1. Introduction

The Union Public Service Commission (UPSC) Civil Services exam is widely considered one of the toughest exams in India. Success in this exam depends on the candidate’s ability to succeed in a variety of areas including deep academic skills, analytical thinking, and effective communication skills. Considering the last phase of this exam, i.e. Personality Test (Interview) candidates feel the need to take up some mock interviews that mimic real exam situations and play an important role in candidate preparation. However, conducting customized interview questions that target individual candidate’s strengths and weaknesses can be a time-consuming and resource-intensive task.

Taking up this challenge, this project explores the potential of generative AI and large language models (LLMs) to address the need for personalized UPSC mock interview question generation. Generative AI, which is a branch of artificial intelligence, has the ability to generate new information, while LLMs are powerful AI models trained on large amounts of textual data. Through this project, we aim to develop a framework that can realistically produce simulated interviews.

This initiative will address the huge gap in the current UPSC exam preparation material by providing candidates with a convenient source of personalized practice questions. This project has the potential to revolutionize UPSC exam preparation by providing candidates with an effective, efficient, and personalized approach to improve their interviewing skills.

**1.1 Background and Overview**

Our final year computer engineering project focuses on personalized UPSC mock interview question generation. We plan to achieve this by combining Generative AI and a Large Language Model, which would streamline the preparation process for aspiring civil servants by tailoring interview questions to their individual profiles. The Detailed Application Form (DAF) is the foundation of our project. It is a comprehensive form that contains the personal, educational, and professional journey of each UPSC candidate. We will extract pertinent information from the DAF submissions, which will serve as the basis of our AI model's operation. This will allow the model to identify patterns, preferences, and areas of expertise specific to each candidate based on its tuned performance which depends on the specific dataset fed to it.

Google Gemini, with its advanced natural language processing capabilities, will be our primary tool for question generation. By using our algorithms, we will be able to create a diverse array of interview questions that are tailored to the nuances of each candidate's profile.

Our project aims to revolutionize the traditional mock interview preparation process by offering candidates a personalized and immersive learning experience. By providing targeted questions that resemble the complexities of the actual UPSC interview, we empower candidates to improve their communication skills, deepen their understanding of diverse topics, and ultimately enhance their chances of success in the rigorous selection process.

Our project represents a convergence of cutting-edge technology and human-centric design. Our goal is to empower UPSC aspirants to navigate the interview stage with confidence and competence.

**1.2 Motivation**

Our motivation for coming up with this idea starts from a desire to ease the interview preparation process for the Union Public Service Commission (UPSC) examinations by providing candidates a full-fledged platform and a source for custom questions and thus empowering them to excel in the interviews. Our ability in harnessing the capabilities of generative artificial intelligence (AI) and large language models to tailor mock interview questions specifically to the individual aspirations and strengths of each candidate fuels this project.

In a world where standardized testing procedures often fails to capture the nuanced abilities and potential of aspiring civil servants, we are driven by the vision of a more personalized and effective approach to exam preparation. By combining cutting-edge AI technology with the complexities of the UPSC examination process, we aim to empower candidates with a dynamic tool that not only simulates the interview experience but also adapts to their unique backgrounds, interests, and knowledge areas.

There are accountable resources for the candidates to prepare for the first two phases of UPSC exam but for the last phase i.e. for interview, the candidate does not have an online platform to practice his/her skills at the ease of fingertips. So as to provide a robust platform, making the interview preparation process easy, and helping the candidates to save their time and utilize it fruitfully motivates us to create such an efficient platform.

**1.3** **Problem Definition and Objectives**

**Problem Definition:**

To create a platform that takes the inputs from user in the form of detailed application form (DAF) and generate personalised questions based on the details in the DAF by using Google Gemini LLM Model.

**Objectives:**

• To design and implement a robust software application capable of generating dynamic mock interview questions based on individual candidate profiles and preferences.

• To evaluate the effectiveness and usability of the developed system through rigorous testing and feedback sessions with a diverse pool of UPSC aspirants.

• To provide a valuable resource for UPSC candidates, empowering them with personalized and targeted preparation materials to enhance their performance and confidence during the interview phase.

**1.4 Project Scope & Limitations**

**Project Scope:**

The project scope identifies the platform that simulates the experience of the personality test (interview) conducted by UPSC for candidates aspiring for various positions in the civil services-oriented jobs, by deploying a fine-tuned large language model i.e. the Google’s Large Language Model – “Gemini”. The simulation offers personalised questions based the candidates’ responses (restricted to the scope of DAF) in the detailed application form.

**Limitations:**

**• Evaluation Metrics:**

Establishing reliable metrics for assessing the quality and effectiveness of the generated mock interview questions poses a challenge. Defining appropriate benchmarks and evaluation criteria that align with the diverse needs and expectations of UPSC candidates is essential for accurately measuring the project's impact.

**• User Adoption and Acceptance:**

The success of the project depends on the adoption and acceptance of the generated mock interview questions by UPSC aspirants. Resistance to change, skepticism regarding AI-based tools, or preferences for traditional preparation methods may hinder the widespread adoption of the system.

**• Technical Challenges:**

Developing and maintaining a sophisticated software application capable of handling large-scale data processing, model training, and user interactions poses technical challenges. Issues such as system scalability, computational resource requirements, and software bugs would impact the reliability and usability of the application in the long run.

**1.5 Methodologies of Problem Solving**

**I) Requirement Analysis:**

Conducted a thorough research and candidate consultations to understand the specific needs, preferences, and challenges of UPSC aspirants regarding interview preparation. Defined clear objectives and requirements for the generative AI system based on these insights.

**II) Data Collection and Preprocessing:**

Gathered a diverse and representative dataset of UPSC interview questions, candidate profiles, and domain-specific knowledge sources. Cleaned, preprocessed, and annotated the data to ensure quality and relevance for training the AI model.

**III) Model Selection and Training:**

Explored various generative AI architectures, such as GPT (Generative Pre-trained Transformer) models and selected the most suitable model for question generation. Fine-tuned the chosen model on the UPSC-specific dataset using transfer learning techniques to adapt it to the task of generating mock interview questions based on context specific prompts.

**IV) System Design and Development:**

Designed and implemented a scalable and user-friendly software application (web-based app) for generating personalized mock interview questions. Integrated the trained AI model with user interface components, database management systems, and deployment frameworks to create a seamless user experience.

**V) Personalization Mechanisms:**

Implemented algorithms and techniques for personalizing the generated questions based on individual candidate profiles, including educational background, career aspirations, and areas of expertise.

**VI) Evaluation Framework:**

Defined a quantitative and qualitative metrics for evaluating the quality, diversity, and relevance of the generated mock interview questions. Conducted extensive testing and validation of the system using representative datasets and user feedback to assess its effectiveness and usability.

**VII) Iterative Refinement:**

Continuously monitored and analysed the performance of the generative AI system in real-world scenarios. Collected feedback from UPSC aspirants, educators, and domain experts to identify areas for improvement and iterate on the system's design, algorithms, and user experience iteratively.

**VIII) Ethical Considerations:**

Incorporated ethical principles and guidelines into all stages of the methodology, including data collection, model training, user interaction, and evaluation. Ensured transparency, fairness, and accountability in the development and deployment of the AI-driven mock interview question generation system.

**IX) Documentation and Dissemination:**

Documented the entire methodology, including data sources, model architecture, implementation details, evaluation results, and lessons learned. Disseminated the findings, insights, and recommendations through research publications, technical reports, and presentations to contribute to the broader academic and professional community.