**Project Design Phase**

**Solution Architecture**

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| Date | 28 June 2025 |
| Team ID | LTVIP2025TMID36180 |
| Project Name | **Personalised learning with generative AI and Lms Integration** |
| Maximum Marks | 4 Marks |

**Solution Architecture:**

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| End Users |

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| - Students |

| - Educators |

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| EduTutor AI UI | ← Web App / Mobile App

| (Dashboard, Quizzes, |

| Feedback Interface) |

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| Authentication| | Google Classroom |

| & User Sync | | Integration API |

| (OAuth 2.0) | | (Course, Student |

+---------------+ | & Assignment Data)|

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| User Profile Manager | | LMS Data Sync Module |

| (Roles, Preferences) | | (Schedules, Subjects) |

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| AI Engine & Core Logic |

| (Personalization, Adaptation, Quiz |

| Generation, Feedback Loop) |

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| Granite LLM / | | IBM Watsonx Models | | Pinecone Vector DB |

| GenAI for Quiz | | for Diagnostics & | | (Semantic Search, |

| Generation | | Evaluation Logic | | Topic Clustering) |

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| Data & Insights Engine |

| (Analytics, Reports, Trends) |

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| Educator Dashboard |

| (Student Progress, |

| Class Insights) |

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**Components Explained :**

**1. User Interface**

* **Students**: Take quizzes, view feedback, follow learning paths.
* **Educators**: View dashboards, assign quizzes, analyze performance.

**2. LMS Integration**

* Integrates with **Google Classroom** to fetch course data, assignments, and student rosters.
* Keeps quiz topics aligned with the curriculum.

**3. AI & Generative Core**

* **Granite LLM**: Generates quizzes based on class topics.
* **IBM Watsonx**: Creates diagnostic tests and evaluates open-ended responses.
* **Adaptive Engine**: Adjusts quiz difficulty based on student history.

**4. Data Intelligence Layer**

* **Pinecone Vector DB**: Stores and retrieves student data using vector similarity (e.g., past answers, topic familiarity).
* **Insights Engine**: Aggregates performance data to suggest interventions or insights.

**5. Security & Auth**

* OAuth-based login through Google for safe access.
* Role-based access control (students, teachers, admins).