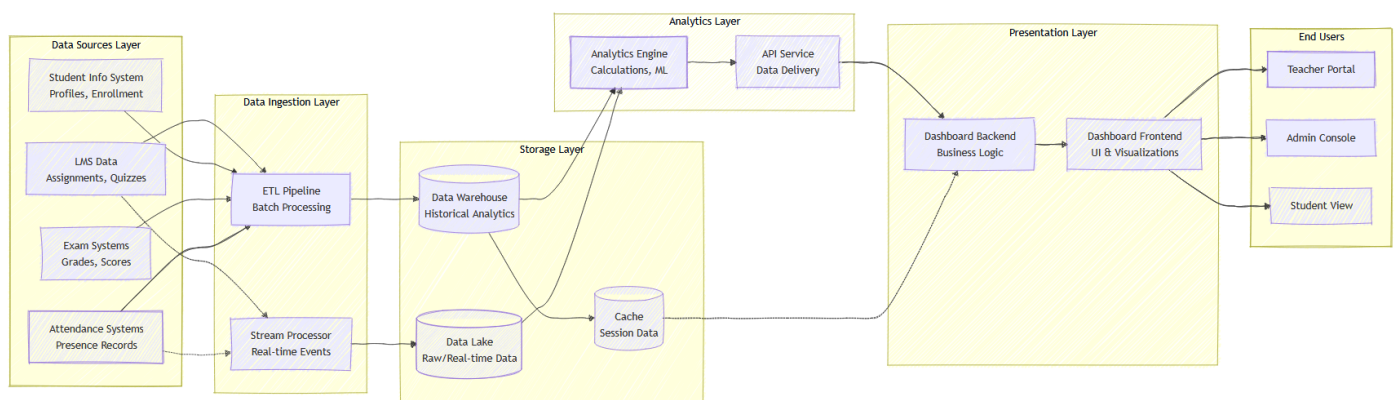


Assignment 1

1. Identify the components of a dashboard system used in PSU or any organization.

- A dashboard system consists of various components, and in an organization, in this example, Pangasinan State University, consists of the following possible components:
 - **Data Sources**, from databases or spreadsheets
 - **ETL Process** (Extract, Transform, Load), these are the tools and workflows to gather, clean, and prepare data.
 - **Data Warehouse** or **Data Lake**, this is a centralized storage for structured or unstructured data.
 - **Analytics software/programs**, processing layer for calculations, aggregations, and data modeling.
 - **Visualization Layer**, these are the Charts, graphs, tables, and KPIs displayed to the user.
 - **Dashboard Interface**, interactive UI where users can view and interact with data.
 - **User Management & Security**, Authentication, authorization, and role-based access control.

2. Sketch a simple dashboard system architecture for student performance analytics.



3. What challenges might arise when implementing a real-time dashboard system?

- When implementing a real-time dashboard, the main challenges that we need to address are:
 1. **Data Quality & Performance:** Ensuring data consistency while managing latency to avoid overload or gaps, and designing for scalability under high query loads.
 2. **Integration & Security:** Connecting separate systems reliably and protecting sensitive data within cost-effective infrastructure.