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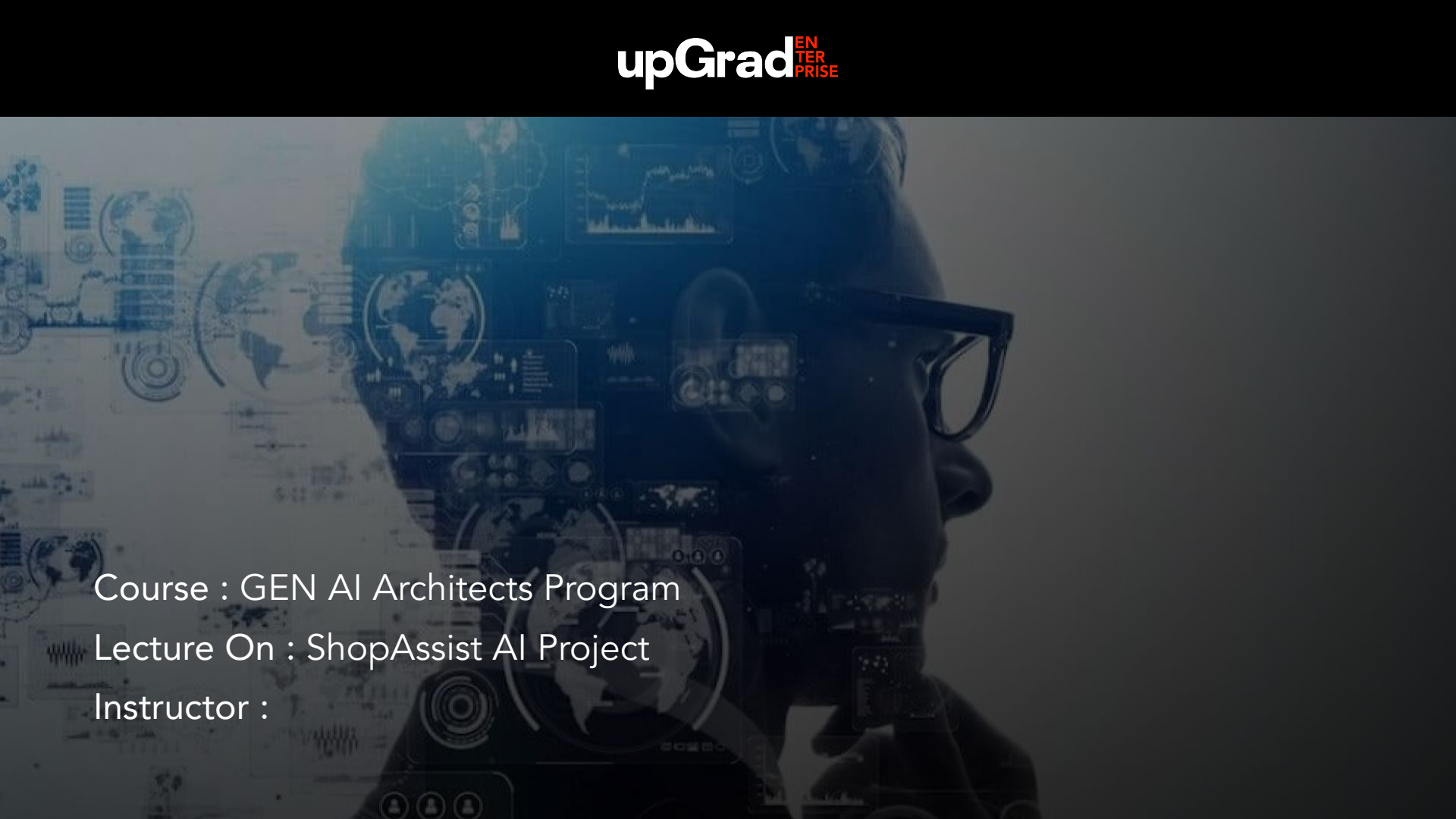
GEN AI Architects Program - Hexaware

9th September, 2024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Course : GEN AI Architects Program
Lecture On : ShopAssist AI Project
Instructor :

In Last Class, we covered….

01 Prompt Engineering

02 Prompt engineering Technical Side

03 Prompt engineering Recent Development

04 Key elements in Prompt Engineering

05 Crafting Prompts

06 Techniques in Prompt Engineering

Today's Agenda

01 ShopAssist AI

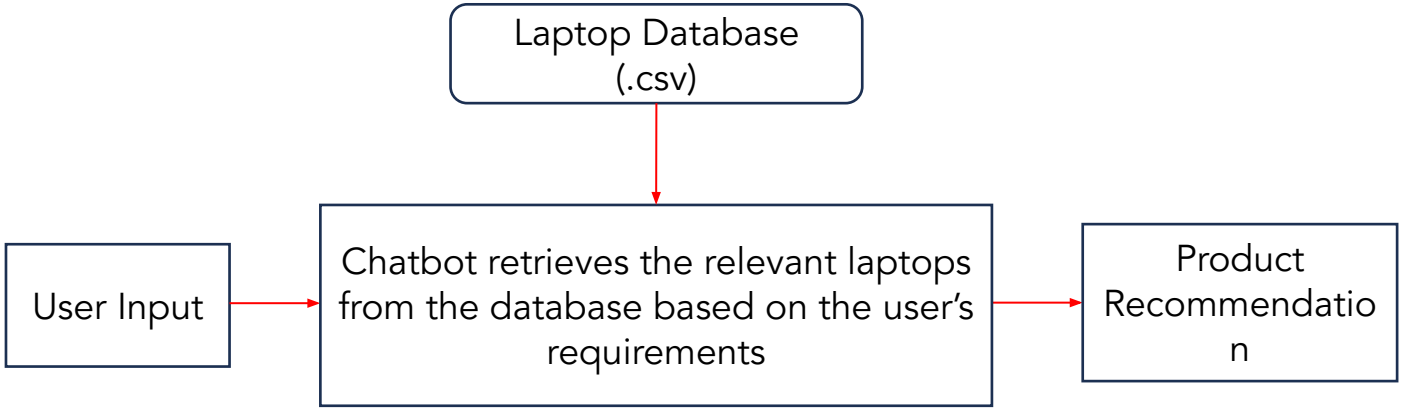
i Chatbot System Design

a Intent Clarity and Intent Confirmation Layers

b Product Mapping and Information Extraction

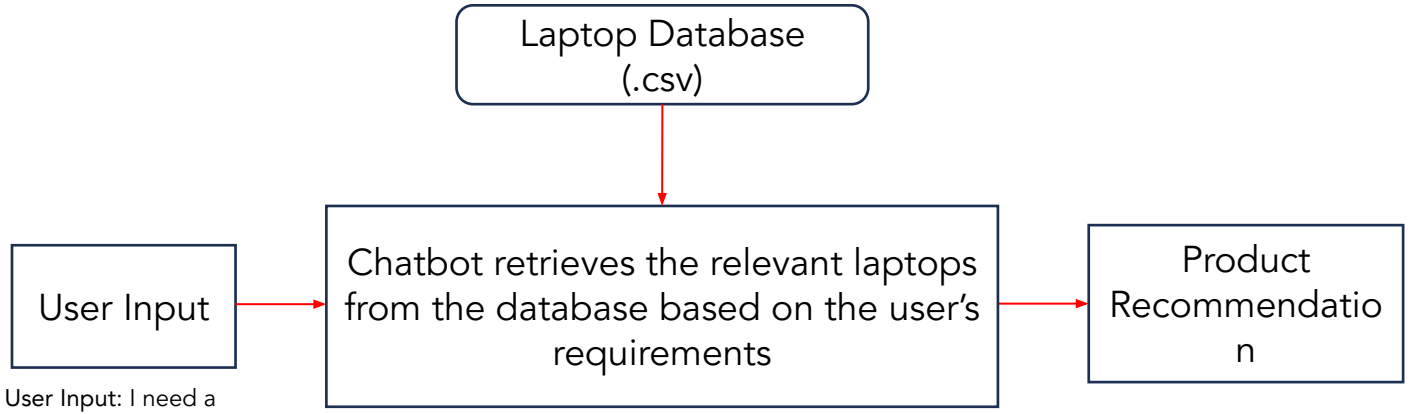
c Product Recommendations

ShopAssist AI



Chatbot initiates conversation with user and describes the laptop requirements

Chatbot ends conversation once user is satisfied with the results and presses exit



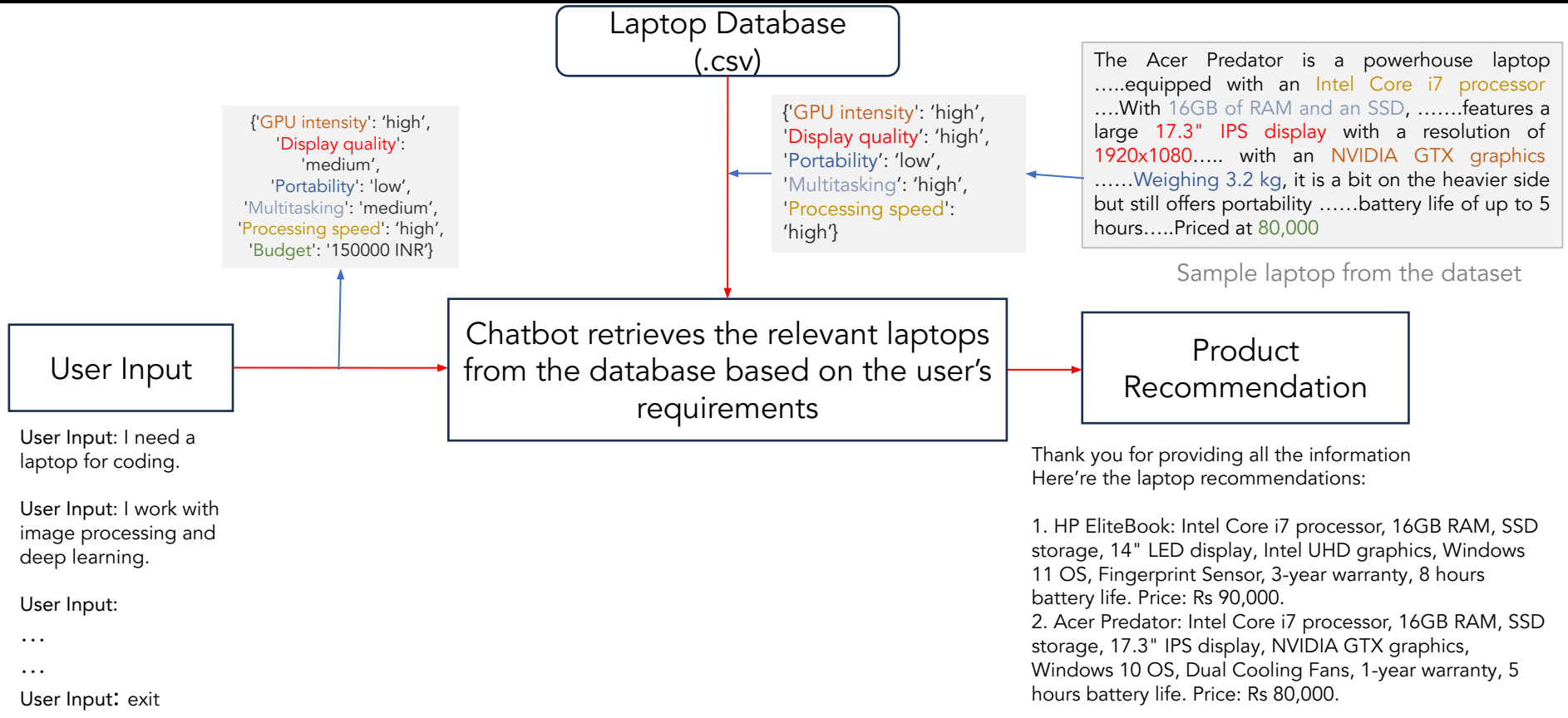
User Input: I need a laptop for coding.

User Input: I work with image processing and deep learning.

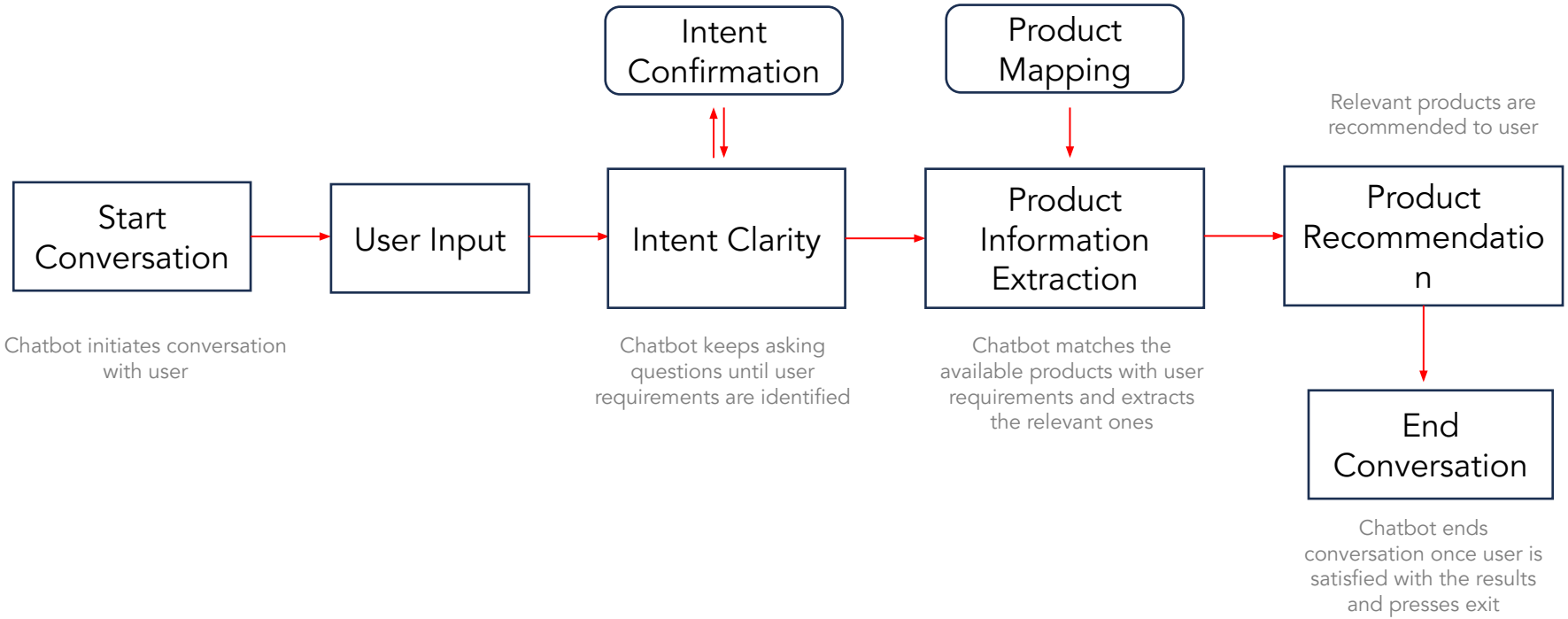
User Input:

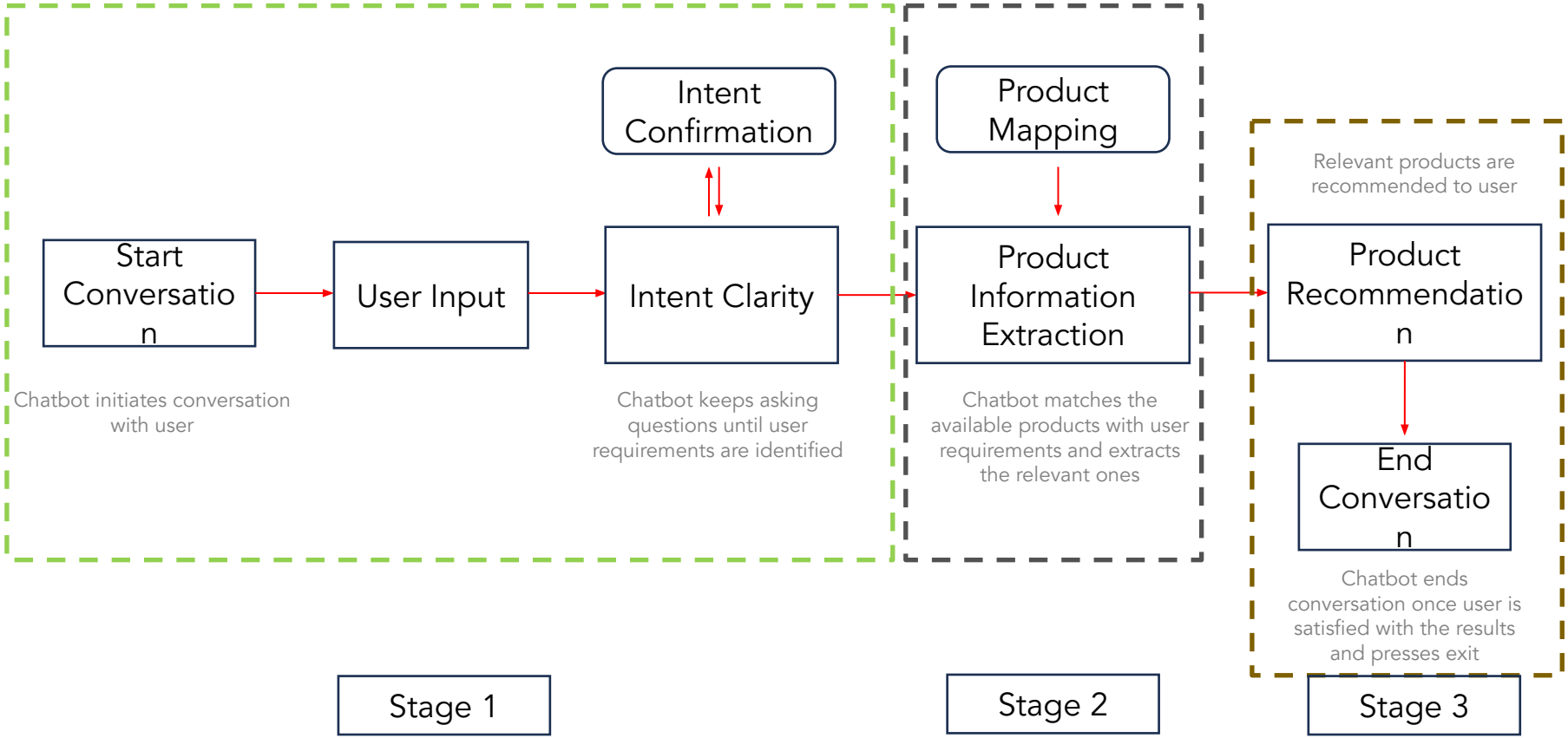
...

User Input: exit

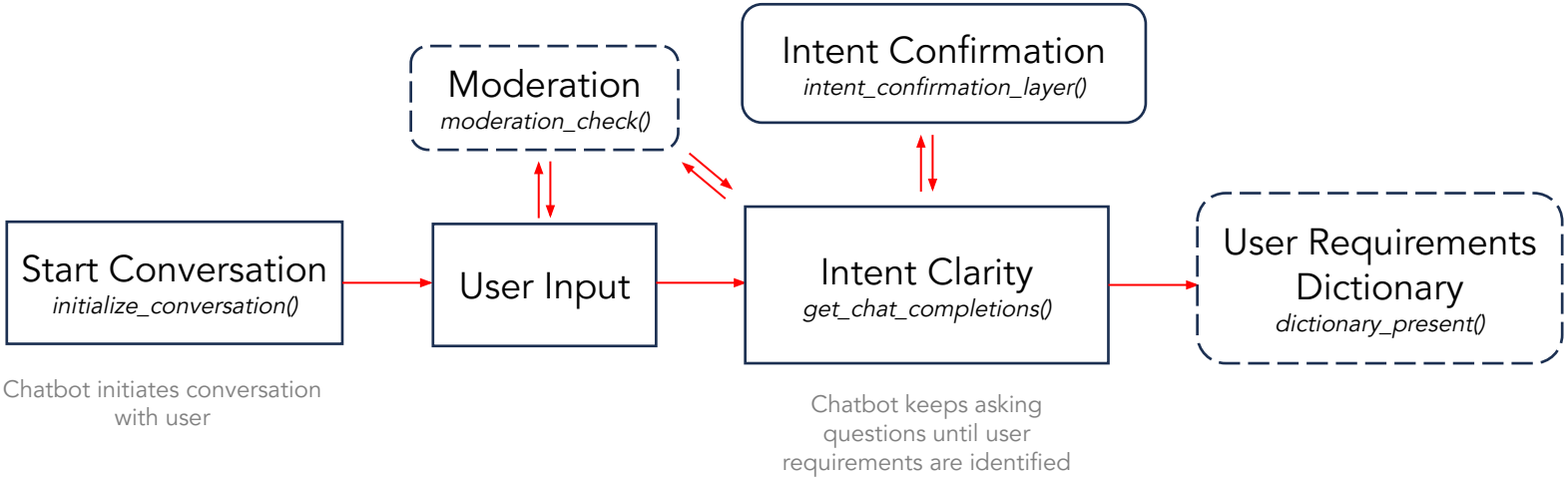

Laptop Database (.csv)
{'GPU intensity': 'high', 'Display quality': 'medium', 'Portability': 'low', 'Multitasking': 'medium', 'Processing speed': 'high', 'Budget': '150000 INR'}
{'GPU intensity': 'high', 'Display quality': 'high', 'Portability': 'low', 'Multitasking': 'high', 'Processing speed': 'high'}
The Acer Predator is a powerhouse laptop …..equipped with an Intel Core i7 processor ….With 16GB of RAM and an SSD, …….features a large 17.3" IPS display with a resolution of 1920x1080….. with an NVIDIA GTX graphics ……Weighing 3.2 kg, it is a bit on the heavier side but still offers portability ……battery life of up to 5 hours…..Priced at 80,000
Sample laptop from the dataset
User Input
Chatbot retrieves the relevant laptops from the database based on the user's requirements
Product Recommendation
User Input: I need a laptop for coding.
User Input: I work with image processing and deep learning.
User Input:
…
…
User Input: exit
Thank you for providing all the information
Here're the laptop recommendations:
1. HP EliteBook: Intel Core i7 processor, 16GB RAM, SSD storage, 14" LED display, Intel UHD graphics, Windows 11 OS, Fingerprint Sensor, 3-year warranty, 8 hours battery life. Price: Rs 90,000.
2. Acer Predator: Intel Core i7 processor, 16GB RAM, SSD storage, 17.3" IPS display, NVIDIA GTX graphics, Windows 10 OS, Dual Cooling Fans, 1-year warranty, 5 hours battery life. Price: Rs 80,000.

CHATBOT SYSTEM DESIGN




Intent Confirmation
Product Mapping
Relevant products are recommended to user
Start Conversation
User Input
Intent Clarity
Product Information Extraction
Product Recommendation
End Conversation
Chatbot initiates conversation with user
Chatbot keeps asking questions until user requirements are identified
Chatbot matches the available products with user requirements and extracts the relevant ones
Chatbot ends conversation once user is satisfied with the results and presses exit
Stage 1
Stage 2
Stage 3

Stage 1: Intent Clarity and Intent Confirmation Layers



In this stage, the chatbot initiates conversation with the user and keeps asking questions until the user's requirements are identified. The user requirements are stored in a Python dictionary and then passed onto the next stage

Stage 1: Sample Conversation

initialize_conversation() starts the conversation

get_chat_completions() returns the response from OpenAI

No at the end denotes the flag from intent_confirmation_layer() that user requirements are not yet identified, and hence the conversation should continue

Series of conversations happen till user requirements are identified

intent_confirmation_layer() has identified the user requirements
Outputs Yes / No

dictionary_present() extracts just the user requirements dictionary from the last response of the chatbot and passes it to the next stage

Chatbot Assistant: Hello! I am an intelligent laptop gadget expert and I am here to help you find the best laptop for your needs. Please let me know what you are looking for in a laptop and any specific requirements you may have.

User: I need a laptop for coding.

Chatbot Assistant: Great! As a coder, you likely require a laptop that can handle multitasking and has a high processing speed. May I know what kind of coding work do you primarily focus on? Are you more involved in web development, data analysis, or software development? Understanding the specific type of coding work will help me tailor my recommendation accordingly.

Intent Confirmation Yes/No: No

User: I work with image processing and deep learning.

. . . . . .

<USER CONTINUES PROVIDING REQUIREMENTS TILL Intent Confirmation Layer provides Yes>

. . . . . .

Intent Confirmation Yes/No: Yes

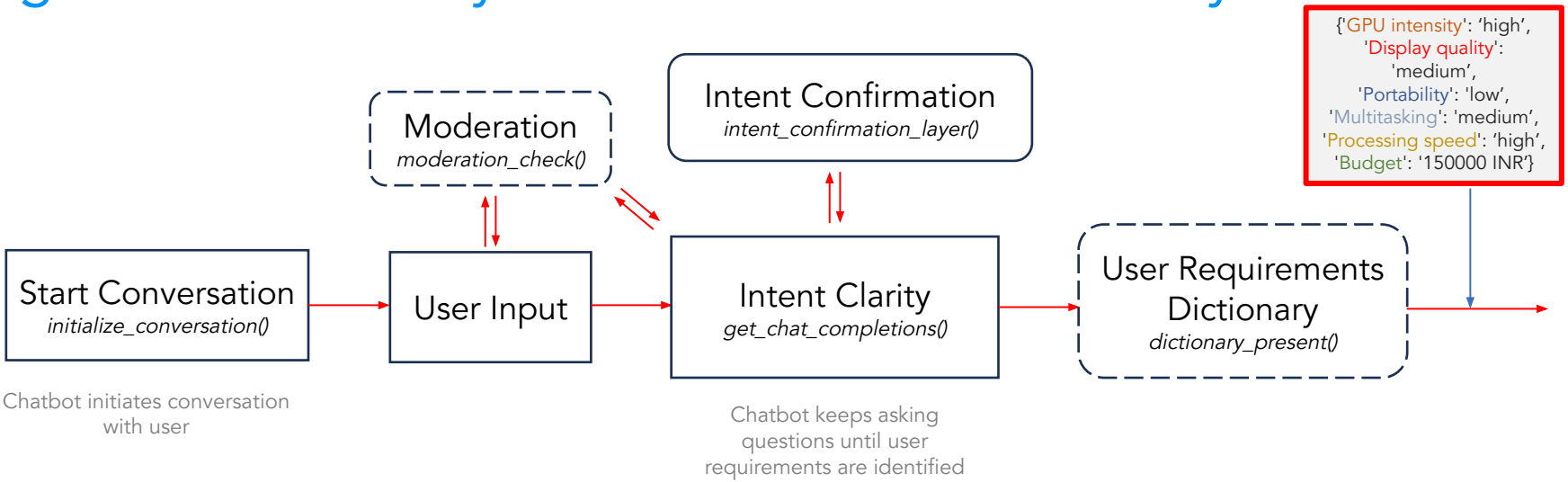
Chatbot Assistant: Thank you for letting me know. Based on your requirements for image processing, deep learning, and gesture recognition, along with your preference for a stationary setup, I have updated the values in the python dictionary as follows:

{'GPU intensity': 'High', 'Display quality': 'medium', 'Portability': 'low', 'Multitasking': 'medium', 'Processing speed': 'High', 'Budget': '150000 INR'}Yes

Answer: {'GPU intensity': 'High', 'Display quality': 'medium', 'Portability': 'low', 'Multitasking': 'medium', 'Processing speed': 'High', 'Budget': '150000 INR'}

Thank you for providing all the information. Kindly wait, while I fetch the products:

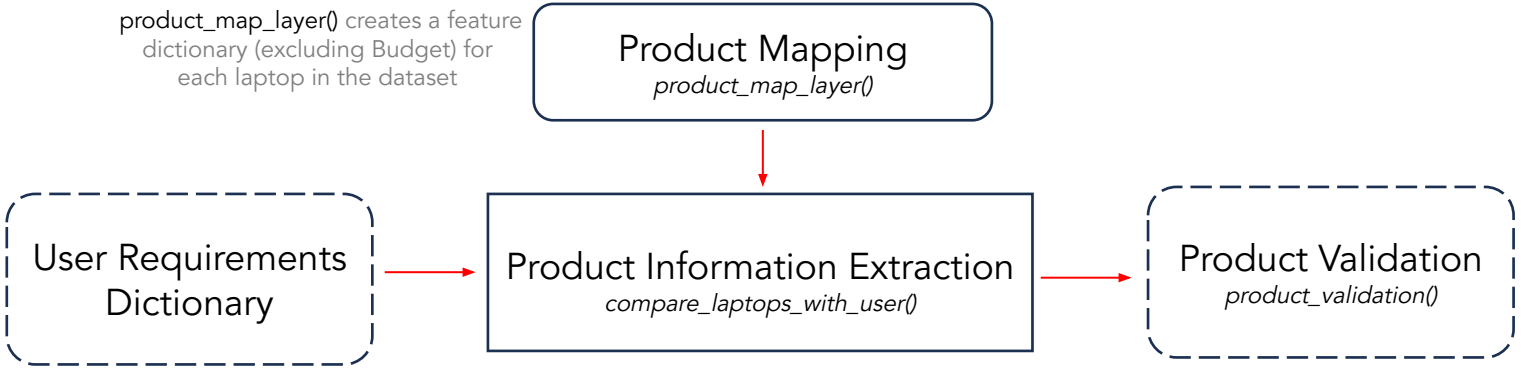
Stage 1: Intent Clarity and Intent Confirmation Layers



In this stage, the chatbot initiates conversation with the user and keeps asking questions until the user's requirements are identified. The user requirements are stored in a Python dictionary and then passed onto the next stage

Stage 2: Product Mapping and Information Extraction

product_map_layer() creates a feature dictionary (excluding Budget) for each laptop in the dataset



Steps performed:

- Extracts details from user requirements dictionary
- Filters the laptops based on budget
- Compares each laptop's feature dictionary with the user requirements and awards a score of:
  - 1, if the laptop's performance is same or better
  - 0, if it's worse
- Calculates the total score for each laptop
- Forwards top3 laptops to the next layer.

If the total score of any laptop > 2, the laptop is forwarded as a recommendation

Stage 2: Example 1

The Acer Predator is a powerhouse laptop …..equipped with an Intel Core i7 processor ….With 16GB of RAM and an SSD, …….features a large 17.3" IPS display with a resolution of 1920x1080….. with an NVIDIA GTX graphics ……Weighing 3.2 kg, it is a bit on the heavier side but still offers portability ……battery life of up to 5 hours…..Priced at 80,000

Sample laptop from the dataset (first filtered based on Budget value)

Product Mapping
product_map_layer()

{'GPU intensity': 'high',
'Display quality': 'high',
'Portability': 'low',
'Multitasking': 'high',
'Processing speed': 'high'}

User Requirements Dictionary

{'GPU intensity': 'high',
'Display quality': 'medium',
'Portability': 'low',
'Multitasking': 'medium',
'Processing speed': 'high',
'Budget': '150000 INR'}

Product Information Extraction
compare_laptops_with_user()

Comparison

GPU intensity: Same
Display quality: Better
Portability: Same
Multitasking: Better
Processing speed : Same

Total score = 1+1+1+1+1 = 5

Product Validation
product_validation()

Total score > 2 Laptop will be forwarded as a recommendation.

Note: The laptops are already filtered for Budget, hence only the other 5 features are compared.

Stage 2: Example 2

Lenovo IdeaPad …….an Intel Core i3 processor running at 2.1 GHz …..With 8GB of RAM and an HDD, …… sports a 15.6" TN display with a resolution of 1366x768…. comes with an Intel UHD GPU …..Weighing 2.2 kg, it is moderately portable……With a one-year warranty and a battery life of up to 5 hours, the Lenovo IdeaPad ensures reliable performance. Priced at 25,000

Sample laptop from the dataset (first filtered based on Budget value)

User Requirements Dictionary

{'GPU intensity': 'high',
'Display quality': 'medium',
'Portability': 'low',
'Multitasking': 'medium',
'Processing speed': 'high',
'Budget': '150000 INR'}

Product Mapping
product_map_layer()

{'GPU intensity': 'low',
'Display quality': 'low',
'Portability': 'medium',
'Multitasking': 'high',
'Processing speed': 'how'}

Product Information Extraction
compare_laptops_with_user()

Comparison

GPU intensity: Worse
Display quality: Worse
Portability: Better
Multitasking: Better
Processing speed : Worse

Score – 0+0+1+1+0 = 2

Note: The laptops are already filtered for Budget, hence only the other 5 features are compared.

Product Validation
product_validation()

Score = 2 Laptop will NOT be forwarded as a recommendation

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Stage 3: Product Recommendations

- In this stage, the chatbot recommends the list of products to the user that have passed the product validation layer and provides further feedback to find the best possible solution.
- In case, no products pass the product validation layer, the chatbot ends the conversation and recommends connecting to a human expert.

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Stage 3: Sample Conversation

(Contd. from previous conversation..)

```
Thank you for providing all the information. Kindly wait, while I
fetch the products:
1.   HP EliteBook: Intel Core i7 processor, 16GB RAM, SSD storage,
     14" LED display, Intel UHD graphics, Windows 11 OS, Fingerprint
     Sensor, 3-year warranty, 8 hours battery life. Price: Rs 90,000.

2. Acer Predator: Intel Core i7 processor, 16GB RAM, SSD storage,
17.3" IPS display, NVIDIA GTX graphics, Windows 10 OS, Dual Cooling
Fans, 1-year warranty, 5 hours battery life. Price: Rs 80,000.

3. MSI GL65: Intel Core i7 processor, 16GB RAM, HDD+SSD storage,
15.6" IPS display, NVIDIA GTX graphics, Windows 10 OS, RGB
Keyboard, 2-year warranty, 4 hours battery life. Price: Rs 55,000.

exit

Thank you for using our service! If you have any more questions in
the future, feel free to ask. Have a great day!
```

initialize_conv_reco()
recommends the top 3 laptops to the user

After user enters exit, the chatbot ends the conversation