**Architecture Document for Financial Analytics Dashboards**

### Overview

This document outlines the architecture for the Financial Analytics Dashboards developed in Tableau. The architecture describes the components, data flow, technology stack, and interactions between various system elements necessary to deliver the dashboards effectively. The goal is to provide a clear understanding of how the dashboards are built and how data is managed and visualized.

### Architecture Components

1. \*\*Data Sources\*\*

- Customers: Contains details about each customer, including ID, name, segment, and geographical location.

- Orders: Includes order ID, customer ID, product ID, quantity sold, total sales amount, and profit information.

- Products: Contains product ID, name, category, subcategory, and price.

- Locations: Provides geographical information, including region, state, and city.

2. \*\*Data Integration Layer\*\*

- Data is extracted from the source systems and stored in a centralized database. This layer is responsible for ensuring data consistency and accuracy before it is used for analytics.

3. \*\*Data Warehouse\*\*

- A data warehouse is utilized to consolidate data from various sources. This layer is structured to support analytical queries efficiently.

- The warehouse hosts pre-aggregated and transformed data, making it easier to perform calculations for metrics such as total sales and profit margins.

4. \*\*ETL Process\*\*

- Extract, Transform, Load (ETL) processes are implemented to:

- Extract data from source systems.

- Transform data by cleaning, validating, and calculating necessary metrics.

- Load the transformed data into the data warehouse for access by Tableau.

- The ETL process can be scheduled to run periodically to ensure the dashboards display the most up-to-date information.

5. \*\*Visualization Layer\*\*

- Tableau is used as the primary tool for data visualization. This layer is where the dashboards are created and published.

- The dashboards are built with a focus on interactivity, utilizing various visualization types such as Big-Ass Numbers (BANs), line charts, heatmaps, and tables.

6. \*\*User Interaction Layer\*\*

- Users interact with the dashboards via Tableau Server or Tableau Online, which provides access control and management features.

- The dashboards include filtering options that allow users to explore data based on various criteria, including time periods, product categories, and geographical locations.

7. \*\*Access Management\*\*

- Tableau Server is employed to manage user access and security for the dashboards.

- Role-based access control ensures that different user groups can access relevant dashboards according to their permissions.

### Data Flow

1. \*\*Data Extraction\*\*

- Data is extracted from the operational databases (customer, orders, products, and locations) either manually or via automated ETL processes.

2. \*\*Data Transformation\*\*

- During the ETL process, data is cleaned and transformed. This includes removing duplicates, correcting errors, and calculating key performance metrics like sales and profit.

3. \*\*Data Loading\*\*

- The transformed data is loaded into the data warehouse, structured for efficient querying.

4. \*\*Data Access\*\*

- Tableau connects to the data warehouse, allowing it to pull the necessary datasets for visualization.

- The dashboards are published to Tableau Server, where they can be accessed by stakeholders.

5. \*\*User Interaction\*\*

- Users access the dashboards via a web interface, interacting with visualizations, applying filters, and drilling down into details.

### Technology Stack

- \*\*Database\*\*: SQL-based relational database (e.g., PostgreSQL, MySQL) used for storing raw data and the data warehouse.

- \*\*ETL Tool\*\*: Tools such as Apache NiFi, Talend, or custom scripts for ETL processes.

- \*\*Data Visualization\*\*: Tableau Desktop for dashboard creation and Tableau Server or Tableau Online for publishing and sharing dashboards.

- \*\*Web Interface\*\*: Tableau Server provides a web interface for users to access and interact with dashboards.

### Security Considerations

- Data encryption is applied to secure sensitive customer and sales data during transit and at rest.

- Role-based access controls ensure that users have appropriate access levels based on their roles within the organization.

- Regular audits and monitoring are conducted to identify and address any potential security vulnerabilities.

### Scalability and Performance

- The architecture is designed to be scalable, accommodating growth in data volume and user access.

- Performance optimization techniques, such as indexing in the database and efficient ETL processes, are implemented to ensure quick load times and responsiveness of dashboards.

### Conclusion

The architecture for the Financial Analytics Dashboards effectively supports the objectives of delivering insights into sales performance and customer behavior. By leveraging a well-structured data warehouse, an automated ETL process, and Tableau's powerful visualization capabilities, stakeholders can access timely and relevant information to drive strategic decision-making. The architecture is designed with scalability, performance, and security in mind, ensuring a robust foundation for future enhancements.