



QUIZIERRA

AI + Real-Time Engagement = The Future of Learning

SMART AI-POWERED REAL-TIME QUIZ PLATFORM

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PROBLEM STATEMENT

Current quiz platforms lack AI automation, adaptive difficulty, real-time analytics, and engaging features such as gamification and camera-based monitoring. Educators and trainers spend significant time manually creating quizzes, while learners receive the same difficulty level irrespective of their skill. There is a need for a smart, AI-powered quiz platform that generates quizzes instantly, supports real-time multiplayer participation, adapts dynamically to user performance, and enhances engagement through modern interactive elements.

PROPOSED SOLUTION

We propose QUIZIERRA, an AI-powered real-time quiz platform that automatically generates quizzes from user notes, PDFs, and topics, supports live multiplayer participation, adapts difficulty based on performance, and enhances engagement through gamification, speech features, camera monitoring, and instant analytics. QuizAI provides a fast, accurate, interactive, and intelligent assessment experience for students, educators, and organizations.

Key Features Overview

Quiz Generation

Instantly create quizzes from various sources.

Multiplayer Quizzes

Host and join real-time quizzes with buzzing and scoring.

Leaderboard

Dynamic score updates and ranking animations in real-time.

Adaptive Difficulty

Questions adjust based on the user's performance.

Speech Input/Output

Supports answering questions and reading them aloud.

Camera Monitoring

Tracks attention and ensures fair play during exams.

Gamification

Includes car-building, streak bonuses, levels, and XP rewards.

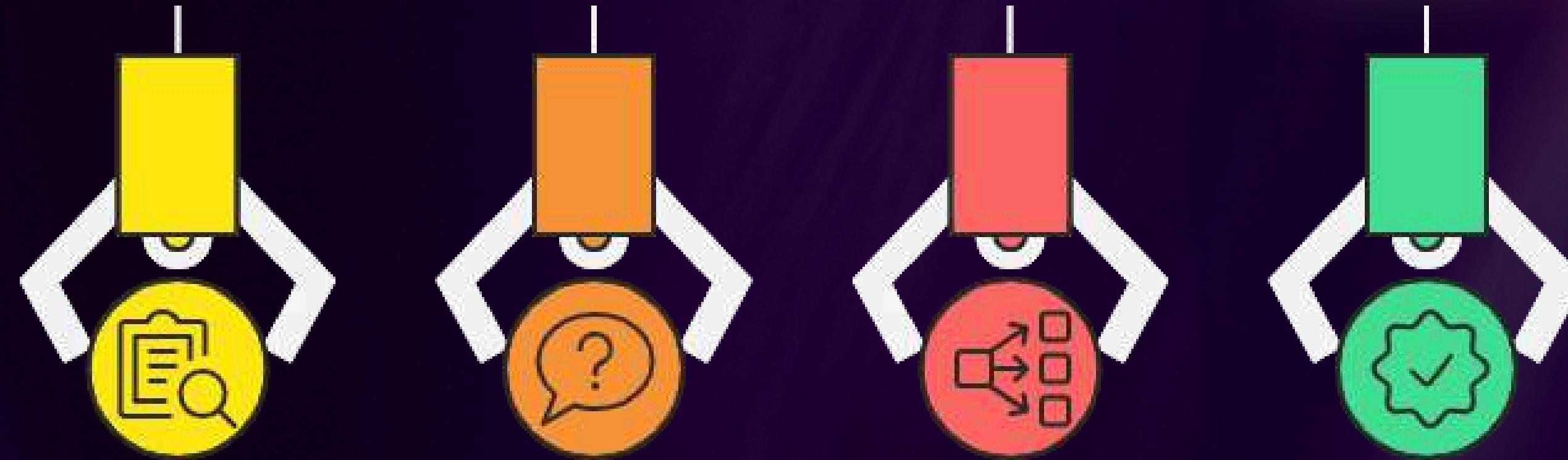
Meme Generator

Generates fun memes based on camera input.

Performance Analytics

Provides visual reports on accuracy, speed, and topic mastery.

AI Quiz Generator



Instant Quiz Creation

Upload various file types or enter a topic for quiz generation. AI processes content using NLP and OCR.

Question Types Generated

Generates MCQs, True/False, Fill-in-the-blanks, and concept-based analytical questions.

Smart Difficulty Assignment

AI analyzes sentence complexity and concept depth to assign difficulty levels. Questions are categorized as Easy, Medium, or Hard.

Key Benefits

Reduces manual work, ensures quality and variety, and scales for various training purposes.

Real-Time Multiplayer Quiz



Quiz Session Start

The host initiates a quiz session from the dashboard. Participants can join using a session code or QR link.

Real-Time Updates

Questions, timers, and answer statuses are updated in milliseconds. This is powered by real-time technologies.

Interactive Experience

Features include a live leaderboard, streak bonuses, answer count animations, and dynamic score updates.

Scalable Use Cases

Suitable for classrooms, hackathons, corporate training, and competitions.

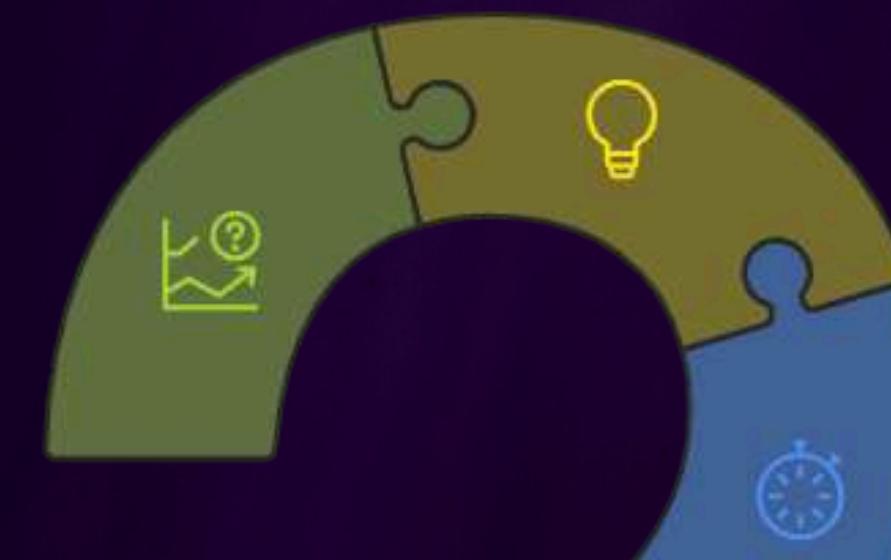
Adaptive AI Difficulty Engine

Concept Strength

Evaluate the user's understanding of concepts to adjust difficulty.

Question Difficulty Success Rate

Analyze the user's success rate on questions of varying difficulty to adjust accordingly.



Response Time

Consider how quickly the user answers questions to adjust difficulty.

Accuracy

Adjust difficulty based on how accurately the user answers questions.

Speech & Camera Features

Camera Monitoring

Prevents cheating in formal assessments by detecting presence and attention.

Privacy Safe

Ensures privacy by enabling camera features only during secure exams.



Text-to-Speech

Helps auditory learners and enhances accessibility by reading questions aloud.

Speech-to-Text

Reduces input time and improves accessibility for fast-paced quizzes and visually impaired users.

Gamification System

XP, Levels & Badges

Earns XP for correct answers, unlocking new car styles and badges.

Car-Building Progression

Unlocks car parts with correct answers, boosting motivation visually.

Streaks & Bonuses

Rewards consecutive correct answers with bonus points and multipliers.



Meme Generator



- **Camera-Based Meme Creation**

Adds fun and personalization by capturing moments and creating memes.

- **AI-Generated Captions**

Provides humorous and relevant captions based on performance metrics.

- **Shareable Content**

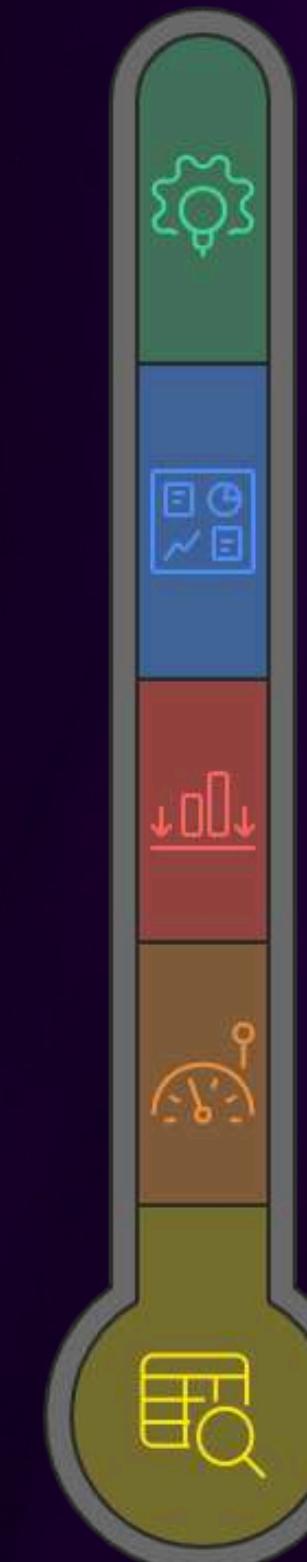
Encourages social interaction by allowing memes to be shared.

- **Engagement Boost**

Reduces stress and increases excitement for results.

Performance Analytics

Actionable
Insights



AI Improvement Suggestions

Offers personalized tips and practice areas

Strength & Weakness Report

Highlights excelled topics and revision needs

Difficulty Trend

Visualizes performance on different difficulty levels

Time Analysis

Shows average response time and time pressure

Accuracy Insights

Provides overall score and topic accuracy

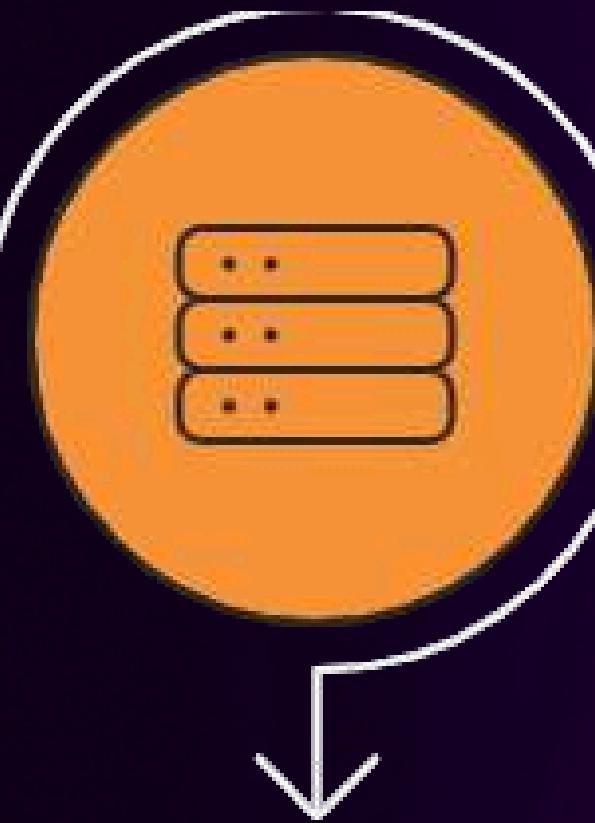
Data Driven

System Architecture



Frontend

React.js for UI,
Tailwind CSS for
styling, Speech APIs
for voice, WebRTC
for camera,
MongoDB for data.



Backend

Node.js
environment,
Express.js
framework,
Socket.io for real-
time, Redis for
caching, REST APIs
for communication.



AI/ML Services

Python for AI,
FastAPI for APIs,
LangChain for LLM,
PyMuPDF for PDF,
Whisper for speech,
ML models for
generation, NLP
pipelines for
analysis.



Database & Storage

MongoDB for user
data, Redis for
leaderboards, Cloud
Storage for files.



DevOps/Deployment

Docker for
containers, NGINX
for proxy, CI/CD for
automation, Cloud
Hosting for
deployment.

Technical Workflow

1. Input & Pre-Processing

User uploads PDFs, notes, or text -OCR extracts text (for images/PDFs) NLP cleans and segments the content

2. AI Quiz Generation

AI identifies key topics & concepts. Generates MCQs, T/F, fill-blanks-Assigns difficulty levels automatically

3. Session Creation

Host initiates live multiplayer quiz Unique session ID, link, and QR code generated

4. Real-Time Gameplay

Players join via link/PIN Questions, timers, and answers are synced instantly (Socket.io/WebRTC) AI adjusts difficulty based on player performance

5. Scoring & Leaderboard

Score calculated using accuracy + time , Live leaderboard updates with animations

6. Post-Quiz Output

Meme generator creates personalized memes , Analytics dashboard shows accuracy, time, strengths & weaknesses

IMPACT AND USE CASES

Impact

- Saves 95% time in quiz creation
- Boosts engagement through real-time gameplay
- Personalized learning with adaptive AI
- Provides deep analytics for educators & corporates
- Enhances accessibility (speech + monitoring)

Use Cases

- Schools & Colleges
- Corporate Training
- Competitive Exams & Mock Tests
- Hackathons & Events
- Online Coaching & Skill Assessments

Conclusion

QUIZIERRA delivers a next-generation quiz experience that transforms traditional assessments into an interactive, intelligent, and enjoyable process.

By integrating:

- AI quiz generation
- Real-time gameplay
- Adaptive difficulty
- Meme-based feedback
- Deep analytics

the platform empowers learners, supports educators, and enhances training outcomes for corporates.

It is built to be scalable, accessible, and future-ready, creating a powerful ecosystem for modern digital learning.