SMART INDIA HACKATHON 2025

TITLE PAGE

- **Problem Statement ID – SIH25048**
- **Problem Statement Title- Gamified Learning Platform for Rural Education**
- **Theme- Smart Education**
- **PS Category- Software**
- **Team ID- 94525**
- **Team Name (Registered on portal)-STEMify**

STEMify

IDEA TITLE

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Problem Title: Gamified Learning Platform for Rural Education

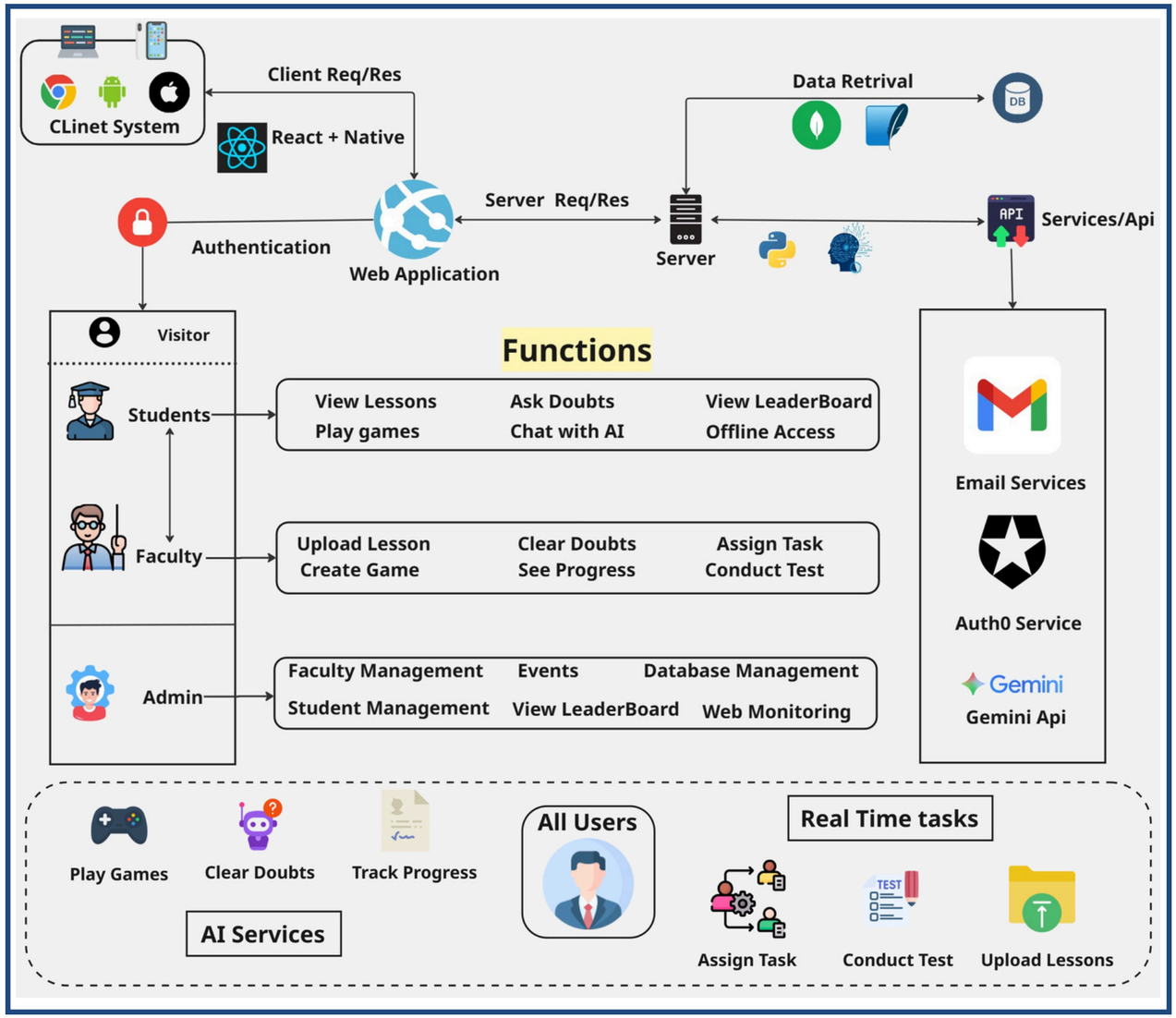
Solution Overview :

- Stemify is a gamified, **multilingual platform** teaching STEM (Science, Technology, Engineering, Mathematics) through **interactive games** for grades 6-12.
- A **centralized dashboard** empowers teachers to track progress and personalize instruction.
- **Offline Access** where Internet is Limited

Unique Features:

- Village Fix-It Simulator
- STEM Comic Creator
- Bluetooth Peer Sync
- Mentorship Minutes
- Curiosity Quests
- Simple Machines Quest
- Festival-Based STEM Missions
- Syllabus Sync Mode
- Puzzle & Logic-Based Learning
- STEM Wall of Fame

System Architecture:



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TECHNICAL APPROACH

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Tech Stack:

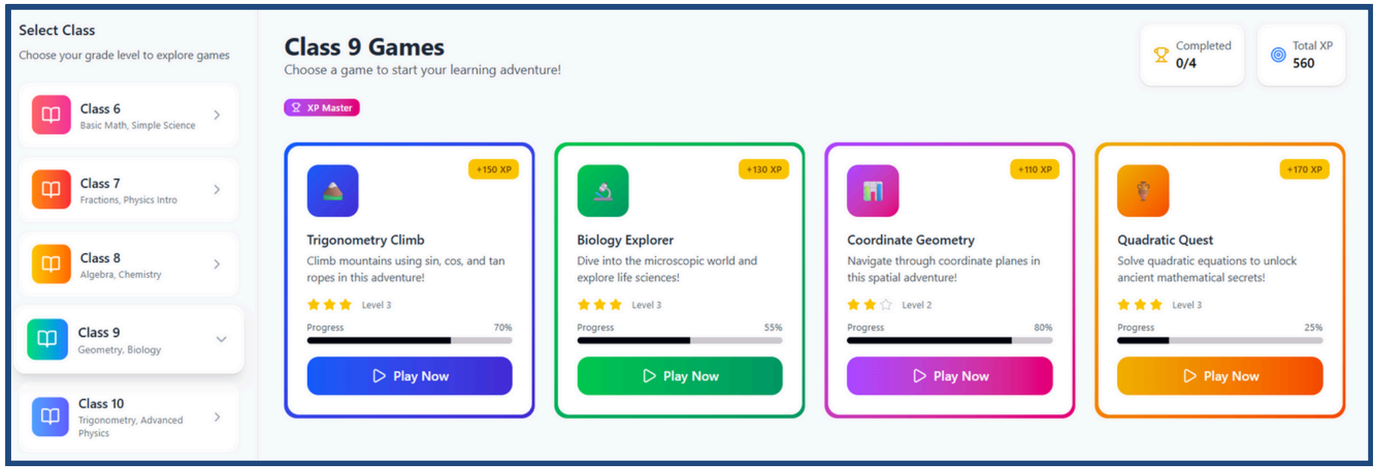
Frontend :

- **ReactJS** (progressive web app, offline support)
- **HTML-5 & CSS**

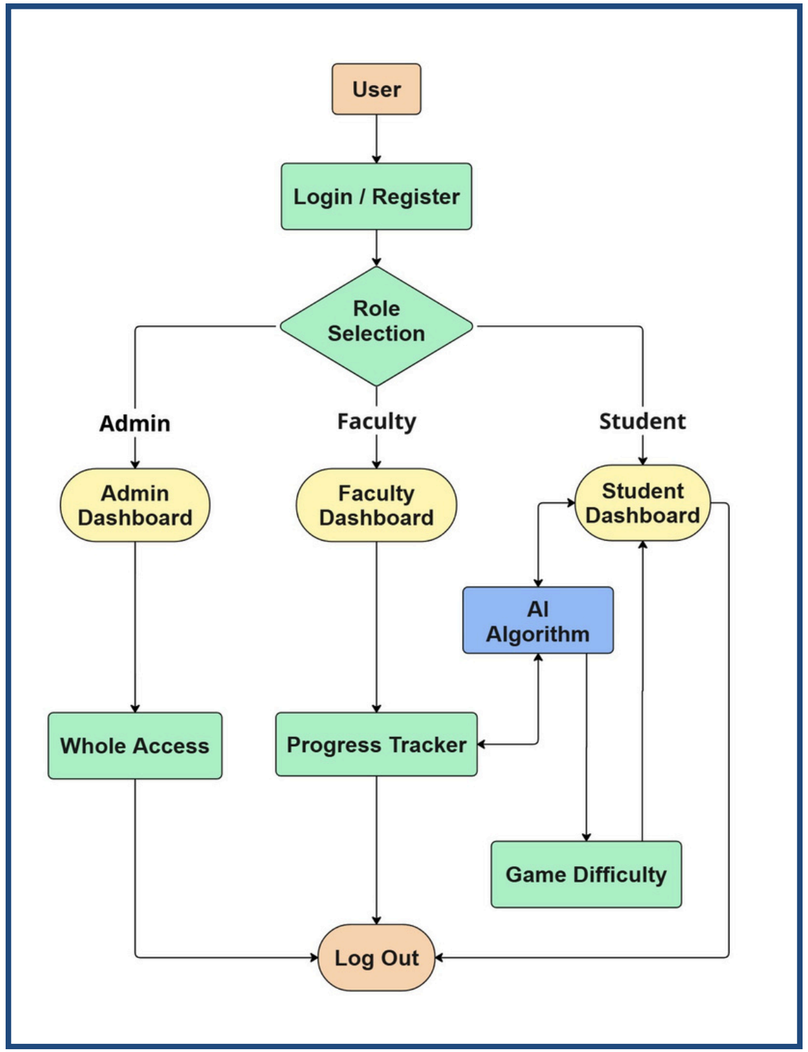
Backend :

- **Python (FastAPI/Django)** → APIs, gamification logic, analytics engine
- **MongoDB**→ Central Database
- **SQLite** → Offline storage
- **Redis (Optional)** → Gamification (leaderboards, streaks, badges)

Prototype:



Flow Diagram:



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FEASIBILITY AND VIABILITY

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Feasibility:

- **Technical:** Lightweight, offline-first architecture for low-bandwidth use.
- **Modular:** Easy updates and adding subjects.
- **Market:** Strong demand in rural areas due to education gaps..
- **Economic:** low-cost configuration based on an open-source and Linux tools in the clouds.

Viability:

- **User Retention:** Students stay interested in progression-based game design.
- **Financial:** Support via grants, foundations, and sponsorships.
- **Impact Scalability:** Skills gained boost community
- productivity.
- **Adaptability:** Easily fits with curriculum and policy changes

Challenges:

- Cultural Adoption
- Device Maintenance
- Competition

Business Potential:

- Freemium Model
- Certification Programs
- Data Analytics Services
- State-Level Contracts

Supporting Facts for Feasibility and Viability

→ G. Y. Hong and M. Masood, "Effects of Gamification on Lower Secondary School Students' Motivation and Engagement," INTERNATIONAL JOURNAL OF EDUCATIONAL AND PEDAGOGICAL SCIENCES, vol. 8, no. 12, pp. 3757–3764, 2014.

→ P. Chhabra and P. Delaney, "Using Gamification to Promote Student Engagement in STEM Project-Based Learning," IEEE INTELLIGENT INFORMATICS BULLETIN, vol. 22, no. 1, pp. 38–47, Dec. 2022.

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IMPACT AND BENEFITS

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Impacts:

Fosters Collaboration: Our site stimulates teamwork in the projects of students, and it makes students feel a sense of community and mutual success.

Localizes Learning: We also render our lessons close to life with a comparison of STEM in local people of agriculture and daily life.

Empowers Digital Leaders: Students do not merely learn, they become mentors and who share knowledge and take tech up in their respective villages.

Increases Student Confidence: The fun and game approach enables students to feel more competent and inspired since they have a positive chance of not dropping out.

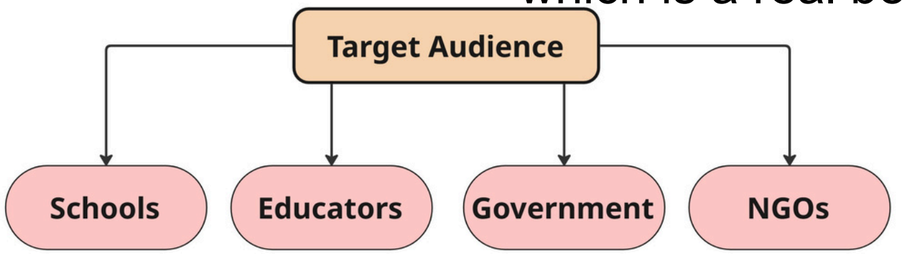
Benefits:

Enhanced Learning: The students receive an individualized and interactive experience, which can be modified to their pace and individual requirements.

Offline-first Reliability: Our solution is fully compatible even lower internet connections so learning will never be an issue.

Economic Empowerment: We open a definite channel through which the students acquire skills that would translate into the real world of employment in the community.

Develops Critical Skills: Our emphasis is on creating problem-solving and critical thinking skills, which is a real benefit in the future of students.



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RESEARCH AND REFERENCES

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2. I. M. García-López, E. Acosta-Gonzaga, and E. F. Ruiz-Ledesma, “**Investigating the Impact of Gamification on Student Motivation, Engagement, and Performance**,” EDUCATION SCIENCES, vol. 13, no. 8, pp. 1–17, Aug. 2023. Paper Link...
3. P. Chhabra and P. Delaney, “**Using Gamification to Promote Student Engagement in STEM Project-Based Learning**,” IEEE INTELLIGENT INFORMATICS BULLETIN, vol. 22, no. 1, pp. 38–47, Dec. 2022. Paper Link...
4. T. Panyajamorn, S. Suanmali, and Y. Kohda, **“Using MOOC and Gamification Hybrid Learning Models in Rural Public Schools in Thailand,”** JOURNAL OF EDUCATORS ONLINE, vol. 18, no. 1, pp. 1–18, 2021. Paper Link...
5. G. Y. Hong and M. Masood, **“Effects of Gamification on Lower Secondary School Students' Motivation and Engagement,”** INTERNATIONAL JOURNAL OF EDUCATIONAL AND PEDAGOGICAL SCIENCES, vol. 8, no. 12, pp. 3757–3764, 2014. Paper Link...