

APO Tool Setup Guide

The comprehensive project report, detailing the database design, can be located in the same directory as this file under the name "Database Design Project Report."

Prerequisites

Make sure you have the following software installed on your system:

1. MySQL:

- mysql-8.1.0-winx64.msi
- mysql-shell-8.1.1-windows-x86-64bit.msi
- mysql-workbench-community-8.0.34-winx64.msi

2. Node and React:

- node-v18.18.2-x64.msi
- npp.8.5.4.Installer.x64.exe

3. Visual Studio Code:

- VSCodeSetup-x64-1.81.0.exe

Steps to Run the Code

1. MySQL Setup

- Install MySQL using the provided installers.
- Set up MySQL Workbench and create a connection.
- Note down the username and password used for the connection.
- Run the following SQL query in a query editor in MySQL Workbench:

```
CREATE DATABASE APO_TEST_DATA_MODEL;
```

2. Code Setup

- Download the complete code from the GitHub repository.
- Open the "APOtool_main" folder in Visual Studio Code.

3. Frontend Setup

- Open a new terminal in VS Code and navigate to the "apo_frontend" folder:

```
cd apo_frontend
```

- Run the following commands:

```
npm install  
npm start
```

- The front end should now be accessible in your browser.

4. Backend Setup

- Open a new terminal in VS Code and navigate to the "apo_backend" folder:

```
cd apo_backend
```

- Open the "create_tables1.js" file and update lines 11 and 12 with your MySQL username and password.

- Run the following commands:

```
npm install
node sql_connection.js
```

- The database will now be connected to the application.

Tool Usage

1. You will see a Login page

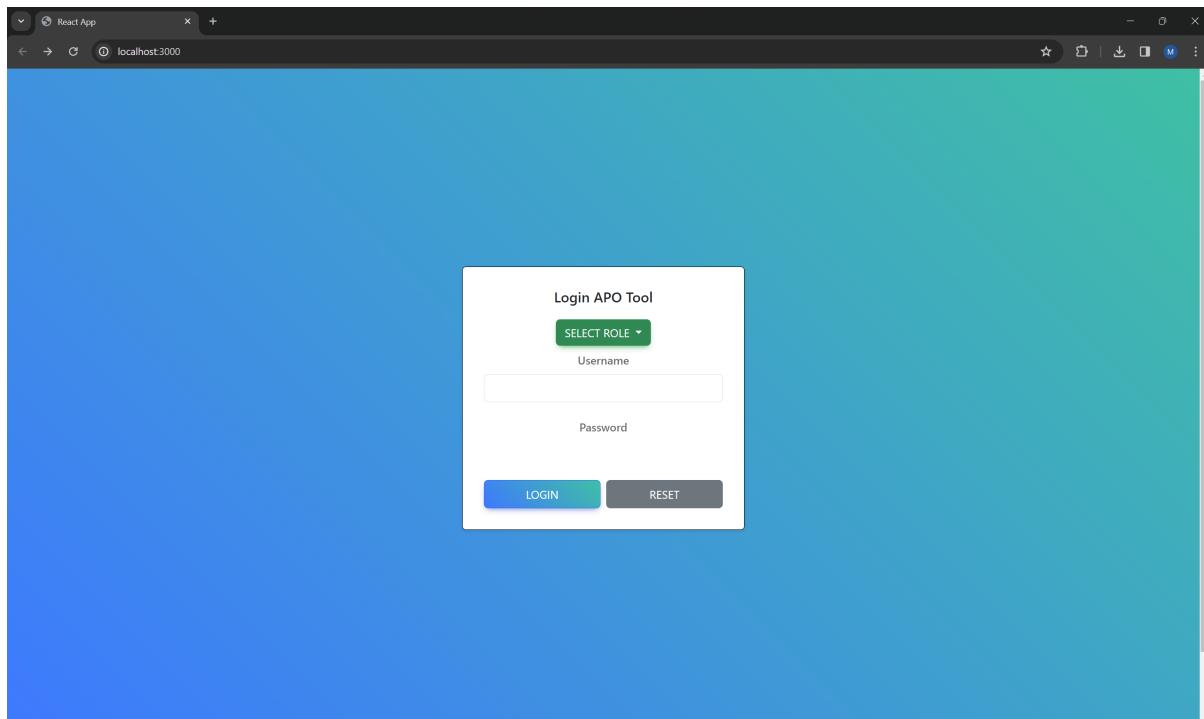


Figure 1: Login Page

2. Now select the consultant in the drop-down box shown below.

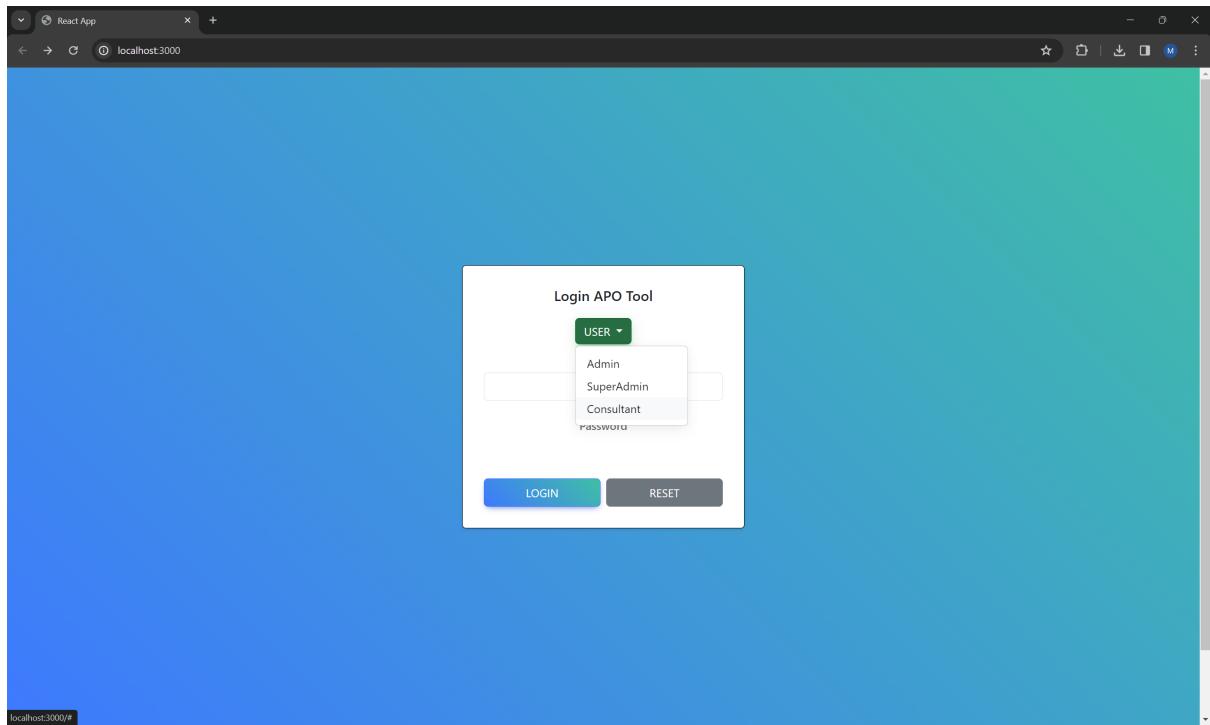


Figure 2: Select Consultant

3. Enter the Username and Password and login. (Username: user, Password: user)
4. Click on "New Customer" and add a new customer as shown below.

A screenshot of a web browser window titled "React App" with the URL "localhost:3000/user/select-customer". The page contains a form with the following fields:

- Customer Name:
- Password:
- Confirm Password: (This field is highlighted with a blue border)

A green "ADD CUSTOMER" button is located below the form.

Figure 3: Adding New Customer

5. After adding a new customer, select that customer and type the password, and login.

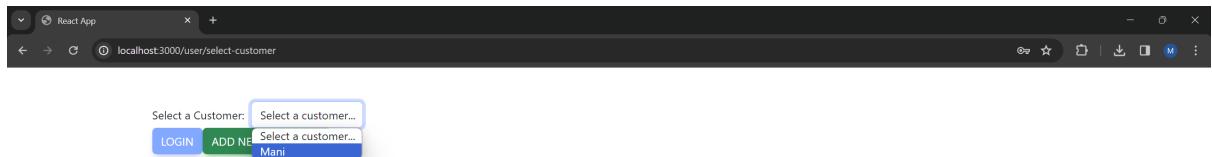


Figure 4: Selecting Customer

6. The home page of the tool will appear on the screen.



Figure 5: Home Page

7. Click on the Menu on the top left of the page; you will see all the options.



Figure 6: Menu Bar

- Click on "View Combined Data" and then click on "L0 Parameters." You will see the results of the applications classified into different R's as shown in the figure below.

tion	Parameters data of the Customer												
	Application Name	Application Complexity	Application Maturity	Application Stability	Business Criticality	Digital and Microservices Readiness	Infrastructure	Interoperability	Knowledge Repositories	Security Adherence	Technical Risk	Technology Maturity/Debt	Inference
A1	1	2.25	2	5	5	5	5	5	0	5	0	5	Retain
A2	5	3.5	3	2.6	3	1	1	0	1	0	3	0	Retire
A3	2	3.75	1.5	4.6	5	3	5	0	5	0	5	0	Retain
A4	1	3.75	3.5	3.2	3	5	1	0	1	0	3	0	Replace
A5	5	2.5	4	4.6	5	1	1	0	5	0	5	0	Retain
A6	2	2.25	2	3	3	3	5	0	1	0	3	0	Retire
A7	1	3.75	3	5	5	5	1	0	5	0	5	0	Retain
A8	5	3.5	3.5	2.6	3	1	5	0	1	0	5	0	Reengineer
A9	2	2.25	2.5	3.2	5	3	1	0	5	0	3	0	Reengineer
A10	5	2.75	3.5	3	3	3	1	0	1	0	3	0	Retire

Figure 7: Results as Excel Sheet View

- Now click on the Menu Bar and open the "Analyzed Reports" option. You will see the distribution of the applications as a pie chart.

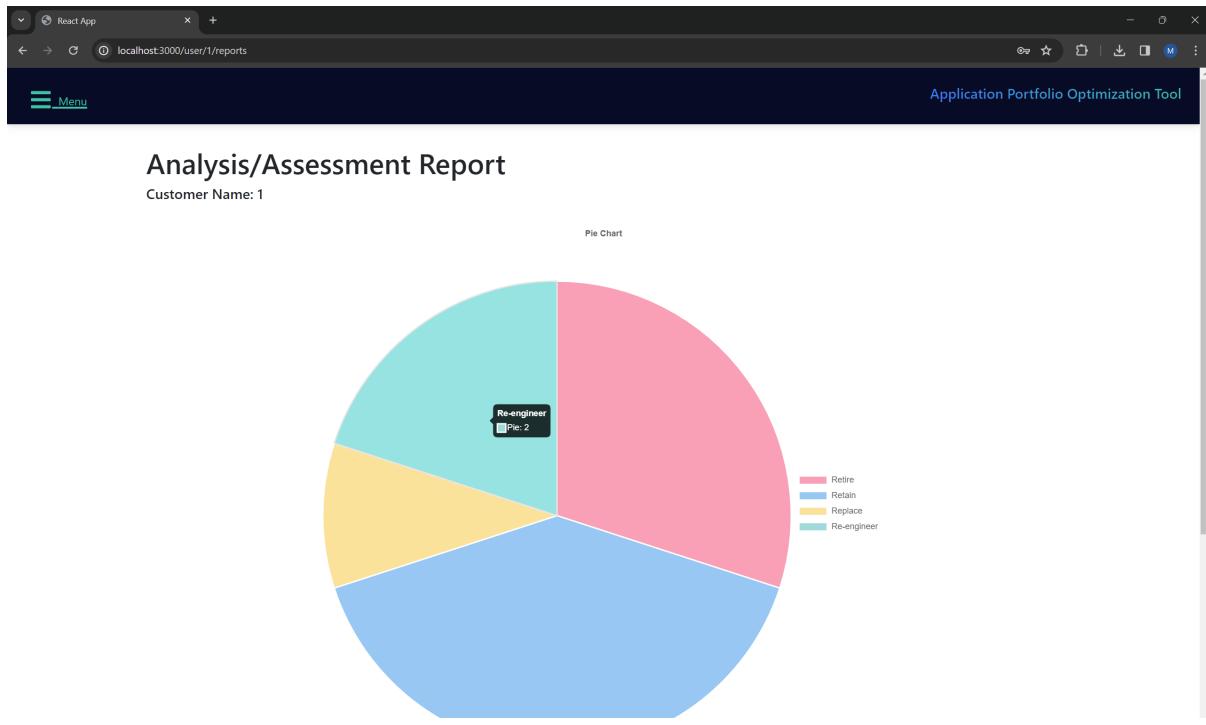


Figure 8: Pie Chart

- If you open MySQL Workbench, you can see the tables created in the APO_TEST_DATA_MODEL database. Below are two screenshots of two of the tables created in the database.

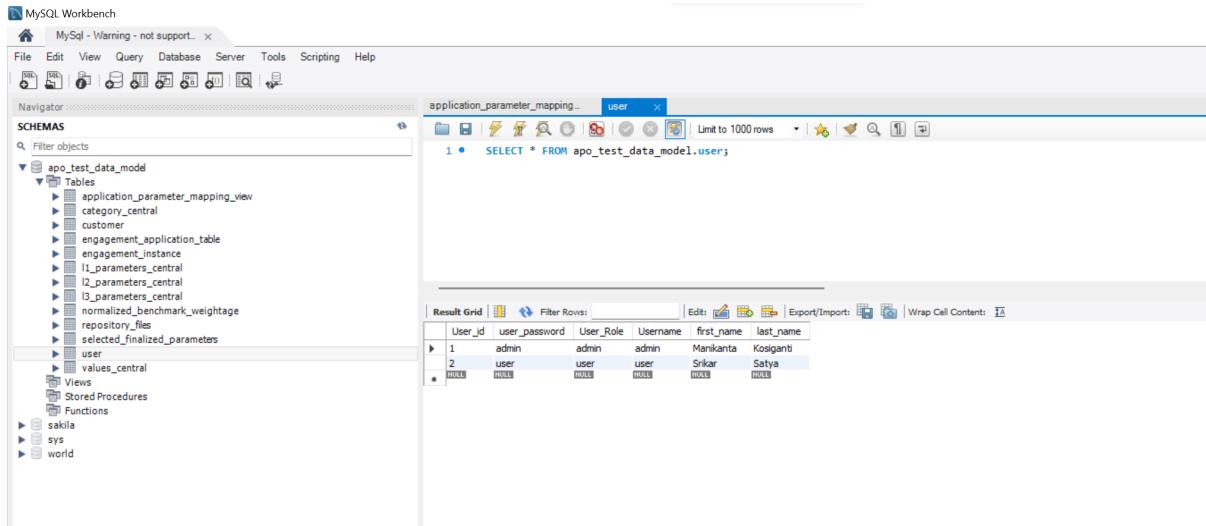


Figure 9: User Table

MySQL Workbench

File Edit View Query Database Server Tools Scripting Help

application_parameter_mapping... user category_centeral

```
1 • SELECT * FROM apo_test_data_model.category_centeral;
```

Category_Central_Id	category_name	Description	Category_Creation_date
1	Business Criticality	NULL	2023-12-03
2	Application Stability	NULL	2023-12-03
3	Application Complexity	NULL	2023-12-03
4	Application Maturity	NULL	2023-12-03
5	Interoperability	NULL	2023-12-03
6	Technology Maturity/Debt	NULL	2023-12-03
7	Digital and Microservices Readiness	NULL	2023-12-03
8	Security Adherence	NULL	2023-12-03
9	Knowledge Repository Repository	NULL	2023-12-03
10	Technical Risk	NULL	2023-12-03
•	NULL	NULL	NULL

Administration Schemas Information

Figure 10: Important Attributes used in the Formulae

List of Formulas and Rules Used

4R Classification

$$\begin{aligned} \text{Business} &= 0.5 \cdot BC + 0.2 \cdot KG + 0.3 \cdot AS \\ \text{Technicality} &= \frac{AC + AM + IO + TM + DMR + SC + TR}{7} \end{aligned}$$

$$\begin{aligned} \text{Retire} &= \text{Business} < 2.5 \& \text{Technicality} < 2.5 \\ \text{Retain} &= \text{Business} > 2.5 \& \text{Technicality} > 2.5 \\ \text{Re-engineer} &= \text{Business} < 2.5 \& \text{Technicality} > 2.5 \\ \text{Replace} &= \text{Business} > 2.5 \& \text{Technicality} < 2.5 \end{aligned}$$

Abbreviations

$$\begin{aligned} \text{Business Criticality} &= BC \\ \text{Application Complexity} &= AC \\ \text{Application Maturity} &= AM \\ \text{Interoperability} &= IO \\ \text{Technology Maturity} &= TM \\ \text{Digital and Microservices Readiness} &= DMR \\ \text{Security} &= SC \\ \text{Knowledge} &= KG \\ \text{Technical Risk} &= TR \\ \text{Application Stability} &= AS \end{aligned}$$

To Fill Empty Values

$$BC = 0.12 \cdot AS + 0.08 \cdot AC + 0.1 \cdot AM + 0.09 \cdot IO + 0.11 \cdot TM + 0.1 \cdot DMR + 0.13 \cdot SC + 0.07 \cdot KG + 0.05 \cdot TR$$

$$AS = 0.1 \cdot BC + 0.09 \cdot AC + 0.08 \cdot AM + 0.07 \cdot IO + 0.1 \cdot TM + 0.09 \cdot DMR + 0.12 \cdot SC + 0.05 \cdot KG + 0.1 \cdot TR$$

$$AC = 0.08 \cdot BC + 0.09 \cdot AS + 0.1 \cdot AM + 0.08 \cdot IO + 0.09 \cdot TM + 0.07 \cdot DMR + 0.11 \cdot SC + 0.06 \cdot KG + 0.12 \cdot TR$$

$$AM = 0.07 \cdot BC + 0.08 \cdot AS + 0.09 \cdot AC + 0.06 \cdot IO + 0.08 \cdot TM + 0.06 \cdot DMR + 0.1 \cdot SC + 0.05 \cdot KG + 0.11 \cdot TR$$

$$IO = 0.06 \cdot BC + 0.07 \cdot AS + 0.08 \cdot AC + 0.09 \cdot AM + 0.1 \cdot TM + 0.11 \cdot DMR + 0.12 \cdot SC + 0.05 \cdot KG + 0.07 \cdot TR$$

$$TM = 0.09 \cdot BC + 0.08 \cdot AS + 0.07 \cdot AC + 0.06 \cdot AM + 0.07 \cdot IO + 0.08 \cdot DMR + 0.1 \cdot SC + 0.05 \cdot KG + 0.09 \cdot TR$$

$$DMR = 0.05 \cdot BC + 0.07 \cdot AS + 0.08 \cdot AC + 0.06 \cdot AM + 0.08 \cdot IO + 0.09 \cdot TM + 0.1 \cdot SC + 0.05 \cdot KG + 0.07 \cdot TR$$

$$SC = 0.07 \cdot BC + 0.08 \cdot AS + 0.09 \cdot AC + 0.1 \cdot AM + 0.07 \cdot IO + 0.08 \cdot TM + 0.09 \cdot DMR + 0.05 \cdot KG + 0.1 \cdot TR$$

$$KG = 0.08 \cdot BC + 0.07 \cdot AS + 0.06 \cdot AC + 0.05 \cdot AM + 0.06 \cdot IO + 0.07 \cdot TM + 0.05 \cdot DMR + 0.1 \cdot SC + 0.08 \cdot TR$$

$$TR = 0.09 \cdot BC + 0.08 \cdot AS + 0.1 \cdot AC + 0.07 \cdot AM + 0.06 \cdot IO + 0.08 \cdot TM + 0.07 \cdot DMR + 0.12 \cdot SC + 0.05 \cdot KG$$