

Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	8 January 2026
Team ID	LTVIP2026TMIDS24884
Project Name	Heart Disease Analysis
Maximum Marks	4 Marks

Technical Architecture:

Technical Architecture defines the structured design of a system, showing how different components like user interface, application logic, database, and visualization tools interact to deliver the final solution.

Example: Online Shopping System

Reference: <https://help.tableau.com/>

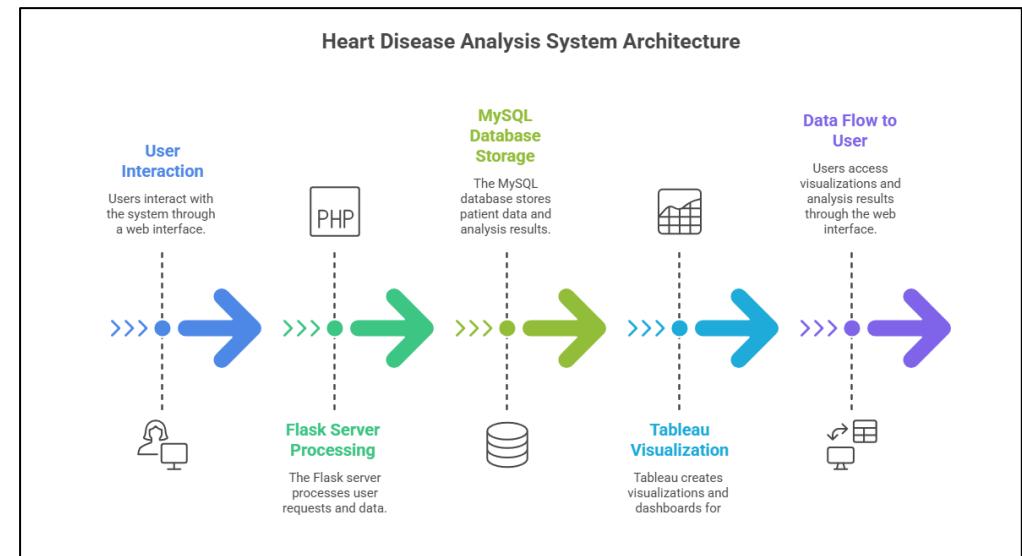
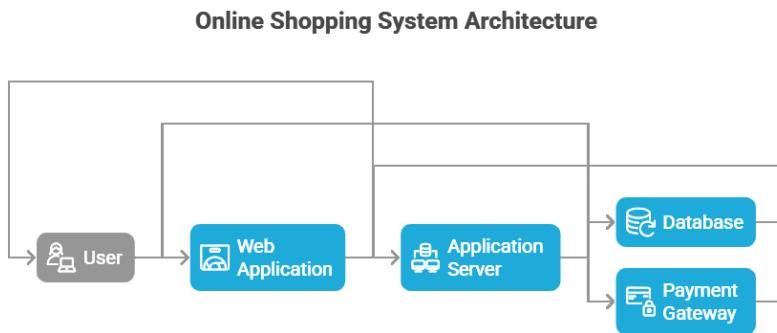


Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based dashboard where users register, login, and view heart disease analytics reports	HTML, CSS, JavaScript, D3.js
2.	Application Logic-1	Backend logic for authentication, session management, data filtering, and report generation	Python with Flask Framework
3.	Application Logic-2	Data processing logic for cleaning, transforming, and preparing dataset for visualization	Python (Pandas, NumPy)
4.	Application Logic-3	Dashboard integration and analytics embedding	Tableau
5.	Database	Stores structured heart disease dataset (Age, BMI, Cholesterol, Smoking, Diabetes, etc.)	MySQL
6.	Cloud Database	Optional cloud-hosted relational database for remote deployment	IBM DB2
7.	File Storage	Stores CSV dataset files and exported reports	Local File System / Cloud Storage
8.	External API-1	Email service API for user confirmation and OTP verification	SMTP API
9.	External API-2	Optional health dataset integration API (future enhancement)	Public Health Data API
10.	Machine Learning Model	Predicts heart disease risk based on health parameters	Logistic Regression / Random Forest (Scikit-learn)
11.	Infrastructure (Server / Cloud)	Application Deployment Environment	Local Server (Windows/Linux) / AWS EC2 / IBM Cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Backend and data processing frameworks used	Flask, Pandas, NumPy, Scikit-learn
2.	Security Implementations	Password hashing, secure login, input validation, protection against SQL Injection	SHA-256 Hashing, HTTPS, OWASP Guidelines

S.No	Characteristics	Description	Technology
3.	Scalable Architecture	3-Tier Architecture separating UI, Logic, and Database layers	Flask + MySQL + Tableau
4.	Availability	System can be hosted on cloud with continuous uptime	AWS EC2 / IBM Cloud
5.	Performance	Optimized SQL queries, indexed database, caching static files	MySQL Indexing, Flask Caching

References:

<https://c4model.com/>

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

<https://aws.amazon.com/architecture/>

<https://flask.palletsprojects.com/>

<https://dev.mysql.com/doc/>