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Practical No. 8 – Collaboration Diagram for Pharmacy Management System

Aim:

To design and understand the Collaboration Diagram for the Pharmacy Management System, representing the interaction among objects and their structural organization in the system.

Introduction:

A Collaboration Diagram, also known as a Communication Diagram, is a type of interaction diagram that shows how objects are linked and how messages are exchanged between them. Unlike Sequence Diagrams, which focus on the time order of messages, Collaboration Diagrams emphasize the structural relationships among interacting objects. In a Pharmacy Management System, it is used to understand the coordination between customers, pharmacists, and the system in various business processes.

Objectives:

1. To depict the relationships among interacting system entities.
2. To illustrate how objects collaborate to perform system functions.
3. To analyze message exchange patterns in the system.
4. To help visualize the logical design of interactions and dependencies.

Theory:

The Collaboration Diagram is one of the fundamental interaction diagrams used in Unified Modeling Language (UML). It combines both structural and behavioral aspects by showing how objects are connected and how they communicate with each other through numbered messages. These diagrams help designers understand not only the sequence of communication but also how system components are organized in relation to one another. In the Pharmacy Management System, this diagram shows how objects such as Customer, Pharmacist, System Interface, and Database interact to complete tasks such as medicine purchase, stock management, or payment processing.

Case Study:

In the Pharmacy Management System, the Collaboration Diagram highlights the cooperative behavior between system components during operations. When a

customer places a medicine request, the system checks stock availability by communicating with the database. If available, a billing message is sent to the pharmacist, followed by payment confirmation. Subsequently, the database updates the stock records and confirms the successful completion of the transaction. These interactions are organized through message numbers that define the flow of communication in the collaboration network. Such diagrams are extremely useful in understanding the logical connections among entities and how the system components coordinate to achieve the desired result.

Advantages:

1. Provides a clear view of object interactions and dependencies.
2. Enhances understanding of communication structure within the system.
3. Supports validation of message exchange and logical connections.
4. Simplifies transition from design to implementation by showing collaboration paths.
5. Helps identify redundant or unnecessary communication links in the system.

Conclusion:

The Collaboration Diagram for the Pharmacy Management System serves as an effective representation of how system entities communicate and cooperate to execute various functions. By emphasizing relationships between interacting objects, it complements other UML diagrams such as Sequence and Class Diagrams. This diagram provides valuable insight into the structure and behavior of the system, ensuring efficient design and smoother implementation during software development.

References:

1. Sommerville, Ian. “Software Engineering.” Pearson Education.
2. Pressman, Roger S. “Software Engineering: A Practitioner’s Approach.” McGraw-Hill.
3. UML Documentation – Object Management Group (OMG).