



MAHARASHTRA EDUCATION SOCIETY'S
(SINCE 1860)

INSTITUTE OF MANAGEMENT & CAREER COURSES (IMCC)

Approved by AICTE and Recognized by Savitribai Phule Pune University, Pune

IMCC Campus, 131, Mayur Colony, Kothrud, Pune 411038, Maharashtra, India | Ph.: 020-2546 6271 / 73 | e-mail: info.imcc@mespune.in | http://imcc.mespune.in

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Ref. No. MES IMCC / 358/ 2024 – 25

Date:16/04/2025

CERTIFICATE

This is to certify that the Project entitled **“TaxQueryAI”** is completed by **“Pratyush Prakash Majumdar”** of M.C.A. Semester II for the Academic Year 2024-25 at MES' Institute of Management & Career Courses (IMCC), Pune - 411038.

To the best of our knowledge, this is an original study done by the said student and important sources used by him/her have been duly acknowledged in this report.

The report is submitted as a part of course ITP21 Mini Project for the Academic Year 2024-25 as per the rules and guidelines prescribed by the institute.

Ms. Kalpana Dhende
Project Coordinator

Ms. Manasi Shirurkar
Program Coordinator

Dr. Ravikant Zirmite
Head, Dept. Of MCA



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CERTIFICATE

This is to certify that the Project entitled **“TaxQueryAI”** is completed by **“Varad Vivek Pandit”** of M.C.A. Semester II for the Academic Year 2024-25 at MES' Institute of Management & Career Courses (IMCC), Pune - 411038.

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Synopsis

Product Functions/Modules

- 1. Core Functionality:** TaxQueryAI allows tax officials to ask questions directly in natural language, which are then converted to SQL queries using LangChain. These queries are executed on a MySQL database containing property tax records from seven Indian cities (Pune, Solapur, Chennai, Erode, Jabalpur, Thanjavur, and Tiruchirappalli) for the years 2013 to 2018. The results are returned as easy-to-understand answers, removing the need for manual database access or technical expertise.
- 2. Chatbot Module:** The system includes a 24/7 AI-powered chatbot that responds to various tax-related queries, providing continuous support to users and helping them retrieve insights on-demand.
- 3. Analytics Dashboard:** An interactive dashboard presents visual insights such as city-wise tax collections, collection gaps, and property-type efficiencies using various charts. This helps tax officials understand trends at a glance.
- 4. Prediction Module:** A forecasting system predicts future property tax trends using machine learning models. These predictions are visualized to assist in planning and policy-making.



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- 5. Data Pipeline:** The data cleaning and processing pipeline is built on Azure services. Azure Data Factory handles ETL workflows, Azure Databricks transforms and cleans the data, and Azure Data Lake stores both raw and processed datasets for use within the system.
- 6. Frontend:** The user interface is built using Next.js and hosted on Vercel, offering a smooth and responsive web experience for interacting with the chatbot and analytics features.
- 7. Backend:** The backend is developed in Python using Flask and Streamlit, with LangChain integrated for natural language processing and MySQL as the main database.

Users of system

- 1. Government tax officials:** They can query historical data, analyze performance, and use predictive insights for planning and auditing purposes.
- 2. City Administrators / Officers:** They can monitor performance, compare trends across cities or years, and generate visual reports for internal decision-making.



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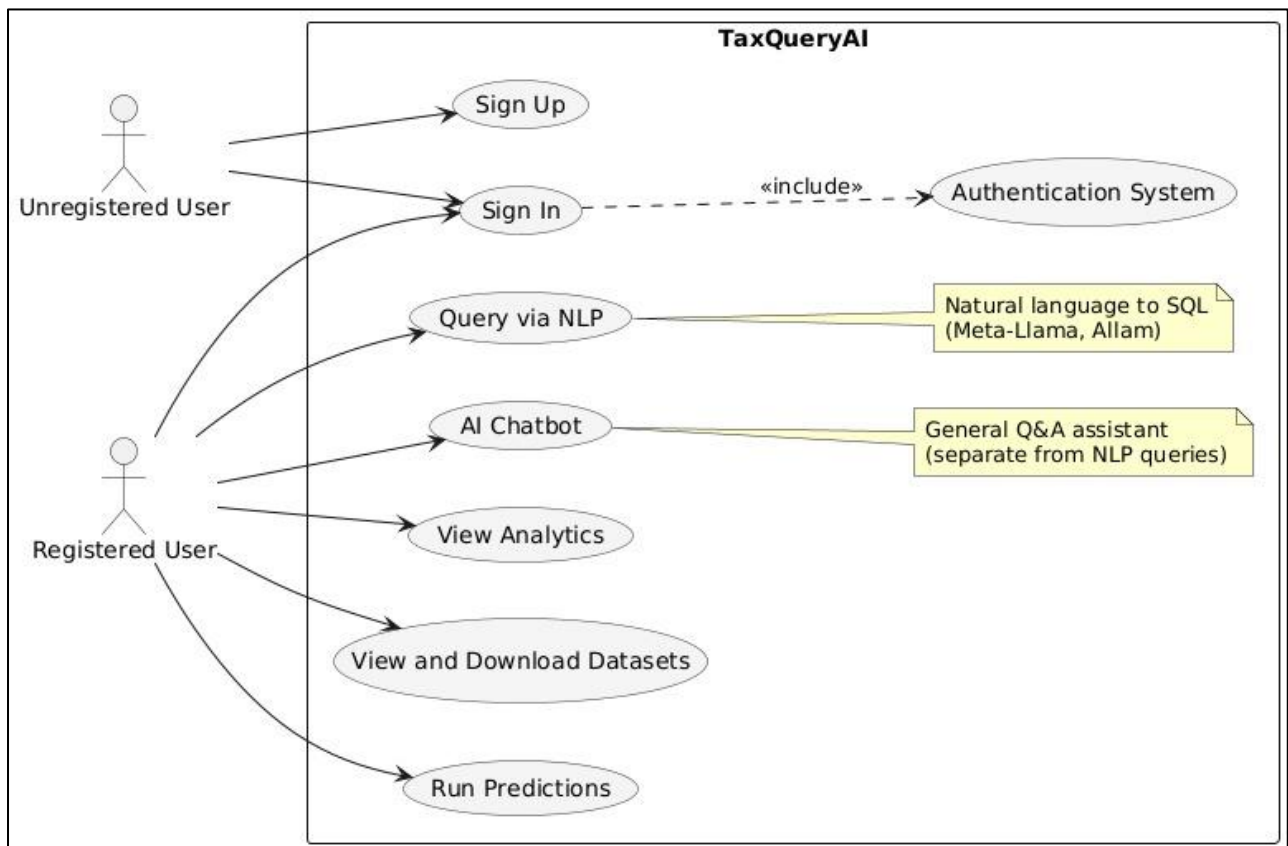
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Use Case Diagram





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Snapshots

1) Home page

TaxQueryAI



Sign in

TaxQueryAI



We simplify indian property tax queries with our advanced querying tool. Get instant answers, detailed analytics, and 24/7 support through our integrated chatbot. Let us handle the complexity, so you don't have to.

Meet the Developers

Varad Pandit



Pratyush Majumdar



TaxQueryAI 2025



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2) Sign-in page

Welcome! Time to unlock the mysteries of property tax—because knowledge (and logging in) is power!

[< Go Back](#)

[Go Home](#)


Sign In

[Sign in](#)

[Forgot Password](#)

[Don't have an account? Sign up](#)

Or

 [Sign in with Google](#)



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3) User interaction page

TaxQueryAI (MySQL Database Q&A Tool)
As per 2013-18

TaxQueryAI
MySQL Database Question & Answer Tool
Start by asking: What are the possible questions I can ask?



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4) User query and response

TaxQueryAI (MySQL Database Q&A Tool)
As per 2013-18

What was the collection gap for the year 2016-17 residential for Thanjavur?

The collection gap for the year 2016-17 residential for Thanjavur was 0.78 crore.

Collection Gap

₹ 0.78 Cr

Year: 2016

What will be the tax demand for the year 2025 in Tiruchirappalli for residential?

The predicted tax demand for Tiruchirappalli Residential in 2025 is 42.51 Cr

Tax Demand Predicted

₹ 42.51 Cr

Year: 2025

Ask Query



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5) Breakdown of the response

TaxQueryAI (MySQL Database Q&A Tool)
As per 2013-18

TQAI

To provide an answer to the question about the predicted tax demand for Tiruchirappalli's residential properties in 2025, I will outline the process in a structured manner, focusing on the past events leading up to the prediction.

- Historical Data Range:** For this analysis, we considered property tax data from the years 2013 to 2018. This data would have included information on tax demands for residential properties in Tiruchirappalli during those years.
- Year of Prediction:** Our focus is on the year 2025. This is the year for which we aim to predict the tax demand for residential properties.
- Machine Learning Model:** We utilized a Linear Regression model, a type of algorithm commonly used in data analysis to identify correlations and predict values based on those correlations.
- Model Training:** We trained our model using the historical data from 2013 to 2018. This involved feeding the model with the tax demands from previous years and the corresponding properties' characteristics. The model then learned to identify patterns and correlations between these factors.
- Model Analysis:** Once trained, the model analyzed the patterns and correlations it had learned from the historical data. It identified trends and relationships between the tax demands and properties' characteristics.
- Prediction Generation:** Based on the patterns it identified, the model predicted that the tax demand for residential properties in Tiruchirappalli in 2025 would be approximately 42.51 Crores.

Please note that this prediction is based on the patterns observed in the historical data and is an estimation. Actual tax demands can be influenced by various factors, some of which might not have been accounted for in the historical data or identified by the model. Therefore, the predicted value should be considered as an approximation rather than a definitive answer.

Ask Query



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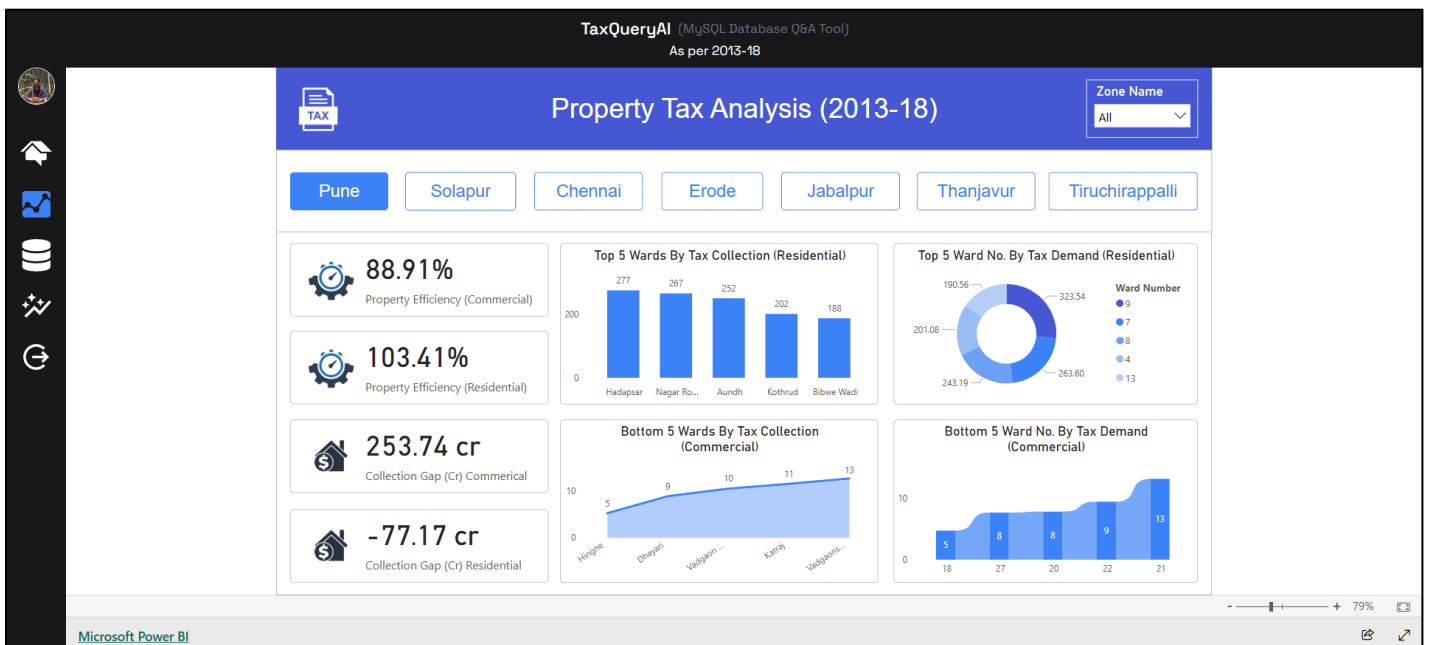
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6) Analytics dashboard





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7) Datasets

TaxQueryAI (MySQL Database Q&A Tool)						
As per 2013-18						
Pune						
City_Name	Zone_Name	Ward_Name	Ward_No	Tax_Collection_Cr_2013_14_Residential	Tax_Collection_Cr_2014_15_Residential	Tax_Collection_Cr_2015_16_Residential
Pune	1	Aundh	8	40.6	42.39	57.78
Pune	1	Baner	17	7.39	9.25	14.37
Pune	3	Bhavani Peth	2	6.03	6.59	10.24
Pune	4	Bibwe Wadi	13	29.22	28.85	46.92
Pune	2	Chandan Nagar	21	5.26	4.9	7.52
Pune	4	Dhankawadi	15	10.82	10.46	19.06
Pune	3	Dhayari	27	1.67	1.87	3.04
Pune	2	Dhole Patil Road	10	20.78	20.07	27.21
Pune	1	Ghole Road	1	14.08	13.66	18.23
Pune	4	Hadapsar	7	42.74	45.08	66.33
Pune	3	Hingne	18	2.89	2.61	3.74
Pune	3	Kasba Peth	6	3.82	4.01	6.86
Pune	4	Katraj	22	6.93	6.21	11.01
Pune	4	Kondhwa	24	10.27	9.9	17.82



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8) Predict and visualize



TaxQueryAI (MySQL Database Q&A Tool)

As per 2013-18

Predict Values

Prediction Type

Tax Demand

City

Solapur

Year

2025

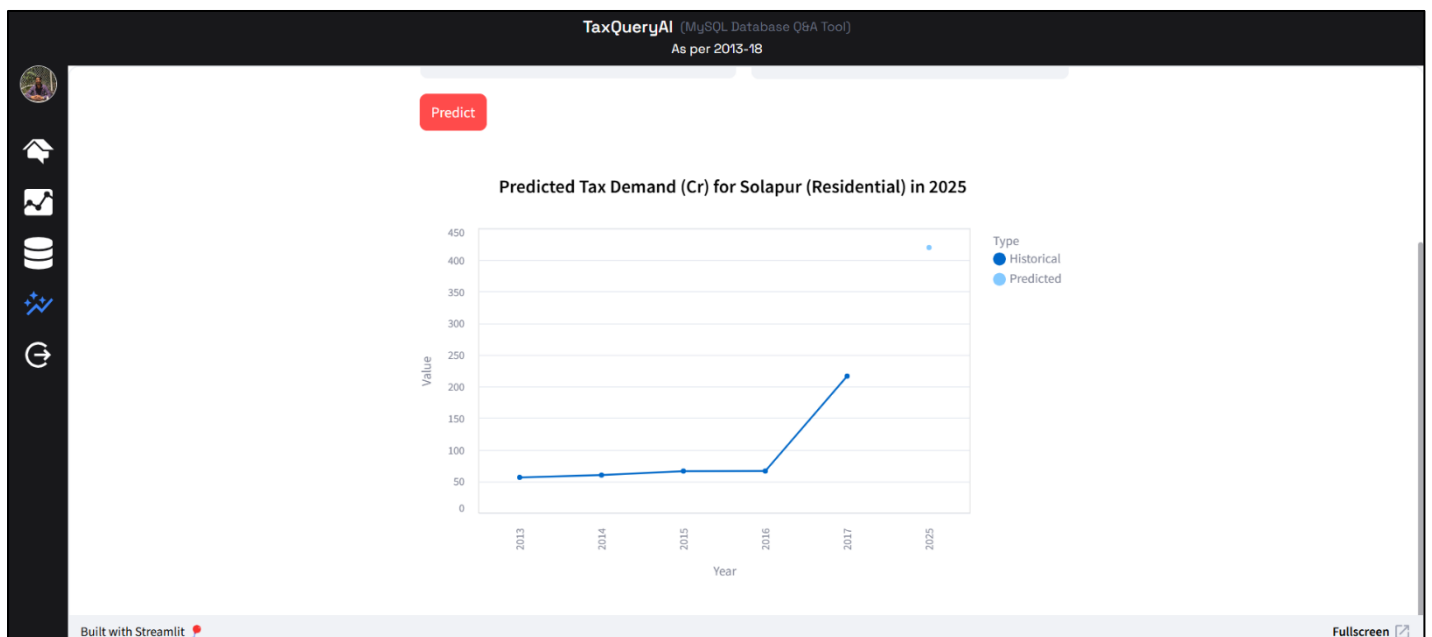
Property Type

Residential

Predict

Built with Streamlit

Fullscreen





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9) Chatbot

TaxQueryAI (MySQL Database Q&A Tool)
As per 2013-18

TaxQueryAI
MySQL Database Question & Answer Tool
Start by asking: What are the possible questions I can ask?

Ask Query

Ask AI

what is collection gap in property tax?

In property tax, the collection gap is the difference between the total property tax assessed and the amount actually collected from property owners.

thanks

You're welcome! If you have more questions, feel free to ask.

Message AI



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10) Stored user responses

Personal > Tracing Projects > TaxQueryAI

TaxQueryAI

ID Data Retention 14d Add Rule

Runs Threads Monitor Setup

1 filter Last 7 days Root Runs LLM Calls All Runs

Name	Input	Output	Error	Start Time	Latency	Dataset	Annotate
RunnableSequence	User: what is collectio...			4/4/2025, 10:55:41 ...			
RunnableSequence	User: what is collectio...	ai: In the context ...		4/4/2025, 10:55:16 ...	0.75s		
RunnableSequence		ai: The term "coll...		4/4/2025, 10:54:56 ...	0.99s		
RunnableSequence	what was the total tax...	**Structured Bre...		4/4/2025, 10:36:15 ...	0.33s		
RunnableSequence	what was the total tax...	SELECT SUM(Tax...		4/4/2025, 10:36:14 ...	1.06s		
RunnableSequence	what was the total tax...	The total tax colle...		4/4/2025, 10:36:09 ...	1.69s		
RunnableSequence	what will be the tax d...	**Structured Bre...		4/4/2025, 10:35:13 ...	0.31s		
RunnableSequence	what will be the tax d...	SELECT SUM(Tax...		4/4/2025, 10:35:12 ...	0.87s		
RunnableSequence	what was the total tax...	SELECT SUM(Tax...		4/4/2025, 10:33:50 ...	1.43s		

Stats

Last 7 days

RUN COUNT

10

TOTAL TOKENS

56,595

MEDIAN TOKENS

4,281

ERROR RATE

0%

% STREAMING

0%

LATENCY

P50: 0.99s P99: 3.44s

Filter Shortcuts

Input Key