**Project Design Phase**

**Proposed Solution Template**

| Date | 25 JUNE 2025 |
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| Team ID | LTVIP2025TMID21159 |
| Project Name | SmartSDLC – AI-Powered Software Development Lifecycle Optimization |
| Maximum Marks | 2 Marks |

**Proposed Solution :**

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| **S.No.** | **Parameter** | **Description** |
|  | Problem Statement (Problem to be solved) | Traditional software development involves manual steps that are time-consuming, error-prone, and resource-intensive. Developers struggle with slow requirement classification, bug fixing, lack of documentation, and repetitive code and test case writing. This reduces productivity and increases development cost. |
|  | Idea / Solution description | SmartSDLC is an AI-powered automation platform that optimizes the Software Development Lifecycle (SDLC) by using transformers and generative AI. It automates six critical phases: requirement classification, code generation, bug fixing, test case creation, code summarization, and chatbot assistance—accessible through a user-friendly Streamlit interface and backed by a FastAPI backend. |
|  | Novelty / Uniqueness | Unlike existing SDLC tools that only address parts of the development cycle, SmartSDLC provides a complete end-to-end solution. It uses powerful language models (like IBM Granite 3.3) to automate multiple coding tasks, summarize logic, and assist developers in natural language—all within a single platform with fallback options like Groq API for high reliability. |
|  | Social Impact / Customer Satisfaction | SmartSDLC enhances developer efficiency, reduces burnout, and improves overall software quality. Educational institutions, startups, and software teams can greatly benefit from faster prototyping, better documentation, and less manual effort, ultimately boosting satisfaction among stakeholders. |
|  | Business Model (Revenue Model) | The platform can follow a **freemium model**—basic features are free, while advanced capabilities (e.g., bulk test case generation, model tuning, API access) are offered via subscription. Additional revenue streams include B2B licensing for companies or integration services for development teams. |
|  | Scalability of the Solution | SmartSDLC is built with modular components, scalable APIs, and cloud support. It can scale across different industries, languages, and codebases. With GPU support and asynchronous processing, the system can handle increasing workloads efficiently. |