

Communication between Personal Assistant and User to Understand Interview Details about Multiple Organizations Using AI BOT Service

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Abstract - The chatBOT is expected to lead the talk which licenses people to get to information by methods for a lightweight illuminating application. Generally, our Personal Assistant is for making exchange much instinctive and well giving to a person. Chatbots are up 'til now using a comfort as the commitment to talk with the end client. Comfort input is insufficient as the talk isn't ordinary with no expression and a discourse isn't just about words. The paper proposes an Personal Assistant with voice correspondence to make a talk dynamically alive. Paper introduced a voiceBOT which will give the interview procedure of association to users. It makes user appreciate the interview strategy of different companies. It used Alexa as BOT service to make voice discussion and dynamically suitable. The user needs to utilize Amazon Echo or reverb to make discussion with Personal Assistant. Proposed framework introduced TalkWithEcho algorithm to talk with Alexa. It is a mechanized arrangement that system propose to assist the user with getting the detail information of the interview procedure. This proposed structure will decently affect user. User can persistently contact with the interview procedure of companies. As proposed system is a Personal Assistant, so it is much savvy and incredible. Further, system can be explore with additional features, for user's inclination and progressively graphical portrayal.

Key Words: Alexa Voice Service, Artificial Intelligence, Virtual Agent, Voice Assistant, Voice Response

1. INTRODUCTION

Proposed system introduced a Personal Assistant which will give insights regarding the interview procedure of different companies to user. It is a voice discussion with the user. Proposed system uses Alexa Voice Service to make voice communication. The capacity to chat with Personal Assistant would make the discourse also intelligent.

A Personal Assistant moreover gives experiences with respect to each and every phase in the interview system. With assistance of this information, the user can understand which organization is sensible for me or what is the methodology of interview. It is the framework to connect with Alexa Voice and give interview details to the user. System introduced

TalkWithEcho algorithm to assemble questions and produce the proper answers. Fundamentally TalkWithEcho algorithm disengaged into 3 areas that underlying portion is making skills in Alexa, a second part is speaking with Alexa and last third part is taking care of responses of Alexa Voice Service. Also includes REST Programming interface to connect with the Alexa Voice Service. Test is to talk with Alexa and manage the discussion. Further, system can be extended as more understanding to our voiceBOT to talk with the user. System using ServiceNow, it's an IDE to make a algorithm.

Proposed a structure to encourages users to realize interview procedure of various organization. A most imperative factor framework overcome that time. Using this framework it absolutely limiting the time which is required to interface with individuals.

2. LITERATURE SURVEY

J. Quintero and R. Asprilla have defined the importance of the voice chatBOT [1]. They mentioned that proposed system to build efficient voice ChatBOT which more friendly and well communicate the end user.

Naz Albayrak, Aydeniz Özdemir, and Engin Zeydan have defined basic concepts, general working of AI based chatBOT. They have provided an example of AI based chatBOT [5].

Tho Quan, Trung Trinh, Dang Ngo, Hon Pham, Long Hoang, Hung Hoang, Thanh Thai, Phong Vo, Dang Pham, and Trung Mai defined how chatBOT is useful in real estate business for lead management. They have introduced an AI chatbot which includes Different machine learning procedures, including perform multiple tasks profound learning strategy for intent identification and regular itemsets for discussion elaboration[10].

Godson Michael D'silva, Sanket Thakare, Shradha More, Jeril Kuriakose introduces system architecture which incorporates examining messages of each ejabberd clients to check whether it's significant or not. On the off chance that it's significant, a computerized Chatbot will start a discussion with that client and help the client to determine the issue by giving a human way associations utilizing LUIS and subjective

administrations. Basically, they have provided SaaS architecture to developed chatBOT for customer care [3].

3. PROPOSED METHODOLOGY

3.1. System Overview

Proposed system introduced Personal Assistant for users to understand the interview methodology of various organization. A user can be an student or whatever different people who is fresher. The straightforward stream of how a user can utilize the Personal Assistant -

1. A user begins conversation with the Personal Assistant.
2. Personal Assistant requests your inquiry.
3. User asks inquiries to the Personal Assistant.
4. At last get the answers from the Personal Assistant.



Fig - 1: Basic Flow of System

Proposed system keeps data about companies in ServiceNow tables. User started discussion with a Personal Assistant by utilizing Amazon Echo. User starts the discussion with a Personal Assistant by saying "Alexa open Placement Agent"

3.2. System Architecture

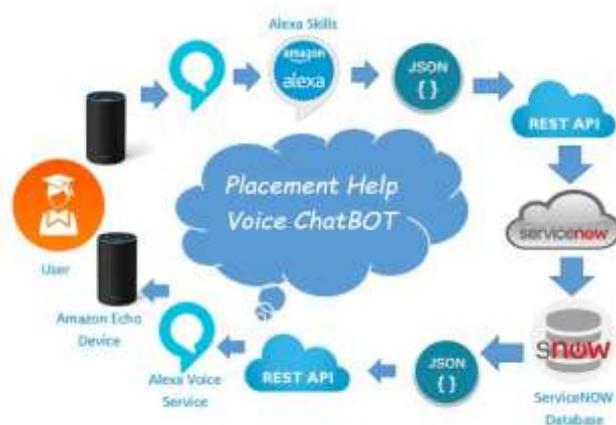


Fig - 2: The architecture of Proposed System

Architecture is consist of following parts -

- 1) *End User* - User is student or any fresher who is looking for a job. He/She is who starts the communication with personal assistant.
- 2) *Echo Device*- It is voice controlled intelligent device. It will take the voice from a user and gives the voice a response to AVS.
- 3) *Voice Service* - It will take the voice from Alexa and convert it into text format.
- 4) *Skills* - It is a model or skill in Alexa which incorporates the inquiries with respect to the interview procedure. This skill just gives the interview process details.
- 5) *JSON Response* - Whatever data got and send from and to ServiceNow/AVS is as JSON. The JSON response is the JSON planned data which is reasonable by AVS.
- 6) *RESTful API Interface* - REST Programming interface is the affiliation point between our ServiceNow and Alexa.
- 7) *ServiceNow IDE* - ServiceNow is a programming IDE in which will take JSON input data from AVS and perform handling on that. It will create the JSON output data from AVS JSON input. REST Programming interface implemented in the ServiceNow.
- 8) *ServiceNow Tables* - It is used to keep information of various organization.

3.3. Process Flow of System

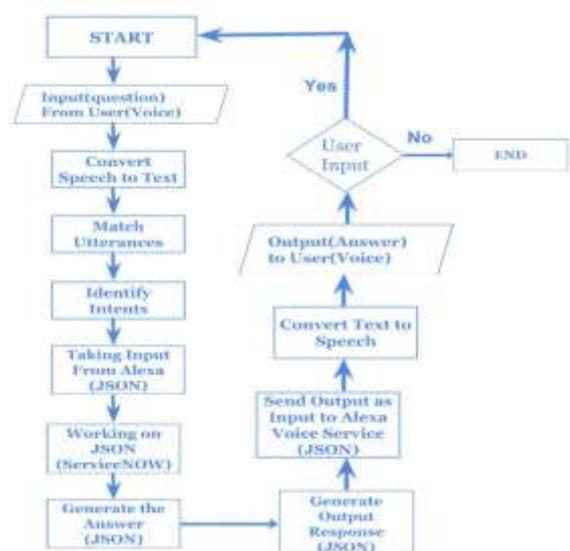


Fig - 3: Process Flow of Proposed System

Proposed system need to configure Amazon Echo.

- 1) *Start* - User needs to invoke Alexa skill which will give bits of knowledge concerning the interview strategy of various companies. After that Alexa give a response to the user as indicated by the interest by a user. For our situation, need to summon ability name as "Placement Helpdesk".
- 2) *Query From User* - User need to ask question to Personal Assistant. A user can get a few information about he/she needs. If a user approaches about what are the interview rounds. Example - "What are the meeting rounds".
- 3) *Converting Voice to text* - It will deal with changing over voice to text.
- 4) *Comparing Sentences* - Alexa discovers certainty dimension of a sentence with respect to a rundown of a sentence. If an appropriate match is found, Alexa gives an answer generally stop the conversation.
- 5) *Identifying Intents* - This movement is finished by AVS. Each and every point is contained different sentences. In the event that a sentence is available, Alexa will pick the regarded aim.
- 6) *Taking Query from AVS* - Proposed framework acquainted RESTful API with partner with AVS. It comprise of algorithm to take data from Alexa and procedure them as per client need.
- 7) *Working on Alexa's Response* - Assume a user needs the "What are the interview rounds?". Here framework needs to decay Alexa input to perform information related activity to take out the related answer. At the point when framework find fitting input by then goes for the accompanying stage.
- 8) *Generate the Answers* - Produce the suitable output as indicated by the JSON got from Alexa.
- 9) *Generate Answer of Query* - Proposed framework need to deliver a output which is reasonable by Alexa. Proposed framework presented a algorithm which will create the output. This output is in JSON structure.
- 10) *Sending Answer of Query to Alexa* - By then framework need to send this data to incorporate by using REST API message. The data is in a JSON containing answers as a substance design.
- 11) *Converting text to voice* - Alexa will change the text to voice.

12) *Sending Answer of Query to User* - At last, user get the answer of his/her query.

3.4. Algorithm

Proposed framework acquainted TalkWithEcho algorithm with connect with Alexa Voice Service. As the name TalkWithEcho, Echo implies its Amazon Echo through which user can talk with our Personal Assistant.

TalkWithEcho algorithm comprises of the accompanying parts -

- 1) *Create Alexa Skills in Alexa Voice Service (Alexa Voice Service Side)*
 - a) *Skill* - Requirements to make expertise in Alexa. Expertise resembles a model which will give the subtleties of the meeting procedure. Example - "Placement Helpdesk".
 - b) *Skill Kit* - It gives APIs, documentation that makes it brisk and straightforward for any user to modify the Alexa.
 - c) *Invocation* - It is a word or sentence. Basically to connect with the Personal Assistant, needs to utilize this name. Please see figure 4.
 - d) *Intents* - The thing a user is endeavoring to accomplish. Please see figure 5.
 - e) *Utterances* - These are the specific sentences that people will use when making an interest to Alexa. Please see figure 5.
 - f) *Slot* - It is a variable which is related to a point allowing Alexa to understand information about the interest. Please see figure 5.

Example - companyName
 - g) *End Points* - An endpoint which Communicate among ServiceNow and Alexa. Please see figure 6.

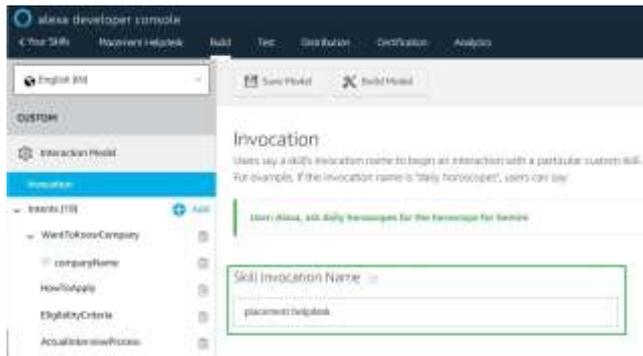


Fig - 4: Skill Invocation Name. In our case, invocation name as “placement helpdesk”. A student can start communication with a Virtual Assistant by saying “Alexa open placement helpdesk”



Fig - 5: Intent, Utterances/Sentences, Slots.



Fig - 6: HTTP Endpoint. To communicate with ServiceNow developer tool need endpoint. ServiceNow tool access this HTTP endpoint through REST API which is created in ServiceNow.

2) *Connect with Alexa Voice Service (ServiceNow developer side)*

Proposed framework utilizing ServiceNow ITSM apparatus to actualize the TalkWithEcho calculation. So whatever the interfacing and coding part did in this ServiceNow. Framework presented REST API name "Placement HelpDesk" which is an interface between the ServiceNow and Alexa Voice Service. As REST API which is comprise of various strategies. Proposed framework utilized the POST technique to send back the appropriate responses of understudies' inquiry to Alexa Voice Service. REST API Path - `/api/x_192471_placement/placement_helpdesk`

3) *Process and Generate AVS response (ServiceNow Developer Side)*

At the point when user make any inquiry to Placement helper. This ask for goes to the Alexa. AVS will create the JSON input and send to the REST Programming interface. System get the AVS input as a JSON. JSON contains the quantity of items, on which system have take a shot at that and send back reaction to Alexa Voice Administration. Following JSON information just comprise of request object. It is a JSON of "Alexa open placement helpdesk".

a) *Decompose AVS REST response at Developer Side*

Once get the input from the AVS administration in JSON design. Proposed framework will disintegrate in an alternate articles precedents - *session, context, request*. Since framework needs this article esteems to recover the information identified with the inquiry pose by user.

Assume user says "Alexa open placement helpdesk". Framework deal with the *request* object. In the solicitation object, there is a "type": "LaunchRequest". By alluding the esteem *LaunchRequest* framework will choose what is the response to the inquiry. *LaunchRequest* is the worked in plan of Alexa user invokes the skill.

For breaking down the AVS REST reaction framework made class name *helpdeskrequest*.

b) *The Mapping between REST response and ServiceNow*

It required to outline JSON input to ServiceNow tables. There is various articles that objects to use to create the appropriate response of user' inquiry.

c) *Generate REST response which is understandable by AVS*

When framework got the AVS reaction from Alexa then it will concentrate on to find the solution of the reaction. Following are the assignment incorporated into this part.

Recover the appropriate responses from the database.

Create the output JSON which is justifiable by AVS.

Example - Suppose understudy says "What is the qualification criteria for Infosys."

When framework get the JSON input from AVS which incorporates an intent name. It needs to delineate name in our table and play out the regarded activity. When intent exists in a table then it will extricate the data identified with that aim. At last, Proposed framework need to make JSON which contains the data and sent to the AVS.

d) *Generate the custom repeat intent*

Proposed system include intent name as RepeatIntent which will provide answer of "Can you please repeat it". To achieve this, system kept previous sentence in JSON itself and using this sentence again back to output json to make the answer of repeat intent.

Mainly proposed algorithm is working on number objects like *session, context, attributes, userattributes, request* to communicate with Alexa Voice Service.

Steps

1. Reading the input from Alexa through REST API.
2. Retrieves the Intent object from JSON
3. Finding IntentName
4. If (IntentName)
 - 4.1. Quite the process if not present in database and wait for next response.
 - 4.2. If exist then go for step 5
5. Retrieve record from the database.
6. Evaluate Script.
7. Get the result of a query.
8. Generate JSON for an answer
9. Generate the response as per the results retrieves from a database.
10. Sending results to Alexa.



Fig - 7: Alexa developer and testing console. When a student says "I want to know a placement process of globant." Then AVS will generate the response data that is JSON Input. System will take this JSON data through REST API and perform processing on that. After that generate the JSON Output data and send back to the AVS. Finally, AVS will give an answer to students' questions.

3.5. Implementation

While implementing the system need to consider following phases.

Assumption - End user is student who is searching for a job. Who is going to use a personal assistant. He/she need to invoke skill which is created in alexa for interview details to start communication.

Following things need to create a skill in alexa and made communication with alexa.

1) *Created Alexa skill into Amazon Alexa*

Needs to create a skill in Alexa skill kit. This skill will provide the information regarding the interview process of multiple companies.

To create a skill, have to follow following steps -

- 1) Create amazon developer account.
- 2) Login with your credential for amazon developer account
- 3) Start building skill
- 4) Created Alexa skill name as "Placement Helpdesk".



Fig - 8: Created Alexa Skill name as "Placement Helpdesk". You can see skill name, language, status and actions. Can edit or delete the skill if needed.

Into that, needs to provide intents and utterances. Means needs to create a model as per mentioned in above in algorithm.

2) Create REST API in ServiceNOW like webhook URL

Created REST API in ServiceNOW. This API which is used to connect with Alexa Service.

This API is a interfacing point between Alexa and our external application. It is responsible for responses sent and receive to and from Alexa/ServiceNOW.

Example REST API -
/api/x_192471_placement/placement_helpdesk

3) Create External Application

Created external application in ServiceNOW. This application stored information about interview process of various companies. Also it is stored number of intents and each record of intent is consist of various actions.

This application consist of following things -

1. List of Intents and their actions
2. Information about interview process
3. Class for creating JSON response
4. Class for decomposing JSON request.

Example - Suppose algorithm get the intent name "HowToApply" from Alexa.

This application search a intent name in a list of intents, if it is found then perform action related to that otherwise return as not found.

4) Start Communication by invoking the skill

Assumption - User has a Echo Device.

If user wants to know information about interview process. Then user needs to invoke the skill which is created before as "Placement HelpDesk". In a skill there is invocation name as "Placement Helpdesk". So to start communication use need to say "Alexa open Placement Helpdesk".

Once user say above statement then following things are perform -

1. This statement go to the Alexa
2. Alexa convert to text

3. She find out the invocation name from statement, if she found then it will generate the response otherwise reply as not found.

4. If she found the skill then she will generate JSON response which will contain the name of intent. Basically when user invoke the skill alexa will send intent name as "LaunchRequest".

Alexa will send following details related to intents -

```
"request": {  
    "type": "LaunchRequest",  
    "requestId": "amzn1.echo-api.request.f9e07a7a-054f-4007-b975-9f7711189074",  
    "timestamp": "2019-02-13T06:34:26Z",  
    "locale": "en-IN",  
    "shouldLinkResultBeReturned": false  
}
```

5) Input from Alexa

When use ask any query to Alexa. Alexa will generate the response. So this input response is consist of following objects -

a) Session

Session object consist of data related to session. If want to maintain any information which will need in whole communication then system can store this information in this object also.

```
"session": {  
    "new": false,  
    "sessionId": "amzn1.echo-api.session.8c4fe1e8-43ca-40fe-8898-72e2550aa83e",  
    "application": {  
        "applicationId":  
        "amzn1.ask.skill.39fa0143-5704-4117-be27-77585bsdb945ef"  
    },  
    "attributes": {  
        "UserAttributes": {  
            "companyName":  
            "infosys",
```

"repeatSentence": "Yes, sure. What you want to know."

```

    }
  },
  "user": {
    "userId":
    "amzn1.ask.account.AFB7DHJD5AM3C4EVHUMWWP
    C1535G4JEUGDDRORK4QS7NMAGPTBKRUB352NFMX
    2ENVXS3X2PYQOM3REERRZN3MOSweweSVXP2UR45
    RWYQRH6RTZUJEYMRAC3XMV5IZO4K46YR3ZRJKG
    3BOK3ENHGRK3DKOG3DZPQR6AYC2C2AMVSVQ4HN
    OIBSQLT635JZTTXIFIKHYLBWHVLB43JKZR36EQ"
  }
},

```

b) Context

This object not much important for us to design the system. It is also consist of application related information.

c) Request

This object consist of the intent name nas slot name. What is the type of intent whether it is *LaunchRequest* or *IntentRequest*.

Following is the object is sent from Alexa when use ask "How can I apply for it?"

```

"request": {
  "type": "IntentRequest",
  "requestId": "amzn1.echo-
  api.request.547e4645-cddf-4e19-a7d4-
  4387f88c6a68",
  "timestamp": "2019-02-13T06:40:08Z",
  "locale": "en-IN",
  "intent": {
    "name": "HowToApply",
    "confirmationStatus": "NONE"
  }
}

```

6) Get the Information

In this phase proposed framework took this response into a our external application. External

application will search intent name in its database if it found then perform specific actions. In a point 7, when user ask query "How can I apply for it.". Alexa sent a input response which consist of intent name as "HowToApply".

7) Output send to Alexa

In this phase, system generate the output in JSON format and send output to Alexa. Created class to generate a response in a JSON format. Following is the script which will generate the output.

```

(function(content, attributes){
  var answerOfQuestion;

  var      companyName      =
  attributes.UserAttributes.companyName;

  userAttributes = {};

  userAttributes.companyName = companyName;

  //get the information about company

  var      compnayDetails      =      new
  GlideRecord('x_192471_placement_company_informat
  ion');

  compnayDetails.addQuery('u_company_name',co
  mpanyName);

  compnayDetails.query();

  if (compnayDetails.next()) {
    answerOfQuestion      =
    compnayDetails.getValue('u_how_to_apply');
  }

  userAttributes.repeatSentence      =
  answerOfQuestion;

  var attrObj = {};

  attrObj.UserAttributes = userAttributes;

  //Generate the output for received response from
  Alexa.

  var      helpDeskResponse      =      new
  HelpDeskResponseBuilder();

  helpDeskResponse.setOutputSpeech("PlainText",
  answerOfQuestion, "");
}

```

```
helpDeskResponse.setReprompt("PlainText", "Can you please repeat.", "");
```

```
helpDeskResponse.setAttributes(attrObj);
```

```
helpDeskResponse.setEnd(false);
```

```
result = helpDeskResponse.getResponse();
```

```
})(content, attributes);
```

8) Repeat Statement

System handle a scenario if user wants to repeat something. So for that purpose Algorithm created a object as "UserAttributes". In this object system store the statement which is previously answered. System maintain this object till the end as system need any information quickly. It avoids the time to retrieve the information from database. It is useful to store repetitive information which user needed consistently.

```
"attributes": {
    "UserAttributes": {
        "companyName":
"infosys",
        "repeatSentence": "Yes,
sure. What you want to know."
    }
},
```

9) Working with slots

Slots are the parameter, which is needed while communication. Suppose user ask query like "I want to know interview process of Infosys". In this query user can ask about any company like TCS, Accenture etc. So proposed system created Slot for that companyName. Menas while creating an utterances in a skill as "I want to know interview process of {{companyName}}". Proposed framework created "companyName" as slot. Also same for number of test like online test, aptitude test, technical test, there is NameofRounds and SessionName.



Fig - 9: Created slot type as "NameOfRounds", Which includes the name of interview rounds.

10) Structure of input and output JSON

In this phase proposed system includes the way of developing JSON output and input. It developed a classes which is creating and decomposing a JSON input/output whenever needed.

Example -

User - What they ask in online test?

Personal Assistant - Basically they given multiple choice question related to permutation and combination, time and work, time speed and distance , data interpretation, puzzles. Online test is divided into a 3 sections. This test consist of sixty five questions for ninety five minutes. and you have to give fourty correct answers to pass this test.

a) JSON Input from Alexa

```
"request": {
    "type": "IntentRequest",
    "requestId": "amzn1.echo-api.request.c7601b3a-ba0d-4ccf-b0ab-878eadf5e967",
    "timestamp": "2019-02-13T08:50:00Z",
    "locale": "en-IN",
    "intent": {
        "name": "WhatTheyAsk",
        "confirmationStatus": "NONE",
        "slots": {
            "SectionName": {
                "name":
"SectionName",
```

```

    "confirmationStatus": "NONE"
    },
    "RoundName": {
        "name":
    "RoundName",
        "value":
    "online test",
        "resolutions": {
            "resolutionsPerAuthority": [
                {

```

"authority": "amzn1.er-authority.echo-sdk.amzn1.ask.skill.39fa0143-5704-4117-be27-77585bb945ef.NameofRounds",

b) *Generated JSON output and send back to Alexa*

```

    "status": {
        "code": "ER_SUCCESS_MATCH"
    },
    "values": [
        {
            "value": {
                "name":
    "Online Test",
                "id": "ONLINE"
            }
        }
    ]

```

```

    {
        "body": {
            "version": "1.0",
            "response": {
                "outputSpeech": {
                    "type": "PlainText",
                    "text": "Basically they given multiple choice question related to permutation and combination, time and work, time speed and distance , data interpretation, puzzles. Online test is divided into a 3 sections. This test consist of sixty five questions for ninety five minutes. and you have to give fourty correct answers to pass this test."
                },
                "reprompt": {
                    "outputSpeech": {
                        "type": "PlainText",
                        "text": "Can you please repeat."
                    }
                }
            },
            "shouldEndSession": false,

```

```

        "type": "_DEFAULT_RESPONSE"
    },
    "sessionAttributes": {
        "UserAttributes": {
            "companyName":
                "infosys",
            "testName": "Online
                Test",
            "repeatSentence":
                "Basically they given multiple choice question related
                to permutation and combination, time and work, time
                speed and distance , data interpretation, puzzles.
                Online test is divided into a 3 sections. This test consist
                of sixty five questions for ninety five minutes. and you
                have to give fourty correct answers to pass this test."
        }
    }
}
    
```

$T = \{t1, t2, t3\}$

Where, t1 = What is the eligibility criteria

t2 = How many questions are in online test

t3 = What are the interview rounds.

o = Answer of user query

$\{a \in A \mid \text{where } A \text{ is the answer of the user query}\}$

$A = \{a1\}$

Where, a1 is the result of the query

e = The system will terminate in below cases -

- Complete Conversation
- Out of scope sentences
- Unrecognized Sentences
- Stop internet connection

4. MATHEMATICAL MODEL

4.1 Overall Proposed System

Let S be the proposed system that were given in the assignment where,

$$S = \{s, e, i, o\}$$

Where,

s = start/initial state of the system

e = end/final state of the system

i = input to the system

o = Output of the system

Hence,

$$s = \{x,y,z\}$$

x = Login to amazon account

y = configure amazon alexa device

$$x \cup y \in s$$

i = User Query

$$\{t \in T \mid \text{where } T \text{ is a query asked by user}\}$$

4.2 TalkWithEcho Algorithm

Let S be the algorithm that were given in the assignment where,

$$S = \{I, P, O\}$$

I = Input (User query as a JSON format)

P - Process (Functions)

O - Output (Query's answer as a JSON format)

I = User query as a JSON format

$$\{t \in T \mid \text{where } T \text{ is a input to the algorithm}\}$$

$$T = \{t1, t2, t3, t4\}$$

Where, t1 = SessionAttributes

t2 = Previous sentence

t3 = JSON Input Objects

t4 = User Query

P = Different function

{f ∈ F | where F is the procedures used in algorithm}

F = {f1, f2, f3, f4, f5, f6}

f1 - JSON Output Creation

f2 - Decomposing the Alexa JSON

f3 - Resolution

f4 - Managing Slots

f5 - Repeat Intents

f6 - Maintain the scope of communication

O = Query's answer as a JSON format

{a ∈ A | where A is the result of the algorithm}

A = {a1, a2, a3, a4, a5}

a1 - Repeat Sentence

a2 - User Attributes

a3 - Output Speech

a4 - Answer of query

a5 - JSON Output Object

O ∈ A

5 RESULTS AND DISCUSSION

5.1 Result Analysis

Basically any chatbot performance can be evaluated based on following metrics.

Actually for calculating the performance of proposed system, I have tested this application with 50 students. All students are freshers.

1. User Metrics

- a. *Total Users* - This is the most basic metric. It captures the number of people using your chatbot. This matter because its trend shows the change in the number of users and therefore the amount of data your chatbot has been exposed to.

Tested this application on 50 students/users.

2. Messages Metrics

- a. *Conversation Starter Messages* - This is the number of messages where you start the interaction by the bot.

Only 1 message system use to start the communication.

- b. *Bot Messages* - Bot messages are the total number of messages sent by the chatbot in each interaction.

For every interaction there is one message from bot which is the answer of user's query. There are number of messages system will generate as the user's query.

- c. *In Messages* - User can ask his/her question in multiple ways.

3. Bot Metrics

- a. *Goal Completion Rate (84%)* - This captures the percentage of successful engagement through chatbot. Users will probably try to reach different information or service.

Example - User wants to know what is the interview process of specific company.

So system stores near about 13 similar type of questions. So if user ask any related meaning question, then system will give same answers. (42 users)

- b. *Fall Back Rate (FBR)(24%)* - No robot is perfect. Therefore chatbots are expected to fail sometimes, but what really matters is those failures happen regularly or in some extreme cases. This is the percentage of times our chatbot failed or experienced a near-failure situation.

As per, tested this application - there are 12 students are failed to getting exact answers and failed. (12 users)

- c. *User Satisfaction (86%)* - A new metric can be defined through the exist survey. User engaging with the chatbot can rate their experience to achieve further product excellence. (43 users are satisfy with providing suggestions).

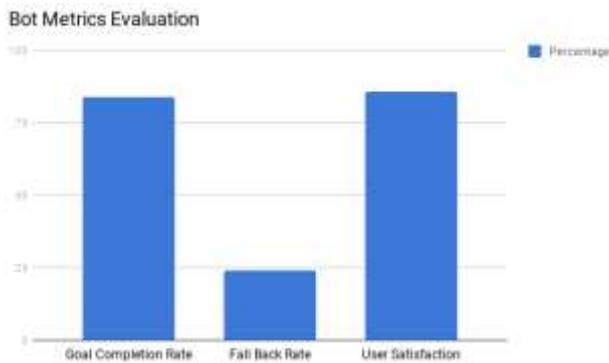


Chart - 1: Evaluation of bot metric with respect to percentage.

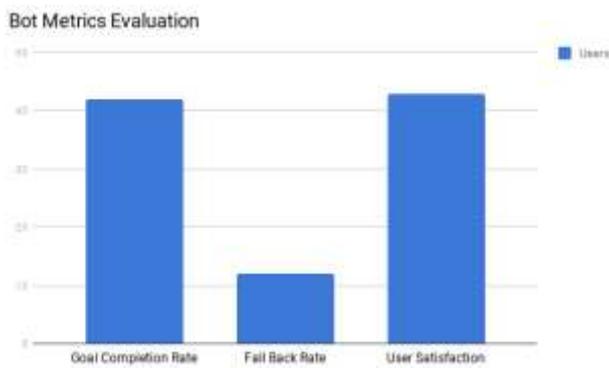


Chart - 2: Evaluation of bot metric with respect to users.

5.2 Comparison between various AI BOT Services

Proposed system using Alexa AI platform to developed our chatBOT. There are different kind of AI platform is available. Following are the multiple platforms like IBM Watson Conversation, Dialogflow, Microsoft BOT Framework etc.

	Dialogflow	Amazon Lex	LUIS	IBM Watson
Programming Languages	SDKs, Android, iOS, Cordova, JavaScript, HTML, Node.js, .NET, Unity, Xamarin, C++, Python, Ruby, PHP, Epson Moverio,	IoS and Android SDKs, Java, JavaScript, Python, CLI, .NET, Ruby, PHP, Go, and C++	C# SDK, Python SDK, Node JS SDK, and Android SDK	Node SDK, Java SDK, Python SDK, iOS SDK, and Unity SDK

	Botkit, Java			
Apps/Integration	built-in integration with Google Assistant, Facebook Messenger, and Slack	Integration with Facebook, Slack, and Twilio		
Platform	Google Assistant and other messaging platforms	Integration with Facebook, Slack, and Twilio; but if you want to connect to a messaging device/application that isn't supported, there's the Amazon Lex API	Facebook, Kik, Slack, Telegram, Twilio, Microsoft Teams, Skype, GroupMe, Web Chat, Email, and Direct Line	Any messaging platform supporting speech, images, and text
Supported Languages	Brazilian Portuguese, Chinese (Cantonese), Chinese (Simplified), Chinese (Traditional), English, Dutch, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, and Ukrainian	US English	English, French, Italian, German, Spanish, Brazilian Portuguese, Japanese, Korean, and Chinese	English and Japanese

Pricing	Free	Trial: 1 year; Paid: \$0.004 per speech query and \$0.00075 per text query	Free: 10,000 transactions free per month; LUIS API — Basic: Up to 10 transactions per second; \$0.75 per 1,000 transactions	Lite, Standard, and Premium plans are available for Watson. Lite: 1,000 queries per month; Standard: \$0.0025 per API call; Premium: Price as per request
Limit for API calls	Unlimited	Trial: 10k speech queries, 5k text queries; Paid: Unlimited	Free: 10,000 queries per month and five queries per second. Paid: Ten queries per second; \$0,75 per 1,000 queries	Lite: 1,000 API queries per month; Standard: Unlimited API queries per month, up to 20 workspaces, up to 2,000 intents; Premium: Unlimited
Third Party Integration	Allowed for different messengers and some additional services	Different messengers, Amazon services, and popular SaaS platforms	Microsoft Azure and different messengers via Bot Framework	IBM Services
Suitable for	Middle-level B2C bots, Virtual Assistants, and MVPs	Preview mode, just for making an opinion	Cortana functionality, IoT applications and virtual assistant apps, and bots integrate	Virtual assistants and bots that integrate with IBM services

			ded to enterprise software	
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Table - 1: Comparison between different AI bot services.

5.3 Communicate with Personal Assistant

An user can speak with a Personal Assistant by utilizing Amazon Echo or Reverb Application or similar applications.

Amazon Echo Device - Amazon's Alexa is man-made brain power bot that allows people to converse with their Amazon Echo. Subsequent to interfacing with Echo, at that point user need to state "Alexa open Placement Helpdesk". They start to talk with a Personal Assistant.

Reverb Application - User have to install this application on his/her cellphone. Subsequent to introducing this application, sign in to your Amazon and say "Alexa open arrangement Helpdesk". They begin to speak with a Personal Assistant.

5.4 Intents and Utterances Relationship

Let say user ask to Personal Assistant is that "What is the qualification criteria for Infosys". So how it is overseen?. To start with, user should know there are various methods for posing the above inquiry. In basic significance, there is one numerous inquiries for same importance and having similar answers.

Examples of same meaning questions -

Is there any eligibility criteria for the interview?

How can I eligible for interview?

How can I eligible for it?

What is the eligibility criteria to apply?

So answer of above all questions are the same but the way of asking the questions are different.

Designer needs to discover all such sort of inquiries and spot them in a one bucket and gave the name to that buck. Framework discover a response to that container in ServiceNow table. At last, this answer will advance to Alexa Voice Service. All intents and utterances are a piece of Alexa Voice Service.



Fig - 10: Intent and Utterances Relationship. In a figure, provided that student can ask the same question in a different way.

5.5 How is the communication between Student and Personal Assistant

As described in a paper it is voice communication. Here, provided the how communication is going between student and Virtual Assistant.

HelpDesk - Personal Assistant

User - STD

User - Alexa open placement agent

Personal Assistant - Welcome to the placement portal. It provides you the details about interview process of particular company. You can know the when the interview is, how many rounds are there and which rounds are there. What they ask in that rounds. How many question and how many question should correct to pass that rounds. What is the eligibility criteria of particular company. Package, probation period, interview location and probably working location. Basically it gives you about interview process details. So please tell me which company's interview process you want to know.

User - Infosys

Personal Assistant - There are Online test, technical round and HR rounds. Total 3 rounds are there. You have to pass all rounds to get selected in infosys. All rounds are elimination rounds.

User - What is online test

Personal Assistant - Online test is a first step of interview. It includes many test for example quantitative test, analytical test, logical test, technical test, database test and many more.

User - What they ask in that

Personal Assistant - Basically they given multiple choice question related to permutation and combination, time and work, time speed and distance, data interpretation, puzzles. Online test is divided into a 3 sections. This test consist of sixty five questions for ninety five minutes.

and you have to give fourty correct answers to pass this test.

User - How many questions are there

Personal Assistant - There are total sixty five questions for ninety five minutes. You have to give Forty answers.

User - What are the interview rounds are

Personal Assistant - There are Online test, technical round and HR rounds. Total 3 rounds are there. You have to pass all rounds to get selected in infosys. All rounds are elimination rounds.

User - What they ask in online test

Personal Assistant - Basically they given multiple choice question related to permutation and combination, time and work, time speed and distance , data interpretation, puzzles. Online test is divided into a 3 sections. This test consist of sixty five questions for ninety five minutes. and you have to give fourty correct answers to pass this test.

User - What are the sections

Personal Assistant - There are total 3 sections. Sections are Online Aptitude Test, Online Verbal Reasoning Test, Online Logical Reasoning Test

User - How many questions are in aptitude test

Personal Assistant - There are total Fifteen questions for Twenty Five minutes. You have to give Ten answers.

User - Can you please repeat.

Personal Assistant - There are total Fifteen questions for Twenty Five minutes. You have to give Ten answers.

So this is the basic discussion between the Personal Assistant and User. Whatever the conversation is voice conversation with the goal that it is progressively powerful and intuitive.

6 FUTURE WORK

- Proposed framework can incorporate with tone analyser so framework can get the sentiments of the users. With the right hand of that emotions, framework can give the suitable reactions.
- Structured framework can in like manner give voice security in case one can need to use it for privately.
- Framework can give graphical portrayal so the discussion will be progressively convincing and it is important for examination of inclination.

- Needs to add more intelligence and provide more training to Personal Assistant.
- Extend Personal Assistant for more natural conversation with user.

7 CONCLUSION

Proposed framework concentrating on interview procedure of different companies with the goal that user get the thought regarding interview process. Personal Assistant is a robotized framework. So that, it is continuously natural discussion among User and Personal Assistant. It is helpful for a clients to make their life straightforward about meeting.

REFERENCES

- [1] J. Quintero, R. Asprilla, "Towards an efficient voice-based chatbot", IEEE Thirty Fifth Central American and Panama Convention (CONCAPAN XXXV), pp. 1 - 6, 2015
- [2] Md. Shahriare Satu, Md. Hasnat Parvez; Shamim-Al-Mamun, "Review of integrated applications with AIML based chatbot", International Conference on Computer and Information Engineering (ICCIE), pp. 87-90, 2015
- [3] Godson Michael D'silva, Sanket Thakare, Shraddha More, Jeril Kuriakose, "Real world smart chatbot for customer care using a software as a service (SaaS) architecture", International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC), pp. 658-664, 2017
- [4] Alexandros Spournias, Konstantinos Christopoulos, Konstantinos Antonopoulos, Christos Panagiotou, Christos Antonopoulos, Theofanis Orfanoudakis, Nikolaos Voros, "Experimental Evaluation of a Novel Personal Assistant in Greek Language for Ambient Assisted Living Environments employing home robots", South-Eastern European Design Automation, Computer Engineering, Computer Networks and Society Media Conference (SEEDA_CECNSM), pp. 1-9, 2018
- [5] Naz Albayrak, Aydeniz Özdemir, Engin Zeydan, "An overview of artificial intelligence based chatbots and an example chatbot application", 26th Signal Processing and Communications Applications Conference (SIU), pp. 1-4, 2018
- [6] Yixuan Chai, Guohua Liu, "Utterance Censorship of Online Reinforcement Learning Chatbot", IEEE 30th International Conference on Tools with Artificial Intelligence (ICTAI), pp. 358-362, 2018
- [7] Albert Verasius Dian Sano, Tanto Daud Imanuel, Mega Intanadias Calista, Hendro Nindito, Andreas Raharto Condrobimo, "The Application of AGNES Algorithm to Optimize Knowledge Base for Tourism Chatbot", International Conference on Information Management and Technology (ICIMTech), pp. 65-68, 2018
- [8] Lisa N. Michaud, "Observations of a New Chatbot: Drawing Conclusions from Early Interactions with Users", IT Professional, pp. 40-47, 2018
- [9] Heru Agus Santoso, Nurul Anisa Sri Winarsih, Edy Mulyanto, Galuh Wilujeng saraswati, Septian Enggar Sukmana, Supriadi Rustad, Muhammad Syaifur Rohman, Adhitya Nugraha, Fahri Firdausillah, "Dinus Intelligent Assistance (DINA) Chatbot for University Admission Services", International Seminar on Application for Technology of Information and Communication, pp. 417-423, 2018
- [10] Tho Quan, Trung Trinh, Dang Ngo, Hon Pham, Long Hoang, Hung Hoang, Thanh Thai, Phong Vo, Dang Pham, Trung Mai, "Lead Engagement by Automated Real Estate Chatbot", 5th NAFOSTED Conference on Information and Computer Science (NICS), pp. 357-359, 2018
- [11] Dhineshkumar Ramasubbu, Krishnamoorthy Baskaran, Grynberg Yann, "Intrusive Plug Management System Using Chatbots in Office Environments", Asian Conference on Energy, Power and Transportation Electrification (ACEPT), pp. 1-4, 2018
- [12] Tussanai Parthornratt, Dollachart Kitsawat, Pasd Putthapipat, Prapap Koronjaruwat, "A Smart Home Automation Via Facebook Chatbot and Raspberry Pi", 2nd International Conference on Engineering Innovation (ICEI), pp. 52-56, 2018
- [13] György Molnár, Zoltán Szüts, "The Role of Chatbots in Formal Education", IEEE 16th International Symposium on Intelligent Systems and Informatics (SISY), pp. 000197-000202, 2018
- [14] Wei-De Liu, Kai-Yuan Chuang, Kuo-Yi Che, "The Design and Implementation of a Chatbot's Character for Elderly Care", International Conference on System Science and Engineering (ICSSE), pp. 1-5, 2018

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