Business Requirements Document

EXAM PAPER REPOSITORY

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Document Status

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1. Executive Summary

This project aims to develop a **question paper repository web application** where students can **upload scanned question papers**, and admins can **approve or reject** them based on authenticity. The system will include features such as **search functionality**, **personalized recommendations**, **notifications**, and a **credit-based access system** for viewing answers. It will also support **automated scanning** of uploaded papers to extract relevant metadata and ensure **quality control**. The platform will manage **server load fluctuations** during exam periods and ensure **secure login via college email IDs**.

This project aims to develop a **question paper repository web application** where students can **upload scanned question papers**, and admins can **approve or reject them** based on authenticity.

Key Features:

- **Automated metadata extraction** (academic year, semester, course code, exam type).
- **Credit-based system** to incentivize **high-quality uploads** and prevent low-quality submissions.
- **Advanced search functionality** for retrieving individual **questions** or **full papers**.
- **Recommendation engine** for similar question papers.
- **Notifications** for users when **searched questions become available** later.
- **Referral system** to attract new users.
- **Scalable server architecture** to handle **exam-time traffic spikes**.
- **Secure authentication** via **college email verification**.

This platform aims to enhance **academic collaboration** and provide students with **efficient access** to past exam resources.

2. Project Objectives

The primary objectives of this project are:

1. **Seamless Question Paper Upload & Verification**
   - Students should be able to **scan and upload question papers** easily.
   - Extract metadata like **academic year, semester type, exam type, and course code** automatically.
   - Admins will verify the **availability and readability** of uploaded papers.
2. **Credit-Based System for User Engagement**
   - **Reward students** with credits for uploading **unique and high-quality** question papers.
   - **Reduce credits** for students who upload **garbage or duplicate** papers.
   - Users must **spend credits** to access answers.
3. **Advanced Search & Retrieval System**
   - Users can **search questions by course code, year, semester, and keywords**.

    - Extract individual **questions from uploaded papers** and store them separately.
4. **Recommendation & Notification System**
    - Implement a **basic recommendation engine** to suggest similar question papers.
    - Notify users when **relevant questions** become available later.
5. **User Growth & Referral System**
    - Introduce a **referral system** to attract more users and encourage uploads.
6. **Scalable Infrastructure & Security Measures**
    - Optimize server management to handle **traffic spikes during exams**.
    - Secure user login using **college email authentication**.

3. Project Scope

In Scope:

✔ Development of a **web application** with student and admin roles.
✔ **Question paper upload system** with scanning and metadata extraction.
✔ **Admin dashboard** for review, approval, and rejection of papers.
✔ **Credit-based system** for rewarding/punishing students.
✔ **Search functionality** for retrieving **questions & papers**.
✔ **Recommendation system** for similar question papers.
✔ **Notification system** for new uploads.
✔ **Referral system** to increase engagement.
✔ **Scalability measures** for peak server load times.
✔ **Secure authentication** with college email verification.

Out of Scope:

✖ Development of a **mobile app** (initial phase will focus on web).
✖ **AI-based automated grading** of answers.
✖ **Offline functionality** for accessing the repository.

4. Business Requirements

Functional Requirements

1. **User Management:**
    - Students should be able to register and log in using their college email IDs (OAuth 2.0 integration).
    - Administrators should have access to manage users, review uploaded papers, and manage the credit system.
2. **Paper Upload and Processing:**
    - Students should be able to scan and upload exam papers (image or PDF format).

    - The system should automatically extract metadata (academic year, semester, exam type, course code) using OCR.
    - The system should provide a verification workflow for administrators to review uploaded papers for readability and accuracy.
3. **Question Extraction and Storage:**
    - The system should automatically segment scanned papers into individual questions.
    - Questions should be stored with associated metadata.
4. **Search and Retrieval:**
    - Students should be able to search for questions or papers based on metadata (course code, semester, keywords).
    - Search results should display relevant questions or links to full papers.
5. **Recommendation System:**
    - The system should recommend similar questions based on metadata and content.
6. **Notification System:**
    - Students should receive notifications when new papers are uploaded or when a previously unavailable paper becomes available.
7. **Credit System:**
    - Students should earn credits for uploading high-quality and unique papers.
    - Students should be able to use credits to access papers.
    - The system should track student credits.
8. **Referral System:**
    - Students should be able to refer other students and earn rewards.
9. **Reporting and Analytics (Admin Features):**
    - Administrators should have access to reports on uploads, downloads, user activity, and credit usage.

Non-Functional Requirements

1. **Performance:** The system should be responsive and handle a large number of users and uploads, especially during peak exam periods.
2. **Scalability:** The system should be scalable to accommodate future growth in users and data.
3. **Security:** The system should protect user data and prevent unauthorized access.
4. **Usability:** The system should be easy to use and navigate for both students and administrators.
5. **Availability:** The system should be available with minimal downtime.
6. **Maintainability:** The system should be easy to maintain and update.

5. Key Stakeholders

Stakeholder	Role & Responsibility
Students	Upload papers, earn/spend credits, search for questions
Admin	Verify and approve/reject papers
Developers	Build & maintain the web application
Project Manager	Oversee project execution & delivery
Clients (University/College)	Review and approve project features

Project team

Name	Role	Responsibilities
Achanta Nandini Sri Vijaya	Project Lead & Backend/Frontend Developer	Project management, system design, backend/frontend dev, quality control, testing
Bitra Sri Pragna	ML/Data Engineer	ML integration, metadata extraction, quality control, user history analysis
Kuncharapu Naga Sri Harsha	Backend/Frontend Developer	Backend dev (auth, uploads, credits), frontend dev (UI/UX, search), server optimization

6. Project Assumptions

- The college will provide access to student email addresses for authentication.
- Exam papers follow a relatively consistent format, which will aid in OCR accuracy.

7. Project Constraints

- **Server Load:** Traffic spikes during exams, minimal usage otherwise.
- **Data Quality:** Poor-quality uploads may affect search and recommendations.
- **Security & Authentication:** Only verified college emails should be allowed.
- **User Engagement:** Requires incentives to encourage uploads.

- **Storage & Performance:** Efficient storage and indexing for fast retrieval.

Constraint/Risk	Description	Mitigation Strategy
Server Load	**Traffic spikes during exams**	**Auto-scaling on cloud hosting**
Data Quality	**Poor-quality uploads may affect search and recommendations**	**Admin verification & credit system**
Security & Authentication	**Only verified college emails should be allowed**	**College email authentication**
User Engagement	**Requires incentives to encourage uploads**	**Reward-based credit system & referral system**
Storage & Performance	**High volume of scanned documents**	**Efficient compression & indexing of stored papers**

8. Cost-Benefit Analysis

Costs

- **Development Costs:** Web app development, database setup.
- **Server Costs:** Hosting, storage, scaling for peak loads.
- **Security Measures:** Email authentication, user data protection.

Benefits

- **Increases accessibility** to past question papers for students.
- **Encourages knowledge sharing** through credits & referrals.
- **Improves search efficiency** by storing individual questions.
- **Automates metadata extraction** for better organization.
- **Potential for monetization** through **subscriptions**.

Return on Investment (ROI)

- **Subscription Model:** Premium users can **pay for unlimited access**.
- **Institution Licensing:** Universities can **integrate & pay** for access.

9. Conclusion

The **Question Paper Repository Web Application** will provide a **structured, secure, and scalable solution** for students to **upload, access, and search** past exam papers efficiently. This **credit-based, recommendation-driven** platform will **enhance academic resources** and **boost student participation**.

Next Steps: Approval from stakeholders & development kick-off 🚀