
Software Requirements Specification

for

VR-Based Job Interview Simulator

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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Draft Type and Number	Full Name	Information about the revision. This table does not need to be filled in whenever a document is touched, only when the version is being upgraded.	00/00/00

1. Introduction

The **VR-Based Job Interview Simulator** is a virtual reality application designed to help users practice and improve their job interview skills. It provides a realistic and immersive interview environment where users can face common interview questions and situations. The simulator uses advanced AI to analyze body language, speech, and eye contact, giving users real-time feedback to help them improve their communication skills.

This project aims to make users more confident and prepared for real-life interviews by providing personalized feedback and performance tracking. It includes different types of interview scenarios, such as technical interviews, HR interviews, and stress interviews, allowing users to experience a wide range of interview types. The application also tracks user progress over time, helping them identify their strengths and areas for improvement.

1.1 Document Purpose

The purpose of this Software Requirements Specification (SRS) is to clearly define the requirements for the **VR-Based Job Interview Simulator**. This document provides a complete description of the system, including its goals, features, and technical requirements. It serves as a guide for developers, testers, project managers, and academic supervisors to ensure a shared understanding of the project.

This SRS covers all aspects of the project, including:

- The functional requirements, such as real-time feedback, progress tracking, and personalized reports.
- The non-functional requirements, including performance, security, and data privacy.
- The external interfaces required to integrate the VR system with hardware and software components.
- The assumptions, dependencies, and constraints that may impact the project.

The main goal is to provide a clear and accurate foundation for the design, development, testing, and evaluation of the VR-Based Job Interview Simulator.

1.2 Product Scope

The VR-Based Job Interview Simulator is a comprehensive virtual reality application designed to help users practice and improve their job interview skills. The main goal of this project is to create a realistic interview environment that provides users with valuable experience before facing real-life interviews. The simulator will use AI to provide real-time feedback on important communication aspects, including body language, speech clarity, and eye contact.

The product aims to support a wide range of interview scenarios, including:

- **Technical Interviews:** Focused on assessing a candidate's technical knowledge and problem-solving skills.
- **HR Interviews:** Designed to evaluate soft skills, personality, and cultural fit.
- **Stress Interviews:** Simulating high-pressure situations to test a candidate's composure and response under stress.

The system will also include personalized feedback reports, progress tracking, and secure data management to protect user privacy. The application is intended to be used by students, job seekers, and career coaches to improve interview performance and build confidence.

Key Benefits:

- **Realistic Practice:** Immersive VR environments for realistic interview practice.
- **Personalized Feedback:** AI-driven analysis for detailed performance insights.
- **Progress Tracking:** Continuous performance evaluation to identify strengths and weaknesses.
- **Flexible Scenarios:** Support for various interview types and difficulty levels.

What the Product Does Not Do:

- The simulator does not provide real-time job matching or job application assistance.
- It does not offer direct human coaching or personalized mentorship.
- It is not designed for conducting live interviews or real-time video calls.
- The system does not guarantee job placement or employment outcomes.
- It does not include automated resume review or writing assistance.
- The application requires a VR headset for full functionality and is not designed for use on standard desktops or mobile phones without VR support.

1.3 Intended Audience and Document Overview

This document is intended for the following audiences:

- **Job Seekers** – Primary users who will use the simulator to practice and improve their interview skills.
- **Admins/Trainers** – Users who configure scenarios, assign interviews, and review user performance.

- **Peers** – Fellow users who participate in mock peer interviews.

This SRS is organized into the following sections:

- **Section 1:** Introduction – Provides an overview of the project, including its purpose, scope, and audience.
- **Section 2:** Overall Description – Describes the product's background, functionality, constraints, and assumptions.
- **Section 3:** Specific Requirements – Lists the detailed functional and non-functional requirements.
- **Section 4:** Other Non-functional Requirements – Includes performance, safety, and software quality requirements.
- **Section 5:** Appendices – Contains supporting information, such as the data dictionary and group log.

Each section is designed to give a clear and structured overview of the project to ensure that all team members have a consistent understanding of the system's goals and requirements.

1.4 Definitions, Acronyms and Abbreviations

This section provides a list of important terms, abbreviations, and acronyms used throughout this SRS document to ensure clear understanding:

- **SRS (Software Requirements Specification):** A detailed document that describes the requirements for a software system.
- **VR (Virtual Reality):** A computer-generated simulation of a 3D environment that can be interacted with using special equipment, such as a VR headset.
- **AI (Artificial Intelligence):** The use of algorithms and machine learning models to simulate human intelligence and provide real-time feedback.
- **GUI (Graphical User Interface):** The visual part of the software that allows users to interact with the system through buttons, menus, and icons.
- **API (Application Programming Interface):** A set of tools and protocols that allow different software applications to communicate with each other.
- **FPS (Frames Per Second):** The number of frames displayed per second in a video or virtual environment, affecting the smoothness of the experience.

- **HR (Human Resources):** The department responsible for hiring, managing, and evaluating employees within a company.
- **GDPR (General Data Protection Regulation):** A legal framework by the European Union that sets guidelines for the collection and processing of personal data to ensure user privacy and data protection.
- **UC (Use Case):** A specific scenario that describes how a user interacts with a system to achieve a particular goal.
- **SDK (Software Development Kit):** A collection of tools, libraries, and documentation that developers use to build applications for specific platforms or services.
- **HTC Vive (HTC Virtual Interface Environment):** A high-end virtual reality headset developed by HTC that provides immersive 3D experiences using motion tracking and spatial sensors.
- **IEEE (Institute of Electrical and Electronics Engineers):** A global organization that sets technical standards and guidelines for electronics, computing, and software engineering, including software documentation practices.
- **AI (Artificial Intelligence):** The simulation of human intelligence in machines using algorithms and models to perform tasks like learning, reasoning, and decision-making.
- **Progress Report:** A detailed summary of a user's performance over multiple interview sessions, highlighting strengths and areas for improvement.
- **Eye Contact Tracking:** The process of monitoring where a user is looking during the interview to assess engagement and focus.
- **Body Language Analysis:** The assessment of physical movements and posture during the interview to evaluate confidence and professionalism.
- **Speech Analysis:** The process of evaluating a user's speech for tone, clarity, and vocabulary usage to provide meaningful feedback.
- **User Profile:** The collection of a user's personal information, including name, email, performance history, and login details.
- **Authentication:** The process of verifying a user's identity before allowing access to the system.
- **Scenario:** A predefined set of interview questions based on specific job roles or industries.
- **Real-time Analysis:** The immediate processing of user speech, gestures, and eye movements to provide instant feedback.

- **Data Privacy:** The protection of user information from unauthorized access or misuse.
- **Response Time:** The time taken by the system to process user input and provide feedback.

1.5 Document Conventions

This document follows the standard formatting and structure for Software Requirements Specification (SRS) documents, including the following conventions:

1. Document Structure:

- Each section is clearly numbered for easy reference (e.g., 1.1, 1.2, 2.1).
- Main headings are in bold, size 14, and subheadings are in bold, size 14.
- Regular text is in size 14 with single line spacing for readability.

2. Language Style:

- Simple and clear language is used to make the document easy to understand for all readers.
- Technical terms are defined in the **Definitions, Acronyms, and Abbreviations** section.
- Active voice is preferred for clarity (e.g., "The system provides feedback" instead of "Feedback is provided by the system").

3. Formatting Standards:

- All sections use consistent formatting for lists, tables, and diagrams.
- Important terms and acronyms are highlighted on their first use.
- Diagrams and figures are clearly labeled and referenced in the text.

4. Units and Measurements:

- All measurements are provided in standard units (e.g., seconds, frames per second, milliseconds).
- Numerical data is presented in tables where appropriate for clarity.

5. File Naming:

- All project files, including diagrams and reports, follow a consistent naming convention (e.g., **VR-Simulator-SRS-v1.0.doc**).

6. Version Control:

- The document version is included on the cover page and updated as needed.
- Major updates are noted in the **Revisions** section to track changes.

1.6 References and Acknowledgments

References:

- IEEE SRS Template – Used as the primary guide for the structure and content of this document.
- Course Notes for Software Reliability Engineering – Provided foundational knowledge for designing reliable and high-quality software systems.
- Research Papers on VR and AI – Articles on virtual reality, AI-based training, and realtime feedback systems that helped in defining the technical requirements.
- Online Resources – Various articles, tutorials, and technical documentation for VR development and AI integration.

Acknowledgments:

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- **Peer Reviewers:** Fellow students and classmates who provided constructive feedback on early drafts of this SRS.

2. Overall Description

2.1 Product Overview

The **VR-Based Job Interview Simulator** is a virtual reality application designed to help users practice and improve their job interview skills. The main purpose of this product is to provide a realistic and immersive interview environment, allowing users to experience various interview scenarios in a safe and controlled setting.

Key Features:

- **Realistic Interview Environments:** The system creates virtual interview rooms that closely mimic real-world settings, including office environments, conference rooms, and remote interview setups.
- **AI-Driven Feedback:** The simulator uses artificial intelligence to analyze the user's body language, speech clarity, eye contact, and overall communication skills, providing real-time feedback for improvement.
- **Multiple Interview Types:** The application supports different types of interviews, including:
 - **Technical Interviews:** Assess technical knowledge and problem-solving skills.
 - **HR Interviews:** Evaluate soft skills, personality, and cultural fit.
 - **Stress Interviews:** Test the candidate's ability to handle high-pressure situations.
- **Progress Tracking:** The system records user performance over time, allowing users to track their progress and identify areas for improvement.
- **Personalized Reports:** Users receive detailed performance reports, including strengths, weaknesses, and personalized improvement tips.
- **Secure Data Management:** The application ensures that user data is stored securely and protected against unauthorized access.

System Components:

- **VR Headset:** The primary hardware required to run the application, providing an immersive 3D environment.
- **AI Engine:** The core component that analyzes user performance and generates realtime feedback.
- **User Interface:** A simple and intuitive interface for navigating the application and accessing performance data.
- **Data Storage:** A secure database for storing user profiles, session history, and performance metrics.

Product Perspective:

This simulator is intended for use by students, job seekers, career coaches, and training institutions to improve interview performance and boost confidence. It can also be used by companies for internal training and assessment purposes. The product is designed to work with popular VR platforms like Meta Quest, HTC Vive, and other similar devices.

2.2 Product Functionality

The **VR-Based Job Interview Simulator** provides a wide range of features designed to help users improve their interview skills. The main functions of the system include:

Core Functionalities:

- **Realistic Interview Simulations:**
 - Provides immersive virtual environments that mimic real-world interview settings.
 - Supports different room layouts, including corporate offices, conference rooms, and remote setups.
- **AI-Driven Feedback:**
 - Analyzes user performance in real-time, focusing on body language, speech clarity, tone, eye contact, and confidence.
 - Identifies strengths and weaknesses to provide personalized improvement suggestions.
- **Multiple Interview Scenarios:**
 - Technical Interviews – Assess technical knowledge and problem-solving skills. ○
HR Interviews – Focus on soft skills, personality, and cultural fit.
 - Stress Interviews – Simulate high-pressure situations to test composure and decision-making.
- **Personalized Performance Reports:**
 - Generates detailed reports after each session, highlighting areas of strength and improvement. ○ Provides feedback on communication style, posture, and confidence level.
- **Progress Tracking and Analytics:**
 - Tracks user performance over time to show improvement trends.
 - Provides insights into strengths and areas that need more practice.
- **Customizable Interview Settings:**
 - Allows users to select difficulty levels, question types, and interview formats.
 - Includes random question generation for unpredictable interview practice.
- **Speech Analysis:**
 - Analyzes tone, clarity, and vocabulary usage to improve verbal communication.

- Detects filler words, pauses, and voice modulation issues.
- **Eye Contact and Body Language Monitoring:**
 - Uses VR sensors to track head movement and eye focus.
 - Provides feedback on maintaining proper eye contact and body posture.
- **Secure Data Management:** ○ Encrypts user data for privacy and security. ○ Supports secure login and password protection.

Additional Features:

- **Practice Mode:**
 - Users can practice common interview questions without time pressure.
- **Mock Interview Mode:**
 - Simulates a full-length interview with real-time feedback.
- **Personalized Tips and Recommendations:**
 - Provides actionable advice based on past performance.
- **Integration with Career Portals:**
 - Option to connect with career portals for job matching and application tips (future feature).

2.3 Design and Implementation Constraints

The design and development of the **VR-Based Job Interview Simulator** must consider several technical, hardware, and software constraints to ensure the system is efficient, reliable, and user-friendly. These constraints define the boundaries within which the project must be developed.

Hardware Constraints:

- **VR Headset Requirement:** The application requires a VR headset for full functionality, such as Meta Quest, HTC Vive, or similar devices.
- **High-Performance Graphics:** The system must support high frame rates (minimum 90 FPS) for a smooth and realistic user experience.
- **Spatial Tracking:** Requires accurate motion tracking for body language and eye contact analysis, which may depend on the quality of the VR hardware.

Processing Power: The system should be optimized to run smoothly on VR devices with limited processing power and memory.

Software Constraints:

- **AI Model Integration:** The system must use machine learning models for real-time speech analysis, body language detection, and feedback generation.
- **Real-Time Data Processing:** The application must process user input (e.g., speech, gestures, eye movements) in real-time to provide immediate feedback.
- **Data Security:** All user data must be securely stored and encrypted to prevent unauthorized access.
- **Cross-Platform Compatibility:** The system should be compatible with multiple VR platforms (e.g., Meta Quest, HTC Vive) to reach a larger audience.
- **User Interface Design:** The GUI must be simple, intuitive, and easy to navigate, even for users with limited VR experience.

Networking and Connectivity Constraints:

- **Internet Requirement:** Some features, like progress tracking and personalized reports, may require a stable internet connection.
- **Low Latency:** The system should maintain low latency (less than 20ms) to prevent motion sickness and ensure a responsive user experience.
- **Cloud Integration:** If cloud storage is used for performance data, it must have strong security and fast data retrieval times.

Project Management Constraints:

- **Development Time:** The project must be completed within the academic term to meet submission deadlines.
- **Budget Limitations:** The project must be developed within the available budget, which may limit the use of certain advanced technologies.
- **Team Skills:** The design should consider the technical skills of the development team, including VR programming, AI, and user experience design.

Legal and Ethical Constraints:

- **Data Privacy:** The system must comply with data protection regulations, such as GDPR, to protect user privacy.
- **Ethical AI Use:** The AI algorithms used should be fair, transparent, and free from bias in evaluating user performance.
- **User Safety:** The application should include safety warnings and breaks to prevent VR fatigue and discomfort.

Language and Libraries Constraints:

- The system shall be developed using a high-level programming language suitable for VR and AI applications, such as **C# (for Unity)** or **C++ (for Unreal Engine)**.
- The project may also use **Python** for machine learning models and speech analysis.
- Common libraries and tools may include:

Unity 3D or **Unreal Engine** for VR environment creation.

- **TensorFlow** or **PyTorch** for AI and machine learning.
- **OpenCV** for image and gesture recognition.
- **SpeechRecognition** or **Azure Speech SDK** for real-time speech analysis.
- **REST APIs** for integration with external services.

2.4 Assumptions and Dependencies

The successful development and operation of the **VR-Based Job Interview Simulator** depend on several assumptions and external factors. These assumptions must hold true for the project to meet its goals and deliver the expected results. If any of these assumptions are incorrect or change significantly, it could impact the project's scope, timeline, or performance.

Key Assumptions:

- **VR Hardware Availability:** Users have access to compatible VR headsets, such as Meta Quest, HTC Vive, or other popular devices.
- **Stable Internet Connection:** Users have a stable internet connection for data synchronization, real-time feedback, and software updates.

- **User Skill Level:** Users have basic knowledge of how to operate VR devices and interact with virtual environments.
- **AI Model Accuracy:** The AI algorithms used for speech, body language, and eye contact analysis are accurate enough to provide meaningful feedback.
- **Data Privacy Compliance:** The system must comply with relevant data privacy laws (e.g., GDPR) to protect user information.
- **Reliable Power Supply:** The hardware required for the simulator (e.g., VR headset, computer) must have a reliable power supply.

Regular Software Updates: The VR platform and supporting software libraries will continue to receive updates and support from their manufacturers.

Dependencies:

- **External Libraries and APIs:** The project depends on external libraries for AI, machine learning, and VR functionality, such as Unity, Unreal Engine, or OpenXR.
- **Speech Recognition Services:** The system may rely on third-party speech analysis APIs, like Google Speech-to-Text or Azure Speech Services, for accurate voice analysis.
- **Cloud Storage Providers:** If the project uses cloud storage for performance data, it will depend on the availability and reliability of these services.
- **Development Tools:** The project relies on development tools like Unity, Blender (for 3D modeling), and Python (for AI algorithms).
- **Team Collaboration:** Successful project completion depends on effective collaboration among team members, including developers, designers, and testers.
- **Testing and Feedback:** The system's accuracy and usability depend on extensive user testing and feedback during the development phase.

3. Specific Requirements

3.1 External Interface Requirements

The **VR-Based Job Interview Simulator** must interact with various external hardware and software components to deliver a seamless and immersive user experience. These interfaces define how the system communicates with external devices and platforms.

3.1.1 User Interfaces

VR Headset Interface: The main user interface is the VR headset, which provides the 3D virtual environment for interviews. This interface includes the following components:

- Virtual hands and gesture recognition for realistic interactions.
- Voice input for answering interview questions.
- Eye-tracking sensors (if available) for analyzing eye contact and focus.

Graphical User Interface (GUI): The simulator includes a simple, user-friendly GUI for tasks such as:

- Selecting interview types (technical, HR, stress).
- Viewing performance reports and progress tracking.
- Accessing settings and customization options.

Mobile and Web Interfaces (Optional): Future versions may include mobile or web apps for reviewing performance data and receiving personalized interview tips.

3.1.2 Hardware Interfaces

VR Headsets: The application must support popular VR headsets like Meta Quest, HTC Vive, and other similar devices. These headsets should provide:

- High-resolution displays for realistic visuals.
- Low-latency tracking for smooth interactions.
- High frame rates (90 FPS or higher) for comfort and realism.

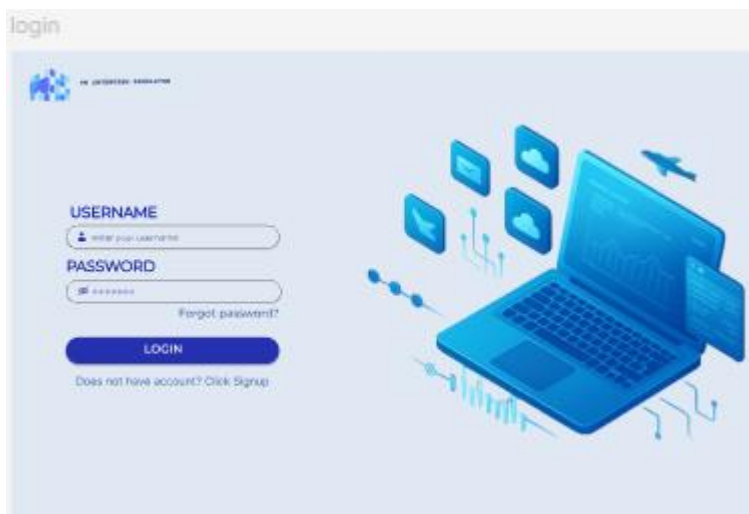
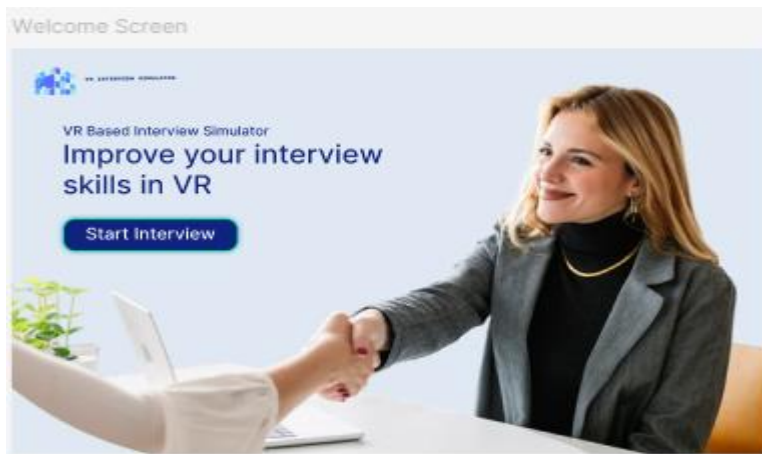
Motion Controllers: For hand gesture recognition and virtual hand interactions.

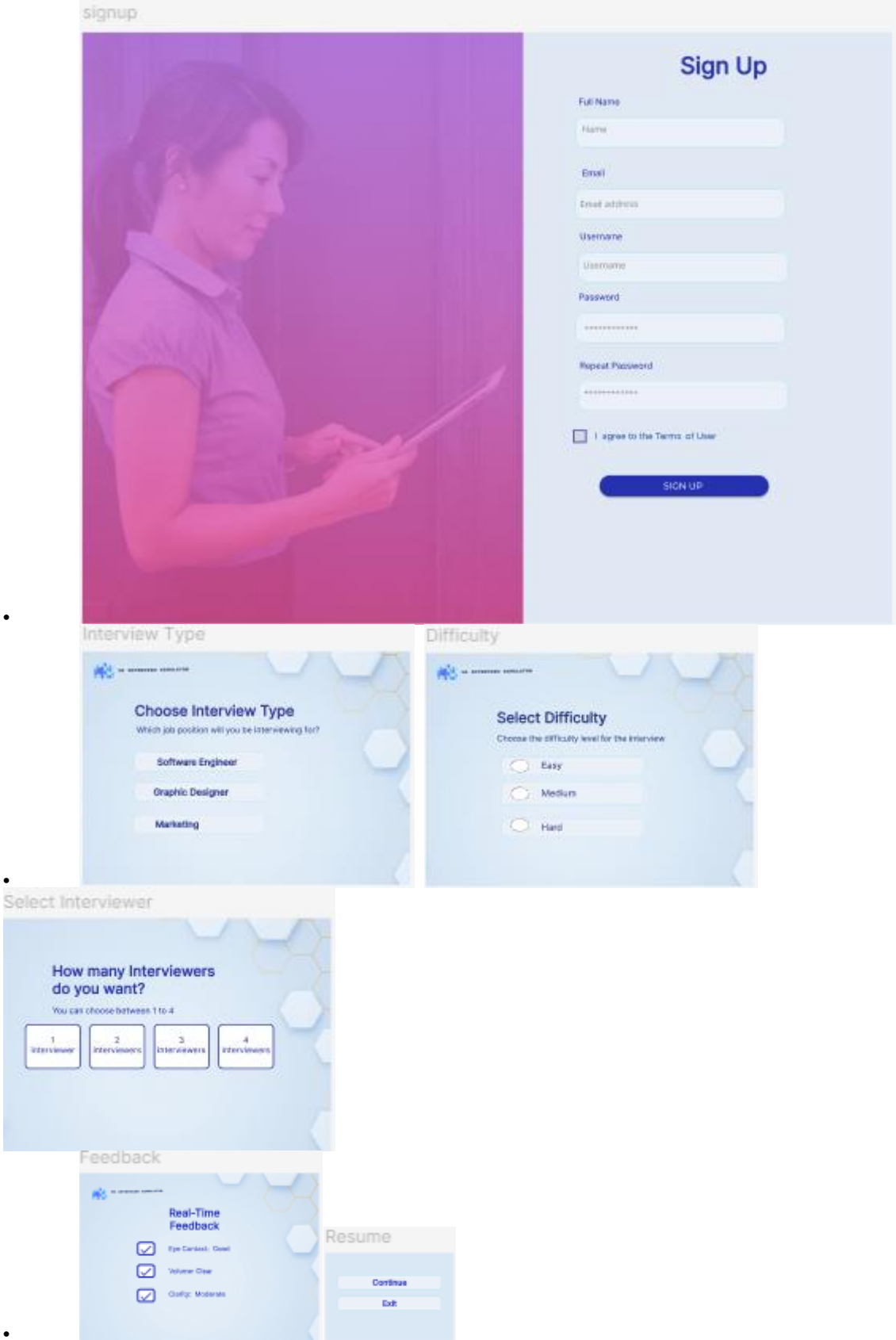
Microphone and Speakers: For real-time voice communication and audio feedback.

Haptic Feedback Devices (Optional): To enhance the sense of touch in future versions.

3.1.3 Software Interfaces

- **AI Analysis Module:** Interfaces with AI models for real-time feedback on speech, body language, and eye contact.
- **Speech Recognition API:** Integrates with external services like Google Speech-to-Text or Microsoft Azure Speech for accurate speech analysis.
- **Cloud Storage Services:** For storing user profiles, performance history, and personalized feedback.
- **Authentication Services:** For secure user login and data protection.
- **Analytics Platform:** For tracking user progress and generating performance reports.
- **2D Screens**





- 3D Screens
- 1 interviewer



- 2 interviewers



- **3 interviewers**



- **4 interviewers**



3.1.4 Software Limitations

Requires VR Hardware

The system cannot function without a compatible VR headset (e.g., Meta Quest, HTC Vive). Users without VR devices cannot access the main features of the simulator.

Internet Dependency

A stable internet connection is required for real-time feedback, AI-based speech analysis, user authentication, cloud storage, and progress tracking. Offline functionality is limited or unavailable.

Hardware Performance Requirements

The application requires high-performance devices capable of maintaining ≥ 90 FPS and low latency to prevent motion sickness. Lower-end VR systems may result in lag, reduced immersion, or poor performance.

User Skill Assumption

The simulator assumes users are familiar with VR hardware usage and basic virtual environment interactions. Inexperienced users may face a learning curve.

No Real-Time Job Matching

- The system does not connect users with real job opportunities or perform job applications. It is limited to skill-building simulations only.

No Human Mentorship

- The feedback and interaction are fully AI-driven. The simulator does not offer live coaching or interaction with real human interviewers.

Third-Party API Dependency

- The system relies on external APIs for speech recognition, AI analysis, and cloud storage. Downtime or changes in these services could impact system availability and performance.

Language and Accent Recognition

AI speech analysis may be less effective for users with strong regional accents or non-supported languages, potentially reducing feedback accuracy.

3.2 Functional Requirements

F1: Realistic Interview Environments

- The system shall provide immersive 3D virtual environments that closely resemble realworld interview settings.
- The system shall allow users to select different interview backgrounds, such as corporate offices, conference rooms, or remote workspaces.
- The system shall support realistic environmental sounds to enhance immersion.

F2: Multiple Interview Types

- The system shall support different interview types, including:
 - o Technical Interviews – Focused on problem-solving and technical skills.
 - o HR Interviews – Assess soft skills, personality, and cultural fit.
 - o Stress Interviews – Simulate high-pressure situations to test user composure.

F3: Real-Time Feedback

- The system shall provide real-time feedback on:
 - o Body language and posture.
 - o Eye contact and focus.
 - o Speech clarity, tone, and confidence.
- The feedback shall be personalized based on user performance and provided immediately during the interview.

F4: Randomized Question Sets

- The system shall provide a wide range of interview questions, including technical, behavioral, and situational questions.
- The system shall select questions randomly to simulate real-life interview unpredictability.

F5: Personalized Performance Reports

- The system shall generate personalized reports after each interview, including:
 - o Overall performance score.
 - o Strengths and weaknesses.
 - o Areas for improvement.
- The system shall store these reports for future reference.

F6: Progress Monitoring

- The system shall track user performance over multiple sessions.
- The system shall display progress trends over time to help users identify improvement areas.

F7: Skill Analysis

- The system shall analyze user speech for tone, clarity, and vocabulary.
- The system shall detect filler words, pauses, and speech patterns to provide detailed feedback.

F8: Customizable Interview Settings

- The system shall allow users to customize interview settings, including difficulty levels, question types, and interview durations.
- The system shall support industry-specific scenarios (e.g., technology, finance, healthcare).

F9: Secure Data Storage

- The system shall securely store user data, including performance history and personalized feedback.
- The system shall protect user data from unauthorized access.

F10: Data Privacy and Compliance

- The system shall comply with data privacy regulations (e.g., GDPR) to protect user information.
- The system shall include secure authentication mechanisms for user login.

F11: Intuitive User Interface

- The system shall provide a simple, user-friendly interface for easy navigation and control. • The system shall support gesture-based controls for natural interactions in the VR environment.

F12: Third-Party API Support

- The system shall support integration with external APIs for speech recognition, AI analysis, and performance tracking.

F13: Trainer-Assigned Custom Scenarios

- The system shall allow trainers or administrators to assign predefined or custom interview scenarios to users.
- The system shall support assigning scenarios based on difficulty level, industry, and role.
- The assigned scenarios shall be accessible to the user upon login.

F14: Role-Based AI Question Generation

- The system shall use AI to generate and ask interview questions based on the selected job role.
- The system shall extract key skills from the role and adjust the question complexity accordingly.
- The system shall adapt follow-up questions based on user responses in real time.

F15: Session Repetition Feature

- The system shall allow users to repeat previous interview sessions for practice.
- The system shall store and list completed sessions with timestamps and question categories.
- The system shall offer the option to replay AI feedback from the repeated session.

F16: Personal Goal Setting and Tracking

- The system shall allow users to set custom goals related to their interview preparation.
- The system shall track progress toward these goals over time.
- The system shall display visual progress indicators on the user dashboard.

F17: User Profiles and Login

- The system shall provide secure user authentication and profile creation.
- The system shall store individual progress history, preferences, and performance reports.
- The user shall be able to update their profile details from the dashboard.

F18: Interview Reminders and Rescheduling

- The system shall allow users to schedule and reschedule mock interview sessions.
- The system shall send automated reminders via email or notifications before the interview time.
- The system shall alert users if they miss a session and offer rescheduling options.

F19: Multi-Language Support

- The system shall support conducting interviews in multiple languages selected by the user.
- The system shall ensure accurate speech analysis and feedback in the chosen language.
- The system shall allow switching languages from the settings panel.

F20: Peer Interview Matching

- The system shall allow users to connect with a peer for live interview practice.
- The system shall match peers based on availability and interview type preferences.
- The system shall provide a rating and feedback system after each peer session.

F21: Role Switching in Peer Mode

- The system shall allow users to take the role of either interviewer or interviewee in peer interview sessions.
- The interviewer shall have access to structured question sets and note-taking tools.
- The system shall alternate roles based on user preference or session structure.

F22: Shared Code Editor for Technical Interviews

- The system shall include a built-in shared code editor for technical interview sessions.
- The code editor shall support real-time collaborative coding with syntax highlighting.
- The editor shall log the code session for later feedback and review.

F23: Structured Interview Questions

- The system shall provide a curated set of structured questions for various roles and interview types.
- The questions shall be grouped by category, difficulty, and role relevance.
- Trainers and admins shall be able to update or add new question sets.

F24: Peer Feedback and Rating

- The system shall allow users to rate each other after a peer interview session.
- The system shall provide optional feedback forms with structured criteria.
- The feedback shall be visible to the user in their profile.

F25: Inappropriate Behavior Reporting

- The system shall allow users to report inappropriate behavior during live or peer sessions.
- The report shall be submitted to admins for review and possible action.
- The system shall notify the user when the report has been reviewed.

F26: Time-Limited Sessions

- The system shall allow users or admins to set time limits for each interview session.
- The system shall display countdown timers during the session.
- The system shall auto-end the session when the timer expires and begin analysis.

F27: Peer Session Scheduling

- The system shall allow users to schedule peer interview sessions through a shared calendar.
- The system shall show availability slots of matched peers in real time.
- The system shall confirm and notify both users upon successful scheduling.

F28: Session Start Notifications

- The system shall send a notification to users before the start of a scheduled interview or peer session.
- Notifications shall be sent through email, in-app alerts, or both depending on user preferences.
- The system shall display a countdown to start within the VR environment or dashboard.

F29: Realistic Avatar Expression Mapping

- The system shall map user facial expressions onto their VR avatar using headset sensors (if available).
- The system shall animate lip-sync and emotions based on speech and facial movement.
- The system shall provide feedback if the user's expressions appear inappropriate or mismatched during the interview.

F30: Industry-Specific Question Banks

- The system shall include predefined question banks for specific industries (e.g., IT, finance, healthcare, marketing).
- The system shall allow admins to update or add custom questions to each industry bank.
- The system shall use job role and selected industry to filter the question pool dynamically.

F31: Interviewer Tone Simulation

- The system shall simulate different interviewer personalities (friendly, neutral, strict) to reflect real-world diversity.
- The user shall be able to select or randomize the interviewer tone for each session.
- The system shall adjust pacing, tone, and reaction timing based on selected interviewer type.

F32: AI Confidence Scoring

- The system shall calculate and display a "confidence score" after each session based on vocal strength, body language, and timing.
- The system shall explain the score using key performance indicators (e.g., steady voice, consistent eye contact).
- The score shall be tracked over time in performance reports.

F33: Onboarding and First-Time User Guide

- The system shall provide a guided tutorial for first-time users explaining controls, navigation, and features.
- The system shall allow users to skip or replay the tutorial anytime from the settings menu.
- The onboarding shall include demo interview questions with feedback examples.

F34: Cross-Device Sync and Access

- The system shall sync user data across supported VR devices (e.g., Meta Quest, HTC Vive). • The system shall allow users to access progress reports from web or mobile dashboards even outside VR.
- The system shall notify users of sync issues or multiple logins.

F35: Offline Mode (Limited Functionality)

- The system shall offer an offline mode with limited features for environments with no internet access.
- The offline mode shall include access to saved sessions, basic interview scenarios, and question banks.
- Data shall be synced to the cloud once the internet is available.

F36: Safety and Health Break Alerts

- The system shall monitor the session duration and prompt users to take breaks after extended usage.
- The system shall display visual reminders to prevent VR fatigue, eye strain, and dizziness.
- The user shall be able to customize the break frequency in settings.

F37: Interview Environment Customization

- The system shall allow users to change the interview room's lighting, color theme, and furniture style.
- The system shall provide a preview before applying environment changes.
- Custom environments shall be saved as presets in the user profile.

F38: Accessibility Voice Navigation

- The system shall support voice-controlled navigation for users with motor disabilities.
- The system shall respond to voice commands for starting interviews, changing settings, and repeating questions.
- The voice navigation feature shall be toggled from accessibility settings.

F39: Mock Group Interview Mode

- The system shall simulate group interviews where multiple virtual interviewers interact with the user.
- The system shall present questions in turns from each virtual panelist.
- Feedback shall include how well the user addressed each interviewer.

F40: Stress Level Indicator

- The system shall monitor and estimate the user's stress level during interviews using biometric or behavioral data (if hardware supports).
- The system shall display stress trends in the performance report.

- The system shall suggest calming techniques if stress spikes during sessions.

3.3 Use Case Model

Use Case Diagram:

A visual use case diagram will be provided separately to show main actors (Job Seeker, System, AI Engine, Admin, Peer, Cloud Storage) and their interactions with system modules (e.g., Register/Login, Start Interview, Receive Feedback, View Reports, Conduct Peer Interview).

3.3.1 Use Case #U1: Register/Login to System

- **Author:** System Authenticator
- **Purpose:** Allow users to securely register, log in, and access personalized features.
- **Preconditions:** User opens the app and internet is available.
- **Post conditions:** User is authenticated and redirected to dashboard.
- **Actors:** Job Seeker, System (Authentication Module), Cloud Storage

3.3.2 Use Case #U2: Configure Interview Scenario

- **Author:** Admin
- **Purpose:** Allow users or admins to select interview type, role, and difficulty level.
- **Preconditions:** User is logged in.
- **Post conditions:** Interview configuration is saved and applied.
- **Actors:** Job Seeker, Admin, System

3.3.3 Use Case #U3: Start Simulated Interview

- **Author:** VR Engine
- **Purpose:** Begin a virtual interview session in a realistic 3D environment.
- **Preconditions:** Scenario configured and VR headset calibrated.
- **Post conditions:** Session initiated and user interaction recorded.
- **Actors:** Job Seeker, System (VR Environment), AI Engine

3.3.4 Use Case #U4: Receive Real-Time Feedback

- **Author:** AI Engine
- **Purpose:** Provide live visual/audio feedback based on user behavior.
- **Preconditions:** Active interview session in progress.

- **Post conditions:** User receives guidance (e.g., on speech, posture, eye contact).
- **Actors:** Job Seeker, AI Engine

3.3.5 Use Case #U5: Generate & View Performance Report

- **Author:** Analysis Engine
- **Purpose:** Summarize session results in a detailed performance report.
- **Preconditions:** Interview session completed.
- **Post conditions:** Report generated, stored, and viewable on dashboard.
- **Actors:** Job Seeker, System (Cloud Storage), Admin

3.3.6 Use Case #U6: Schedule or Reschedule Interview

- **Author:** Notification System
- **Purpose:** Let users set or change interview times and receive reminders.
- **Preconditions:** User logged in and has upcoming session.
- **Post conditions:** Notification sent and schedule updated.
- **Actors:** Job Seeker, System

3.3.7 Use Case #U7: Conduct Peer Interview Session

- **Author:** Peer Collaboration Module
- **Purpose:** Allow users to practice interviews with peers.
- **Preconditions:** Peers matched and scheduled.
- **Post conditions:** Session completed and feedback exchanged.
- **Actors:** Job Seeker, Peer, System

3.3.8 Use Case #U8: Customize Virtual Environment

- **Author:** Environment Engine
- **Purpose:** Enable users to change interview room aesthetics.
- **Preconditions:** User accesses environment settings.
- **Post conditions:** Selected customizations applied and saved.
- **Actors:** Job Seeker, System

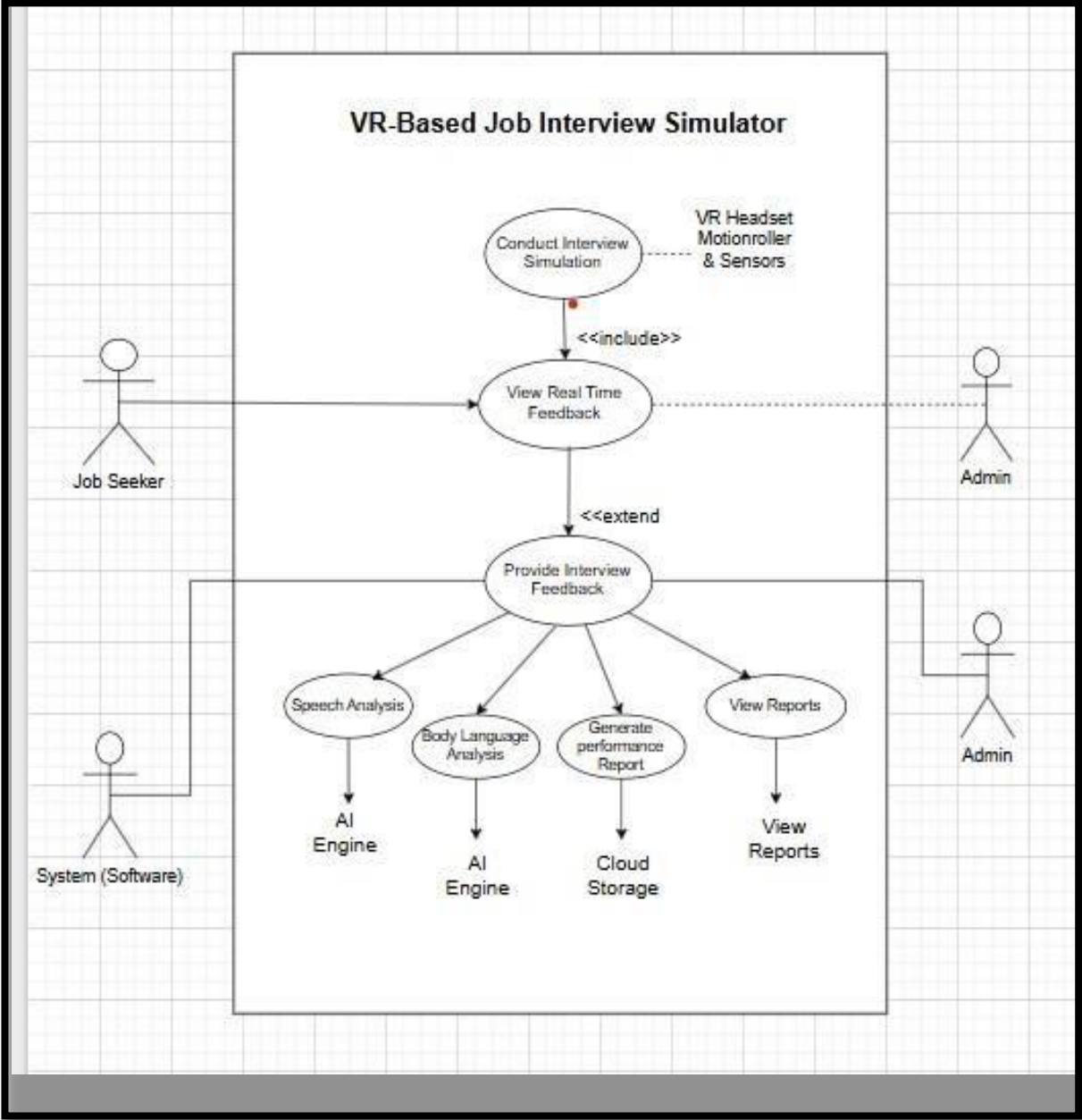
3.3.9 Use Case #U9: Access Offline Interview Mode

- **Author:** Local System Module
- **Purpose:** Allow limited functionality when offline.

- **Preconditions:** No internet connectivity.
- **Post conditions:** User accesses local sessions; data syncs when online.
- **Actors:** Job Seeker, System

3.3.10 Use Case #U10: Set Personal Interview Goals

- **Author:** Goal Tracker
- **Purpose:** Enable users to set and track custom interview practice goals.
- **Preconditions:** User is logged in.
- **Post conditions:** Goals saved and progress indicators updated.
- **Actors:** Job Seeker, System



4. Other Non-functional Requirements

4.1 Performance Requirements

- The system shall render VR environments at a minimum of 90 frames per second (FPS) on supported VR headsets to ensure a smooth and immersive experience.
- The system shall support uninterrupted VR interview sessions lasting up to 60 minutes without crashing or degrading performance.
- The virtual interview environment and candidate profile data shall load within 5 seconds over a standard broadband connection.
- The system shall complete virtual room setup and calibration within 10 seconds upon session launch.
- The system shall process voice-based biometric authentication within 2 seconds on compatible devices, if biometric login is enabled.

4.2 Safety and Security Requirements

- The system shall display VR safety prompts to users before entering the immersive interview environment.
- The system shall warn users if unsafe conditions are detected, such as poor lighting or limited play area boundaries.
- The system shall ensure that all data communications occur over secure HTTPS protocols.
- The system shall manage user authentication and session control using Firebase Authentication and OAuth 2.0.
- The system shall protect personal and performance data in compliance with GDPR and Pakistan's Personal Data Protection Bill (PDPB) regulations.

4.3 Reliability Requirements

- The system shall autosave user performance data and progress at intervals not exceeding 2 minutes.

- The system shall maintain uptime of at least 99.9% using cloud hosting and server replication mechanisms.

4.4 Maintainability Requirements

- The system codebase shall follow the Model-View-Controller (MVC) architecture to separate concerns and streamline maintenance.
- System modules shall be independently testable and managed using Git version control.
- The backend infrastructure shall scale to support up to 100,000 concurrent interview sessions.

4.5 Compatibility Requirements

- The system shall support Meta Quest, HTC Vive, and other OpenXR-compatible VR headsets.
- The VR interface shall scale and render correctly on headsets with varying resolutions and field-of-view specifications.

5. Other Requirements

Domain Requirements:

- The system shall allow users to register and log in using email or social accounts (Google, Facebook).
- The application shall simulate interview environments in seated and standing VR modes.
- The system shall evaluate lighting and tracking quality to provide real-time user guidance.
- The system shall display visual guidelines during interaction (e.g., eye contact markers, gesture prompts).
- The system shall allow sorting of interview modules by job role, difficulty level, or domain (e.g., HR, technical).
- Users shall be able to annotate answers or sessions with voice notes for review.
- The system shall support live audio feedback during mock sessions with mentors or AI.
- The app shall allow real-time preview of AI-generated feedback on body language and speech.
- Admin users shall be able to manage interview templates, add questions, and review performance logs.
- The system shall notify users about new practice modules or feature updates.

- The app shall support exporting performance summaries and interview reports as PDFs.
- The system shall suggest practice modules based on mood or confidence level (e.g., relaxed mode, challenge mode).
- The app shall restore the last active session on relaunch.
- All VR content shall comply with PEMRA and local regulatory standards.
- The system shall protect personal user data in compliance with GDPR and PDPB regulations.

Inverse Requirements:

- The system shall restrict access to VR sessions if headset permissions or calibration are incomplete.
- The system shall show VR safety warnings before initiating immersive environments (e.g., “Ensure clear space around you”).
- The application shall operate without crashing on supported VR devices with at least 4 GB RAM.
- Virtual setup shall complete within 10 seconds under normal tracking conditions.
- The system shall limit simultaneous multi-user sessions based on performance thresholds.
- Personal and session data shall be stored securely using Firebase Authentication and Firestore encryption.
- The app shall follow OWASP secure coding practices to mitigate vulnerabilities.
- The system shall prevent navigation or interaction outside the designed virtual environment to avoid spatial errors.
- User authentication shall support two-factor login and enforce account lockout after repeated failures.
- The app shall accept only standardized question sets and assets to ensure consistent rendering.
- Device temperature and system load shall be monitored, with warnings for unsafe usage.
- All API calls shall be secured with HTTPS to protect data in transit.

- Legal disclaimers and terms of service shall be shown during account registration and updated as required.
- Interview scenarios shall avoid culturally inappropriate or controversial content by default.
- Offline access shall be limited to downloaded question sets and previously completed sessions.

6. Appendix A – Data Dictionary

Term	Description
User Profile	Personal information of the user including name, email, performance history, and login details.
AI Model	The machine learning algorithm used to provide real-time feedback on speech, body language, and eye contact.
Scenario	The set of predefined interview questions based on different job roles or industries.
VR Session	The duration of a single interview practice session, including all user interactions.
Feedback Score	The numerical rating provided after each interview session, reflecting the user's performance.
Response Time	The time taken by the system to process user input and provide feedback.
Authentication	The process of verifying a user's identity before allowing access to the application.
Real-time Analysis	The immediate processing of user speech, gestures, and eye movements to provide instant feedback.
Progress Report	A detailed summary of the user's performance over multiple sessions.
Speech Analysis	The process of evaluating the user's speech for clarity, tone, and vocabulary.

Body Language Analysis	The assessment of physical movements and posture during the interview.
Eye Contact Tracking	The measurement of where the user is looking during the interview to assess engagement.

7. Appendix B - Group Log

Date	Team Member	Task Description
07/05/2025	Abeeha Fatima	Introduction
07/05/2025	Amina Hussain	Overall Description
07/05/2025	Eman Muzaffar	Specific Requirements
14/05/2025	Eman Muzaffar	Non-Functional Requirements
14/05/2025	Eman Muzaffar, Amina Hussain	Use cases (draw)
14/05/2025	Amina Hussain	Use cases Description and other requirements
14/05/2025	Abeeha Fatima	Other requirements and Appendix A