

Web-Based Information System Design

Gram Panchayat Management System

#TEAM MEMBERS

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ER DIAGRAM

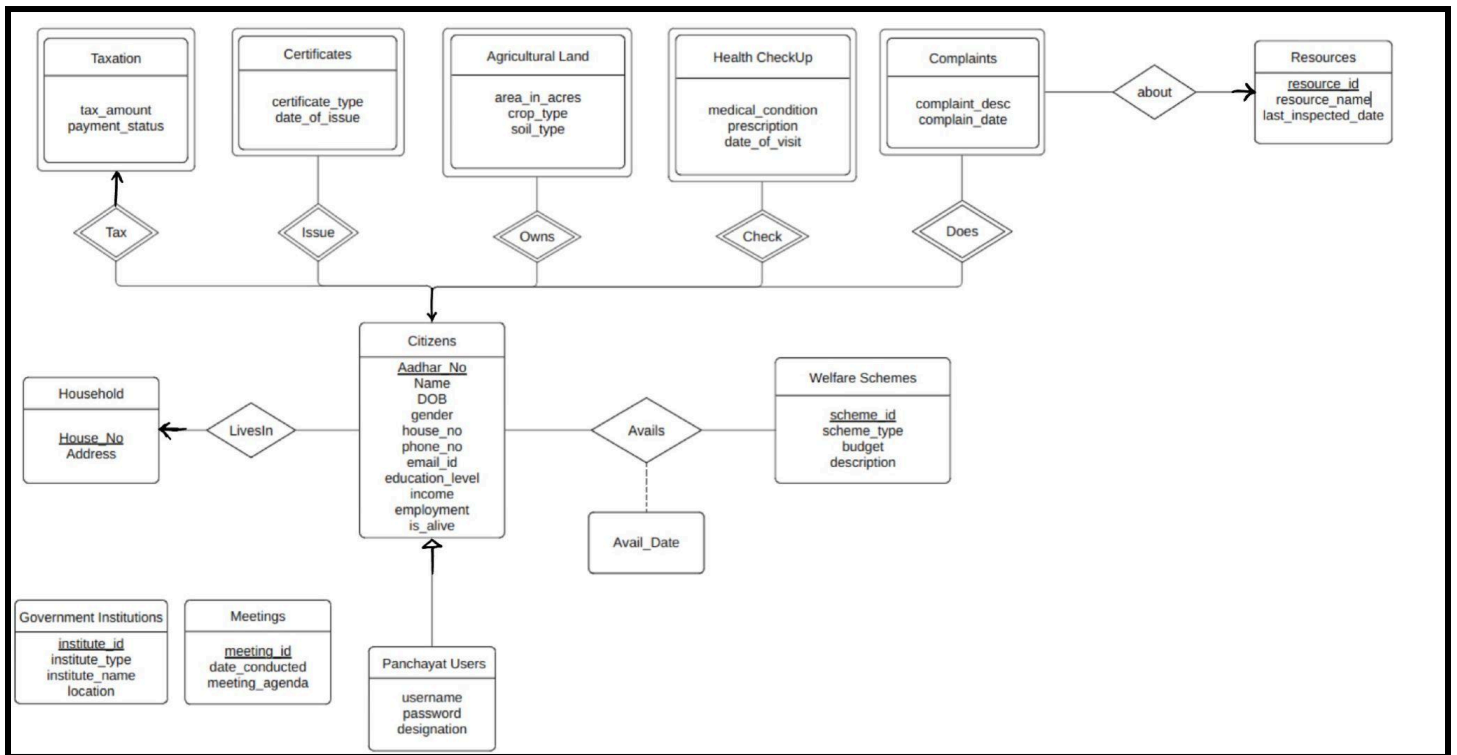
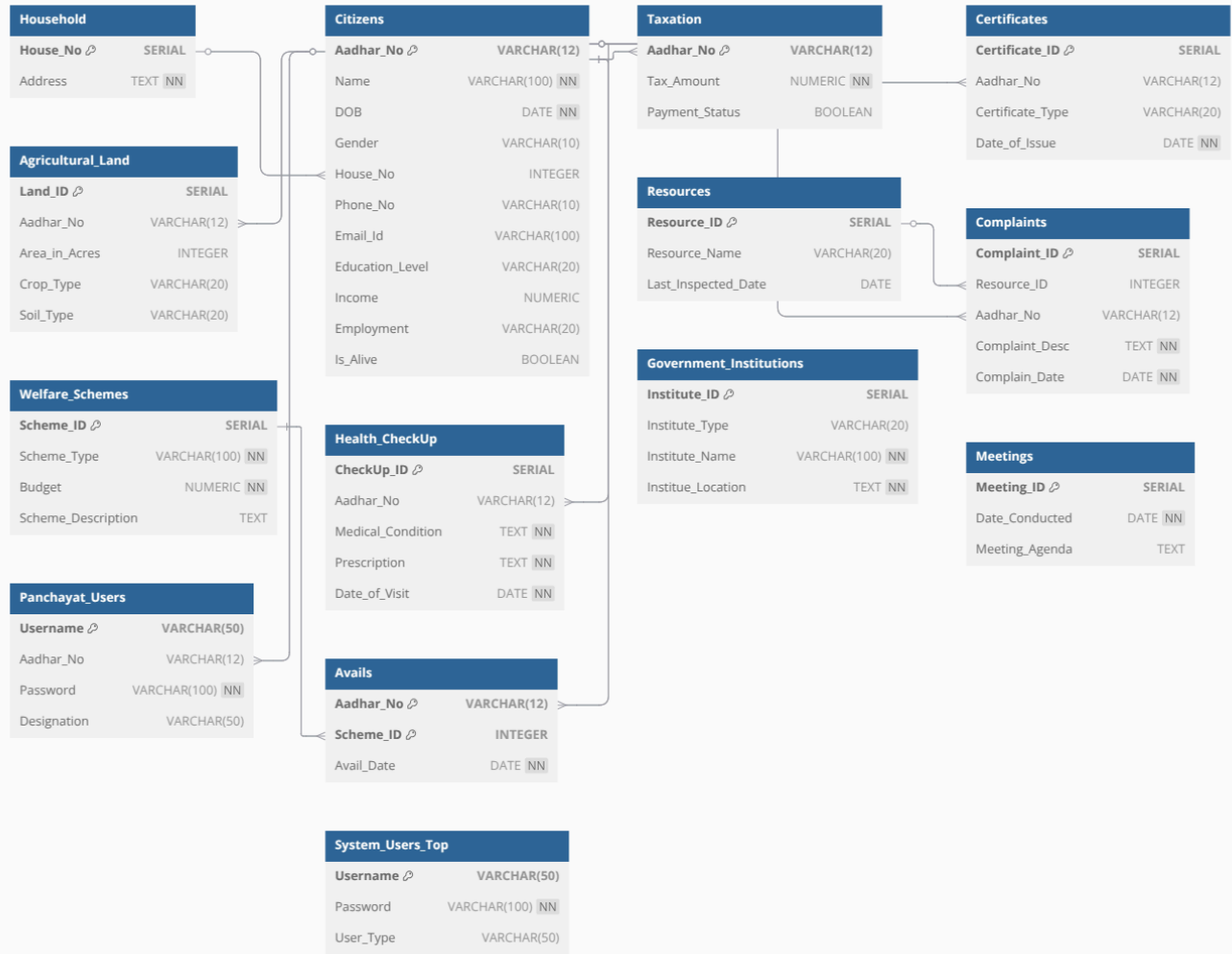


TABLE SCHEMA



Top System Users

```
CREATE TABLE System_Users_Top(  
  Username VARCHAR(50) PRIMARY KEY,  
  Password VARCHAR(100) NOT NULL,  
  User_Type VARCHAR(50) CHECK (User_Type IN ('System Administrator', 'Government Official'))  
);  
CREATE UNIQUE INDEX unique_administrator ON System_Users_Top (User_Type) WHERE User_Type = 'System  
Administrator';
```

Panchayat Members

```
CREATE TABLE Panchayat_Users (  
  Username VARCHAR(50) PRIMARY KEY,  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Password VARCHAR(100) NOT NULL,  
  Designation VARCHAR(50) CHECK (Designation IN ('Sarpanch', 'Naib Sarpanch', 'Panchayat Secretary', 'Gram Sevak',  
'Ward Member', 'Community Mobilizer'))  
);  
CREATE UNIQUE INDEX unique_sarpanch ON Panchayat_Users (Designation) WHERE Designation = 'Sarpanch';  
CREATE UNIQUE INDEX unique_naib_sarpanch ON Panchayat_Users (Designation) WHERE Designation = 'Naib  
Sarpanch';
```

Citizen and Table Management

```
CREATE TABLE Citizens (  
  Aadhar_No VARCHAR(12) PRIMARY KEY CHECK (LENGTH(Aadhar_No) = 12 AND Aadhar_No ~ '^[1-9][0-9]{11}$'),  
  Name VARCHAR(100) NOT NULL,  
  DOB DATE NOT NULL,  
  Gender VARCHAR(10) CHECK (Gender IN ('Male', 'Female')),  
  House_No INTEGER REFERENCES Household(House_No),  
  Phone_No VARCHAR(10) CHECK (LENGTH(Phone_No) = 10 AND Phone_No ~ '^[6-9][0-9]{9}$'),  
  Email_Id VARCHAR(100) CHECK (Email_Id ~ '[a-zA-Z0-9._%+-]+@[a-zA-Z0-9.-]+\.[a-zA-Z]{2,}$'),  
  Education_Level VARCHAR(20) CHECK (Education_Level IN ('Uneducated', 'High School', 'Secondary School',  
'Graduate', 'Post Graduate')),  
  Income NUMERIC CHECK(Income >= 0),  
  Employment VARCHAR(20) CHECK (Employment IN ('Unemployed', 'Employee', 'Self Employed', 'Business')),  
  Is_Alive BOOLEAN DEFAULT TRUE  
);
```

```
CREATE TABLE Household (  
  House_No SERIAL PRIMARY KEY,  
  Address TEXT NOT NULL  
);
```

Certificate and Welfare Management

```
CREATE TABLE Certificates (  
  Certificate_ID SERIAL PRIMARY KEY,  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Certificate_Type VARCHAR(20) CHECK (Certificate_Type IN ('Birth', 'Death', 'Caste', 'Domicile', 'Residence',  
'Character')),  
  Date_of_Issue DATE NOT NULL  
);  
  
CREATE TABLE Welfare_Schemes (  
  Scheme_ID SERIAL PRIMARY KEY,  
  Scheme_Type VARCHAR(100) NOT NULL,  
  Budget NUMERIC NOT NULL,  
  Scheme_Description TEXT  
);
```

```
CREATE TABLE Avails (  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Scheme_ID INTEGER REFERENCES Welfare_Schemes(Scheme_ID),  
  Avail_Date DATE NOT NULL,  
  PRIMARY KEY (Aadhar_No, Scheme_ID)  
);
```

Land and Health Management

```
CREATE TABLE Agricultural_Land (  
  Land_ID SERIAL PRIMARY KEY,  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Area_in_Acres INTEGER NOT NULL CHECK (Area_in_Acres > 0 AND Area_in_Acres <= 60),  
  Crop_Type VARCHAR(20) CHECK (Crop_Type IN ('Rice', 'Wheat', 'Sugarcane', 'Cotton', 'Jute', 'Maize', 'Millets', 'Pulses',  
'Mustard', 'Groundnut', 'Mango', 'Banana', 'Coconut', 'Vegetables', 'Sugarcane', 'Grapes')),  
  Soil_Type VARCHAR(20) CHECK (Soil_Type IN ('Alluvial', 'Black', 'Red', 'Laterite', 'Peaty Soil', 'Desert Soil', 'Mountain  
Soil'))  
);
```

```
CREATE TABLE Health_CheckUp (  
  CheckUp_ID SERIAL PRIMARY KEY,  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Medical_Condition TEXT NOT NULL,  
  Prescription TEXT NOT NULL,  
  Date_of_Visit DATE NOT NULL  
);
```

Financial And Tax Management

```
CREATE TABLE Taxation (  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Tax_Amount NUMERIC NOT NULL DEFAULT 0,  
  Payment_Status BOOLEAN DEFAULT FALSE,  
  PRIMARY KEY (Aadhar_No)  
);
```

Resource and Complaint Management

```
CREATE TABLE Resources (  
  Resource_ID SERIAL PRIMARY KEY,  
  Resource_Name VARCHAR(20) CHECK (Resource_Name IN ('Roads', 'Drainage System', 'Water', 'Park', 'Electricity',  
'Waste Management')),  
  Last_Inspected_Date DATE  
);
```

```
CREATE TABLE Complaints (  
  Complaint_ID SERIAL PRIMARY KEY,  
  Resource_ID INTEGER REFERENCES Resources(Resource_ID),  
  Aadhar_No VARCHAR(12) REFERENCES Citizens(Aadhar_No),  
  Complaint_Desc TEXT NOT NULL,  
  Complain_Date DATE NOT NULL  
);
```

Institution and Meeting Management

```
CREATE TABLE Government_Institutions (  
  Institute_ID SERIAL PRIMARY KEY,  
  Institute_Type VARCHAR(20) CHECK (Institute_Type IN ('Educational', 'Health', 'Banking', 'Administration')),  
  Institute_Name VARCHAR(100) NOT NULL,  
  Institue_Location TEXT NOT NULL  
);
```

```
CREATE TABLE Meetings (  
  Meeting_ID SERIAL PRIMARY KEY,  
  Date_Conducted DATE NOT NULL,  
  Meeting_Agenda TEXT  
);
```

LIST OF FUNCTIONALITIES IMPLEMENTED

System Administrator

An exhaustive dashboard provides the options to do the following things:

- View/Add/Edit/Delete *Government Officials*
- View/Add/Edit/Delete *Panchayat Employees*
- Full access to the *database* using exclusive *SQL Queries (in a terminal like interface)*

Government Officials

An exhaustive dashboard provides the options to do the following things:

- Monitor Census
 - Total population count
 - Gender-wise population count
 - Age-wise population distribution
 - Employment-status wise distribution
 - Education-level wise distribution
 - Vital yearly statistics (*i.e. Births and Deaths in the current year*)
- Monitor Taxation Data
 - Total taxation statistics (*i.e. total amount owed, amount collected, and amount yet to be collected*) (*a progressive bar to demonstrate this*)
 - The list of tax defaulters (*count and list of people who have not paid the taxes yet*)
- Monitor Medical Data
 - Provide disease-specific stats for the current year

- Monitor Welfare Schemes Being Implemented
 - All the welfare schemes are implemented, the total budget allocated, and the list of beneficiaries.
- Monitor Agricultural Data
 - Provide the crop distribution by type and area and the total aggregated land under cultivation.
- Monitor Built Government Institutions
 - View all the institutions owned by the government by type (educational, health, banking, administrative offices)

Panchayat Employees

An exhaustive dashboard provides the options to do the following things:

- Citizen and Household Management:
 - View/Add/Edit/Delete Citizen records: Manage citizen details like Aadhar number, name, DOB, and contact information.
 - View/Add/Edit/Delete Household records: Handle household data, including house number and address.
- Certificate and Welfare Management:
 - Issue/Edit/View Certificates of Citizens: Manage issuance and updates of certificates like birth, caste, etc.
 - Issue Death Certificate: Declare a citizen deceased by issuing a death certificate.
 - View/Add/Edit/Delete Welfare Schemes: Oversee welfare schemes, including budget and descriptions.
 - Register citizens for the available welfare schemes: Enroll citizens in applicable schemes.
- Land and Health Management:
 - Register/Edit Agricultural Land Records: Manage agricultural land details, including area and crop type.
 - Modify/Add/View Health-related records of a citizen: Update health check-up records and medical conditions.
- Financial and Tax Management:
 - Modify/Add/Edit Taxation Data of a Citizen: Update tax payment status and amounts.
- Resource and Complaint Management:
 - Track/Add/Update the Resources in the village: Manage resource details like roads and water supply.
 - View/Resolve Complaints raised by citizens: Address citizen complaints regarding resources.
- Institution and Meeting Management:

- View/Add various Panchayat-held institutions category-wise: List institutions like schools and hospitals.
- Add/Delete Panchayat Meeting Details: Record meeting dates and agendas.

Citizens

An exhaustive view that gives adequate information that a citizen requires:

- Personal Information (*Aadhar number, House number, Address, Phone number, Email*)
- Health Check-up Records
- Taxation Information and payment status
- All the welfare schemes the citizen is registered under
- Agricultural Land Data that the citizen holds
- All the complaints registered by the citizen (*along with a provision to raise one*)
- All the certificates owned by the citizen
- All the Government Institutions present in the village (*category-wise overview*)

About Us

A page that displays the whole Panchayat Team, along with their *contact* details

Note: *All the passwords stored in the database are hashed using the md5 method of hashing; this is implemented for the 'Panchayat Employees' and 'Government Officials'.*

LIST OF TOOLS USED

- Python (*with Flask, Flask-SQLAlchemy, Flask_WTF, psycopg2, psycopg2-binary, hashlib*)
- HTML, CSS, JavaScript, Jinja (*with font awesome, ajax*)
- PostgreSQL