

# GetIdea

## An idea generation genAI application.

**GetIdea** is a project which aims to **provide users with innovative solutions by combining products from various fields based on user input**. The application **will suggest unique product idea** derived from the selected products, fostering creativity and innovation.

**Target Users:** Entrepreneurs, Product developers, Hobbyists.

### Data Sources:

- Manual Collection.
- Chatgpt (Prompt engineering).

The data contains product details like,

- **Product ID** - Giving unique identification to each product.
- **Product Name** - The name of the product.
- **Product Field** - The field to which the product belongs.
- **Product features** - The features of product.
- **Description** - The summary about the product.

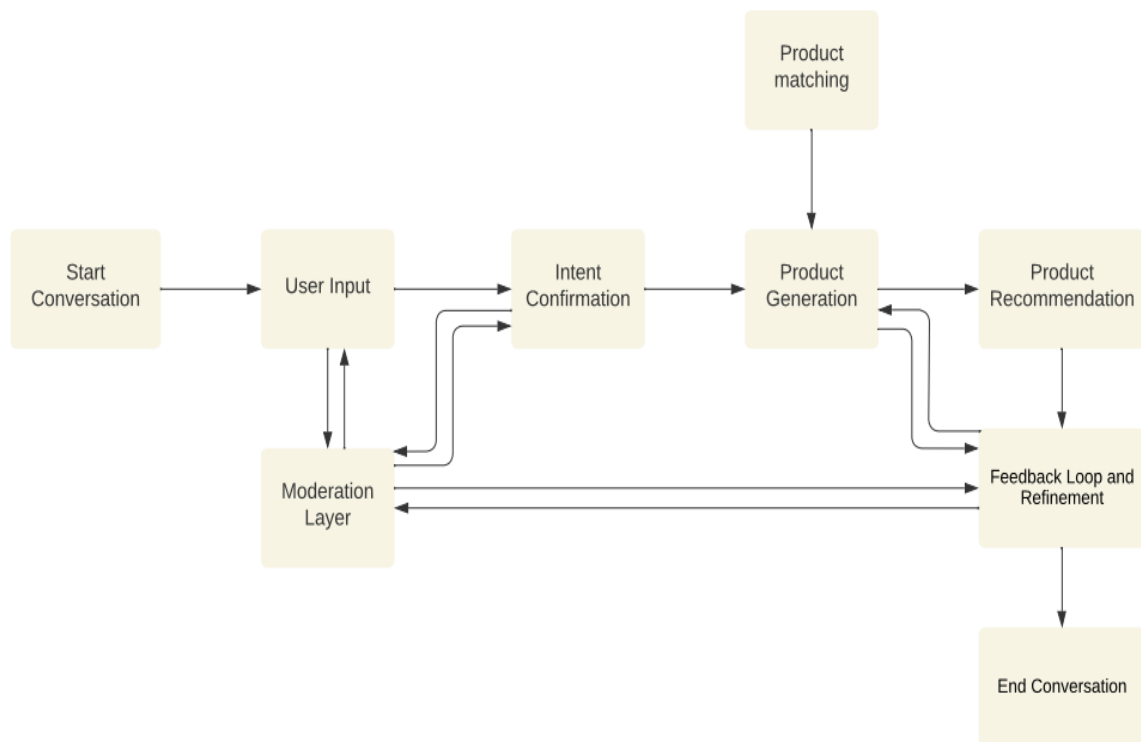
1	product_id	name	field	features	description								
2	1	Smartphone	Technology	touchscreen; camera; internet connectivity	A portable device with a touchscreen, camera, and internet connectivity.								
3	2	Washing Machine	Home Appliances	automatic washing; drying; energy efficient	A home appliance that automatically washes and dries clothes, designed to be energy efficient.								
4	3	Running Shoes	Fashion	lightweight; breathable material; supportive sole	Shoes designed for running, featuring lightweight and breathable materials with a supportive sole.								
5	4	Fitness Tracker	Healthcare	heart rate monitor; step counter; sleep analysis	A wearable device that monitors heart rate, counts steps, and analyzes sleep patterns.								
6	5	Laptop	Technology	portable; high performance; long battery life	A portable computer with high performance capabilities and long battery life.								
7	6	Refrigerator	Home Appliances	cooling; freezer compartment; energy efficient	A home appliance that provides cooling and includes a freezer compartment, designed to be energy efficient.								
8	7	Smartwatch	Healthcare	notifications; fitness tracking; heart rate monitor	A wearable device that provides notifications, tracks fitness activities, and monitors heart rate.								
9	8	Blender	Home Appliances	blending; variable speed control; easy to clean	A kitchen appliance used for blending ingredients, featuring variable speed control and easy cleaning.								
10	9	Electric Scooter	Transportation	electric motor; foldable; long battery life	A foldable scooter powered by an electric motor, with a long battery life for extended use.								
11	10	Headphones	Technology	noise cancelling; wireless; high fidelity sound	Audio devices worn over the ears, featuring noise cancellation, wireless connectivity, and high fidelity sound.								
12	11	Hat	Fashion	sun protection; fashionable; various styles	A headwear item that provides sun protection and comes in various fashionable styles.								
13	12	Tablet	Technology	touchscreen; portable; app ecosystem	A portable device with a touchscreen interface and access to a wide range of applications.								
14	13	Gaming Console	Home Automation	high performance; online multiplayer; exclusive games	A device designed for playing video games, offering high performance, online multiplayer capabilities, and exclusive games.								

A snippet of Product details.

The csv file can be found at this link:

<https://raw.githubusercontent.com/Unnathi-Gowda54/GetIdea/main/products.csv>

## System Design:



### 1. Start Conversation

- Action: Chatbot initiates conversation with the user.
- Objective: Welcome the user and set the context for the interaction.
- Example: "Welcome to GetIdea! How can I assist you today?"

### 2. User Input

- Action: User provides input about the products they are interested in.
- Objective: Gather initial information on the user's desired products.
- Example: User lists products or features they are interested in (e.g., "I want a gadget that combines a smartwatch and a fitness tracker with GPS and music capabilities").
- Assistant asks questions like,
- "Do you want the gadget to have additional features like heart rate monitoring or waterproof capabilities?"
- "So, you want a device that combines a smartwatch, a fitness tracker, GPS, music capabilities, heart rate monitoring, and is waterproof. Is that correct?"

### **3. Moderation Layer**

- Action: Filter user input for harmful or inappropriate content.
- Objective: Ensure user input is safe and appropriate for further processing.
- Example: Detect and flag inappropriate language or requests that violate guidelines.

### **4. Intent Confirmation.**

- Action: Chatbot asks clarifying questions to understand user requirements more clearly and checks if all the key values are filled. Returns result as 'yes' if the intent is confirmed otherwise 'no'.
- Objective: Ensure the chatbot fully understands the user's needs to get the required dictionary of product details.
- Example: {'result': yes/no}

### **5. Product Matching and Generation.**

- Action: Match user requirements with available data and generate a new product concept.
- Objective: Use generative AI to combine features and create a unique product.
- Example: Combine the features of a smartwatch and fitness tracker, ensuring compatibility and optimizing design to meet user needs.

### **6. Feedback Loop and Refinement**

- Action: Allow the user to provide feedback and request adjustments if needed.
- Objective: Refine the product concept based on user feedback to ensure it meets their expectations.
- Example: "Is there anything you would like to add or change about this product? Perhaps more battery life or a different design?"

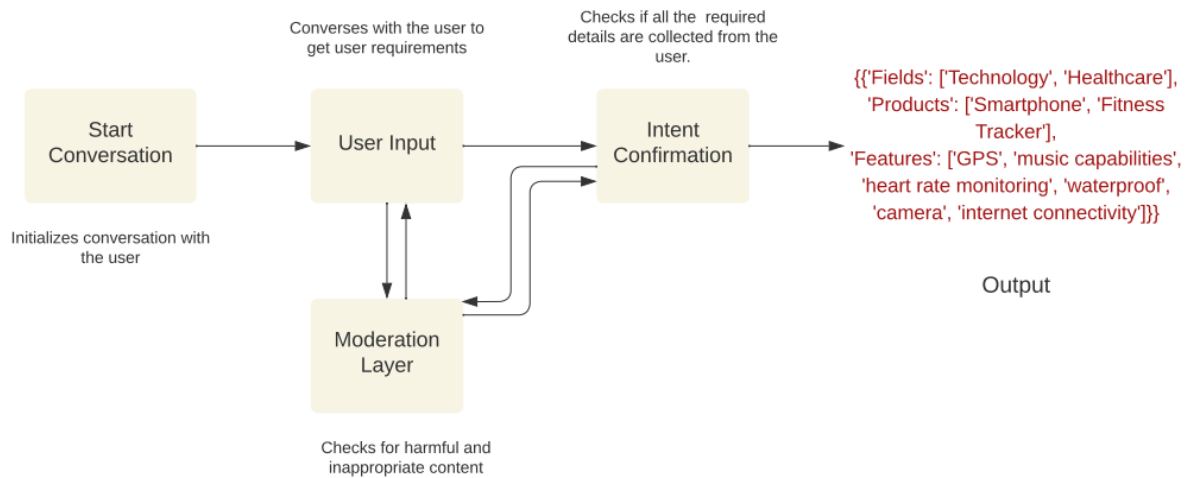
### **7. Moderation Layer (Feedback and Refinement)**

- Action: Filter user feedback for harmful or inappropriate content.
- Objective: Ensure feedback is safe and appropriate for further processing.
- Example: Detect and flag any harmful content in user feedback.

### **8. End Conversation**

- Action: End the interaction once the user is satisfied with the results.
- Objective: Ensure the user is happy with the proposed solution and gracefully end the session.
- Example: "Thank you for using our service. If you need further assistance, feel free to reach out. Have a great day!"

## Stage 1:



Stage-1 starts with initializing a conversation and collecting user input. A moderation layer checks for harmful content, while intent confirmation ensures all necessary details are obtained. The output specifies fields, products, and features based on user requirements.

The output is a json object.

The Stage-1 includes following phases:

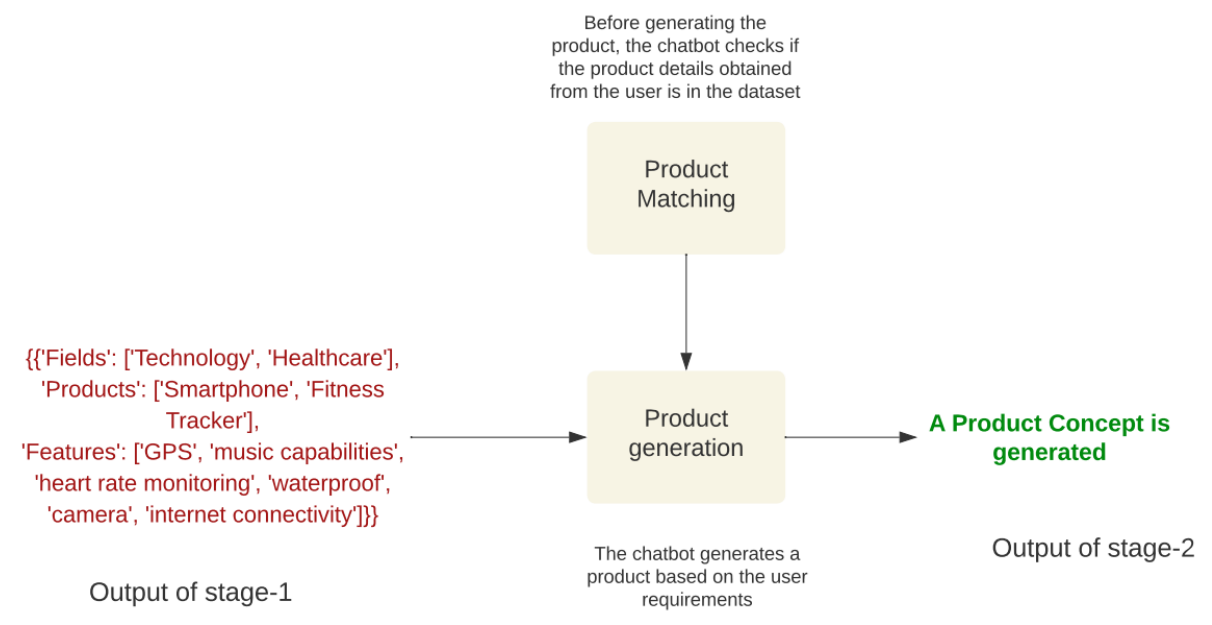
1. Start conversation.
2. User Input.
3. Moderation Check.
4. Intent Confirmation.

### **Implementation:**

- **initialize\_conversation()**  
This function initializes a conversation that helps users find innovative product combinations by asking questions and understanding their needs. It guides the assistant to fill a user profile dictionary with values for 'Fields', 'Products', and 'Features'.
- **get\_chat\_completions()**  
This function generates responses from the OpenAI Chat API using the GPT-3.5-turbo model, with an option to receive the output in JSON format.
- **moderation\_check()**  
This function takes a user's input and sends it to the OpenAI API for moderation. It checks if the input is flagged for any issues. Based on the API's response, the function returns either "Flagged" or "Not Flagged".

- **intent\_confirmation\_layer()**  
This function evaluates a given input text to ensure it contains specific keys ('Fields', 'Products', 'Features') and checks if these keys have values filled correctly. It generates a JSON response with 'Yes' if all values are correctly filled, otherwise 'No' along with the reason. The function uses OpenAI's GPT-3.5 model to perform this evaluation.
- **dictionary\_present()**  
This function takes a string input, checks if it contains a Python dictionary with specific keys ('Fields', 'Products', 'Features'), and extracts the dictionary in JSON format if present. It ensures that the dictionary's keys and values match a predefined format.

## Stage 2:



The chatbot first performs product matching to verify if the user-provided details exist in the dataset. If matched, the chatbot proceeds to generate a product based on these requirements. The output is a generated product concept based on the input from Stage 1.

### An example of generated product concept:

**Product Name:** TechStyle Pulse+

**Product Description:** TechStyle Pulse+ is a hybrid device that combines shoes and fitness tracker that seamlessly blends fashion and technology to enhance both style and functionality for users who value fitness and interactive design features. This innovative product is designed to cater to individuals seeking a personalized experience with customizable lighting options, smart sensors, and integrated fitness tracking capabilities. TechStyle Pulse+ aims to revolutionize the way users engage with their fitness routines and daily activities by providing real-time feedback and interactive elements to promote a healthier lifestyle.

## Key Features:

- Customizable Lighting: Users can personalize the device's lighting to match their outfit or mood, adding a touch of flair to their style.
- Smart Sensors: Advanced sensors track various data points such as activity levels, sleep patterns, and even environmental factors to provide users with insightful feedback.
- Pulse Rate Checker: The device includes a built-in pulse rate checker that monitors the user's heart rate during workouts or throughout the day for a comprehensive health assessment.
- Interactive Design Elements: TechStyle Pulse+ offers interactive design elements that engage users through touch-sensitive surfaces or gesture controls, enhancing the overall user experience.
- Fitness Tracking: Users can track their fitness goals, steps taken, calories burned, and more, making it easy to stay motivated and monitor progress towards a healthier lifestyle.

This stage includes following phases:

1. Product Matching  
**Matched Products** = user mentioned products present in dataset.  
**Unmatched Products** = user mentioned products not present in dataset.
2. Product Generation

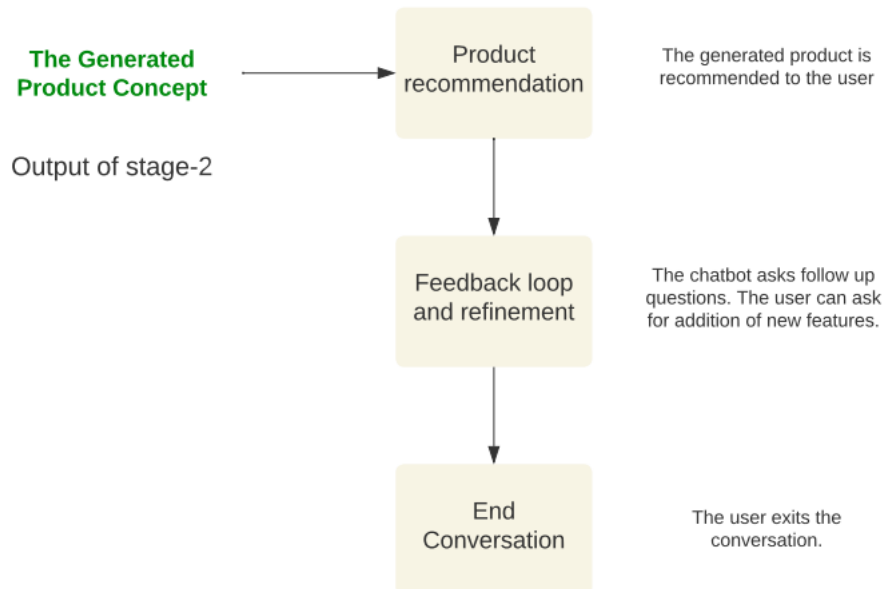
## Implementation:

- **match\_requirements\_with\_dataset()**  
This function compares a user's specified product requirements with a given dataset. It identifies and lists products that match the dataset, appends relevant features and descriptions of matched products.
- **generate\_product\_concept()**  
This function generates a new product concept by matching user requirements with available data from a dataset. It prepares a prompt for an AI model to create a detailed product description, name, and key features based on the matched information. If some user-requested products are not found in the dataset, it includes an appropriate apology message in the output.

There are three cases here:

- 1. All the products are matched:** The products are matched with the dataset. If there are matched products in the user requirements dictionary, then, the assistant generates a product concept.
- 2. Only some of the products are matched:** When there are some unmatched products, the assistant outputs a apology message for the unavailable product information and generates a product concept for matched products.
- 3. No matched products:**  
When there are no matched products, the assistant outputs an apology message.

### Stage 3:



The generated product concept from the previous stage is recommended to the user. The user can then provide feedback and request feature additions through a feedback loop. This iterative process continues until the user is satisfied. Finally, the user exits the conversation.

This stage includes following phases:

1. Product Recommendation
2. Feedback loop and refinement
3. End Conversation

#### **Implementation:**

- **ask\_follow\_up\_questions()**  
This function generates a follow-up conversation about a product. It constructs a prompt to simulate a product recommender engaging with a user by asking relevant questions. If no product is provided in the input string, the function outputs an empty string.
- **handle\_user\_input()**  
This function handles user interaction for customizing a product based on initial requirements. It asks follow-up questions to determine if additional features are needed and updates the product concept accordingly. The function also checks for inappropriate responses and provides a way for users to restart or conclude the conversation.

- **dialogue\_management()**

This function manages a conversational system between a user and the chatbot assistant, initializing the conversation, handling user input, performing moderation checks, and managing the recommendation process based on user interactions. It retrieves and confirms the user's intent, generates a product concept based on the conversation, and presents the recommended product to the user. If any message is flagged during moderation checks, the conversation is halted, and the user is prompted to restart.

## **Prompting Techniques Used:**

- Few-shot prompting.
- Chain of thought prompting

## **The Challenges Faced:**

- In applying correct prompts
- In implementing Open AI function call. Couldn't implement it.
- In prompting to avoid hallucinations and mis-consideration of scenarios.
- In ensuring feedback mechanisms. Couldn't get this mechanism to work right.

## **An Example Conversation between User and the Chatbot:**

**Assistant:** Welcome to GetIdea! How can I assist you today?

**User:** Hi! I'm Bhumi

**Assistant:** Hello Bhumi! Welcome to GetIdea. How can I assist you today?

**User:** I'm looking for a product that combines a door lock with smartphone

**Assistant:** Great choice! To better understand your requirements, could you please specify if you have any particular features in mind for this product that combines a door lock with a smartphone?

**User:** I would like it to be durable and to have touchscreen functionality

**Assistant:** Got it! For a product that combines a door lock with smartphone capabilities, with a focus on durability and touchscreen functionality, would you also be interested in features like remote access or keyless entry?

**User:** I would like keyless entry



**Assistant:** Fantastic choice! A product that combines a door lock with smartphone capabilities, emphasizing durability, touchscreen functionality, and keyless entry, sounds like a great innovation. Would you like any additional features such as security notifications or integration with smart home systems?

**User:** I would like to add security notifications

**Assistant:** Thank you for providing all the information. Kindly wait, while I generate the product:

Here is your Product!

Product Name: SecureTech Connect

Product Description: SecureTech Connect is an innovative home security solution that combines the functionality of a smart door lock with the convenience of a smartphone, offering a seamless and secure way to monitor and control access to your home. This cutting-edge product is designed to provide advanced security features while ensuring ease of use and installation for homeowners looking to enhance their security measures.

Key Features:

- Touchscreen Interface: The intuitive touchscreen interface allows for easy and convenient access control, eliminating the need for traditional keys.
- Keyless Entry: SecureTech Connect offers keyless entry options, providing users with a hassle-free way to unlock their doors using their smartphones.
- Security Notifications: Receive real-time security notifications directly to your smartphone, keeping you informed of any suspicious activities or unauthorized access attempts.
- Durable Construction: Built to withstand various weather conditions and potential tampering, ensuring long-lasting durability and reliability.
- Easy Installation: Simple and straightforward installation process, making it easy for users to set up and start using the device quickly.
- Integrated Camera: Equipped with a built-in camera for added security, allowing users to monitor their entryway remotely and capture footage of any events.
- Internet Connectivity: Stay connected to your home security system from anywhere with internet connectivity, enabling remote access and control through the smartphone app.

This comprehensive home security solution aims to provide peace of mind and convenience for users seeking a modern and reliable way to protect their homes and loved ones.

I hope you find SecureTech Connect to be a suitable home security solution for your needs. Is there anything specific you are looking for in a home security system or any additional features you would like to see in SecureTech Connect?

**User:** yes

**Assistant:** Please specify the additional feature(s):  
Please enter the features separated with a comma(,):

**User:** Remote access

**Assistant:**

Please wait while I get the product

Here is your Product!

Product Name: SecureLink Connect

Product Description: SecureLink Connect is an innovative smart home security system that combines the functionality of a door lock and a smartphone to provide users with a seamless and comprehensive security solution. This cutting-edge product is designed to offer advanced security features while ensuring ease of use and installation for homeowners looking to enhance their home security setup. SecureLink Connect integrates keyless entry, security notifications, touchscreen controls, and remote access capabilities to provide users with peace of mind and control over their home security.

Key Features:

- Touchscreen Interface: The intuitive touchscreen interface allows for easy operation and customization of security settings.
- Keyless Entry: SecureLink Connect offers keyless entry options for convenient access control without the need for physical keys.
- Security Notifications: Users receive real-time security notifications on their smartphone, keeping them informed of any security events or breaches.
- Durable Construction: Built to be durable and long-lasting, ensuring reliable performance and protection for your home.
- Easy Installation: Simple and straightforward installation process, making it easy for users to set up and start using the system.
- Camera Integration: The system includes a built-in camera for visual monitoring and added security surveillance.
- Internet Connectivity: SecureLink Connect connects to the internet for remote access and control of the security system from anywhere.
- Remote Access: Users can remotely access and manage the security system through their smartphone, providing convenience and peace of mind.
- Secure Data Transmission: Ensures that all data transmitted between the system and the smartphone is encrypted and secure, protecting user privacy and information.

**User:** exit