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VASANTDADA PATIL PRATISHTHAN'S
COLLEGE OF ENGINEERING & VISUAL ARTS

Quasar 4.0

Problem Statement: The Adaptive Mastery & Engagement Platform (AMEP)

PS NO : 01

College Name: Vivekanand Education Society's Insititute of Technology (VESIT)

Team Name: CodingWizards

Team Members: Abhishek Gore, Krrish Gupta, Rushabh Gupta, Unmesh Bhangale

IDEA / APPROACH DETAILS

Solution :- A unified AI-assisted education platform that enables personalized learning, real-time engagement tracking, and efficient project-based assessment in classrooms.

Adaptive Learning Engine

1) Tracks concept-wise mastery
2) Recommends practice for weak areas
3) Eliminates waster study time

Inclusive Engagement Tracking

1) Real-time student feedback
2) 100% participation ensured
3) Instant engagement insights

Project-Based Learning

1) Team-based project tracking
2) Peer review for soft skills
3) Objective skill assessment

Unified Teacher Dashboard

1) Single View of class progress
2) AI assisted teaching insights
3) Mastery & engagement analytics

Adaptive Learning → Engagement → Teacher Insights → Better Outcomes

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TECHNICAL APPROACH

Frontend:-

React

Tailwind CSS

Redux

Backend:-

Node.js

Express.js

JWT

Database:-

Mongo DB

Redis

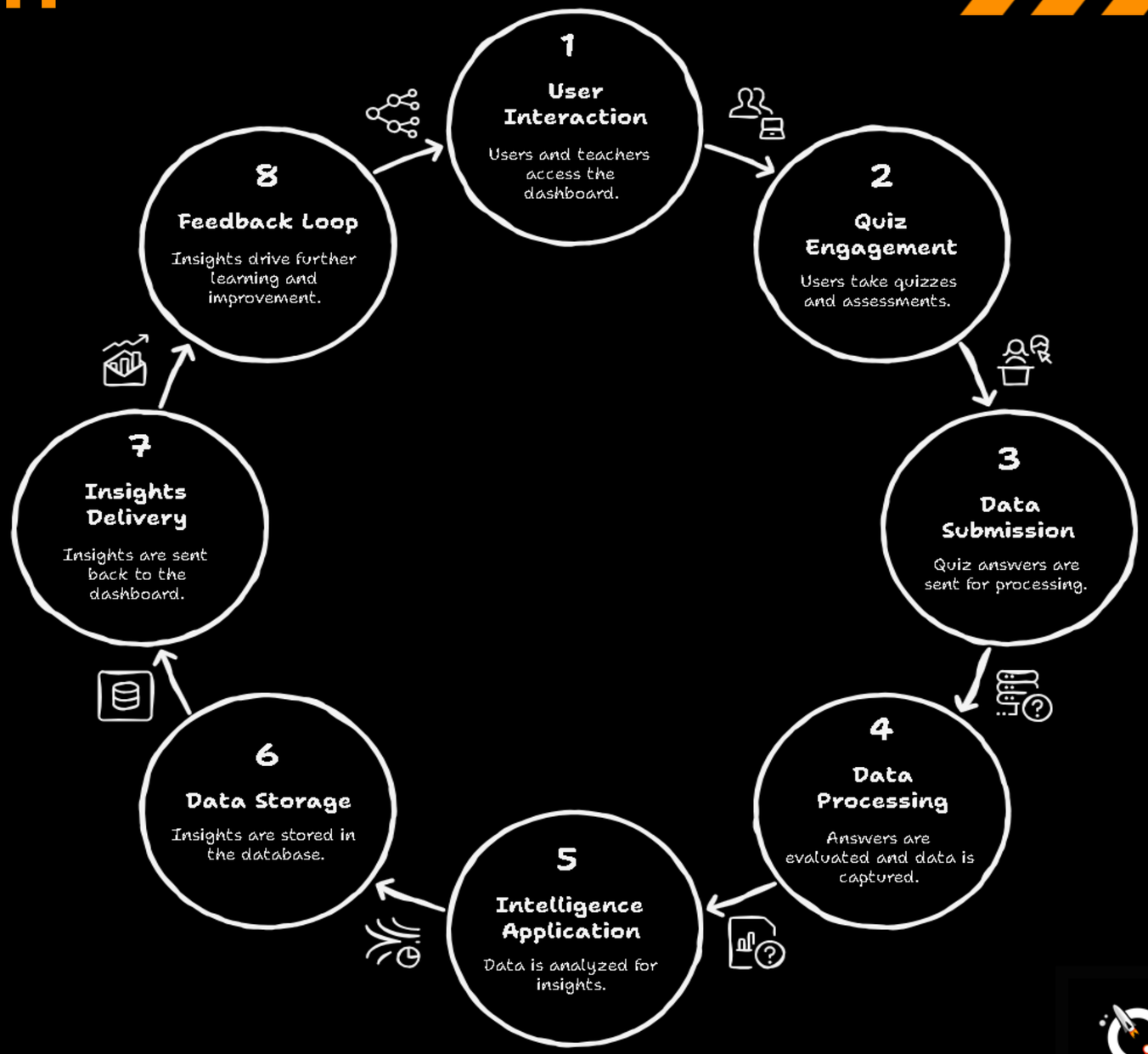
Cloudinary

Others:-

OpenAI

Chart.js

Docker



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FEASIBILITY & VIABILITY

Feasibility

API – First Integration
Uses existing LLM APIs & WebSockets

Modular Web Architecture
Independent student & teacher modules

Rapid MVP Development
Browser-based across devices

Hardware Agnostic
Works on browsers across devices

Viability :- Risk analysis and mitigation

Potential challenges and risks

- Data privacy & student consent
- Accuracy of engagement detection
- Adoption resistance from teachers
- Scalability with large class sizes

Strategies to overcome these challenges

- Anonymous & consent-based data collection
- Start with explicit feedback (polls)
- Simple, low-learning-curve dashboards
- Cloud-based architecture for scaling

IMPACT & BENEFITS

Policy aligned **impacts** leading to measurable real-world **benefits**

IMPACT

Alignment with NEP 2020

1) Competency based, mastery driven learning
2) Personalized learning pathways

Impact On Educational Boards

1) Objective, real-time academic insights
2) Reduced manual reporting

Impact On Schools And Institutions

1) Automated teacher workload
2) Standardized, flexible assessments

BENEFITS

Social Benefits

- Inclusive classrooms and equitable assessment
- Improved student confidence and participation

Economical Benefits

- Cost-effective alternative to multiple edtech tools
- Efficient use of teacher's time

Environmental Benefits

- Paperless assessment and digital workflows
- Reduced physical resource consumption

RESEARCH & REFERENCES

RESEARCH

NEP 2020 :- https://www.education.gov.in/sites/upload_files/mhrd/files/NEP_Final_English.pdf

Serverless architecture :- https://cloud.google.com/serverless?hl=en

REFERENCES

Google classroom :- https://classroom.google.com/

Vedantu :- https://www.vedantu.com/

WebSockets :- https://developer.mozilla.org/en-US/docs/Web/API/WebSockets_API

Feature/Aspect	AMEP	Google Classroom	Vedantu
Personalized Adaptive Learning	✅	❌	❌
Real-Time Engagement Tracking	✅	❌	❌
No Invisible Students	✅	❌	❌
Project-Based	✅	✅	❌
Unified Teacher Dashboard	✅	✅	❌
NEP 2020 Alignment	✅	❌	❌