

# Tools of Structured Analysis

## Chapter 6

# Structured Analysis

- It is a set of techniques and graphical tools that allow the analyst to develop a new kind of system that is understandable to the user

# Why do we use these tools?

- Use graphics whenever possible to help communicate better with the user.
- Differentiate between logical and physical system
- Build a logical system model to familiarize the user with system characteristics and interrelationships before implementation

# Data Flow Diagram

- It was first developed by Larry Constantine as a way of expressing system requirements in a graphical form.
- It is also known as Bubble Chart

# DFD Symbols

- **Square** defines a source or destination of data.

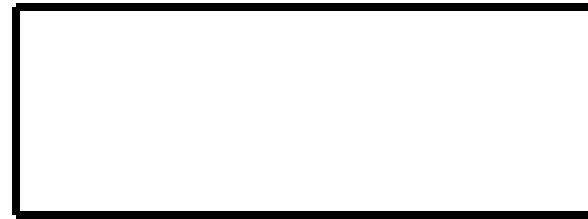
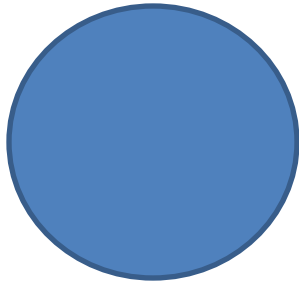


- **Arrow** identifies data flow, means the data in motion. It is a pipeline through which information flows.



# Continued...

- **Circle or a bubble** represents a process that transforms incoming data flow into outgoing data



- **Open rectangle** is a data store, or data at rest, or a temporary repository of data

# Constructing a DFD

- Processes should be named and numbered for easy reference
- The direction of flow is from top to bottom and from left to right
- Data flow from the source to destination, although they may flow back to a source
- When a process is exploded into lower level details, they are numbered
- The names of data stores, sources, and destinations are written in capital letters. Process and data flow names have the first letter of each word capitalized

# Data Dictionary

- A structured place to keep details of the contents of data flows, processes, and data store.
- It is a structured repository of data about data.
- It is a set of definitions of all DFD elements



# Advantages of Data Dictionary

- Documentation- it is a valuable reference in any organization.
- It improves analyst/user communication by establishing consistent definitions of various elements, terms and procedures
- It is important step in building a database

# Items to be defined in Data Dictionary

- **Data Elements-** smallest unit of data that provides for no further decomposition.  
For example: date consists of day, month and year
- **Data Structure-** a group of data elements handled as a unit.  
For example: phone is a data structure consisting of four data elements: area-code-exchange-number-extension.
- **Data Flows and Data Stores-** data flows are data structures in motion, whereas data stores are data structures at rest. A data store is a location where data structures are temporarily located.

# Data Dictionary

Smallest Unit  
of Data

Data  
Elements

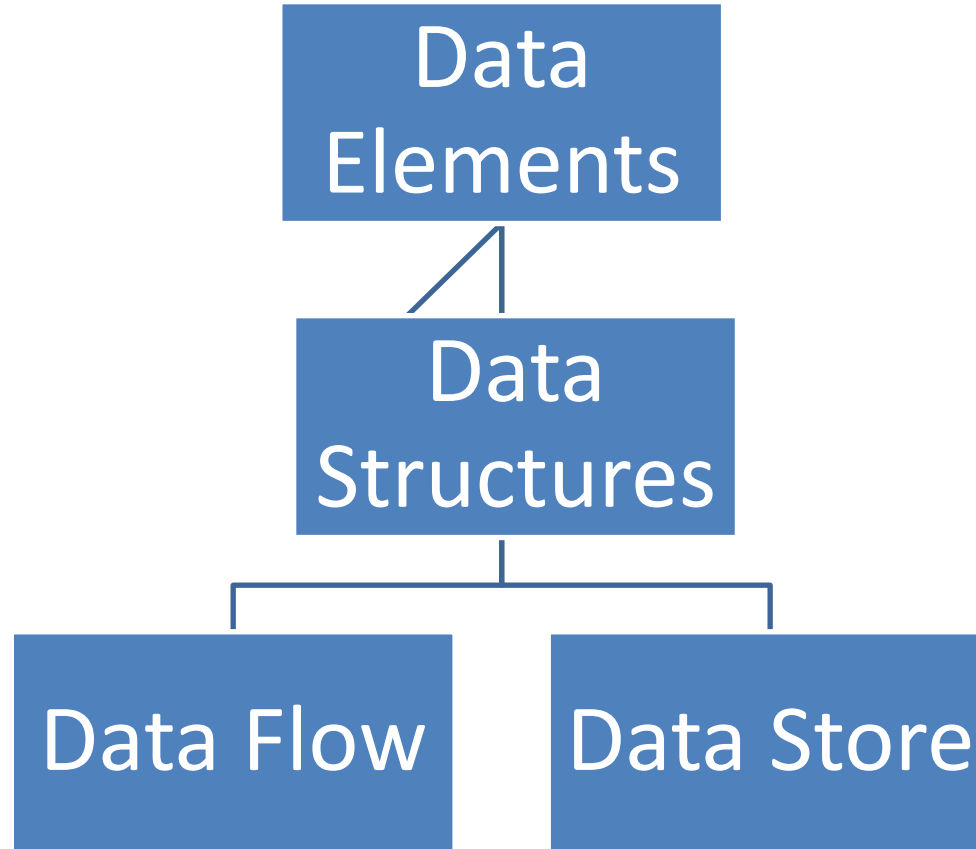
Group of Data  
Elements

Data  
Structures

Groups of  
Data  
Structures

Data Flow

Data Store



# Data Elements

- For e.g.

Author Name:

First

Middle

Last

Alias

The Description of Data Element should include:

1. Name
2. Description &
3. An Alias (Synonym)

# Data Elements

- Whether or not Data Element has the following:
  - A Different Name:
    - For e.g. A Purchase Order may exist as Pur. Order, Purchase Ord., or P.O. We will record all these in Data Dictionary under Definition of Purchase Order.
  - Usage Characteristics
    - Range of Values or Frequency of use or both.
    - 2 types:
      - Value within Range: For e.g. Payroll between 1000 and 10000 = Continuous Value.
      - Specific Value: For e.g. Depts. In a Firm coded 100 (Accounting), 110 (HR), 111 ( Operations) etc.

# Data Elements

- Control Information
  - Such as Source, Date of Origin, Users, or Access Authorization.  
For e.g. Looking for Properties of Word Doc.
- Physical Location
  - In terms of Record of File or Database.  
For e.g. Where Storage is done C Drive, D Drive, CD ROM etc.

# Data Structures

- It is the Group of Elements .

For e.g.

Data Structures:           Book Details

Data Elements: Author Name (M)

Title of the Book (M)

ISBN (Optional)

Publisher Name (M)

Quantity Ordered (M)

Some Element are Mandatory whereas others are Optional

# Data Flows and Data Stores

- Data Flows = Data Structures in Motion
- Data Stores = Data Structures at Rest

For e.g.

Data Flow/Store

Comments

Book Details

From ABC Book Store

Edition

4<sup>th</sup>

Quantity

10 Copies

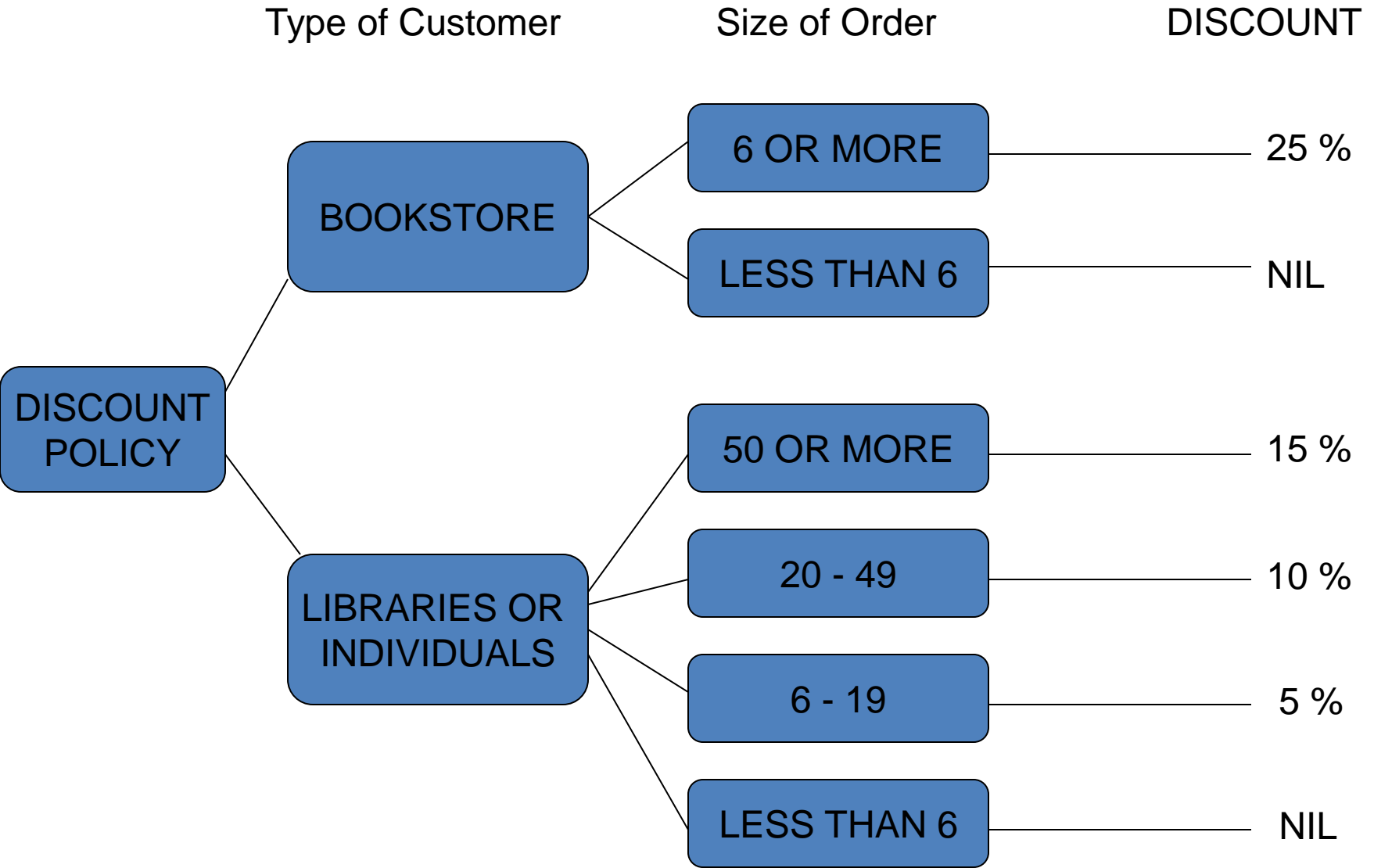
Customer Details



# Decision Tree

- Once the data elements are defined in the data dictionary, we begin to focus on the processes.
- **For example:**

Bookstores get a trade discount of 25%; for orders from libraries and individuals, 5% allowed on orders of 6-19 copies per book title; 10% on orders for 20-49 copies per book title; 15% on orders for 50 copies or more per book title



# Structured English

- Structures English is like structured programming, it uses logical construction and sentences designed to carry out instructions
- Designs are made through IF, THEN, ELSE, and SO statements

# An Example

IF order is from Bookstore

and-IF order is for 6 copies or more per book title

THEN: Discount is 25%

ELSE (order is for fewer than 6 copies per book title)

SO: no discount is allowed

ELSE (order is from libraries or individuals)

# Continued...

**ELSE** (order is from libraries or individuals)

**SO-IF** order is for 50 copies or more per book title

Discount is 15%

**ELSE IF** order is for 20 to 49 copies per book title

Discount is 10%

**ELSE IF** order is for 6 to 19 copies per book title

Discount is 5%

**ELSE** (order is for less than 6 copies per book order)

**SO:** no discount is allowed

# Decision Tables

- It is a table of possibilities for defining a problem and the actions to be taken
- It is a single representation of the relationships between conditions and actions
- It consists of two parts: stub and entry
- The stub part is divided into an upper quadrant called the condition stub and a lower quadrant called the action stub
- The entry part is also divided into an upper quadrant, called the condition entry and a lower quadrant called the action entry

<b>Condition Stub</b>		<b>Condition Entry</b>					
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
	Customer is Bookstore	Y	Y	N	N	N	N
<b>IF</b>	Order size 6 copies or more ?	Y	N	N	N	N	N
<b>(Condition)</b>	Customer Librarian or Individual			Y	Y	Y	Y
	Order-size 50 copies or more ?			Y	N	N	N
	Order-size 20-49 copies ?				Y	N	N
	Order-size 6-19 copies ?					Y	N
<b>Then</b>	Allow 25% Discount	X					
<b>(action)</b>	Allow 15% Discount			X			
	Allow 10% Discount				X		
	Allow 5% Discount					X	
	No Discount allowed		X				X
	<b>Action Stub</b>	<b>Action Entry</b>					