**Part 4: Evaluating TrendyThreads’ data architecture: Strengths and areas for improvement**

Conduct a detailed assessment of TrendyThreads’ enterprise data architecture by analyzing its core components. Identify strengths and areas for improvement to optimize performance, scalability, and security. Refer to *Part 4 in the lab instructions.*

#### 1. Name of the enterprise: TrendyThreads

#### 2. Strengths

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Strength** | **Description** | **Impact** |
| **1** | Use of Cloud-Native Solutions | TrendyThreads utilizes scalable data warehouse technologies such as Amazon Redshift, Google BigQuery, and Snowflake, which are well-suited to scale horizontally and handle large volumes of data efficiently. | Enables flexible scaling to meet increasing data volumes and user demands, reducing the risk of system slowdowns during peak periods. |
| **2** | Comprehensive Integration Stack | The stack includes ETL tools (Talend, Apache NiFi), API gateways (AWS API Gateway, Kong), and real-time streaming platforms (Kafka, Kinesis), indicating robust capabilities for integrating and orchestrating data across systems. | Facilitates timely and consistent data movement across systems, supporting real-time operations and reducing manual reconciliation efforts. |
| **3** | Dedicated Governance Tools | Tools like Collibra and Alation suggest a strong commitment to managing data quality, lineage, and stewardship. | Promotes enterprise-wide data stewardship and trust in analytics through clear ownership and lineage of critical data assets. |

#### 3. Areas for improvement

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Area for improvement** | **Description** | **Impact** |
| **1** | Elastic Auto-scaling Strategy Not Detailed | While the technologies are scalable, there’s no specific mention of automated scaling policies or performance monitoring mechanisms to dynamically adjust resources based on load. | Without automated resource allocation, there is a risk of performance degradation during traffic spikes or over-provisioning that increases costs. |
| **2** | End-to-End Orchestration Visibility | There’s no mention of workflow orchestration platforms (like Apache Airflow or Prefect) that would help provide visibility and control across all integration processes. | Increases the complexity of troubleshooting data pipeline failures, leading to longer downtimes and delayed analytics. |
| **3** | Governance Policy Enforcement | While tools are in place, the document lacks detail on how governance policies are operationalized and enforced across departments. | Without strict enforcement, governance may remain theoretical, leading to inconsistent data quality and challenges in regulatory reporting. |