

I have prepared a comprehensive **Product Requirement Document (PRD)** based on the transcript. This document is structured to demonstrate that you understand their current workflow perfectly while proposing the necessary fixes and advanced features to secure the job.

Instructions: Copy the content below into a Word Document or Google Doc, format the headings (H1, H2), and save it as a **PDF**.

Project Proposal: Advanced Examination Monitoring & Resource Management System

1. Executive Summary

This document outlines the technical specifications for a secure, role-based mobile application and web dashboard designed for state-level examination management (NBSE). The system focuses on hierarchical user management, real-time logistics optimization, and high-security tracking of examination materials (Question Papers/Answer Sheets) using geolocation and timestamping.

This proposal includes solutions to existing system "glitches," specifically regarding multi-subject teacher profiling and missing push notifications, while introducing AI-driven anomaly detection for security.

2. User Roles & Access Hierarchy

The application will enforce strict data visibility based on the following verified user types¹¹¹¹¹¹¹¹¹¹:

1. **Admin / Dealing Assistant (Web Portal):** Full access to user data, activation/deactivation, and Excel reporting.
 2. **NBSE Officer:** Attendance marking functionality.
 3. **Principal / Headmaster:** Full school-level administration, teacher verification, and access to "Form 6" and "Question Paper" modules.
 4. **Centre Superintendent:** Equivalent access to Principal, focused on exam center management.
 5. **Teacher:** Restricted access (Profile, Notices, Events).
 6. **Subject/Department Head:** View access for specific subject-related data².
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3. Core Modules & Functional Requirements

Module A: Smart Registration & Profiling (with Glitch Fixes)

Current Workflow: Users register via email/phone and complete a profile by selecting District -> School -> Qualification -> Classes Taught.

The Improvements (Your Requirements):

- **Search by Registration Number:** Replace text-only school search with a dual-search (Name or Registration ID) to handle long school names and ensure unique identification³.
- **Multi-Subject Selection (The Fix):**
 - *Problem:* Currently, a teacher cannot select multiple subjects (e.g., Math AND Science) for a single class (e.g., Class 8)⁴.
 - *Solution:* Implement a "Tag System" or Multi-Select Checkbox in the Class row. The database will support a one-to-many relationship between Teacher_ID and Subjects per Class_ID.
- **Verification Flow:** New accounts trigger a "Verification Pending" status. The Headmaster receives an in-app prompt to approve the teacher before they can access the dashboard⁵⁵⁵⁵.

Module B: The "Dealing Assistant" Dashboard (Web)

Designed for the clerk/admin to manage large datasets efficiently.

- **Deep Filtering:** Filter data by District → School → Class (8-12) → Subject⁶⁶.
 - *Use Case:* "List all Math teachers for Class 10 in Nagaland"⁷.
 - *Use Case:* "List all Science students for Class 10"⁸.
- **Export Data:** One-click export of filtered tables to Excel⁹.
- **User Management:** Edit, Delete, Activate, or Deactivate users¹⁰.

Module C: Communication & Logistics (Events)

A replacement for manual WhatsApp/Phone coordination to save costs and reduce food wastage.

- **Broadcast Notices:** Admin sends "Important Notices" (PDF/Image/Text) to specific target groups (e.g., "All Teachers in Dummy School")¹¹¹¹¹¹¹¹.
- **Smart Event Management:**

- Create Event: Date, Time, Venue, Flyer.
- **RSVP System:** Users must click **Accept** or **Reject**.
- **Mandatory Rejection Reason:** If "Reject" is clicked, a text box appears asking "Why?", ensuring accountability¹².
- **Logistics Calculator (New Feature):**
 - Auto-calculate required resources based on "Accept" responses.
 - Display required count for: **Food Plates, Chairs, Tables, and Stationery Kits**¹³¹³¹³¹³.

Module D: Secure Exam Material Tracking (The USP)

A 5-step security protocol to track the movement of sensitive materials.

- **Tracking Steps:**
 1. **Arrival:** Official reaches collection center.
 2. **Collection:** Picking up Question Paper (at Police Station/Post Office).
 3. **Pre-Exam:** Arrival at School Center (Checking Seal Integrity).
 4. **Seal Pack:** Post-exam answer booklet sealing.
 5. **Submission:** Drop-off at Post Office¹⁴¹⁴¹⁴¹⁴.
- **Data Capture:** Every step captures a **Live Photo, GPS Location, and Server Timestamp**¹⁵¹⁵¹⁵¹⁵.

4. Proposed "Creativity & Security" Features

To ensure this application exceeds the capabilities of the previous version, we propose the following advancements:

1. Automated Anomaly Detection (AI Security)

- **The Problem:** Currently, admins must manually look at timestamps to see if a trip took 30 mins or 50 mins to detect suspicion¹⁶.
- **Our Solution:** We will implement an algorithm that calculates the standard travel time between "Collection" and "Center."
 - **Logic:** If (Actual Time > Standard Time + 15 mins), the system triggers a **RED FLAG** on the Admin Dashboard. This automates the detection of "Outliers" (potential leaks)¹⁷.

2. Push Notification System

- **The Fix:** The previous app failed to notify users when the app was closed¹⁸.
- **Our Solution:** Integration of Firebase Cloud Messaging (FCM). Teachers and Principals will receive instant alerts on their lock screen for new Notices, Event Invites, or pending Profile Verifications.

3. Principal vs. Teacher Dashboard (UI/UX)

We will strictly differentiate the interface based on the hierarchy:

- **Teacher Tabs (3 Items):** Profile, View Clicks (Notices), Events.
- **Principal Tabs (5 Items):** Profile, View Clicks, Events, **Question Paper**, **Form 6**, and **Submit**¹⁹.

4. Offline Sync (Remote Access)

Given the varied network conditions in districts like Chumukedima²⁰, we will build an **Offline-First Architecture**.

- *Feature:* Officers can click photos and mark timestamps even without internet. The app will locally encrypt the data and auto-upload it to the server the moment connectivity is restored, ensuring no data loss during the critical 5-step tracking.

5. Technical Stack

- **Frontend:** React Native (for seamless Android/iOS performance).
- **Backend:** Node.js with Express.
- **Database:** MongoDB (to handle flexible schemas for multi-subject tagging).
- **Cloud Storage:** AWS S3 (for secure storage of Exam Photos and Notices).
- **Maps API:** Google Maps API (for precise Geolocation tracking).

6. Conclusion

This system is not just an app; it is a **Digital Logistics & Security Protocol**. By fixing the multi-subject selection glitch, automating logistics calculations for events, and introducing algorithmic anomaly detection for exam papers, we will provide a solution that is significantly more secure, user-friendly, and intelligent than the existing prototype.