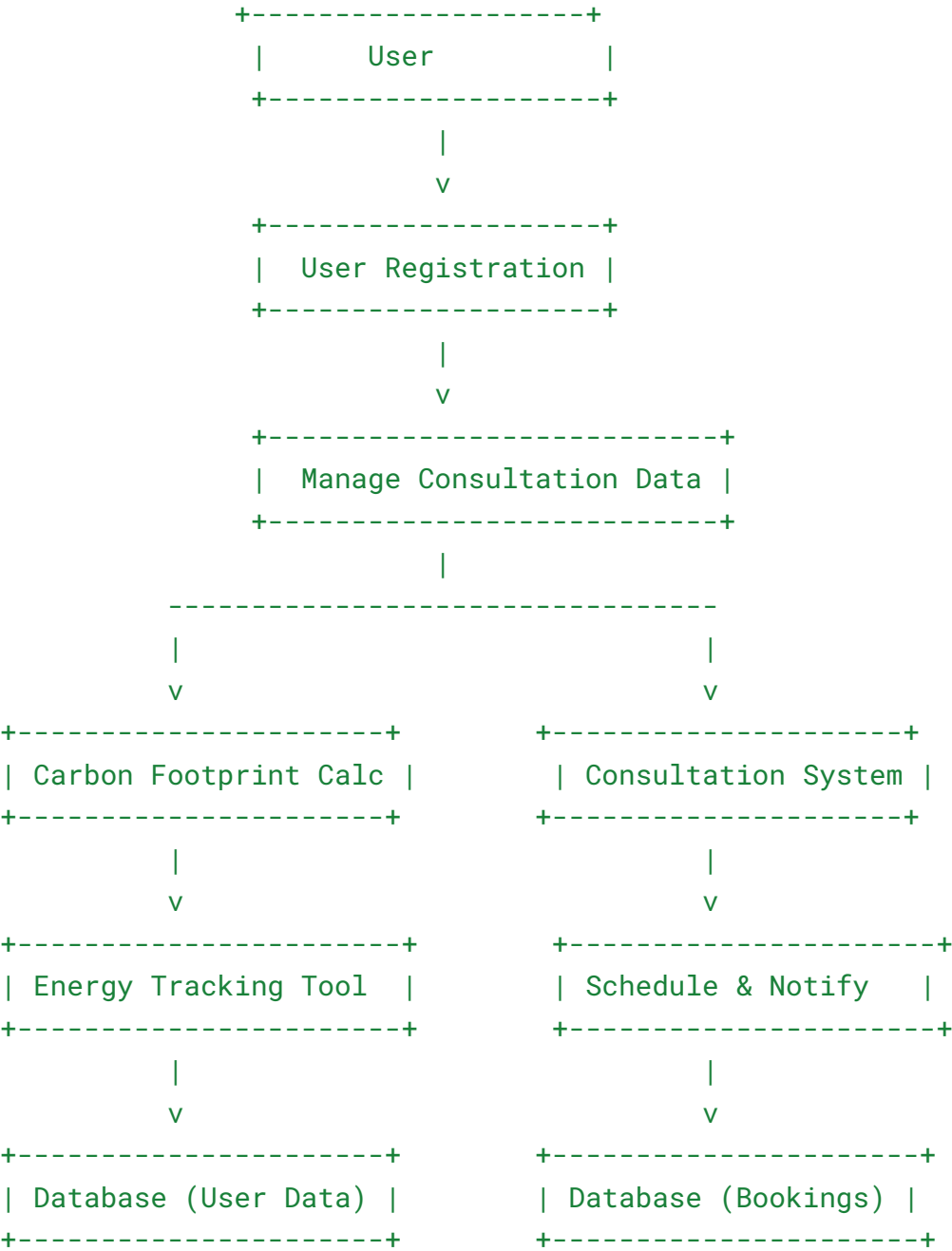Here are the **visual representations** of the diagrams in a text-based format:

---

1. Data Flow Diagram (DFD - Level 1)
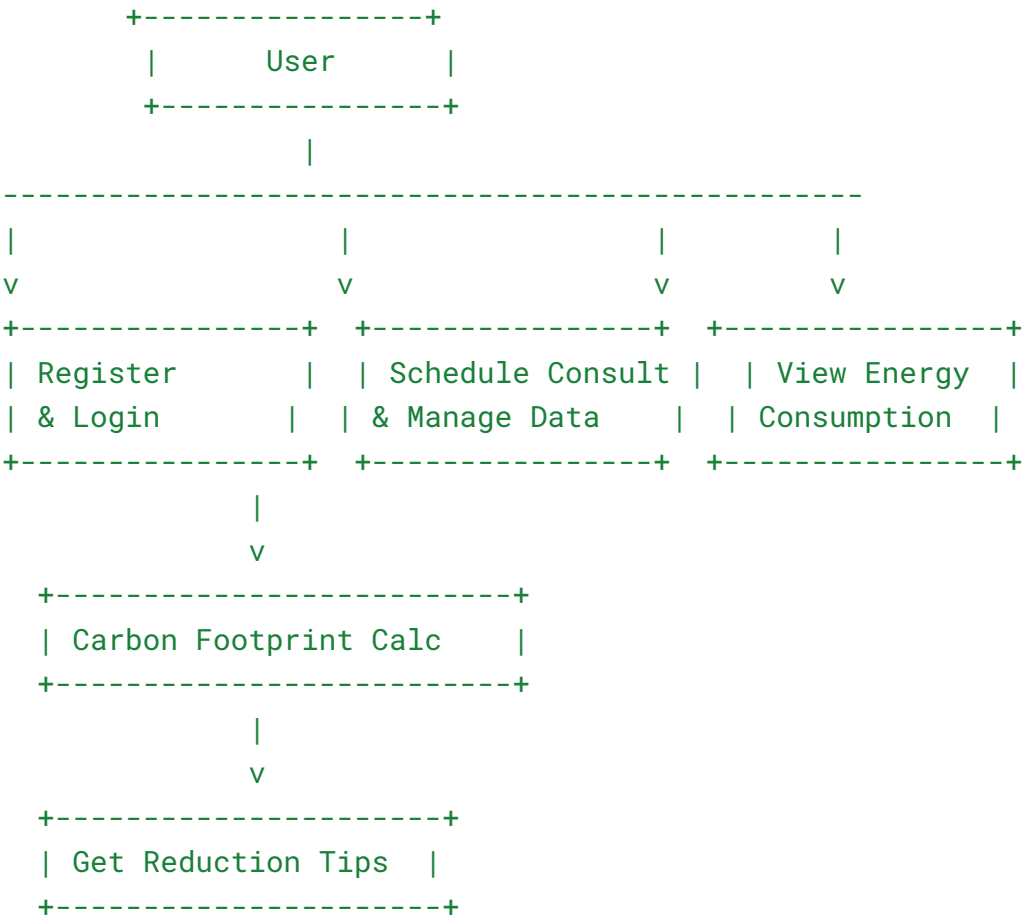
pgsql
CopyEdit

```
                +-------------------+
                |      User         |
                +-------------------+
                          |
                          v
                +-------------------+
                | User Registration |
                +-------------------+
                          |
                          v
                +--------------------------+
                |  Manage Consultation Data |
                +--------------------------+
                          |
                -------------------------------
                |                             |
                v                             v
+----------------------+      +-------------------+
| Carbon Footprint Calc |     | Consultation System |
+----------------------+      +-------------------+
            |                             |
            v                             v
+----------------------+      +----------------------+
| Energy Tracking Tool  |     | Schedule & Notify    |
+----------------------+      +----------------------+
            |                             |
            v                             v
+----------------------+      +----------------------+
| Database (User Data) |      | Database (Bookings)  |
+----------------------+      +----------------------+
```
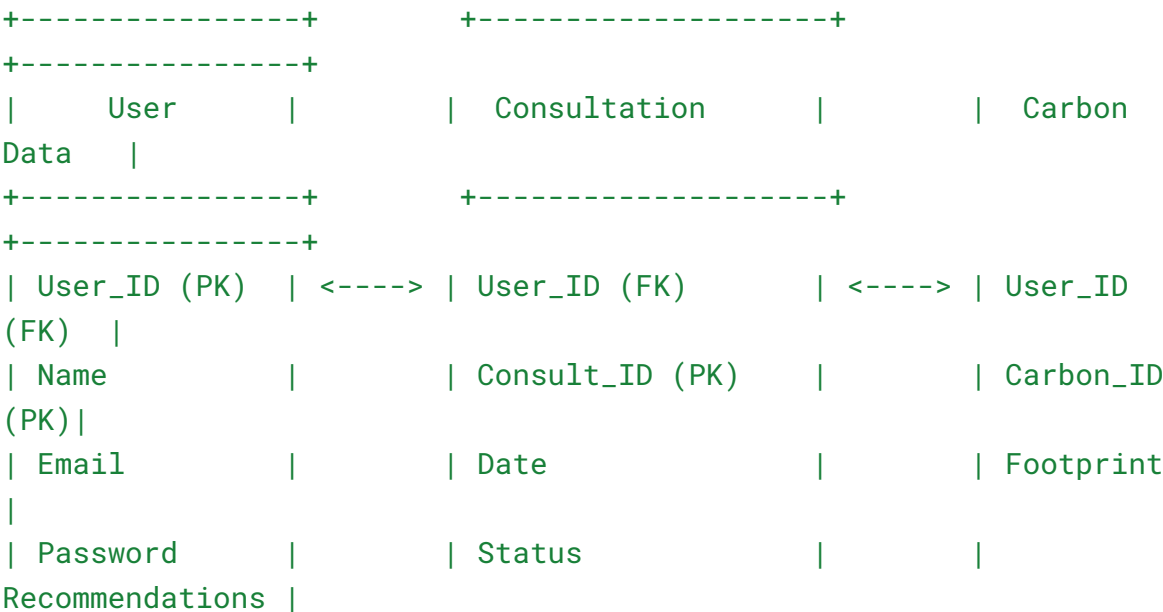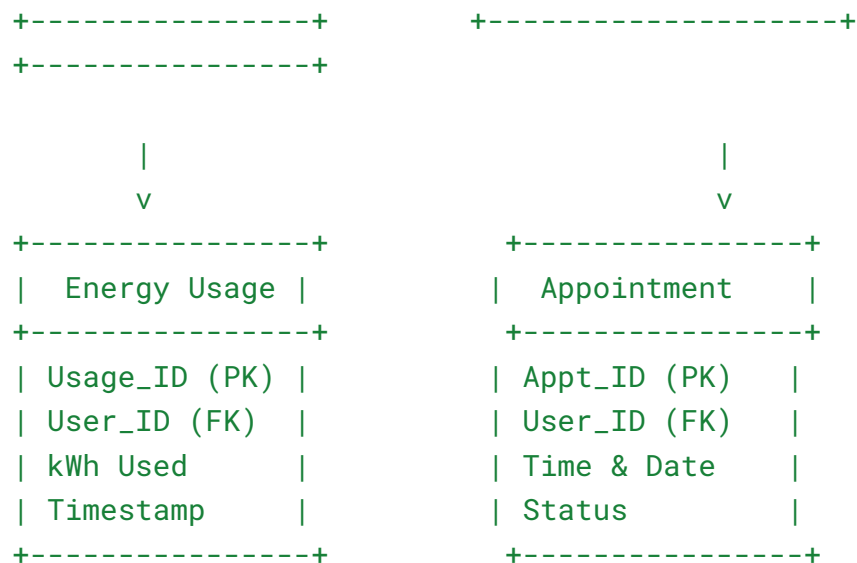
---

2. Use Case Diagram

pgsql

```
CopyEdit
        +---------------+
        |     User      |
         +---------------+
                |
-------------------------------------------------
|               |               |           |
v               v               v           v
+---------------+  +---------------+  +---------------+
| Register      |  | Schedule Consult |  | View Energy   |
| & Login       |  | & Manage Data    |  | Consumption   |
+---------------+  +---------------+  +---------------+
            |
            v
  +-------------------------+
  | Carbon Footprint Calc   |
  +-------------------------+
            |
            v
  +----------------------+
  | Get Reduction Tips   |
  +----------------------+
```

---

3. Entity Relationship Diagram (ERD)

pgsql
CopyEdit
```
+---------------+        +-------------------+         +---------------+
|     User      |        |   Consultation    |         |    Carbon
Data    |
+---------------+        +-------------------+         +---------------+
| User_ID (PK)  | <----> | User_ID (FK)      | <----> | User_ID
(FK)   |
| Name          |        | Consult_ID (PK)   |         | Carbon_ID
(PK)|
| Email         |        | Date              |         | Footprint
|
| Password      |        | Status            |         |
Recommendations |
```

```
+---------------+          +------------------+
+---------------+          +------------------+

        |                          |
        v                          v
+---------------+          +---------------+
|  Energy Usage |          |  Appointment  |
+---------------+          +---------------+
| Usage_ID (PK) |          | Appt_ID (PK)  |
| User_ID (FK)  |          | User_ID (FK)  |
| kWh Used      |          | Time & Date   |
| Timestamp     |          | Status        |
+---------------+          +---------------+
```

This represents the **logical flow** of data and relationships **without images** but still structured visually. Let me know if you need modifications!

User → Consultation (*One-to-Many*)

- One user can schedule multiple consultations.

User → Carbon Data (*One-to-One*)

- Each user has one carbon footprint record.

User → Appointment (*One-to-Many*)

- A user can book multiple appointments.

Consultation → Appointment (*One-to-One*)

- Each consultation is linked to a single appointment.

Carbon Data → Energy Usage (*One-to-Many*)

- A carbon footprint record tracks multiple energy usage records.

Website Hierarchy (Detailed Text-Based Visual)

mathematica
CopyEdit
Home
 ├── About Us
 ├── Services
```

```
|     ├── Green Energy Products
|     ├── Solar Panel Installation
|     ├── EV Charging
|     ├── Smart Home Management
├── Carbon Footprint Calculator
|     ├── User Input Form
|     ├── Calculation Results
|     ├── Tips to Reduce Carbon Footprint
├── Energy Tracking Tool
|     ├── User Dashboard
|     ├── Historical Data Charts
|     ├── Monthly Reports
├── Consultation Scheduling
|     ├── Book Appointment
|     ├── View & Manage Appointments
|     ├── Notifications & Reminders
├── User Account
|     ├── Register/Login
|     ├── Profile Settings
|     ├── Saved Reports
├── Accessibility Options
|     ├── Font Size Control
|     ├── Contrast Modes
|     ├── Voice Assistance
├── Contact Us
|     ├── Inquiry Form
|     ├── Live Chat Support
|     ├── Social Media Links
```

Visual Interface for Each Web Page

Here's a **text-based UI representation** of how each webpage could be structured.

---

1. Home Page

pgsql
CopyEdit

```
+-------------------------------------------------+
|   [Company Logo]    [Navigation Menu] [Login]   |
+-------------------------------------------------+
```

```
|              Welcome to Rosla Tech            |
|  "Empowering Sustainability Through Innovation"  |
|      [Learn More]  [Get Started]             |
+-----------------------------------------------+
|       [Carbon Calculator]  [Schedule Consult]  |
|        [Energy Tracker]      [Green Products]  |
+-----------------------------------------------+
|            [Customer Testimonials]            |
+-----------------------------------------------+
|          [Footer: Contact | Privacy]          |
+-----------------------------------------------+
```

2. Carbon Footprint Calculator

pgsql
CopyEdit

```
+-----------------------------------------------+
|             Carbon Footprint Calculator       |
+-----------------------------------------------+
|  [Enter your energy usage, transportation, etc.]|
|  [Submit]                                     |
+-----------------------------------------------+
|  Your Carbon Footprint: [XX kg CO2]           |
|  Suggested Actions:                           |
|  - Use solar energy                           |
|  - Reduce daily power consumption             |
|  - Switch to energy-efficient appliances      |
+-----------------------------------------------+
| [Save Report]  [Download PDF]  [Share]        |
+-----------------------------------------------+
```

3. Energy Tracking Tool (Dashboard)

pgsql
CopyEdit

```
+-----------------------------------------------+
|             Energy Consumption Dashboard      |
+-----------------------------------------------+
|   Monthly Usage: [Graph of kWh Consumption]   |
|   Average Daily Consumption: [XX kWh]         |
|   Carbon Offset: [XX kg CO2 Saved]            |
```

```
+-----------------------------------------------+
|  [View Historical Data]  [Download Report]    |
|  [Set Energy Saving Goals]                    |
+-----------------------------------------------+
```

---

4. Consultation Scheduling

pgsql
CopyEdit

```
+-----------------------------------------------+
|              Book a Consultation              |
+-----------------------------------------------+
|   Select Service: [Dropdown Menu]             |
|   Select Date & Time: [Calendar Picker]       |
|   Your Contact Info: [Form Fields]            |
|   [Confirm Booking]                           |
+-----------------------------------------------+
|  [View My Appointments]  [Cancel Appointment] |
+-----------------------------------------------+
```

---

5. User Account (Profile Settings)

less
CopyEdit

```
+-----------------------------------------------+
|               User Dashboard                  |
+-----------------------------------------------+
|  [Profile Picture]  Username: [JohnDoe]       |
|  Email: [johndoe@email.com]                   |
|  Saved Carbon Reports: [View Reports]         |
|  Energy Tracking Data: [Access Dashboard]     |
|  Consultation History: [View Appointments]    |
+-----------------------------------------------+
|  [Edit Profile]  [Change Password]  [Logout]  |
+-----------------------------------------------+
```

Would you like me to refine any section further? 🚀

You said:
now give me explainations

Explanations for Website Hierarchy and Visual Interface

Website Hierarchy Explanation

The website is structured into logical categories, ensuring a **seamless user experience** while maintaining clarity and efficiency. Below is a breakdown of each section and its purpose:

1. **Home Page**

   - Acts as the **entry point** for users.
   - Provides **quick access** to core functionalities like Carbon Footprint Calculator, Consultation Booking, and Energy Tracking.
   - Features **company branding, mission statement, and key call-to-actions** (e.g., "Learn More," "Get Started").

2. **About Us**

   - Provides background on **Rosla Technologies' mission, vision, and services**.
   - Builds **trust and credibility** with users.

3. **Services**

   - Lists **all available green energy services** provided by Rosla Technologies.
   - Includes **subcategories** for different solutions:
     - Green energy products
     - Solar panel installation & maintenance
     - EV charging
     - Smart home management

4. **Carbon Footprint Calculator**

   - Helps users **assess their carbon footprint** by inputting relevant data.
   - Suggests **actionable tips** based on results to encourage sustainability.

5. **Energy Tracking Tool**

   - Allows users to **monitor energy usage** over time.
   - Provides **visual insights** (graphs, reports) for better decision-making.

6. **Consultation Scheduling**

   - Enables users to **book appointments** with Rosla Technologies.
   - Integrates **reminders and notifications** to improve engagement.

7. **User Account**

   - Manages **user authentication** (register, login, profile settings).

- ○ Allows users to **save reports, track energy data, and manage appointments**.
8. **Accessibility Options**

    - ○ Ensures **inclusivity** for users with disabilities.
    - ○ Offers features like **font size adjustments, high contrast mode, and voice assistance**.
9. **Contact Us**

    - ○ Provides **multiple ways to reach Rosla Technologies** (email, chat, social media).
    - ○ Includes an **inquiry form** for user questions.

Visual Interface Explanation

Each webpage is designed to be **intuitive, functional, and user-friendly** while maintaining a **consistent aesthetic**. Below are explanations for each key section:

1. Home Page

- Acts as a **navigation hub**, allowing users to quickly access key sections.
- Highlights **essential services** and **call-to-actions** to drive engagement.
- Includes **testimonials and company credibility** to improve trust.

2. Carbon Footprint Calculator

- Provides an **interactive form** where users can enter daily activities (e.g., energy consumption, travel habits).
- Generates **real-time results** showing estimated carbon footprint.
- Suggests **customized recommendations** for reducing environmental impact.
- Includes **download and share options** for user convenience.

3. Energy Tracking Tool

- Displays **monthly and daily energy consumption** in an **interactive dashboard**.
- Includes **graphs and analytics** to provide clear insights.
- Allows users to **set energy-saving goals** and **track progress**.

4. Consultation Scheduling

- Provides a **simple and effective booking system**.
- Users can **select service type, choose available time slots, and receive confirmation notifications**.
- Includes **appointment management options** (reschedule, cancel).

5. User Account (Profile Settings)

- Stores **user data, saved reports, and consultation history**.
- Allows users to **edit personal details** and **manage preferences**.
- Ensures **secure authentication** with password-protected login.

Why This Structure?

The proposed design is **user-centric**, ensuring:

✅ **Ease of Navigation** – Clear menu hierarchy and structured pages.
✅ **Engagement** – Encourages users to interact with tools like the Carbon Footprint Calculator.
✅ **Accessibility & Inclusivity** – Provides essential usability features for all users.
✅ **Efficiency** – Optimized workflow for booking consultations and tracking energy data.

Test Type	Testing Approach	Test Cases / Scenarios	Expected Outcome	Justification	Who Carries Out the Test?
Black Box Testing *(Functional Testing)*	**Unit Testing**	Test user registration with valid and invalid inputs.	Valid users should be registered; invalid inputs should display error messages.	Ensures that only correct data is stored and prevents faulty registrations.	**QA Testers & Developers**
	Integration Testing	Verify if consultation scheduling updates the database correctly.	Successfully booked appointments should be retrievable from the database.	Ensures that data flow between UI and backend is seamless.	**QA Testers**
	System Testing	Test the entire carbon footprint calculation workflow from input to report generation.	The system should correctly process user inputs and generate accurate reports.	Ensures that all functional requirements are working as intended.	**QA Testers & Business Analysts**

Test Type	Testing Approach	Test Cases / Scenarios	Expected Outcome	Justification	Who Carries Out the Test?
	Usability Testing	Test UI accessibility features (font size, contrast mode, screen readers).	Users should be able to adjust settings without technical difficulty.	Ensures inclusivity for all users, including those with disabilities.	**UX Designers & Testers**
	Performance Testing	Test system response time when multiple users book consultations simultaneously.	The system should handle concurrent bookings efficiently without crashing.	Ensures scalability and prevents system failures under heavy load.	**Performance Testers & Developers**
	Security Testing	Test if unauthorized users can access or modify consultation data.	Unauthorized users should be blocked; sensitive data should remain secure.	Ensures protection against data breaches and unauthorized access.	**Cybersecurity Experts**

Test Type	Testing Approach	Test Cases / Scenarios	Expected Outcome	Justification	Who Carries Out the Test?
White Box Testing *(Structural Testing)*	**Code Review**	Analyze login authentication logic for security vulnerabilities.	Ensure passwords are encrypted and prevent SQL injection.	Protects against cyber threats like hacking and data theft.	**Developers & Security Analysts**
	Unit Testing	Check if energy tracking tool correctly stores and retrieves energy usage data.	Stored data should be accurate, and retrieval should work as expected.	Ensures system reliability by confirming database interactions work properly.	**Developers**

Path Testing	Check all possible paths in the carbon footprint calculator algorithm.	Each calculation path should produce the correct CO2 emissions value.	Prevents incorrect calculations and ensures reliable outputs.	**Developers & Algorithm Testers**
Loop Testing	Test for infinite loops in energy tracking graphs rendering large datasets.	The system should handle large datasets without performance issues.	Prevents performance degradation and ensures smooth user experience.	**Developers & Performance Testers**
Data Flow Testing	Verify if user data flows correctly from input forms to the database.	Input data should be stored and retrieved accurately without loss.	Ensures correct data movement, avoiding corruption or loss of information.	**Database Engineers & QA Testers**