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Project Title: Intelligent Customer Help Desk with Smart Document Understanding

Project Scope:

- Create a customer care dialog skill in Watson Assistant to answer customer's questions with relevant information.
- Use Smart Document Understanding to build a Watson Discovery collection and train Watson Discovery to output correct passages to any query made by my Watson assistant.
- Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery
- Build a web application using Node-Red to provide a user interface with integration to all these services & deploy the same on IBM Cloud Platform

Deliveries:

In this project, there will be another option unlike any other chatbots. If the customer question is about the operation of a device, the application shall pass the question onto Watson Discovery Service, which has been pre-loaded with the device's owner manual – ecobees3 User Guide for a heater which in turn reply with relevant sections of the manual to the question asked by the user.

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1 INTRODUCTION

1.1 Overview

1.2 Purpose

2 LITERATURE SURVEY

2.1 Existing problem

2.2 Proposed solution

3 THEORETICAL ANALYSIS

3.1 Block diagram

3.2 Hardware / Software designing

4 EXPERIMENTAL INVESTIGATIONS

5 FLOWCHART

6 RESULT

7 ADVANTAGES & DISADVANTAGES

8 APPLICATIONS

9 CONCLUSION

10 FUTURE SCOPE

11 BIBILOGRAPHY APPENDIX

A. Source code

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1.INTRODUCTION

1.1 Overview:

The main objective of the project is to create an Intelligent Customer Help Desk with smart document understanding using different AI Services (Watson Discovery , Watson Assistant, Cloud function and Node Red). With this project, one will get an insight on how to build interactive information retrieval systems by combining various Watson Services.

Project Requirements: Python, IBM Cloud, IBM Watson

Software Requirements: Watson Assistant, Watson Discovery, Cloud Function, Node-Red.

Project Team: Ritika Agrawal (Individual)

Project Duration: 19 days

1.2 Purpose:

The typical customer care chatbot can answer simple questions, such as store locations and hours, directions, and maybe even making appointments.

When a question falls outside of the scope of the pre-determined question set, the option is typically to tell the customer the question isn't valid or offer to speak to a real person.

In this project, there will be another option. If the customer question is about the operation of a device, the application shall pass the question onto Watson Discovery Service, which has been pre-loaded with the device's owner manual. So now, instead of "Would you like to speak to a customer representative?" we can return relevant sections of the owner manual to help solve our customers' problems.

2.LITERATURE SURVEY

2.1 Existing problem:

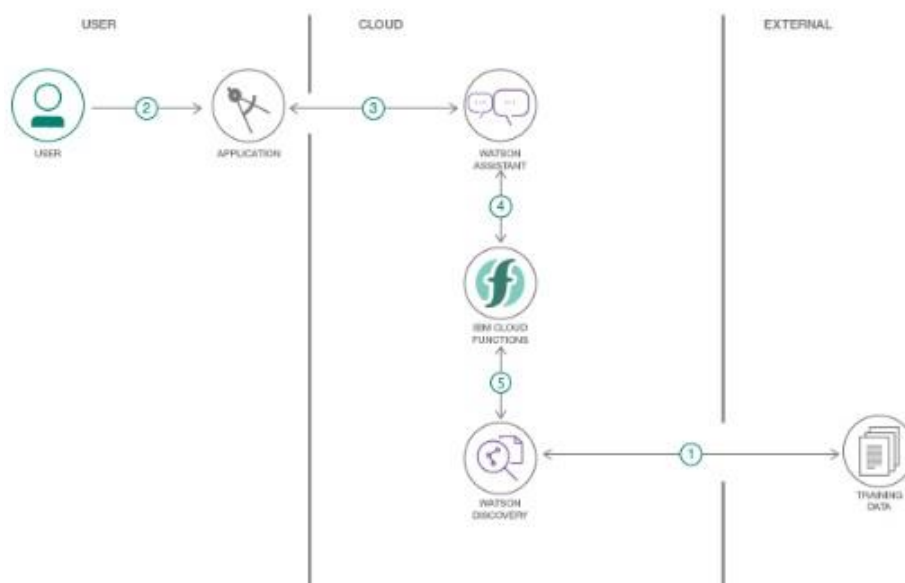
The problem that we are here trying to solve is to ensure minimum involvement of customer agent ,hereby giving satisfactory answers to all of the customer's questions with the help of an AI powered chatbot without having to return a recorded statement of “would you like to connect with an agent?”.

2.2 Proposed Solution:

To solve the above problem, we will be using a virtual agent like Watson Discovery , preload it with a document – ecobees3 heater manual in this case and train it on the data to find relevant passages from the manual that solves customer's query.

3 THEORETICAL ANALYSIS

3.1 Block Diagram:



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The user places a question on an interface of an application which will be node-red dashboard for this project connected to a Watson assistant. Watson Assistant in turn will contact Watson Discovery through cloud functions to execute a query based on user input and extract the required output to present to user via node-red dashboard interface.

3.2 Hardware / Software designing:

1. Create an account on IBM Cloud.
2. Create instances of Watson Assistant, Watson Discovery and Node-Red
3. Launch Watson Assistant, create a dialogue skill and configure it.
4. Load Watson Discovery with the required documents, train and configure it.
5. Use Cloud Functions to create an action of connecting Watson Assistant with Watson Discovery.
6. Use Node-Red to create a flow and install node-red dashboard to build an interface for the application and integrate all the services together.

4 EXPERIMENTAL INVESTIGATIONS

Images showing results of all the IBM cloud services(Watson Assistant , Watson Discovery, Cloud functions, Node-red) created:

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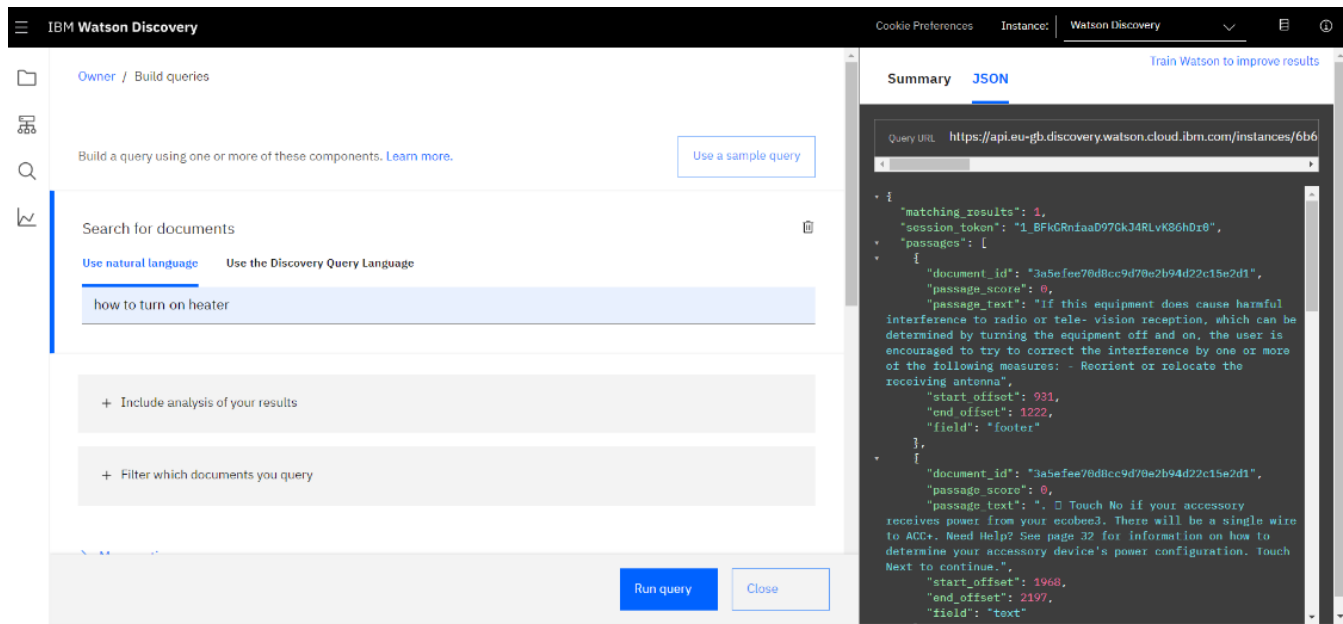


Figure 1: Running a Query on Watson Discovery

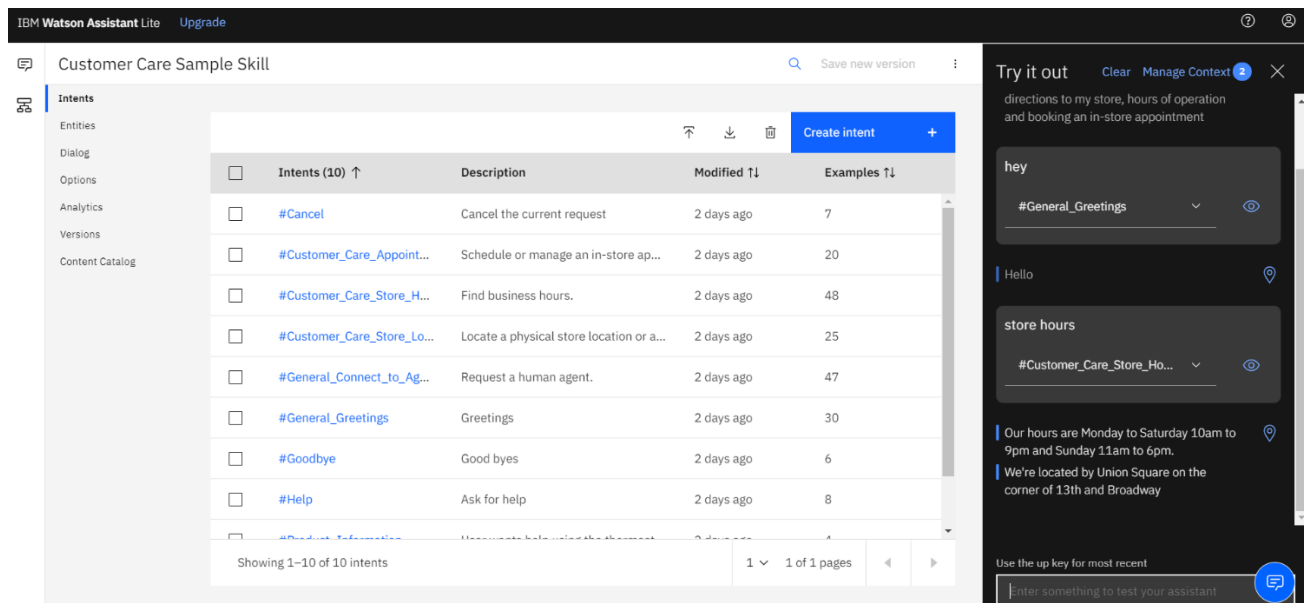


Figure 2: Testing Watson Assistant Chat Bot

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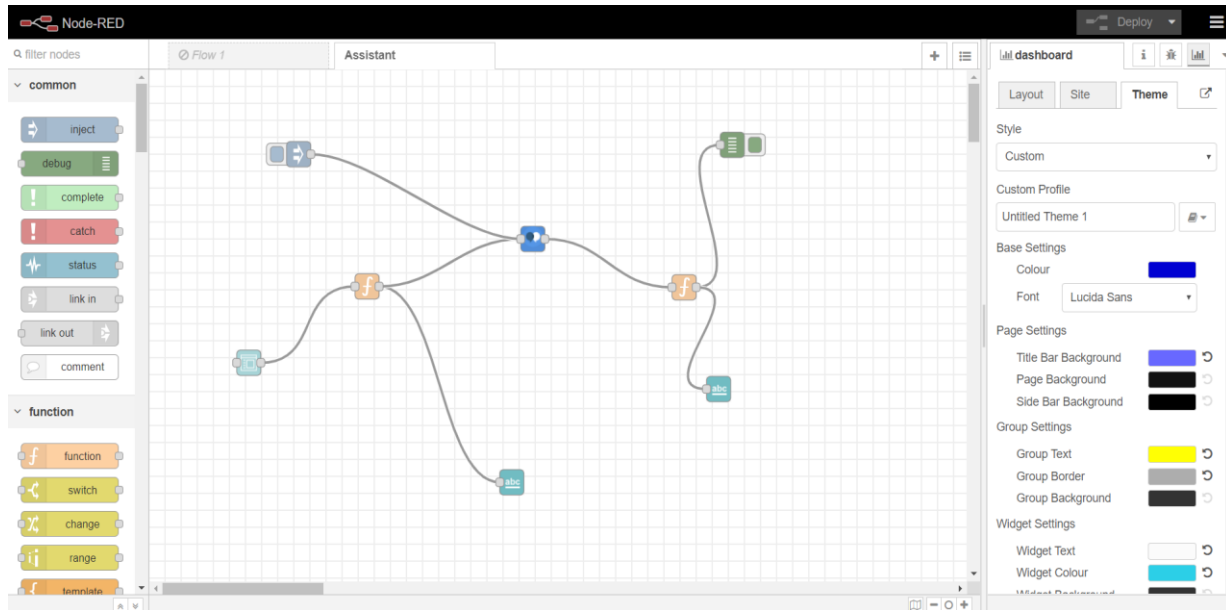


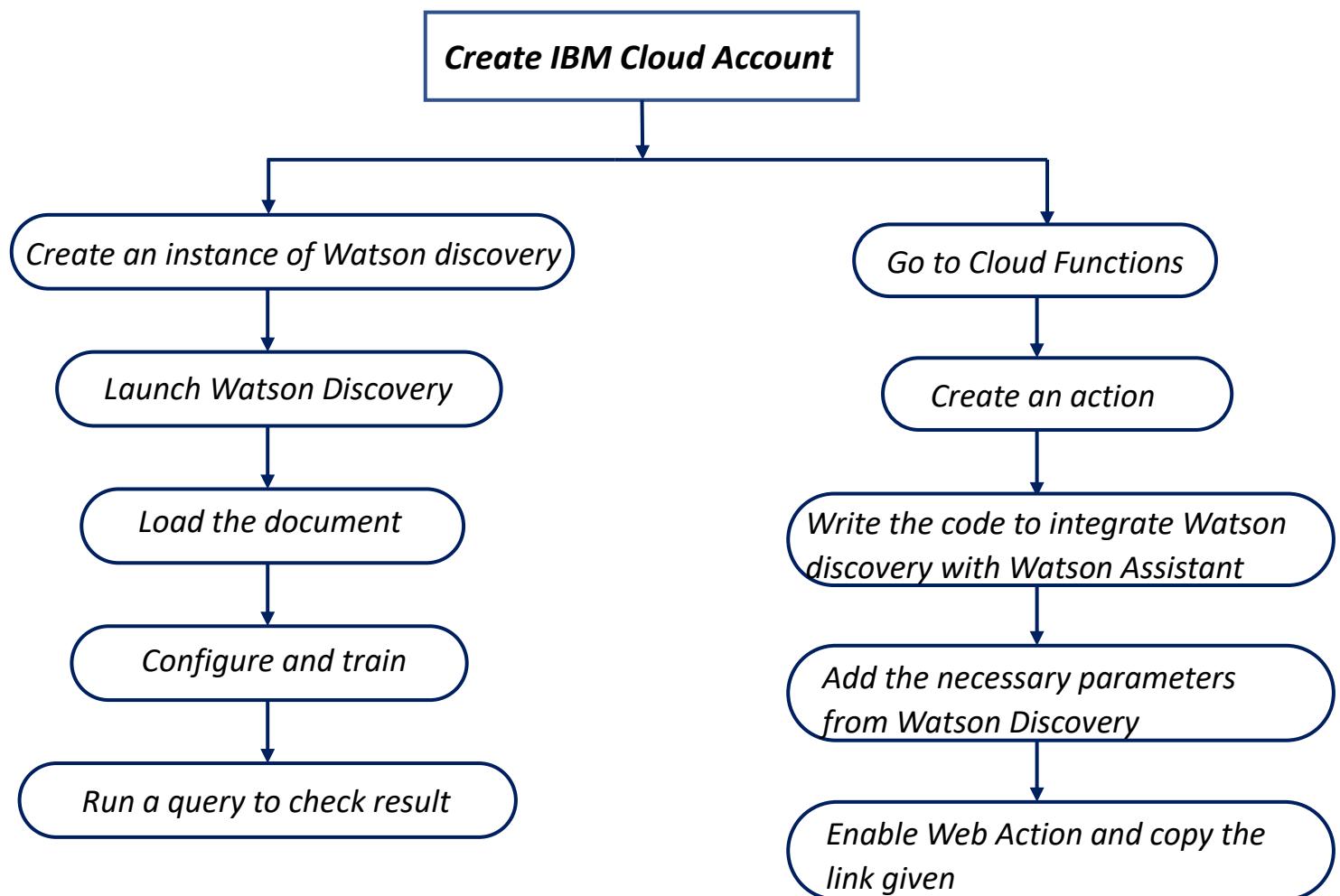
Figure 3:Node-RED flow

The image shows the Node-RED User Interface, which is a chat interface for a customer care bot. The interface has a blue header bar with the text 'Customer Care'. Below the header, there is a dark gray chat area. At the top of the chat area, there is a section titled 'User's Reply' in yellow. Below this title, there is a text input field with the placeholder text 'Enter the Input' and the text 'hey' entered. Below the input field, there are two buttons: 'SUBMIT' and 'CANCEL'. Below the buttons, there is a label 'Your Input' and the text 'hey'. Below the 'User's Reply' section, there is a section titled 'Bot's Reply' in yellow. Below this title, there is a text area containing the text 'Hello. How can I help this evening?'.

Figure 4: Node-RED User Interface

5 FLOWCHART

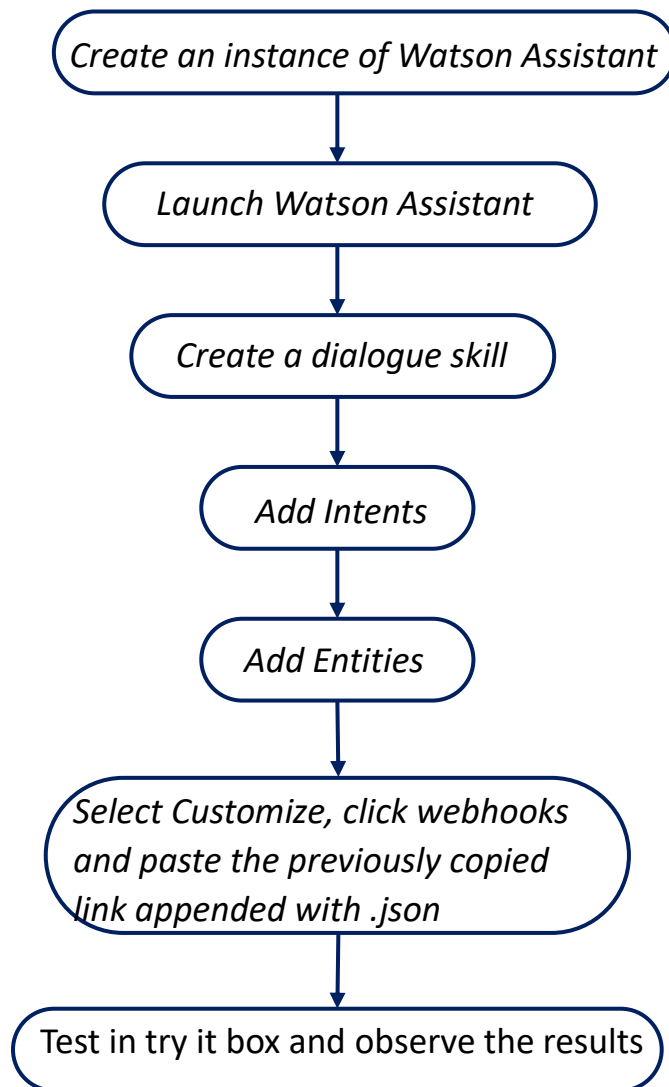
5.1 Step 1:



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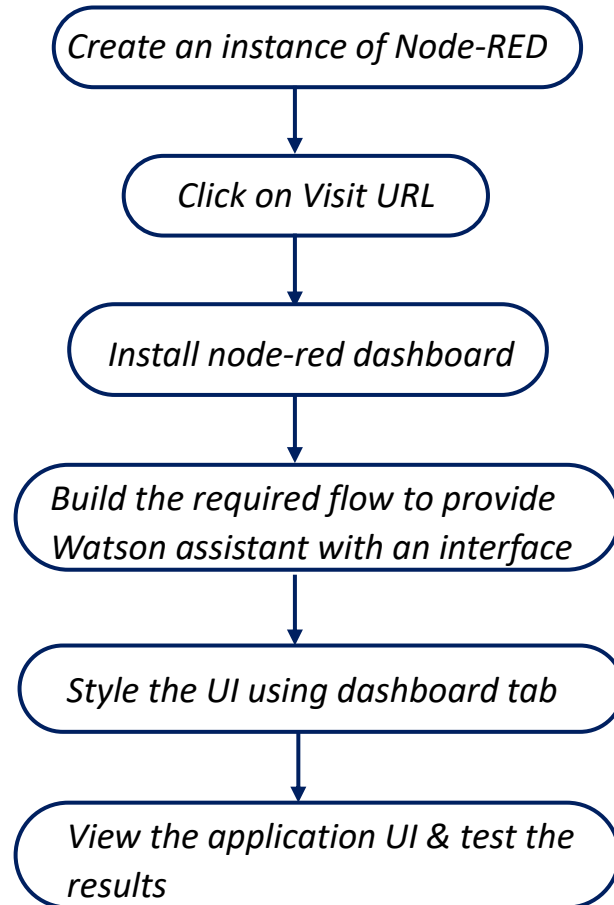
5.2 Step 2:



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5.3 Step 3:



6 RESULT

The Customer Help Desk is working with satisfactorily giving appropriate results to a customer's questions.

7 ADVANTAGE & DISADVANTAGES

Other than reducing man power and being cost efficient, a chat bot can provide with many other advantages like employees instead of providing answers to customer's questions and work on other projects.

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Like any other technology, there some disadvantages of using a chat bot. They can misguide a customer by providing incorrect details with may leave the customer unsatisfied, in turn losing the company its audience. Training a chat bot to work efficiently is a tedious task.

8 APPLICATIONS

- ✓ Used in chat applications like Facebook, Messenger, Slack and Telegram.
- ✓ OK Google is a chatbot that fetches information from the internet.
- ✓ Provide Customer Service.

9 CONCLUSION

Through this project, I learned about IBM Cloud Services, learned to build a chatbot using Watson Assistant and deploy on IBM Cloud. This internship proved to be fruitful and I thoroughly enjoyed every part of this journey.

10 FUTURE ENHANCEMENTS

We can improve our model by including more intents and entities in the Watson dialogue skill. Also we can add speech to text and text to speech services to improve customer experience.

11 BIBLIOGRAPHY APPENDIX

A SOURCE CODE:

The source code can be viewed using the following link-:

<https://github.com/SmartPracticeschool/IISPS-INT-296-Intelligent-Customer-Help-Desk-with-Smart-Document-Understanding>

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