INDIA SCHOOL INFRASTRUCTURE DASHBOARD-UDISE

1.Project Objective

To analyse and visualize school-level education data across India, enabling stakeholders to assess infrastructure, enrolment, and geographic distribution of schools. The dashboard supports data-driven decision-making for improving educational access and resource allocation.

Overview

This project uses a comprehensive dataset containing details of schools from multiple Indian states, including:

- **Geographic data**: State, district, village, latitude, and longitude
- **Administrative data**: School codes, categories, management types
- **Infrastructure metrics**: Number of classrooms, other rooms, teachers
- **Enrolment statistics**: Student counts by level and total
- **Temporal data**: Year of establishment

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2. Data Sources

- **Source Description and Timeline:** India Data Portal and 1980-2019
- **Domain**: Education

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3. Problem Statement

Analysing enrolment trends to detect underserved populations or overburdened schools.

- **Mapping geographic disparities** between urban and rural schools.
- **Comparing management types** to understand their reach and performance.

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4. Attribute Details:

Attribute	Data Type	Description
State	String	Name of the Indian state
State Code	Integer	Numeric code representing the state
District	String	District within the state

Village	String	Village or locality of the school
UDISE Village Code	String	Unique identifier for the village
School Name	String	Official name of the school
School Code	String	Unique identifier for the school
School Category	String	Educational level offered
Management	String	Type of school management
Year of Establishment	Integer	Year the school was founded
Longitude	Float	Geographic longitude of the school
Latitude	Float	Geographic latitude of the school
Location Type	String	Urban or Rural classification
Class From	Integer	Starting grade level
Class To	Integer	Ending grade level
Pre-Primary Rooms	Integer	Number of pre-primary rooms
Class Rooms	Integer	Number of classrooms
Other Rooms	Integer	Additional rooms (labs, libraries, etc.)
Teachers	Integer	Total number of teachers
Pre-Primary Students	Integer	Students in pre-primary
Non-Primary Students	Integer	Students in upper grades
Total Students	Integer	Total student enrolment

5.Tools & Technologies

- **Excel:** Data cleaning, transformation, and Pivot Tables.
- **Power BI:** Data modelling, DAX calculations, visualization, and interactive dashboard creation.

Data Visualization & Dashboarding:

- **Power BI** Interactive charts, maps, and filters
- Real-time data exploration
- User-friendly interface for non-technical stakeholder

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6. Data Pre-Processing (Excel / Power Query)

Using Excel

Excel is ideal for quick inspections and basic cleaning tasks:

- **Remove Duplicates**: Use Data → Remove Duplicates to eliminate repeated rows

- **Data Type Formatting**: Convert columns like Year, Latitude, Longitude to proper numeric formats.
- **Text Clean-up**: Use TRIM, CLEAN, and PROPER functions to standardize names and locations.

Using Power Query

1.Load Data

2.Clean Column Names

3. Filter & Remove Rows

4. Change Data Types

5. Handle Missing Data

6. Add Calculated Columns

7. Load to Excel

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7. Data Modelling and DAX

- **Single Table Model:** Dataset is already denormalized, start with a flat model.
- **Calculated Columns & DAX Measures:** Implemented DAX formulas for key metrics, such as Total students, Average Student Teacher Ratio, calculated count rows

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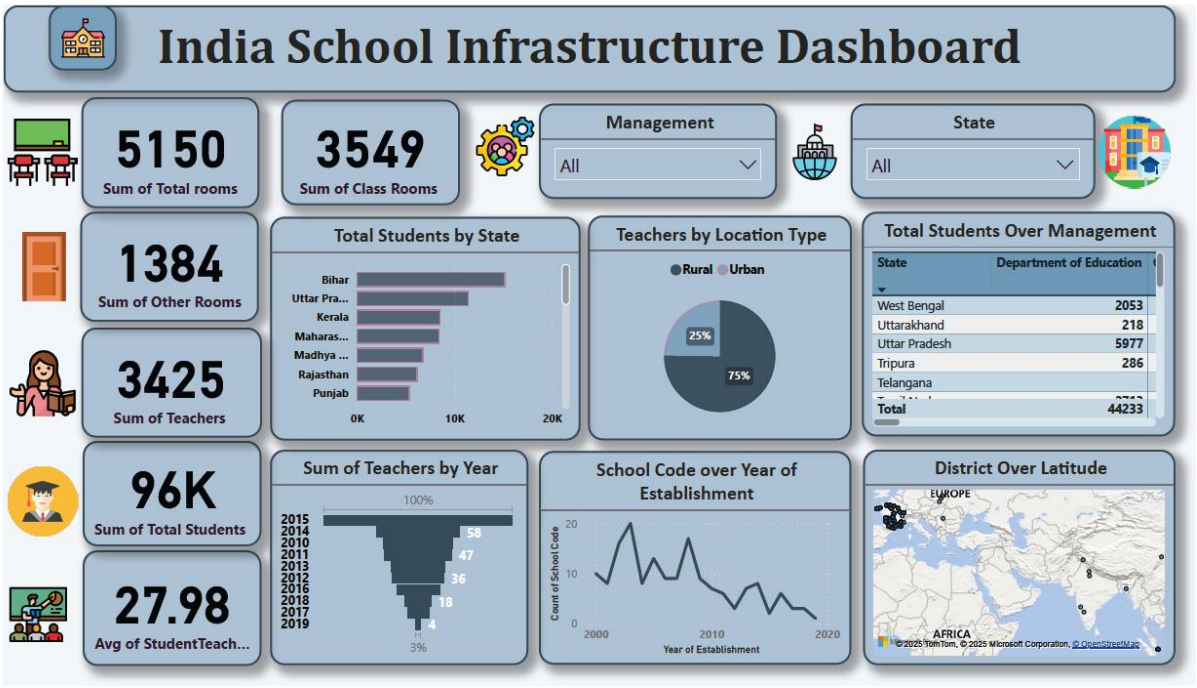
8. Analysis and Visualizations

Dashboard Features: The dashboard enables exploration of school-level data to uncover patterns, disparities, and opportunities for improvement. Core analytical objectives include

- **Infrastructure Analysis**: Assess availability of classrooms, other rooms, and teachers.
- **Enrolment Trends**: Compare student counts across regions, categories, and management types.

Visualization Component

- Bar Charts
- Pie Charts
- Line Charts
- Tables with Slicers
- KPI Cards



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9. Insights & Conclusions

Key Findings:

- Rural Dominance
- Government-Run Schools
- Infrastructure Gaps
- Enrolment Disparities
- Growth Trend

Provide the analysis insights:

Descriptive:

Total number of schools by state, category, and management type.
Average number of classrooms, teachers, and students per school.
Distribution of schools across urban and rural areas.

Diagnosis:

High Student-Teacher ratios in government schools maybe due to staffing shortages or budget constraints.

Private school tend to have better facilities but serve fewer students, possibly due to affordability barriers.

Predictive:

Urban areas may see increased private school penetration due to demand for quality education.
States with rapid school growth post-2000 may continue expanding, especially in underserved districts.

Prescriptive:

Prioritize infrastructure upgrades in high-enrolment, low-resource schools.
Deploy more teachers to schools with high student-teacher ratios.

10. Conclusions

This education data analysis highlights critical disparities and opportunities within India's school infrastructure and enrolment landscape.
The dashboard provides a powerful lens to examine how schools are distributed, managed, and resourced across states and districts.
Transforming raw data into actionable insights, this project empowers policymakers, educators, and planners to make informed decisions that promote equitable access to quality education across India.