Experiment No. 6   ㉔

Aim : Demonstrate the concept of Collaboration Diagram in UML using the Example of an print server model in an office

Objective: To understand & create a Collaboration Diagram in UML that represents the interaction between objects in a Print Server System within an office.

Theory : A collaboration diagram also known as Communication diagram is a type of interaction diagram in UML that shows how objects interacts with each other to perform a particular task. It It focuses on the structural organisation of objects & their links, as well as the sequence of messages or data exchanged.

Key Concepts :
i) Objects : Instances of classes involved in the interaction.
ii) Links : Connection between objects.
iii) Messages : Numbered arrows representing the sequence & flow of communication between the objects.

Collaboration diagrams are useful for visualizing object interactions in systems where structure & messaging order both matters.

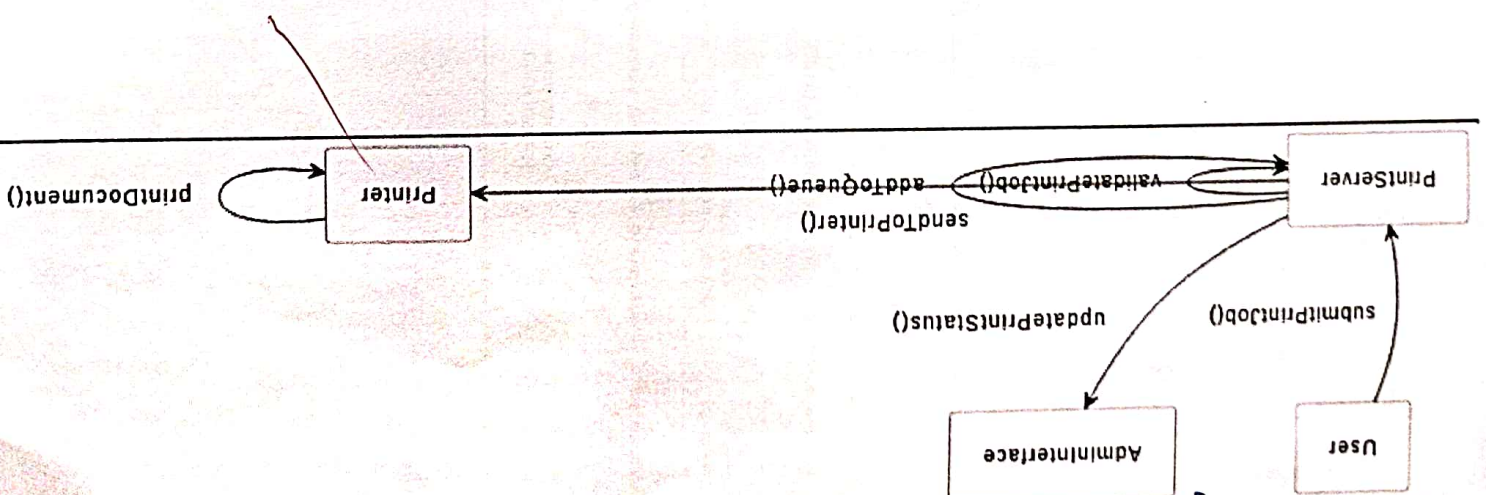|	
System Eg:	**Print Server Model in an office :**
	In a typical office environment, users / staff sends print jobs to a certain print server, which manages a queue of jobs & communicates with one or more printers. The system also includes an Admin interface for managing printers and monitoring the Queue if needed.

Objects involved :

i) User : Sends print Requests.

ii) Print Server : Handles Requests, Queues Jobs & sends them to printers.

iii) Printer : Executes the print Jobs

iv) Admin Interface : Allows the admin to manage & monitor printers & print jobs.

Typical interaction Flow :

i) User sends a document to print server.

ii) Print Server validates the request & adds it to the queue.

iii) Print Server selects an available printer.

iv) The Print Job is forwarded to selected Printer.

v) Printer Processes & completes the Job.

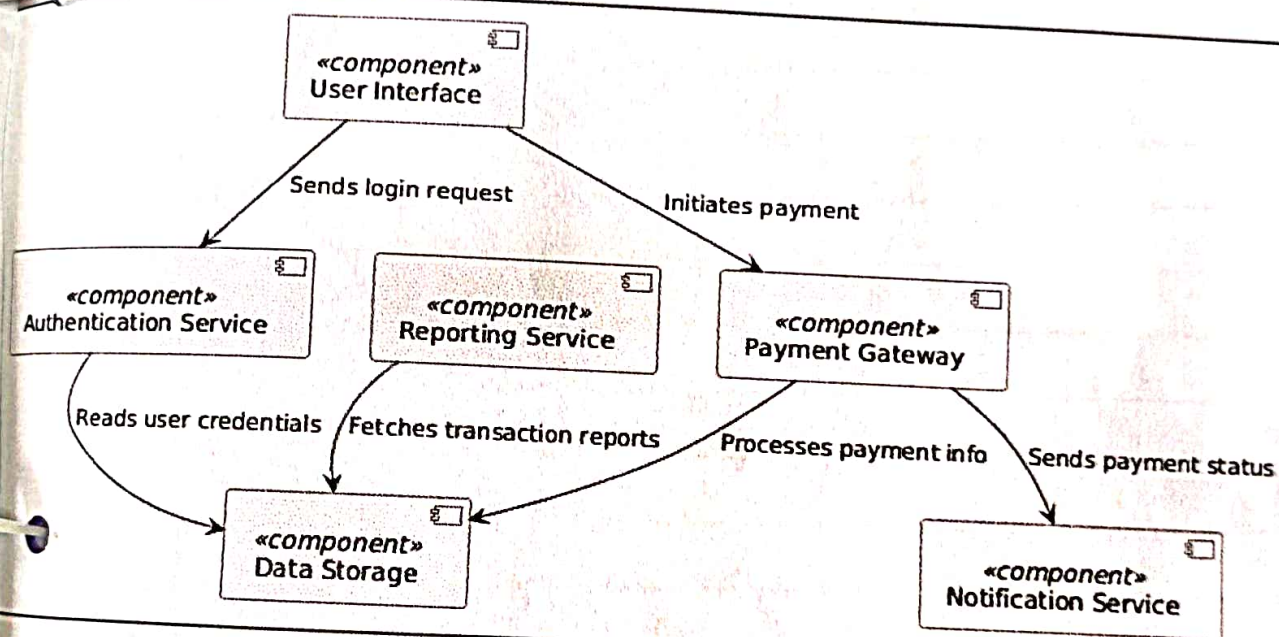vi) Admin interface can be used to check the status or cancel jobs

Conclusion : The collaboration diagram helps in visualizing Object–Level interactions & message sequencing in a structured layout. Through the print server model, the experiment was successfully executed.
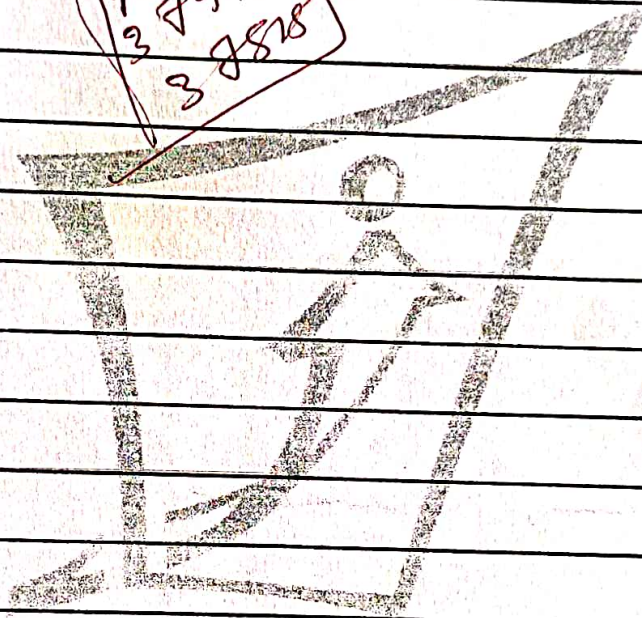

Collaboration Diagram : Print Server model

Printer — printDocument()

PrintServer → validatePrintJob() → addToQueue() → sendToPrinter() → Printer

PrintServer → updatePrintStatus() → AdminInterface

User → submitPrintJob() → PrintServer

OTT

«component»
User Interface

Sends login request

Initiates payment

«component»
Authentication Service

«component»
Reporting Service

«component»
Payment Gateway

Reads user credentials

Fetches transaction reports

Processes payment info

Sends payment status

«component»
Data Storage

«component»
Notification Service

Conclusion: The collaboration diagram helps in visualizing object-level interactions & message sequencing in a structured layout. Through the print server model, the experiment was successfully executed.