Project Design Phase-II

Technology Stack (Architecture & Stack)

Date	31 January 3035
Team ID	LTVIP2025TMID47828
Project Name	Heritage Treasures: An In-Depth Analysis Of UNESCO World Heritage Sites In Tableau
Maximum Marks	4 Marks

Technical Architecture:

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

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1	User Interface	Tableau Dashboards for end-user insights	Tableau Public / Tableau Server
2	Application Logic-1	ETL and data wrangling pipeline	Python (Pandas, NumPy)
3	Application Logic-2	API integration for fetching heritage data	Python (Requests, JSON)
4	Application Logic-3	Clustering sites by geography	Scikit-learn (KMeans / DBSCAN)
5	Database	Structured data storage	MySQL / PostgreSQL
6	Cloud Database	Cloud database option for scalability	IBM Cloudant / AWS RDS
7	File Storage	Raw data & analysis snapshots	AWS S3 / Local File System
8	External API-1	UNESCO WHS API or scraped data	Python Web Scraping / Public API

S.No	Component	Description	Technology
9	External API-2	Geo-location or mapping	Google Maps API / OpenStreetMap
10	Machine Learning Model	Predictive analytics / clustering by region & type	Scikit-learn, Matplotlib
11	Infrastructure	Local dev & cloud deployment	Localhost (Dev), AWS EC2 or IBM Cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology / Tools Used
1	Open-Source Frameworks	For data processing, ML, and visualization	Pandas, Scikit-learn, Flask, Plotly
2	Security Implementations	Data encryption in transit, OAuth for APIs, IAM roles	HTTPS, OAuth 2.0, AWS IAM, SHA-256
3	Scalable Architecture	Modular ETL + ML + BI, can scale on cloud or containerized setup (3-tier)	Docker, Kubernetes, AWS Lambda (optional)
4	Availability	Hosted on cloud with load-balanced endpoints and backups	AWS CloudFront, IBM Load Balancer, S3
5	Performance	Cached queries, fast-loading Tableau dashboards, optimized DB indexing	Redis (optional), CDN, MySQL Indexing