Project Design Phase

Problem – Solution Fit

Date	25 Aug 2025
Team ID	NM2025TMID11403
Project Name	SmartSDLC – AI-Enhanced Software Development Lifecycle
Maximum Marks	2 Marks

1. Problem(s) Identified

Problem ID	Problem Description
P1	Software development teams often face delays due to manual requirement gathering and classification.
P2	Developers spend excessive time writing boilerplate code, reducing productivity.
P3	Bug fixing and testing are time-consuming and often error-prone when done manually.
P4	Lack of automation leads to inconsistent documentation and knowledge gaps.

2. Target Audience (Who is facing the problem?)

Stakeholder Type	Description
Developers	Need faster code generation, bug fixing, and test case creation.
Project Managers	Require clearer classification of requirements and traceability across the SDLC.
QA Engineers	Demand consistent, auto-generated test cases to validate code quickly.
Clients	Expect timely delivery and functional clarity in development cycles.

3. Existing Alternatives

Alternative	Drawback
Manual SDLC Tools (e.g., Excel, Word)	Time-consuming and prone to error
Traditional IDE Plugins	Lack AI-powered adaptability for natural language inputs
Standalone AI tools	Do not cover end-to-end SDLC stages in a single platform

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4. Solution Offered (SmartSDLC)

Feature	How It Solves the Problem
Requirement Classification from PDFs	Automates mapping to SDLC phases using IBM Granite LLM
AI Code Generator	Converts user stories into ready-to-deploy Python code
Bug Fixer	Auto-identifies and fixes bugs with explanation
Test Case Generator	Produces structured pytest cases for functional code
Code Summarizer	Explains code functionality in plain English
Chatbot Assistant	Real-time SDLC support for developers and team members

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5. Unique Value Proposition

SmartSDLC is an AI-powered platform that automates the most time-intensive stages of the Software Development Lifecycle — from gathering requirements to generating production-ready code, testing, and documentation — using IBM's Granite LLM and deployed with a Gradio interface for ease of use.

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6. Adoption Triggers

Trigger	Explanation
Time Savings	Reduces hours of manual coding and testing effort
Accuracy	Enhances consistency and lowers human error
Integration	Can be integrated into modern DevOps and Agile workflows easily
Usability	Minimal technical training required for non-developers