Project Title
Autonomous Recruitment Agent using GenAI for HR & Talent Acquisition

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Problem Statement:

Traditional recruitment processes are slow, manual, and fragmented—especially when screening resumes, scheduling interviews, collecting feedback, and managing onboarding. This project aims to build an intelligent, **autonomous recruitment agent** powered by **GenAI and workflow orchestration** to automate the end-to-end hiring lifecycle.

Project Objectives:

- Develop AI agents for resume screening, interview scheduling, feedback collection, and onboarding coordination.
- Integrate with real-world APIs (Google Calendar, Email, Calendly).
- Use GenAI capabilities like LLMs, vector embeddings, and agent frameworks (LangChain or Azure OpenAI).
- Deliver a functional HR Tech application prototype.

Tech Stack & Tools:

Component	**Tools**
LLM	GPT-4o / GPT-3.5-turbo with Function Calling
Vector Store	ChromaDB / Pinecone
Embeddings	OpenAI Embedding API / HuggingFace
Backend	FastAPI / Flask
Workflow	LangChain Agents / Azure Agentic Workflows
Database	PostgreSQL / DynamoDB
Calendar & Email	Google Workspace API / Microsoft Graph API
Frontend (Optional)	React / Streamlit
Deployment	Render / Railway / AWS EC2

Project Phases & Student Tasks

Phase 1: Exploration & Planning

Tasks:

- Research HRTech domain and current AI-based recruitment tools
- Understand key pain points in resume screening, scheduling, feedback, onboarding
- Study LLM APIs, LangChain, vector databases, embedding models

Deliverables:

- Literature review document
- Functional requirement specification (FRS)
- Tool feasibility report

Phase 2: Resume Screening Agent

Tasks:

- Build resume parser (use spaCy, PDFplumber, or pytesseract for OCR)
- Extract fields: name, email, skills, experience, education etc.
- Convert resumes and job descriptions into embeddings
- Use cosine similarity or FAISS/ChromaDB for profile matching
- Auto-score and shortlist resumes

Deliverables:

- Working resume parser
- Vector database integration
- Candidate match scoring dashboard

Outcomes:

- Automated shortlist generation from uploaded resumes

Phase 3: Interview Scheduling Agent

Tasks:

- Integrate Google Calendar / Calendly API
- Automate scheduling based on interviewer availability
- Send invites via email
- Allow autonomous rescheduling

Deliverables:

- Scheduling module with UI/API
- Logs of calendar invites and updates

Outcomes:

- AI agent that schedules/reschedules interviews autonomously

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Phase 4: Feedback Collection Agent

Tasks:

- Design interview feedback form for interviewers
- Collect structured data from form
- Auto-parse feedback and update candidate status
- Trigger emails: selected/rejected/hold

Deliverables:

- Feedback capture and parsing tool
- Candidate status update mechanism

Outcomes:

- Reduced feedback loop delays and human dependency

Phase 5: Onboarding Coordination Agent

Tasks:

- Send offer letters & onboarding documents (via email API)
- Collect ID proof, banking details, etc.
- Send reminders (nudge emails/SMS)
- Alert HR for delays/non-responsive candidates

Deliverables:

- End-to-end onboarding automation
- Admin dashboard to track onboarding progress

Outcomes:

- Seamless onboarding journey with minimal HR intervention

Phase 6: Testing, Integration & UI

Tasks:

- Connect all 4 agents in one orchestration pipeline
- Build simple UI to interact with agents (using Streamlit or React)
- Test against edge cases and real sample data
- Collect user feedback

Deliverables:

- Final integrated system
- User testing results and feedback report

Phase 7: Final Report, Demo & Submission

Tasks:

- Prepare technical report (architecture, code, tools used)
- Record demo video walkthrough
- Host final prototype (Render or localhost)
- Submit GitHub repo, ppt, and documentation

Deliverables:

- Final report
- Demo video
- Submission package

Final Deliverables

1. **Functional Prototype** of Autonomous HR Agent (4 modules)
2. **Source Code** with README
3. **Project Report (IEEE format)** with:
    - Architecture diagrams
    - LLM prompts/workflows
    - Screenshots
    - Evaluation metrics
4. **Demo Video**
5. **Poster & PPT for Evaluation Day**

Learning Outcomes for Students

By the end of this project, students will:

- Understand the application of GenAI and LLMs in HRTech.
- Gain experience with prompt engineering, vector search, agent orchestration.
- Build hands-on integration with real-world APIs.
- Learn to work collaboratively on a modular AI system.
- Understand agile development and Git-based collaboration.