### **Integration Documentation: School Dropout Analysis System**

#### **1. Introduction**

This document outlines the steps to integrate various components of the **School Dropout Analysis System**, designed to analyze dropout rates and their contributing factors across different regions. The system aligns with SDG 4: Quality Education and aims to provide insights that can guide interventions.

#### **2. System Overview**

The system integrates data from various sources, including:

* **School data**: Information on schools, students, teachers, and resources.
* **Dropout data**: Information on students who have dropped out, including reasons such as poverty, early marriages, parental loss, and change of interest.
* **Regional data**: Socioeconomic factors such as employment rates, infrastructure (schools, roads, laboratories), and access to essential services (water, food, housing).

The system performs data analysis and visualization using tools such as SQL for querying, Google Sheets for data manipulation, and a dashboard for presenting insights.

#### **3. Database Integration**

* **Schema Design**: The database includes tables for Schools, Students, Teachers, Dropouts, Resources, and Regions. Each table is linked by foreign keys such as school\_id and region\_id, ensuring that data is relational and can be queried effectively.  
  Example integration:
  + **Schools** table references Regions via region\_id.
  + **Dropouts** table references Students via student\_id, capturing reasons for dropout.
* **Data Insertion**: Data from schools, students, teachers, and regions is imported into the system, either manually through SQL scripts or automated data feeds.

#### **4. API Integration**

For advanced functionality, REST APIs can be developed to:

* Fetch data related to school performance, dropout rates, and regional resources.
* Automate data updates from external systems (e.g., regional census, school boards).

These APIs can be accessed to retrieve real-time data and feed into the analytics pipeline.

#### **5. Data Analytics Integration**

The data analytics process is conducted using SQL for querying and Google Sheets for analysis. Key analyses include:

* Dropout rates by region and gender.
* Correlation between resource availability (books, computers, laboratories) and dropout rates.
* Teacher distribution and subject coverage across regions.

The results are visualized using an **Excel dashboard** or **Google Sheets** for easy interpretation and presentation.

#### **6. Dashboard Integration**

The final step involves integrating data into a dashboard, which is updated regularly through:

* Data imports from the database (via SQL or APIs).
* Automated scripts that pull updated data into Google Sheets or Excel.

The dashboard includes visualizations of key metrics:

* Dropout rates by region and gender.
* Resource allocation and cost analysis.
* School performance compared to regional infrastructure.
* Reasons for the dropout across gender and regions.

#### **7. Testing and Validation**

Before full deployment, the following steps are recommended:

* **Unit testing**: Ensure all SQL queries return correct data and handle edge cases.
* **API testing**: Verify that data retrieval through APIs is accurate and timely.
* **Dashboard validation**: Confirm that the dashboard reflects accurate and up-to-date insights based on the latest data.

#### **8. Conclusion**

The integration of data, analytics, and visualization tools in the School Dropout Analysis System provides a comprehensive solution to analyze dropout rates and their contributing factors. The seamless integration ensures that stakeholders have the necessary insights to address dropout challenges and improve educational outcomes aligned with SDG 4.

The link to the pitch deck presentation for the School Dropouts Analysis System

https://gamma.app/docs/Reducing-School-Dropout-Rates-through-Data-School-Dropout-Analysi-94rtq0a3ywn8fis