AI-POWERED BOT FOR MANAGING AND ADMINISTERING CLOUD SERVICES

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Abstract: Cloud technology has become ubiquitous in the modern era, with companies relying on it to provide users with highly available and easily accessible applications and infrastructure. However, IT administrators face the daunting task of monitoring and managing these cloud assets, which can lead to a high level of effort and the need to access different consoles for different information. An AI-powered bot can greatly reduce the workload of IT admins by handling the monitoring and management of cloud assets. Currently, many enterprises have rudimentary resource management systems that require an Azure or resource administrator to log onto the Admin Portal of their resources and apply filters to search through multiple screens for even basic information on utilization and cost. This leads to inefficient resource management and overspending on underutilized resources. To address this issue, a cloud services management bot can be created and integrated with an enterprise's collaboration suite to enhance the modern workspace. The bot can be trained on a set of query data using natural language processing packages included in the Azure Cognitive Services suite. Once queries are processed, the system can connect with the respective endpoints of the Azure Resource Management REST APIs to retrieve relevant resource utilization information and present it to the end-user.

Index Terms - **Information, untrusted, brokers, privacy.**

I. INTRODUCTION

A chat bot, or chatbot, is a computer program that uses artificial intelligence (AI) to simulate conversation with human users through messaging applications, websites, or mobile apps. Chat bots can be designed to perform a variety of tasks, such as answering customer inquiries, providing product recommendations, scheduling appointments, and even carrying out automated transactions. They use natural language processing (NLP) and machine learning algorithms to understand user input and generate appropriate responses. Chat bots have become increasingly popular in recent years as businesses seek to provide faster and more personalized customer service.

The objective is to develop a cloud services management bot that can be seamlessly integrated with an enterprise's collaboration suite to enhance their modern workspace. The bot will undergo training using a set of query data and artificial intelligence techniques such as natural language processing (NLP) from the Azure Cognitive Services suite. Upon receiving user queries, the system will connect with the corresponding endpoints of the Azure Resource Management REST APIs to retrieve relevant resource utilization information and present it to the end user. This modern workspace-based cloud services management bot will offer quick and accurate responses to user queries regarding resource usage across the company's cloud and SaaS resources. It leverages AI-based NLP algorithms to provide the most up-to-date and pertinent information to users, reducing the workload for IT admins by eliminating the need to switch between multiple windows.

II. RELATED WORKS

Multilayer perceptron natural language processing applications [6] include speech recognition and machine translation [8]. Currently, chat-bots represent one of the most significant applications of NLP [5] in the world. As a result, many large companies actively hire NLP researchers, and modern advanced personal assistants heavily rely on NLP. The acoustic model, which is responsible for translating the vector features of an audio signal into phoneme probabilities [1], was implemented by the DNN in speech recognition. People can easily use the application by launching it with the help of Google Voice Search. Upon opening, the application will provide voice instructions on how to use it, and output will be provided both in voice and text formats [3]. Chatbot that utilizes Artificial Intelligence Markup Language (AIML) and Latent Semantic Analysis (LSA) was proposed to provide efficient and accurate answers to any query based on a dataset of frequently asked questions (FAQs) [7]. AI system can predict diseases based on symptoms and provide a list of available treatments, as well as provide information on the composition of medicines and their prescribed uses [4]. Approach involved in designing an auditing framework for cloud storage systems, followed by an efficient and privacy-preserving auditing protocol was proposed. Extended this protocol to support data dynamic operations, which is both efficient and provably secure in the random oracle model. Furthermore, extended the protocol to facilitate batch auditing for multiple owners and multiple clouds, without the use of any trusted organizer [2].

III. PROPOSED SYSTEM

Our proposed solution addresses the business problem associated with the current method by creating a bot using Azure Cognitive Services. The bot will be deployed on a separate application or collaboration tool in the Microsoft Office 365 suite, such as Microsoft Teams. With the help of natural language processing, it will be trained to respond to queries about specific resources, overall resource utilization, cost per cluster, and more. Once deployed, users, such as Resource Manager/Azure Admin, will be able to access the bot via Microsoft Teams and prompt it to respond to their inquiries. To achieve this, we will utilize existing public cloud-based cognitive services in the Azure Cognitive Services package, along with the Microsoft Azure Resource Manager REST API to generate responses to queries.

Problem Definition: The problem definition highlights the diverse needs for design and implementation in detail. Given the ever-evolving nature of the IT environment, we recognize the need to adapt and improve productivity. To address this, we propose the use of an AI-based bot to simplify the life of IT admins and overcome the challenge of manual processes. IT administrators often face the challenge of juggling multiple windows and tools on their work computers to gather necessary information and perform management tasks. However, a solution to this problem is the installation of a bot, which can be accessed from anywhere, including mobile devices, Google Assistant or Alexa. This proactive approach allows administrators to maintain control without the complexity of remembering various complex commands to retrieve data from shells. The AI component of the bot takes care of the difficult tasks.

Methodology: The project adopts a top-down approach methodology, which emphasizes thorough planning and a complete understanding of the system. The project is divided into three modules, each of which processes the given data to produce results. The Bot is developed using the Model-View-Controller (MVC) model, with the data being the Model, the user interface being the View, which is the channel through which the bot is deployed, and the Controller handling requests.
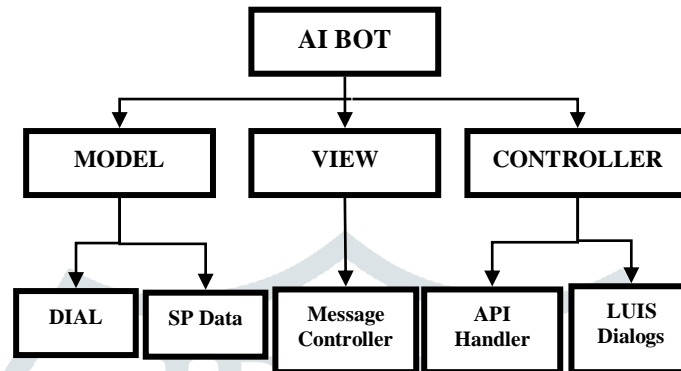

Figure.1 Hierarchical diagram of the AI BOT

The hierarchical diagram of the system is illustrated in Figure.1, which outlines all the components utilized in the AI bot. These components are categorized into three modules.

Architectural Design: The system architecture of the entire project is illustrated in Figure.2, which outlines the structure of the developed system, including its various modules, externally visible properties, and relationships. This figure shows the overall architectural design of the system.
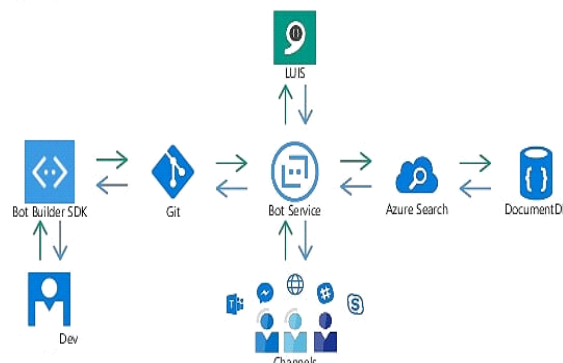

Figure.2 Architecture of Cloud Management Bot

Detailed Design: The detailed design is similar to the architectural design but with a higher level of granularity, explaining each component in detail. Figure.3 provides a comprehensive overview of the structure and components of the Bot.
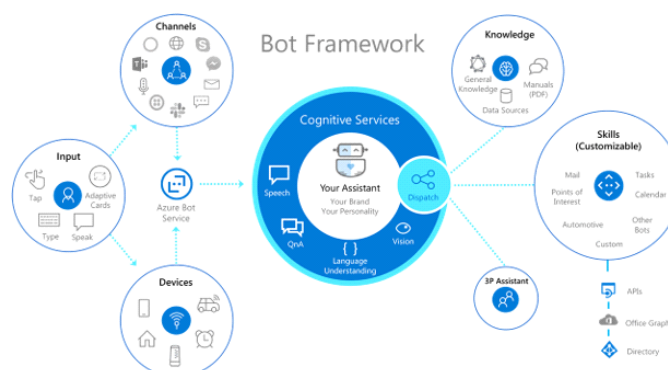

Figure.3 Detailed Architectural Diagram of the AI based Cloud Management BOT.

IV. RESULTS AND DISCUSSION

All the test cases mentioned below Table.1 are passed successfully. No defects encountered. The sample power BI dash board is shown in Fig 4. Furthermore, Fig.5 shows the successful conversation of Bot.

Table.1 Test Cases for AI Bot

| TEST NO	TEST	EXPECTED RESULT	PASS/FAIL	REMARK
1	Adding the bot to the mentioned channels	The bot must be visible in the chat	Pass	User should use the unique values to add the bot
2	Testing for giving the input	Bot must reply for the text	Pass	Users can give any inputs
3	Testing for input with error	Bot must respond ignoring the errors	Pass	Users can give any inputs with errors
4	Testing for adaptive cards	Adaptive cards must perform the defined action	Pass	Users can select the input from cards
5	Testing for report generation	The bot must display the requested report	Pass	Users can get the reports in chat
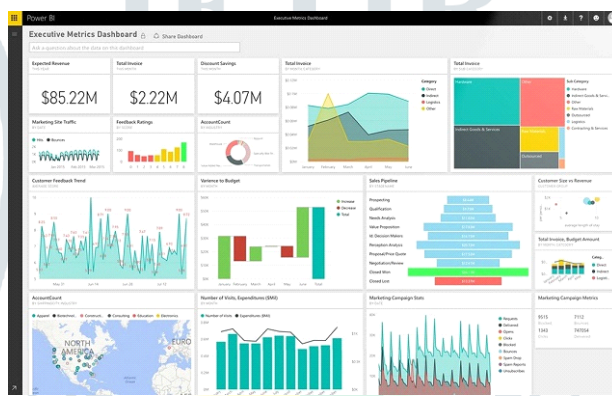
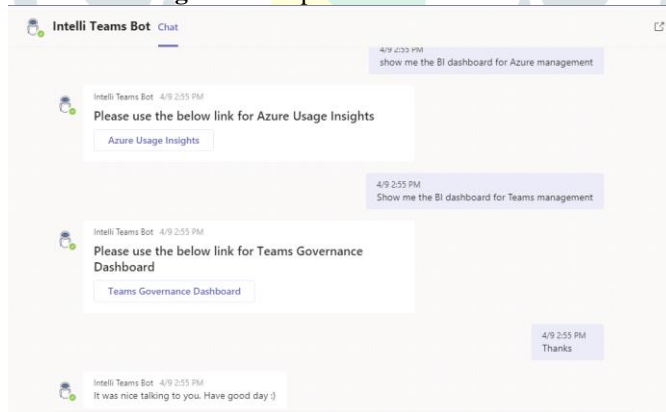**Figure.4** Sample Power BI dashboard.

Figure.5 Successful completion of Bot conversation.

V. CONCLUSION AND FUTURE SCOPE

The results demonstrate that the bot has been successfully added to the Teams channel and user chat, allowing for the management, monitoring, and administration of cloud services via a single bot interface. There is room for improvement, including the ability for the bot to communicate with Azure's Graph API to enable monitoring and deployment of resources within the Azure environment. Additionally, alerts can be triggered based on resource utilization of cloud assets and sent to the cloud administrator. Utilizing Microsoft's bot framework service, the bot can also be added to smart assistants like Google Assistant or Alexa and accept audio inputs.

REFERENCES

[1] Antony, P.J., Santhanu P Mohan and Soman, K.P. 2010. SVM Based Part of Speech Tagger for Malayalam. IEEE International Conference on Recent Trends in Information Telecommunication and Computing.

[2] Kan Yang and Xiaohua Jia. 2013. An Efficient and Secure Dynamic Auditing Protocol for Data Storage in Cloud Computing. IEEE Transactions on Parallel and Distributed Systems, Vol.24, no.9, 2013.

[3]   Kumar, M. N., Chandar, P. C. L., Prasad, A. V and Sumangali, K. 2016. Android based educational Chatbot for visually impaired people. IEEE International Conference on Computational Intelligence and Computing Research (ICCIC), Chennai, India. 1-4.

[4]   Madhu, D., Jain, C. J. N., Sebastain, E., Shaji, S and Ajayakumar, A. 2017. A novel approach for medical assistance using trained chatbot. International Conference on Inventive Communication and Computational Technologies (ICICCT), Coimbatore, India. 243-246.

[5]   Milla T Mutiwokuziva, Melody W Chanda and Prudence Kadebu, "A neural network-based chat-bot", 2nd International Conference on Communication and Electronics Systems (ICCES 2017).

[6]   Pathak, N. 2017. Using Natural Language Understanding. In: Artificial Intelligence for .NET: Speech, Language, and Search. Springer.

[7]   Ranoliya, B.R., Raghuwanshi, N and Singh, S. 2017. Chatbot for university related FAQs. International Conference on Advances in Computing, Communications and Informatics (ICACCI), Udupi, India. 1525-1530.

[8]   Widrow & Lehr, B. Widrow and M. A. Lehr. 1990. "30 Years of Adaptive Neural Networks: Perceptron Madaline and Backpropagation", Proc. IEEE, 78(9):1415-1442.