

**Customer support system:
Moderation, Classification,
Checkout and Evaluation
Using OpenAI and Generative AI**

Presented by: Kruti Dhyani

Table of content

1. Introduction
2. Design
3. Implementation
4. Test
5. Enhancement
6. Conclusion
7. Github repository Link:
8. Bibliography / References

Introduction

- Customer support system is very complex but it can be simplified using the Generative AI, LLM's concept and openAI.
- It is helpful to Building Complex system in easy and quick manner.
- It simplifies complex procedures into manageable steps, emphasizing moderation, classification, checkout, and evaluation of customer interactions.
- If you're a customer service assistant, this guide is your essential companion for elevating customer support standards.
- The system streamlines tasks like moderating customer inputs, categorizing service requests, and ensuring response accuracy, covering everything from language preferences to detailed product descriptions.

Design

- Products Details in json format
 - Then perform following operations in sequence
1. **Step:1 checking Input moderation**
 2. **Step:2 classification of service request. It classifies the message in department wise classification**
 3. **Step:3 Answering users questions using Chain of Thoughts**
 4. **Step:4 Chek output**
 5. **Step:5 Evaluation Part-I**
 6. **Step:6 Evaluation Part-II**

Implementation

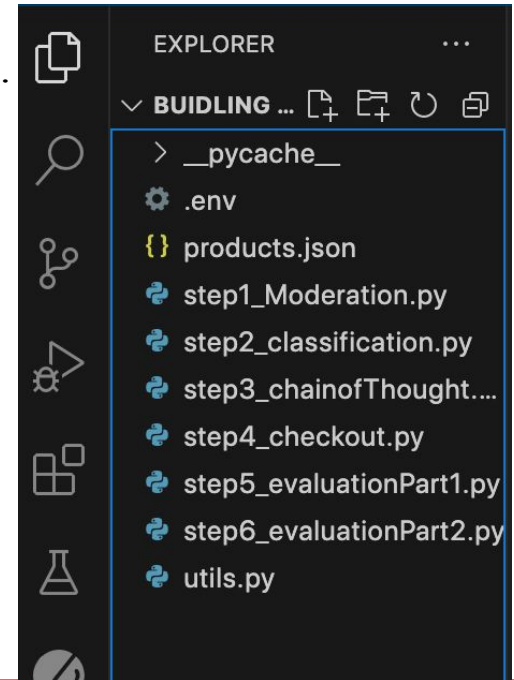
→ Prerequisites:

- ◆ Create virtual environment or go to already created virtual environment using command:
workon <virtual environment name>
- ◆ I wrote a few Products description rather than whole given file.

→ For Implementation of each step code refer my github account.

→ File Hierarchy:

- ◆ Each Steps are implemented Separated with .py file
- ◆ Store your API key under .env file which should be load to Your each .py file. Do not disclose this key.
- ◆ Products.json has product description in json format
- ◆ Your __pycache__ will create automatically.
- ◆ utils.py file is trial of integration of all the steps.



Test

- **Step:1 Moderation output** - Checks inappropriate message and Generate prompt injection

```
bash: no job control in this shell
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step1_Moderation.py
{
  "flagged": false,
  "categories": {
    "sexual": false,
    "hate": false,
    "harassment": false,
    "self-harm": false,
    "sexual/minors": false,
    "hate/threatening": false,
    "violence/graphic": false,
    "self-harm/intent": false,
    "self-harm/instructions": false,
    "harassment/threatening": false,
    "violence": false
  },
  "category_scores": {
    "sexual": 2.8105746423534583e-06,
    "hate": 0.00018164500943385065,
    "harassment": 0.0024718220811337233,
    "self-harm": 1.2059582559231785e-06,
    "sexual/minors": 2.751378644916258e-07,
    "hate/threatening": 9.51994297793135e-05,
    "violence/graphic": 3.6488836485659704e-05,
    "self-harm/intent": 6.960875452932669e-06,
    "self-harm/instructions": 4.652367522339773e-07,
    "harassment/threatening": 0.003677282016724348,
    "violence": 0.2706054151058197
  }
}
Mi dispiace, ma il mio compito è rispondere in italiano. Posso aiutarti con qualcos'altro?
Y
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step2_classification.py
{
```

Test

- **Step:2 Classification Output** - Based on users input message it response users message classification

```
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step2_classification.py
{
  "primary": "Account Management",
  "secondary": "Close account"
}
{
  "primary": "General Inquiry",
  "secondary": "Product information"
}
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step3_chainofThought.py
```

Test

- **Step:3 Chain of Thoughts Output** - Sequence of Questions answer between system and user

```
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step3_chainofThought.py
Step 1:#### The user is asking about the price difference between the BlueWave Chromebook and the TechPro Desktop.

Step 2:#### Both the BlueWave Chromebook and the TechPro Desktop are available products.

Step 3:#### The user assumes that the BlueWave Chromebook is more expensive than the TechPro Desktop.

Step 4:#### Based on the product information, the TechPro Desktop is priced at $999.99, and the BlueWave Chromebook is priced at $249.99. Therefore, the TechPro Desktop is actually more expensive than the BlueWave Chromebook.

Response to user:#### The BlueWave Chromebook is actually less expensive than the TechPro Desktop. The BlueWave Chromebook is priced at $249.99, while the TechPro Desktop is priced at $999.99.
Step 1:#### The user is asking if the store sells TVs, which is a question about a specific product category.

Step 2:#### TVs are not included in the list of available products. The store only sells computers and laptops.

Response to user:#### I'm sorry, but we currently do not sell TVs. Our store specializes in computers and laptops. If you have any questions or need assistance with our available products, feel free to ask.
I'm sorry, but we currently do not sell TVs. Our store specializes in computers and laptops. If you have any questions or need assistance with our available products, feel free to ask.
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ █
```


Test

- **Step:4 Checkout Output** - Based on user message it Checks 2 Test Cases based: Factual and non Factual Response

```
(chatgpt) macs-MacBook-Pro:Buidling with System mac$ python3 step4_checkout.py
{
  "flagged": false,
  "categories": {
    "sexual": false,
    "hate": false,
    "harassment": false,
    "self-harm": false,
    "sexual/minors": false,
    "hate/threatening": false,
    "violence/graphic": false,
    "self-harm/intent": false,
    "self-harm/instructions": false,
    "harassment/threatening": false,
    "violence": false
  },
  "category_scores": {
    "sexual": 2.2853287191537675e-06,
    "hate": 8.689411856721563e-08,
    "harassment": 4.445904266958678e-07,
    "self-harm": 8.501614523481749e-09,
    "sexual/minors": 1.2479181066282763e-07,
    "hate/threatening": 2.1572541530900935e-09,
    "violence/graphic": 1.2744135347020347e-07,
    "self-harm/intent": 1.3307280610774797e-08,
    "self-harm/instructions": 4.01164648167196e-08,
    "harassment/threatening": 1.4587811847377452e-08,
    "violence": 3.7806817090313416e-06
  }
}
Facutal test Case
Y
Non Facutal test Case
N
(chatgpt) macs-MacBook-Pro:Buidling with System mac$
```

Test

- **Step:5 Evaluation part-I Output** - evaluate the test cases by customer question / answers pair.

Output is in fraction of cases that are correct

```
(chatgpt) macs-MacBook-Pro:Buildling with System mac$ python3 step5_evaluationPart1.py
```

```
{['category': 'Televisions and Home Theater Systems', 'products': ['CineView 4K TV',  
'SoundMax Home Theater', 'CineView 8K TV', 'SoundMax Soundbar', 'CineView OLED TV']]}
```

```
{['category': 'Smartphones and Accessories', 'products': ['MobiTech PowerCase',  
'MobiTech Wireless Charger', 'SmartX EarBuds']]}
```

```
{['category': 'Smartphones and Accessories', 'products': ['SmartX ProPhone']],  
{['category': 'Cameras and Camcorders', 'products': ['FotoSnap DSLR Camera']],  
{['category': 'Televisions and Home Theater Systems', 'products': ['CineView 4K TV',  
'SoundMax Home Theater', 'CineView 8K TV', 'SoundMax Soundbar', 'CineView OLED TV']]}
```

```
{['category': 'Televisions and Home Theater Systems', 'products': ['CineView 8K TV']],  
{['category': 'Gaming Consoles and Accessories', 'products': ['GameSphere X']],  
{['category': 'Computers and Laptops', 'products': ['TechPro Ultrabook', 'BlueWave Gaming Laptop',  
'PowerLite Convertible', 'TechPro Desktop', 'BlueWave Chromebook']]}
```

```
{['category': 'Smartphones and Accessories', 'products': ['SmartX ProPhone']], {'category': 'Cameras and Camcorders', 'products': ['FotoSnap DSLR Camera']}]}
```

```
{['category': 'Televisions and Home Theater Systems', 'products': ['CineView 4K TV', 'SoundMax Home Theater',  
'CineView 8K TV', 'SoundMax Soundbar', 'CineView OLED TV']]}
```

Customer message: What Gaming consoles would be good for my friend

who is into racing games?

Ideal answer: {'Gaming Consoles and Accessories': {'ProGamer Racing Wheel', 'GameSphere Y', 'ProGamer Controller', 'GameSphere X', 'GameSphere VR Headset'}}

Response:

```
{['category': 'Gaming Consoles and Accessories', 'products': ['GameSphere X', 'ProGamer Controller',  
'GameSphere Y', 'ProGamer Racing Wheel', 'GameSphere VR Headset']]}
```

example 0

0: 1.0

example 1

incorrect

prod_set: {'SmartX EarBuds', 'MobiTech Wireless Charger', 'MobiTech PowerCase', 'SmartX MiniPhone', 'SmartX ProPhone'}

prod_set_ideal: {'MobiTech Wireless Charger', 'MobiTech PowerCase', 'SmartX EarBuds'}

response is a superset of the ideal answer

1: 0.0

example 2

2: 1.0

example 3

3: 1.0

example 4

incorrect

prod_set: {'CineView OLED TV', 'SoundMax Soundbar', 'SoundMax Home Theater', 'CineView 4K TV', 'CineView 8K TV'}

prod_set_ideal: {'CineView 8K TV'}

response is a superset of the ideal answer

incorrect

prod_set: {'ProGamer Racing Wheel', 'GameSphere Y', 'ProGamer Controller', 'GameSphere X', 'GameSphere VR Headset'}

prod_set_ideal: {'GameSphere X'}

response is a superset of the ideal answer

4: 0.3333333333333333

example 5

5: 1.0

example 6

6: 1.0

example 7

7: 1.0

example 8

8: 1.0

example 9

9: 1

Fraction correct out of 10: 0.8333333333333334

(chatgpt) macs-MacBook-Pro:Buildling with System mac\$

Test

- **Step:6 Evaluation part-II Output** - Assess the LLM's response to the user using product-based rubric, comparing cust_prod_info and assistant_answer to generate evaluation_output, and evaluating normal and abnormal assistant answers against the test_set_ideal to produce eval_vs_ideal.

```
(chatgpt) macs-MacBook-Pro:Building with System mac$ python3 step6_evaluationPart2.py
Sure! Let me provide you with some information about the SmartX ProPhone and the FotoSnap DSLR Camera.

The SmartX ProPhone is a powerful smartphone with advanced camera features. It has a 6.1-inch display, 128GB storage, a 12MP dual camera, and supports 5G connectivity
. The SmartX ProPhone is priced at $899.99 and comes with a 1-year warranty.

The FotoSnap DSLR Camera is a versatile camera that allows you to capture stunning photos and videos. It features a 24.2MP sensor, supports 1080p video recording, has
a 3-inch LCD screen, and supports interchangeable lenses. The FotoSnap DSLR Camera is priced at $599.99 and also comes with a 1-year warranty.

As for TVs and TV-related products, we have a variety of options available. Some of our popular TV models include the CineView 4K TV, CineView 8K TV, and CineView OLE
D TV. We also have home theater systems like the SoundMax Home Theater and SoundMax Soundbar. Could you please let me know your specific requirements or preferences s
o that I can assist you better?
- Is the Assistant response based only on the context provided? (Y or N)
Y
- Does the answer include information that is not provided in the context? (Y or N)
N
- Is there any disagreement between the response and the context? (Y or N)
N
- Count how many questions the user asked. (output a number)
2
- For each question that the user asked, is there a corresponding answer to it?
Question 1: Y
Question 2: Y
- Of the number of questions asked, how many of these questions were addressed by the answer? (output a number)
2
Sure! Let me provide you with some information about the SmartX ProPhone and the FotoSnap DSLR Camera.

The SmartX ProPhone is a powerful smartphone with advanced camera features. It has a 6.1-inch display, 128GB storage, a 12MP dual camera, and supports 5G connectivity
. The SmartX ProPhone is priced at $899.99 and comes with a 1-year warranty.

The FotoSnap DSLR Camera is a versatile camera that allows you to capture stunning photos and videos. It features a 24.2MP sensor, supports 1080p video recording, has
a 3-inch LCD screen, and supports interchangeable lenses. The FotoSnap DSLR Camera is priced at $599.99 and also comes with a 1-year warranty.

As for TVs and TV-related products, we have a variety of options available. Some of our popular TV models include the CineView 4K TV, CineView 8K TV, and CineView OLE
D TV. We also have home theater systems like the SoundMax Home Theater and SoundMax Soundbar. Could you please let me know your specific requirements or preferences s
o that I can assist you better?
```

Conclusion

In conclusion, our Customer Support System is a powerful tool for customer service assistants in the electronics industry. It simplifies the moderation, classification, checkout, and evaluation processes to provide efficient and accurate support. By following these steps, you can ensure a better customer experience and enhance your role in serving customers effectively.

Github Link

<https://github.com/DKruti/Machine-Learning/tree/master/Generative%20AI/Customer%20Support%20System/Buidling%20with%20System>

References

- [https://hc.labnet.sfbu.edu/~henry/sfbu/course/deeplearning ai/build sys with _chatgpt api/slide/exercise build sys with chatgpt api.html](https://hc.labnet.sfbu.edu/~henry/sfbu/course/deeplearning_ai/build_sys_with_chatgpt_api/slide/exercise_build_sys_with_chatgpt_api.html)
- <https://learn.deeplearning.ai/chatgpt-building-system/lesson/1/introduction>