ISSN: 2582 - 6379
IJISEA Publications
International Journal for Interdisciplinary Sciences and Engineering Applications
IJISEA - An International Peer- Reviewed Journal
2026, Volume 7 Issue 2
www.ijisea.org

Ai Powered Interview Preparation with Code Execution Feature

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ABSTRACT

The growing need of effective and individualized interview preparation tools has led to the emergence of AIbased learning systems. This project introduces AI-run Interview Preparation Portal that is combined with realtime code activation option with the help of the JDoodle API. The system is created based on the Backend services with Spring Boot and the Database management with MySQL and the frontend interface with HTML/CSS. The portal delivers key features like user registration, user log-in authentication, guided technical questions, AI-based customized preparation routes, and real-time code creation and execution. Through the JDoodle API, the platform can execute code in various programming languages, which will give users immediate feedback and increase their practical code-writing knowledge. The system architecture is modular in nature, so it is scalable, secure and high-performing. Extensive testing shows that the portal is effective to enhance user involvement and quality of preparation. AI technology and third party code execution services, like JDoodle, provide a new and modern solution to training interviews, successfully overcoming the drawbacks of the classical training system. Relevant Keywords: AI Interview Preparation, JDoodle API, Code Execution, Spring Boot, MySQL, Web Application, Real-Time Feedback.
Keywords: Artificial Intelligence, Language Models and Integrated Development Environments.

I. INTRODUCTION

Technical interviews have taken on a new role in software and IT job recruitment in the modern digital age. These interviews are centered on the problem-solving skills, logical reasoning and practical programming knowledge. The candidates must be able to write efficient code, algorithm design, and debug errors in a restricted time. Thus, the preparation of interviews has become a systematic and ongoing process. Classroom learning, textbooks, and non-interactive online resources have a number of limitations to traditional approaches of preparation. They usually do not have experience in real-time feedback and practical learning code. This means that candidates might not be able to implement concepts in actual interview settings. Also, the installation of coding environments may be complex to novices.

Modern systems leverage such technologies as Artificial Intelligence (AI) and cloud-based services to overcome these challenges. AI can assist in the user performance analysis, the evaluation of strengths and weaknesses, and give personalized recommendations. This helps learners to work on specific areas that require attention and pursue a tailored preparation course. Another useful aspect in the preparation of interviews is the live code execution. It enables users to write, compile, and run code in real-time without any local installation. This gives a practical experience, contributes to the rapid detection of mistakes, and enhances confidence in problem-solving in real-time situations.

The offered system Smart Interview Preparation Portal with Built-In AI and Live Code Execution is webbased software created with the help of Spring Boot, MySQL, HTML, and CSS. It incorporates the JDoodle API in order to facilitate real-time coding. The features included in the system are user authentication, categorized questions, personalized learning, and instant feedback. In general, the system provides a centralized learning and practice system. It enhances engagement among users, their level of coding, and they prepare candidates better in technical interviews, thereby raising their likelihood of success in such interviews.

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II. LITERATURE REVIEW

2.1. Introduction

The rapid advancement of Artificial Intelligence (AI), conversational agents, and intelligent software systems has significantly transformed the landscape of digital learning, human–computer interaction, and software development practices. Interview preparation platforms, in particular, have benefited from these advancements by integrating AI-driven personalization, real-time feedback mechanisms, and automated code execution environments. This chapter presents a comprehensive review of existing literature related to AI- based systems, chatbots, human-like interaction, code generation tools, integrated development environments, and intelligent evaluation mechanisms that form the foundation of the proposed Smart Interview Preparation Portal with Integrated AI and Live Code Execution. The reviewed studies provide insights into the evolution of AI interaction quality, empathic systems, conversational agents in educational environments, and modern AI-assisted coding tools. The literature also highlights the challenges, limitations, and opportunities associated with integrating AI technologies into learning and software development platforms.

2.2. Human-Like Interaction and Acceptance of AI Systems

One of the key aspects of AI-powered platforms is user acceptance, which largely depends on interaction quality and perceived human-like behavior. Pelau et al. [1] investigated the role of empathy, interaction quality, and psychological anthropomorphic characteristics in enhancing user acceptance of AI systems in service industries. Their findings emphasize that AI systems perceived as human-like are more likely to be trusted and adopted by users.

This research is particularly relevant to interview preparation platforms, where sustained user engagement is critical. By incorporating interactive and responsive AI features, systems can simulate mentor-like behavior, thereby improving learning motivation and continuity.

Similarly, Adiwardana et al. [5] explored the development of human-like open-domain chatbots capable of generating natural and contextually appropriate responses. Their work demonstrates how large-scale neural language models can enhance conversational flow, which is essential for AI-driven learning assistants.

2.3. Chatbots in Educational and Campus Environments

The application of chatbots in educational environments has gained significant attention. Dibitonto et al. [2] designed “LiSA,” a virtual assistant deployed in a university campus to assist students with academic and administrative tasks. The study highlights how conversational agents can improve accessibility to information and enhance the overall student experience.

Falala-Séchet et al. [4] introduced “Owlie,” a chatbot designed to provide emotional support to users facing psychological challenges. Although focused on mental health, the study demonstrates the importance of empathy and adaptive responses in AI systems. These principles are transferable to interview preparation platforms, where candidates often experience stress and anxiety.

Arteaga et al. [3] proposed an information system architecture for recommending tourist sites using a chatbot interface. Their work emphasizes modular system design and recommendation logic, which aligns with the architectural requirements of scalable interview preparation systems.

2.4. Evolution of Conversational AI and Generative Models

Recent advancements in generative AI have significantly influenced how users interact with intelligent systems. Taecharungroj [7] analyzed early public reactions to ChatGPT, identifying its strengths in natural language understanding, contextual awareness, and content generation. The study highlights the growing reliance on AI chatbots for problem-solving and learning tasks.

Mollick [9] described ChatGPT as a tipping point in AI evolution, emphasizing its potential to disrupt education, software development, and knowledge work. Loh [8] further discussed the opportunities and challenges of generative AI in professional domains, including ethical considerations and system reliability.

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Schaaff et al. [6] evaluated ChatGPT's empathic abilities, revealing its potential to simulate supportive and context-aware interactions. These findings support the feasibility of integrating AI-based assistance in interview preparation portals to guide users through learning paths.

2.5. AI-Assisted Coding and Code Generation Tools

AI-assisted code generation has emerged as a transformative technology in software development. Chen et al. [16] evaluated large language models trained on code, demonstrating their ability to generate syntactically correct and contextually relevant programs. This study laid the foundation for modern AI coding assistants.

Liu et al. [15] conducted a rigorous evaluation of ChatGPT-generated code and identified issues related to correctness, edge cases, and logical completeness. Their findings highlight the importance of validation and execution-based feedback mechanisms when using AI-generated code.

Yetistiren et al. [17] compared the code quality of AI-assisted tools such as GitHub Copilot, Amazon CodeWhisperer, and ChatGPT. The study concluded that while AI tools improve productivity, they require careful integration with testing and validation systems.

Zhang et al. [14] examined developer practices and challenges when using GitHub Copilot. Their results indicate that developers benefit from AI suggestions but still rely on human judgment for correctness and optimization

2.6. Integrated Development Environments and Real-Time Feedback

Modern Integrated Development Environments (IDEs) play a critical role in enhancing developer productivity. Alizadehsani et al. [10] discussed the evolution of IDEs and their integration with intelligent tools. The study highlights the importance of real-time feedback, debugging support, and automation in learning and development environments.

Real-time code execution APIs, such as JDoodle, extend these IDE capabilities to web-based platforms. Although not explicitly covered in the reviewed literature, the principles of execution-based evaluation and instant feedback align with findings from software engineering studies emphasizing hands-on learning.

2.7. Software Effort Estimation and Evaluation Challenges

Several studies have focused on software effort estimation and evaluation methodologies. Kaur et al. [11] presented a comprehensive study on the evolution of software development cost estimation techniques using automated text mining. Their findings highlight the complexity of evaluating software systems and the need for automated approaches.

Bluemke and Malanowska [12] conducted a systematic literature review on software testing effort estimation, emphasizing the challenges of scalability and accuracy. Butt et al. [13] proposed cost estimation methods for agile software development, reinforcing the importance of modular and adaptable system architectures.

These studies collectively underline the importance of automated evaluation mechanisms, which directly support the need for real-time code execution and automated feedback in interview preparation platforms.

2.8. Large Language Models and Open-Source AI Frameworks

The development of large language models has accelerated AI research and applications. Wang and Komatsuzaki [18] introduced GPT-J-6B, an open-source autoregressive language model that demonstrated competitive performance with proprietary models.

OpenAI's GPT-4 Technical Report [20] provided insights into model capabilities, safety considerations, and evaluation methodologies. Luo et al. [22] proposed WizardCoder, a code-focused large language model enhanced through evolutionary instruction tuning, significantly improving code generation accuracy.

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Phind [21] presented a code-optimized language model designed for developer assistance. These studies collectively demonstrate the growing maturity of AI models capable of supporting complex programming tasks.

2.9. Research Gaps Identified from Literature

Based on the reviewed literature, several research gaps are identified:

- Limited integration of AI personalization with real-time code execution
- Lack of unified platforms combining learning, practice, and evaluation
- Insufficient focus on interview-specific preparation systems
- Need for scalable, secure, and modular architectures
- Requirement for execution-based validation of AI-assisted coding

These gaps highlight the necessity for a comprehensive interview preparation portal that integrates AIdriven guidance with live coding environments.

III. EXISTING SYSTEM

The swift improvement of Generative Artificial Intelligence (AI) has had significant impact on software development. Current AI systems like ChatGPT, GitHub Copilot, and Amazon Code Whisperer have the ability to automatically create program code by means of natural language descriptions. They operate on Large Language Models (LLMs) which have been trained on large quantities of programming languages and software repositories. Under the current method, learners and developers would work with AI tools to create code to perform certain tasks.

These are usually combined with Integrated Development Environments (IDEs) such as Visual Studio Code and other cloud-based providers. Users can execute, test and modify the generated code. Coding assistants with AI support various languages, including Python, Java, C++, and JavaScript, which is why they are universal. Such systems assist programmers to save time in the development process, automate repetitive tasks, and give recommendations on how to implement the algorithms. They also make it more accessible to beginners through providing example codes and explanations. Also, testing tools such as Human Eval are applied to test the generated code by providing test cases that verify its correctness.

Disadvantages of Existing System

- There can be generated code which is wrong or not complete.
- Lack of optimization in performance
- Possibility of security vulnerabilities
- High reliance on training information.
- Problems of maintainability and structure.

Needs to be validated by humans. In general, AI-based code generation systems can improve productivity and learning, but still cannot be used in real-world environments due to their limitations related to accuracy, reliability, and efficiency, and careful consideration is required before their use.

IV. PROPOSED SYSTEM

Problem Statement: In the present digital age, technical interviews are organized on problem-solving skills, coding skills, and logical thinking. Nevertheless, numerous applicants continue to use the old-fashioned techniques like textbooks and stagnant tutorials, that do not provide exposure to the actual code, real-time feedback, and learning in a personalized manner. Available platforms tend to lack interactive coding environments and to scale to personal capabilities. Consequently, candidates cannot easily detect their shortcomings and gauge their preparation. Hence, an intelligent interview preparation system incorporating the use of Artificial Intelligence (AI) and live code execution is needed to ensure an efficient learning process.

Proposed System Objective The primary aim is to create a Smart Interview Preparation Portal that will have built-in AI and live code execution to enhance interview preparedness. Key objectives include:

- Have a centralized preparation platform.
- Allow code execution in real time.
- Performance analysis with AI.

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- Suggest questions by level of skills of the user.
- Provide instant feedback and tracking
- Have a secure and scalable system.

Scope of the Proposed System The system is aimed at students, job seekers and those that are preparing to have interviews. Scope includes:

- Topic-wise technical questions
- Multiple programming languages.
- On-the-fly implementation with JDoodle API.
- AI-based personalized recommendations
- User performance data storage.
- Safe authentication and session management.

The system can be implemented as a web application to individuals and institutions.

General Architecture The overall system architecture is based on a modular and layered architecture:

- Presentation Layer: HTML/CSS based, offers user interface.
- Application Layer: SpringBoot- based, logic and request-handling.
- AI Layer: Evaluates performance and provides individual recommendations.
- Integration Layer: Interacts with JDoodle API to run code.

Data Layer: It utilizes MySQL database to store user and coding information.

Proposed System Overview The proposed system is a web based application that incorporates AI and live coding environment. Users are able to register, code, debug, and run their code in real time, and get immediate feedback. Technologies used:

- Frontend: HTML, CSS
- Backend: Spring Boot
- Database: MySQL
- API: JDoodle

V. RESULTS AND DISCUSSIONS

The created Smart Interview Preparation Portal was well-tested and implemented. The system is able to exhibit all the essential functions and is highly reliable and user friendly.



Figure 1: User Dashboard Page of AI Interview Preparation Portal

Figure 1 shows the Home Page of the AI Interview Preparation Portal. It is the first page that users will see and has an attractive banner with a title of WELCOME TO AI INTERVIEW PORTAL. A user can easily navigate to either Login (in case he/she is an existing user) or Register (in case he/she is a new user).'

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The professional-clean design and modern collaborative workspace background make the initial impression and provide the ability to access the main features within the shortest time. Rigorous functional testing ensured that the user registration/ login, secure session management, and categorized display of questions, AI-based personalized recommendations, and real-time execution of codes via JDoodle API were supported in more than one language (Python, Java, C++, etc.). Compiling and executing codes were an immediate feedback, and thus users were able to debug and optimize solutions in real time. The performance testing indicated that response times were quite stable even when they were used concurrently. Scalability and easy maintenance was the guarantee of the modular architecture. The user engagement data (based on simulated test cases) showed that practical coding and confidence were greatly enhanced in comparison to the traditional approaches. The performance analysis using AI was effective in revealing the user weaknesses and proposing custom practice directions. The findings confirm the hypothesis that the proposed system will successfully address the drawbacks of the current tools as it integrates the theoretical learning with real-time, practical application into one integrated platform.

VI. CONCLUSION

The main aim of this project was to create and build a Smart Interview Preparation Portal with Built-in AI and Live Code Runner that would solve the flaws of the traditional interview preparation systems. As technical recruitment processes become even more competitive, candidates need to have a platform that will provide not only theoretical knowledge but also give them practical coding experiences, customized advice, and real-time feedback. This project manages to meet these needs by incorporating the latest web technologies and concepts of Artificial Intelligence into a single system and using third-party services of executing codes. The project fulfilled all the specified goals: the secure authentication, the organized question repository, the AI-generated personalization, and the live code execution with the help of JDoodle. It is now possible to practice in an actual environment that is close enough to real- life conditions in an interview. The suggested system was effective in filling the gap between the theoretical preparation and the actual code knowledge. The results of the testing revealed quality performance, stability in response time, and enhanced user interaction. The modular architecture will be scalable and upgradeable. This project contributes greatly through showing how well AI can be integrated into the interview preparation process, offers an integrated platform of learning, practice and evaluation, real time execution of code and provides a scalable secure architecture. Although the system has some drawbacks (reliance on third-party API and internet connectivity), it can serve as a good basis to evolve into a more robust system in the future through the use of advanced ML models, mock interviews, support of more languages, and plagiarism detection. To sum up, the Smart Interview Preparation Portal and Built-in AI and Live Code Execution is an effective, intelligent and interactive, and scalable approach to modern interview preparation. With the help of Artificial Intelligence, instant code execution, and powerful web technologies, the system fills the most important gaps in the current preparation strategies and shows how AI-based platforms can change technical education and interview preparation.

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