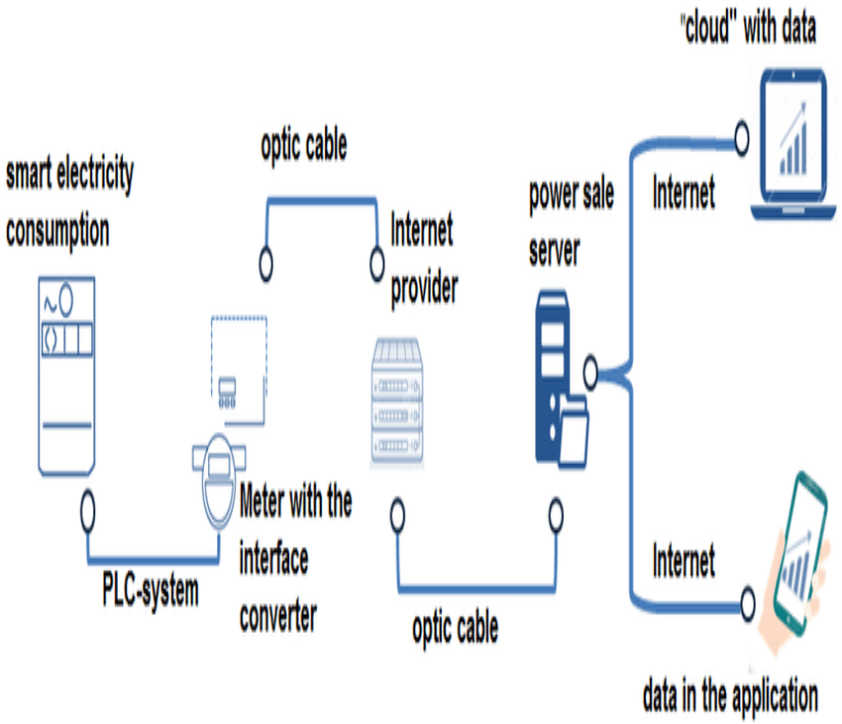
Project Design Phase-II
Technology Stack (Architecture & Stack)

Date	18 May 2023
Team ID	NM2023TMID12378
Project Name	Smart billing system for water suppliers

Technical Architecture:

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

Smart Billing System For Water Suppliers :



Guidelines:

- Include all the processes (As an application logic / Technology Block)
- Provide infrastructural demarcation (Local / Cloud)
- Indicate external interfaces (third party API's etc.)
- Indicate Data Storage components / services
- Indicate interface to machine learning models (if applicable)

Table-1 : Components & Technologies:

S.No	Component	Description	Technology
1.	User Interface	Web UI, Mobile App, Chatbot etc.	HTML, CSS, JavaScript / Angular Js / React Js etc.
2.	Application Logic-1	Customer Registration Process:User initiates the registration process by providing their personal and contact information.	Java / Python
3.	Application Logic-2	Meter Installation Process:When a new customer signs up for the water supply service, schedule a meter installation appointment.	IBM Watson STT service
4.	Application Logic-3	Meter Reading and Consumption Calculation Process:Retrieve meter readings from the installed smart water meters at regular intervals (e.g., monthly).	IBM Watson Assistant
5.	Database	A smart billing system for water suppliers typically involves managing and processing data related to water usage, customer accounts, and billing information	MySQL, NoSQL, etc.
6.	Cloud Database	For a smart billing system for water suppliers, you can consider using a cloud-based database service to store and manage the necessary data	IBM DB2, IBM Cloudant etc.
7.	File Storage	A smart billing system for water suppliers may require file storage capabilities to store and manage various types of documents and files related to billing, customer records, and other relevant data	IBM Block Storage or Other Storage Service or Local Filesystem
8.	External API-1	External APIs (Application Programming Interfaces) play a crucial role in the application for a smart billing system for water suppliers. They provide a way to connect and interact with external services, data sources, or systems to enhance the functionality and capabilities of the billing system	IBM Weather API, etc.

9.	External API-2	The use of external APIs enhances the functionality, efficiency, and connectivity of a smart billing system for water suppliers by enabling seamless integration with external systems, automating processes, and leveraging external services to deliver a more robust and comprehensive solution.	Aadhar API, etc.
10.	Machine Learning Model	Overall, the purpose of a machine learning model in a smart billing system for water suppliers is to optimize billing accuracy, improve operational efficiency, enhance customer satisfaction, detect anomalies and fraud, and support proactive decision-making in water resource management	Object Recognition Model, etc.
11.	Infrastructure (Server / Cloud)	Application Deployment on Local System / Cloud Local Server Configuration:Set up a dedicated server or use an existing machine with sufficient processing power, memory, and storage capacity to handle the application's requirements. Cloud Server Configuration : Choose a cloud provider like Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), or IBM Cloud.	Local, Cloud Foundry, Kubernetes, etc.

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	List the open-source frameworks used	Technology of Opensource framework
2.	Security Implementations	List all the security / access controls implemented, use of firewalls etc.	e.g. SHA-256, Encryptions, IAM Controls, OWASP etc.
3.	Scalable Architecture	Justify the scalability of architecture (3 – tier, Micro-services)	Technology used
4.	Availability	Justify the availability of application (e.g. use of load balancers, distributed servers etc.)	Technology used
5.	Performance	Design consideration for the performance of the application (number of requests per sec, use of Cache, use of CDN's) etc.	Technology used