

SCHOOL VIOLENCE MONITORING SYSTEM

Technical Documentation

Overview

The system is designed to collect, monitor, analyze, and report on school violence data. It consists of five main modules: **Data Collection, Indicators, Visualization, Reports, and Settings**. Each module has specific technical operations, models, and views that work together to provide administrators, data entry staff, and viewers with actionable insights.

1. Data Collection

Purpose: Capture raw data from Students, Teachers, and Parents.

- **Models:**
 - Student, Teacher, Parent with fields for demographics, violence experience, perpetrators, vulnerable places, etc.
- **Views:**
 - Data collection reports: Displays all collected records.
 - Export data collection excel: Exports data into Excel with separate sheets for other useful operation and sharing across stakeholders.
- **Operations:**
 - Queries via Django ORM.
 - Excel export using `xlsxwriter`.
 - Boolean fields (True/False) are normalized/converted to "Yes/No".
 - Data organized by various category basing to the response from the field.

2. Indicators

Purpose: Provide statistical measures and performance indicators, and monitor the project KPIs.

- **Views:**
 - Indicator reports: Calculates rates and percentages for reporting, violence experience, recurrence, and effectiveness.
 - Both baseline and data-oriented indicators has been identified and implemented accordingly

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- **Operations:**
 - Aggregates data with annotate (Count("id")) in indicator progress monitoring.
 - Computes percentages relative to total students.
 - Prepares datasets for charts (labels + values) serialized via json.dumps.
- **Some of Key Indicators:**
 - Student Reporting rate.
 - Experienced vs. unexperienced VAC.
 - Effectiveness of reporting system.
 - Recurrence rate.

3. Visualization

Purpose: Graphical representation of violence data.

- **Views:**
 - Visualization reports: Prepares datasets for charts (violence types, perpetrators, regions, gender distribution).
- **Operations:**
 - Queries grouped by violence type, gender, region, perpetrators.
 - Organizes data into JSON arrays for frontend chart libraries.
 - Handles missing values with "Unknown".
 - Structures violence by gender for stacked bar charts.

4. Reports

Purpose: Generate detailed tabular and exportable reports.

- **Views:**
 - Violence reports: Summarizes violence data.
 - Export violence.pdf: Generates PDF reports with ReportLab library.
 - Export violence. excel: Generates Excel reports with xlswriter library.
- **Operations:**
 - PDF export: Simple Document Template, Table, Paragraph, Spacer.
 - Excel export: formatted headers and borders.

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- Percentages calculated relative to total students.
- Safeguards for missing logo and consistent styling.

5. Settings

Purpose: System administration and configuration.

- **Views:**
 - dashboard: Displays system user guide.
 - User list, add user, edit user, delete user: Manage users with role-based restrictions.
 - Backup database: Dumps all data into JSON.
 - Restore database: Restores data from uploaded JSON.
 - System settings: Configurable preferences.
- **Operations:**
 - Role-based access enforced via `@user_passes_test(is_admin)`.
 - Prevents deleting last Admin or self-deletion.
 - Uses Django's `dumpdata` and `loaddata` for backup/restore.
 - Dashboard template provides user guide with links to system functions.

Summary

- **Data Collection:** Raw data entry and export.
- **Indicators:** Statistical analysis and performance metrics.
- **Visualization:** Chart-ready datasets.
- **Reports:** Tabular summaries with PDF/Excel export.
- **Settings:** User management, backup/restore, and configuration.