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# Smart ATM Cash Forecasting & Real-Time Refill System

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Business Requirement Document



Business Analyst Project Report  
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## BUSINESS REQUIREMENT DOCUMENT (BRD)

### PROJECT NAME: SMART ATM CASH FORECASTING & REAL-TIME REFILL SYSTEM

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#### 1. Project Overview

Banks currently manage ATM cash refilling through fixed schedules and manual forecasting. This often results in ATMs running out of cash during peak hours, festival seasons, and salary-credit days. The manual process lacks accuracy, causes customer dissatisfaction, and increases operational costs.

The Smart ATM Cash Forecasting & Real-Time Refill System solves this problem by predicting cash usage for each ATM using historical data, location patterns, and daily trends. The system generates refill alerts, optimizes cash van routes, and provides a centralized dashboard for monitoring cash levels across all ATMs.

#### 2. Business Objectives

- Predict cash usage for each ATM for the next 24 hours.
- Reduce manual forecasting and operational overhead by 70%.
- Avoid cash-out incidents during peak periods.
- Optimize cash van refill routes to reduce fuel/time cost by 30%.
- Improve customer satisfaction and ATM up-time.
- Provide real-time alerts when ATM cash drops below defined thresholds.

#### 3. Scope

##### In Scope

- Cash level monitoring for all ATMs.
- Prediction engine to estimate next-day cash usage.
- Automated refill alerts based on thresholds.
- Route optimization for cash van teams.
- Dashboard for ATM operations manager.
- Integration with notification system (SMS, email, app alert).
- Historical data analysis (last 90 days minimum).

##### Out of Scope

- ATM hardware changes.

- Vendor negotiation or logistics team hiring.
- ATM security system upgrade.
- Bank core banking integration (except cash logs).

#### **4. Stakeholders**

- **ATM Operations Manager** – Oversees cash refilling.
- **Cash Van Team** – Executes physical refill process.
- **Bank Branch Manager** – Approves refill plans.
- **System Administrator** – Manages system access.
- **Forecasting Engine / AI System** – Predicts cash requirement.
- **Notification Service** – Sends alerts.
- **Customers** – Users affected when ATM runs out of cash.

#### **5. AS-IS Process (Current State)**

- ATM cash usage is monitored manually.
- Operations team checks Excel reports for each ATM's withdrawal patterns.
- Refill schedule is fixed (daily/alternate days), not based on demand.
- No automated prediction.
- No prior warnings before ATM runs out of cash.
- Cash vans travel long routes unnecessarily.
- High operational cost and poor customer satisfaction.

#### **6. TO-BE Process (Future State)**

- System automatically predicts cash requirement for each ATM.
- Real-time alerts when ATM cash < 20%.
- Refill priority scores generated automatically.
- Cash van route optimized based on refill needs.
- System sends automated notifications to manager & cash van team.
- Dashboard displays all ATMs with cash levels and predicted demand.

#### **7. Business Requirements**

##### **BR-01: Cash Forecasting**

The system must forecast cash usage for each ATM based on historic and real-time data.

#### **BR-02: Threshold Alerts**

The system must send alerts when ATM cash falls below 20%.

#### **BR-03: Denomination Breakdown**

The system must calculate required denominations (100, 200, 500, 2000 notes).

#### **BR-04: Refill Priority Score**

The system must calculate refill priority based on cash level, location, and forecast.

#### **BR-05: Cash Van Route Optimization**

The system must generate optimal route for cash vans based on refill priority.

#### **BR-06: Dashboard**

The system must provide a dashboard showing ATM ID, cash level, forecast, last refill time, and status.

#### **BR-07: Notifications**

The system must notify Operations Manager and Cash Van Team for refill actions.

#### **BR-08: Reporting**

The system must generate daily and weekly reports of ATM usage and refill history.

### **8. Functional Requirements Summary**

(BR → High-Level Function)

BR ID	High-Level Function
BR-01	Forecast ATM cash usage daily & hourly
BR-02	Trigger low-cash alerts
BR-03	Calculate note denominations
BR-04	Generate refill priority score
BR-05	Optimize cash van route
BR-06	Show ATM dashboard
BR-07	Send notifications
BR-08	Generate reports

### **9. Assumptions & Constraints**

## Assumptions

- Accurate ATM withdrawal logs are available.
- ATM network connectivity is stable.
- Historical data for at least 90 days is provided.

## Constraints

- Forecast accuracy depends on data quality.
- Cash vans have limited travel capacity.
- System must be accessible only by authorized users.

## 10. Risks

- Incorrect predictions may lead to underfilling or overfilling.
- Data delays may affect forecasting accuracy.
- OTP/email delivery failures for notifications.
- ATM downtime may affect real-time cash reading.

## 11. Success Metrics

- Less than 2% ATM cash-out incidents.
- 30% reduction in unnecessary refill trips.
- 90% forecast accuracy.
- 20% reduction in customer complaints.

## 12. Approval

Role	Name	Signature	Date
Business Analyst			
Operations Manager			
Branch Manager			
Product Owner			