

Project Design Phase-II

Technology Stack (Architecture & Stack)

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| Date | 14 February 2026 |
| Team ID | LTVIP2026TMIDS88300 |
| Project Name | Measuring the pulse of prosperity: an index of economic freedom |
| Maximum Marks | 4 Marks |

Technical Architecture:

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

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

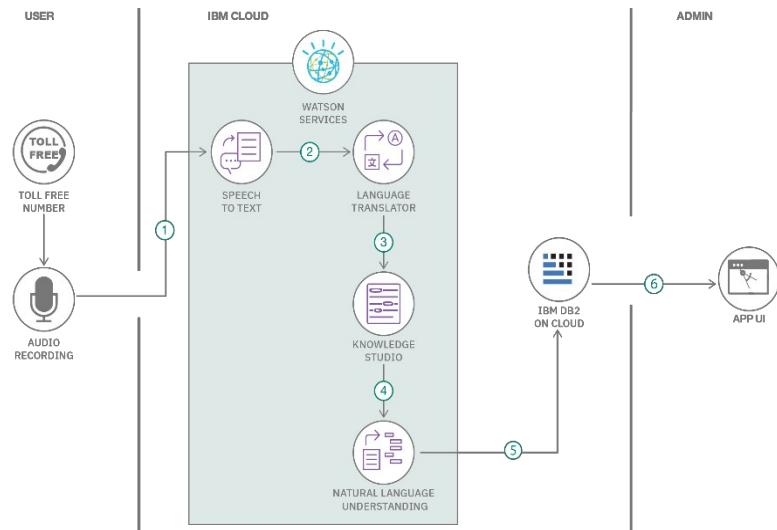


Table-1: Components & Technologies:

| S. No | Component | Description | Technology |
|-------|---------------------------------|--|----------------------------------|
| 1. | User Interface | Web interface for data visualization & interaction | HTML, CSS, JavaScript, Plotly.js |
| 2. | Application Logic-1 | Data preprocessing and normalization | Python |
| 3. | Application Logic-2 | Correlation analysis between economic index and indicators | Python (SciPy, stats models) |
| 4. | Application Logic-3 | Interactive dashboard generation | Streamlit / Flask / Dash |
| 5. | Database | Store raw and processed data | MySQL |
| 6. | Cloud Database | Host for shared/real-time access | Firebase |
| 7. | File Storage | Upload and manage datasets (CSV, Excel) | Local Filesystem |
| 8. | External API-1 | Pull additional economic data | World Bank API, |
| 9. | External API-2 | Geo mapping or visualization services | Google Maps API. |
| 10. | Machine Learning Model | Predict prosperity based on economic indicators | Scikit-learn Regression Model |
| 11. | Infrastructure (Server / Cloud) | Hosting and deployment | Local. |

Table-2: Application Characteristics:

| S. No | Characteristics | Description | Technology |
|-------|--------------------------|--|---|
| 1. | Open-Source Frameworks | Frameworks used for visualization and app deployment | Streamlit, Plotly, Dash, Pandas |
| 2. | Security Implementations | Basic input validation, role access, and secure upload | SSL, SHA-256 hashing, Firebase Auth |
| 3. | Scalable Architecture | Modular, scalable with cloud hosting & stateless APIs | Microservices architecture on Flask/Streamlit |
| 4. | Availability | Cloud-hosted with minimal downtime | AWS EC2, Firebase Hosting, Streamlit Cloud |
| 5. | Performance | Optimized through caching and minimal payload visualization for fast loading | JSON queries |

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>