**Solution Architecture**

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| **Date** | **19-06-2025** |
| **Team ID** | **LTVIP2025TMID48265** |
| **Project Name** | **Strategic Product Placement Analysis: Unveiling Sales Impact with Tableau Visualization** |
| **Maximum Marks** | **4 marks** |

**What is Solution Architecture?**

Solution Architecture serves as the blueprint that connects business needs with the technical implementation of the analytics solution. It acts as a bridge between the retail challenges—such as lack of visibility into sales performance, ineffective product placement, and fragmented reporting—and the technological tools like Tableau dashboards, data sources, and ETL processes used to address them.

The architecture outlines:

* The structure of the system including data sources, analytics workflows, and visualization layers
* How data flows from raw transactional systems to actionable insights
* Technologies and integrations involved
* Deployment and access management strategies

**Goals of the Solution Architecture for This Project:**

* Integrate diverse retail data sources (sales, inventory, promotions) into a unified analytical environment
* Build scalable and interactive Tableau dashboards that reflect key business metrics
* Ensure real-time or near-real-time data refresh for timely decision-making
* Implement user role-based access to dashboards and reports for data security and relevance
* Provide a flexible architecture that supports future analytics expansion, including predictive insights or mobile access

**Core Components of the Architecture**

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| **Layer** | **Component** | **Description** |
| Data Integration | ETL Process (e.g., Tableau Prep) | Extracts and transforms data from POS systems, inventory databases, and promotional records. |
| Data Storage | Data Warehouse / Data Lake | Central repository where cleaned and structured data is stored for analysis. |
| Analytics & Visuals | Tableau Desktop & Server | Creation and hosting of interactive dashboards displaying sales trends, product placement, etc. |
| Security & Access | Tableau User Roles & Permissions | Defines access rights ensuring that store managers, merchandisers, and executives see relevant data. |
| Reporting & Alerts | Scheduled Reports & Subscriptions | Automated report delivery and alerts to stakeholders on key metrics or anomalies. |

**Data Flow within the System**

User Journey and Data Movement:

1. **Data Extraction:** Sales, inventory, and promotion data are extracted from operational systems via ETL tools.
2. **Data Processing:** The extracted data is cleaned, joined, and aggregated in the data warehouse.
3. **Dashboard Development:** Tableau connects to the warehouse to build reports showing product performance, sales by geography, and promotional impact.
4. **User Interaction:** End users access dashboards through Tableau Server, filtering and drilling down to explore insights.
5. **Scheduled Reporting:** Reports are generated and sent to stakeholders automatically, ensuring timely updates.

**Summary**

This solution architecture ensures:

* A seamless integration of multiple retail data sources into a unified analytics platform.
* Real-time, interactive Tableau dashboards tailored for strategic decision-making around product placement and sales.
* Role-based access to sensitive data, ensuring security and focused insights.
* Scalable infrastructure that can grow with business needs and support advanced analytics in the future.

By leveraging modern data pipelines and Tableau’s visualization power, the architecture supports efficient, data-driven retail strategies that improve sales outcomes and operational transparency.