Smart Bridge Internship

Project Report
on

AI Powered News Search App

by

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GIT HUB : https://github.com/ThasthuThilak/smartintern

Introduction

1. Overview

The web is home to massive amounts of data, with more being created every day. Organizations can harness this constant stream of information to gain understanding, plan strategies, and find opportunities. 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 fulfils our need to find the obvious and recent news articles and update them regularly.

After the discovery service is integrated with Slack Workspace, it gives a bot as an intermediate to search news with a keyword.
In addition, the web application also analysis the sentimental present in the news article and extracts key words and concepts to make it attractive and understandable format for the user to understand what is important and what is not.

Literature Survey

Existing Problem

News applications which are currently using is confusing the usres, with multiple functions and overflow of design, these applications still do not fulfil the demand of the news users and often get results from the past days, weeks and months, which confuses the users only.

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 very low number of users.

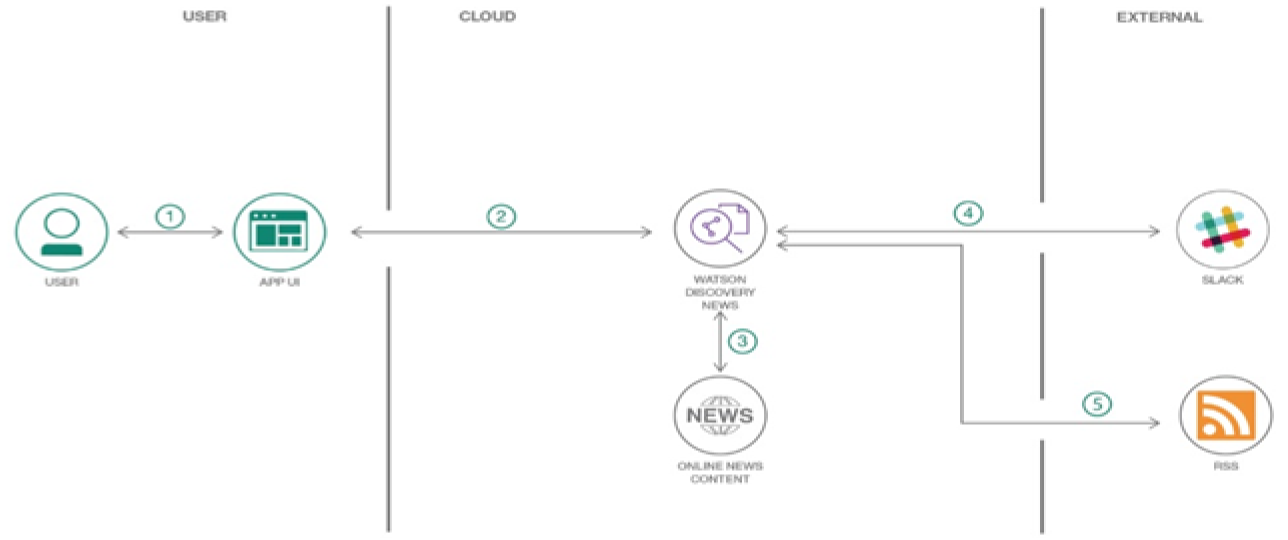
Proposed Solution

Discovery service available in the IBM cloud, creating a web app to get the latest and obvious news results fast and user friendly. 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 emotional analysis, we make the user interface more interactive, easier to understand and attain more number of users.

Theoretical Analysis

Block Diagram



1. The user interacts with the app UI(Built with Node-RED or Cloud or Local) to request relevant news content.
2. The app sends user requests to Watson Discovery News.
3. The Watson Discovery Service is continually crawling the web to update its Discovery News collection.
4. The Watson Discovery Service responds to Slack search requests.

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/

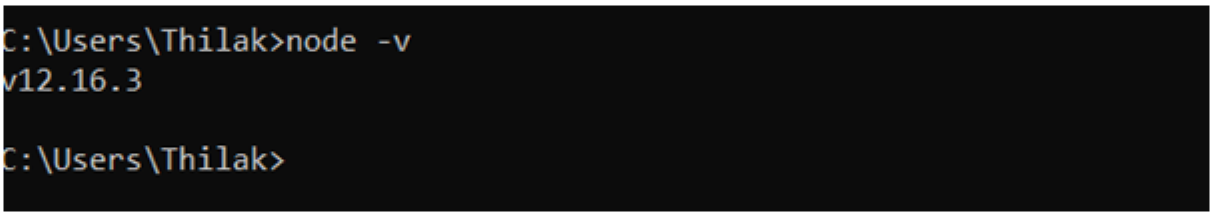
The installer will prompt you for the installation location. Leave the default location, unless you have a specific need to install it somewhere else – then click Next.

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:\Users\Thilak>node -v
v12.16.3

C:\Users\Thilak>
```

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

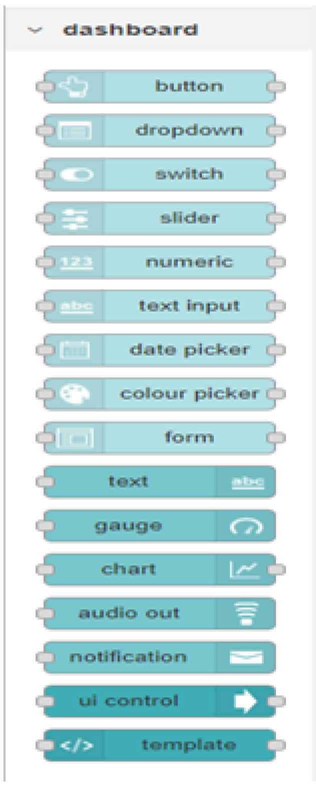
fig 2 shows the nodes that will be added

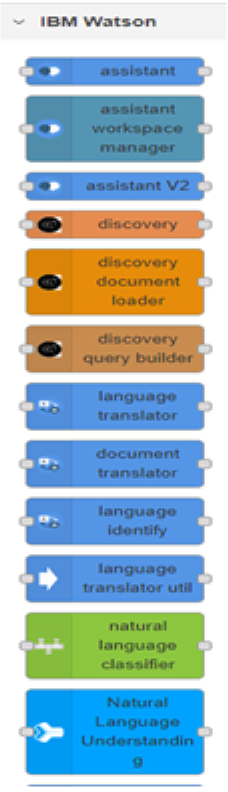
Adding node-red-dashboard module:

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





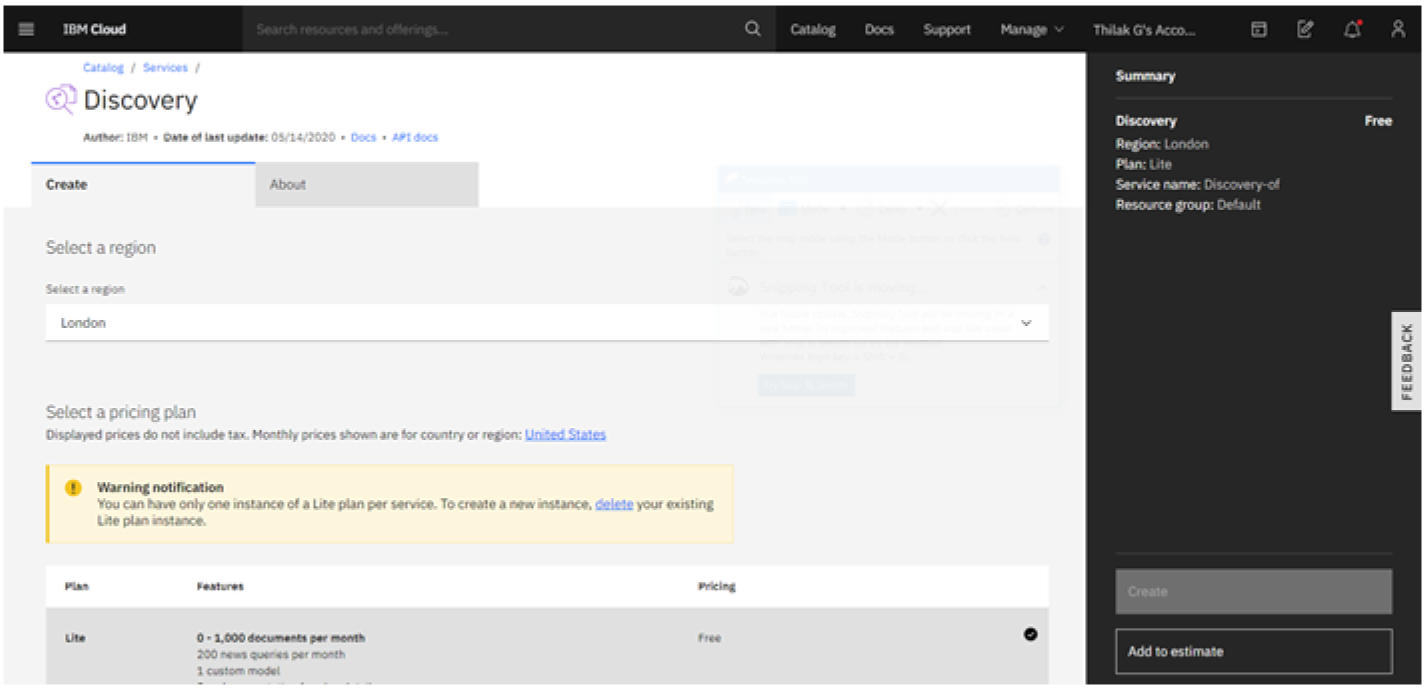
Task 1 Creating and deploying Watson discovery news app locally.

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 catalogue 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.



Author: IBM • Date of last update: 05/14/2020

Select a region

Select a region: London

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: United States

Warning notification
You can have only one instance of a Lite plan per service. To create a new instance, delete your existing Lite plan instance.

Plan	Features	Pricing
Lite	0 - 1,000 documents per month 200 news queries per month 1 custom model	Free

Summary

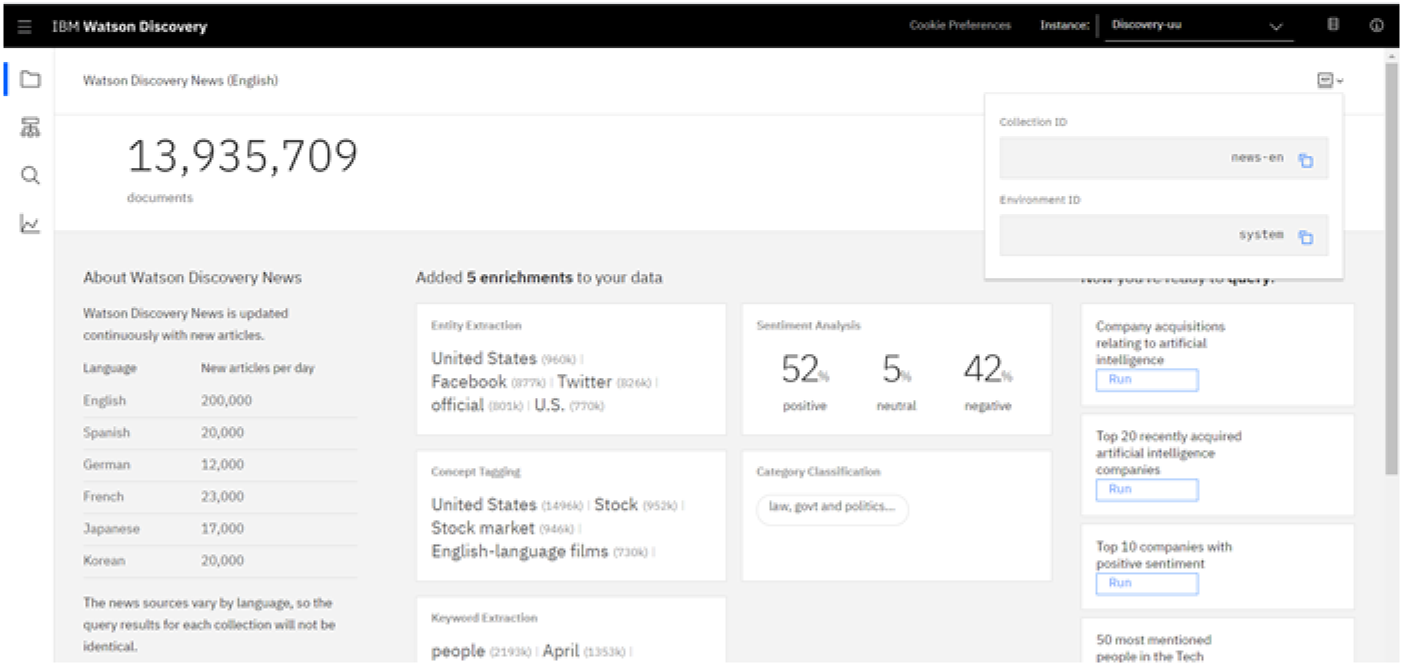
Discovery — Free
Region: London
Plan: Lite
Service name: Discovery-of
Resource group: Default

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.



Watson Discovery News (English)

13,935,709
documents

Collection ID
news-en

Environment ID
system

About Watson Discovery News

Watson Discovery News is updated continuously with new articles.

Language	New articles per day
English	200,000
Spanish	20,000
German	12,000
French	23,000
Japanese	17,000
Korean	20,000

The news sources vary by language, so the query results for each collection will not be identical.

Added **5 enrichments** to your data

Entity Extraction
United States (960k) | Facebook (877k) | Twitter (826k) | official (801k) | U.S. (770k)

Sentiment Analysis
52% positive
5% neutral
42% negative

Concept Tagging
United States (1496k) | Stock (952k) | Stock market (946k) | English-language films (730k) |

Category Classification
law, govt and politics...

Keyword Extraction
people (2193k) | April (1353k) |

Company acquisitions relating to artificial intelligence
Run

Top 20 recently acquired artificial intelligence companies
Run

Top 10 companies with positive sentiment
Run

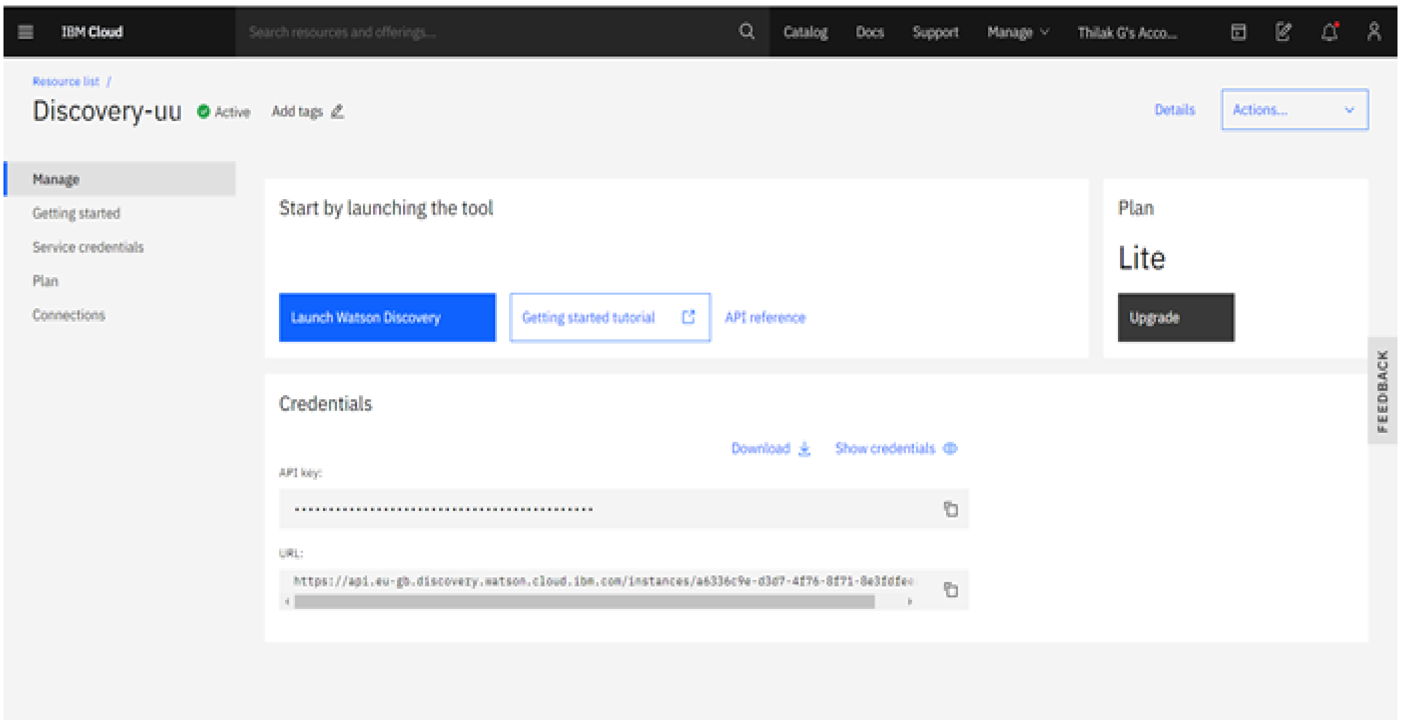
50 most mentioned people in the Tech

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.



Discovery-uu Active Add tags

Start by launching the tool

Plan
Lite

Credentials

API key:
....

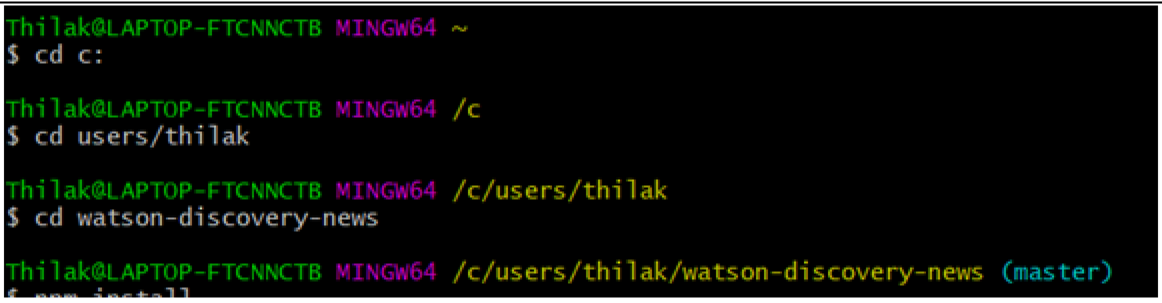
URL:
https://api.eu-gb.discovery.watson.cloud.ibm.com/instances/a6336c9e-d3d7-4f76-8f71-8e3fdfe

1.4 Deploying Watson-discovery-news App locally.

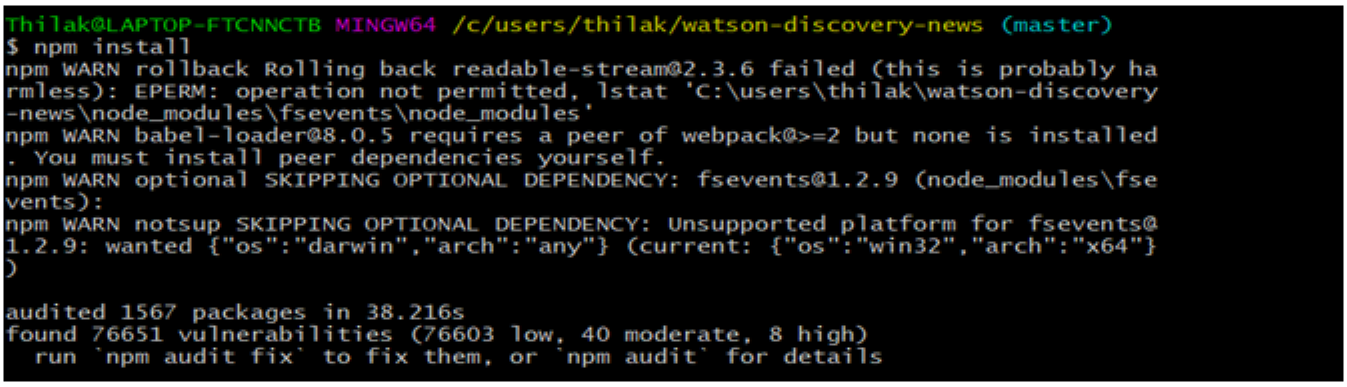
Note: Since deploying App on IBM cloud is not possible with Lite account so we deploy locally on your machines.

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

```
GIT CLONE HTTPS://GITHUB.COM/IBM/WATSON-DISCOVERY-NEWS
```



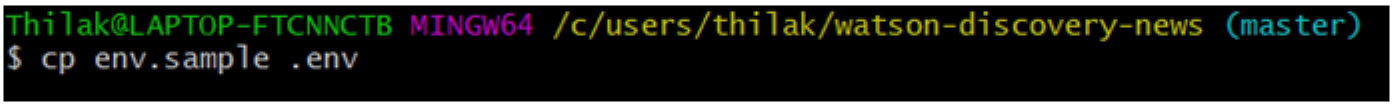
```
Thilak@LAPTOP-FTCNNCTB MINGW64 ~
$ cd c:

Thilak@LAPTOP-FTCNNCTB MINGW64 /c
$ cd users/thilak

Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak
$ cd watson-discovery-news

Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak/watson-discovery-news (master)
$ npm install
```



```
Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak/watson-discovery-news (master)
$ npm install
npm WARN rollback Rolling back readable-stream@2.3.6 failed (this is probably ha
rmless): EPERM: operation not permitted, lstat 'C:\users\thilak\watson-discovery
-news\node_modules\fsevents\node_modules'
npm WARN babel-loader@8.0.5 requires a peer of webpack@>=2 but none is installed
. You must install peer dependencies yourself.
npm WARN optional SKIPPING OPTIONAL DEPENDENCY: fsevents@1.2.9 (node_modules\fse
vents):
npm WARN notsup SKIPPING OPTIONAL DEPENDENCY: Unsupported platform for fsevents@
1.2.9: wanted {"os":"darwin","arch":"any"} (current: {"os":"win32","arch":"x64"}
)

audited 1567 packages in 38.216s
found 76651 vulnerabilities (76603 low, 40 moderate, 8 high)
  run `npm audit fix` to fix them, or `npm audit` for details
```

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

1. copy env.sample .env



```
Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak/watson-discovery-news (master)
$ cp env.sample .env
```

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

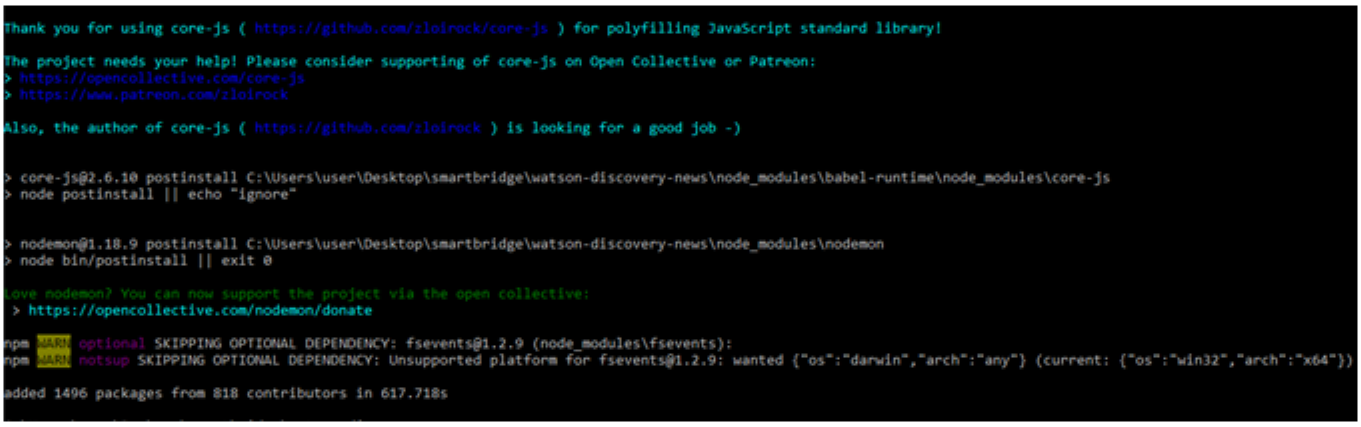
1. Notepad .env

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.

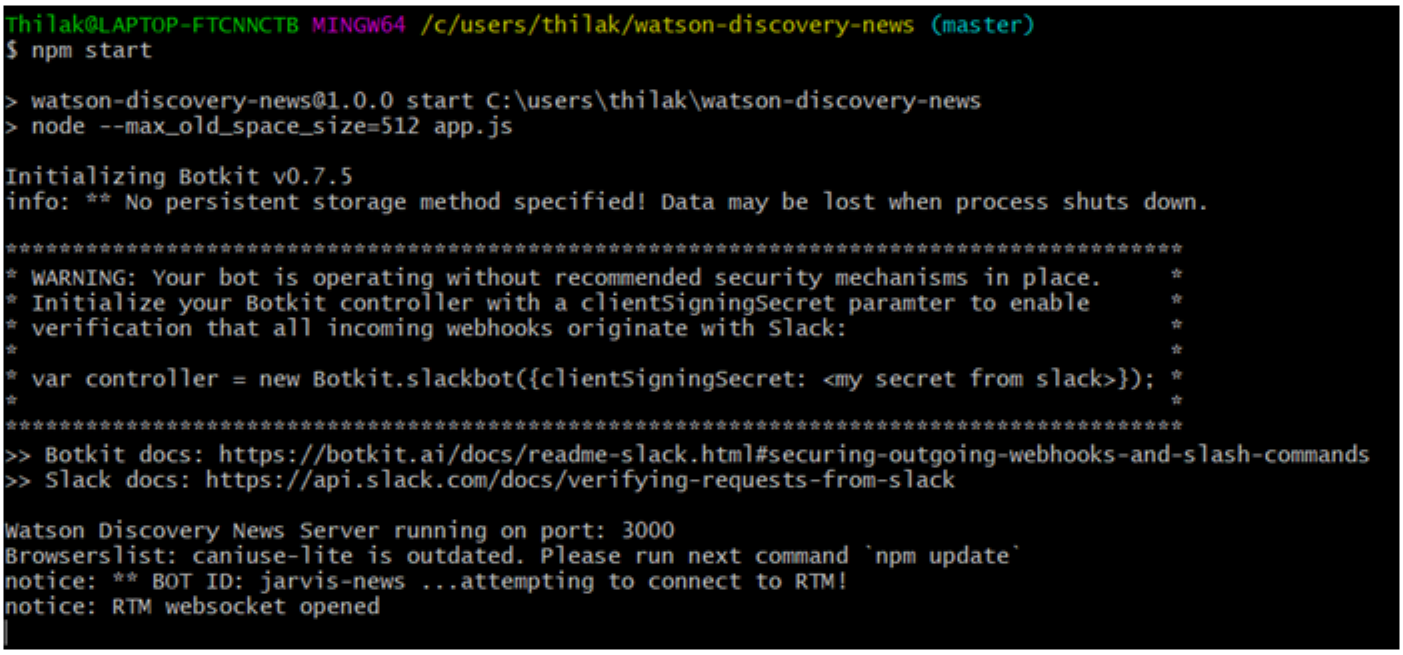
1. npm install



```
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.

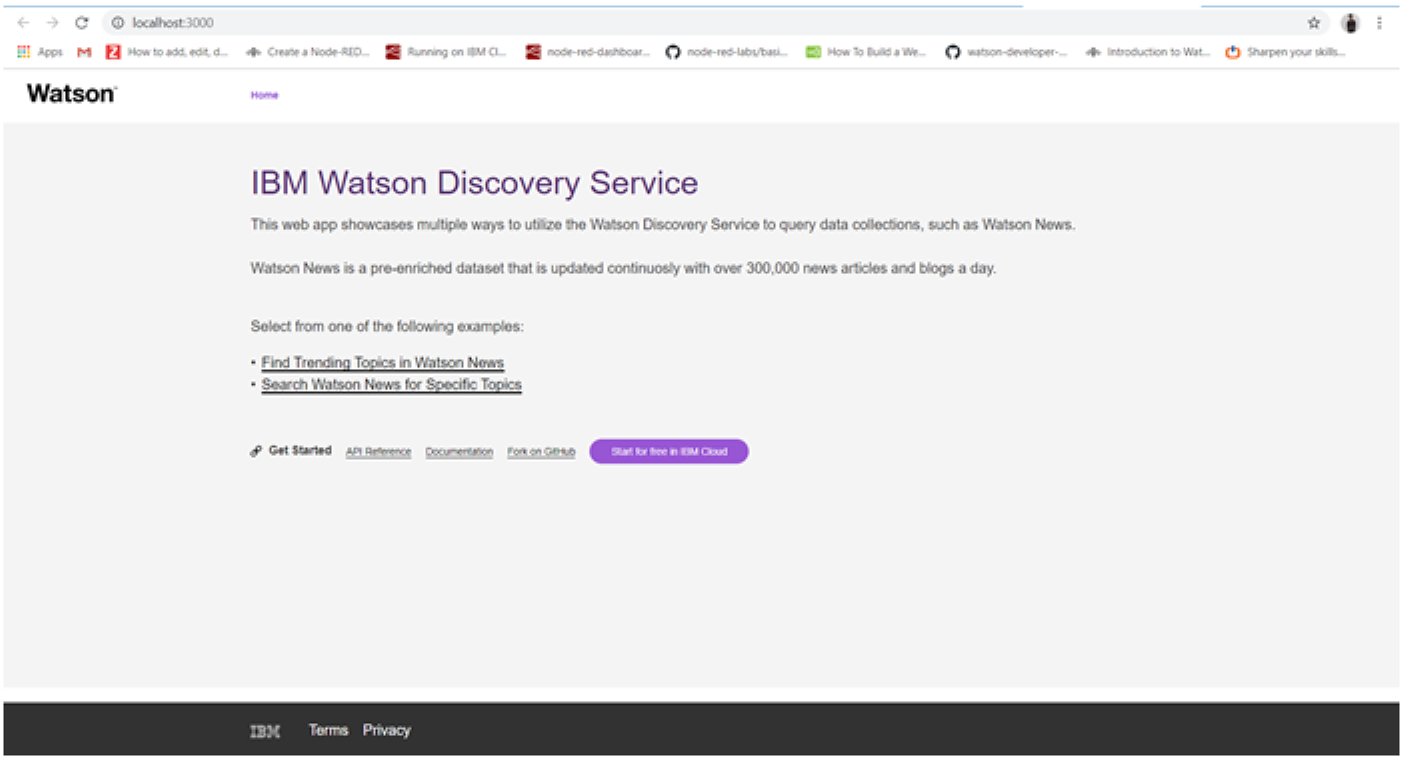
1. npm start



```
Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak/watson-discovery-news (master)
$ npm start

> watson-discovery-news@1.0.0 start C:\users\thilak\watson-discovery-news
> 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-slash-commands
>> Slack docs: https://api.slack.com/docs/verifying-requests-from-slack

Watson Discovery News Server running on port: 3000
Browserslist: caniuse-lite is outdated. Please run next command `npm update`
notice: ** BOT ID: jarvis-news ...attempting to connect to RTM!
notice: RTM websocket opened
```

The application will be available in your browser at http://localhost:3000

Sample output:



IBM Watson Discovery Service

This web app showcases multiple ways to utilize the Watson Discovery Service to query data collections, such as Watson News.

Watson News is a pre-enriched dataset that is updated continuosly with over 300,000 news articles and blogs a day.

Select from one of the following examples:

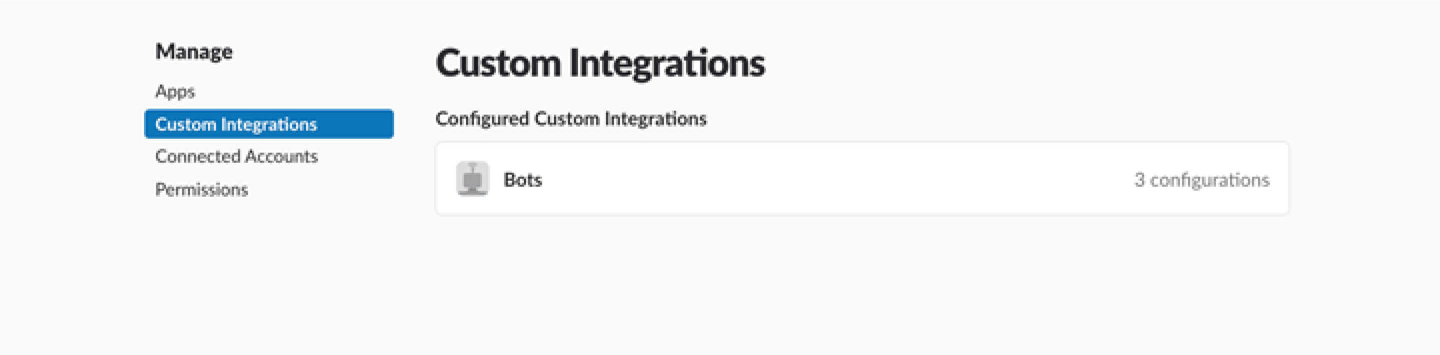
- Find Trending Topics in Watson News
- Search Watson News for Specific Topics

Task 2 Integrating Slack bot with Watson discovery news app.

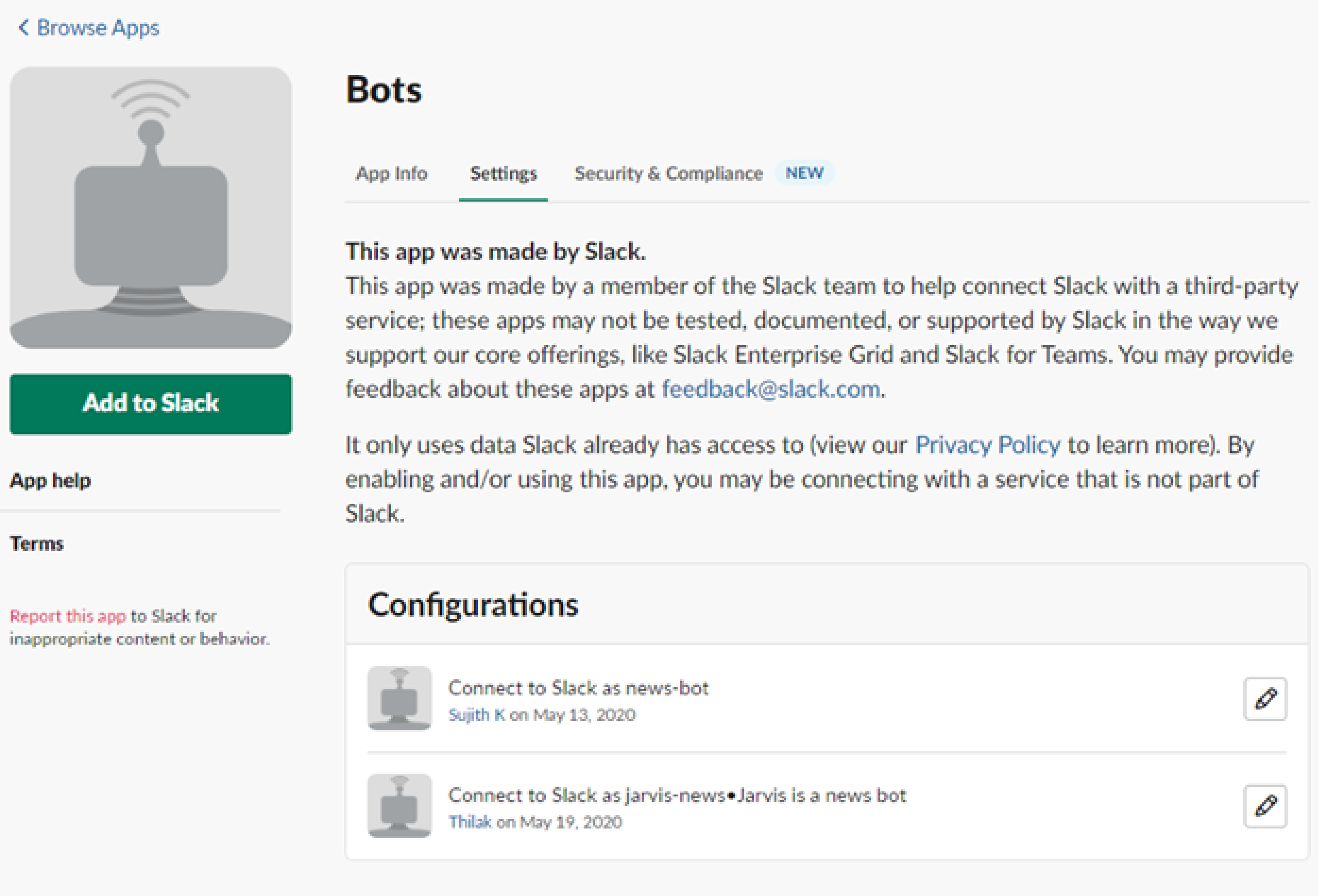
To integrate a new Slack Bot into your existing Slack team, navigate to https://<my.slack.com>/apps/manage/custom-integrations, where <my.slack.com> is the Slack workspace you want to customize.

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.



This app was made by Slack.
This app was made by a member of the Slack team to help connect Slack with a third-party service; these apps may not be tested, documented, or supported by Slack in the way we support our core offerings, like Slack Enterprise Grid and Slack for Teams. You may provide feedback about these apps at 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 may be connecting with a service that is not part of Slack.

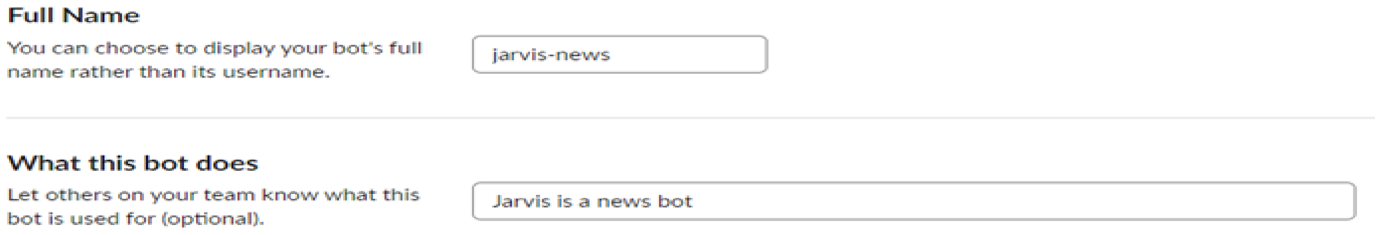
Report this app to Slack for inappropriate content or behavior.

Configurations

Connect to Slack as news-bot
Sujith K on May 13, 2020

Connect to Slack as jarvis-news•Jarvis is a news bot
Thilak on May 19, 2020

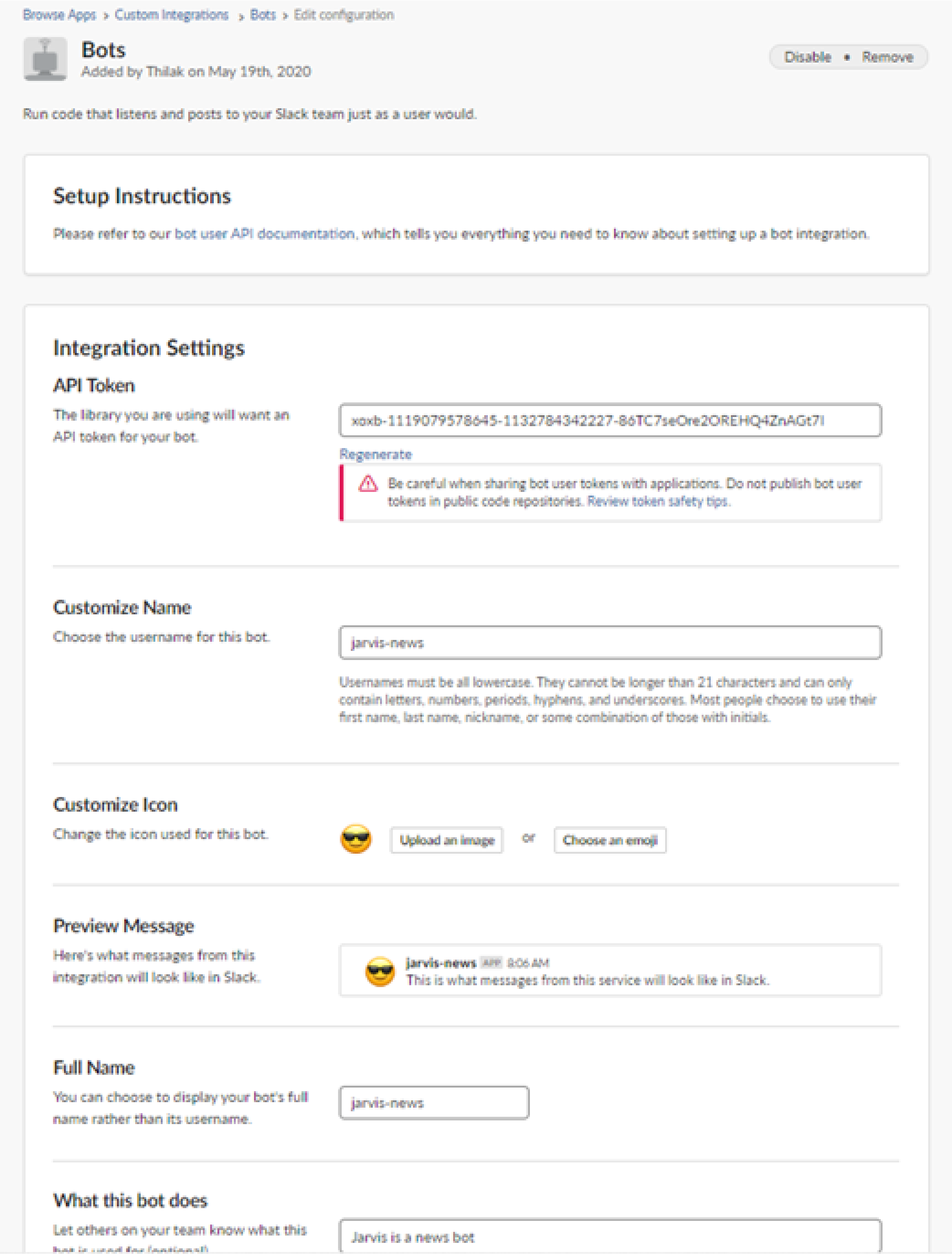
Step 3: Enter a username for the bot and click Add bot integration.



Full Name
You can choose to display your bot's full name rather than its username.
jarvis-news

What this bot does
Let others on your team know what this bot is used for (optional).
Jarvis is a news bot

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



Browse Apps > Custom Integrations > Bots > Edit configuration

Bots

Added by Thilak on May 19th, 2020

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-1119079578645-1132784342227-86TC7seOre2OREHQ4ZnAGt7I

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

Customize Name

Choose the username for this bot.

jarvis-news

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

Customize Icon

Change the icon used for this bot.

Preview Message

Here's what messages from this integration will look like in Slack.

jarvis-news APP 8:06 AM

This is what messages from this service will look like in Slack.

Full Name

You can choose to display your bot's full name rather than its username.

jarvis-news

What this bot does

Let others on your team know what this bot is used for (optional)

Jarvis is a news bot

2.2 Configuring slack bot

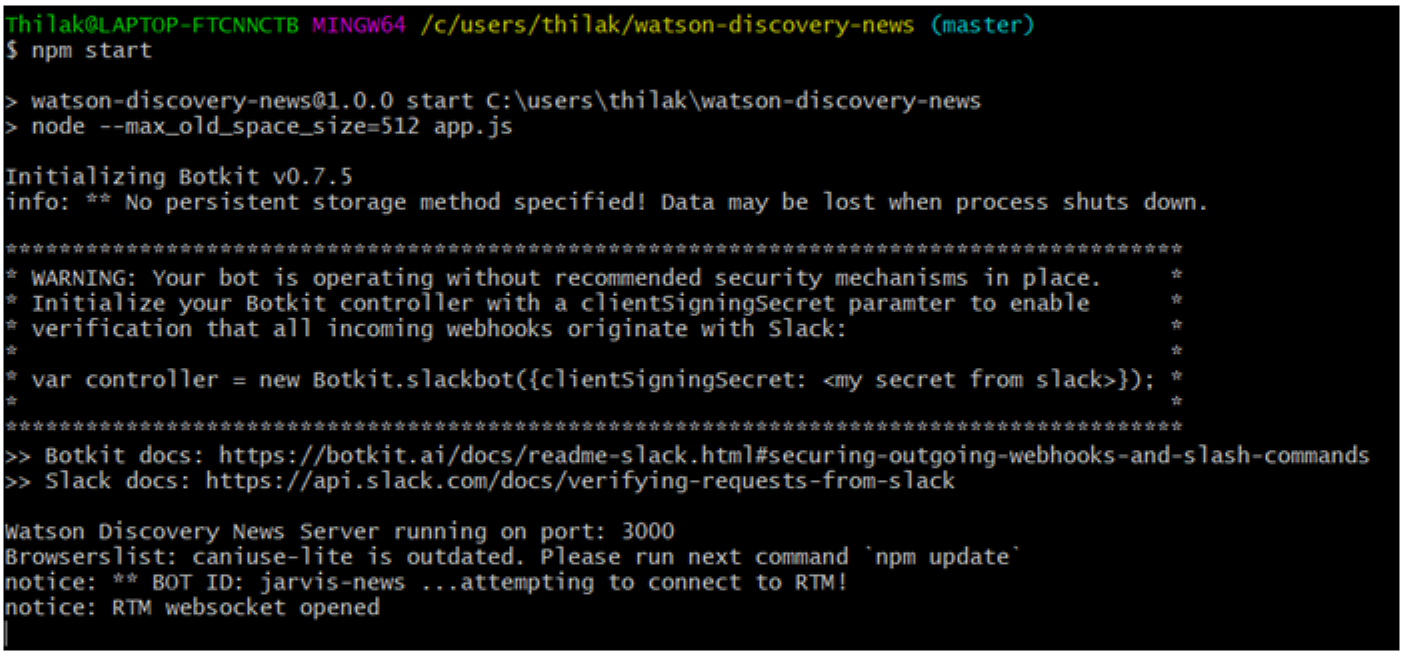
Step 1: Edit the .env file and enter the Slack Bot API Token saved in the previous step.

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

Step 2: Restart application

1. npm start

Sample output on cmd:



```
Thilak@LAPTOP-FTCNNCTB MINGW64 /c/users/thilak/watson-discovery-news (master)
$ npm start

> watson-discovery-news@1.0.0 start C:\users\thilak\watson-discovery-news
> 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.

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* 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-slash-commands
>> Slack docs: https://api.slack.com/docs/verifying-requests-from-slack

Watson Discovery News Server running on port: 3000
Browserslist: caniuse-lite is outdated. Please run next command `npm update`
notice: ** BOT ID: jarvis-news ...attempting to connect to RTM!
notice: RTM websocket opened
```
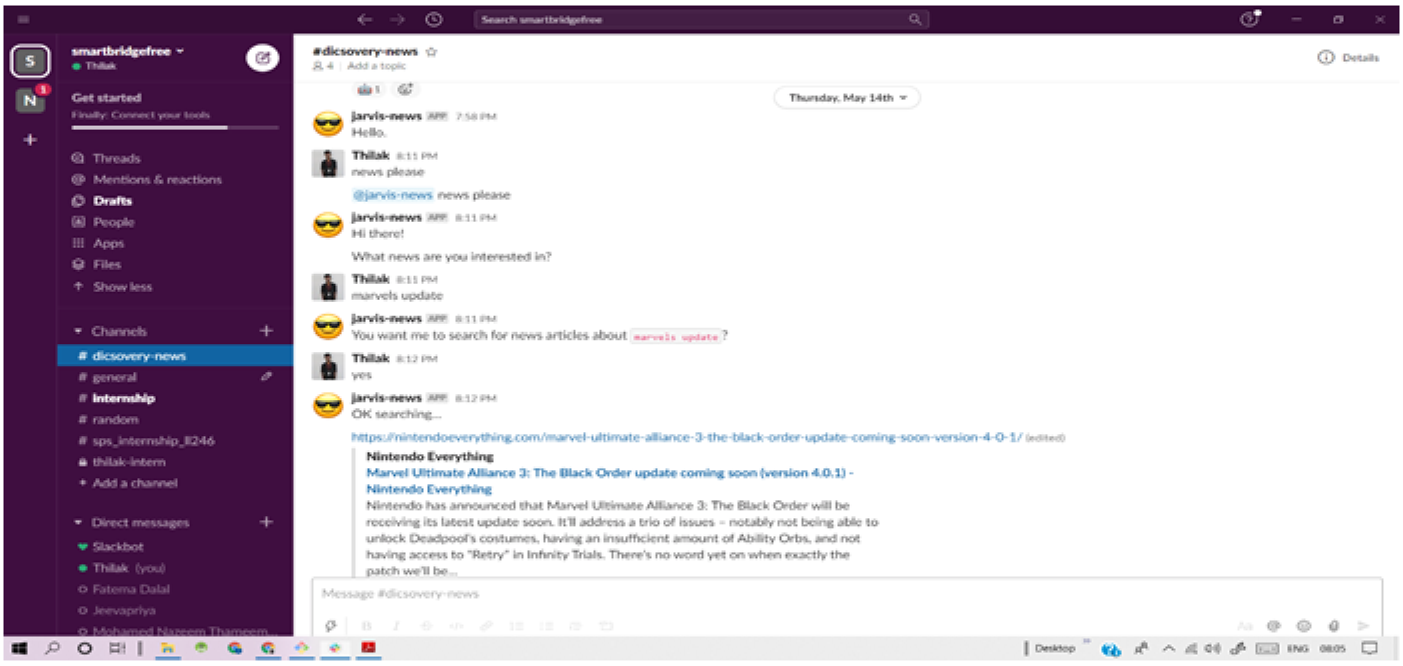

Bot on slack:



jarvis-news APP 7:58 PM
Hello.

Thilak 8:11 PM
news please

@jarvis-news news please

jarvis-news APP 8:11 PM
Hi there!

What news are you interested in?

Thilak 8:11 PM
marvels update

jarvis-news APP 8:11 PM
You want me to search for news articles about `marvels update`?

Thilak 8:12 PM
yes

jarvis-news APP 8:12 PM
OK searching...

https://nintendoeverything.com/marvel-ultimate-alliance-3-the-black-order-update-coming-soon-version-4-0-1/ (edited)

Nintendo Everything
Marvel Ultimate Alliance 3: The Black Order update coming soon (version 4.0.1) - Nintendo Everything
Nintendo has announced that Marvel Ultimate Alliance 3: The Black Order will be receiving its latest update soon. It'll address a trio of issues – notably not being able to unlock Deadpool's costumes, having an insufficient amount of Ability Orbs, and not having access to "Retry" in Infinity Trials. There's no word yet on when exactly the patch we'll be...

Task 3 Creating App user interface using node-red

Installation node-red has been done earlier to refer click-here.

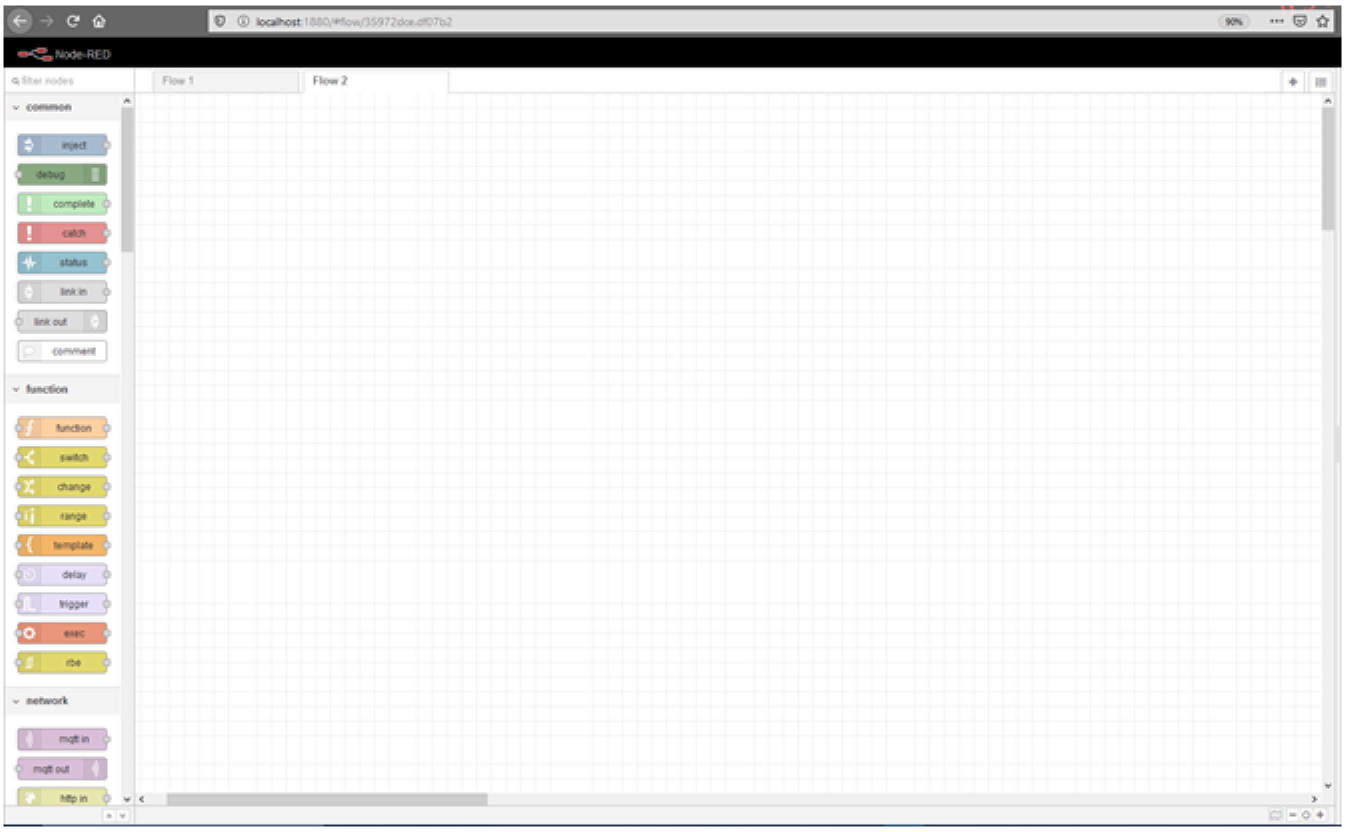
Step 1: Running node-red

Once installed as a global module you can use the node-red command to start Node-RED in your terminal. You can use Ctrl-C or close the terminal window to stop Node-RED.

```
1. node-red
```

You can then access the Node-RED editor by pointing your browser at http://localhost:1880.

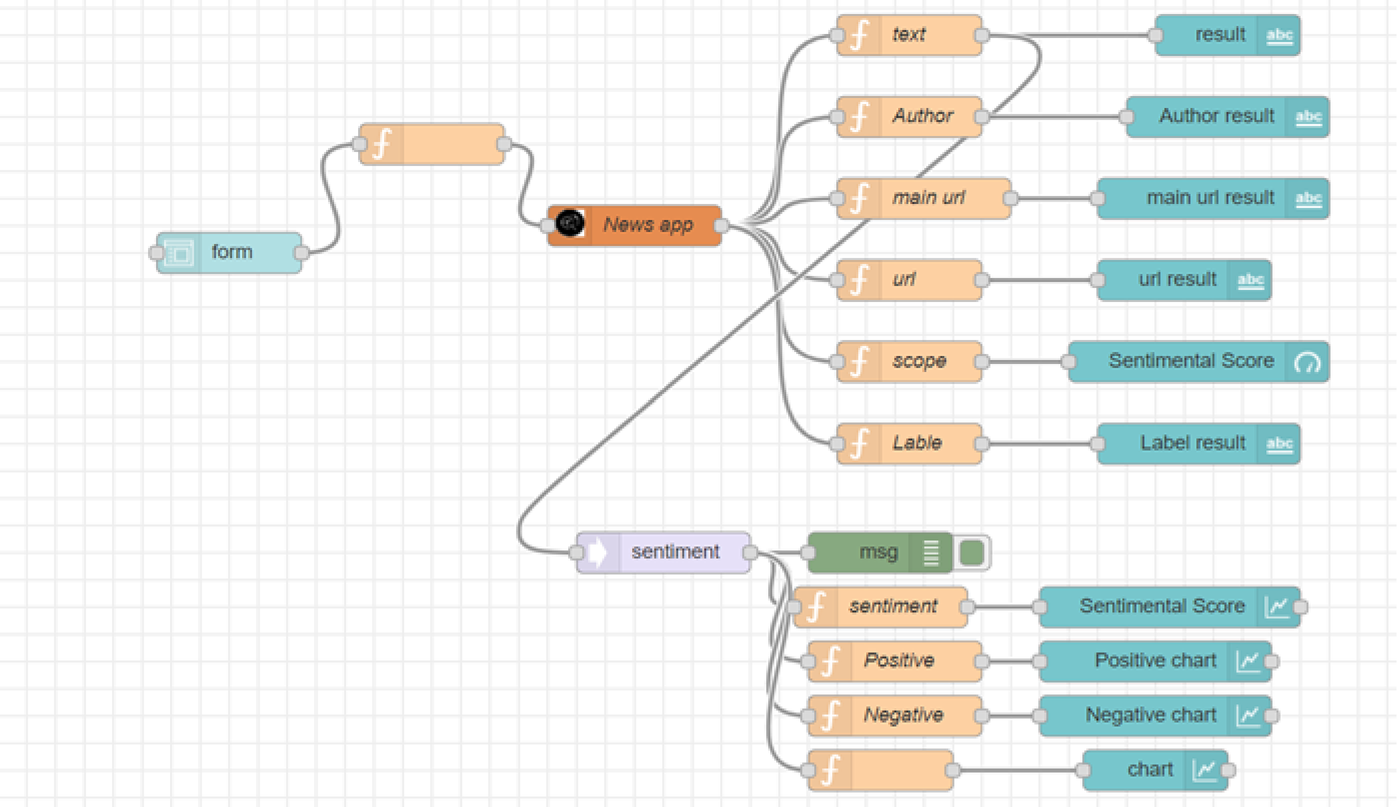
Sample Output at http://localhost:1880.



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

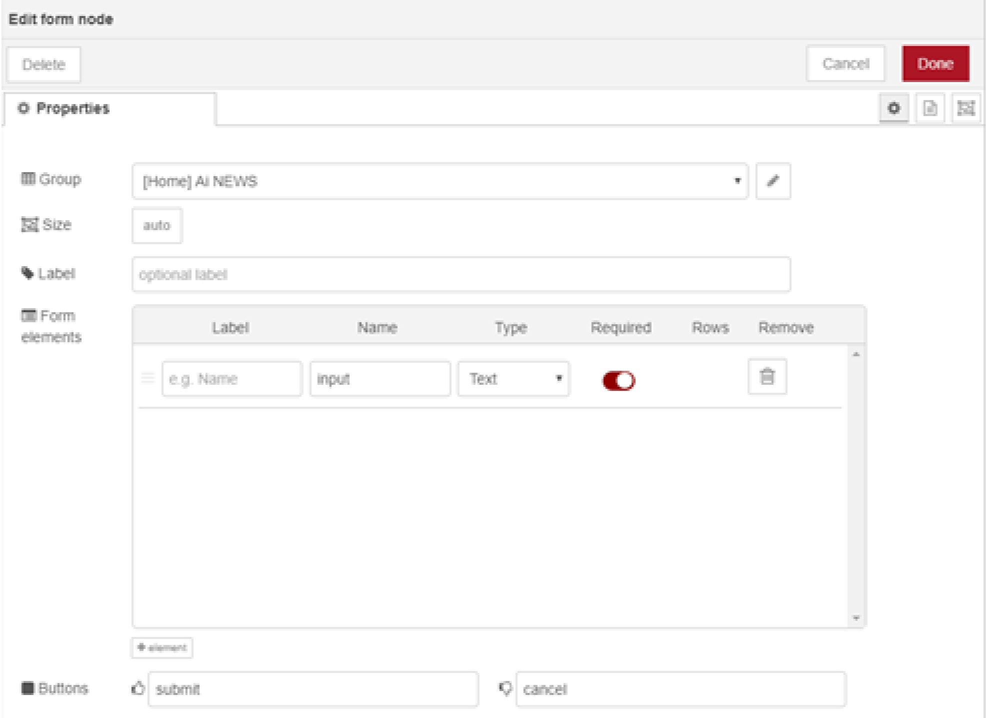


Nodes used:

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

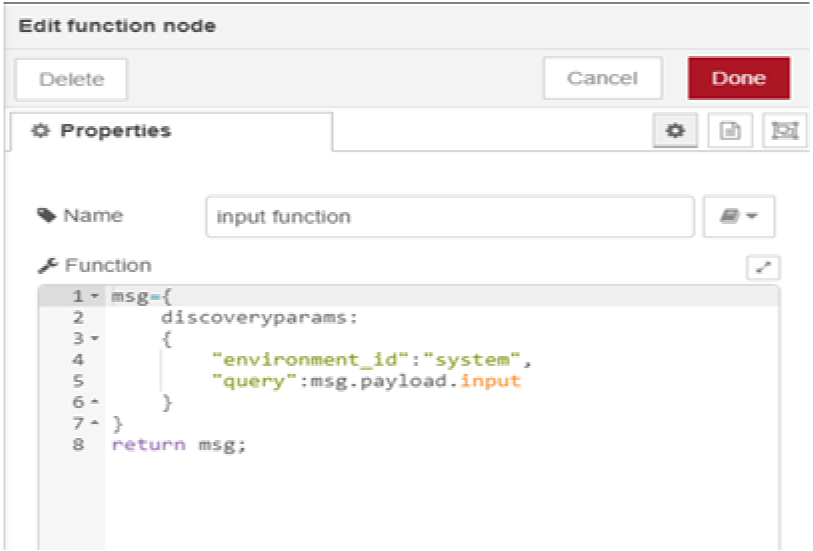
Group	[Home] Ai NEWS
Size	auto
Label	optional label

Form elements

Label	Name	Type	Required	Rows	Remove
e.g. Name	input	Text	●		

Buttons: submit / cancel

1. Input function node



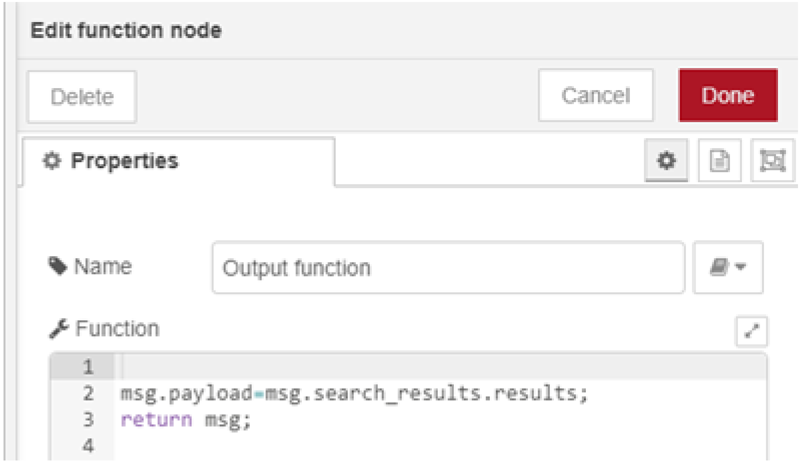
Name: input function

Function

```
msg={
    discoveryparams:
    {
        "environment_id":"system",
        "query":msg.payload.input
    }
}
return msg;
```

Query node configuration is shown in the next Task

1. Output function node



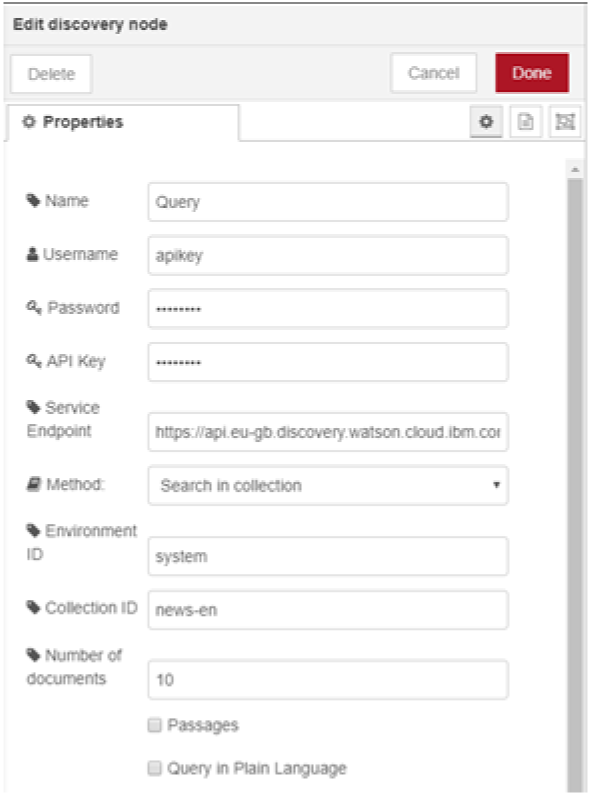
Name: Output function

Function

```

msg.payload=msg.search_results.results;
return msg;

```

Task 4 Integrating Watson discovery service with UI

1. Configuring discovery node



Edit discovery node

Name: Query

Username: apikey

Password: ••••••••

API Key: ••••••••

Service Endpoint: https://api.eu-gb.discovery.watson.cloud.ibm.cor

Method: Search in collection

Environment ID: system

Collection ID: news-en

Number of documents: 10

□ Passages

□ Query in Plain Language

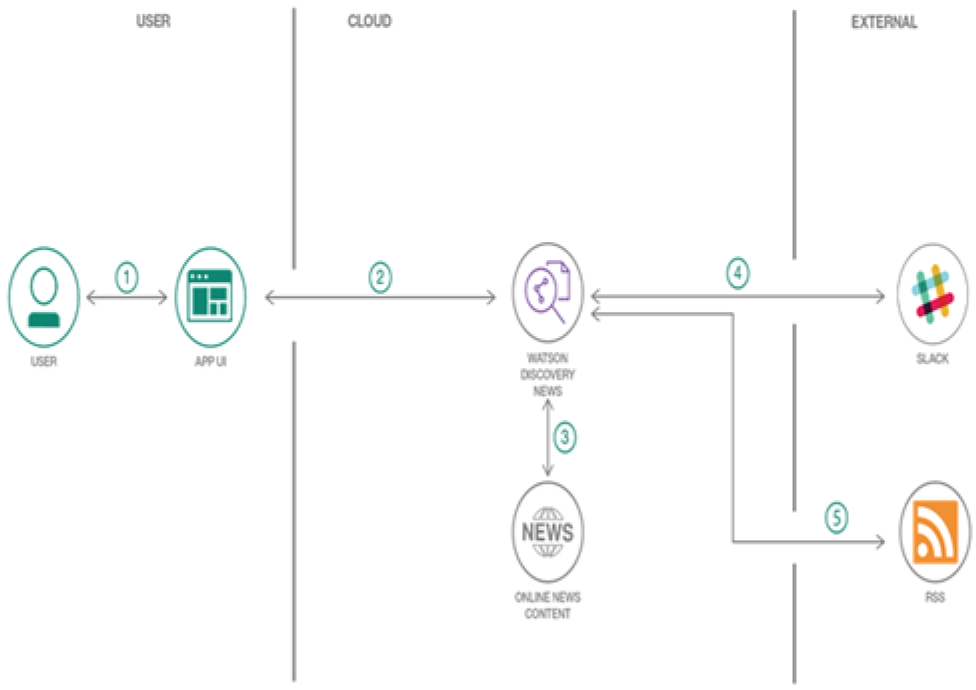
Passoword , API key , Service Endpoint can be found in the IBM credentials file downloaded here

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.

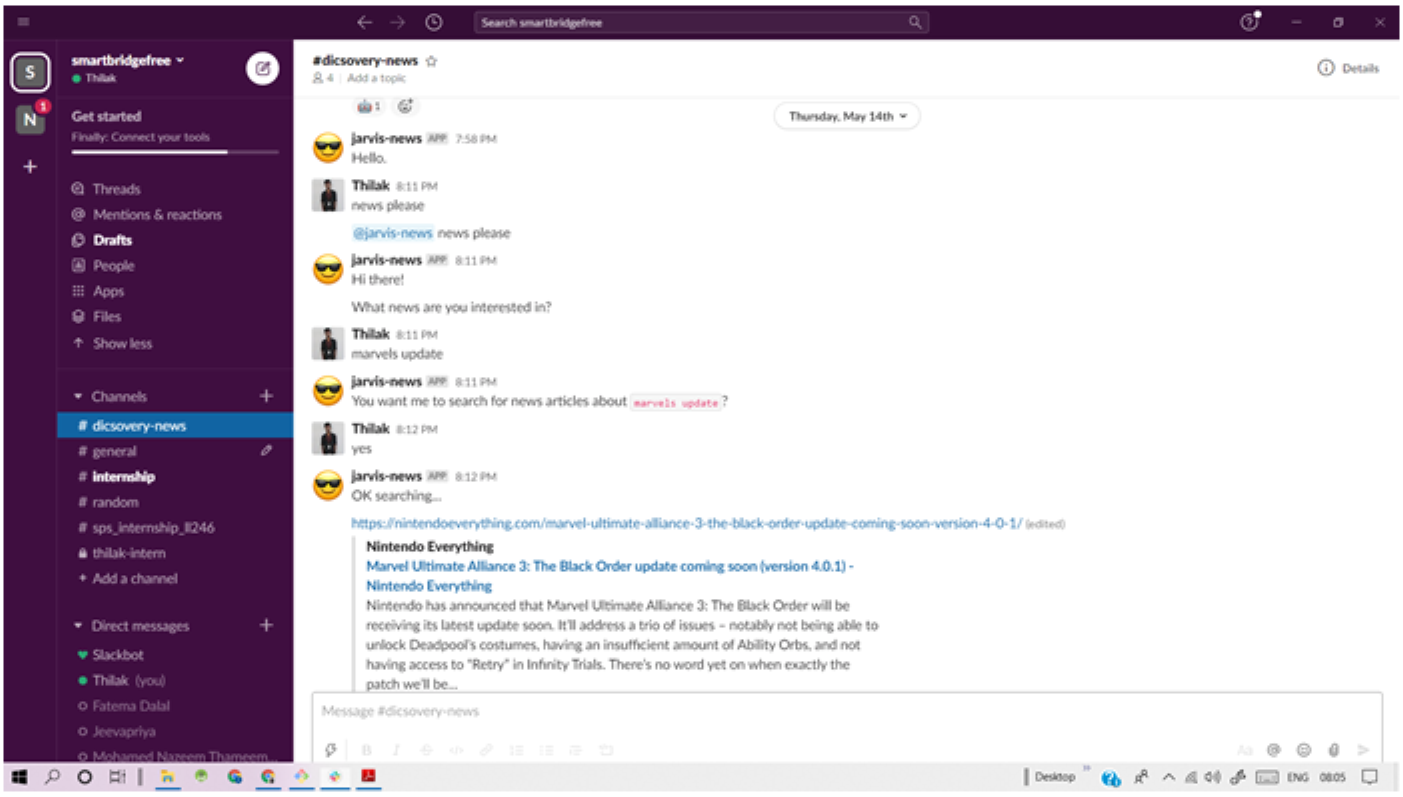
Slack then integrates with Watson's discovery service so that news articles can be searched on more than one platform, and finally sentiment analysis is performed on the data / news articles being searched.

Flowchart



Result

Bot on slack:



jarvis-news APP 7:58 PM
Hello.

Thilak 8:11 PM
news please

@jarvis-news news please

jarvis-news APP 8:11 PM
Hi there!

What news are you interested in?

Thilak 8:11 PM
marvels update

jarvis-news APP 8:11 PM
You want me to search for news articles about `marvels update`?

Thilak 8:12 PM
yes

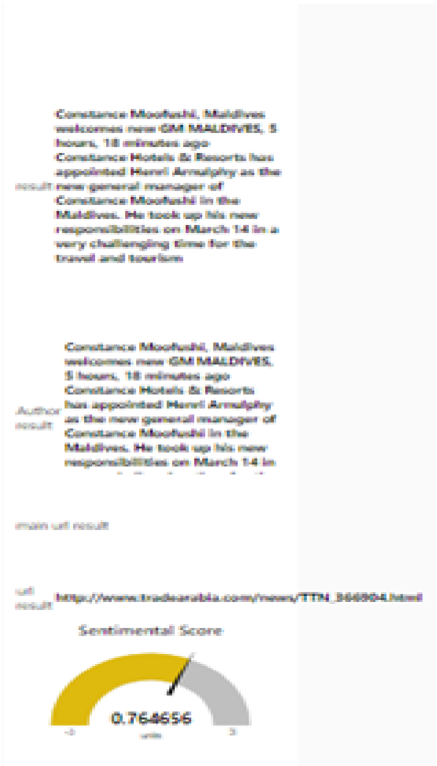
jarvis-news APP 8:12 PM
OK searching...

https://nintendoeverything.com/marvel-ultimate-alliance-3-the-black-order-update-coming-soon-version-4-0-1/ (edited)

> Nintendo Everything
> Marvel Ultimate Alliance 3: The Black Order update coming soon (version 4.0.1) - Nintendo Everything
> Nintendo has announced that Marvel Ultimate Alliance 3: The Black Order will be receiving its latest update soon. It'll address a trio of issues – notably not being able to unlock Deadpool's costumes, having an insufficient amount of Ability Orbs, and not having access to "Retry" in Infinity Trials. There's no word yet on when exactly the patch we'll be...

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 from of a simple UI.

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

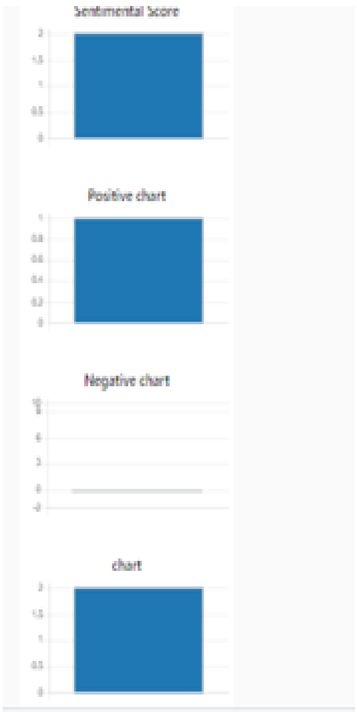


result Constance Moofushi, Maldives welcomes new GM MALDIVES, 5 hours, 18 minutes ago Constance Hotels & Resorts has appointed Henri Armalphy as the new general manager of Constance Moofushi in the Maldives. He took up his new responsibilities on March 14 in a very challenging time for the travel and tourism

Author result Constance Moofushi, Maldives welcomes new GM MALDIVES, 5 hours, 18 minutes ago Constance Hotels & Resorts has appointed Henri Armalphy as the new general manager of Constance Moofushi in the Maldives. He took up his new responsibilities on March 14 in

main url result

url result http://www.tradearabia.com/news/TTN_366904.html



Output URL: http://localhost:1880/ui/#!/0?socketid=iiYB3Q5322Xrtq3KAAAC

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

➤ https://github.com/ThasthuThilak/smartintern

➤ https://nodered.org/

➤ https://slack.com/intl/en-in/help/articles/360002079527-A-guide-to-Slack%E2%80%99s-Discovery-APIs

➤ https://www.w3schools.com/