# Intelligent Customer Help Desk With Smart Document Understanding

# Project Report

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**Project ID:** SPS_PRO_99

**Category:** Artificial Intelligence

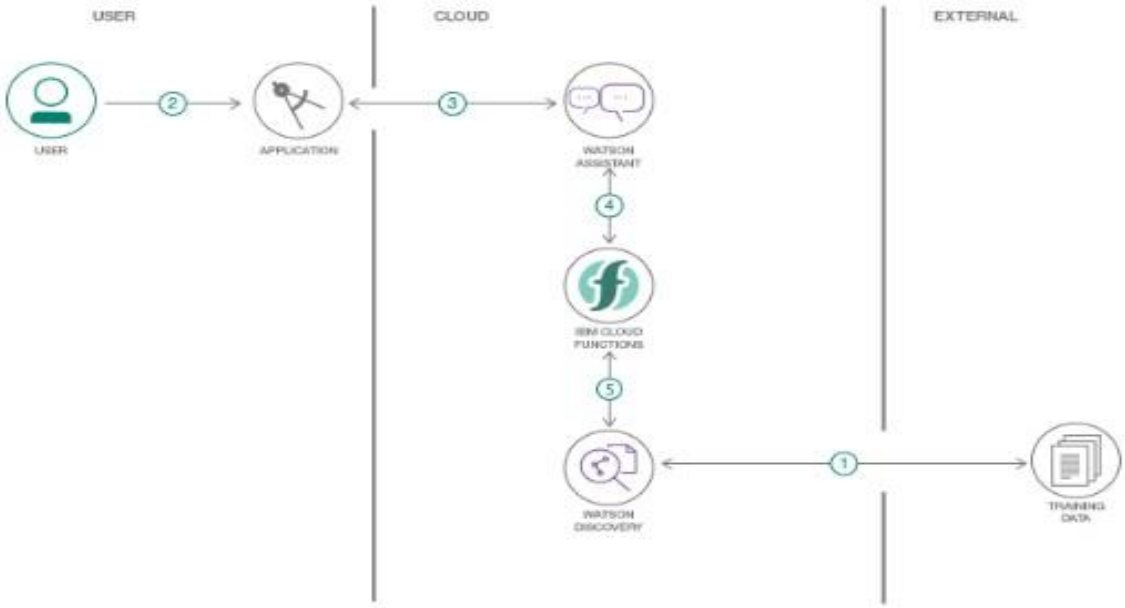
## Abstract

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's manual. So now, instead of "Would you like to speak to a customer representative?" we can return relevant sections of the owner's manual to help solve our customers' problems.

To take it a step further, the project shall use the Smart Document Understanding feature of Watson Discovery to train it on what text in the owner's manual is important and what is not. This will improve the answers returned from the queries.

## *Here is the flow diagram of the project*




## Chatbot details:

- The chatbot is built on Samsung TV store.
- For this we have used user manual  as data sets.
- This Chatbot can answer to the queries regarding customer care and product details.

## Project deliverables:

- Assistant Skill
- Node red flow
- Data sets used for the project
- Cloud function

# <u>Background of project</u>:-

A chatbot is a computer program that imitates human conversation — spoken, written, or both. Chatbots conduct conversations with people, and developers typically hope that users will not realize they’re actually talking to a robot.

The term chatbot comes from “chatterbot,” a name coined by inventor Michael Mauldin in 1994. He created Julia, the first chatbot made with Verbot, a popular software program and development kit. Today, AI chatbots are also known by many other names: talkbot, bot, IM bot, intelligent chatbot, conversation bot, AI conversation bot, talking bot, interactive agent, artificial conversation entity, or virtual talk chatbot.

Artificial intelligence (in the form of natural-language processing, machine learning, and deep learning, which we will discuss later) makes it possible for chatbots to “learn” by discovering patterns in data. Without training, these chatbots can then apply the pattern to similar problems or slightly different questions. This ability gives them the “intelligence” to perform tasks, solve problems, and manage information without human intervention.

Of course, problems can and do arise, including instances in which chatbot limitations frustrate customers. Talk bots also raise some interesting ethical and philosophical questions that researchers have pondered from the start, and we’ll cover those later.

## About IBM Watson:-

**Watson** is a question-answering computer system capable of answering questions posed in natural language developed in IBM's Deep Q&A project by a research team led by principal investigator David Ferrucci. Watson was named after IBM's founder and first CEO, industrialist Thomas J. Watson.
**IBM Watson Assistant** is a white label cloud service that allows enterprise-level software developers to embed an artificial intelligence (AI) virtual assistant (VA) in the software they are developing and brand the assistant as their own. Watson uses IBM's Deep Q&A software and the Apache UIMA (Unstructured Information Management Architecture) framework implementation.

## About IBM Discovery:-

**Watson Discovery** is an award-winning enterprise search and AI search technology that breaks open data silos and retrieves specific answers to your questions while analysing trends and relationships buried in enterprise data. ... Unlike competitors, Watson Discovery can be deployed on any cloud or on-premises environment. A common way to use Discovery is by accessing the Discovery APIs from your application. The Watson team releases SDKs that support many programming languages so that you can use Discovery easily in a web or mobile application. All of the data content is stored and enriched within a Discovery collection.

## NodeRED:-

**Node-RED** is a flow-based development tool for visual programming developed originally by IBM for wiring together hardware devices, APIs and online services as part of the Internet of Things.

Node-RED provides a web browser-based flow editor, which can be used to create JavaScript functions. Elements of applications can be saved or shared for re-use. The runtime is built on Node.js. The flows created in Node-RED are stored using JSON. Since version 0.14, MQTT nodes can make properly configured TLS connections.

# Getting started with NodeRed:-

## 1.Find the Node-RED Starter in the IBM Cloud Catalog:-

Log in to IBM Cloud.

open the catalog and search for **node-red**.

Click on the **Node-RED App** tile.

This will show you an overview of the Starter Kit and what it provides.

## 2.Create your application:-

Now you need to create the Node-RED Starter application.

- On the *Create* tab, a randomly generated App name will be suggested. Either accept that default name or provide a unique name for your application. This will become part of the application URL.

**Note:** If the name is not unique, you will see an error message and you must enter a different name before you can continue.

- The Node-RED Starter application requires an instance of the Cloudant database service to store your application flow configuration. Select the region the service should be created in and what pricing plan it should use.

**Note:** You can only have one Cloudant instance using the Lite plan. If you have already got an instance, you will be able to select it from the Pricing plan select box. You can have more than one Node-RED Starter application using the same Cloudant service instance.

- Click the **Create** button to continue. This will create your application, but it is not yet deployed to IBM Cloud.

## 3. Enable the Continuous Delivery feature:-

At this point, you have created the application and the resources it requires, but you have not deployed it anywhere to run. This step shows how to setup the Continuous Delivery feature that will deploy your application into the Cloud Foundry space of IBM Cloud.

On the next screen, click the Deploy your app button to enable the *Continuous Delivery* feature for your application.

- You will need to create an **IBM Cloud API key** to allow the deployment process to access your resources. Click the New button to create the key. A message dialog will appear. You can accept the default values and confirm to close the dialog.
- Increase the **Memory allocation per instance** slider to at least 128MB. If you do not increase the memory allocation, your Node-RED application might not have sufficient memory to run successfully.
- The Node-RED Starter kit only supports deployment to the **Cloud Foundry** space of IBM Cloud. Select the region to deploy your application to. This should match the region you created your Cloudant instance in. Lite users might only be able to deploy to your default region.

Click **Next** to continue.

- Configure the **DevOps toolchain** by selecting the **region** it should be created in – again, try to match the region you selected previously.

Click **Create**. This will take you back to the application details page.

- After a few moments, the **Deployment Automation** section will refresh with the details of your newly created Delivery Pipeline. The Status field of the pipeline will eventually show In progress. That means your application is being built and deployed.

Click on the **Status** field to see the full status of the Delivery Pipeline.

The Deploy stage will take a few minutes to complete. You can click on the View logs and history link to check its progress. Eventually the Deploy stage will go green to open it up.

## 4 .Open the Node-RED application:-

- Now that you've deployed your Node-RED application, let's show it has passed. This means your Node-RED Starter application is now running.

1. Back on the application details page, you should now see the **App URL**, **Source** and **Deployment target** fields filled in.
2. Click on the **App URL** to open up your Node-RED application in a new browser tab.

## 5.Configure your Node-RED application:-

The first time you open your Node-RED app, you'll need to configure it and set up security.

1. A new browser tab will open with the Node-RED start page.
   On the initial screen, click **Next** to continue.
2. Secure your Node-RED editor by providing a **username** and **password**. If you need to change these at any point, you can either edit the values in the Cloudant database, or override them using *environment variables*. The documentation on nodered.org describes how to do this. Click **Next** to continue.
3. The final screen summarizes the options you've made and highlights the environment variables you can use to change the options in the future.
   Click **Finish** to proceed.
4. Node-RED will save your changes and then load the main application. From here you can click the **Go to your Node-RED flow editor** button to open the editor.

## 6.Add extra nodes to your Node-RED palette:-

Node-RED provides the palette manager feature that allows you to install additional nodes directly from the browser-based editor. This is convenient for trying nodes out, but it can cause issues due to the limited memory of the default Node-RED starter application.

The recommended approach is to edit your application's package.json file to include the additional node modules and then redeploy the application.

This step shows how to do that in order to add the node-red-dashboard module.

1. On your application's details page, click **Source** url. This will take you to a git repository where you can edit the application source code from your browser.
2. Scroll down the list of files and click on **package.json**. This file lists the module dependencies of your application.
3. Click the **Edit** button

4.Add the following entry to the top of the dependencies section
***Note:*** Do not forget the comma at the end of the line to separate it from the next entry.

5. Add a **Commit message** and click **Commit changes**
At this point, the Continuous Delivery pipeline will automatically run to build and deploy that change into your application. If you view the Delivery Pipeline you can watch its progress. The Build section shows you the last commit made and the Deploy section shows the progress of redeploying the application.

6.Once the Deploy stage completes, your application will have restarted and now have the node-red-dashboard nodes preinstalled.

We have now created a Node-RED application that is hosted in the IBM Cloud. You have also learned how to edit the application source code and automatically deploy changes.

## Integrating Watson assistant with NodeRed:-

1.Login to IBM and go to the catalog

2.Search for node-red and select “Node-RED Starter “ Service

3.Enter the Unique name and click on create a button

Note: Your Node-red service is starting

4.Once your Node-red Service is “Running” or “ Awake” click on “visit app url” to launch Node-red Service

5. We have to configure Node red for the first time. Click on next to continue

6. Secure your node red editor by giving a username and password and click on Next

7: Click Next to continue

8. Click Finish

9. Click on Go to Node-Red flow editor to launch the flow editor

10.Node red editor has various nodes with the respective functionality

11.Drag assistant node on to the flow and design your UI accordingly.

## Scope of Work:

- Create a customer care dialog skill in Watson Assistant

- Use Smart Document Understanding to build an enhanced Watson Discovery collection
- Create an IBM Cloud Functions web action that allows Watson Assistant to post queries to Watson Discovery
- Build a web application with integration to all these services & deploy the same on IBM Cloud Platform

## Smart Document Understanding:-

SDU is one such field in IBM discovery, which allows us to quickly train Watson discovery, which will improve the answers returned by your application. We can annotate required text as titles, sub titles**,** tables and many more. So the bot recognizes the queries very well and gives accurate answers.

## Configuring your collection with Smart Document Understanding:-

You can use Smart Document Understanding (SDU) to quickly train IBM Watson Discovery for IBM Cloud Pak for Data to extract fields in your documents, which will improve the answers that your application returns. The specified fields can also be enriched.

With SDU, you can annotate fields within your documents to train custom conversion models. As you annotate, Watson is learning and will start predicting annotations. After an SDU model is created, it can be exported and used on other collections.

**PDF, Microsoft Word, Microsoft PowerPoint, Microsoft Excel, and image files (PNG, TIFF, JPG) can be annotated in the SDU editor. For the complete list of file types that Discovery for Cloud Pak for Data supports**

## Manage Fields:-

The **Manage fields** tab contains several options:

**Identify fields to index**

**Improve query results by splitting your documents**

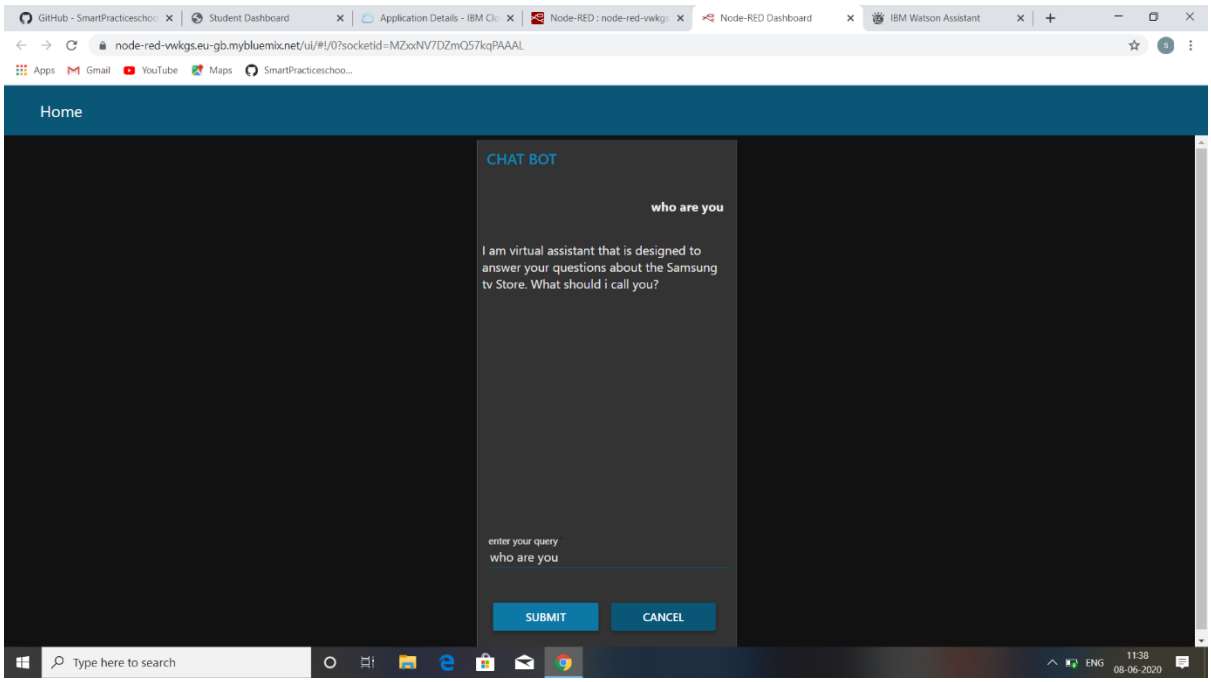
**Date format settings**

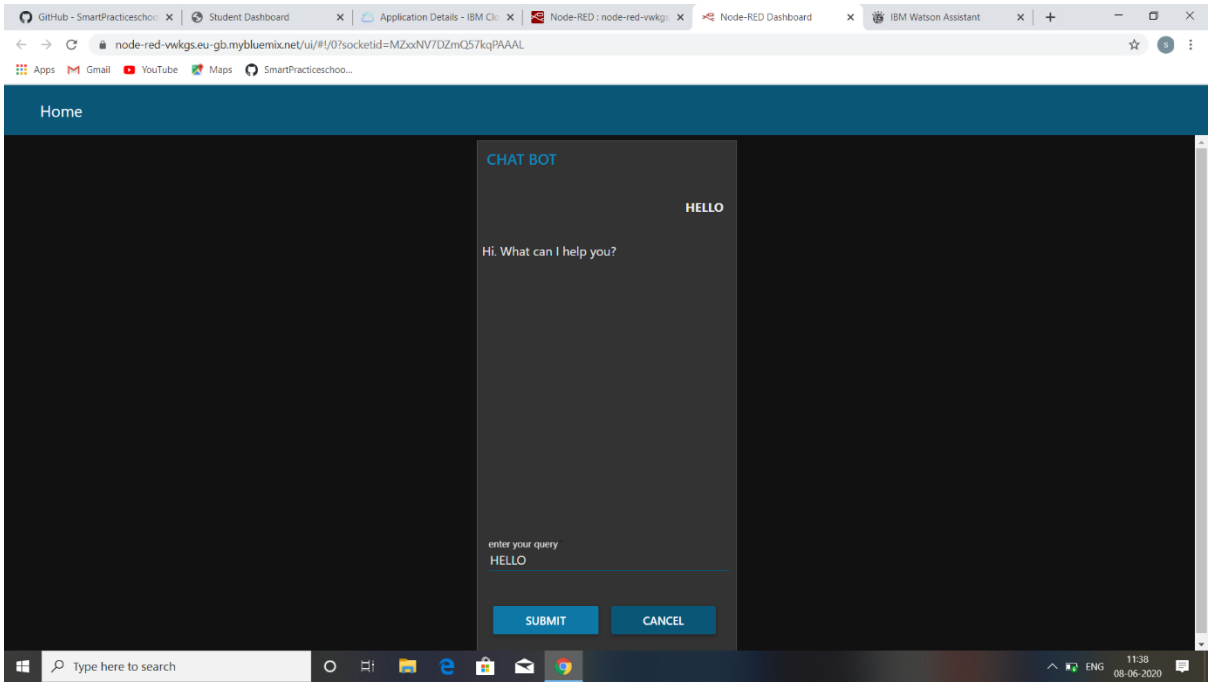
To access the **Manage fields** page, click the **Manage collections** icon on the navigation pane and open a collection. Click the **Manage fields** tab. For more information on collections, see Creating and managing collections.

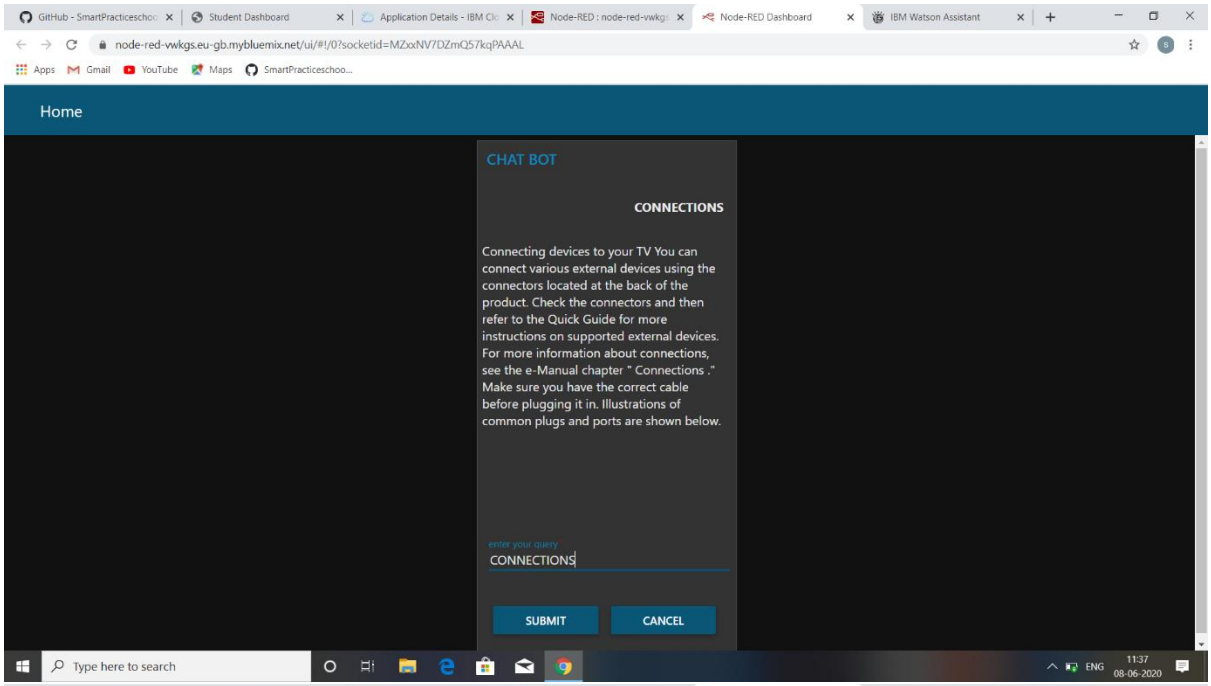
**Identify fields to index** - Use this option to choose which fields should be included in the index for this collection. You can switch off any fields that you do not want to index. For example, your PDFs may contain a running header or footer that does not contain useful information, so you can exclude those fields from the index.

**Improve query results by splitting your documents**. Use this option to split your documents into segments based on a field name. After your documents are split, each segment is a separate document that will be enriched, indexed, and returned as a separate query result. Documents are split based on a single field name, for example title, author, question.

## Snaps of the responses given:




GitHub - SmartPracticeschoo
Student Dashboard
Application Details - IBM Clo
Node-RED : node-red-vwkgs
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Apps
Gmail
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Maps
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Home
CHAT BOT
CONNECTIONS
Connecting devices to your TV You can connect various external devices using the connectors located at the back of the product. Check the connectors and then refer to the Quick Guide for more instructions on supported external devices. For more information about connections, see the e-Manual chapter " Connections ." Make sure you have the correct cable before plugging it in. Illustrations of common plugs and ports are shown below.
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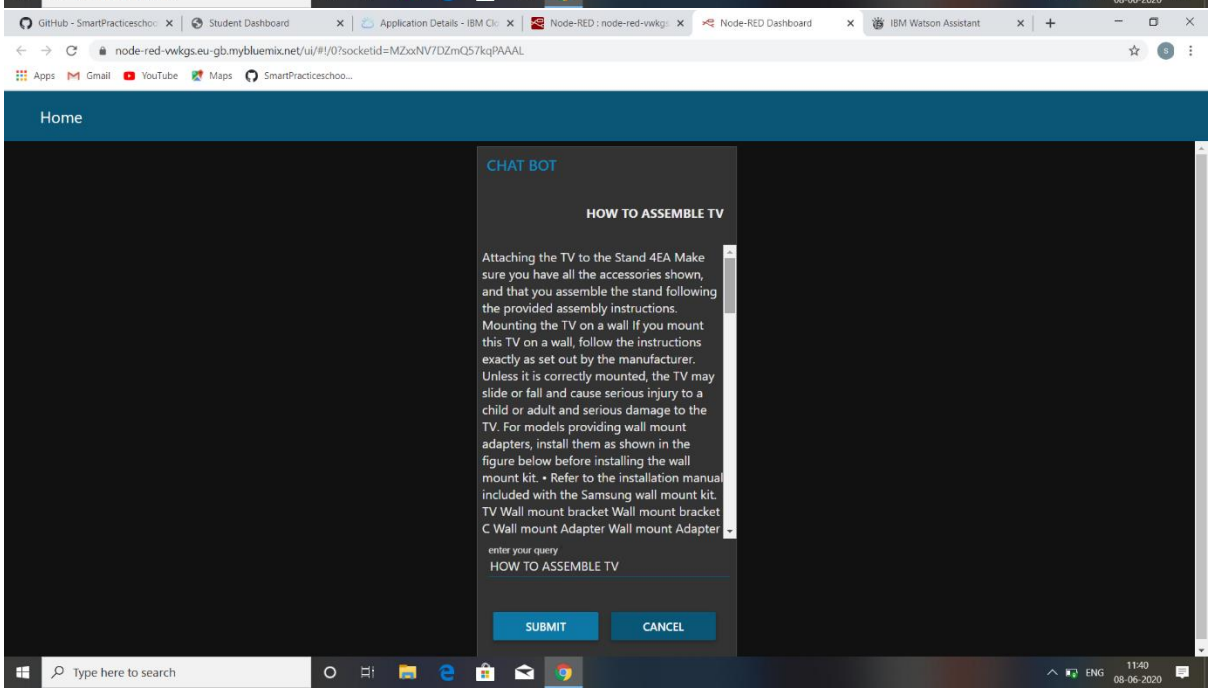
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CHAT BOT
HOW TO ASSEMBLE TV
Attaching the TV to the Stand 4EA Make sure you have all the accessories shown, and that you assemble the stand following the provided assembly instructions. Mounting the TV on a wall If you mount this TV on a wall, follow the instructions exactly as set out by the manufacturer. Unless it is correctly mounted, the TV may slide or fall and cause serious injury to a child or adult and serious damage to the TV. For models providing wall mount adapters, install them as shown in the figure below before installing the wall mount kit. • Refer to the installation manual included with the Samsung wall mount kit. TV Wall mount bracket Wall mount bracket C Wall mount Adapter Wall mount Adapter
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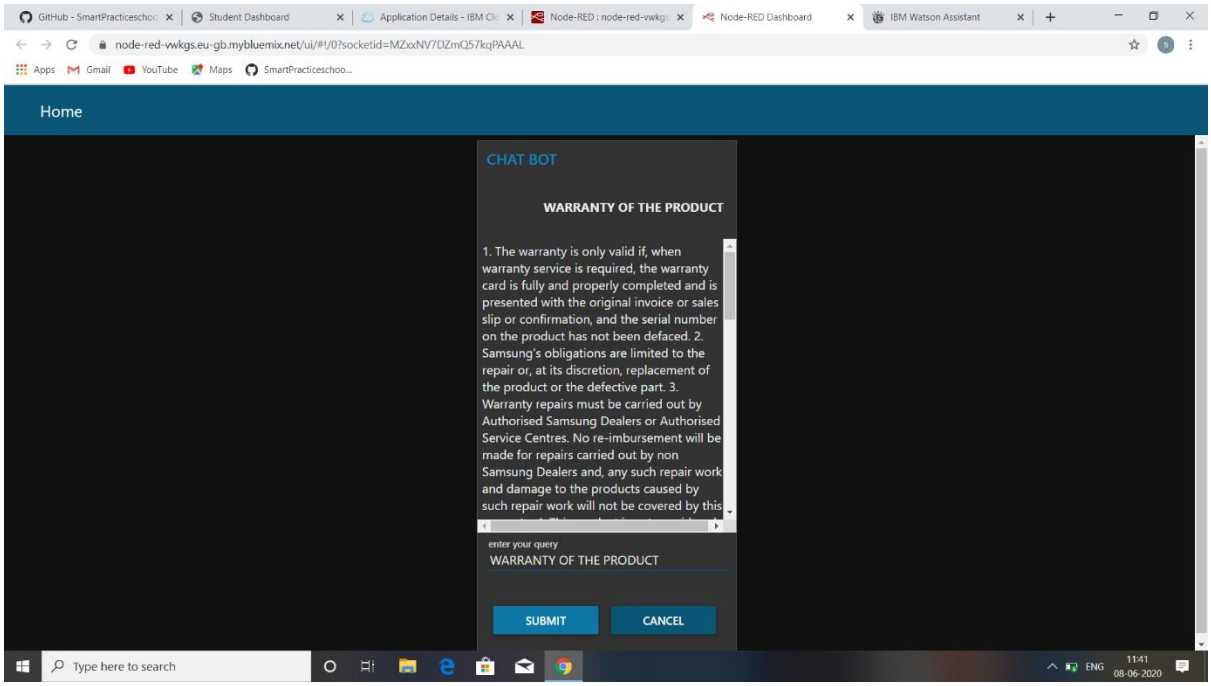
Home
CHAT BOT
WARRANTY OF THE PRODUCT
1. The warranty is only valid if, when warranty service is required, the warranty card is fully and properly completed and is presented with the original invoice or sales slip or confirmation, and the serial number on the product has not been defaced. 2. Samsung's obligations are limited to the repair or, at its discretion, replacement of the product or the defective part. 3. Warranty repairs must be carried out by Authorised Samsung Dealers or Authorised Service Centres. No re-imbursement will be made for repairs carried out by non Samsung Dealers and, any such repair work and damage to the products caused by such repair work will not be covered by this
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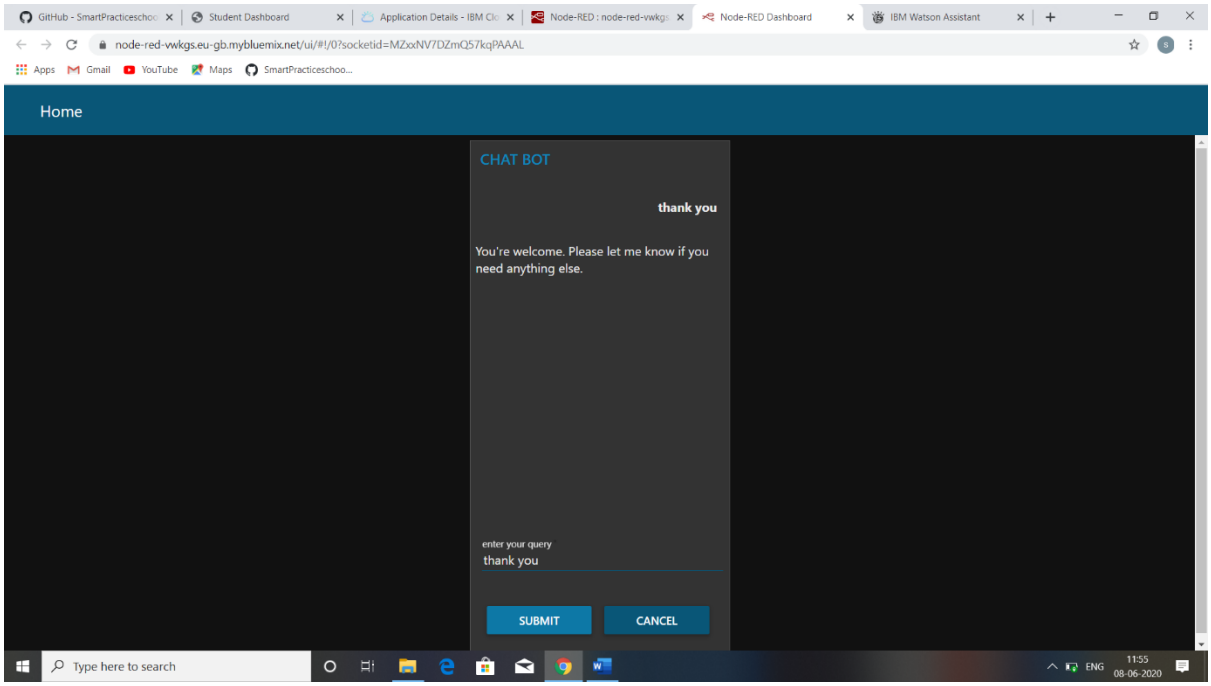
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