be sent via SMS/Email/App

- Alerts must be delivered within 5 seconds

US-06: Receive Warning Alerts

As an Operations Manager
I want to receive alerts when ATM cash is between 20–50%
So that I can plan the day's refill in advance

Acceptance Criteria:

- Warning triggers at 20–50%

- Alert must include ATM details

- Must appear in dashboard alert center

4. Denomination Calculation Module:

US-07: Get Denomination Breakdown

As a Cash Van Team Lead
I want to calculate how many notes are needed per ATM
So that I refill the ATM with correct denominations

Acceptance Criteria:

- Must generate 100, 200, 500, 2000 notes breakdown

- Must consider typical withdrawal pattern

- Must display "recommended denomination mix"

5. Priority Scoring Module:

US-08: View Refill Priority Score

As a Operations Manager
I want to see priority ranking for all ATMs
So that I can refill highest-risk ATMs first

Acceptance Criteria:

- Priority score must consider: cash %, forecast, location, footfall

- Must color-code ATMs (Red/Yellow/Green)

- Must update automatically

6. Cash Van Route Optimization:

US-09: Generate Cash Van Route

As a Cash Van Team
I want to get the shortest route covering all critical ATMs
So that I can save time and fuel during refills

Acceptance Criteria:

- Route must be optimized based on priority

- Must consider travel distance

- Must allow real-time changes

US-10: Re-Optimize Route During Delays

As a Cash Van Team
I want to get a new route if traffic/ATM issues occur
So that I can avoid delays in refilling

Acceptance Criteria:

- Must re-calculate route

- Must update within seconds

- Must alert team about the new order

7. Dashboard Module:

US-11: View ATM Dashboard

As an Operations Manager
I want to see all ATM cash levels on one screen
So that I can make informed decisions quickly

Acceptance Criteria:

- Table view + map view

- Filters: city, branch, priority

- Graphs for historical + forecast

US-12: Drill Down ATM Details

As an Operations Manager
I want to click on an ATM to see full details
So that I can view usage trends

Acceptance Criteria:

- Must show full transaction history

- Must show forecast graph

- Must show last refill date

- Must show required denomination

8. Reporting Module:

US-13: Daily ATM Usage Report

As a Branch Manager
I want to download daily ATM performance reports
So that I can review overall consumption

Acceptance Criteria:

- Must generate PDF report

- Must include consumption, alerts, refills

- Must send via email automatically at 6 AM

US-14: Weekly Trend & Forecast Report

As a Operations Manager
I want to review weekly forecast trends
So that I can plan resources and cash allocation

Acceptance Criteria:

- Must show 7-day forecast

- Must include top critical ATMs

- Must show cash consumption graph

9. User Access Module:

US-15: Role Based Access

As a System Admin
I want to assign roles to users
So that they can access only what they need

Acceptance Criteria:

- Role types: Admin, Manager, Cash Van Team, Branch Manager

- Each role must have permission mapping

- Login must be secured