

eYSIP2018

EYANTRA IoT SMART ASSISTANT & IFTTT FOR IoT



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Duration of Internship: 21/05/2018 – 06/07/2018

2018, e-Yantra Publication

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Abstract

A web or an app interface for IoT may not always be easy for people to work with, especially if they aren't used to such kinds of applications. But what if you could tell someone to do things on your behalf? eYantra IoT Smart Assistant (eYISA) is inspired from the goal to bring the magic of IoT to the fingertips of users and accessible over voice commands. In AWS IoT writing rules is hard and not that much intuitive, you also need to know SQL (for AWS IoT Rule Engine). And it's difficult to select devices over which you want to write rules. A simple GUI needed to write rules to invoke the actions on devices.

Completion status

The project is successfully completed, all deliverables are achieved. We have successfully created Smart Assistant using dialogflow engine which is able to perform all the frequent queries that take place on IoT platform. And also we have developed flexible block based GUI for IFTTT rules.

Hardware parts

- ESP DHT sensor
- 5 day workshop kit
- For connection diagram and setup refer this repository [Interfacing with AWS-IoT](#)



1.2. SOFTWARE USED

Software used

- [Dialogflow](#)
- [Mongoose OS](#)
- [PageKite](#) or [ngrok](#)
- [Cloud Functions Local Emulator](#)
- [blockly](#)

Assembly of hardware

For circuit diagram and steps of assembly of hardware check this repository [Interfacing with AWS-IoT](#)

Setup Guide

To start follow this instruction of to install [iot-platform](#) and setup for AWS-IoT [Installation Guide](#)

Step 1

After completing setup of [iot-platform](#) and AWS-IoT then run server of [iot-platform](#)

Step 2 - For Development Setup

Configure your [PageKite](#) account (its free of one month) then follow this [quickstart](#).

1. Tunnel [iot-platform](#) server to public ip using this command

```
pagekite.py 8002 iotplatform-eyantra.pagekite.me
```

2. To deploy [webhook function](#) for fullfillment of dialogflow in Cloud Functions Local Emulator follow this [guide](#)
3. Tunnel [webhook function](#) deployed in Cloud Functions Local Emulator to public ip using this command

```
pagekite.py 8010 webhook-eyantra.pagekite.me
```



1.4. SOFTWARE AND CODE

4. To setup Dialogflow follow this [guide](#) upto 4th instruction.
5. Then after configuring all setting of dialogflow you will get Google Project Id in setting of your Agent.
6. Then enter the fulfillment URL as

```
https://webhook-eyantra.pagekite.me/<YOUR_PROJECT_ID>/<YOUR_REGION>/eYantraWebhook
```

Step 2 - For Production Setup

1. It is assumed that iot-platform server is hosted on cloud server like EC2(Amazon).
- 2.To deploy [webhook function](#) for fulfillment of dialogflow in [Google Cloud Functions](#) follow this [guide](#)
3. Then enter the fulfillment URL as

```
https://<YOUR_REGION>-<YOUR_PROJECT_ID>.cloudfunctions.net/eYantraWebhook
```

Software and Code

Github Repository with code and documentation: [Link](#)

Webhook(fulfillment) program:

JavaScript program that receives user query data from DialogFlow engine, calls corresponding rest APIs of iot-platform and returns the response to DialogFlow.

natural-cron readableToCron.js:

JavaScript Library to convert normal English phrases into "Cron expressions". Visit [here](#) for more details.

Use and Demo

1. Connect the hardware device to power supply and make sure it is switched on.
2. Verify that device has active internet connection.
3. Make sure all the servers are started and working as explained in installation guide.



1.6. FUTURE WORK

4. Use the assistant(Web assistant on iot-platform, Google actions simulator, DialogFlow simulator or Google assistant on handheld device) to fire queries.

Future Work

- After increasing the efficiency of the assistant through more training, especially working with Hindi phrases then it can be used anywhere
- Assistants can be made dynamic enough to adapt to other APIs, So APIs are accessible over Natural Language of users even in form of text or voice.

Bug report and Challenges

Efficiency of Assistant:

Though efficiency of assistant has become quite good over the course of development, still the efficiency can be improved with more training.

Efficiency of natural-cron.js:

Building a program that will convert english phrases to desired cron expressions was a major challenge. Efficiency of natural-cron.js library can be consistently improved over the course of time to handle complex phrases.

Challenges:

- Implementing OAuth2 token based authentication for login via Google Assistant
- Making the assistant dynamic to handle all devices and sensors
- Improving accuracy of dialogflow agent
- Implementing save and restore for Blockly blocks

Bibliography

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- [2] DialogFlow, *Reference documentation for Google's DialogFlow engine*, <https://dialogflow.com/docs/getting-started>
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