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

Date	26 October 2023
Team ID	TSK-8446672
Project Name	Project - Subscribers Galore : Exploring World's Top Youtube Channels
Maximum Marks	4 Marks

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	Frontend	Web Application: Developing a web-based user interface for easy access.	React.js & Redux
2.	Backend	Server-side Logic: Implementing the backend logic to data processing, analysis, and user requests. RESTful API: Create a RESTful API to interact with the frontend and retrieve data.	Node.js & Express.js
3.	Database	Database Management System (DBMS): Using a DBMS to store and manage data efficiently. Database Design: Designing a database schema that supports the storage of YouTube channel information, subscriber counts.	PostgreSQL & MongoDB
4.	Web Scarping	Web Scraping Module: Implementing a web scraping module to collect data from YouTube channels. Scraping Scheduler: Schedule periodic scrapes to keep data up-to-date.	Python
5.	Data Analysis	Data Processing Engine: For data processing and analysis. Algorithm Implementation: Implementing algorithms to identify trends, patterns, and correlations in the data.	Python, Pandas & Numpy

6.	YouTube API Integration	Integration Module: Integrating the YouTube API to gather detailed information about channels, videos, and user engagement. Authentication: Implementing secure authentication for accessing the API.	Python (Google API Client Library)
7.	Authentication and Authorization	User Authentication: Securing user authentication for accessing personalized features. Authorization: Implementing role-based access control to manage user privileges.	JWT(JSON Web Tokens) & Passport.js
8.	Caching	Cache Layer: Implementing caching mechanisms to improve performance and reduce redundant API calls.	Redis
9.	Data Visualization	Visualization Libraries: Using libraries for interactive and informative data visualization. Dashboard: Create a user-friendly dashboard for visualizing channel statistics and trends.	Tableau, IBM, Power BI
10.	Collaboration and Social Features	User Interaction Features: Implementing features that allow users to share findings, comment on channels, and collaborate. Notification System: Notifying users of updates or new insights.	WebSocket(Socket.io), Firebase Realtime Database
11.	Deployment	Cloud Hosting: Considering deploying your application on cloud platforms. Containerization: Using containerization to ensure consistent deployment across environments.	Docker, Heroku, AWS, Azure or Google Cloud

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Web Application Framework Frontend Framework Data Processing Framework API Framework Content Management System (CMS)	Django React Apache Spark Flask WordPress
2.	Security Implementations	Authentication and Authorization Data Encryption Secure APIs Regular Security Audits Monitoring and Logging	OAuth 2.0 Transport Layer Security (TLS) API keys Security audit tools (SIEM) systems
3.	Scalable Architecture	Microservices Architecture Elastic Compute Resources Horizontal Scaling Load Balancing Database Sharding	Docker Istio Amazon Web Services (AWS) AWS Auto Scaling HAProxy
4.	Availability	Redundancy Fault Tolerance Backup and Disaster Recovery Monitoring and Alerting Load Balancing	Pacemaker Keepalived Veeam Nagios F5 BIG-IP
5.	Performance	Content Delivery Optimization Browser Caching Minification and Compression Lazy Loading Database Optimization Caching Mechanisms Load Testing Optimized Code	Amazon CloudFront Cache-Control headers UglifyJS LazyLoad.js Indexing: B-tree, Hash, Bitmap indexes Redis Apache JMeter Chrome DevTools, Visual Studio Profiler ESLint (JavaScript), Stylelint (CSS)