What is Data Flow Diagram?

Data flow diagrams are used to graphically represent the flow of data in a business information system. DFD describes the processes that are involved in a system to transfer data from the input to the file storage and reports generation.

Data flow diagrams can be divided into logical and physical. The logical data flow diagram describes flow of data through a system to perform certain functionality of a business. The physical data flow diagram describes the implementation of the logical data flow.

DFD Symbols

There are **four basic symbols** that are used to represent a data-flow diagram.

Process

A process receives input data and produces output with a different content or form. Processes can be as simple as collecting input data and saving in the database, or it can be complex as producing a report containing monthly sales of all retail stores in the northwest region.

Every process has a name that identifies the function it performs.

The name consists of a verb, followed by a singular noun.

Example:

- Apply Payment
- Calculate Commission
- Verify Order

Data Flow

A data-flow is a path for data to move from one part of the information system to another.

Data Store

A data store or data repository is used in a data-flow diagram to represent a situation when the system must retain data because one or more processes need to use the stored data in a later time.

Note that:

- A data store must be connected to a process with a data-flow.
- Each data store must have at least one input data-flow and at least one output data-flow (even if the output data-flow is a control or confirmation message).

External Entity

An external entity is a person, department, outside organization, or other information system that provides data to the system or receives outputs from the system. External entities are components outside of the boundaries of the information systems. They represent how the information system interacts with the outside world.

- A rectangle represents an external entity
- They either supply data or receive data
- They do not process data

Note that:

- External entities also are called terminators because they are data origins or final destinations.
- An external entity must be connected to a process through a data-flow.

Balancing DFD

When performing top-down decomposition to a DFD to lower level DFDs, the inputs and outputs must be conserved between levels of DFDs. For example, level n & n+1 must have the same inputs and outputs

Context-Level Diagram

A context diagram gives an overview and it is the highest level in a data flow diagram, containing only one process representing the entire system.

It should be split into major processes which give greater detail and each major process may further split to give more detail.

- All external entities are shown on the context diagram as well as major data flow to and from them.
- The diagram does not contain any data storage.
- The single process in the context-level diagram, representing the entire system, can be exploded to include the major processes of the system in the next level diagram, which is termed as diagram 0.

Level 1 DFD

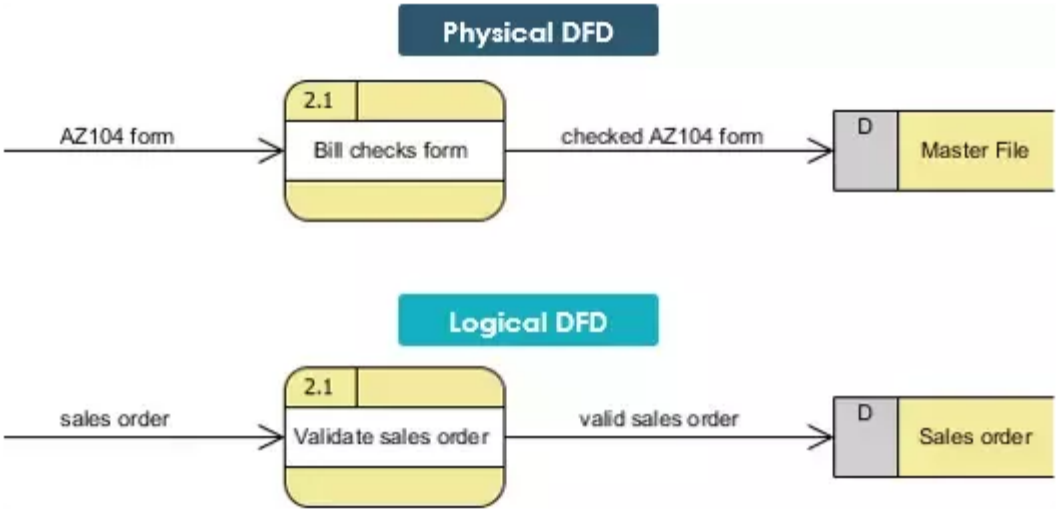
Processes in diagram 0 (with a whole number) can be exploded further to represent details of the processing activities.

Logical vs Physical Data Flow Diagrams

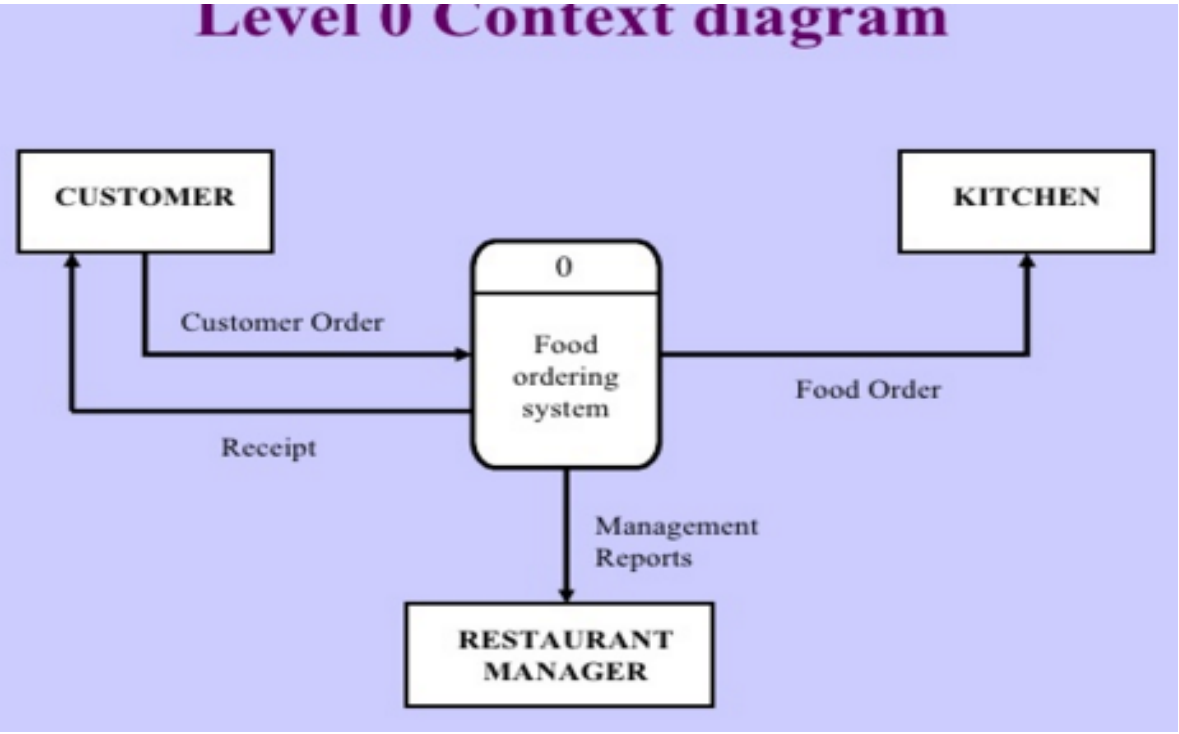
Data flow diagrams are categorized as either logical or physical. A logical data flow diagram focuses on the business and how the business operates. It is not concerned with how the system will be constructed. We can ignore implementation specifics such as, computer configuration, data storage technology, communication or message passing methods by focusing on the functions performed by the system, such as, data collection, data to information transformation and information reporting.

A physical data flow diagram shows how the system will be implemented, including the hardware, software, files, and people in the system. It is developed such that the processes described in the logical data flow diagrams are implemented correctly to achieve the goal of the business.

Physical DFD specifies actual flow of physical documentation, while logical DFD only focus on the information flow in business term.



Features	Logical	Physical
Model	How the business operates	How the system will be implemented
Process	Essential sequence	Actual sequence
Data store	Collections of data	Physical files and databases, manual files
Type of data store	Permanent data collections	Master files, transaction files
System controls	Business controls	Controls for data validation, record status, system security


Level 0 Context diagram
CUSTOMER
KITCHEN
0
Customer Order
Food ordering system
Food Order
Receipt
Management Reports
RESTAURANT MANAGER

DFD level 1

Food Ordering System