# Project Design Phase-II

Technology Stack (Architecture & Stack)

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| Date: | 17 June 2025 |
| Team ID: | LTVIP2025TMID48532 |
| Project Name: | Measuring the Pulse of Prosperity: An Index of Economic Freedom Analysis |
| Maximum Marks: | 4 Marks |

## Technical Architecture

The architecture of the Economic Freedom Index App is based on a cloud-native, scalable, and secure system design that supports mobile and web access. Below is a description of each major component and technology used.

## Table-1: Components & Technologies

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| S.No | Component Description | Technology |
| 1 User Interface - | Web & Mobile App access | ReactJS (Web), Flutter (Mobile) |
| 2 Application Logic-1 - | Registration and Authentication | Node.js |
| 3 Application Logic-2 - | Data Aggregation & API Layer | Python (FastAPI) |
| 4 Application Logic-3 - | Index Calculation Engine | Python (Pandas, NumPy) |
| 5 Database - | Structured data storage | PostgreSQL |
| 6 Cloud Database- | Cloud hosted structured DB | AWS RDS (PostgreSQL) |
| 7 File Storage - | Documents and media | AWS S3 |
| 8 External API-1 - | Global economic data | World Bank Open API |
| 9 External API-2 - | Authentication Services | Google OAuth / Firebase Auth |
| 10 Machine Learning Model | Recommendation Engine | Scikit-learn |
| 11 | Infrastructure (Server / Cloud) | AWS EC2, Docker, Kubernetes |

## Table-2: Application Characteristics

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| S.No | Characteristics Description | Technology |
| 1 Open-Source Frameworks | - Base development frameworks | ReactJS, Flutter, Node.js, FastAPI |
| 2 Security Implementations | User data and access security | OAuth 2.0, HTTPS, JWT, OWASP, SHA-256 |
| 3 Scalable Architecture - | Micro services and container orchestration | Docker, Kubernetes, AWS ECS |
| 4 Availability - | Ensures uptime and load management | AWS Load Balancer, Multi-AZ RDS |
| 5 Performance - | Fast user interaction and data access | Redis Cache, AWS CloudFront CDN |