**PROJECT TITLE : AI-POWERED INTERVIEW PREPARATION CHATBOT WITH RESUME ANALYZER**

**NAME :** AJINKYA MARICHE (23011026)

NISHANT GAKARE (23011032)

**AIM :**

In this experiment, we will learn how to identify **functional and non-functional requirements** from a given problem statement. These are the primary components of a **Software Requirements Specification (SRS)** for the Ai powered interview preparation chatbot with Resume analyzer**.**

**Introduction:**

Preparing for interviews can be a daunting process, especially for fresh graduates and professionals switching careers. The AI-Powered Interview Preparation Chatbot with Resume Analyzer is designed to address this challenge by offering tailored guidance through intelligent conversation and resume evaluation. This tool aims to simulate real interview scenarios and provide valuable insights by leveraging natural language processing and machine learning techniques.

**THEORY :**

Objectives :

### After completing this document, you will be able to:

### Identify functional and non-functional requirements for an AI-driven interview prep system

### Understand how resume analysis integrates into a conversational chatbot

### Recognize common design principles for intelligent career-assistive software

### **Requirements :**

Requirements specify what the system should do. In this case, the chatbot will provide:

* Personalized interview questions based on resume content
* Skill gap identification from resume analysis
* Real-time conversational simulation with feedback
* Tips and recommendations based on job roles and industry standards

Characteristics of Requirements :

1. **Unambiguity**
   * Clearly state what constitutes a “matched skill” or “gap” in the resume
   * Define response latency for chat interactions
2. **Consistency**
   * Ensure resume suggestions align with the interview questions generated
   * Maintain uniform feedback criteria across different resumes
3. **Completeness**

* Cover technical, behavioral, and HR interview domains
* Address varied user roles (freshers, experienced candidates, career switchers)

Categorization of Requirements :

User requirements:

* Users should receive feedback on resume strengths and weaknesses
* Users can chat with the bot to practice common interview questions
* The system should allow uploads of resume files in standard formats (PDF, DOCX

System requirements:

* The system shall analyze resumes using NLP every time a resume is uploaded
* The chatbot shall maintain conversation context for personalized question flow
* System shall retrieve job role-specific templates from its knowledge bas

Functional Requirements:

### The system shall allow resume upload and extract relevant sections (e.g., skills, education, experience)

### The system shall identify missing keywords for target job roles

### The chatbot shall generate personalized interview questions based on resume insights

### The chatbot shall engage in natural-sounding Q&A sessions simulating different interview formats

### The system shall provide instant feedback and improvement suggestions

### **Preparing Software Requirements Specifications**

**Software Requirements Specification (SRS) Document**

**1. Introduction**

* **Purpose**:  
  To assist job seekers in preparing for interviews by offering automated mock interviews and personalized resume feedback.
* **Scope**:  
  A web-based application that simulates job interviews using chatbot technology and evaluates resumes based on industry expectations. The system is targeted toward students and professionals.
* **Overview**:  
  IPCRA allows users to upload resumes, engage in interactive AI-based interviews, receive improvement suggestions, and track progress over time.

**2. General Description**

* **Functions**:
  + Resume Upload and Analysis
  + Job Role Selection
  + Dynamic Interview Simulation
  + Feedback and Recommendations
  + Dashboard with History and Statistics
* **User Community**:
  + Registered Students
  + Job-Seeking Professionals
  + Career Advisors / Admins

**3. Functional Requirements**

* **Possible Outcomes**:
  + Resume parsing and feedback report
  + Mock interview simulation with scoring
  + Suggestions for improvement and learning
* **Input-Output Relationship**:
  + Input: User credentials, resume file, selected job role
  + Output: Feedback report, interview transcript, readiness score

**4. User Interface Requirements**

* **Software Interfaces**:
  + Resume Analyzer (PDF/DOCX parser)
  + Chatbot UI with follow-up prompts
  + Admin panel for tracking and reporting
* **Examples**:
  + Upload resume button with drag-and-drop
  + Chat window with typing and voice input
  + Dashboard cards showing latest activity

**5. Performance Requirements**

* **Response Time**:
  + Resume feedback within 5–10 seconds
  + Interview question response < 2 seconds
* **Throughput**:
  + Handle 100 concurrent interviews
* **Scalability**:
  + Modular backend allows integration of new job domains

**6. Non-Functional Attributes**

* **Usability**:
  + Mobile responsive UI
  + Clear action prompts for each step
* **Reliability**:
  + 99.9% uptime required
  + Fault-tolerant interview logs
* **Security**:
  + Passwords stored as hashed values
  + Resume files deleted after session completion
  + GDPR-compliant data handling

**7. Schedule and Budget**

* **Timeline**:
  + Requirement gathering: 1 week
  + Design and development: 4–6 weeks
  + Testing and deployment: 2 weeks
* **Cost Estimate**:
  + Frontend tools: ₹15,000
  + Backend/NLP APIs: ₹30,000
  + Testing: ₹5,000
  + Total Estimate: ₹50,000

**8. Appendices**

* **Supplementary Information**:
  + Example resumes and chatbot transcripts
  + Job role templates and question banks
* **Glossary**:
  + NLP: Natural Language Processing
  + IPCRA: Interview Preparation Chatbot & Resume Analyzer
  + ATS: Applicant Tracking System

**SIMULATION:**

### **Functional Requirements**

The AI-Powered Interview Preparation Chatbot with Resume Analyzer should allow users to **register and log in** based on their profile, such as *fresher*, *experienced professional*, or *career switcher*. Once authenticated, users must be able to **upload their resumes** in supported formats like PDF or DOCX.

The system should automatically **analyze the resume**, extracting relevant sections such as **skills, experience, education, achievements**, and comparing them against selected **job role templates** to identify **gaps** or **matched criteria**.

The chatbot should simulate **interview sessions**, asking **personalized questions** based on the resume content, targeted job role, and user profile. It should support multiple interview types including:

* Technical interviews
* HR and behavioral interviews
* Situational case-based interviews

The system must provide **real-time feedback** during the mock interview session, identifying strengths, improvement areas, and response style. It should also generate a **summary report** at the end, including:

* Skill match percentage
* Suggested improvements for resume and answers
* Industry readiness rating

A user-friendly dashboard should display previous interview attempts, feedback history, and resume performance over time. Users must be able to filter past sessions by date, job role, or interview type. Additionally, users should be allowed to **re-upload updated resumes** and restart the simulation as needed.

**PROCEDURE:**

#### **General Instructions:**

#### To perform the experiments in the Software Engineering Virtual Lab using the AI-Powered Interview Preparation Chatbot with Resume Analyzer as the chosen topic, follow these general steps:

#### **Read the theory** related to resume analysis and AI-based interview preparation systems.

#### **Understand the simulation** based on the chatbot’s functionality and expected outputs.

#### (Optional) Take the **self-evaluation** to assess your grasp of system behaviour and design principles.

#### **Attempt and solve** the exercises focused on functional and non-functional design decisions.

#### **Experiment-Specific Instructions (**for AI Interview Chatbot**):**

* **Carefully read the problem statement** for the AI-based interview system and resume analyzer.

1. **Identify inconsistencies or gaps** in the requirements, such as missing feedback mechanisms or unsupported resume formats.
2. **Clearly define the functional and non-functional requirements**, including chatbot interactions, resume parsing, personalization, and performance standards.
3. If using the virtual lab interface, **select the appropriate fields or features** (e.g., resume upload, job role selection, mock interview settings) and click **‘Submit’** to begin the experiment.

**CASE STUDY:**

**1: AI-Powered Interview Preparation Chatbot with Resume Analyzer**

The Virtual Career Development Lab has been setup to support job-seeking students and professionals with advanced career preparation tools. It hosts intelligent systems that combine AI technologies with user-friendly interfaces for skills enhancement, resume analysis, and interview simulation.

As the need for career guidance continues to grow, it has been proposed to develop an AI-Powered Interview Preparation Chatbot with Resume Analyzer (IPCRA). This web-based solution will allow registered users to receive intelligent feedback on their resumes and simulate job interviews tailored to their target roles. While resume analytics evaluate skills, gaps, and formatting, the chatbot conducts dynamic interview sessions based on uploaded resume data. For administrators, the system will offer dashboards showing performance trends and usage statistics.

The final deliverable is a secure web application that uses modern frameworks and natural language processing APIs to deliver personalized guidance. Although this system is available only within an institutional network, measures will be taken to ensure no sensitive user data (like authentication details) are stored in plain text.

**Identification of Functional Requirements**

From the system overview, we can extract key functions, even before deep analysis:

**User Registration**

Any student or professional wishing to use the IPCRA system must register by providing basic personal info, target job roles, and credentials. On successful registration, a user ID and password is created. These credentials are used for all future sessions.

**User Login**

A registered user logs into the system using their credentials. Upon success, they are directed to a personalized dashboard featuring:

* Resume upload
* Role-based interview configuration
* Feedback history  
  Failed login attempts trigger security protocols. After three incorrect tries, the user is prompted with their security question. If answered correctly, a reset link is sent to their email. Otherwise, the account is temporarily locked until admin intervention.

**Resume Upload and Analyzer**

Users can upload resumes in supported formats. The analyzer scans:

* Skills
* Education
* Work experience
* Formatting patterns  
  It flags missing competencies for selected job roles and suggests improvements.

**Interview Simulation**

Based on resume content and selected roles, the chatbot initiates mock interviews covering:

* Technical questions
* Behavioral and HR scenarios
* Job-specific topics  
  Performance metrics are tracked per session. Feedback and Suggestions

**Post interview, the system provides:**

* Skill match reports
* Suggested improvements
* Readiness score  
  These reports are stored and available for download.

**Search Features**

Users and admins can search feedback reports by:

* User ID
* Job role
* Interview type
* Date of simulation

**Table 01: Identifier and Priority for Software Requirements**

| No | Requirement | Priority |
| --- | --- | --- |
| R1 | New User Registration | High |
| R2 | User Login | High |
| R3 | Resume Upload & Analysis | High |
| R4 | Interview Simulation with Chatbot | High |
| R5 | Feedback Generation & Visualization | High |
| R6 | Security-Based Account Recovery | Medium |
| R7 | Dashboard Search Features | Medium |

**Identification of Non-Functional Requirements**

**Performance Requirements**

* The system should operate 24x7
* Up to 1,000 users should be able to access simultaneously without lag

**Security Requirements**

* System restricted to institutional intranet or verified user base
* Passwords must be hashed and securely stored
* Resume data must not be used for external training models without consent Software Quality Attributes
* Conversational accuracy of chatbot must improve over time using feedback loops
* Resume analyzer must adapt to evolving job market keywords

**Database Requirements**

* Resume metadata and feedback must be stored securely
* Interview session logs must be retained for audit purposes

**Design Constraints**

* Must be developed as a responsive web app, working in Chrome, Firefox, Edge
* The chatbot must utilize a language model API with support for follow-up queries
* Resume parsing engine must support PDF, DOCX and TXT formats

**FLOW DIAGRAM:**.

**A diagram of a chatbot

AI-generated content may be incorrect.**

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  A commercial AI interview bot offering real-time coaching and resume feedback.
* [Bossed.ai](https://bossed.ai/)  
  Voice-powered AI interview simulator with personalized feedback and difficulty levels.
* [Enhancv Resume Checker](https://enhancv.com/resources/resume-checker/)  
  ATS-friendly resume checker with AI-powered suggestions and formatting tips.

**Conclusion**

The IPCRA system streamlines career readiness through smart resume analysis and interactive interview simulations. It empowers users with personalized feedback and skill insights while ensuring secure access and high performance within the institutional network. With well-defined requirements and modern web technologies, IPCRA sets the foundation for scalable, AI-driven career guidance.