Basic Details of the Team and Problem Statement

Ministry Name : Ministry of Chemicals and Fertilizers

PS Code: 1321

Problem Statement Title: Compilation and Collection of optimum Level (variable) of data set from the Chemical and Petrochemical Industries in the country, aiming to smoothen the decision-making and insight generation in the strategic initiative
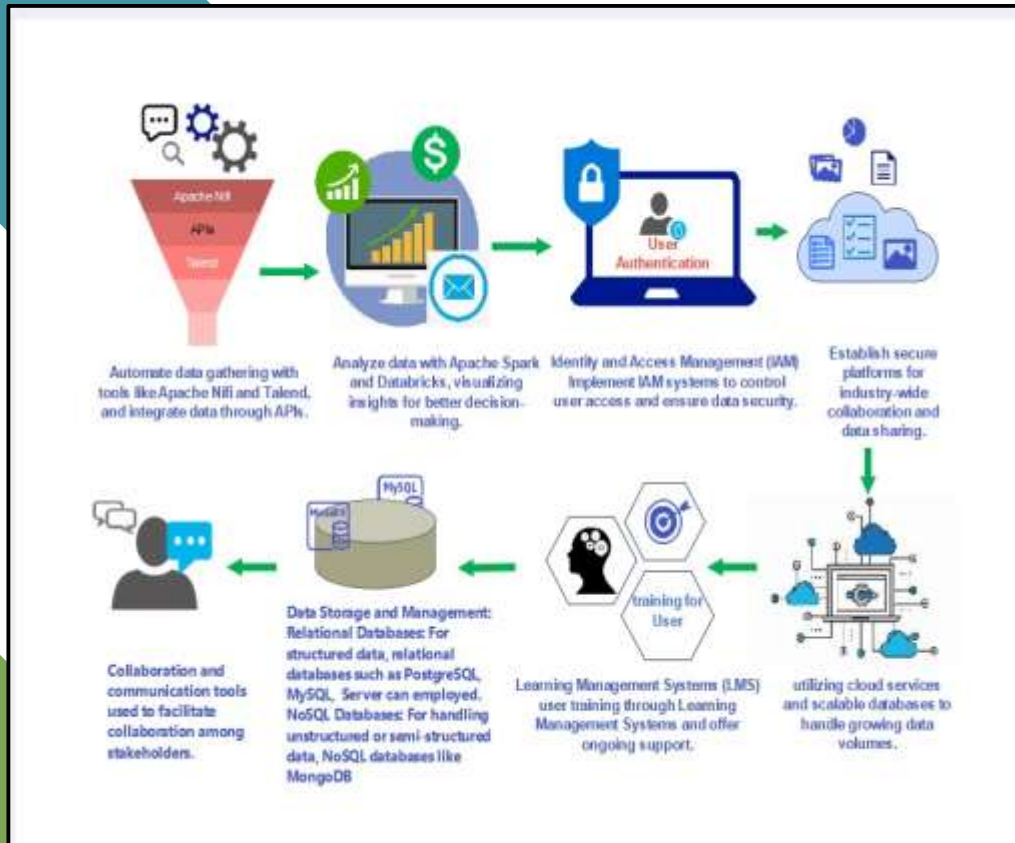
Team Name: Spartan2023

Team Leader Name: Neha Deepak puri
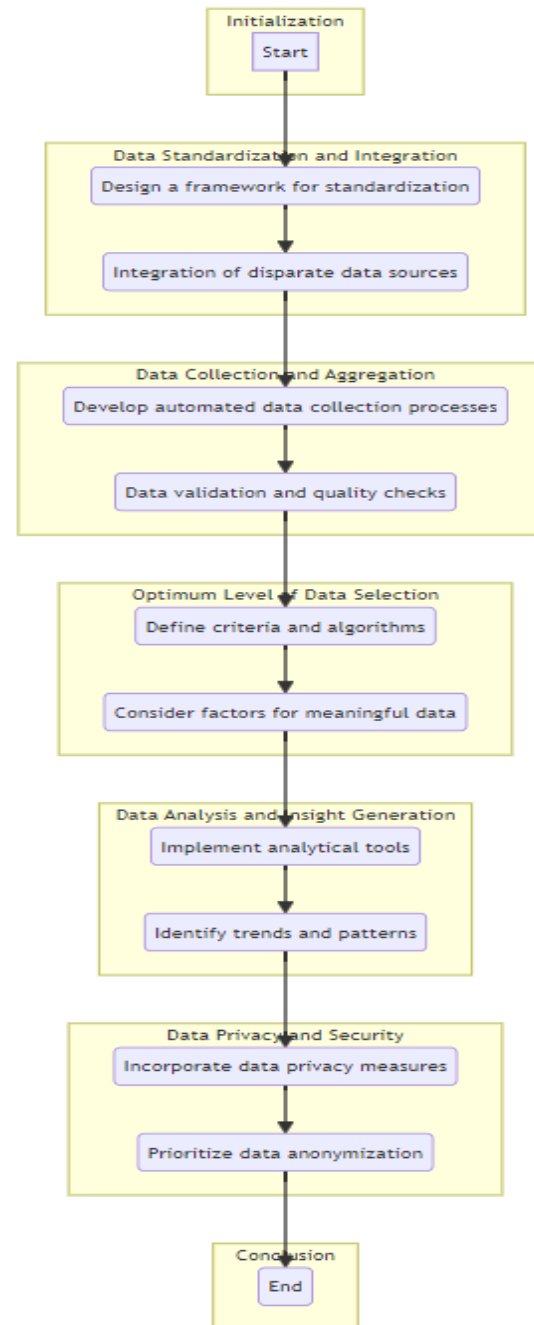
Institute Code (AISHE): C-41256

Institute Name: K K Wagh Institute of Engineering Educational Research

Theme Name: Smart Automation

Introduction:

➤ Our data management solution for the chemical and petrochemical industries begins with data standardization and integration

➤ We design a unified framework to harmonize data formats and definitions across diverse stakeholders.

➤ We enables seamless integration of data from various sources, including production records, laboratory results, market data, and regulatory information.

➤ Data collection and aggregation, leveraging automation and ETL tools to efficiently extract, transform, and load data into a centralized repository, with rigorous validation and quality checks to ensure data accuracy.

➤ our solution employs smart data selection algorithms to determine the most relevant and valuable information while respecting data privacy regulations

➤ Data privacy and security are paramount throughout the process, with measures such as data anonymization, encryption, access controls, and audit trails to protect sensitive information.

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Initialization
Start

Data Standardization and Integration
Design a framework for standardization
Integration of disparate data sources

Data Collection and Aggregation
Develop automated data collection processes
Data validation and quality checks

Optimum Level of Data Selection
Define criteria and algorithms
Consider factors for meaningful data

Data Analysis and Insight Generation
Implement analytical tools
Identify trends and patterns

Data Privacy and Security
Incorporate data privacy measures
Prioritize data anonymization
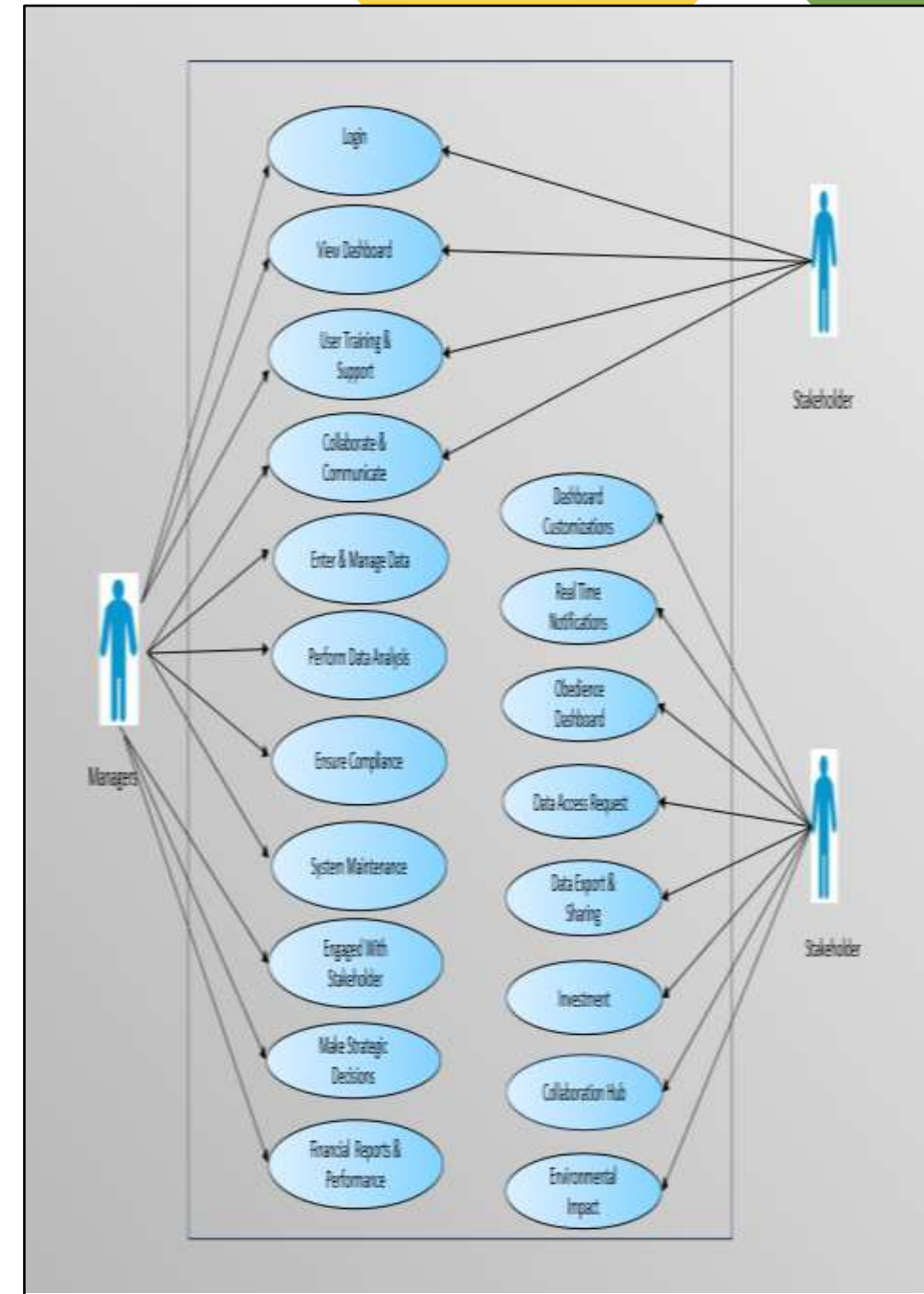
Conclusion
End

Describe your Technology stack here:

➤ Data Standardization: JSON Schema, Data Modeling
➤ Data Collection and Integration: Apache Nifi, Talend, APIs
➤ Smart Data Selection: Machine Learning Algorithms, Python
➤ Data Analysis & Insights: Apache Spark, Databricks, Visualization Tools
➤ Data Security: Encryption (SSL/TLS), Access Control (IAM), Blockchain\
➤ Scalability: Cloud Computing, Scalable Databases
➤ **Data Validation and Quality** Checks: Data Quality Tools
➤ Automated Data Collection Processes: ETL (Extract, Transform, Load) Tools
➤ User Authentication and Authorization: Identity and Access Management (IAM)

Describe your Use Cases here

➢ Companies use the solution to upload data (e.g., production data, lab results, market data).
➢ Solution standardizes data formats, definitions, and structures.
➢ Data integration combines disparate data sources into a cohesive dataset.
➢ Automated data collection gathers data efficiently.
➢ Data validation and quality checks ensure data accuracy and reliability.
➢ Aggregation is automated, minimizing manual intervention.
➢ Stakeholders use analytical tools to explore the dataset.
➢ Identify trends, patterns, and correlations within the data.
➢ Generate actionable insights for decision-making and industry improvements.

Describe your Dependencies Show stopper here

➢ The chemical and petrochemical industries may have a wide range of data sources, each with its own unique formats and structures. We will need to find a way to harmonize data from diverse sources.

➢ Ensuring data accuracy, reliability, and consistency can be a major challenge.

➢ Handling sensitive data may involve complex legal and ethical considerations.

➢ Implementing robust security measures, including encryption, access controls, and audit trails, to protect data from breaches and unauthorized acces

Team Member Details

Team Leader Name: Neha Deepak Puri

Branch : BE   Stream : AI & DS   Year : III

Team Member 1 Name: Apeksha Ravindra Gangurde

Branch : BE   Stream : AI & DS   Year : III

Team Member 2 Name: Mansi Jitendra Joshi

Branch : BE   Stream : AI & DS   Year : III

Team Member 3 Name: Kanchan Kishor Supekar

Branch : BE   Stream : AI & DS   Year : III

Team Member 4 Name: Samrudhi Gajendra Mulay

Branch : BE   Stream : AI & DS   Year : III

Team Member 5 Name: Shrushti Anil Ahire

Branch : Btech   Stream : CSE   Year :I

Team Mentor 1 Name: N M Shahane

Category : Academic   Expertise (AI/ML/Blockchain etc): AI   Domain Experience (in years):   15+

Team Mentor 2 Name: D D Bage

Category : Academic   Expertise (AI/ML/Blockchain etc): IOT,AI   Domain Experience (in years):   10+