

Web Application to Implement Dialing Agent used by RCM

**Rayyan Shabbir
Hamza Bin Umar**

OOP in Python + 20 Mega Apps in Python

Overview

- Problem Statement
- Proposed Solution
- Methodology
 - Flowchart
 - Class Diagram
 - Architecture Diagram
 - Sequence Diagram
- Website Walk-through
 - User
 - Admin
- Results
- Future Work
- Conclusion

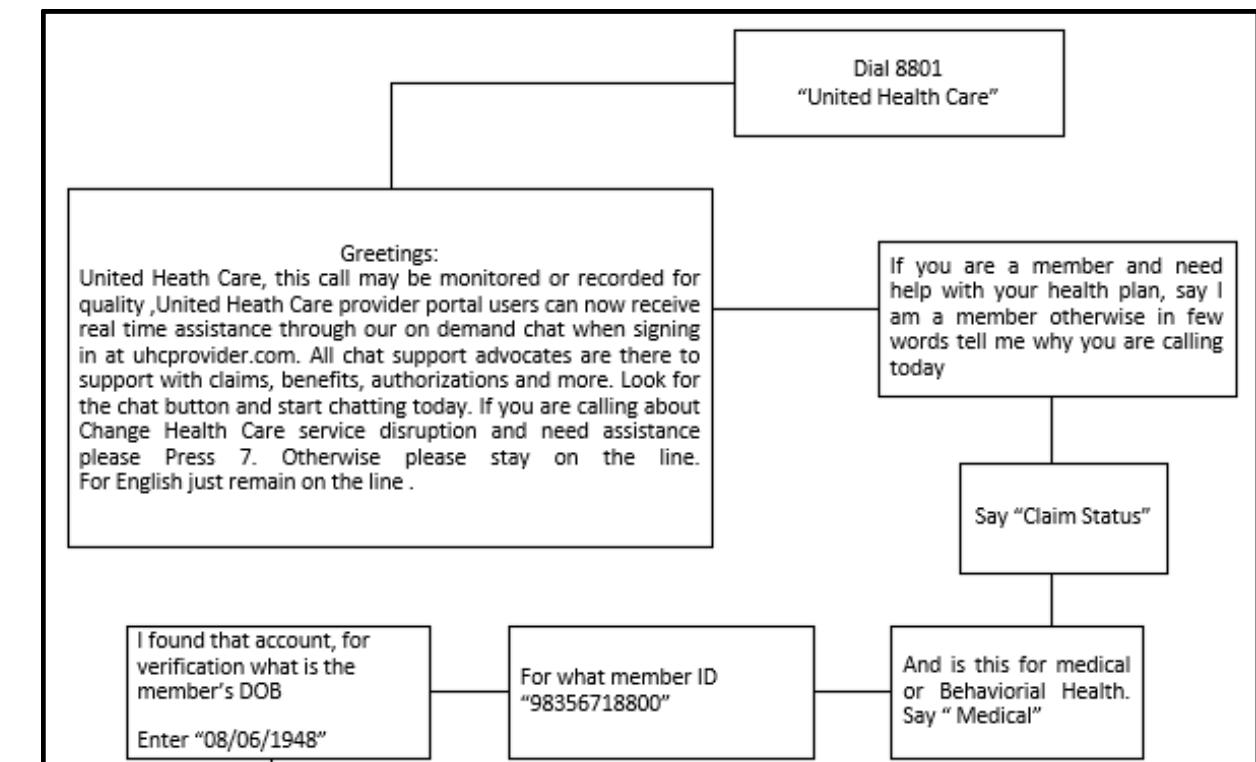
Problem Statement

- Manual IVRs' JSON updates via Visio Flowchart are **inefficient and error-prone**.
- The process leads to slow data management and inconsistencies.
- RCM agents experience reduced productivity in insurance interactions.
- Increasing insurance data needs expose the method's limitations.
- Delays and inaccurate submissions stem from manual processes.
- An automated solution is needed for **faster, error-free workflows**.

Proposed Solution

1. Working with Manual Flowcharts

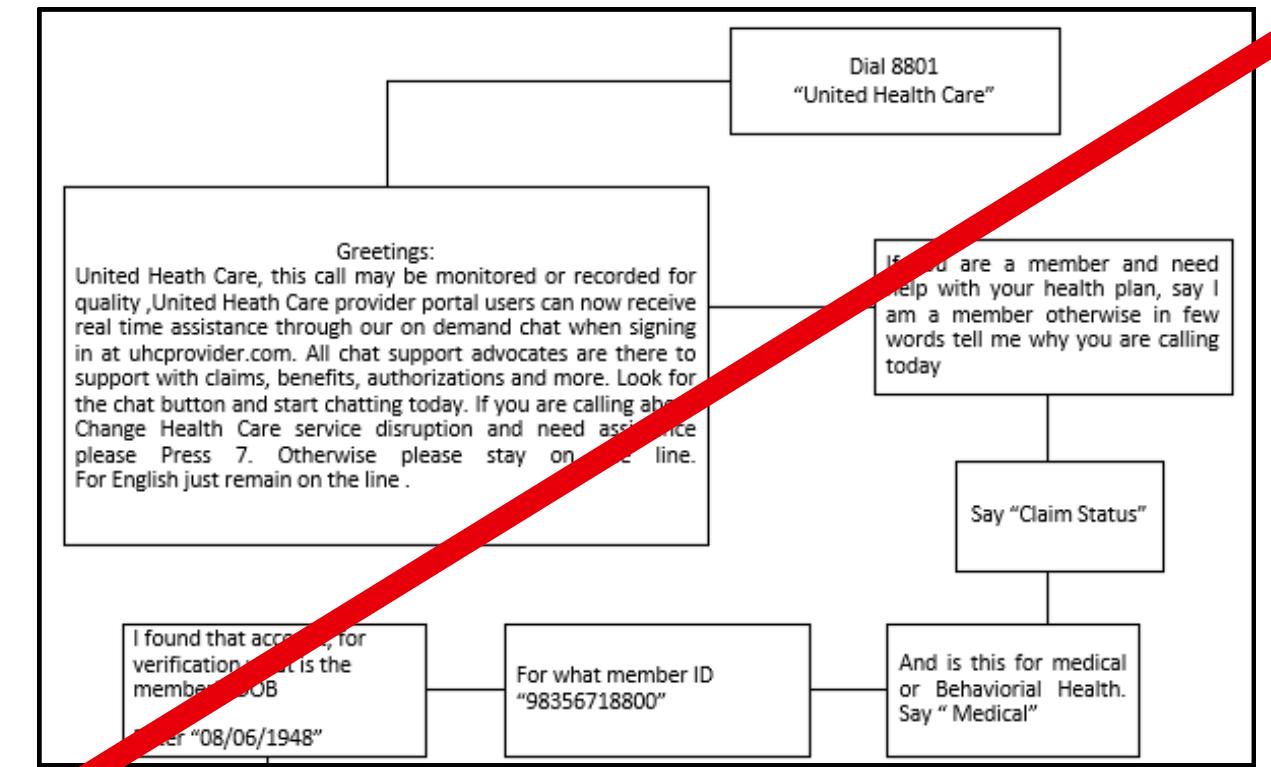
- Manual flowcharts are error-prone, leading to inefficiencies, slow updates, and inconsistencies in data management.



Proposed Solution

1. Working with Manual Flowcharts

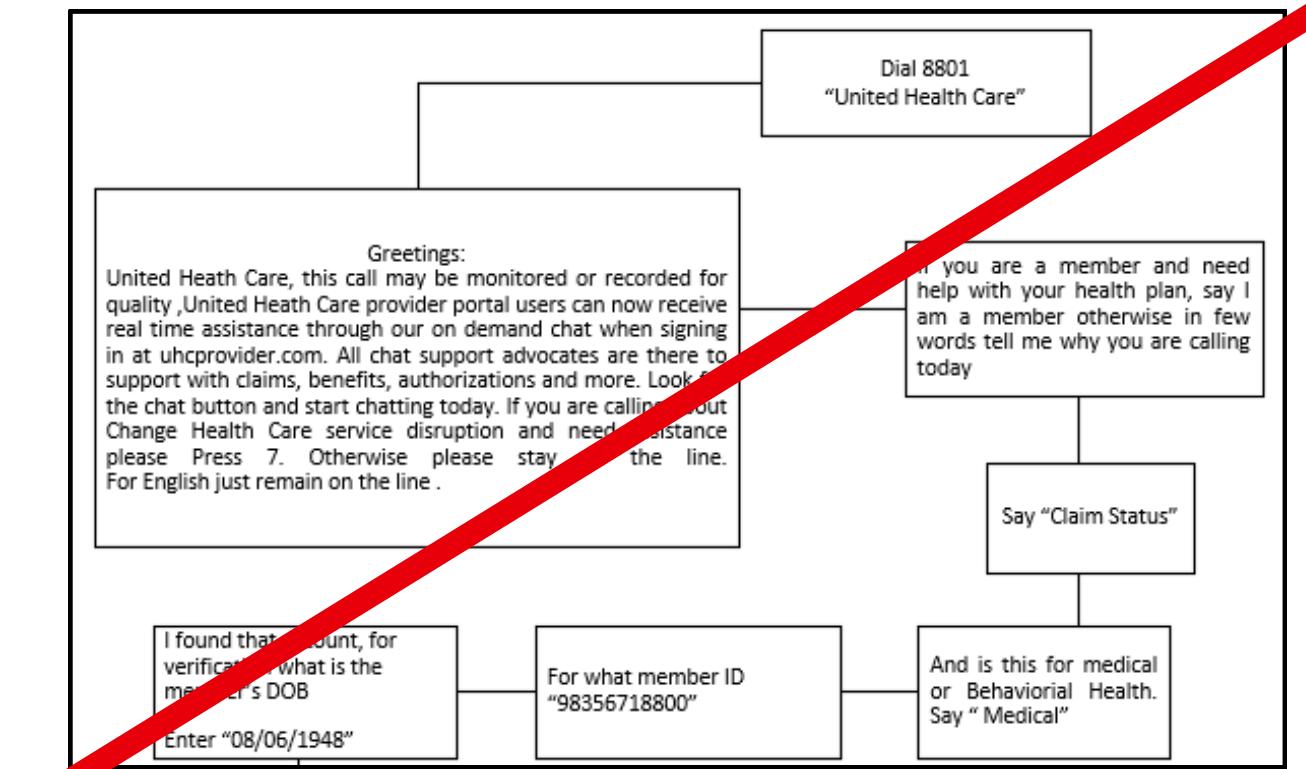
- Manual flowcharts are error-prone, leading to inefficiencies, slow updates, and inconsistencies in data management.



Proposed Solution

1. Working with Manual Flowcharts

- Manual flowcharts are error-prone, leading to inefficiencies, slow updates, and inconsistencies in data management.



2. Automated Web Application for IVR Data Management

- Web application automates IVR insurance data management with a user-friendly interface and dynamic JSON generation.
- MongoDB backend ensures efficient storage, with multi-user support and customisable fields, sentences, and actions.
- Automates JSON updates for fast, error-free, and consistent data management.

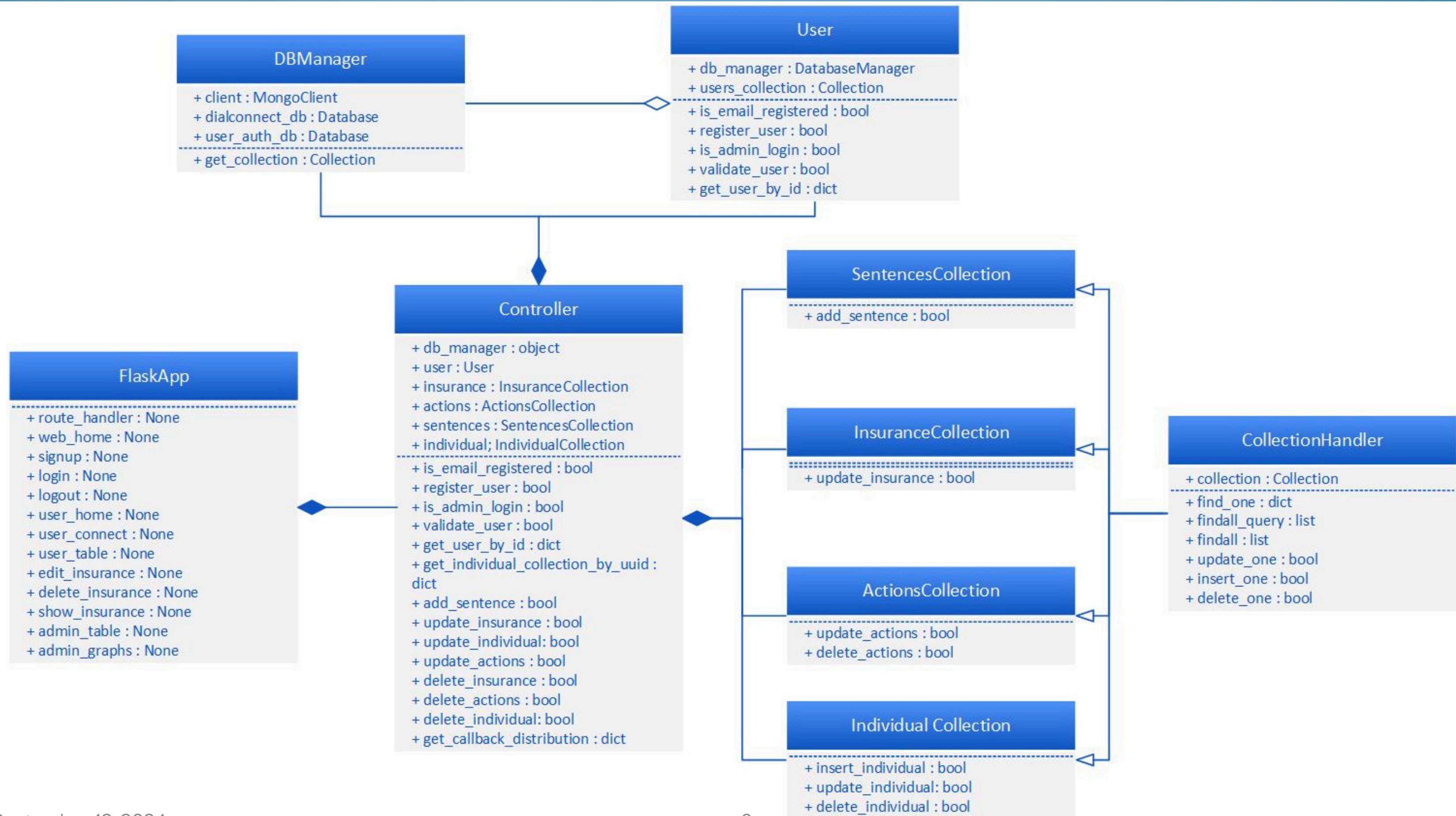
```
{
  "_id": {},
  "United_Health_Care": {
    "NPI": {
      "excel": {},
      "sending_data": "",
      "callback": "send_dtmf"
    },
    "United_Health_Care_Claim_Status": {
      "excel": {},
      "sending_data": "2",
      "callback": "send_audio_words"
    }
  }
}
```

Tech Stack

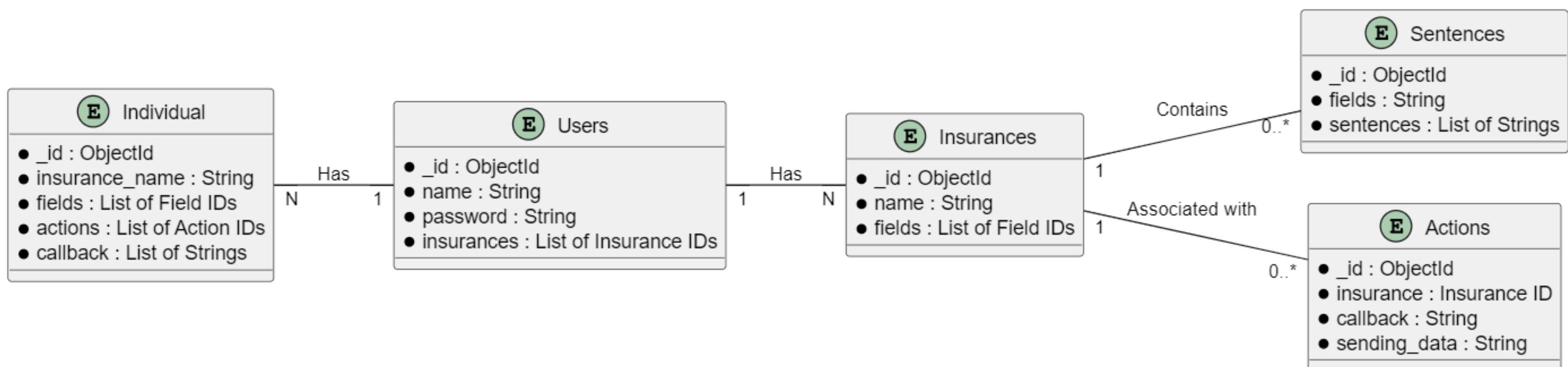
- Html
- Css
- Bootstrap
- Javascript
- Python (Flask)
- MongoDB



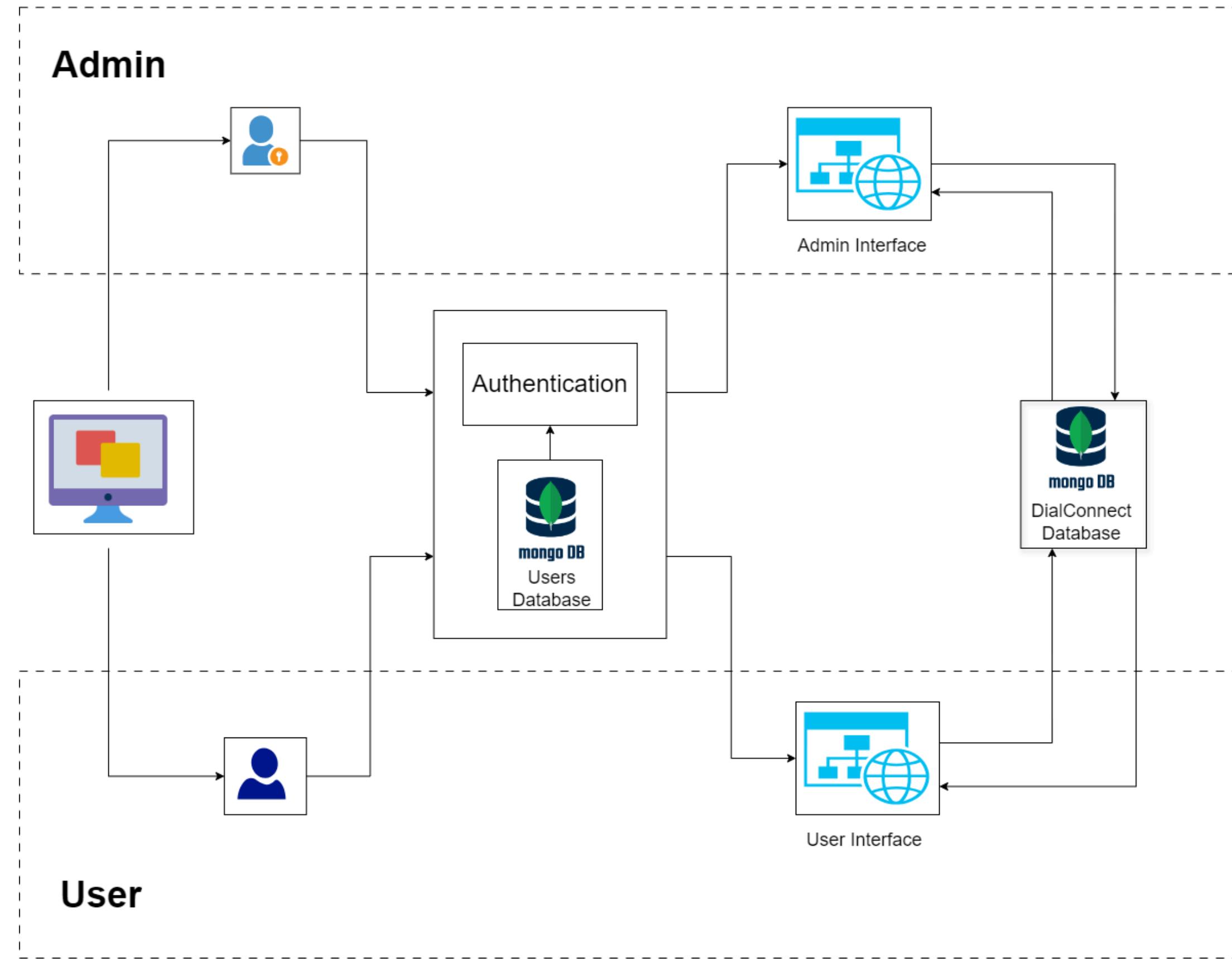
Methodology (Class Diagram)



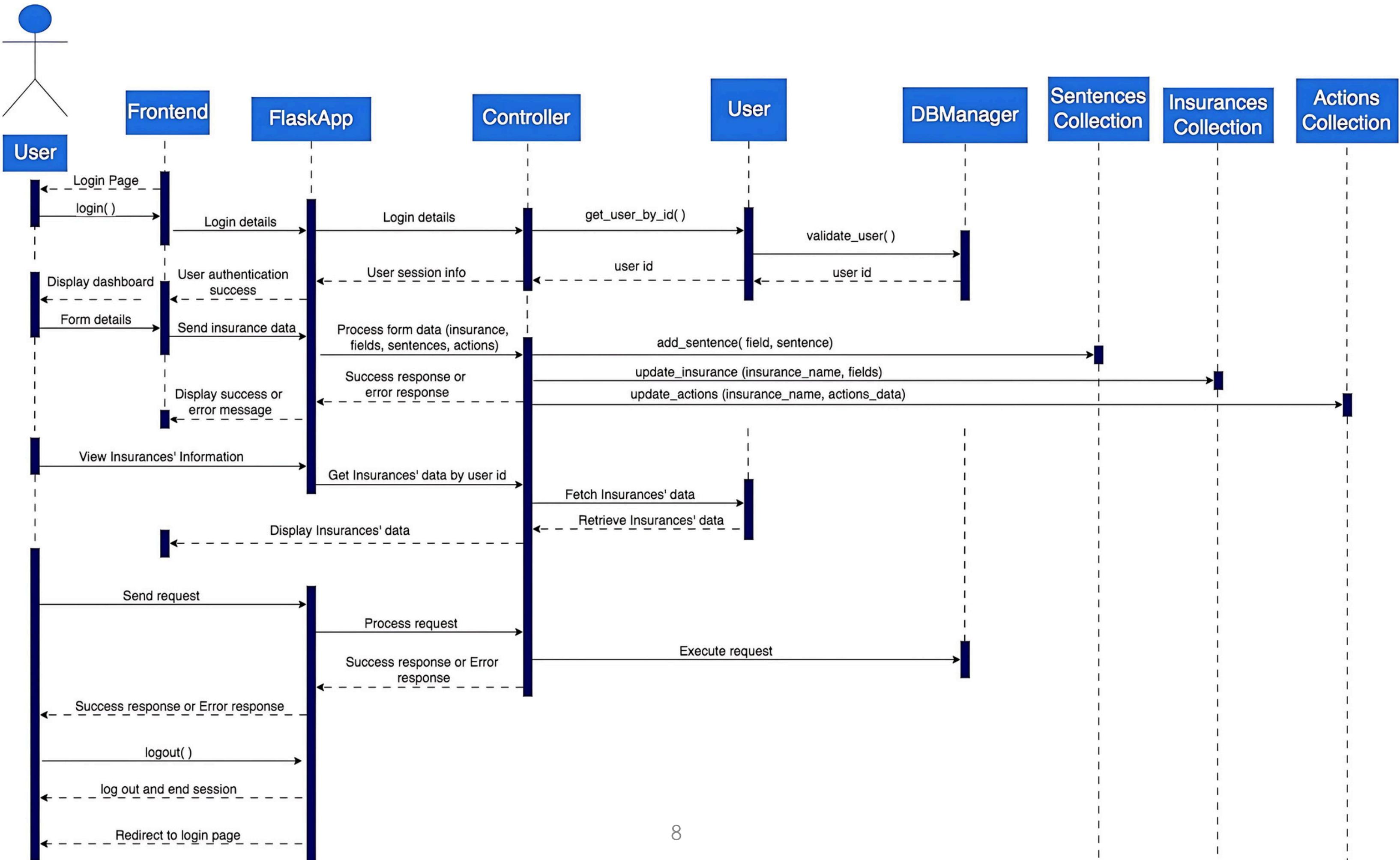
Methodology (Database Schema)



Methodology (Architecture Diagram)

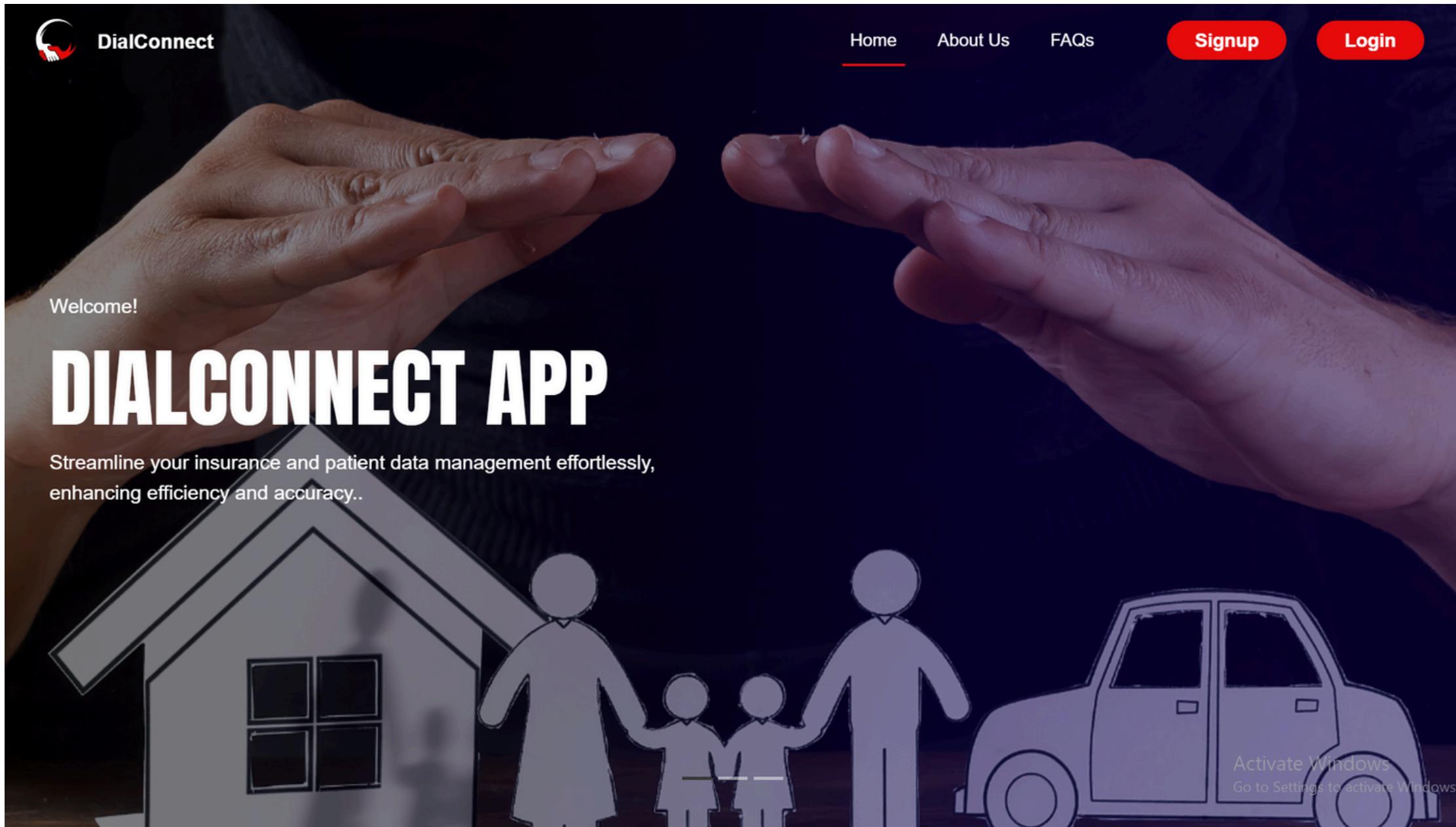


Methodology (Sequence Diagram)



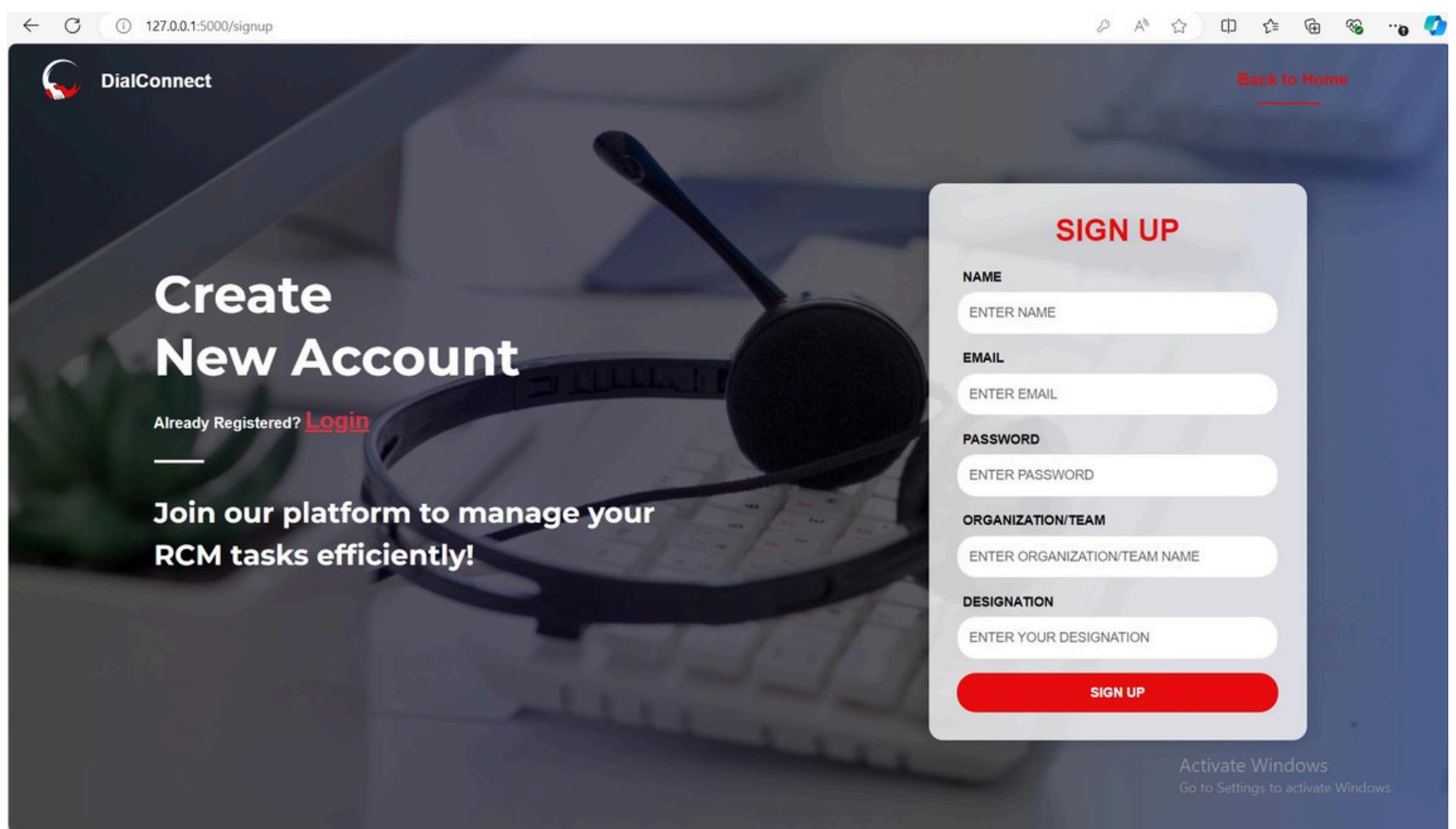
Website Walk Through

DialConnect Home Page



Website Walk Through

Sign Up



The sign-up page for DialConnect. It features a large "Create New Account" button on the left and a "Join our platform to manage your RCM tasks efficiently!" message below it. A "Back to Home" link is at the top right. The main area contains a "SIGN UP" form with fields for Name, Email, Password, Organization/Team, and Designation, each with an "ENTER" placeholder. A red "SIGN UP" button is at the bottom. A watermark for "Activate Windows Go to Settings to activate Windows." is at the bottom right.

DialConnect

Create New Account

Already Registered? [Login](#)

Join our platform to manage your RCM tasks efficiently!

Back to Home

SIGN UP

NAME
ENTER NAME

EMAIL
ENTER EMAIL

PASSWORD
ENTER PASSWORD

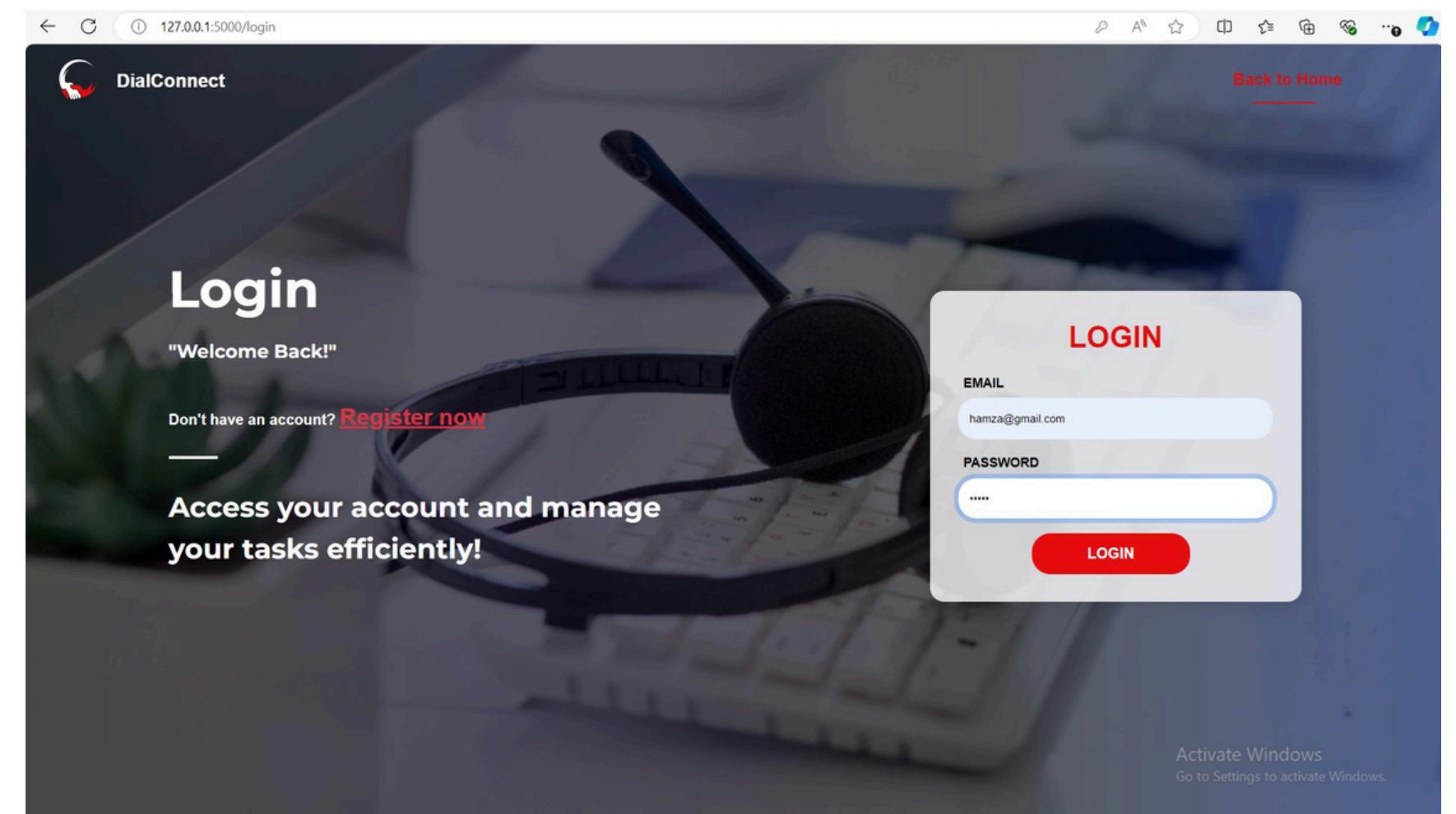
ORGANIZATION/TEAM
ENTER ORGANIZATION/TEAM NAME

DESIGNATION
ENTER YOUR DESIGNATION

SIGN UP

Activate Windows
Go to Settings to activate Windows.

Login



The login page for DialConnect. It features a "Login" button on the left and a "Welcome Back!" message above a "Don't have an account? [Register now](#)" link. A "Back to Home" link is at the top right. The main area contains a "LOGIN" form with fields for Email and Password, both with "hamza@gmail.com" and "****" placeholders respectively. A red "LOGIN" button is at the bottom. A watermark for "Activate Windows Go to Settings to activate Windows." is at the bottom right.

DialConnect

Login

Welcome Back!

Don't have an account? [Register now](#)

Back to Home

LOGIN

EMAIL
hamza@gmail.com

PASSWORD

LOGIN

Activate Windows
Go to Settings to activate Windows.

Website Walk Through (User)

User Dashboard

The screenshot shows a web browser window for the URL 127.0.0.1:5000/user_home. The page has a dark blue background with a network-like graphic on the right. On the left is a sidebar with the DialConnect logo and links for Home, Add Dial Plan, Insurance Companies, and Logout. The main content area features a large "Welcome John Smith" message. Below it is a paragraph of text: "Your personalized workspace is ready, tailored to keep your experience seamless and efficient. Everything you need is right at your fingertips, designed to make your journey smooth and intuitive." A "PROFILE" section displays the user's details: Email: john@curemd.com, Designation: RCM-L01, and Team/Organisation: RCM-CureMD. To the right of the profile is a callout box with the text: "Add your details in the DialConnect Form right here and keep your information current and complete. It's all at your fingertips!" and a red "Add Dial Plan" button. At the bottom right, there is a watermark for "Activate Windows" with the instruction "Go to Settings to activate Windows.".

Welcome John Smith

Your personalized workspace is ready, tailored to keep your experience seamless and efficient. Everything you need is right at your fingertips, designed to make your journey smooth and intuitive.

PROFILE

Email: john@curemd.com

Designation: RCM-L01

Team/Organisation: RCM-CureMD

Add your details in the DialConnect Form right here and keep your information current and complete. It's all at your fingertips!

Add Dial Plan

Activate Windows
Go to Settings to activate Windows.

Website Walk Through (User)

Add Dial Plan

The screenshot shows a web browser window with the URL `127.0.0.1:5000/user_connect`. The page title is "Let's Dial Connect". On the left, there is a sidebar with the "DialConnect" logo, a "Home" button, an "Add Dial Plan" button (which is currently selected), an "Insurance Companies" button, and a "Logout" button.

The main content area is titled "Anthem". It displays three rows of dial plan entries:

Select Field	Sentence	Action	Callback
NPI	Would you like to enter your policy	Enter Action	Audio
Claims	I see you are a Provider in a few w	1	Audio
Date of Birth	Given any of the following Date of t	Enter Action	Select Audio Keypad

At the bottom right of the main content area, there is a tooltip with the text "more information" and a green plus sign icon. A "Submit" button is located at the bottom center of the main content area.

Website Walk Through (User)

View Existing Dial Plan

The screenshot shows the 'Dial Connect' website interface. On the left, there is a dark sidebar with the 'DialConnect' logo at the top. Below it are three menu items: 'Home' (with a house icon), 'Add Dial Plan' (with a checklist icon), and 'Insurance Companies' (with a magnifying glass icon). At the bottom of the sidebar is the 'Logout' button (with a right-pointing arrow icon). The main content area has a title 'Dial Plan Information' and a subtitle 'Dial Plan Information of Insurance Companies'. Below these is a search bar with a magnifying glass icon and the word 'Search'. The central part of the page is a table titled 'Names of Insurance Companies' with columns for Sr., Names of Insurance Companies, Show Info, Edit/Update Info, and Delete Info. The table contains five rows of data:

Sr.	Names of Insurance Companies	Show Info	Edit/Update Info	Delete Info
1	Ambetter	Show	Edit	Delete
2	Cigna	Show	Edit	Delete
3	IGI Life Insurance	Show	Edit	Delete
4	UHU Company	Show	Edit	Delete
5	State Farm	Show	Edit	Delete

In the bottom right corner of the main content area, there is a message: 'Activate Windows' followed by 'Go to Settings to activate Windows.'

Website Walk Through (User)

Edit Plan

The screenshot shows a web browser window with the URL 127.0.0.1:5000/edit_insurance/IGI%20Life%20Insurance. The page title is "Edit Information for IGI Life Insurance". The left sidebar, titled "DialConnect", includes links for Home, Add Dial Plan, Insurance Companies, and Logout. The main content area displays a table for editing information:

Sr.	Field Names	Sentences	Action	Callback Feature	
1	NPI	New NPI required.		Audio	<button>Remove</button>
2	IGI_Life_Insurance_Ref	Any Reference	2	Keypad	<button>Remove</button>
3	Date of Birth	Your Date of Birth?	Enter action	Audio	<button>Remove</button>

Buttons at the bottom include "+ Add more information", "Save", and "Close". A watermark for "Activate Windows" is visible in the bottom right corner.

Website Walk Through (Admin)

Admin Dashboard

The screenshot shows a web browser window with the URL `127.0.0.1:5000/admin_table`. The page title is "Dial Plan Information". A green success message at the top states "Admin login successful!". Below it, a sub-header says "Dial Plan Information of all Insurance Companies". On the left, a sidebar menu includes "DialConnect" logo, "Insurance Companies" (selected), "Graphs Visualization", and "Logout". A search bar with placeholder "Search" is present. The main content is a table listing insurance companies:

Sr.	Names of Insurance Companies	Show Info	Edit/Update Info	Delete Info
1	Ambetter	Show	Edit	Delete
2	Cigna	Show	Edit	Delete
3	IGI Life Insurance	Show	Edit	Delete
4	UHU Company	Show	Edit	Delete
5	State Farm	Show	Edit	Delete
6	Aetna	Show	Edit	Delete
7	Anthem	Show	Edit	Delete

At the bottom right, there is a watermark: "Activate Windows Go to Settings to activate Windows."

Website Walk Through (Admin)

Admin Statistics

The screenshot shows the DialConnect Admin Statistics interface. On the left is a dark sidebar with the DialConnect logo at the top. Below the logo are three menu items: "Insurance Companies" (with a magnifying glass icon), "Graphs Visualization" (with a bar chart icon), and "Logout" (with a user icon). The main content area on the right features a bar chart titled "Callback Feature Preferences". The chart has "Number of Preferences" on the y-axis (ranging from 0 to 7) and "Callback Type" on the x-axis (with categories "Keypad" and "Audio"). A single blue bar reaches the value of 7 for the "Keypad" category. A tooltip for this bar indicates "Keypad Number of Preferences: 7". Below the chart, there is a message: "Activate Windows Go to Settings to activate Windows."

Callback Feature Preferences

Keypad Number of Preferences
Number of Preferences: 7

Callback Type	Number of Preferences
Keypad	7
Audio	3

Activate Windows
Go to Settings to activate Windows.

Results

Actions

```
▼ {  
  ▶ "_id": {...},  
  ▶ "Ambetter": {  
    ▶ "Ambetter_Provider": {  
      ▶ "excel": {...},  
      ▶ "sending_data": "1",  
      ▶ "callback": "send_dtmf"  
    },  
    ▶ "Ambetter_Claims": {...},  
    ▶ "NPI": {...}  
  }  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "Cigna": {...}  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "IGI Life Insurance": {  
    ▶ "Tax": {...}  
  }  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "UHU Company": {...}  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "State Fam": {  
    ▶ "DOS": {  
      ▶ "excel": {  
        ▶ "key": "DOS",  
        ▶ "indices": [  
          ▶ [5,  
            7],  
          ▶ [...],  
          ▶ [...]  
        ],  
        ▶ "regex": []  
      }  
    }  
  }  
}
```

Insurances

```
▼ {  
  ▶ "_id": {...},  
  ▶ "Ambetter": [  
    ▶ "Ambetter_Provider",  
    ▶ "Ambetter_Claims",  
    ▶ "NPI"  
  ]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "Cigna": [...]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "IGI Life Insurance": [...]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "UHU Company": [...]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "State Fam": [  
    ▶ "DOS"  
  ]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "Aetna": [...]  
}  
  
▼ {  
  ▶ "_id": {...},  
  ▶ "Anthem": [...]  
}
```

Sentences

```
▼ {  
  ▶ "_id": "default",  
  ▶ "Ambetter_Provider": [  
    ▶ "If you know your agent extension number please say extension, otherwise p  
  ],  
  ▶ "Ambetter_Claims": [  
    ▶ "I see you are a Provider in a few words please state the reason for your  
  ],  
  ▶ "NPI": [  
    ▶ "Ok lets take you to claims to proceed we require your NPI. We will give y  
    ▶ "Give npi number in mean time so that we proceed."  
  ],  
  ▶ "PolicyNum": [...],  
  ▶ "DOB": [...],  
  ▶ "Tax": [...],  
  ▶ "DOS": [  
    ▶ "Given any DOS."  
  ],  
  ▶ "Anthem_Provider": [...]  
}
```

Conclusion

- The developed web application simplifies the management of insurance-related data for the IVR system.
- By automating data input and generating JSON files dynamically, the system reduces manual errors and improves workflow efficiency.
- With its scalable design, multi-user support, and intuitive interface, the application ensures a smooth, personalized experience for RCM agents.
- This solution leads to faster, more accurate processing during insurance calls, enhancing the overall productivity and efficiency of the RCM team and AI team by 70-80%.

Future Work

- **Incorporation with SmartDialer:** Integrating the MongoDB data with the current system.
- **Expanded Insurance Support:** Extend the application to handle a broader range of insurance companies with unique data requirements.
- **Security Enhancements:**
 - Audit Logging:
 - Tracks login attempts, data edits, and admin actions.
 - Helps monitor suspicious activity.
 - CAPTCHA & Brute Force Protection:
 - Adds CAPTCHA to prevent automated login attacks.
 - Ensures only valid users log in.

Thank You

QnA