# Product Perspective

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The proposed system is a Smart E-Learning Platform that operates as a standalone solution, yet is designed with high flexibility to allow integration with external services such as OpenAI APIs for AI features and Google Meet for live sessions.  
  
The platform consists of four main integrated subsystems:  
  
1. Web-Based Learning Portal (React.js + Node.js/Express.js)  
 This is the primary interface for students, teachers, and parents. It handles content access, course management, assessments, grading, analytics, and communication through secure REST APIs.  
  
2. Mobile Companion Application (Flutter)  
 A synchronized lightweight interface mainly for students and parents to track lessons, view progress, receive notifications, and access exams or materials using the same backend services.  
  
3. Hybrid Database Layer (PostgreSQL + MongoDB)  
 - PostgreSQL stores all structured academic data such as users, courses, exams, attendance records, and grades.  
 - MongoDB is used to store unstructured or media content such as lecture videos, PDF notes, or exam recordings.  
 Together, both databases act as a unified data foundation for the platform.  
  
4. AI-Powered and Gamification Extensions  
 The platform includes optional modular AI features, such as a Chatbot for assistance, an Automated Exam Generator, Student Weakness Detection Engine, and a Coins & Rewards System to enhance engagement and performance. These components are designed as plug-in extensions, ensuring that the system remains scalable and upgradable over time.  
  
Overall, the platform is not dependent on any external LMS but can operate independently or be connected to other systems if required. Its modular design ensures that future enhancements such as screen recording during exams (WebRTC) or real-time virtual classrooms can be integrated smoothly without affecting the core functionality.