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Innovative Alex as a Hospital Receptionist

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ABSTRACT –

Hospital receptionists are the first point of contact between a hospital or healthcare facility and its patients. These receptionists play an important role in healthcare facilities, performing customer service and administrative duties such as booking appointments, answering patient questions, answering telephone and calls to confirm patient appointments. A questionnaire was designed for potential patients designing Alexa. Capture inputs to verify the feasibility, relevance, and technical acceptance of use cases. Chatbot designs are slowly shifting from voice to voice communication, like Alexa tested on the Dot Echo, a smart speaker powered by Amazon Voice Services (AVS).

By designing chatbots in addition to custom Alexa skills, developers can use multiple Amazon Web Services. The design uses AWS to host the voice server and Azure to host the backend built in C#. After that, we connect the Echo device to the system we created. The concept of connected smart devices makes chatbot solutions accessible anytime and anywhere.

Keywords - chatbot; Hospital Receptionist; Alexa; Amazon Web Services; Azure;

INTRODUCTION

A medical receptionist has a busy day. Between making new appointments, welcoming patients and filling out patient forms, accepting and delivering groceries, they have to adapt to ordering medical equipment, daily contact with nurses and doctors, the list is long. Most of the time, receptionists are annoyed by the workload. This article describes the design of an innovative chatbot based on a hospital receptionist to help patients with their appointment follow-up queries. Chatbots are actually used in many applications [4].

The evolution of science and technology has led to a gradual change in the way information is obtained. Artificial intelligence and the latest IT solutions make them more efficient, simple and interactive for the user.

The interaction between human users and computers is an important part of the information exchange process. Chatbot simplifies this interaction and makes it user-friendly. Intelligent man-machine dialogue is a distinctive feature of chatbots.

Chatbots are programmed to be able to communicate with users via textual interactions [1]. Chatbots can be used effectively as assistants to perform functions traditionally performed by humans, or as boundary tools to control connected device systems. Text-based or message-based chatbot designs have gradually shifted to designs based on voice communication. Microphones and smart speakers that enable voice interaction have played an important role in the development of chatbots. The Internet of Things, a concept of connected smart devices, has changed the way chatbots interact..

Hospital Receptionists face many challenges in the performance of their duties, such as dealing with patients and visitors, answering phone calls and answering all questions, scheduling appointments and get to appointments on time. Urgency of time is the biggest problem in rush tasks. Chatbots that work like Alexa solve these problems and help patients keep track of their appointments. Chatbots or conversational agents fall into the category of modern mobile health services. They use natural language and speech-based interactions when communicating with patients, via a "speech-to-speech communication model" [2].

BACKGROUND & RELATED WORK

[1] This model can help people deal with their anxieties and fears as design chatbots slowly transition from text to voice interactions. Designing chatbots in addition to custom Alexa skills allows developers to use a range of Amazon web services such as AWS Lambda, Simple Email Service

(SES), Simple Notification Service (SNS), and DynamoDB.AWS. DynamoDB is a NoSQL database service that offers greater scalability and faster performance. Alexa can be implemented on a local network via an Android application for better usability [3].

Developers don't have to worry about managing hardware provisioning, replication, software patches, installation and configuration, or cluster scaling, because all of these is managed by DynamoDB [5].

It also protects sensitive data with encryption at rest, reducing the burden on developers. It allows creating and maintaining any amount of data. Additionally, DynamoDB processes incoming requests at any traffic level.

AWS SNS is a cloud-based notification service that can be used to generate message notifications from serverless and distributed applications. It is a durable and secure platform that offers higher throughput and availability.

A real and reliable data source is needed to extract the back-end data for the chatbot design.

DESIGN AND METHODOLOGY

A. SURVEY OF TECHNOLOGY ACCEPTANCE BY USERS

It is important to study technology acceptance for real use cases and analyze user acceptance of the technology or content. The researchers used the model as part of the M-Health app. It focuses on

areas such as effort expectations, performance expectations, amenities, social impact, price value and trust.

used these capabilities to design a questionnaire for receptionists to study the feasibility and acceptance of voice-based chatbots to help receptionists in their daily work.

A set of questions is constructed to check users' primary familiarity with smartphones or chatbots and predict how often they will use them.

Multiple questions were asked to record user feedback when accepting Alexa as a Hospital Receptionist and as an Alternate Hospital Receptionist.

Almost all users had primary exposure to technology, but some of them admitted that they no longer use chatbots on a regular basis. Since most respondents often feel the need for a hospital receptionist on a daily basis, they admit that they are sometimes unable to ask questions or problems using devices such as Alexa. While they prefer to sit quietly until no one comes out of hospital management, they agree that replacing receptionists with Alexa is just one job they don't want to eliminate entirely.

When testing the feasibility of Alexa as a receptionist, users were asked to agree with parameters on a scale of 1 to 5 (strongly disagree, disagree, neutral, agree, strongly agree). Figure 1 shows a statistical summary of the survey, highlighting the positive trends of Alexa users as receptionists. The explanatory factors of the survey analysis lead to a more accurate analysis of technology acceptance. User responses help build the chatbot's design capabilities, making it a relevant and engaging tool for users. The analysis of the survey [2] explained from the UTAUT2 factors leads to a more accurate analysis of the acceptance of the technology.

User feedback helps build chatbot design capabilities, making it relevant and engaging for users.

B.DESIGN AND BLOCK DIAGRAM

Alexa is a popular virtual voice assistant application developed by Amazon. Alexa-enabled devices such as Amazon Echo Plus, Echo Studio or Echo dot. Alexa provides real-time data retrieval, voice interaction, weather forecast, broadcast, smart audio and video streaming, to-do list management, home automation control and other functions. Third-party users can also configure these features by designing and installing custom "skills" on their Alexa-enabled smart speakers. The skill, like a mobile application, allows users to perform certain defined tasks involving functionality such as service assistance or voice interaction.

Alexa has become a popular tool for realizing the concept of intelligent and interactive chatbots.

 Designing chatbots in addition to custom Alexa skills allows developers to use a range of Amazon Web Services. It also   handles cloud computing resource management, capacity provisioning and autoscaling, server and operating system maintenance, registry, and code monitoring. Developers simply provide the skill code in one of the supported languages, while the rest is handled by Azure's suite of cloud services, including compute, analytics, storage, and networking.A voice communication between a user and an Alexa-enabled Echo dot device could be observed.

The Alexa Skills Kit (ASK) handles user requests captured as audio cues. It converts audio input to equivalent text to detect the "intent" or context of the request. Corresponding to the detected intent, call the associated API created in .net. A request-response interaction between the skill and the VRA occurs.

The backend created for the request made takes the appropriate action, such as retrieving data or generating a response.
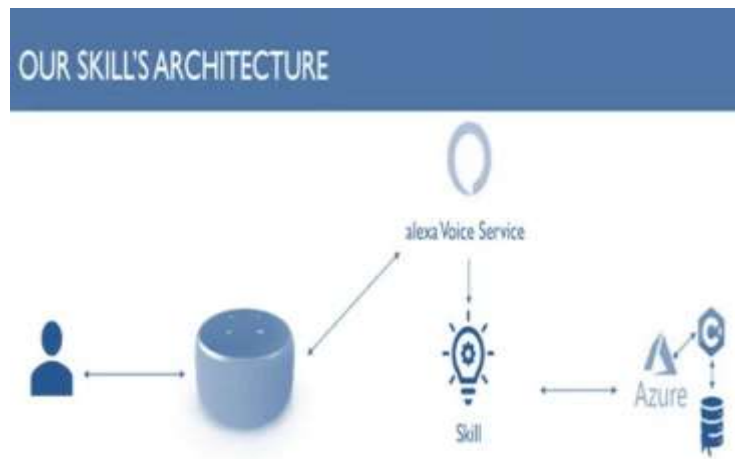
C.METHODS FOR CREATING SYSTEM

The following steps follow for creating fully functioning Alex.

START

Building our skills, Create Backend in C#,

Hosting the services on Azure,

Make the backend talk to the Alexa skill, Build the Data Model ,

Adding More Intents , Testing .

IMPLEMENTATION & VERIFICATION

An AWS developer account and an AWS Management Console account are required to configure the Alexa skill using Amazon   Web Services [6]. The ASK Developer Console allows programmers to configure and publish custom Alexa skills. On the other hand, the AWS Management Console parameter.

Programmers work with multiple AWS services, monitor cloud services, manage users and roles, manage costs, and configure custom dynamic skills using the ASK Custom Interaction Model [7]. The logic for implementing the voice interface interaction is defined when configuring the Alexa skill. The following sections are defined: Invocation: A specific keyword or phrase spoken by the user to initiate an interaction with the Alexa skill. Intents: An intent is a structural model of a specific feature that defines the steps of a voice interaction, a list of sample user requests,

and corresponding actions. Intents can have optional parameters, such as locations.Slots are like variables that can take values specified by some common properties, such as slot, date or duration of a training activity. It is also possible to configure a custom slot type if the expected slot is not in Amazon's built-in slot list [8]. Example utterances: An example utterance is a list of possible phrases a user can say to invoke a specific intent or in response to a defined question. ASK searches for the best match with an input request from a list of example utterances to identify the intent.Dialog model: A dialog model is a structure in which dialog steps are defined for an interaction between Alexa and a user to capture the required data required to invoke a specific intent.The importance of decision making has been reported by many researchers in different fields. Some of them are the E-LEACH protocol, using IoT smart device controllers [9, 10]. Lambda functions are configured on top of custom built-in templates available in the AWS Serverless Application Repository to support ASK and NodeJS for Lambda [11].

TESTING AND VALIDATION METHODOLOGIES:

Initially, Echo dot devices were tested with wake-up words and frequently asked questions after setup. The Uiting profiler can be used during the build phase to test defined statements before actually deploying the skill. Test the utterance to verify that Alexa can recognize or invoke the desired intent. Since user input is also required, actions that define dialog slots and delegates can also be tested through the utterance configuration file. However, the functionality of the following actions cannot be verified because the Lambda function is not active when the statement is tested. Once the skill is deployed, the "Alexa Simulator" can be used to test the functionality without using any Alexa-enabled smart speakers. Alexa Simulator supports text messaging and voice interaction, and maintains conversations like a real device. The AWS Management Console can be referenced to verify the functionality of subsequent actions triggered by Lambda billing and execution permissions.

CONCLUSION

In conclusion, the use of Innovative Alex as a hospital receptionist presents a promising solution to many of the challenges faced by modern healthcare facilities. Through its advanced AI technology, Innovative Alex can efficiently manage patient intake, answer frequently asked questions, and provide real-time updates on wait times and appointments. This can lead to improved patient satisfaction, reduced wait times, and streamlined operations for the hospital staff. Additionally, the use of Innovative Alex can free up hospital staff to focus on more complex tasks such as patient care and treatment. However, it is important to note that while Innovative Alex can greatly enhance hospital operations, it should not be seen as a replacement for human interaction and care. The success of Innovative Alex as a hospital receptionist ultimately depends on striking the right balance between AI technology and human interaction, ensuring that patients receive the care and attention they need while still benefitting from the efficiency and convenience offered by Innovative Alex.

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