CREATING DATA FLOW DIAGRAM

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TABLE OF CONTENTS

WHAT ARE DATA FLOW DIAGRAMS?

- Data Flow Diagrams model events and processes i.e. activities which transform data within a system.

- A Data Flow Diagram, is a pictorial representation of data that flows from one process to another process inside a system(generally an information system) along with mentioning how data flows into the system and out of the system.

WHY THEY ARE USEFUL?

- A DFD shows an abstract or functional view of the system to be developed.

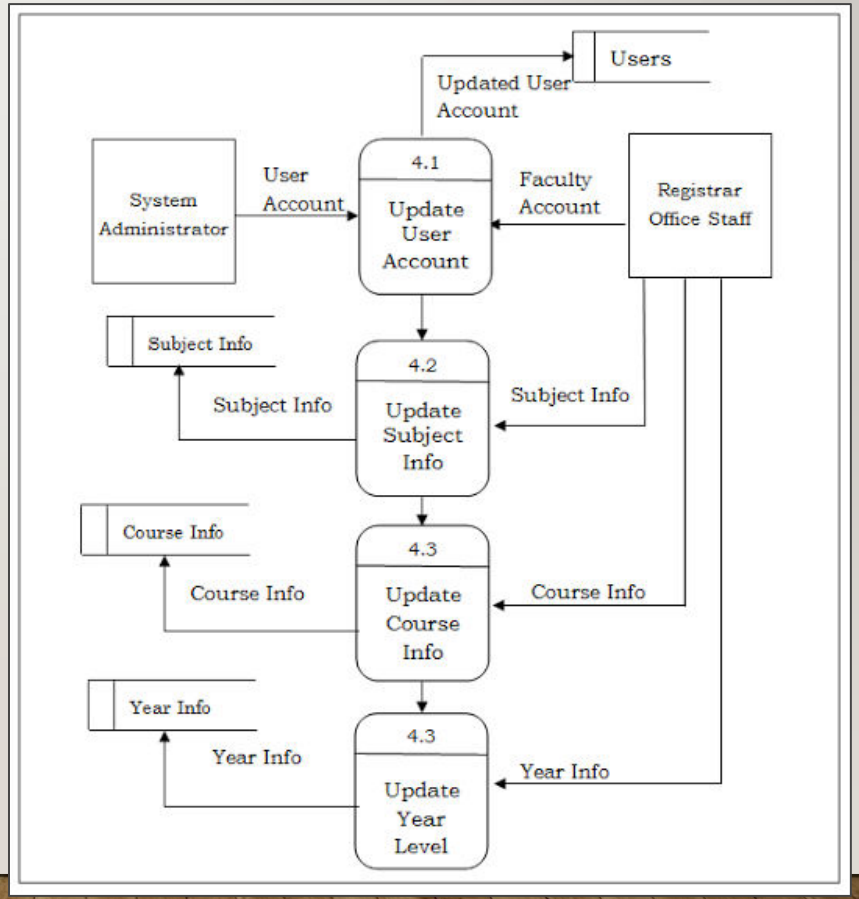
- The graphical representation easily overcomes any gap between 'user and system analyst' and 'analyst and system designer' in understanding a system.

SYMBOLS USED IN A DFD

- Process/es: denoted by a process box.
- Data flow: denoted by a labelled arrow.
- Data store: denoted by an open rectangle or two parallel lines.
- Entity: denoted by a rectangle

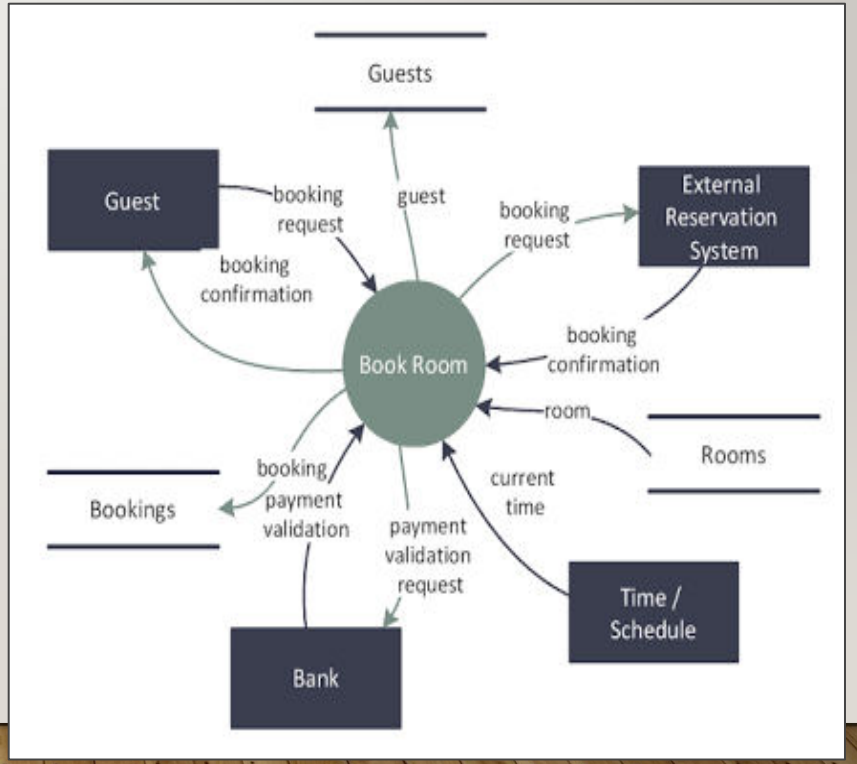
PROCESSES

- Processes transform or manipulate data.
- Processes are 'black boxes' - we don't know what is in them until they are decomposed.
- The name of the process is usually given in such a way that represents the functionality of the process.



DATA FLOWS

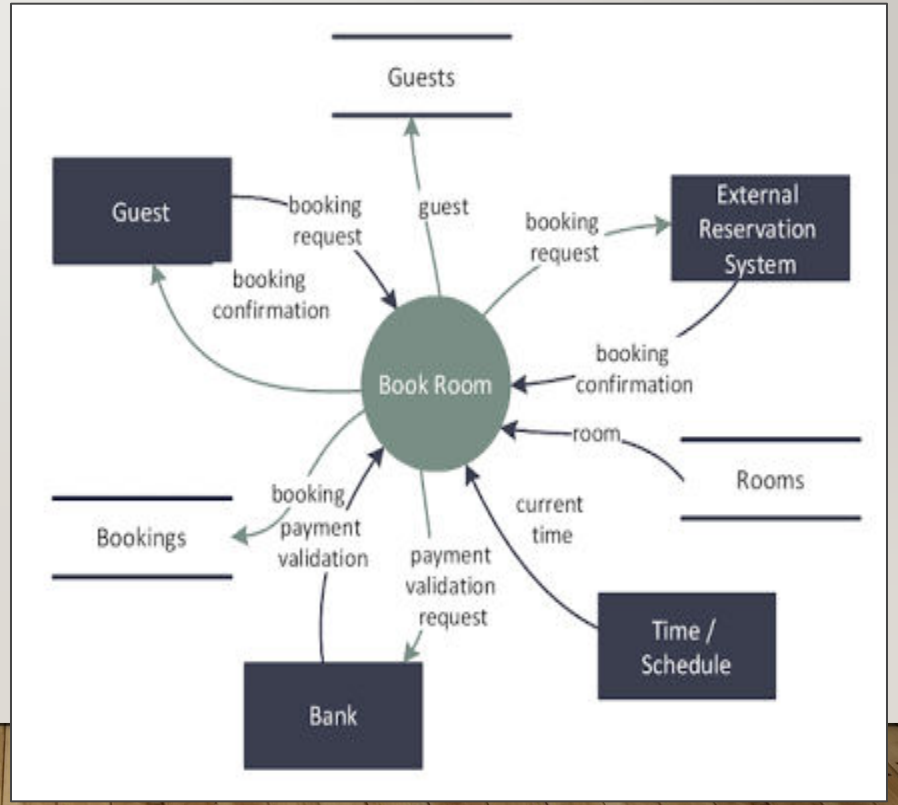
- Depicts data/information flowing to or from a process.
- The arrows must either start and/or end at a process box.
- It is impossible for data to flow from data store to data store except via a process, and
- External entities are not allowed to access data stores directly.
- Arrows must be named.



EXTERNAL ENTITIES

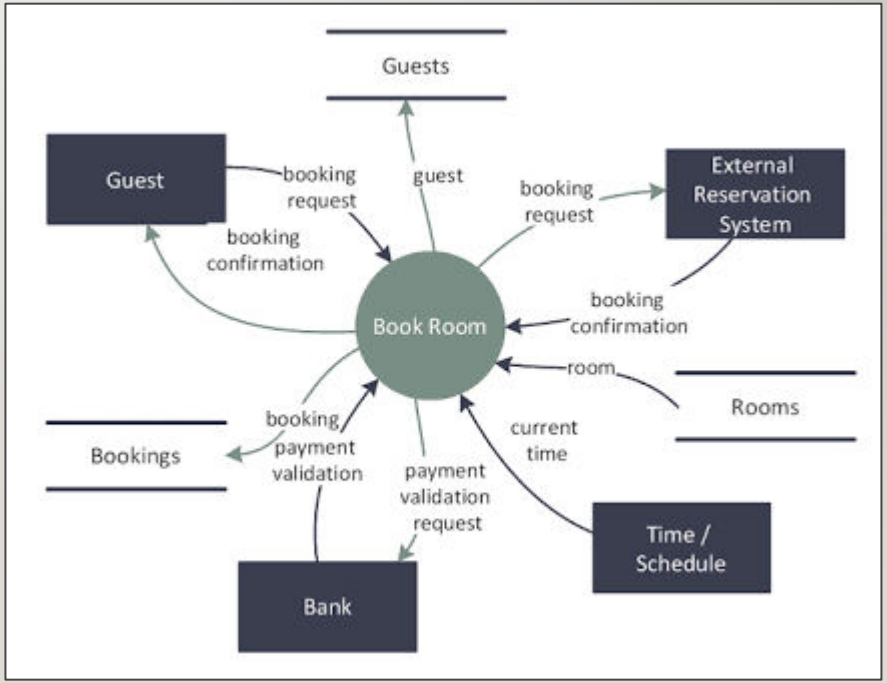
- Also known as 'External sources/recipients, are things (eg: people, machines, organisations etc.) which contribute data or information to the system or which receive data/information from it.

- The name given to an external entity represents a Type not a specific instance of the type.



DATA STORES

- Are some location where data is held temporarily or permanently.
- In physical DFDs there can be 4 types.
  - D = computerised Data
  - M = Manual, e.g. filing cabinet.
  - T = Transient data file, e.g. temporary program file
  - T(M) = Transient Manual, e.g. in-tray, mail box.

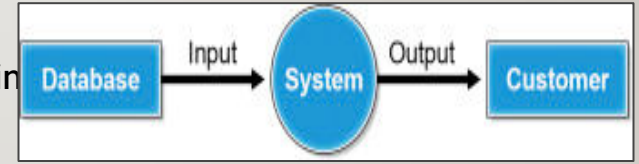


RULES FOR CREATING DFDS

- Entities are either 'sources of' or 'sinks' for data input and outputs - i.e. they are the originators or terminators for data flows.
- Data flows from Entities must flow into Processes.
- Data flows to Entities must come from Processes.
- Processes and Data Stores must have both inputs and outputs (What goes in must come out!)
- Inputs to Data Stores only come from Processes.
- Outputs from Data Stores only go to Processes.
- External Entities only come at level 0 DFD.

LEVELS OF DFD

- Level 0 or context diagram: represents broad overview of a system.
- The entire system is shown as single process and also the interactions of external entities with the system are represented in context diagram.



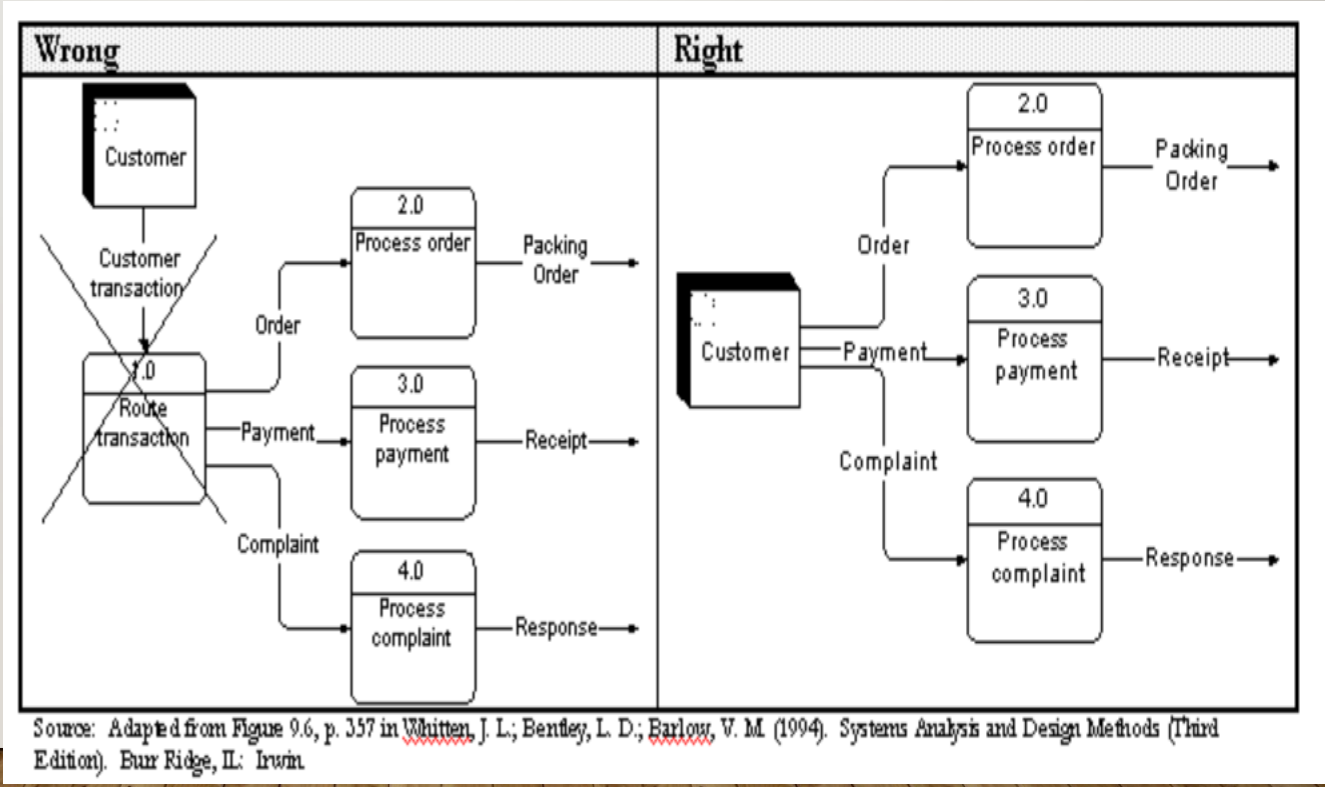
- Further we split the process in next levels into several numbers of processes to represent the detailed functionalities performed by the system.(level 2, level 2 etc.)

NUMBERING OF PROCESSES

Numbering of processes : If process ‘p’ in context diagram is split into 3 processes ‘p1’, ‘p2’and ‘p3’ in next level then these are labeled as 0.1, 0.2 and 0.3 in level 1 respectively. Let the process ‘p3’ is again split into three processes ‘p31’, ‘p32’ and ‘p33’ in level 2, so, these are labeled as 0.3.1, 0.3.2 and 0.3.3 respectively and so on.

COMMON MISTAKES I

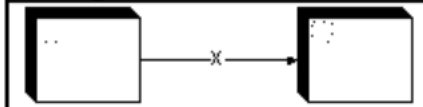
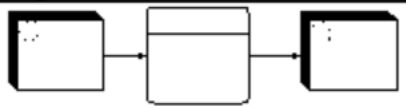
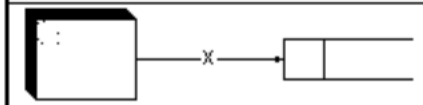
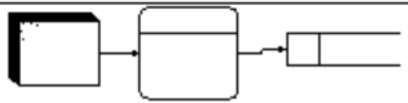
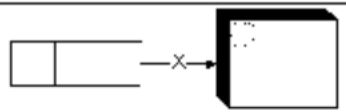
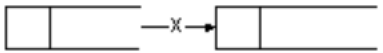
- Processing steps that do not change data, do not belong to DFDs.



Source: Adapted from Figure 9.6, p. 357 in Whitten, J. L.; Bentley, L. D.; Barlow, V. M. (1994). Systems Analysis and Design Methods (Third Edition). Burr Ridge, IL: Irwin.

COMMON MISTAKE 2

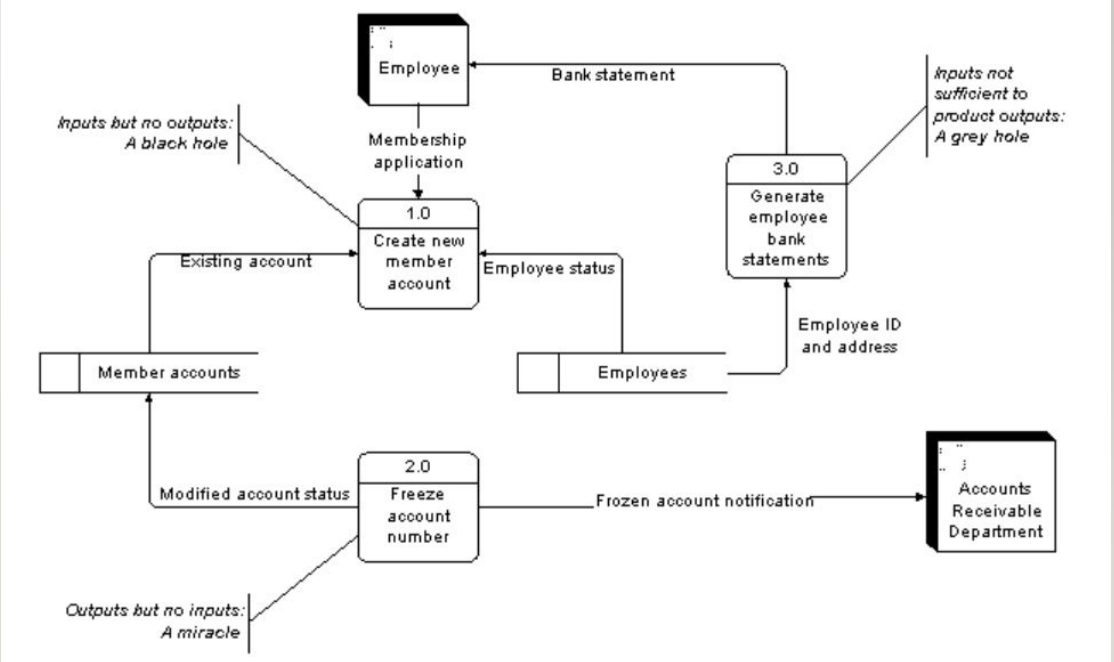
Common Data flow diagram mistakes

Wrong	Right	Description
		A source or a sink cannot provide data to another source or sink without some processing occurring.
		Data cannot move directly from a source to a data store without being processed.
		Data cannot move directly from a data store to a sink without being processed.
		Data cannot move directly from one data store to another without being processed.

Source: Adapted from Figure 9.9, p. 360 in Whitten, J. L.; Bentley, L. D.; Barlow, V. M. (1994). Systems Analysis and Design Methods (Third Edition). Burr Ridge, IL: Irwin.

COMMON MISTAKE 3

Black holes, grey holes and miracles



Source: Adapted from Figure 9.5, p. 356 in Whitten, J. L.; Bentley, L. D.; Barlow, V. M. (1994). Systems Analysis and Design Methods (Third Edition). Burr Ridge, IL: Irwin.

A SIMPLE EXAMPLE OF DFD

Draw a context-level DFD to depict the typical user authentication process used by any system. An user gives two inputs -- user name and password.

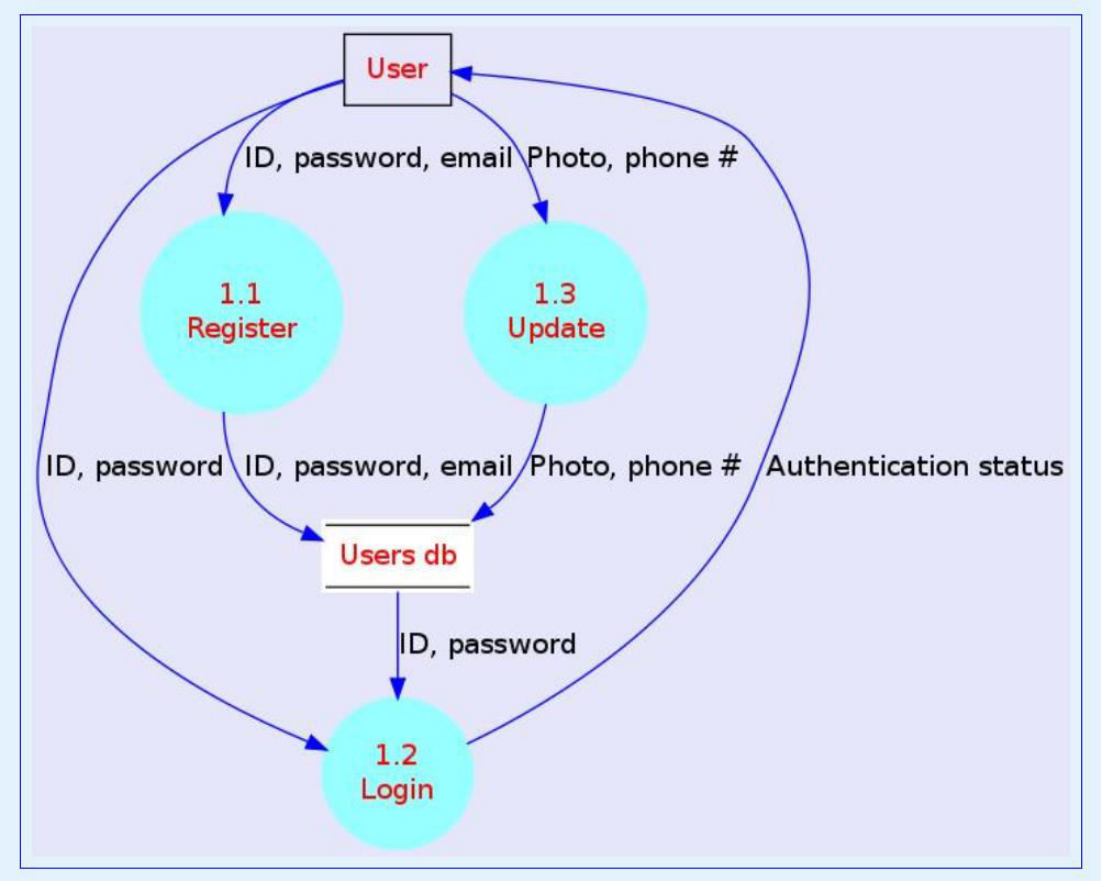
EXAMPLE 2 DFD

DFD for a Social Networking site

The Absolute Beginners Inc. is planning to launch a revolutionary social networking site, EyeCopy. You have been entrusted with designing a DFD for the proposed application. In particular, you have been asked to show the following scenarios:

- User registration
- User login
- Profile update

Draw a Level 1 DFD to depict the above data flow and the corresponding processes. Should there be any data store in the DFD?


User
ID, password, email
Photo, phone #
1.1
Register
1.3
Update
ID, password
ID, password, email
Photo, phone #
Authentication status
Users db
ID, password
1.2
Login

THANK YOU!