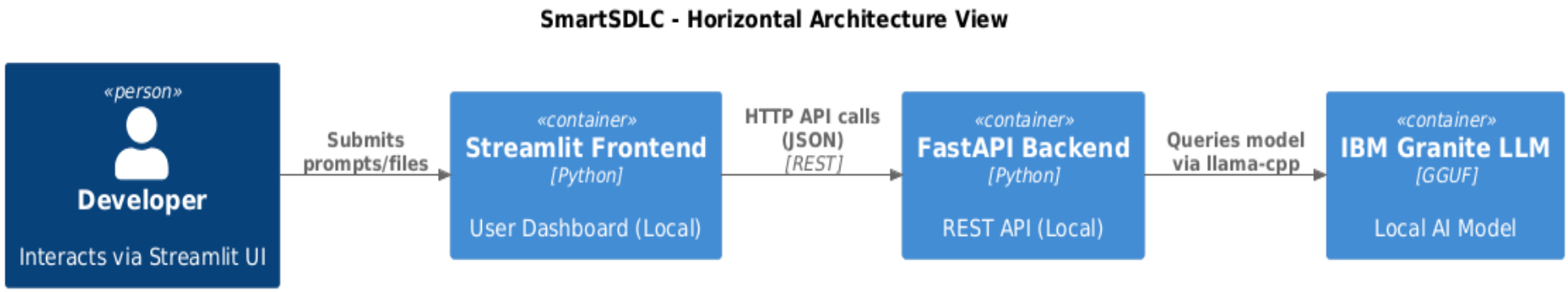
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	19 JUNE 2025
Team ID	LTVIP2025TMID37665
Project Name	SMART SDLC
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table1 & table 2



Technology Stack Tables

Table-1: Component Breakdown

S.No	Component	Description	Technology
1.	User Interface	Web-based dashboard for SDLC tasks	Streamlit (Python)
2.	Application Logic-1	Requirement analysis & design generation	FastAPI + IBM Granite LLM
3.	Application Logic-2	Code generation & explanation	llama-cpp-python (GGUF runtime)
4.	Application Logic-3	Testing & bug fixing	Pytest (Backend)
5.	Database	Session history storage	SQLite (File-based)
6.	File Storage	PDF uploads for requirement analysis	Local filesystem
7.	Machine Learning Model	AI-powered SDLC automation	IBM Granite-3.3B (granite-3.3-2b-instruct-Q4_K_M.gguf)
8.	Infrastructure	Local development/deployment	Python venv, Docker (Future)

Table-2: Application Characteristics

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Backend API, Frontend, AI integration	FastAPI, Streamlit, llama-cpp-python
2.	Security Implementations	Local data processing, no cloud dependencies	N/A (Offline-first)
3.	Scalable Architecture	Modular design (frontend/backend separation)	Microservices (FastAPI)
4.	Availability	Single-user local execution	99% uptime (local hardware-dependent)
5.	Performance	Optimized for prompts <512 tokens (~2 sec response)	GPU-accelerated inference (4GB VRAM)

References:

https://c4model.com/

https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/

https://www.ibm.com/cloud/architecture

https://aws.amazon.com/architecture

https://medium.com/the-internal-startup/how-to-draw-useful-technical-architecture-diagrams-2d20c9fda90d