

**TEMASEK POLYTECHNIC**

**SCHOOL OF INFORMATICS & IT**

**DIPLOMA IN APPLIED ARTIFICIAL INTELLIGENCE**

**ROBOTICS PROCESS APPLICATION (CAI2C01)**

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Project Proposal

Student Name (Matric Number) : Shubham Kaushik (2301418F)

Tutorial Group : TC22 / P03

Jenny LING (TP)

Tutor : Mr Emile SABASTIAN

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* To achieve quality outputs from the AI tool, you should provide good prompt that is clear and specific. Be precise and provide context. Avoid asking open-ended questions.

**Project Name**

Nexus Customer Insight

**Business Domain**

Business Domain is inclusive of E-commerce companies. Nexus Customer Insight bot focuses on leveraging web browser and applications to aid, E-commerce companies, optimization of customer engagement, visualize ways to increase sales, and provide personalized marketing.

**Target Department/Users**

**The Target Departments and Users of the E-commerce organizations would be:**

1. **Marketing Department**

* Marketing Department can refer to the collection of customer data when they were on the website and from which social media platform did they come from to better grasp which marketing was effective and etc

1. **Sales Department**

* Sales Department will access to data from Power BI which will help the department to identify customers that are high-value, target potential upsell opportunities and tailor their sales approaches which turn will garner more sales.

1. **Customer Relationship Management (CRM) Team**

* Nexus Customer Insight will allow the CRM Team to maintain and even improve customer relationships by ensuring timely and personalized communication.

1. **Data Analytics Team**

* Data Analytics Team that works with other department to help better analyze the data (for e.g. Marketing Department) with access to Nexus Customer Insight bot will need to spend less time in Data Preparation and focus their efforts on advanced analytics and insight generation.

**Project Overview**

* **Purpose: [Function of the robot]**

A diagram of a company

Description automatically generatedThe purpose of Nexus Customer Insight bot is to streamline and enhance data management alongside with communication process for business operating with online customers such as e-commerce stores, with automation of tasks using applications, Power BI, Outlook, Notepad, PDFs, Google Analytics, Anaconda Navigator and Google Excel Sheet. With Nexus Customer Insight bot, business is able to;

1. Gain **better** understanding of their customers.
2. Figure out ways on how to **improve** their sales.
3. Maintain **better** relationship with their customer.

Organization using always highlight how using RPA during repetitive task such as gathering data of customers in Google Excel Sheet or gathering data for the company such as gathering statistics from Google Analytics. They believe that this time could be used somewhere else. In 2019, it was discovered that 51% of people described robotic automations as helping to improve operations. This lead to 42% of employees stating to improved employee experience. This was possible due to robotic automation replacing mundane tasks and allowing people to work which is important and less mundane for employees

* **Function:**

**Function 1:** Data Collection and Storage

**Function:**

Nexus Customer Insight Bot automates the collection of data of customer’s activity on the website (e.g. Revenue made, Avg. Session Duration & much more). This is then stored in an Excel Sheet to further use for Power BI.

**Application in use:** Google Analytics, Google Excel Sheet

**Benefits:**

* **Efficiency:** The process of pressing the dropdown to choose variable type(e.g., Avg. Session Duration & etc.), then copying the data of 4 columns and then pasting it in Google Excel sheet for another 60-90 rows of data. My robot automates the receptivity tasks, which save time for the [Data Analytics Team](#TargetUser). At the end of the day reducing lots of manual effort.
* **Accuracy:** In such a repetitive task, human error may occur (e.g during data entry). Nexus Customer Insight bot prevents such errors from taking place.
* **Centralized:** Nexus Customer Insight gathers all of the data into a single location, Google Excel Sheet. Making it easier to access and manage the data.

**Function 2:** Data Cleaning and Preparation

**Function:** When using data, we must make sure data does not have any errors. When using data for sending Emails via Outlook and when gathering data from Google Analytics and using it for Power BI visualisation, we must make sure that the Data Cleaning and Preparation takes place. Using Anaconda Navigator, a python code, upon running will import the Google Excel file and the code will check for:

1. Missing values

* If missing values:
* Fill/Drop Missing Values

1. Validate data type.

* If wrong data type:
  + Convert incorrect data type.

1. Remove duplicates.
2. Check ranges of the values [Where necessary]
3. Turn data back into an excel file.
4. Save the new cleaned excel file.

**Application In Use:** Anaconda Navigator, Google Excel Sheet

**Benefits:**

* **Data Quality and Accuracy:** This process ensure that the data is free from errors, such as missing values and duplicates values, before that data was used for tasks such as sending an email or Power BI visualization.
* **Correct read of data:** With correct data, Data Analyst team or the CRM Team would have the right analysis of data.

**Function 3:** Data Visualisation and Website Activity Analysis

**Function:** Nexus Customer Insight with the aid of applications it is able to gather data regarding the website (e.g. Revenue made, Avg. Session Duration & much more) and generate a visualisation using the essential data. **Application In Use**: Google Analytics, Power BI, Google Excel Sheet

**Benefits**:

* **Behavioural Insights**: Using data (e.g. Session Duration at certain pages) will provide detailed insights into how customers interacted with the website. Introducing room, for improvement of the website navigation.
* **Optimization Opportunities**: Using visualization (e.g Add to Cart vs Checkouts) will allow the E-commerce business have improved decision-making such as, identifying ways to improve user experience and to increase conversion.

**Function 4:** Personalized Email Communication

**Function**: Nexus Customer Insight bot automates the process of sending email which are personalized as you have your name written in the email. Giving it a personal touch for the customer. The emails could be sent for promotions, updates, follow-ups & etc. **Application In Use**: Outlook, Notepad, Google Excel Sheet

**Benefit**s:

* **Improved Engagement**: Personal touch in the emails would increase customer engagement and response rate
* **Consistency**: The regular consistent email would increase customer engagement, driving sales higher
* **Scalability**: The repetitive task being replaced but Nexus Customer Insight allows for the E-commerce store to handle larger volumes of emails, which opens the gates to scaling their business

**Robot Category**

Nexus Customer Insight bot would be considered as Unattended Automation.

* Almost no Human Intervention:

Human guidance and sorts are not required. Steps such as data collection, email sending, and etc. are all automated where the task is carried out by Nexus Customer Insight bot.

* Scheduled or Trigger-Based:

Nexus Customer Insight bot can be scheduled to run at specific time throughout the week to gather data throughout the day and send personalized emails as well.

**Current Scenario** **[Step-by-step]**

***Context***:

* E-Commerce Data is saved at Google Firebase,
* Pre-written email has been written in notepad named; “Email\_Products\_Bought\_Customer” & “Email\_Not\_Products\_Bought\_Customer”.

**Step 1**: Open Google Browser and Open up Google Excel Sheet file.

**Step 2**: Create the Excel Sheet File and name it as “Customer\_Email”

**Step 3**: Link Customer\_Email” to E-Commerce Store’s Firebase

* Press Extension -> ‘Setting Icon’ -> Copy Script Id -> Click Libraries -> Paste Script Id -> Name Identifier as ‘Email DB’
* Press Services -> Choose Google Sheet API -> Click on Code.gs
* Paste link [Provided in Reference] and copy and paste code in Code.gs -> Copy Firebase URL and paste it in the code -> Select function to run as ‘getAllData’ & run the code -> Wait for the code to finish running -> Excel Sheet contains the data from Firebase
  + If you gets ‘Access Error’:
    - Press ‘Allow’ and wait for the code to finish running

**Step 4**: Download Excel Sheet File and open it in Excel Sheet App.

**Step 5**: Open Anaconda Navigator -> Open Jupyter Notebook

**Step 6**: Open “Data\_Preparation.ipynb” file

[Code uses “Customer\_Email.xslx” as the file name to search for the file]

**Step 7**: Run the code in Jupyter Notebook, which consist of python code.

* Step 1: The code will check for missing values.
  + -> If missing values exist ~> Fill/Drop Missing Values
* Step 2: Validate data type.
  + -> If wrong data type ~> Convert incorrect type
* Step 3: Remove the duplicate values.
* Step 4: Check range of values (Where necessary)
* Step 5: Save the file as “Updated\_Customer\_Email.xslx”

**Step 8**: Open Outlook, Open “Updated\_Customer\_Email.xslx” in Excel Sheet app, Open 2 Notepads which are named; “Email\_Products\_Bought\_Customer” & “Email\_Not\_Products\_Bought\_Customer”

**Step 9**: Start Sending Personalized Emails to Customer via Outlook

* Step1: Check if individual bought products from the website before
* Step 2: If person **bought** products before:
  + Step 1: Copy text from “Email\_Products\_Bought\_Customer” notepad.
  + Step 2: Click on Send Email button -> Paste the text.
  + Step 3: Replace the special characters with the person’s name.
  + Step 4: Send the email.
* Step 3: If person did **not** buy product before:
  + Step 1: Copy the email written in text from the notepad “Email\_Not\_Products\_Bought\_Customer”
  + Step 2: Click on Send Email button -> Paste the text.
  + Step 3: Replace the special characters with the person’s name.
  + Step 4: Send the email.
* Step 4: Repeat these steps for all the customer (e.g 600 customers)

**Step 9**: Open Google Analytics & Open Microsoft Excel Sheet App

* Step 1: Create a new Microsoft Excel Sheet file and name it “Website Analytics Data”.
* Step 2: Open Google Analytics on Google Browser.
* Step 3: Under home -> 4 columns can be seen set to anything data variable you like
* Step 4: Look through 50-90 data variables and copy and paste data of each data variable into the “Website\_Analytics\_Data.xslx” excel sheet file.

**Step 10**: Preparing for Data Preparation. Open Anaconda Navigator.

* Step 1: Open Jupyter Notebook in Anaconda Navigator
* Step 2: Open “Data\_Preparation\_2.ipynb” file which consist python code.
* Step 3: The code in will check for missing values.
  + -> If missing values exist ~> Fill/Drop Missing Values
* Step 4: Validate data type.
  + -> If wrong data type ~> Convert incorrect type
* Step 5: Remove the duplicate values.
* Step 6: Check range of values (Where necessary)
* Step 7: Save the file as “Updated\_Website\_Analytics\_Data.xslx” file.

**Step 11**: Open Power BI.

* Step 1: Press “+ New Report” and Press “Excel” shee as an options
* Step 2: Import the “Updated\_Website\_Analytics\_Data.xslx” file into the report
* Step 3: Start using the Visualisation Tool available in the report

**Automation Scenario**

Automation Scenario for Nexus Customer Insight Bot [Step-by-step]

**Step 1: Open Google Browser and Create Excel Sheet File**

1. **Open Browser**: Open Browser
   * Input: https://docs.google.com/spreadsheets/
   * Set your “Browser Type” as Chrome 🡪 Under Analyse File > Workflow Analyzer Settings > UI Automation Classic > Browser
2. **Click**: Click
   * Input: Indicate the element “Blank Spreadsheet”
3. **Type Into**: Type Into the File Name
   * Input: “Customer\_Email”

**Step 2: Link Customer\_Email spreadsheet to Firebase**

1. **Click**: Click
   * Input: Indicate the element “Extensions”
2. **Click**: Click
   * Input: Indicate the element “Settings” Icon
3. **Get Text**: Get Text of Script ID
   * Output: Script\_Id
4. **Click**: Click
   * Input: Indicate the element “Libraries”
5. **Type Into**: Type Into the text field
   * Input: Script\_Id
6. **Type Into**: Type Into the Identifier Name Text Field
   * Input: “Email DB”
7. **Click**: Click
   * Input: Indicate the element “Services”
8. **Select Item**: Select Item
   * Input: Indicate the element “Google Sheet API”
9. **Click**: Click
   * Input: Indicate the element “Code.gs”
10. **Get Text**: Get text of the code [Link of the has been provided]
    * Output: code
11. **Type Into**: Type into Code.gs
    * Input: code
12. **Get Text**: Get text of Firebase URL
    * Output: db\_url
13. **Type Into**: Type Into
    * Input: db\_url
14. **Select Item**: Select Item
    * Input: getAllData
15. **Click**: Click
    * Input: Run

**Step 3: Handle Access Error (If any)**

17. **Element Exists**: Element Exists

* Input: Indicate the element “Allow Access” pop up
* Output: Access\_Error

1. **If**: If the condition exsists
   * Condition: Access\_Error
   * Then:
     + Click: Click “Allow” button
       - Input: Indicate the element “Allow” button

**Step 4: Download “Customer\_Email” and Open Microsoft Excel Sheet** App

19. **Click**: Click the “Download” button

* Input: Indicate the element “Download” button

1. **Open Application**:
   * Input: Indicate “Excel Sheet App” application
   * Do:
     + Click: Click on “Customer\_Email” Spreadsheet
       - Indicate the element “Customer\_Email” file

**Step 5: Open Jupyter Notebook and Data Preparation**

1. **Open Application**:
   * Input: Indicate “Anaconda Navigator” application
2. **Open Application**:
   * Input: Indicate “Jupyter Notebook” application
   * **Do:**
     + **Click**: Click on “Data\_Preparation.ipynb” file
       - Input: Indicate the element “Data\_Preparation.ipynb”

**Step 6: Run Data Preparation Code**

1. **Click**: Click “Run” button
   * Input: Indicate the element “Run” button

**Step 9: Open Microsoft Excel Spreadsheet and the Updated Excel Sheet**

1. **Open Application**:
   * Input: Indicate “**Microsoft Excel Spreadsheet**” application
   * Do:
     + **Click**: Click on the new file in Microsoft Excel Spreadsheet
       - Input: Indicate the element “Updated\_Customer\_Email.xslx” file
       - Output: customer\_emails

**Step 7: Open Outlook and Notepad for Emailing**

1. **Open Application**:
   * Input: Indicate “Outlook” application
2. **Open Application**:
   * Input: Notepad
   * Do:
     + Input: Indicate the element: Email\_Products\_Bought\_Customer” notepad
3. **Open Application**: Open Application
   * Input: Notepad
   * Do:
     + Input: Indicate the element : “Email\_Not\_Products\_Bought\_Customer” notepad

**Step 8: Send Personalized Emails**

* + **For Each Row**: For each row of “Updated\_Customer\_Email.xslx”
  + **Datatable**: customer\_emails
  + **Do:** 
    - **Else If**:
    - Condition: {If Customer had bought products before}
    - Then:
      * **Get Text**: Get Text
        + Output: customer\_emails\_1
      * **Click**: Click
        + Input: Send Email Button [This creates Draft Email]
      * **Type Into**: Type Into Draft Email
        + Input: customer\_emails\_1
      * **Replace Matching Pattern**: Replace specials character with the name of the individual customer
        + Input: {Configure the Regular Expression}
      * **Click**: Click on “Send Email” button
        + Input: Indicate the element “Send Email” button
    - Else:
      * **Get Text**: Get Text
        + Output: customer\_emails\_2
      * **Click**: Click
        + Input: Indicate the “Send Email” Button [This creates Draft Email]
      * **Type Into**: Type Into Draft Email
        + Input: customer\_emails\_2
      * **Type Into**: Type Into Draft Email
        + Input: Person's Name
      * **Click**: Click on “Send Email” button
        + Input: Indicate the element “Send Email” button

**Step 9: Open Google Analytics and Create Website Analytics Data Spreadsheet**

1. **Open Browser**:
   * Input: <https://support.google.com/analytics/answer/6367342?sjid=3605593739412772922-AP#access&zippy=%2Cin-this-article>
   * Do:
     + Click: Click on specific link
       - Input: Indicate the element {Link}
2. **Open Application**: Open Microsoft Excel Sheet
   * Input: Indicate the “Microsoft Excel Sheet” application
   * Do:
     + Click:
       - Indicate new element “New Spreadsheet”
     + Type Into:
       - Input: “Website\_Analytics\_Data” [File name]
3. **Repeat Number of Times**:
   * For each: Item
   * Repeat number of times: 67
   * Do:
     + Click: Click on dropdown button and click on variable type
       - Indicate the element {Variable}
     + Get Text: Get the stats of each variable
       - Output: stats\_analysis
     + Type into: Type into the “Website\_Analytics\_Data” file
       - input: stats\_analysis

**Step 10: Data Preparation for Website Analytics Data**

1. **Open Application:**
   * Input: Indicate “Anaconda Navigator” the application
2. **Click**:
   * Input: Indicate the element “Jupyter Notebook”
3. **Click**: Click on the file for data preparation
   * Input: Indicate the element “Data\_Preparation\_2.ipynb” file
4. **Click**: Click on the “Run” button
   * Input: Indicate the element “Run” button [This will clean the data and generate us a updated file]

**Step 11: Preparing Data Visualization in Power BI**

1. **Open Application**:
   * Input: Indicate the “Power BI” application
2. **Click**: Click on “+ New Report” button
   * Input: Indicate the ““+ New Report” button
3. **Import Data**: Import Data
   * Click: Click on Excel Sheet Option
     + Indicate the element “Excel Sheet” option.
     + Click: Once folders show up, click on the updated file -
   * Indicate the element “Updated\_Website\_Analytics\_Data.xslx” file

**References**

Code: [https://github.com/anish-gyawali/Ioni...](https://www.youtube.com/redirect?event=video_description&redir_token=QUFFLUhqbDlFa2xMNi1MZHVBaTJFbEdudnJaZ2ZpdGdnZ3xBQ3Jtc0tsMEZldGpSbmhZcDg5N0VpVkc2enJZc2hlT3dLQ3drRHR5MlhvckNmU0F6WEo2SUQ0cHB6SXdYSjVxQ0VNbXhuX21UTHVjYWRhdkhraFZJa19PZWlLeUJaU0dOamM1XzRXYzRBTkNRSU4zXzBDT0ZrVQ&q=https%3A%2F%2Fgithub.com%2Fanish-gyawali%2FIonic-firebase-excel%2Fblob%2F535a878109aba694ced1bba7758eaf0530a5211b%2FexcelCode.gs&v=dOwZ5gzl9wI)

Article:<https://www.pega.com/insights/articles/survey-reveals-biggest-benefits-challenges-rpa-solutions>

Article: <https://flobotics.io/blog/rpa-statistics/>

**Process Flow Chart**

**Flowchart Link:**

[**https://drive.google.com/file/d/1NLkgEGVUbepcBcnPzh2mTK7IwW-87Wxt/view?usp=sharing**](https://drive.google.com/file/d/1NLkgEGVUbepcBcnPzh2mTK7IwW-87Wxt/view?usp=sharing) **[Open with draw.io]**

Overview of Flowchart

**A diagram of a company

Description automatically generated with medium confidence**

Part 1

**A diagram of a flowchart

Description automatically generated**

Part 2

Part 3

**A diagram of a workflow

Description automatically generated**

**A screenshot of a computer

Description automatically generated**