

# Yuvaan AI - Project Documentation

**Project Name:** Yuvaan AI

**Role:** Smart Hiring & Recruitment Platform

**Tech Stack:** MERN (MongoDB, Express.js, React + Vite, Node.js) + Tailwind CSS

**Current Status:** Functional MVP (Minimum Viable Product) with planned AI Microservices.

## 1. Project Overview & Behavior

**Yuvaan AI** is a dual-role recruitment platform designed to streamline the hiring process for both **Candidates** (Job Seekers) and **Employers** (Recruiters).

### Core Value Proposition

**New: AI-Powered Video Screening.**

**Replace First-Round Interviews with AI-Assisted Screening.**

**Yuvaan AI** basically reduces the time between HR and candidates by providing sufficient and deserving candidates for the role. It automates the initial screening process, allowing recruiters to focus only on top-tier talent.

Yuvaan helps HR teams save 70% of interview time by automating first-round video screenings with intelligent candidate analysis

### Key Behavior

- **Dual Authentication:** Users can sign up/login as either an "Employer" or a "Candidate." The dashboard and available features change dynamically based on this role.
- **Real-Time Data:** All actions (Posting jobs, applying, shortlisting) are instantly saved to a MongoDB database and reflected across the platform.
- **Status Workflow:** The platform manages the full lifecycle of an application:
  - Pending -> Interviewing -> Completed -> Shortlisted / Rejected .

## 2. Detailed Page Functionality

### A. Authentication Module

- **Login / Register ( /login , /register ):**
  - **Feature:** Role selection (Employer/Candidate) via visual cards.
  - **Behavior:** Authenticates user against MongoDB `users` collection. Stores JWT token and user info in `localStorage` .

- **Security:** Prevents cross-role login (e.g., An Employer cannot log in via the Candidate form).

## B. Employer Module (Recruiter View)

- **Dashboard** (`/employer/dashboard`):
  - **Stats:** Displays total jobs posted, interviews conducted, and active candidates.
  - **Recent Jobs:** Lists the 5 most recent job postings with status badges.
  - **Recent Candidates:** Lists recent applicants with their current status and AI score.
- **Post a Job** (`/employer/create-job`):
  - **Feature:** Form to create a job with Title, Description, Skills, Experience Level.
  - **AI Feature:** "Generate Questions" button (Simulated AI, transitioning to LLM) creates 5 relevant interview questions based on the job description.
- **Candidates List** (`/employer/candidates`):
  - **Feature:** A searchable, filterable table of *all* applicants across all jobs.
  - **Filters:** Search by Name/Role/Email, Filter by Status (Pending, Shortlisted, etc.).
- **Application Details** (`/employer/applications/:id`):
  - **Deep Dive:** Shows Candidate Name, Email, Resume link, and Interview Score.
  - **Actions:**
    - **View Resume:** Opens uploaded PDF in a new tab.
    - **Shortlist:** Updates status to `Shortlisted`.
    - **Reject:** Updates status to `Rejected`.
    - **Undo:** Allows reverting a decision back to `Pending`.
- **AI Reports** (`/employer/reports`):
  - **Analytics:** Visual graphs showing Hiring Funnel (Applied vs Interviewed vs Hired) and Average AI Scores.
- **Settings** (`/employer/settings`):
  - **Profile:** Update Name/Email (Persists to Database).
  - **Security:** Password reset UI.

## C. Candidate Module (Job Seeker View)

- **Dashboard** (`/candidate/dashboard`):
  - **Stats:** Overview of Applied Jobs, Pending Reviews, and Profile Completeness.
  - **Job Feed:** List of available jobs fetched from the database.
  - **Smart Action Buttons:**
    - "Take Interview" (If new).

- "Continue" (If already applied).
- "Submitted" (If interview finished).
- **Interview Page** (`/candidate/interview/: jobId`):
  - **Video UI:** Camera & Microphone preview (Simulated recording logic).
  - **Question Flow:** Steps through the specific questions generated for that job.
  - **Submission:** Updates application status to `Completed` and generates a mock AI score (Placeholder for ML Evaluator).
- **Profile Page** (`/candidate/profile`):
  - **Resume Upload:** Upload PDF files via `Multer`.
  - **Status Check:** Visual indicator (Green Checkmark) if a resume is already on file.

### 3. Backend Architecture & Future AI Integrations

#### Directory Structure

```
backend/
  ├── models/
  │   ├── User.js      (Name, Email, Role, ResumeLink)
  │   ├── Job.js       (Title, Desc, Questions, EmployerID)
  │   └── Application.js (JobID, CandidateID, Status, Score)
  ├── routes/
  │   ├── authRoutes.js (Login/Register)
  │   ├── userRoutes.js (Profile Update, Resume Upload)
  │   ├── jobRoutes.js (Create Job, Get Jobs)
  │   └── applicationRoutes.js (Apply, Status Update, Fetch Lists)
  ├── middleware/
  │   └── uploadMiddleware.js (Multer config for PDFs)
  └── uploads/          (Physical storage for resume files)
```

#### Proposed AI/ML Microservice Architecture

To reduce the gap between HR and candidates, a Python-based microservice is required to handle heavy ML tasks. This service will communicate with the Node.js backend.

#### Required ML Models:

1. **Speech-to-Text Model:**
  - **Function:** Transcribes the candidate's video interview audio into text.
  - **Tech:** OpenAI Whisper / Google Speech API.
2. **Question Generator Model:**
  - **Function:** Generates dynamic, role-specific interview questions based on the Job Description (JD).

- **Tech:** LLM integration (Gemini Pro / GPT-4).
3. **Evaluator Model:**
- **Function:** Analyzes the transcribed text against the expected answer key. It evaluates confidence, keywords, and sentiment.
  - **Tech:** Custom NLP pipelines or LLM-based grading prompts.

## Real-Time Communication Layer

- **Socket.io Integration:** Essential for real-time collaboration.
  - **Usage:** Live notifications when a candidate applies, real-time status updates on the dashboard without refreshing, and future chat functionality between HR and Shortlisted candidates.

## 4. Features Implemented vs. Future Roadmap

### Features Completed (The MVP)

1. **Full Auth System:** Secure Login/Signup with Role-based access control.
2. **Job Management:** Employers can create, view, and manage job listings.
3. **Application System:** Candidates can apply, preventing duplicate applications.
4. **Interview Workflow:** Simulated video recording flow with question navigation.
5. **Hiring Logic:** Employers can Shortlist/Reject candidates, updating the database in real-time.
6. **File System:** Resume Upload (PDF) and Retrieval via Multer.
7. **Analytics:** Basic reporting dashboard for Employers.
8. **Responsive UI:** Mobile-friendly layouts using Tailwind CSS.

### Future Roadmap (To be Developed)

1. **Advanced Backend with Socket.io:**
  - Implement `Socket.io` server-side to enable instant notifications for employers when a high-scoring candidate applies.
  - Enable live status updates for candidates (e.g., seeing "Shortlisted" pop up instantly).
2. **Integration with LLM Models:**
  - Connect Node.js backend to a Python Flask/FastAPI service.
  - **Workflow:**
    1. Candidate records video -> Upload to Cloud.
    2. **Speech-to-Text** model transcribes audio.
    3. **Evaluator** model compares transcript with Job Description.

4. **Question Generator** creates unique questions for follow-up rounds.

### 3. **Real Video Storage:**

- *Current:* Recording is UI-only.
- *Future:* Implement `MediaRecorder` API to capture video blobs and upload them to AWS S3 or Cloudinary.

### 4. **Chat System:**

- Allow direct messaging between Employer and Shortlisted candidates using the Socket.io infrastructure.

## 5. Summary of Project Functionality

**Yuvaan AI** is currently a robust **Hiring Management System**. It successfully digitizes the recruitment workflow, replacing spreadsheets and emails with a centralized dashboard. It handles data persistence, file management, and complex user flows (Employer vs Candidate) seamlessly.

The project is now poised for the next phase: **Intelligence Integration**. By adding Socket.io for real-time collaboration and integrating specific ML models (Speech-to-Text, Question Generator, Evaluator), Yuvaan AI will fulfill its promise of drastically reducing hiring time and automating the identification of deserving candidates.