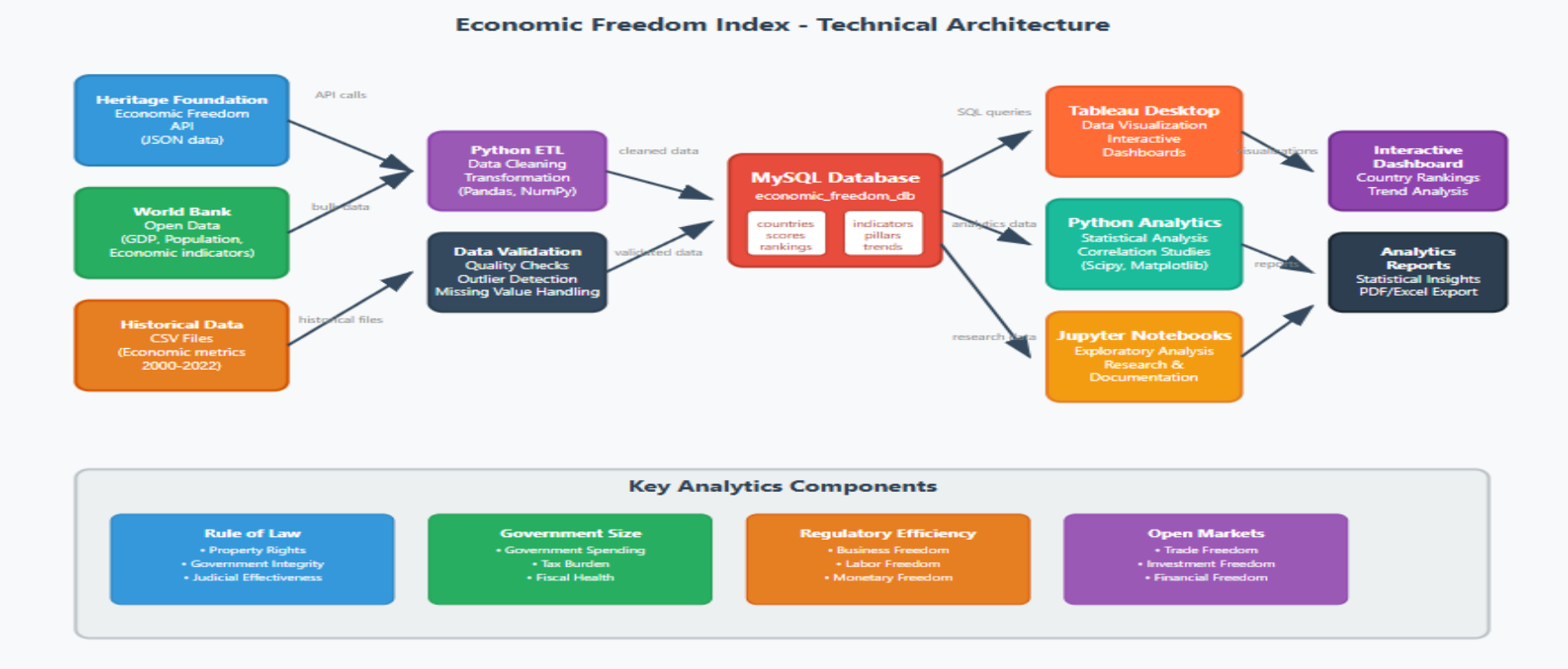
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	26 June 2025
Team ID	LTVIP2025TMID37895
Project Name	Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis
Maximum Marks	4 Marks

Technical Architecture:

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



Example: Order processing during pandemics for offline mode

Reference: https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web-based UI to visualize dashboards and interact with economic freedom data	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Logic for fetching and preprocessing raw economic data	Java / Python
3.	Application Logic-2	Logic for data cleaning and categorization into 12 indicators	Python, MySQL procedures
4.	Application Logic-3	Dashboard logic to filter, sort, and compare countries	Tableau filters, calculated fields, and parameters
5.	Database	Storage for country-wise scores and historical data	MySQL, NoSQL, etc.
6.	Cloud Database	Remote access to dataset for teams or real-time updates	Google Cloud SQL, Amazon RDS.
7.	File Storage	Storing visual assets, exported CSVs and PDFs	Google Drive / Local file system / Tableau Export
8.	External API-1	For retrieving real-time economic indicators or exchange rates	World Bank API / IMF API
9.	External API-2	Region classification or country metadata	REST Countries API / GeoNames API
10.	Machine Learning Model	Trend prediction of economic freedom scores over time	Time Series Forecasting Model (Prophet/ARIMA)
11.	Infrastructure (Server / Cloud)	Deployment on cloud platform or Tableau Public	Tableau Cloud / AWS EC2 / Google Cloud Platform.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Uses open-source technologies for data processing and visualization	Python (Pandas, NumPy), MySQL, Tableau Public, Flask
2.	Security Implementations	Implements user access controls for dashboard access, encrypted database connections	SSL/TLS, MySQL encryption, IAM roles, SHA-256, OWASP
3.	Scalable Architecture	Cloud-based and modular; can scale horizontally by adding servers or vertical scaling for heavier loads	3-tier architecture using Tableau Server + MySQL + GCP
4.	Availability	High availability through Tableau Cloud / Public or Google Cloud hosting; can use distributed instances	Load Balancer (GCP/AWS), auto-scaling groups
5.	Performance	Designed for fast response: optimized queries, data aggregation, and pre-processed datasets	Use of Tableau Extracts (TDE/Hyper), CDN for assets

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