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

Date	18 November 2023
Team ID	Team - 592117
Project Name	Image caption generator using deep learning
Maximum Marks	4 Marks

Technical Architecture:

Technical architecture encompasses the fundamental structure and design of a software system, outlining its key components, their interactions, and the underlying framework that enables its functionality. This includes hardware infrastructure, software modules, databases, networking protocols, and interfaces. It also addresses critical considerations such as data storage, scalability, security measures, and compliance with industry standards. The architecture dictates how the system handles increasing loads and ensures optimal performance. It encompasses deployment strategies, whether on-premises or on cloud platforms, as well as procedures for error handling, recovery, and backups. Integration with external services and APIs is also specified, enabling seamless interaction with third-party applications. Furthermore, it delineates development, testing, staging, and production environments, ensuring consistency across different stages of the software development life cycle. Monitoring and logging mechanisms are put in place to track system behavior, performance metrics, and errors. Maintenance procedures and strategies for upgrades are defined to keep the system up-to-date and efficient. Documentation is crucial, providing insights into architectural decisions and best practices, facilitating knowledge transfer among team members and aiding in troubleshooting. In essence, technical architecture serves as the foundational blueprint for the construction and maintenance of a robust and effective software system.

The Deliverable shall include the architectural diagram as below and the information as per the Table1 & Table 2

Architectural Diagram

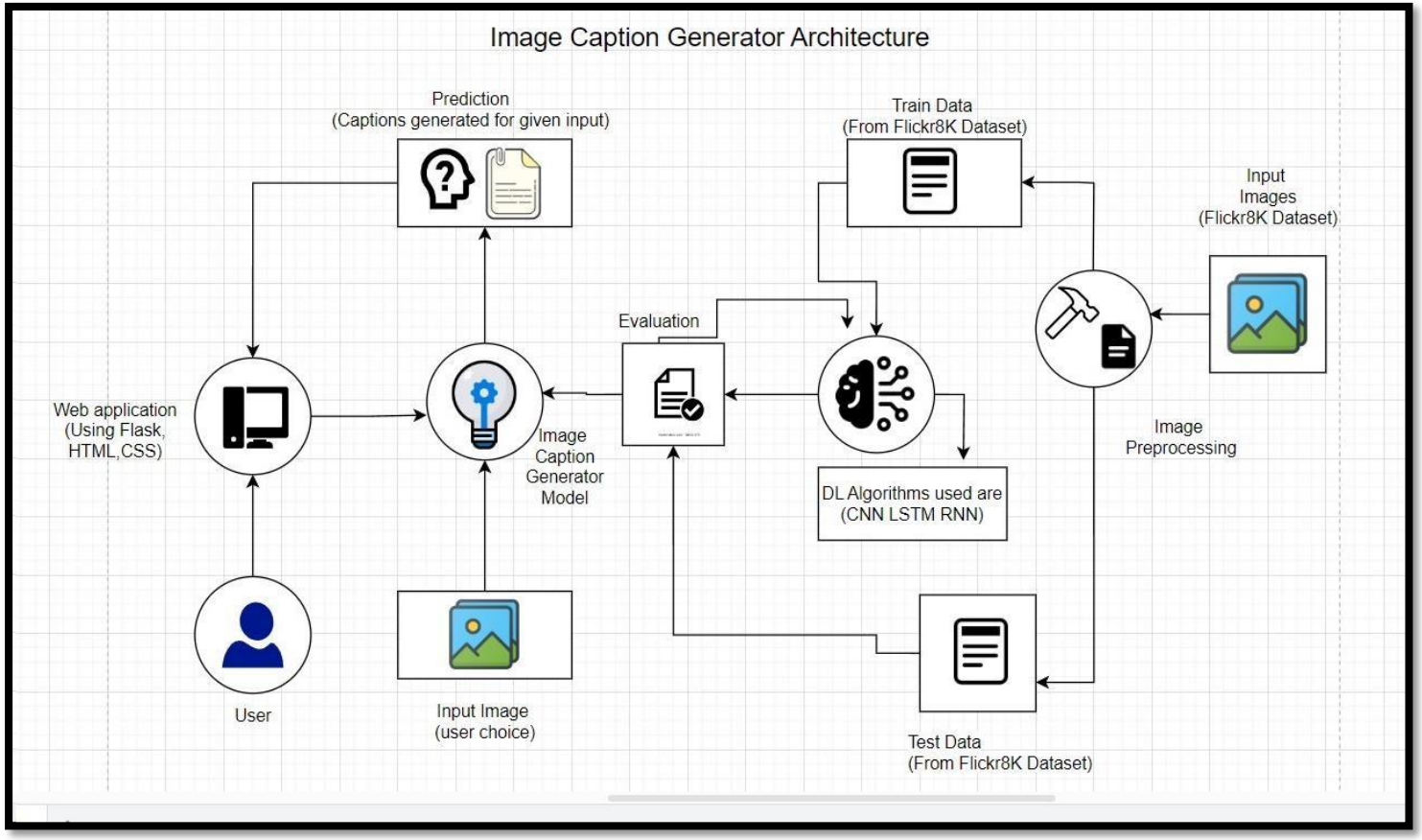

Table-1
Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface Design	To display the image for which the user wants to generate a caption.	HTML, CSS.
2.	User Experience	Image caption generation delivers quick descriptions for images, with user-friendly features like editing, and easy sharing for an enhanced experience.	HTML, CSS.
3.	Application Logic - 1	Image Processing: Preprocess the user-uploaded image.	TensorFlow.
4.	Application Logic - 2	Feature Extraction and Model Prediction: Extract features using a pre-trained model. Predict captions using a sequence-to-sequence model.	TensorFlow.
5.	Application Logic - 3	Post-processing and Output: Post-process the generated caption. Display the final caption to the user.	TensorFlow.
6.	Machine Learning Model	Image caption generation ML models automatically describe images, enhancing accessibility, user experience, content organization, and supporting applications.	TensorFlow.
7.	Flask Integration	Web pages for home page and result are integrate d with flask app.py	VS Code

Table-2
Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	TensorFlow, VS Code
2.	Availability	Achieve high availability for image caption generation with load balancing, redundancy.	Tensorflow, Flask
3.	Performance	Image caption generation performance is assessed through metrics like accuracy, model architecture, and inference speed.	TensorFlow.
4.	Offline Access	Allow utilize the application without a continuous internet connection.	Flask.
5.	Image Upload and Processing	Allow users to upload images for caption generation with backend processing.	Flask
6.	Responsive Web Design	Ensure the web application is accessible and user-friendly on various devices.	HTML, CSS