

Smart Bridge Internship

Project Report

on

AI Powered News Search App

Done by

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-COIMBATORE

Table of Contents

1. Introduction.....	3
a. Overview	
b. Purpose	
2. Literature Survey.....	4
a. Existing Problem	
b. Proposed Solution	
3. Theoretical Analysis.....	5
a. Block Diagram	
b. Hardware/Software Designing	
4. Experimental Investigations.....	24
5. Flowchart.....	24
6. Result.....	25
7. Advantages and Disadvantages.....	26
8. Applications.....	26
9. Conclusion.....	26
10. Future Scope.....	27
11. Bibliography.....	27

12.Appendix.....	28
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a. Source code

GIT HUB : <https://github.com/vishzzl/smartbridgeinternship>

INTRODUCTION

1. Overview

The idea is to make finding and consuming news easier than ever, whilst providing an experience that's customized to each reader and supportive of media publications. Artificial Intelligence (AI) is taking the world by storm. This exciting technology an enormous range of applications in many industries. The AI element is designed to learn from what you read to help serve you a better selection of content over time, while the app is presented with a clear and clean layout.Enriched news data can help your application make dynamic connections across current events faster.

2 .Purpose

The purpose of this project is to develop a web application that meets the needs of the user to find the most relevant and recent news articles worldwide and update them regularly.

Since the discovery service is integrated with Slack, a bot is created and this bot gives the search news with a keyword described in search.

In addition, the web application also has the sentiment analyzes of the searched news article and extracts key words and concepts to make it easier for the user to understand the main content of the news which is important .This keyword provides an over view of the news content to the user in short.

Literature Survey

a.Existing Problem:

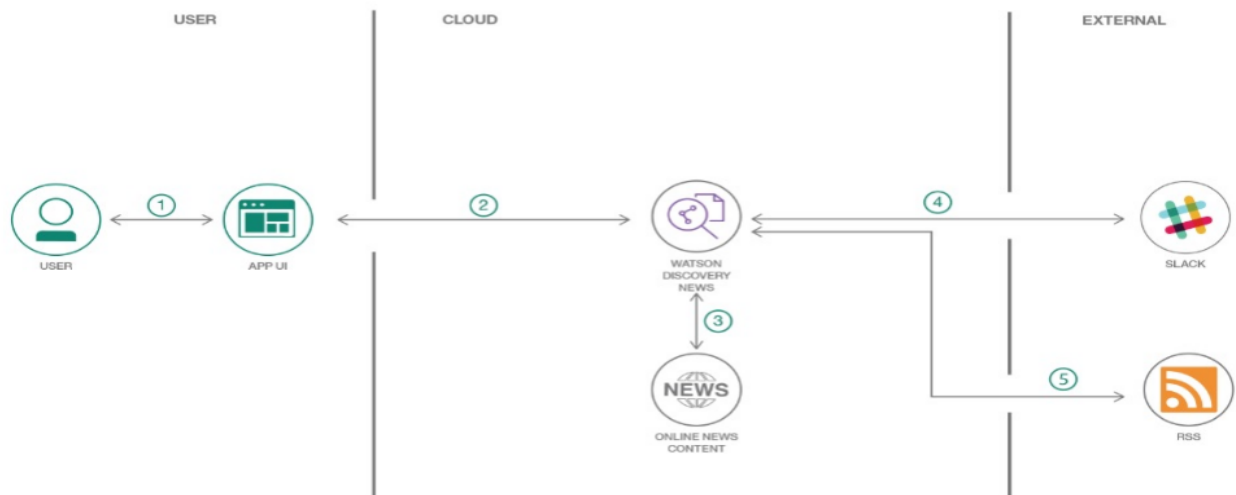
All current news applications does not provide sentimental analysis in most cases. These existing app can make the common man dazed as it contains immense news with multiple functions and inflate design layouts which is not needed here. These existing applications is not meeting the demands users for the latest news users why because they often get results of news from the past days, weeks and months which makes the users more confusing.Also, there is no way in these apps to know what the approximate feeling of the audience is regarding the article or news topic, which makes it less interactive and easy to use.

b.Proposed Solution:

In the proposed solution, we have included the sentimental anaysis. Sentiment analysis is a text analysis method that detects polarity (e.g. a *positive* or *negative* opinion) within text of the news which is helpful for the users .For this project, we have used the Discovery service available in the IBM cloud, creating a web app to get the latest news results is fast . When integrated with Red Node Flow, the IBM Discovery Service can create a simple, engaging, organized user interface that provides users with relevant news articles as Discovery Service continuously crawls the web for the latest news to provide.By adding this emotional analysis, we make the user interface more interactive and easier to understand.

Theoretical Analysis

a.Block Diagram:



The above block diagram demonstrates the user interactions with the user interface created through the red node application which produces the relevant topic about which user would like to get news.

The user interface integrated with the discovery service will use the service to present the most recent and relevant news articles, corresponding to what the user searched for. As our slack is also integrated with discovery, we can use our bot and ask it to search for news by typing in the keyword and the bot searches for news articles related to it.

b. Software Designing

The following Task are required to make the complete application with slack bot integration.

Project Tasks

1. Creating and deploying Watson discovery news app locally.
2. Integrating Slack-bot with Watson Discovery.
3. Creating node-red user Interface.
4. Integrating node-red UI with Watson Discovery.

Setting up the development Environment

1. Installing Git

Install Git on Windows. The most official build is available for download on the Git website. Just go to <https://git-scm.com/download/win> and the download will start automatically. Note that this is a project called Git for Windows, which is separate from Git itself.

2. Installing Node.js

Introduction

Node.js is a run-time environment which includes everything you need to execute a program written in JavaScript. It's used for running scripts on the server to render content before it is delivered to a web browser.

2.1.1 Download Node.js Installer

In a web browser, navigate to <https://nodejs.org/en/download/>

The installer will prompt you for the installation location. Leave the default location, unless you have a specific need to install it somewhere else – then click Next.

Verify Installation

Open a command prompt (or PowerShell), and enter the following:

```
1. node -v
```

The system should display the Node.js version installed on your system

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.17763.1217]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\surui>node -v
v12.16.3
```

3. Installing Node-RED

Introduction

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.

Installing Node-RED as a global module adds the command node-red to your system path. Execute the following at the command prompt:

```
1. npm install -g --unsafe-perm node-red
```

Adding A collection of Node-RED nodes for IBM Watson services:

```
1. npm install node-red-node-watson
```

[fig 2 shows the nodes that will be added](#)

Adding node-red-dashboard module:

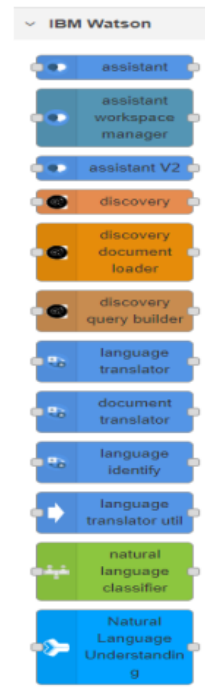
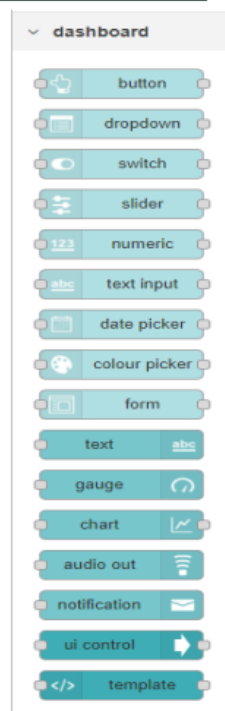
This module provides a set of nodes in Node-RED to create a live data dashboard quickly.

```
1. npm install node-red-dashboard
```


fig 1 shows the nodes that will be added

fig 1
node-red
dashboard

fig 2
watson
discovery
nodes



Task 1 Creating and deploying Watson discovery news app locally.

1.1 Creating Watson Discovery service on IBM cloud.

1. Pre-requisites : IBM cloud account.
1. About Watson Discovery: IBM Watson Discovery, we can ingest, normalize, enrich, and search your unstructured data (JSON, HTML, PDF, Word, and more) with speed and accuracy. It packages core Watson APIs such as Natural Language Understanding and Document Conversion along with UI tools that enable you to easily upload, enrich, and index large collections of private or public data.

Step 1: Login to IBM cloud account.

Step 2: Click 'Create resource' on your IBM Cloud dashboard.

Step 3: Search the catalog for Discovery.

Step 4: Click Discovery to launch the create panel.

Step 5: From the panel, enter a unique name, a region and resource group, and a plan type (select the default lite plan). Click Create to create and enable your service..

The next step is to configure your Watson Discovery service.

The screenshot shows the IBM Cloud console interface for creating a new Watson Discovery service. The top navigation bar includes the IBM Cloud logo, a search bar, and links to Catalog, Docs, Support, Manage, and the user's account (Richard Hagarty's Account). The main content area is titled 'Discovery Lite • IBM'. It features a descriptive paragraph about the service's capabilities, followed by links to 'View Docs', 'View API Docs', and 'Terms'. Below this is a metadata section showing 'AUTHOR: IBM', 'PUBLISHED: 05/07/2019', and 'TYPE: Service'. The configuration section includes a 'Service name' field with the value 'Discovery-ur', a 'Choose a region/location to deploy in:' dropdown set to 'Dallas', and a 'Select a resource group:' dropdown set to 'default'. There is also a 'Tags' field with the example 'env:dev, version-1'. A 'Features' section lists four key benefits: 'Rapid results', 'Domain Intelligence', 'AI ready for business', and 'Cloud Native, Enterprise Grade and Secure'. At the bottom, there is a 'Need Help? Contact IBM Cloud Support' link and two buttons: 'Add to estimate' and 'Create'.

IBM Cloud Search resources and offerings... Catalog Docs Support Manage Richard Hagarty's Account

← View all **Discovery** Lite • IBM

Add a cognitive search and content analytics engine to applications to identify patterns, trends and actionable insights that drive better decision-making. Securely unify structured and unstructured data with pre-enriched content, and use a simplified query language to eliminate the need for manual filtering of results.

[View Docs](#) [View API Docs](#) [Terms](#)

AUTHOR IBM
PUBLISHED 05/07/2019
TYPE Service

Service name: Discovery-ur

Choose a region/location to deploy in: Dallas Select a resource group: default

Tags: Examples: env:dev, version-1

Features

- Rapid results**
Spend less time struggling with your data. Automated ingestion and integrated natural language processing in a fully managed cloud service removes the complexity from dealing with natural language content.
- Domain Intelligence**
Adapt Discovery's understanding of your corpus with integrated machine learning to find the most relevant answers. Teach Discovery to apply knowledge of unique entities and relations in your industry or organization with Watson Knowledge Studio.
- AI ready for business**
Uncover deep connections throughout your data by using advanced AI functions out of the box, such as natural language queries, passage retrieval, relevancy training, relationship graphs and anomaly
- Cloud Native, Enterprise Grade and Secure**
Take advantage of enterprise-grade security and support, such as data isolation, end to end encryption, GDPR compliance and support for non-regulated PII data, built to scale on the cloud.

Need Help? [Contact IBM Cloud Support](#)

[Add to estimate](#) [Create](#)

1.2 Configuring Watson Discovery service on IBM cloud.

Step 1: Find the Discovery service in your IBM Cloud Dashboard.

Step 2: Click on the service and then click Launch tool

The Watson Discovery News data collection is already associated with your service. You'll use this collection as the data source for your app. To access the collection, you must find the **COLLECTION_ID** and **ENVIRONMENT_ID**. To find these values:

Step 3: Click on the collection from the Manage Data panel. In this case, it is named Watson Discovery News.

Step 4: Click on the drop-down icon located in the top right corner of the panel.

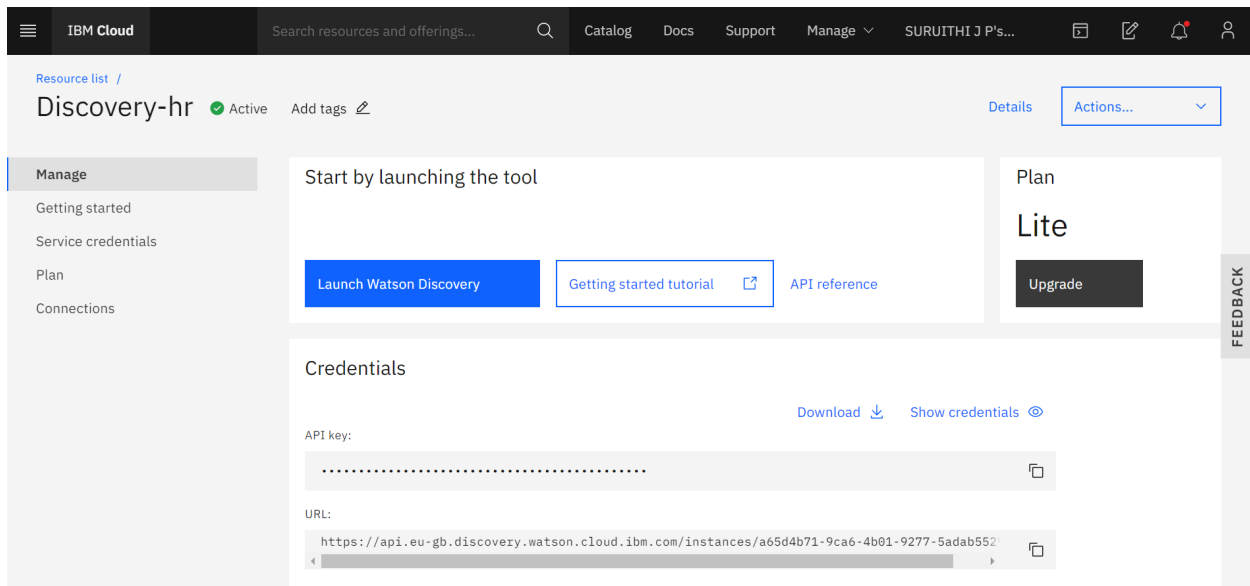
The screenshot displays the IBM Watson Discovery web interface. At the top, a black header bar contains the 'IBM Watson Discovery' logo, 'Cookie Preferences', and an 'Instance:' dropdown set to 'Discovery-hr'. The main content area is titled 'Watson Discovery News (English)' and features a large, bold number '13,459,182' representing the number of documents. Below this, a table lists 'New articles per day' for various languages: English (200,000), Spanish (20,000), German (12,000), and French (23,000). To the right, a section titled 'Added 5 enrichments to your data' shows 'Entity Extraction' results for 'United States', 'Facebook', 'Twitter', 'official', and 'U.S.'. Below this, a 'Sentiment Analysis' section displays three percentages: 52%, 5%, and 42%. On the far right, a panel titled 'Now you're ready to query:' offers two options: 'Company acquisitions relating to artificial intelligence' and 'Top 20 recently acquired artificial intelligence companies', each with a 'Run' button. A dropdown menu is open in the top right corner, showing the 'Collection ID' as 'news-en' and the 'Environment ID' as 'system'.

1.3 Saving Watson Discovery credentials.

you'll need to add the Watson Discovery credentials to the .env file Later.

Step 1: Locate the service credentials listed on the home page of your Discovery service.

Step 2: click on the download link and save the file.



1.4 Deploying Watson-discovery-news App locally.

Note: Since deploying App on IBM cloud is not possible with Lite account so we deploy locally on your machines.

Step 1: Use the following command to clone the Watson-discovery-news GitHub repository.

```
1. git clone https://github.com/ibm/watson-discovery-news
```

Step 2 : Use the following command to create .env file

```
1. copy env.sample .env
```

Step 3: Use the following command to Enter Watson discovery service credentials in .env file

step to download credentials [here](#)

Copy paste the credentials from downloaded file to .env.

```
1. Notepad .env
```

Step 4: Installing packages and dependencies

A package is a folder containing a program described by a package.json file

This command installs a package, and any packages that it depends on.

```
1. npm install
```

```
Thank you for using core-js ( https://github.com/zloirock/core-js ) for polyfilling JavaScript standard library!

The project needs your help! Please consider supporting of core-js on Open Collective or Patreon:
> https://opencollective.com/core-js
> https://www.patreon.com/zloirock

Also, the author of core-js ( https://github.com/zloirock ) is looking for a good job -)

> core-js@2.6.10 postinstall C:\Users\user\Desktop\smartbridge\watson-discovery-news\node_modules\babel-runtime\node_modules\core-js
> node postinstall || echo "ignore"

> nodemon@1.18.9 postinstall C:\Users\user\Desktop\smartbridge\watson-discovery-news\node_modules\nodemon
> node bin/postinstall || exit 0

Love nodemon? You can now support the project via the open collective:
> https://opencollective.com/nodemon/donate

npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.9 (node_modules\fsevents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@1.2.9: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"})

added 1496 packages from 818 contributors in 617.718s
```

Step 5: Running the deployed app.

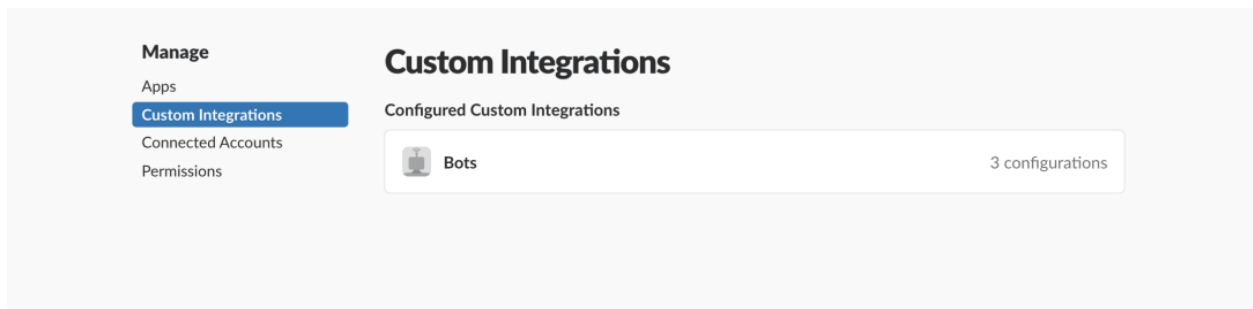
```
1. npm start
```

Task 2 Integrating Slack bot with Watson discovery news app.

To integrate a new Slack Bot into your existing Slack team, navigate to <https://<my.slack.com>/apps/manage/custom-integrations>, where <my.slack.com> is the Slack workspace you want to customize.

2.1 Creating slack bot

Step 1: From the Cutsom Integrations page, select the Bots option.



Step 2: To add a new bot, select the Add Configuration button.

[< Browse apps](#)



Add to Slack

App help

Terms

Report this app to Slack for inappropriate content or behaviour.

Bots

[App info](#) [Settings](#) [Security & compliance](#)

This app was made by Slack.

This app was made by a member of the Slack team to help connect Slack to a third-party service. These Slack apps might not be tested, documented or supported by Slack in the way we support our core offerings, such as Slack Enterprise Grid and Slack for Teams. You can provide feedback about these apps by emailing feedback@slack.com.

It only uses data Slack already has access to (view our [privacy policy](#) to learn more). By enabling and/or using this app, you might be connecting to a service that is not part of Slack.

Configurations



Connect to Slack as jpnewsapp
[rooban9420](#) on 14 May 2020



Connect to Slack as suruithinewsapp
[rooban9420](#) on 10 May 2020



Step 3: Enter a username for the bot and click Add bot integration.

[Browse apps](#) > [Custom integrations](#) > [Bots](#) > [New configuration](#)



Bots

Connect a bot to the Slack Real Time Messaging API.

Run code that listens and posts to your Slack team just as a user would.

Username

Start by choosing a username for your bot


suruithinewsapp

Username must be all lower case. They cannot be longer than 21 characters and can only contain letters, numbers, full stops, hyphens and underscores. Most people choose to use their first name, last name, nickname or a combination of those with initials.

Add bot integration

By creating a bot integration, you agree to the [Slack API terms of service](#).

Step 4: Once created, save the API Token that is generated.

**Bots**

Added by rooban9420 on 10th May 2020

Disable • Remove

Run code that listens and posts to your Slack team just as a user would.

Setup instructions

Please refer to our [bot user API documentation](#), which tells you everything you need to know about setting up a bot integration.


Integration settings

API token

The library you are using will want an API token for your bot.

xoxb-1113222485445-1127226446705-YttMjjBKKoePSG0PhyzFpdNQ

Regenerate

 Be careful when sharing bot user tokens with applications. Do not publish bot user tokens in public code repositories. [Review token safety tips.](#)

Customise name

Choose the username for this bot.

suruithinewsapp

Usernames must be all lower case. They cannot be longer than 21 characters and can only contain letters, numbers, full stops, hyphens and underscores. Most people choose to use their first name, last name, nickname or a combination of those with initials.

2.2 Configuring slack bot

Step 1: Edit the .env file and enter the Slack Bot API Token saved in the previous step.

```
# Slack
SLACK_BOT_TOKEN=<slack_bot_token>
#note paste token without the brackets
```

Step 2: Restart application

```
1. npm start
```

Sample output on cmd:

```
54 packages are looking for funding
  run `npm fund` for details

found 6 vulnerabilities (5 low, 1 moderate)
  run `npm audit fix` to fix them, or `npm audit` for details

surui@DESKTOP-31741JN MINGW64 ~/Desktop/watson-discovery-news-master (master)
$ npm start

> watson-discovery-news@1.0.0 start C:\Users\surui\Desktop\watson-discovery-news-master
> node --max_old_space_size=512 app.js

Initializing Botkit v0.7.5
info: ** No persistent storage method specified! Data may be lost when process shuts down.

*****
* WARNING: Your bot is operating without recommended security mechanisms in place. *
* Initialize your Botkit controller with a clientSigningSecret paramter to enable *
* verification that all incoming webhooks originate with Slack: *
* *
* var controller = new Botkit.slackbot({clientSigningSecret: <my secret from slack>}); *
* *
*****
>> Botkit docs: https://botkit.ai/docs/readme-slack.html#securing-outgoing-webhooks-and-slas
>> Slack docs: https://api.slack.com/docs/verifying-requests-from-slack

Watson Discovery News Server running on port: 3000
notice: ** BOT ID: jpnewsapp ...attempting to connect to RTM!
notice: RTM websocket opened
```

Bot on slack:

Suruithi ▾
● rooban9420

↑ Show less

▼ Channels +

- # general
- # newsapp
- # random

+ Add a channel

▼ Direct messages +

- ♥ Slackbot
- rooban9420 (you)

+ Invite people

▼ Apps +

- jpnewsapp
- suruithinewsapp

#random ☆
👤 1 | Non-work banter and water cooler conversation

Thursday, 14 May ▾

rooban9420 20:03
@suruithinewsapp hi

suruithinewsapp APP 20:03
Hello.

rooban9420 20:05
news please

suruithinewsapp APP 20:06
Hi there!
What news are you interested in?

rooban9420 20:09
@suruithinewsapp cricket news

suruithinewsapp APP 20:09
You want me to search for news articles about **cricket news**?

Message #random

⚡ | B I 🔗 </> 🔗 🔗 🔗 🔗 🔗 🔗

Suruithi ▾
● rooban9420

↑ Show less

▼ Channels +

- # general
- # newsapp
- # random

+ Add a channel

▼ Direct messages +

- ♥ Slackbot
- rooban9420 (you)

+ Invite people

▼ Apps +

#random ☆
👤 1 | Non-work banter and water cooler conversation

Thursday, 14 May ▾

suruithinewsapp APP 20:09
OK searching...

Here are some news articles...

<https://www.dawn.com/news/1545108> (edited)

DAWN.COM
PCB set to unveil formation of new bodies
PCB has to announce the office-bearers of the six provincial and 90 city cricket associations in domestic structure.
31 Mar

<https://news.abplive.com/sports/new-zealand-cricket-board-initiate-e-awards-ceremony-for-their-annual-cricket-awards-1207019> (edited)

news.abplive.com
New Zealand Cricket Board Initiate E- Awards Ceremony For Their Annual Cricket Awards
During the Covid-19 induced stay at home norms, the 2020 New Zealand Cricket Awards will be for the first time will be given electronically . The Award ceremony has been broken into parts and will start from Tuesday and continue till Friday with a

Details

Task 3 Creating App user interface using node-red

Step 1. Find the Node-RED Starter in the IBM

steps to create a Node-RED Starter application in the IBM Cloud are:

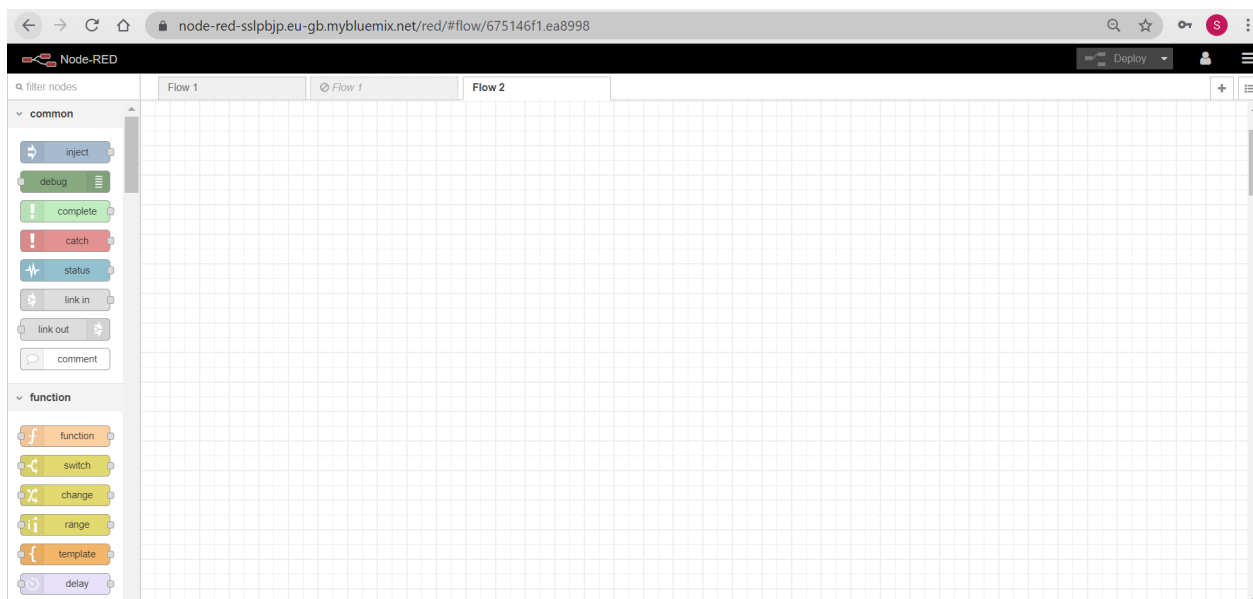
1. Log in to [IBM Cloud](#).
2. Open the catalog and search for **node-red** .
3. Click on the **Software** tab .
4. Click on the **Node-RED App** tile .
5. Click on the **Create app** button .

Step 2. Configure your application

Step 3. Enable the Continuous Delivery feature

Step 4. Open the Node-RED application

Step 5. Configure your Node-RED application



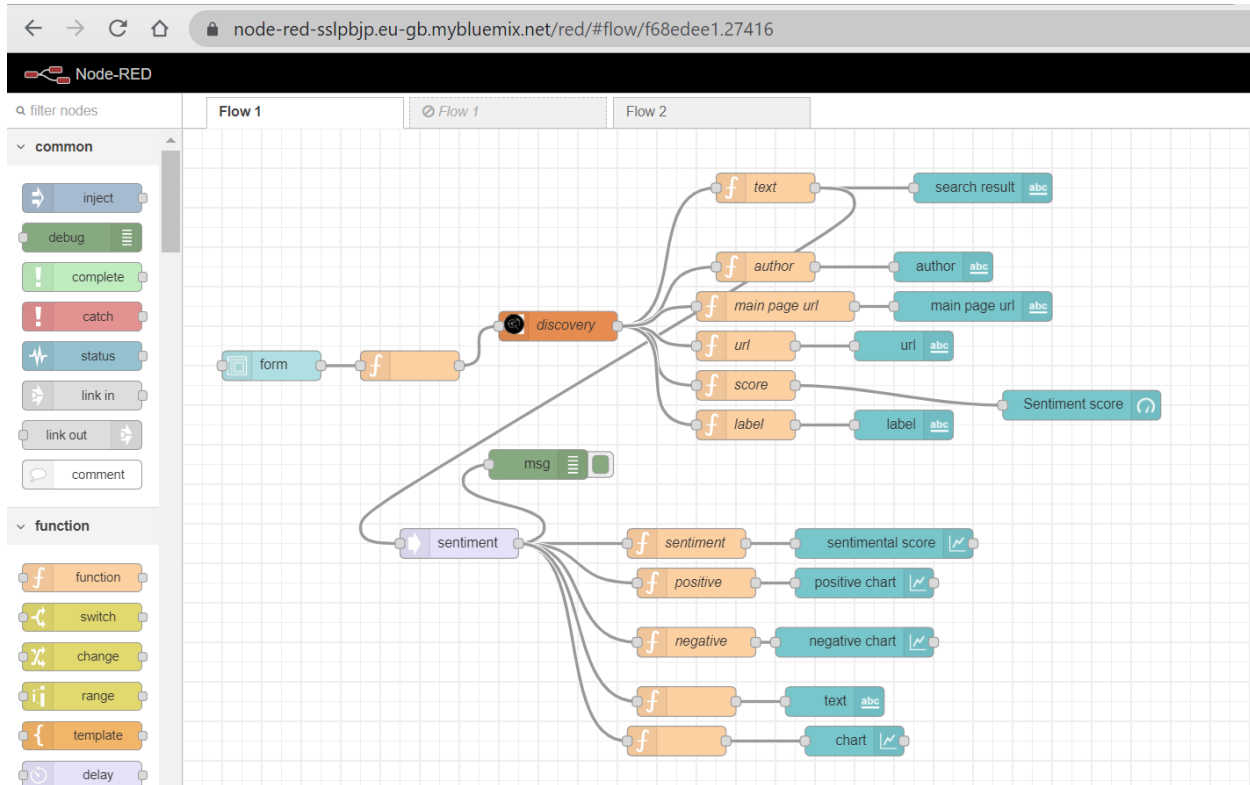
Step 6. Add extra nodes to your Node-RED palette

Step 2: Node-red flow for Watson discovery news

A **flow** is represented as a tab within the editor workspace and is the main way to

organize **nodes**. **Flow** tabs.

Drag and drop the nodes from the nodes from palette then connect using wire



Nodes used:

1. Form node
2. Function node
3. Query node
4. Template node
5. gauge node
6. chart node

Step 3: Configuring the nodes

1. Form node

Edit form node

Delete

Cancel

Done

Properties

Group

[Home] jp

Size

14 x 4

Label

optional label

Form elements

Label	Name	Type	Required	Rows	Remove
Enter the input	Input	Text	<input checked="" type="checkbox"/>		

+ element

Buttons

submit

cancel

Topic

optional msg.topic

1. Input function node

Edit function node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🖼

🔑 Name

Name

📄 ▼

🔧 Function

↗

1 ▾ msg={

2 discoveryparams:

3 ▾ {

4 "environment_id":"system",

5 "query":msg.payload.Input

6 ^ }

7 ^ }
i

8 return msg;

Query node configuration is shown in the next [Task](#)

1. Output function node:

Edit function node

Delete

Cancel

Done

⚙️ Properties

⚙️

📄

🖼️

🔑 Name

Output function

📄

🔧 Function

↗️

1

2 msg.payload=msg.search_results.results;

3 return msg;

4

Task 4 Integrating Watson discovery service with UI

1. Configuring discovery node:

Edit discovery node

Delete

Cancel

Done

⚙ Properties

⚙

📄

🔍

🔑 Name

discovery

👤 Username

suruithi

🔑 Password

.....

🔑 API Key

.....

🔑 Service Endpoint

https://api.eu-gb.discovery.watson.cloud.ibm.co

📖 Method:

Search in collection ▼

🔑 Environment ID

system

🔑 Collection ID

news-en

🔑 Number of documents

1

☒ Passages

☒ Query in Plain Language

🔑 Query for Search

☐ Enabled

Page No : 25

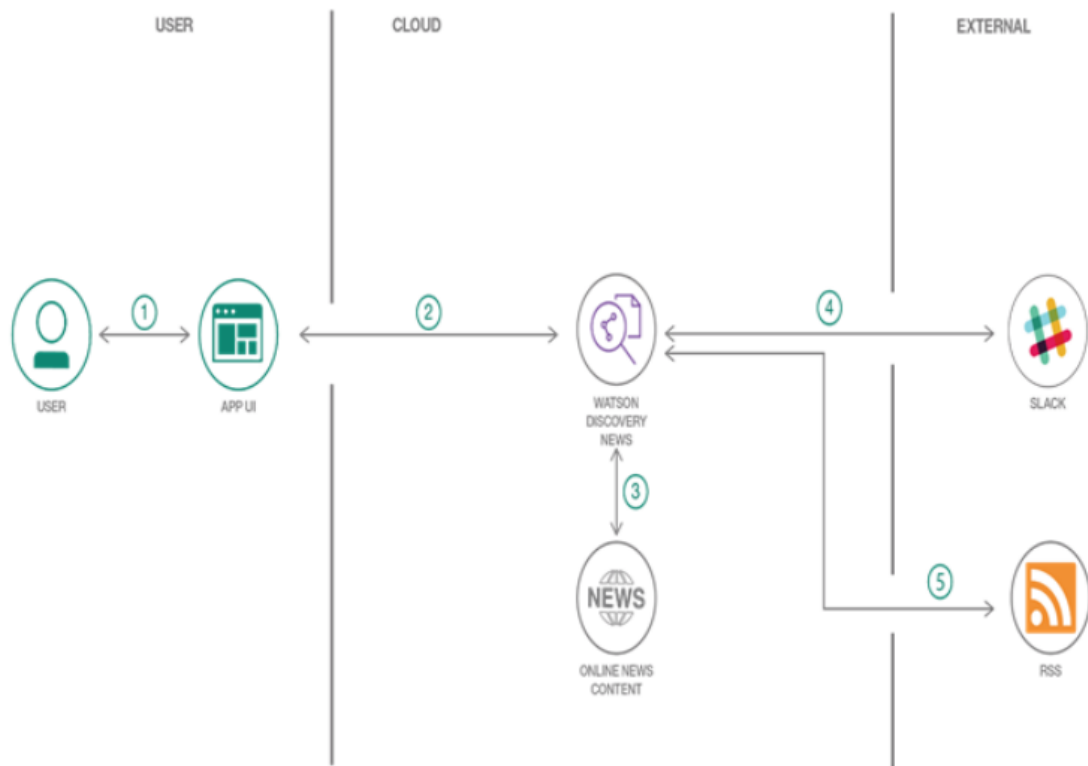
Password , API key , Service Endpoint can be found in the IBM credentials file downloaded [here](#)

Experimental Investigation

First we use the discovery service to configure and query adding our collection. A red node application is created in which the discovery is integrated and a simple flow of 5 nodes is created to enter the news topic and the results show related news.

Slack then integrates with Watson's discovery service so that news articles can be searched on more than one platform, and finally sentiment analysis is performed on the data / news articles being searched.

Flowchart



Result

Bot on slack:

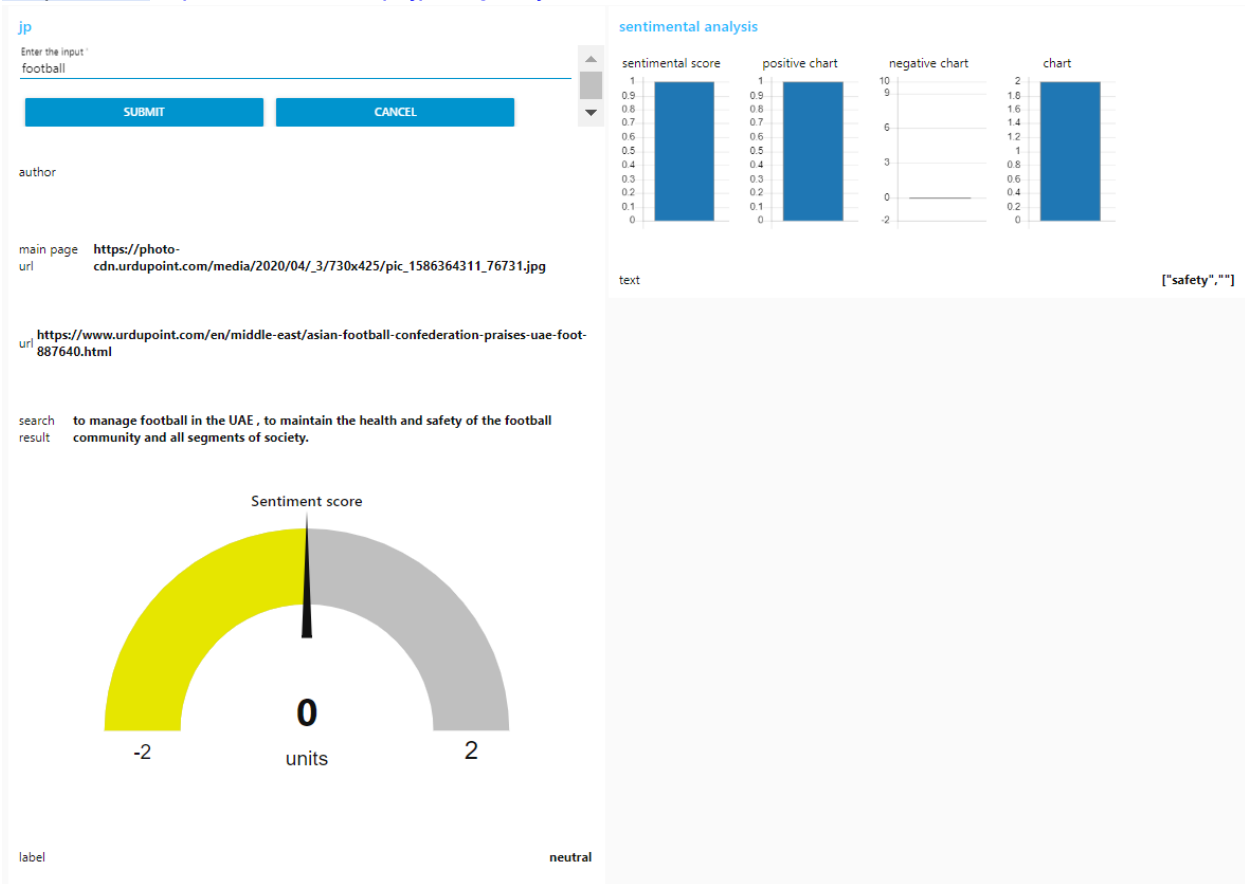
The first screenshot shows a Slack interface with a sidebar on the left containing a list of channels: #general, #newsapp, #random (selected), and direct messages. The main window shows a conversation in the #random channel. A user named rooban9420 asks for news, and the bot suruithinewsapp responds with a search query for cricket news.

The second screenshot shows the same Slack interface, but the bot has returned search results for cricket news articles. The results include links to DAWN.COM and news.abplive.com, both reporting on the New Zealand Cricket Board's initiative to award players electronically.

The Watson discovery application will be able to fetch relevant news articles within milliseconds, provide sentiment analysis on the fetched data, extract features, concepts, and keywords in the data all in the form of a simple UI.

User Interface can be found at <http://localhost:1880/ui/>

Output URL: https://node-red-sslpbjp.eu-gb.mybluemix.net/ui/#!/0?socketid=XvXeEX6V_SxE0FDrAAAB



Advantages and Disadvantages

1. The web application provides interactive sentiment analysis.
2. It can be accessed through more than one platform that is through slack.
3. It collects and delivers the most recent data.
4. It does not have additional features like storing news history.
5. It does not provide a stand-alone app rather uses a web application.

Applications

1. This web applications can be used by any user in need of accurate and fast results.
2. Can be used by firms and organizations.
3. Can be used in stock market to make predictions.

Conclusion

This project gives some basic working knowledge of the Watson Discovery Service and showed you how to use Discovery along with JavaScript and Node.js to build your own news mining web application. It also gives insight into real-world applications of AI and helps us understand Slack better.

Future Scope

1. The web application van be integrated with cloud and made into a mobile app to use it on-the-go.

2. Additional sentiments can be added in the UI.
3. Related and trending news topics can be shown to the user.

Bibliography

1. <https://github.com/IBM/watson-discovery-news/>
1. <https://nodered.org/>
1. <https://slack.com/intl/en-in/help/articles/360002079527-A-guide-to-Slack%E2%80%99s-Discovery-APIs>
2. <https://www.w3schools.com/>

