

## SYSTEMS ANALYSIS & DESIGN

# MODELLING PROCESS

by  
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# Chapter Description

## Expected Outcomes

- To discuss the logical modeling of processes by referring to Data Flow Diagram (DFD) as a tool to support analysis
- To know decision tables and structured language usage

## References

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- Alan Dennis, Barbara Haley Wixom, David Tegarden, "Systems Analysis and Design With UML : An Object-Oriented Approach ", John Wiley, 2010
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# Modeling The Process

Model the process by using graphical tool that allows the analyst to represent various processes and data flows associated with the system. It is called as the Data Flow Diagram (DFD).

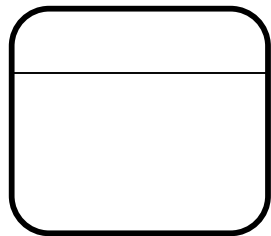
DFD is a graphical tool that depicts the sequence of processes and functions contained within a specified system boundary and the flow of data through that system.



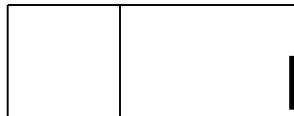
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# DFD

Two most are the Gane-Sarson and the DeMarco-Yourdon symbol sets. Below are symbols in Gane-Sarson:



Process



Data store

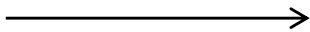


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# DFD



Source or Sink



Data flow



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# Components of DFD

- Process
  - An activity or function performed for a specific business reason.
  - Every process has:
    - ✓ A number
    - ✓ A name (verb)
    - ✓ One or more output data flows
    - ✓ One or more input data flows



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# Components of DFD

## Data flow

- A single piece of data or a logical collection of data
- Always starts or ends at a process
- Every data flow has
  - ✓ A name (noun)
  - ✓ One or more connections to a process



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# Components of DFD

## Data Store

- A collection of data that is stored in some way
- Data flowing out is retrieved from the data store
- Data flowing in updates or is added to the data store
- Every data store has
  - ✓ A number
  - ✓ A name (noun)



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# Components of DFD

## External entity

- A person, organization, or system that is external to the system but interacts with it.
- External entity is the origin or destination of data (outside the system).
- Every external entity has
- A name (noun)



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# DFD Rules

There are two DFD rules that apply:

- The inputs to a process are different from the outputs of that process.
  - Processes intend to transform inputs data into outputs data
- Objects on a DFD have unique names.
  - Every process has a unique name.



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# Context Diagram

Context Diagram is intended to identify the system boundary with regard to its relationship to any source or sink entities that may interact with it.

It is the initial DFD in every business process



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# Context Diagram

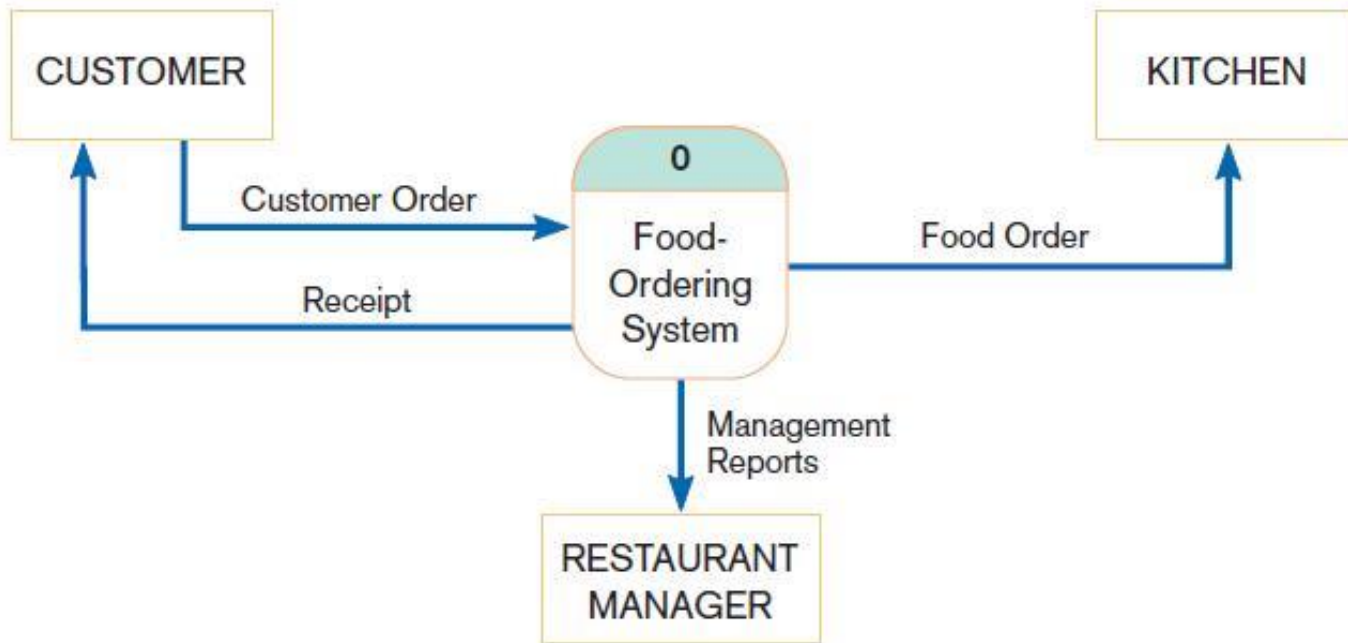
## Features of context diagram:

- Top-level view that shows the overall boundaries of the system
- Represent the results of fact-finding
- One process symbol, numbered 0 (zero) is drawn in the center
- Data flows connect the process to the entities
- No data store



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# Context Diagram



**FIGURE 5.1**  
Context diagram of food-ordering system



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# DFD

Level- 0 diagram is a data flow diagram that signifies a system's major processes, data flows, and data stores at a high level of detail.

- ✓ Processes are numbered as 1.0, 2.0, 3.0 etc.
- ✓ These will be decomposed into more lower-level DFDs.



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# Decomposing DFD

Decomposing DFD is repetitive process to break a system into finer detail.

One process in upper level DFD is explained in greater detail.

Example: level-1 DFD results from decomposition of level-0 DFD.

The process of decompose continues until no sub process can logically be broken down any further.



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# Balancing DFD

The concept of balancing define that all the input data flows to a process and all the output data flows from a process in the parent diagram should be preserved at the next level of DFD decomposition.



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# Structured English

Describing a process using subset of standard English.

It describes process logic

- Use only standard sequence, selection, and iteration structures organized into nested and grouped procedures.
- simple English statements such as add, multiply, and move.
- Use indentation for readability



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# Decision Table

Describing a process using decision table

It describes process logic

- Show a logical structure that describes process logic
- Every logical combination is shown initially
- Results then can be combined and simplified
- Programmers can use decision tables in developing code



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# Decision Tree

- Graphical representation that shows a decision table's conditions, actions, and rules
- Logic structure is shown horizontally
- Easy to construct and understand
- Decision table is better in complex situations



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# Questions

1. Discuss common mistakes made by system analyst during requirements determination?
2. What are the advantages and disadvantages of direct observation?
3. Structured English is a modified form of English language used to specify the logic of information system processes. [ T/F ]



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