Tutorial 3
Business Process Design and Data Flow Diagrams

You will learn to:

- **Prepare context diagrams.**
- **Prepare data flow diagrams.**
- **Prepare table of entities and activities.**

Discussion Questions:

1. Describe the who, what, where, and how of the following scenario. A customer gives his purchase to a sales clerk, who enters the sale in a cash register and puts the money in the register drawer. At the end of the day, the sales clerk gives the cash and the register tape to the cashier.

ANS. *Who:* The sales clerk performs the information processing activities.

What: (1) Give purchase to sales clerk.

(2) Enter sale in register (if it is an electronic register, data stores could be updated).

(3) Put money in drawer.

(4) Give cash and register tape to cashier.

Where: Store (at the check-out counter).

How: A manual process is performed by the sales clerk using a cash register.

2. Why are many correct logical DFD solutions possible? Why is only one correct physical DFD solution possible?

ANS. For *each* sensible grouping of logical activities, there is a correct logical DFD. And, because many sensible groupings are possible, multiple correct solutions exist. However, only one correct physical DFD is possible for each system because these diagrams are constructed directly from a description of the system. A physical DFD presents a one-to-one correspondence among entities, physical data stores, and data flows, as described in the narrative, leaving little or no room for interpretation.

Practical Exercise:

The following narrative describes the order entry system for the OfficeSupply Company.

OfficeSupply is a wholesale distributor of office supplies, such as disks, stationery, file cabinets, and relate items. Customers receive an updated catalogue annually and place orders over the phone.

When a customer calls in with an order, a clerk asks for the customer ID and name. The clerk keys in the customer number, and the computer retrieves the customer record from the customer database and displays it on the clerk's screen. The clerk compares the customer name to the data on the screen to ensure that the customer is legitimate. If everything checks out, the clerk enters the customer's order. After the order is entered, the computer compares the amount of the order to the available credit to ensure that the purchase does not exceed the credit amount limit.

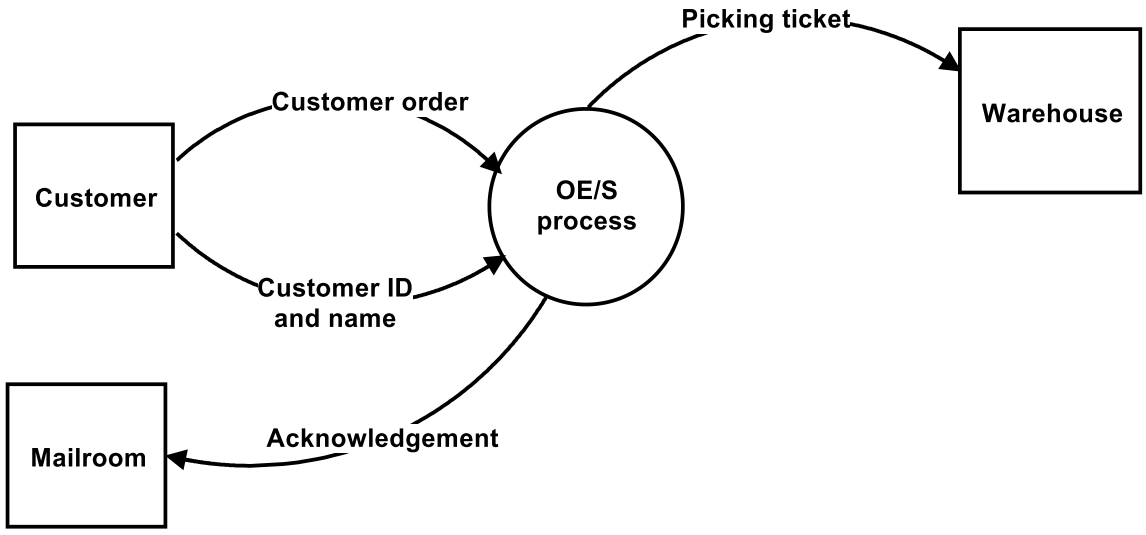
This results in the creation of an entry in the sales event data store and an allocation of inventory. At the end of the day, the sales event data is processed against the customer data and the inventory data, and the sales order is recorded in the sales order master data store. At the same time a customer acknowledgement is printed in the mailroom and is mailed to the customer. Also, a picking ticket is printed in the warehouse and will be used to assemble the customer's order.

a) Prepare a table of entities and activities based on the process described in the narrative above.
b) Construct a context diagram based on the table you prepared in part (a).
c) Prepare a physical DFD (Data Flow Diagram) based on the output from part (a) and (b).
d) Prepare an annotated table of entities and activities based on the output from Part (a), (b) and (c). Indicate on this table the groupings, bubble numbers, and bubble titles to be used in preparing a level 0 logical DFD.
e) Prepare a logical DFD (level 0 only) based on the table you prepared in part (d).

a) Prepare a table of entities and activities based on the process described in the narrative above.

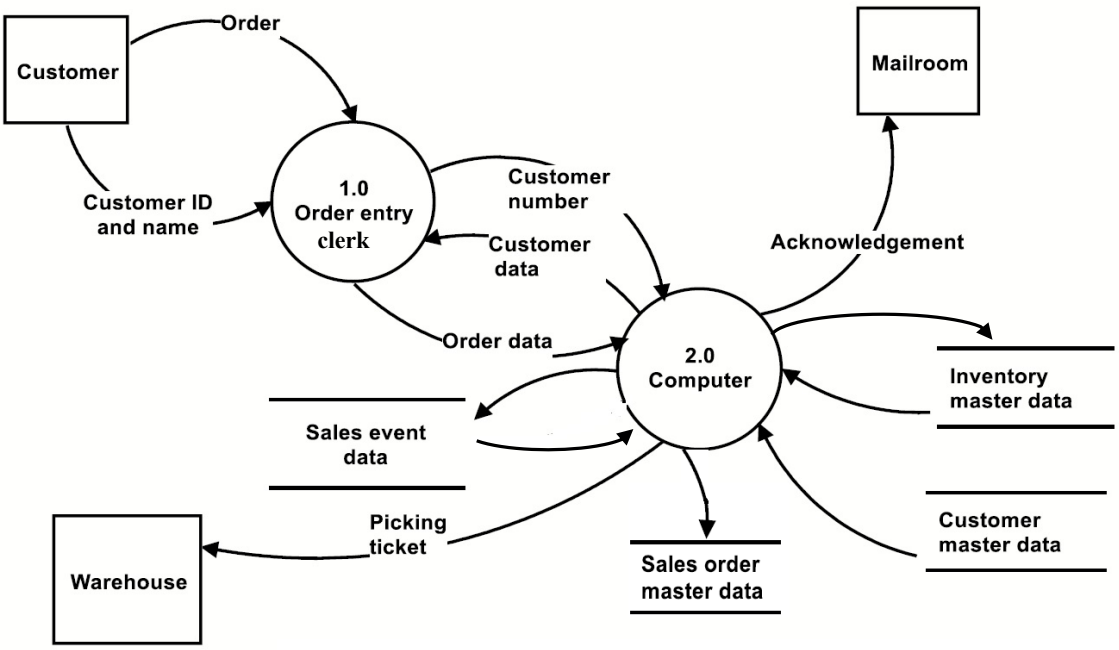
Entities	Para	Activities
Customer	2	1. Call in and give customer ID and name.
Order entry (clerks)	2	2. Enter customer number.
Computer	2	3. Retrieve and display the customer data.
Order entry (clerks)	2	4. Compare name to display.
Customer	2	5. Give order.
Order entry (clerks)	2	6. Key in order.
Computer	2	7. Verify that the order does not exceed credit balance.
	3	8. Create an entry in the sales event data store and allocate inventory.
	3	9. Process the sales event data against the customer and inventory data and record in sales order master data store.
	3	10. Print customer acknowledgement.
	3	11. Print picking ticket.
Mailroom	3	***12. Mail acknowledgement to customer.***
Warehouse	3	***13. Assemble the customer's order.***

b) Construct a context diagram based on the table you prepared in part (a).



Activity 12 and 13 are offline operational activities, which should not be included in the DFDs.

c) Prepare a physical DFD (Data Flow Diagram) based on the output from part (a) and (b).



d) Prepare an annotated table of entities and activities based on the output from Part (a), (b) and (c). Indicate on this table the groupings, bubble numbers, and bubble titles to be used in preparing a level 0 logical DFD.

Entities	Para	Activities	Process
Order entry (clerks)	2	2. Enter customer number.	
Computer	2	3. Retrieve and display the customer data.	
Order entry (clerks)	2	4. Compare name to display.	
	2	6. Key in the order.	***1.0 Validate and record customer order.***
Computer	2	7. Verify that the order does not exceed credit balance.	
	3	8. Create an entry in the sales event data store and allocate inventory.	
Computer	3	9. Process the sales event data against the customer and inventory data and record in sales order master data store.	***2.0 Record sales order.***
	3	10. Print customer acknowledgement.	
	3	11. Print picking ticket.	

e) Prepare a logical DFD (level 0 only) based on the table you prepared in part (d).