

CHATBOT FOR FOOD ORDERING SYSTEM

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Abstract

As we know that time is money, and each company needs to deploy an Artificially Intelligent system in order to interact with the customers. The same functionality is served by the Chatbot. It is a human designed but artificially trained system which is used to give an ease to the human interaction. By deploying this Chatbot to the website main purpose served would be to collect the database of maximum customers visiting our website every day. This database thus received would serve as the medium of interaction between the food outlet and the customers. Customers will also feel convenient in ordering with a more interactive platform rather than manual ordering. Thus, this will lead to generate an enhanced number of customers and thus we could lead to get details example phone number and email id of various customers and directly interact with them with a decreased human assistance

1. Problem statement

In the current customer support system, there is a notable inefficiency in handling a high volume of inquiries, resulting in prolonged response times and decreased customer satisfaction. Traditional channels lack the agility required to provide instant and personalized support. To enhance customer service and streamline communication, there is a need for the development and implementation of an intelligent Chatbot solution. This Chatbot should be capable of understanding and responding to diverse customer queries, offering real-time assistance, and seamlessly integrating with existing systems. The goal is to improve overall customer experience by providing efficient, accurate, and timely responses, ultimately reducing the workload on human agents and enhancing the organization's ability to meet customer expectations.

2. Market/Customer/Business Need Assessment

Food deliver system has become the part of our culture in our day today life. Implementing the Chatbot in food delivery system like chain restaurants, hotels, cloud kitchen etc. will be more efficient and create a direct impact in the business revenue.

2.1) Business:

Chatbots are deployed by businesses to achieve specific goals. These goals may include reducing response time, increasing customer satisfaction, or driving sales. By measuring chatbot performance, businesses can determine whether they are achieving their objectives. Metrics such as user engagement, conversion rate, and customer

Retention provide insights into business outcomes. This data can then be used to adjust strategies and refine the chatbot's performance to meet below business goals

User Retention Rate | Response Success Rate | Conversation Duration | Churn Rate | Customer Feedback

2.2) Market:

In today's competitive business environment, staying ahead of the competition is essential. By measuring chatbot performance, businesses can identify areas where they are falling behind their competitors. This could be related to response time, problem resolution, or overall user experience. By addressing these issues, businesses can improve their chatbot's performance and gain a competitive advantage.

2.3) Customer:

By tracking metrics such as customer demographics, usage patterns, and feedback, businesses can get a better understanding of their customers. This data can be used to create more targeted marketing campaigns and personalized experiences. It can also help identify opportunities for cross-selling and up-selling, enhancing the overall customer experience.



Fig 2.1 Market/Customer/Business Need Assessment

3) Target Specifications and Characterization:

3.1) Objective and Purpose:

To develop a chatbot that enhances customer engagement and provides efficient support. The chatbot should serve as a virtual assistant, capable of understanding and responding to user queries across multiple channels.

3.2) User Interaction:

To create a natural and user-friendly interaction experience. The chatbot should employ natural language processing (NLP) to understand and respond to user input in a conversational manner. It should provide personalized responses based on user history and preferences.

3.3) Functionality:

Provide a range of functionalities to address diverse user needs. Ability to answer frequently asked questions (FAQs) and provide general information. Conduct transactions such as placing orders or making reservations. Escalate complex queries to human agents when necessary.

3.4) Personalization:

Remember user preferences and tailor responses accordingly. Utilize data analytics to continuously improve personalization over time.

3.5) Analytics and Reporting:

Gather insights into user interactions and chatbot performance. Implement analytics tools to track user satisfaction, frequently asked questions, and other relevant metrics. Generate regular reports to inform ongoing improvements.

3.6) Output:

A comprehensive set of specifications and characterizations that serve as a roadmap for the development and ongoing optimization of the chatbot. This ensures that the chatbot aligns with organizational goals and provides a valuable user experience.

4) Business Model:

Monetizing a chatbot in India involves identifying revenue streams and business models that align with the market's characteristics and user behavior. Below are some monetization ideas for a chatbot in India:

4.1) Subscription-Based Model:

Offer a subscription plan to businesses for advanced features, personalized services, or premium support through the chatbot.

4.2) Transaction Fees:

Charge a small percentage of transaction fees for purchases made through the chatbot, especially in the case of food ordering transactions.

4.3) Lead Generation:

Provide lead generation services by integrating the chatbot with businesses looking to collect customer information for marketing purposes.

4.4) Data Analytics Insights:

Offer businesses insights and analytics based on user interactions with the chatbot, helping them make data-driven decisions.

5) Features:

Powered by AI and NLP (Natural Language Processing), AI chatbot is equipped with a range of features that make easy and convenient for customers to place orders and track their orders and for business to enhance their services. Guide users through the process of placing an order, including selecting items, specifying quantities, and customizing options. Provide a summary of the user's order for review before confirmation. Maintain a history of users' past orders for reference and reordering. Allow users to view the menu, including categories, items, descriptions, and prices. Collect user feedback and ratings for both the food

and the chatbot experience. Send notifications about new menu items, promotions, or updates.

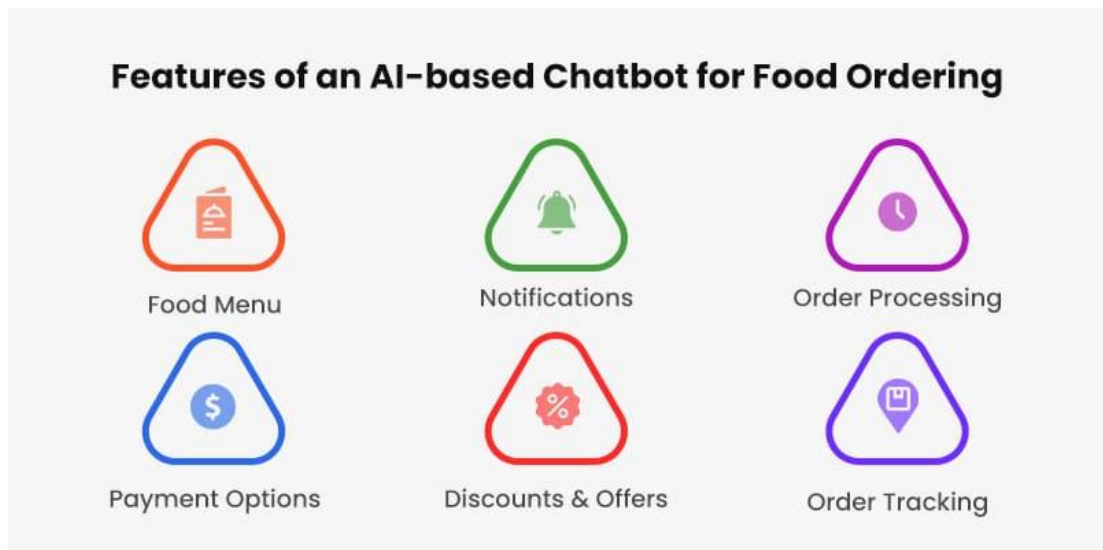


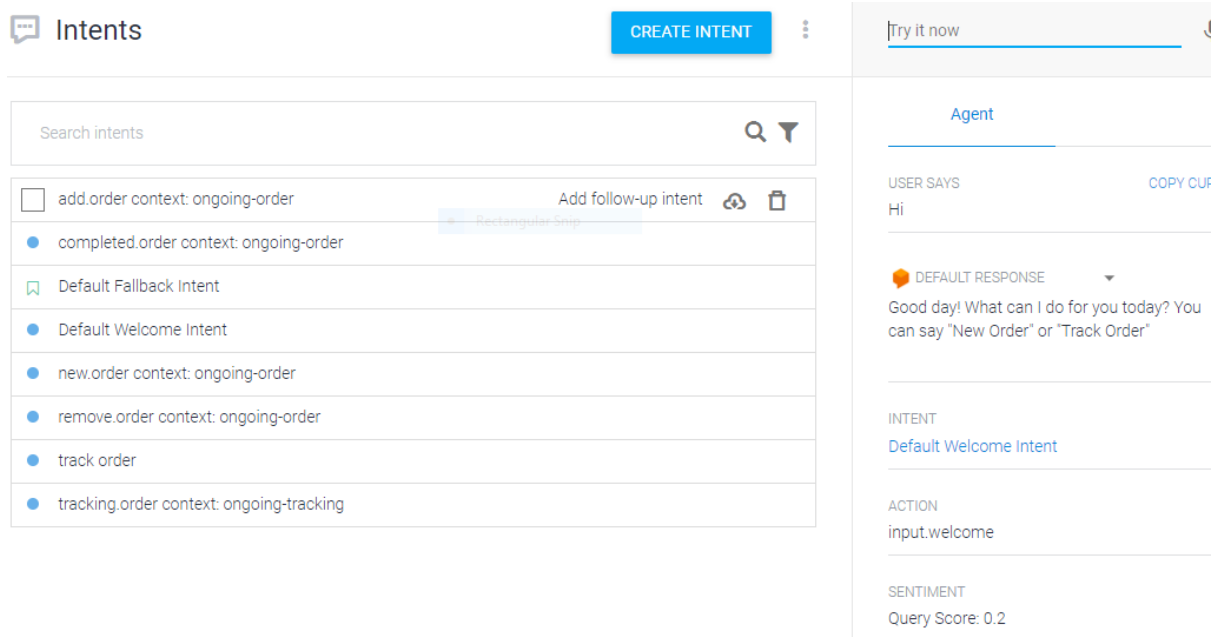
Fig 5.1 Features of an AI based Chatbot for Food Ordering

6) Frame work

Integrating Dialogflow with FastAPI allows you to build a robust chatbot with natural language understanding and efficient API handling. Here's a basic guide on how you can set up a simple chatbot using Dialogflow and FastAPI

6.1) Dialogflow (NLP and Intent Recognition)

By creating a new agent and define intents that represent the possible user queries and responses. In the Dialogflow Console, create service account credentials to allow FastAPI to interact with your Dialogflow agent.



6.2) FastAPI (Backend API)

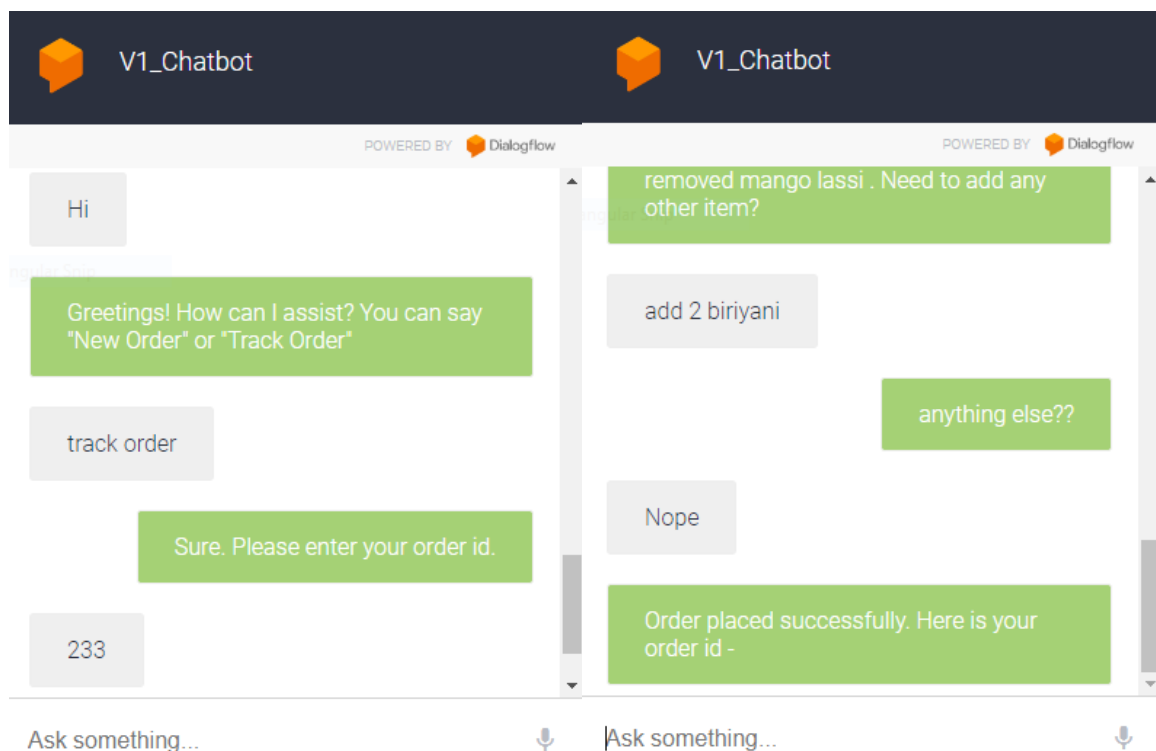
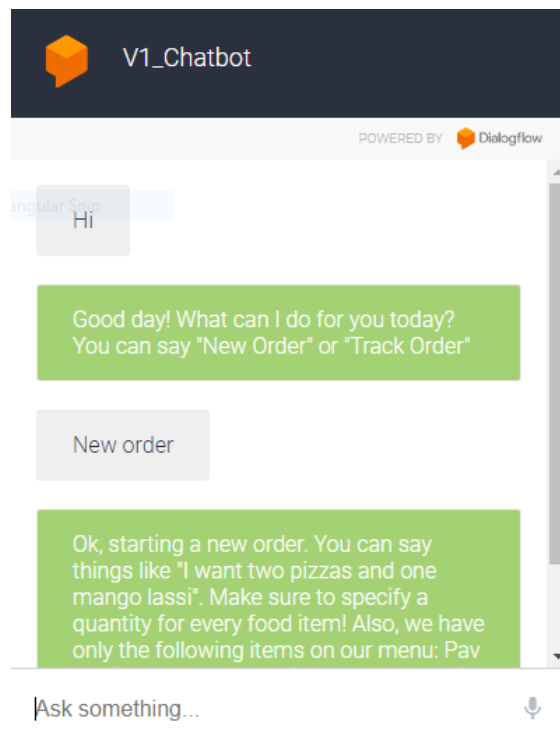
FastAPI will serve as the backbone of our microservice, providing the infrastructure for handling HTTP requests, managing conversation states, and integrating with the model.

7) Product Prototype

The Food ordering chat prototype is designed to provide users with a conversational interface for customers who like to order food online. The chatbot leverages natural language processing (NLP) and predefined conversation flows to engage users in a user-friendly and interactive manner.

Welcome Message | Conversation Flow | User Input Handling Responses and Information Retrieval | Error Handling | Order Placement | Order Tracking

Below is the screenshot that illustrates the key interactions between the chatbot and food ordering customer. This is a mid-level representation, and the actual system may involve more components and intricate details depending on the specific requirements and technologies used.



Schematic Diagram

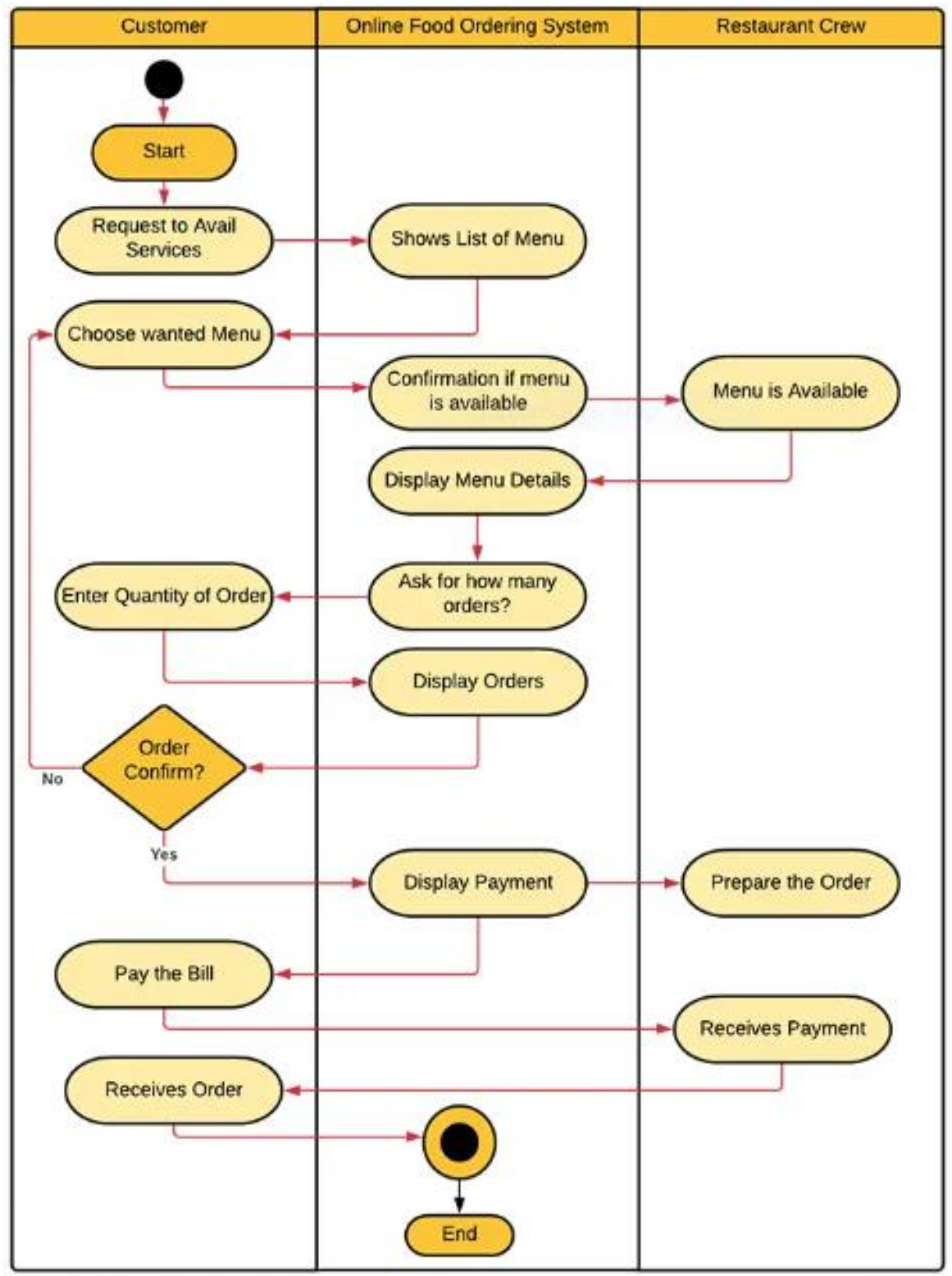


Fig 7.2 schematic diagram of chatbot

Entity Relation

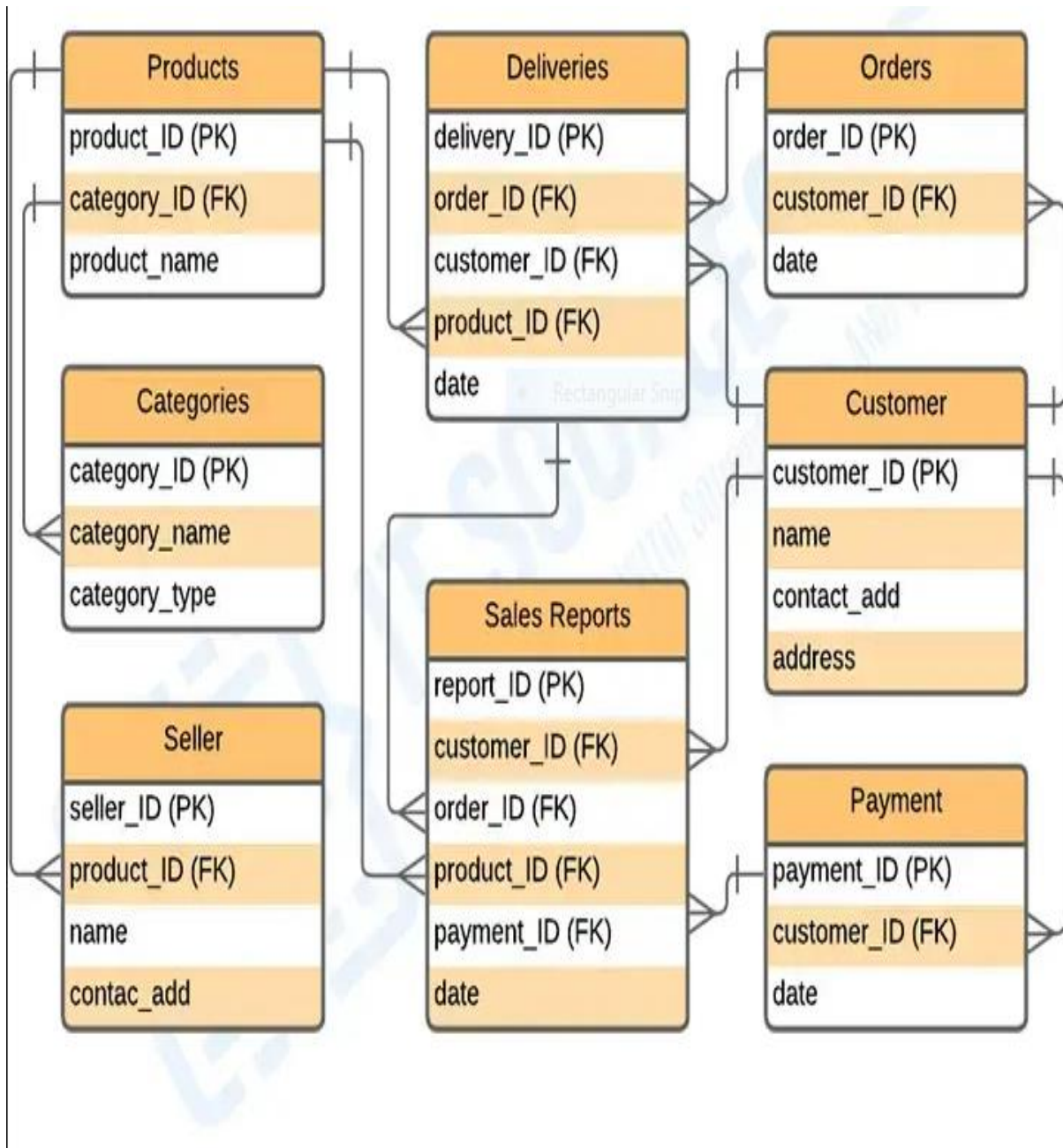


Fig 7.3 Entity Relation Diagram

8) Code Implementation:

Below is the part of code implementation for adding food item in order. The chatbot recognizes commands such as 'menu,' 'order,' and 'remove'. It maintains an in-memory menu and order list. Creating a complete implementation for a food ordering chatbot involves a more extensive codebase and often requires backend integration, database management, and more. However, the code with a simplified example using Python and Dialogflow and fastapi for a basic text-based chatbot. This example uses a simple in-memory menu and order management system

```
def add_to_order(parameters: dict, session_id: str):
    food_items = parameters["food-item"]
    quantities = parameters["number"]

    if len(food_items) != len(quantities):
        fulfillment_text = "Sorry I didn't understand. Can you please specify food items and quantities clearly?"
    else:
        new_food_dict = dict(zip(food_items, quantities))

        if session_id in inprogress_orders:
            current_food_dict = inprogress_orders[session_id]
            current_food_dict.update(new_food_dict)
            inprogress_orders[session_id] = current_food_dict
        else:
            inprogress_orders[session_id] = new_food_dict

        order_str =
generic_helper.get_str_from_food_dict(inprogress_orders[session_id])
        fulfillment_text = f"So far you have: {order_str}. Do you need anything else?"

    return JSONResponse(content={
        "fulfillmentText": fulfillment_text
    })
```

9) Conclusion

In conclusion, the food ordering chatbot project represents a significant step forward in enhancing the efficiency and convenience of the dining experience. Through the integration of advanced natural language processing and machine learning technologies, our chatbot aims to streamline the process of ordering food, providing users with a user-friendly and interactive platform. The project's success lies in its ability to understand and

respond to user queries effectively, offering personalized menu recommendations, handling order customization, and ensuring a seamless transaction process. By leveraging cutting-edge technology, we have created a solution that not only meets but exceeds customer expectations for a modern and efficient food ordering system.

Github link: <https://github.com/prabha-vp/Chatbot-for-food-ordering-system.git>