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

Date	23 October 2023
Team ID	NM2023TMID07210
Project Name	Data Dominators: A Comparitive study of top global universities in data Analytics
Maximum Marks	4 Marks

Architecture

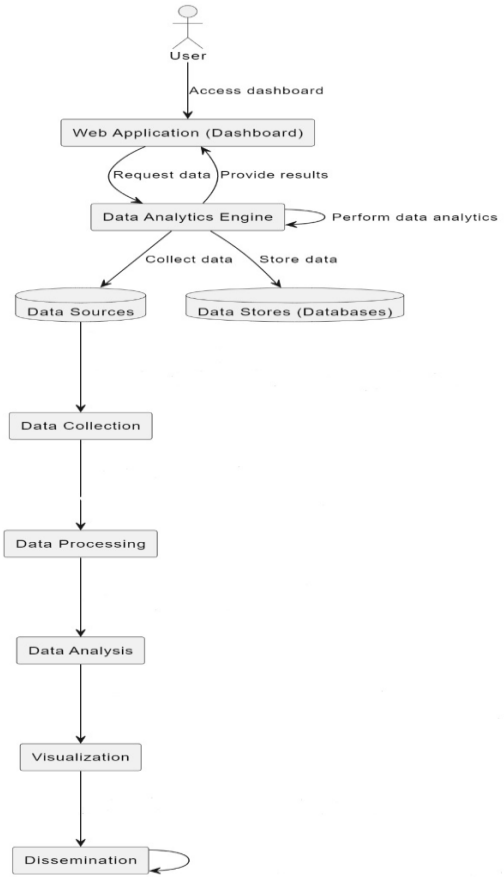

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	React.js is a popular and open-source JavaScript library for building user interfaces. It is maintained by Facebook and a community of developers.HTML is the standard markup language used for creating the structure of web pages.Tableau is a powerful and widely used data visualization tool that allows users to create interactive and shareable dashboards.	• Frontend Framework: React.js, • UI/UX Design: HTML, CSS, JavaScript • Data Visualization: Tableau
2.	Application Logic-1	Developed using Java and Spring Boot, involves setting up a secure and scalable architecture for retrieving, processing, and analyzing data related to universities. This entails developing data access and application logic components, integrating with external APIs, implementing user authentication, and creating a frontend user interface using React.js.	• Java • Frameworks: Spring Boot
3.	Application Logic-2	Data visualization through Tableau is utilized to present insights effectively. The project is designed to handle large datasets and is built with an emphasis on maintainability, security, and scalability, making it a robust platform for comparing universities' data.	IBM Watson STT service
4.	Application Logic-3	By incorporating IBM Watson Assistant, the "Data Dominators" project offers a conversational interface, enabling users to interact naturally with the application, seek data, insights, and assistance through chat interactions. This feature enhances user engagement, simplifies data exploration, and elevates the overall user experience, making the platform more user-friendly and interactive for comparative university data analysis.	IBM Watson Assistant
5.	Database	MySQL serves as the chosen relational database management system, providing a solid foundation for efficiently storing structured data pertaining to universities, rankings, and user profiles. The well-	MySQL

		defined database schema and data models enable organized data storage, streamlined data integration from external sources, and responsive data retrieval and updates. MySQL's proven performance, scalability, and reliability make it a dependable choice, while comprehensive data security measures and regular backups uphold data integrity and safeguard against potential disruptions.	
6.	Cloud Database	Leveraging IBM Db2 as a cloud database for the "Data Dominators" project brings a scalable, highly available, and secure data management solution to the cloud. With its ability to easily scale resources, robust security features, and managed services, Db2 ensures efficient data storage and access while freeing up development resources. Additionally, its compatibility with various cloud services and global availability supports seamless data integration and analysis across multiple regions, enhancing the project's capabilities.	IBM DB2
7.	File Storage	Utilizing IBM block storage, the "Data Dominators" project ensures efficient and scalable file storage for data files, logs, and backups. The chosen IBM block storage solution, such as IBM Elastic Storage Server (ESS) or IBM Spectrum Virtualize, offers the flexibility to accommodate project needs, with the ability to easily scale storage capacity as data requirements grow. This setup assures data availability, reliability, and seamless integration with the project's architecture.	IBM Block Storage

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	React.js Spring Boot Django Ruby on Rails Redux	React.js is a JavaScript library for building user interfaces with a component-based architecture, while Spring Boot is a Java-based framework known for its simplicity and convention over configuration, enabling rapid web

			application development. Django, on the other hand, is a high-level Python web framework designed for clean and pragmatic web development, and Ruby on Rails, written in Ruby, emphasizes convention over configuration and rapid development. Redux, an open-source JavaScript library, is specifically focused on state management for React applications, providing a predictable and efficient approach to handling application state.
2.	Security Implementations	Authentication and Authorization Data Encryption Input Validation API Security Security Patching	SHA-256
3.	Scalable Architecture	A scalable architecture is essential for the "Data Dominators" project as it ensures the ability to accommodate increased data volume and user demand as the platform evolves. It enables the application to flexibly allocate resources, such as computing power and storage, to handle higher workloads, preventing performance bottlenecks and maintaining a responsive user experience. Scalability is crucial in adapting to changing requirements, supporting growth, and ensuring the application's resilience during periods of high demand, ultimately enhancing its long-term sustainability and user satisfaction.	Horizontal Scaling Autoscaling Replication Sharding