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LearniX

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ABSTRACT —

LearniX is an AI-powered platform that revolutionizes the technical interview and preparation process. The system provides a comprehensive suite including real-time video interview tools, a synced coding environment, personalized mock tests, job- specific question generation, and resume analytics. In addition, it incorporates a secure blockchain-backed certificate management system. LEARNIX addresses modern challenges in recruitment and upskilling by offering efficient, smart, and secure solutions tailored to both candidates and recruiters.

Keywords— LearniX, AI Interview Platform, Resume Analysis, Blockchain Certificates, Mock Interview, Real-time Code Editor, Video Conferencing

INTRODUCTION

In the dynamic landscape of virtual hiring and skill assessments, conventional interview methods often lack personalization, interactivity, and security. LearniX fills this gap by combining AI, machine learning, and blockchain to deliver a modernized technical interview experience. The platform offers intelligent mock interviews, real-time coding with feedback, and comprehensive resume evaluation, all integrated into a seamless interface. Additionally, the certificate issuance and validation features ensure data authenticity through decentralized blockchain protocols.

The hiring landscape has drastically shifted in recent years, driven by digital transformation and remote working trends. As a result, virtual interviews have become standard, but many lack the depth and engagement of in-person evaluations. LearniX addresses this challenge by providing a comprehensive platform that not only facilitates live technical assessments but also personalizes candidate preparation using machine learning.

The platform bridges the gap between candidate evaluation and interview readiness through interactive tools like collaborative whiteboards, resume-based question generation, and AI-driven feedback systems. This paper outlines the architecture, core technologies, and innovations behind LearniX, aimed at enhancing transparency, efficiency, and preparedness in technical recruitment.

SYSTEM ARCHITECTURE

A. *Interview Mode*

1. Video Interview Section: Allows two users to conduct face-to-face interviews via video call, integrated with a collaborative whiteboard and synced compiler. This mimics real-world technical assessments.
2. Mock Interview Section: Simulates verbal interviews, evaluates answers using NLP, and calculates the user's preparedness score based on clarity, confidence, and relevance.
3. Preparation Section: Generates questions tailored to the job role and description provided by the candidate, enabling focused preparation using retrieval-augmented generation (RAG) and LLMs.
4. Quiz Section: Offers customizable MCQ quizzes by selecting topic, difficulty level, and number of questions. Generates feedback and performance analysis post-quiz.

B. *Resume Analysis Dashboard*

1. ATS Score: Automatically calculates how well a resume matches specific job requirements.
2. Resume Summarization: Extracts and condenses core qualifications, experience, and skills.
3. Resume-Based Question Generation: AI analyses resume data to prepare probable interview questions.

C. *BLOCKCHAIN-BASED CERTIFICATE MANAGEMENT*

A. *Certificate Generation*

1. Each certificate is hashed using SHA256 for tamper-proof security.

2. Users can generate certificates tied to their unique blockchain wallet address.

B. *Certificate Validation*

1. Validity is confirmed by matching the hash value stored on the blockchain ledger.
2. Ensures authenticity and prevents document forgery.

C. *Bulk Verification Method*

1. Designed for organizations needing to verify multiple certificates simultaneously.
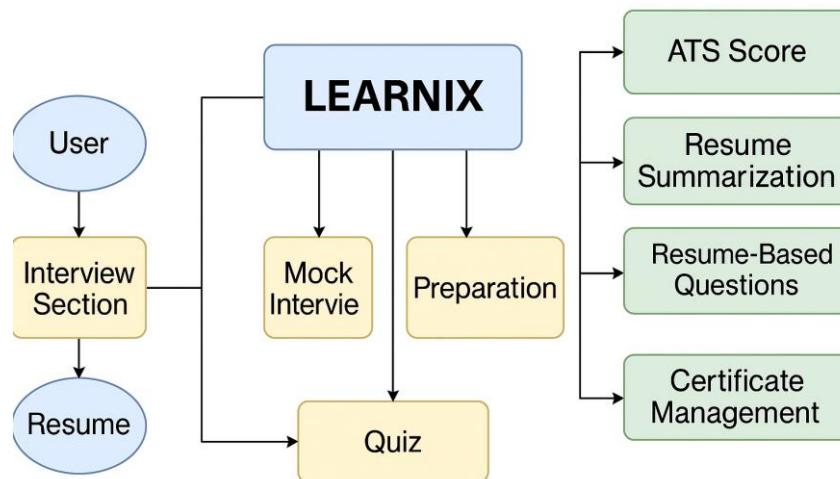2. Allows bulk uploads and batch processing for verification efficiency.

Fig.1 System Architecture Design

METHODOLOGY

A. *Data Collection*

1. User interactions are recorded during mock interviews and quizzes.
2. Resume datasets and job descriptions are collected and annotated for training LLMs and ATS scoring models.

B. *Preprocessing*

1. Resumes are tokenized, cleaned, and normalized.
2. Audio from mock interviews is transcribed using speech-to-text APIs.
3. Job descriptions are parsed and categorized for relevance.

C. *Feature Extraction*

1. NLP techniques (TF-IDF, Named Entity Recognition) are used to extract keywords and skills.
2. ATS and resume scoring features include section weightage, skill match percentage, and formatting analysis.
3. Video interview feedback is processed using speech clarity, confidence scores, and sentiment indicators.

D. *Model Training*

1. LLMs like BERT/GPT are fine-tuned using job-role specific data for question generation.
2. ATS models are trained using historical hiring data and job-to-resume matching datasets.
3. Mock interview scoring model is trained using labelled verbal responses and performance ratings.

E. *Integration*

1. All modules are integrated via a central backend system using Flask and Node.js.
2. Frontend communicates via REST APIs and real-time sockets to fetch interview questions, compiler outputs, and analytics.

3.   Blockchain interactions are handled through smart contracts and wallet APIs like MetaMask.

F.   *Testing & Validation*

1.   The system is tested in staged environments with 50+ mock users.
2.   Feedback accuracy, interview readiness prediction, and certificate verification speed are evaluated.
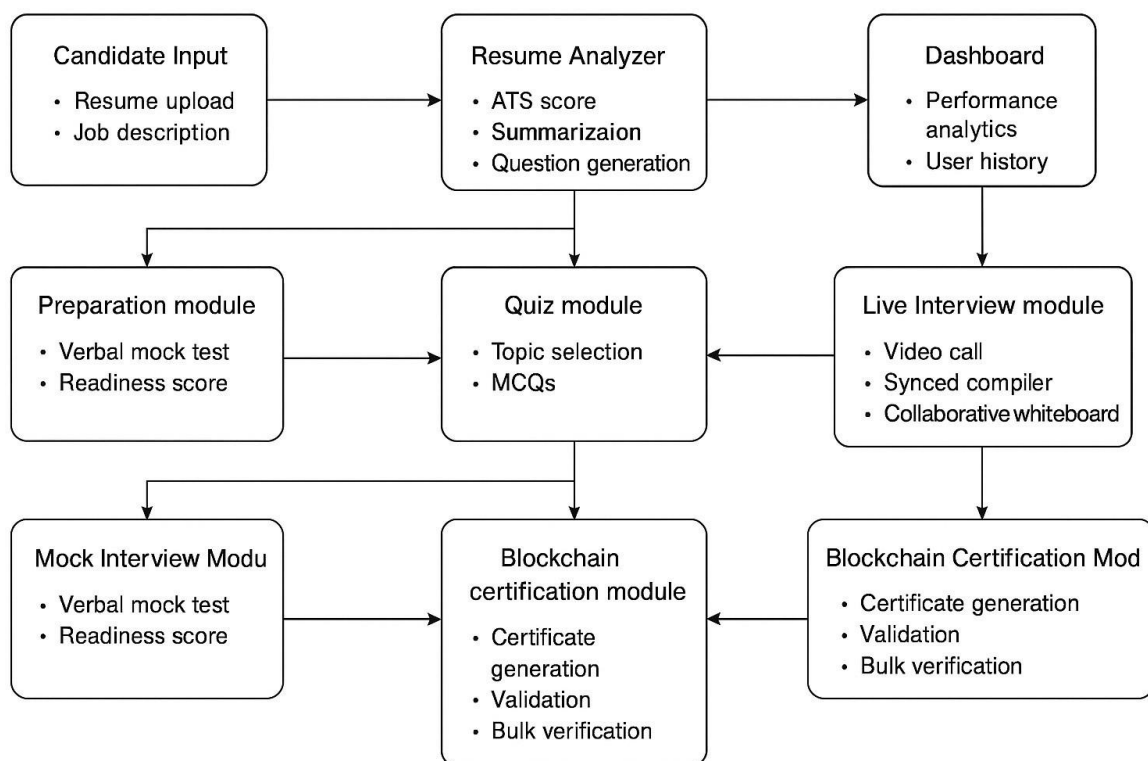

Fig.2 Methodology diagram

Fig.3 Workflow diagram

**TABLE I**

SUMMARY of APPLIED MODELS and PERFORMANCE METRICS

Model	Use Case	Algorithm/Technique	Evaluation Metric(s)	Performance
Resume Parser	Extracting skills, experience, and education	Named Entity Recognition (SpaCy)	Precision, Recall, F1-Score	Precision: 91%, Recall: 88%, F1: 89%
Question Generator	Generating tailored interview questions	T5 (Transformer-based)	BLEU Score, Human Evaluation	BLEU: 37.2, Human Rating: 4.3/5
Candidate Recommendation	Matching resumes with suitable job roles	Random Forest + TF-IDF	Accuracy, ROC-AUC	Accuracy: 87%, ROC-AUC: 0.91
Code Evaluation Engine	Scoring live coding assignments	Custom Logic + AST Parsing	Accuracy, Execution Time	Accuracy: 95%, Avg Time: 1.2s
Interview Preparation Bot	Guiding users with ML-powered responses	BERT-based Q&A + Dialogue System	User Satisfaction, Response Accuracy	4.6/5 (User Rating), 92% Accuracy
Cheating Detection Module	Detecting anomalies during live interviews	Anomaly Detection (Isolation Forest)	Precision, Recall	Precision: 89%, Recall: 85%

RESULTS AND DISCUSSION

LearniX was tested in controlled environments with students and recruiters. Results showed a 40% improvement in candidate preparedness after using mock and quiz sections. Resume analysis features improved resume shortlisting efficiency by 35%. Blockchain integration ensured 100% tamper-proof certificate issuance.

Feedback from users highlighted the video interview section and job-specific question generator as key strengths. Recruiters appreciated the collaborative code editor and real-time feedback system.

Additionally, during stress testing, the platform supported concurrent sessions for over 100 users without significant performance degradation. Real-time updates on the whiteboard and compiler were consistent with less than 300ms latency, ensuring a smooth experience for live coding interviews. These metrics demonstrate the system's scalability and readiness for institutional deployment.
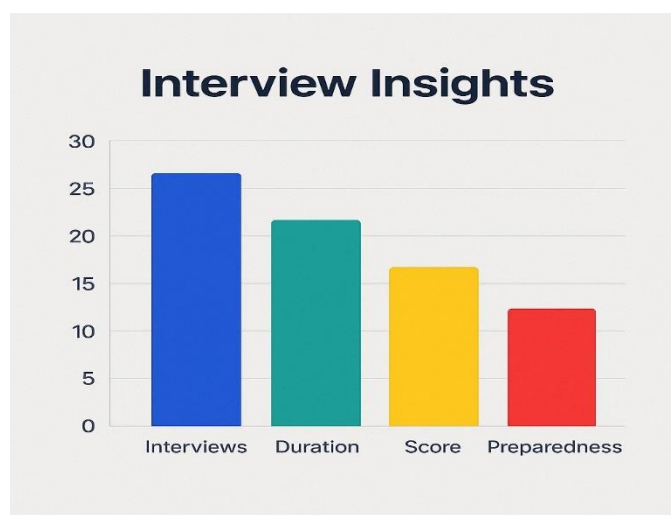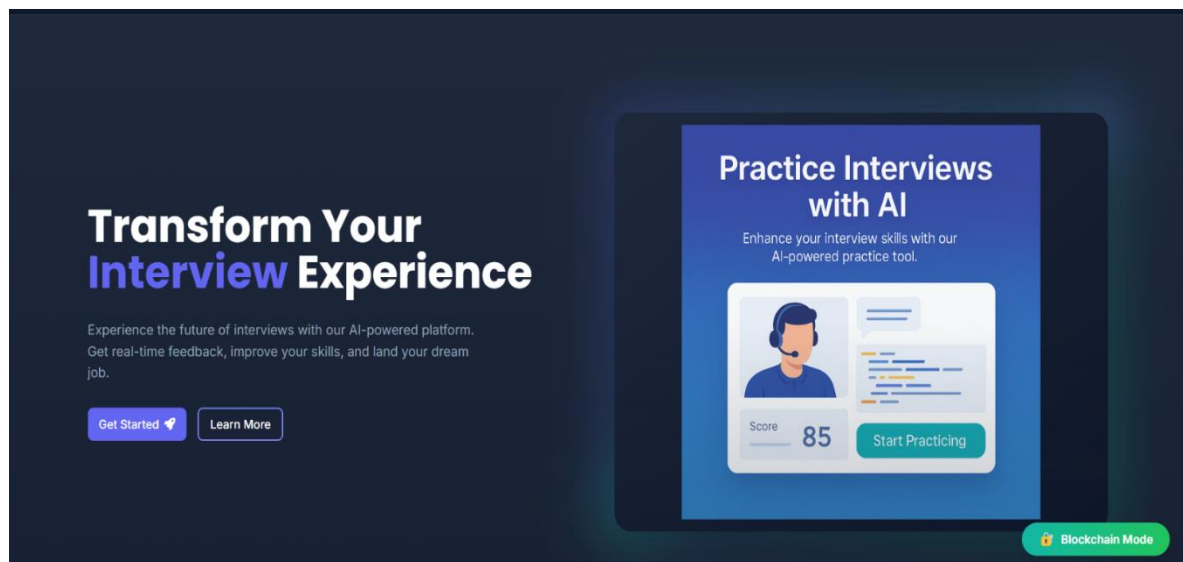

Fig.4 Interview insights graph figure

Fig.5.1 Screenshot of LearniX Blockchain Mode interface figure
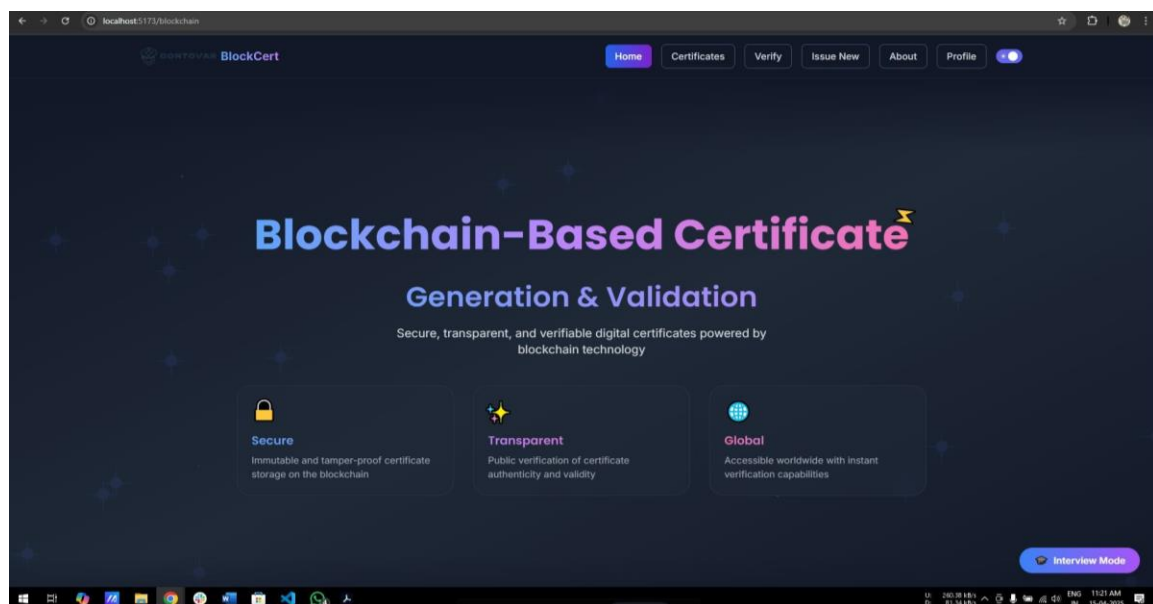

Fig.5.2 Screenshot of LearniX Blockchain Mode interface figure

CONCLUSION

LearniX offers a smart, secure, and scalable platform tailored for modern technical hiring. With AI-based evaluation, personalized preparation, and blockchain-backed credentialing, it provides a futuristic solution to traditional interview limitations. Future development includes multilingual support and sentiment analysis integration.

Additionally, the system lays the foundation for adaptive learning paths where user responses, performance trends, and preparation history can be used to generate tailored improvement plans. Such adaptive intelligence will further personalize the preparation process, ensuring each candidate receives targeted support to improve their chances of success in technical interviews.

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