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The Difference Between Logical & Physical Data Flow Diagrams

A data flow diagram shows the flow of information through a system or an organization. The flow can be portrayed in more than one way, however. In this lesson, we'll examine logical and physical data flow diagrams.

Documenting the Flow

You can ask two people to describe the same object and you will likely get two different descriptions: one person might talk about the color, and the other might talk about the size.

There's also more than one way to describe the flow of information through a business. When you look at how information flows through a business, that is considered to be the logical flow. So a **logical data flow diagram** looks at business events and the data they require and produce.

Another way to look at information flow is to consider the systems involved: the software, hardware, files and people that are part of the process. A **physical data flow diagram** is created from a systems and implementation mindset.

How are data flow diagrams (DFDs) used? You can use a logical DFD to create a model of an existing business process--the ''what''. If you want to change that process, you can draw up a new logical DFD to help you figure out the best path to take. After creating a logical DFD, you can develop a physical DFD to show what system upgrades would be required to implement the modified business process--the ''how''.

Note that DFDs are different from **flowcharts**, which show steps to complete a process but don't show inputs or outputs from external sources.

Let's look at each type of data flow diagram in more detail.

Logical Data Flow Diagram

A logical DFD is a model of how a business operates, and the processes it depicts represent business activities. The logical DFD shows points where data is collected regardless of the type of storage used. Logical data flow diagrams are easier to understand for non-technical personnel, so they can help bridge the gap between technical and business requirements. They can also help foster collaboration and communication about process changes.

A system built with a logical DFD is thought to be more stable because it's based upon business processes instead of transitory business technologies. The business processes shown will likely continue to exist regardless of the physical means used to accomplish them. For example,

businesses will always have a need to monitor payments to vendors, regardless of whether invoices and payments are tracked manually in a ledger book or through a software program.

Physical Data Flow Diagram

A physical DFD can depict a current system or show how a new system will be implemented. The processes shown represent programs, program modules and manual procedures, while the data stores shown represent databases and manual files. The physical DFD also shows system controls for:

- Validating input data
- Obtaining a record
- Making sure a process is complete
- Securing the system

The physical DFD can be thought of as a road map for assembling the machines, people and processes needed to get the job done. It clarifies which processes are performed by machines and which are done by humans. The physical DFD tends to be more complex than the logical DFD because it shows where all potential data storage places can be.

An Example of Using Both Types of Data Flow Diagrams

Let's say your supply warehouse is still using manual logs for checking inventory in and out. Instead of running out to buy the latest wireless handheld scanners and barcode printers, you create a logical DFD to map out inventory processing in the warehouse. You look at warehouse activities from a business standpoint, not from a technology standpoint, in order to map an optimal process flow. This then becomes the basis for a discussion about what technology is required. A physical DFD can then be used, like a measuring stick, to assess the suitability of a potential solution.

Lesson Summary

There are two common ways to diagram the flow of information through a business. The **logical data flow diagram** is used to map out business processes and shows the data required and produced. Think of the logical DFD as the ''what'' of a process. The **physical data flow diagram** shows the same process from a systems perspective; it shows the ''how'' of getting the job done.

It's generally viewed as a good idea to create the logical DFD first, because business processes may outlast the underlying technology. Both types of DFD are more complex than a **flowchart**, which shows process steps but not to the same level of detail.