

Azure migration costs calculator with embedded AI

Development Document

CS 4850 - Section 02 – Fall 2024

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Roles	Name	Major responsibilities	Contact
Project owner	Capstone		
Team leader	Kunal Shenoi	Organize meetings, monitor progress, and submit deliverables. Develop and implement testing protocols.	678-779-4770
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Summary

Purpose

This document provides a comprehensive overview of the development, installation, configuration, and usage of the Azure Migration Costs Calculator with Embedded AI. The purpose is to assist developers, engineers, and stakeholders in understanding and deploying this tool for assessing migration costs from on-premises to Azure.

Scope

This document covers system architecture, dependencies, installation, configuration, API endpoints, database schema, testing, deployment, and maintenance.

Audience

This documentation is intended for software developers, cloud engineers, system administrators, and IT decision-makers involved in implementing, configuring, or using the Azure Migration Costs Calculator.

System Overview

Architecture

- Frontend:
 - Framework: React
 - UI Design: Full-page chatbot interface for user interaction.
- Backend:
 - Language: Python
 - Framework: Flask for efficient API development.
- LLM Integration:
 - API: Ollama API
 - Purpose: Analyze natural language input to extract Azure migration requirements.
- Cloud Services:
 - API: Azure pricing API
 - Queries Azure services to provide cost estimations based on the provided user data.
- Data Storage:
 - Schema: Relational
 - Database: MySQL database solution to manage structured data, offering scalability, flexibility for user queries, and robust security for data storage.

Dependencies

- Python (3.0 or higher)
- Node.js
- Azure SDKs
- MySQL database

Installation Guide

Configuration Parameters

- Azure API keys
- Database connection strings
- AI model access credentials

Prerequisites/Requirements

- Azure account with access to Azure Pricing APIs.
- Admin privileges for installation.
- Node.js and Python installed.

Installation Steps

1. Clone the repository:
 - a. `git clone <repository-url> ~/Azure_Pricing_Calculator`
2. Navigate to the project directory:
 - a. `cd ~/Azure_Pricing_Calculator/GTRI-Azure-Migration-Calculator/Flask/website`
3. Set up a virtual environment. First, navigate to the directory containing your Python virtual environment:
 - a. `cd ~/Azure_Pricing_Calculator`
4. Then, create and activate the virtual environment:
 - a. `python3 -m venv ollama_venv source ollama_venv/bin/activate`
5. Install Python dependencies:
 - a. `pip3 install -r requirements.txt`
6. Build the front-end project. Make sure you're in the website directory, then install and build:
 - a. `npm install npm run build`
7. Run the application.
 - a. `python3 ../app.py`
8. Verify installation. Open your browser and navigate to `http://localhost:<your-port>` to verify that the application is running.

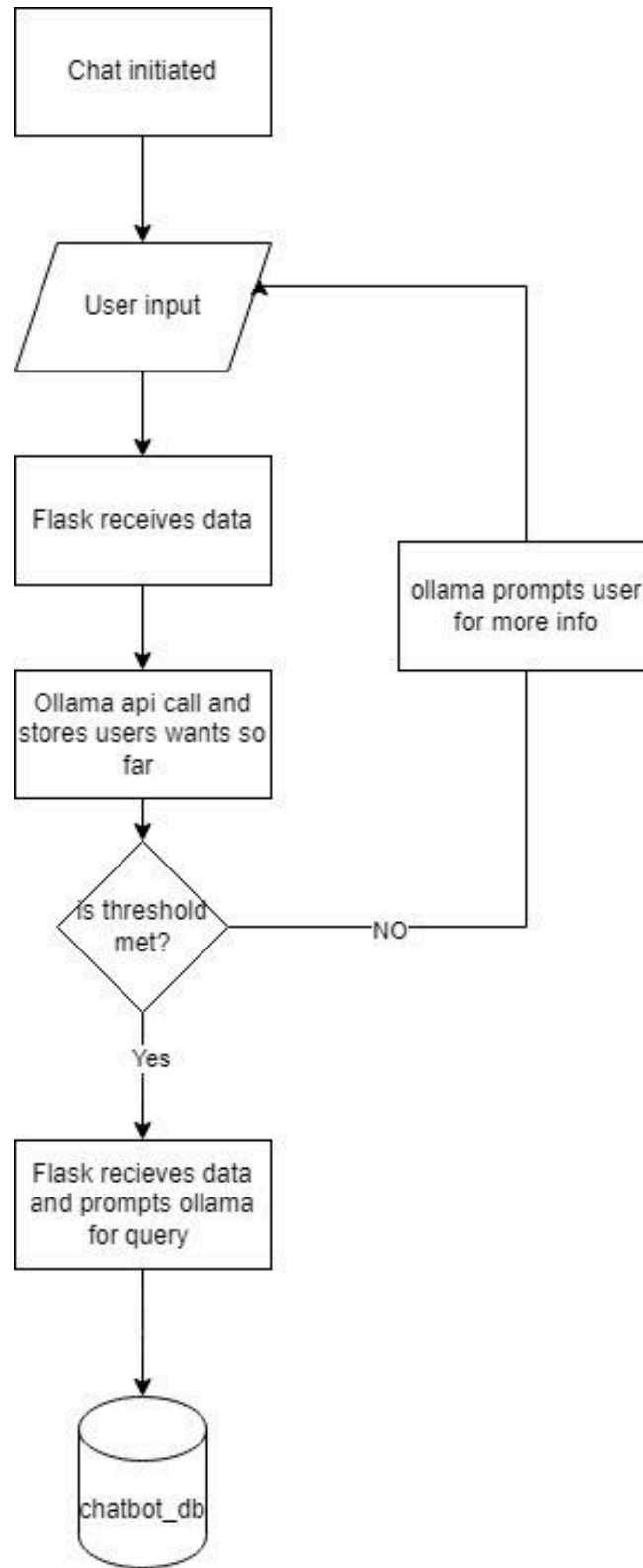
For production deployments, please do not use the development server in a production environment.

Development Outline

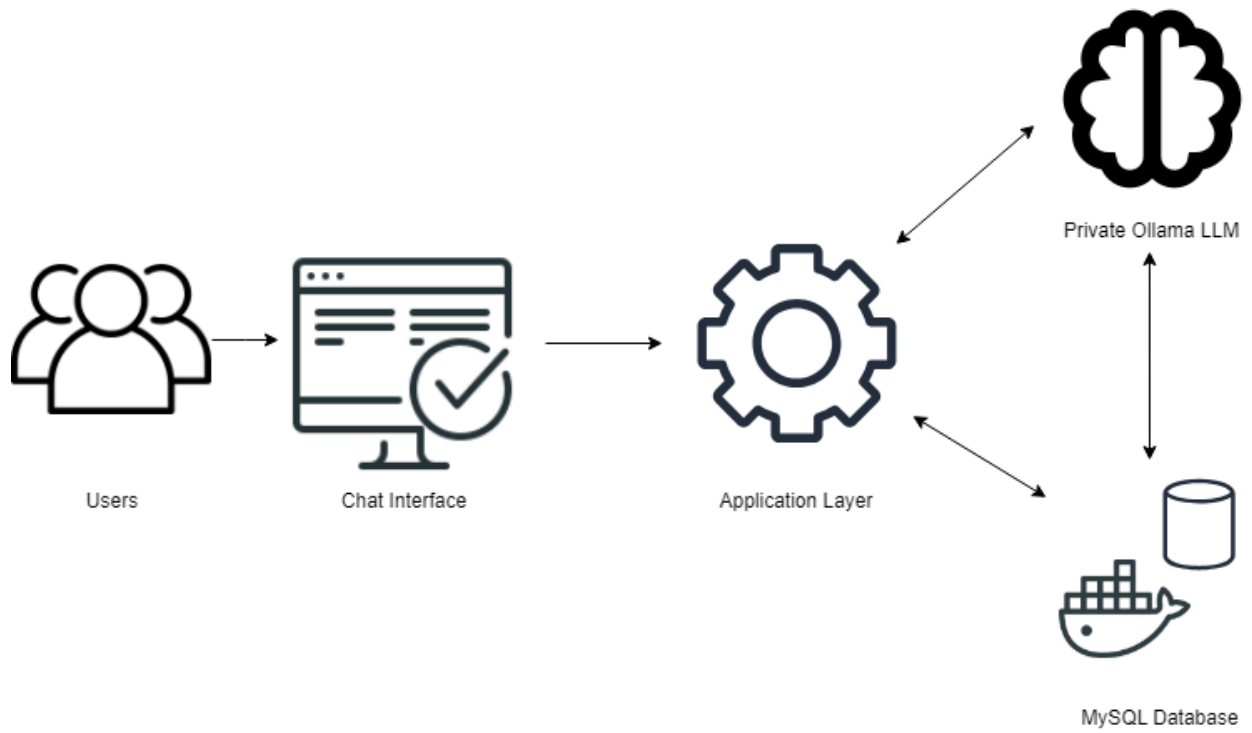
Here's a simplified outline of the steps the team took to build the Azure Migration Costs Calculator:

1. Planning
 - Defined project goals and key features, focusing on providing Azure migration cost estimates.
 - Set a timeline and outlined what features each part of the team would focus on.
2. System Design
 - Chose React for the front-end to make an interactive chatbot interface.
 - Selected Python and Flask for the back-end to handle requests, process data, and connect with external services.
 - Selected a MySQL database to store and organize user and cost data.
3. Building the Frontend
 - Developed the chatbot interface using React to let users enter their migration details.
 - Connected the front-end to the backend to display the chatbot and migration details.
4. Building the Backend
 - Set up a Flask API to process user inputs, manage requests, and connect to the Azure and Ollama APIs.
 - Integrated the Azure Pricing API to pull accurate migration cost data.
5. Database Setup
 - Created a structured MySQL database to store users, user queries, migration details, and pricing data for easy access.
6. Testing
 - Tested each part of the app (front-end, back-end, and database) to make sure everything worked well together.
 - Ensured the app handled user data securely and accurately.
7. Deployment
 - Deployed the app to a staging environment for final testing.
 - Set up production-ready settings and security measures, and released the app for use.

System Workflow Diagram



System Architecture Diagram



Database Entity Relationship Diagram



Frequently Asked Questions (FAQs)

What happens if I input incorrect infrastructure data?

- Incorrect data may lead to inaccurate cost estimates. However, Egbert can adjust to wrong or new information in real-time if needed.

What if I forgot to input all my data at the start of my conversation?

The chatbot will request more data if it deems it necessary, however, you can always add more information to your migration at any time.

What is the maximum number of users allowed in the system?

- The system is scalable to numerous users however It's recommended to monitor the system's resource usage regularly to ensure the hardware can support this use case.

How accurate are the migration cost estimates?

- The estimates are based on real-time Azure pricing and your specific infrastructure details. While highly accurate, they depend on the accuracy of the input data.

How can I update the pricing information?

- Azure Pricing APIs automatically update pricing data to the latest available data from Azure.

Can I customize the migration reports?

- Yes, you can ask our chatbot, Egbert, to customize the final report to fit your use case.

Are there any usage limits for the migration cost calculator?

- There are no set usage limits, but performance may be impacted when processing large datasets.

Can I share the reports with my team?

- Yes, you can export the reports in PDF format and share them with team members or stakeholders as needed.

Glossary

- API: Application Programming Interface
- AI: Artificial Intelligence.
- RESTFUL: An architecture style for application programming interfaces.
- Azure: A cloud computing service offered by Microsoft.
- PII: Personally Identifiable Information.