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

Date	26 June 2025
Team ID	LTVIP2025TMID48377
Project Name	ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data
Maximum Marks	4 Marks

Technical Architecture:

"ToyCraft Tales: Tableau's Vision into Toy Manufacturer Data"

Example: Data-Driven BI System for Toy Manufacturer using Tableau

Scenario: A toy manufacturing company wants to visualize its production efficiency, inventory turnover, and sales performance using Tableau dashboards. The system integrates data from ERP, CRM, and supply chain sources and delivers actionable insights to stakeholders.

A **toy manufacturing company** wants to track and visualize:

*** Production Efficiency**

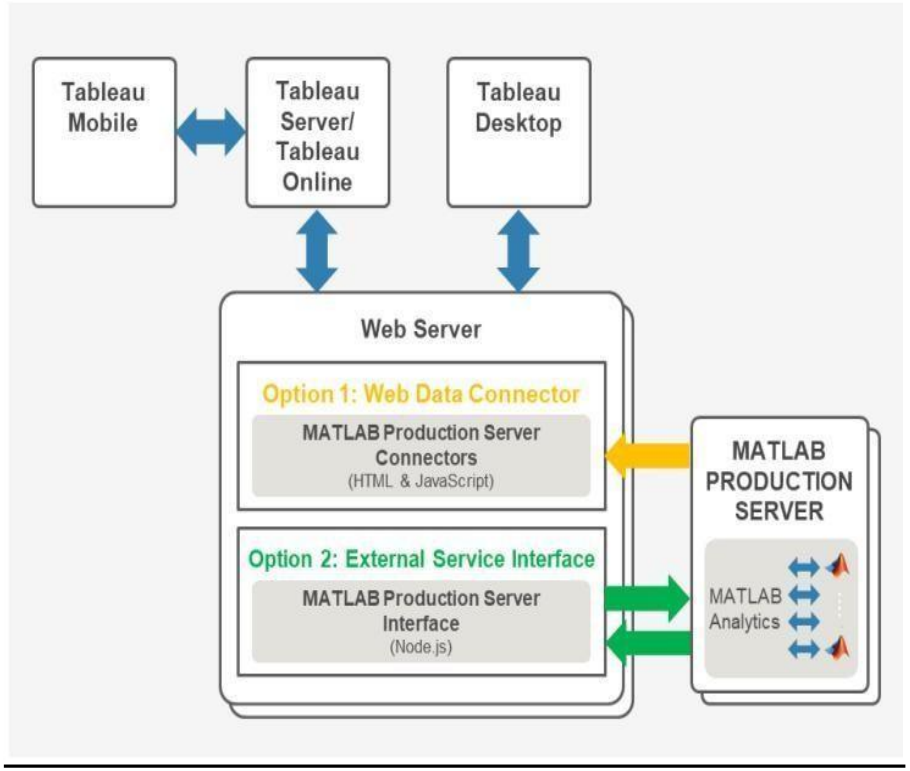
***Inventory Turnover**

***Sales Performance**

using **Tableau dashboards**. The system integrates data from multiple business systems (ERP, CRM, SCM) and delivers **real-time, actionable insights** to managers and analysts

Based on IBM Reference:

https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/



Here are the required guideline headlines:

1. Define Core Objectives
2. Use Clean, Structured Data
3. Design Scalable Architecture
4. Build Interactive Tableau Dashboards
5. Implement Security and Access Control

Table 1:Components and Technologies

S.no	Component	Description	Technology
1	User Interface	interactive dashboards for Sales, Inventory, and Production Analytics	Server/Online
2.	Application Logic-1	Python logic to clean, transform and enrich toy manufacturing data	Python (Pandas, NumPy)
3.	Application Logic-2	(Optional) STT for voice-enabled dashboard access	IBM Watson STT API
4.	Application Logic-3	(Optional) Chatbot to assist users in querying data in natural language	IBM Watson Assistant
5.	Database	Structured operational DB for internal use	PostgreSQL / MySQL
6.	Cloud Database	Scalable cloud data warehouse for analytics and dashboard feeding	Snowflake / Amazon Redshift
7.	File Storage	Storage for Excel/CSV raw files from sales or supplier feeds	AWS S3 / Google Cloud Storage
8.	External API-1	Weather data to correlate toy sales trends with climate	IBM Weather API / OpenWeatherMap
9.	External API-2	Verify vendor or distributor details through national ID integration	Aadhar API (or simulated)
10.	Machine Learning Model	Predict toy demand, seasonal patterns, and return risk	Scikit-learn / TensorFlow.
11	Infrastructure	Tableau and data pipeline deployment on cloud	AWS EC2, Docker, Kubernetes, Tableau Online

Table-2: Application Characteristics:

S.No	Characteristics	Description	Technology
1.	Open-Source Frameworks	Used for ETL, ML, and data ingestion	Python, Flask, Apache Airflow, DBT
2.	Security Implementations	IAM roles, RLS in Tableau, encryption for data	SHA-256, SSL, OAuth 2.0, Tableau Security
3.	Scalable Architecture	Microservices and 3-tier model used for Tableau Online	Docker, REST APIs, Snowflake, modular deployment
4.	Availability	Load-balanced cloud deployment ensures high uptime)	AWS Load Balancer, Multi-zone Tableau Server
5.	performance CDN usage	Tableau extracts, in-memory caching, CloudFront	Tableau Hyper Extracts, Redis, AWS optimized queries, and

References:

*IBM Architecture Reference: https://developer.ibm.com/patterns/online-order-processing-system-during-pandemic/ *C4 Architecture: https://c4model.com/

*AWS Architecture: https://aws.amazon.com/architecture