SMART BRIDGE INTERNSHIP

GENERATIVE AI WITH IBM CLOUD

Project Title:

SmartSDLC -AI-Enhanced Software Development Lifecycle

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Phase 1:Brainstorming & Ideation

Objective:

To identify the pain points in the traditional Software Development Lifecycle (SDLC) and conceptualize how AI can streamline the process.

Description:

* Traditional SDLC is time-consuming, heavily manual, and often inconsistent.
* Brainstormed the idea of using AI models to automate every major stage of SDLC.
* Identified IBM Watsonx and NLP technologies as key enablers.

Key Points:

* Focused on **end-to-end automation**.
* Designed to support both **technical and non-technical users**.
* Proposed modules: Requirement Classifier, Code Generator, Bug Fixer, Test Case Generator, Code Summarizer, Chatbot Assistant.

Phase 2: Requirement Analysis

Objective:

To automate the understanding and classification of raw user requirements.

Description:

* Users upload **PDF documents** with unstructured requirements.
* Extract content using **PyMuPDF**.
* Watsonx AI classifies sentences into SDLC stages: Requirements, Design, Development, Testing, Deployment.
* Output is transformed into **user stories** and organized for planning.

Key Points:

* Enhances traceability and clarity.
* Reduces manual requirement gathering time.
* Enables sprint planning using structured data.

Phase 3: Project Design

Objective:

To provide design-level understanding and quality control using AI.

Description:

* Code Summarizer: Analyzes code and explains its function in simple language.
* Bug Fixer: Detects syntax/logical errors and returns corrected code.

Key Points:

* Aids **documentation and onboarding**.
* Improves **code quality** before development.
* Helps understand legacy or third-party codebases.

Phase 4: Project Planning

Objective:

To use AI-classified user stories for efficient sprint and task planning.

Description:

* Once requirements are classified, they are grouped by SDLC stage.
* These user stories are used to plan Agile sprints and assign tasks.
* Enables planning tools to track phase-wise progress.

Key Points**:**

* Supports **Agile and Scrum workflows**.
* Helps project managers in **task breakdown and prioritization**.
* Offers clarity by aligning tasks with SDLC phases.

Phase 5: Project Development

Objective:

To generate production-ready code using AI from natural language prompts or user stories.

Description:

* Developers input a prompt like “Create a login page in React.”
* Watsonx AI processes the prompt and returns **syntax-highlighted code**.
* Code is clean, contextually appropriate, and ready for deployment or enhancement.

Key Points:

* Speeds up prototyping and development.
* Supports multiple languages like Python, JavaScript, etc.
* Eliminates boilerplate coding effort.

Phase 6: Functional & Performance Testing

Objective:

To automate the test case generation process using AI.

Description:

* Developer inputs functional code or a requirement.
* Watsonx AI generates test cases using frameworks like unittest, pytest.
* Helps validate logic and performance automatically.

Key Points:

* Ensures consistent **test coverage**.
* Saves time spent on manual test creation.
* Makes the QA process more efficient and reliable.