

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?

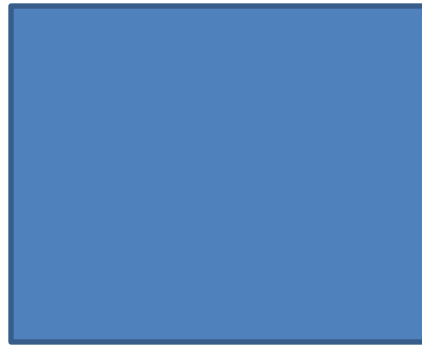
- Use graphics whenever possible to help communicate better with the user.
- Differentiate between logical and physical system
- Build a logical system model to familiarize the user with system characteristics and interrelationships before implementation

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.

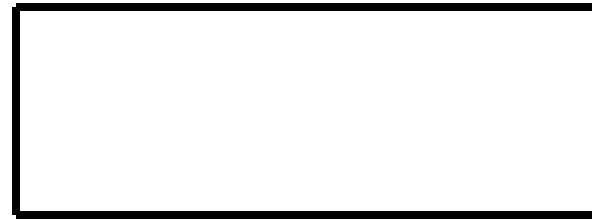
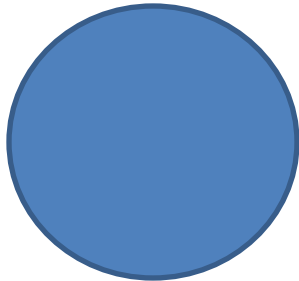


- **Arrow** identifies data flow, means the data in motion. It is a pipeline through which information flows.



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

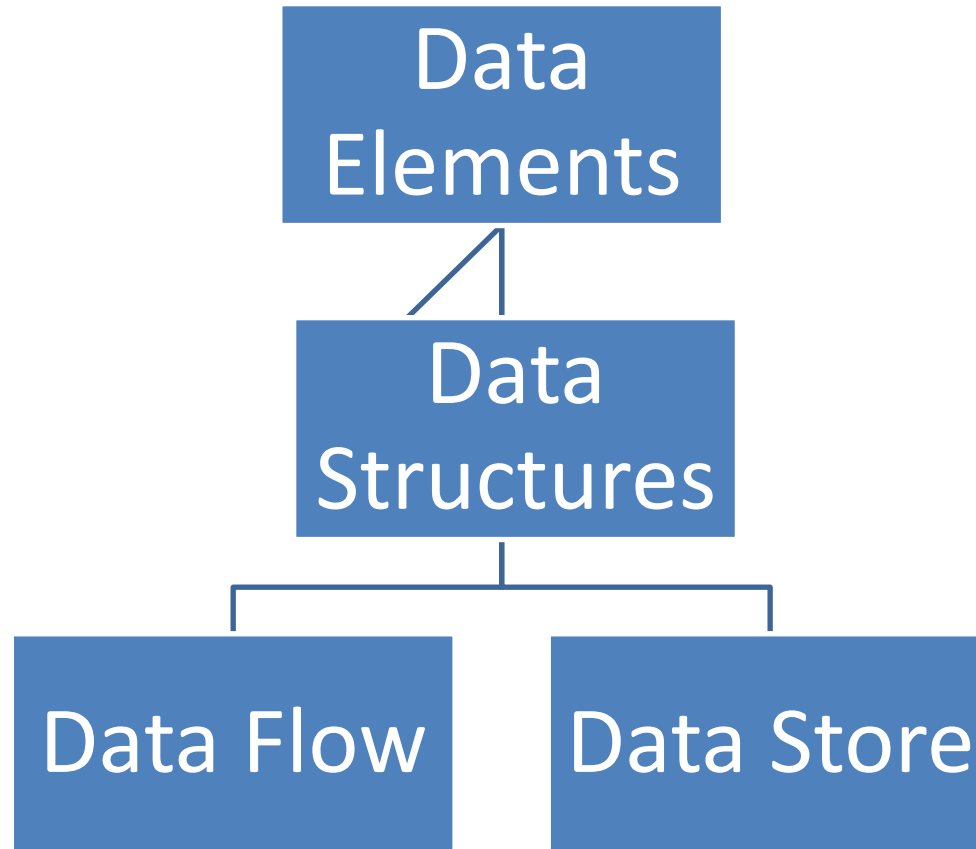
Group of Data
Elements

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

4th

Quantity

10 Copies

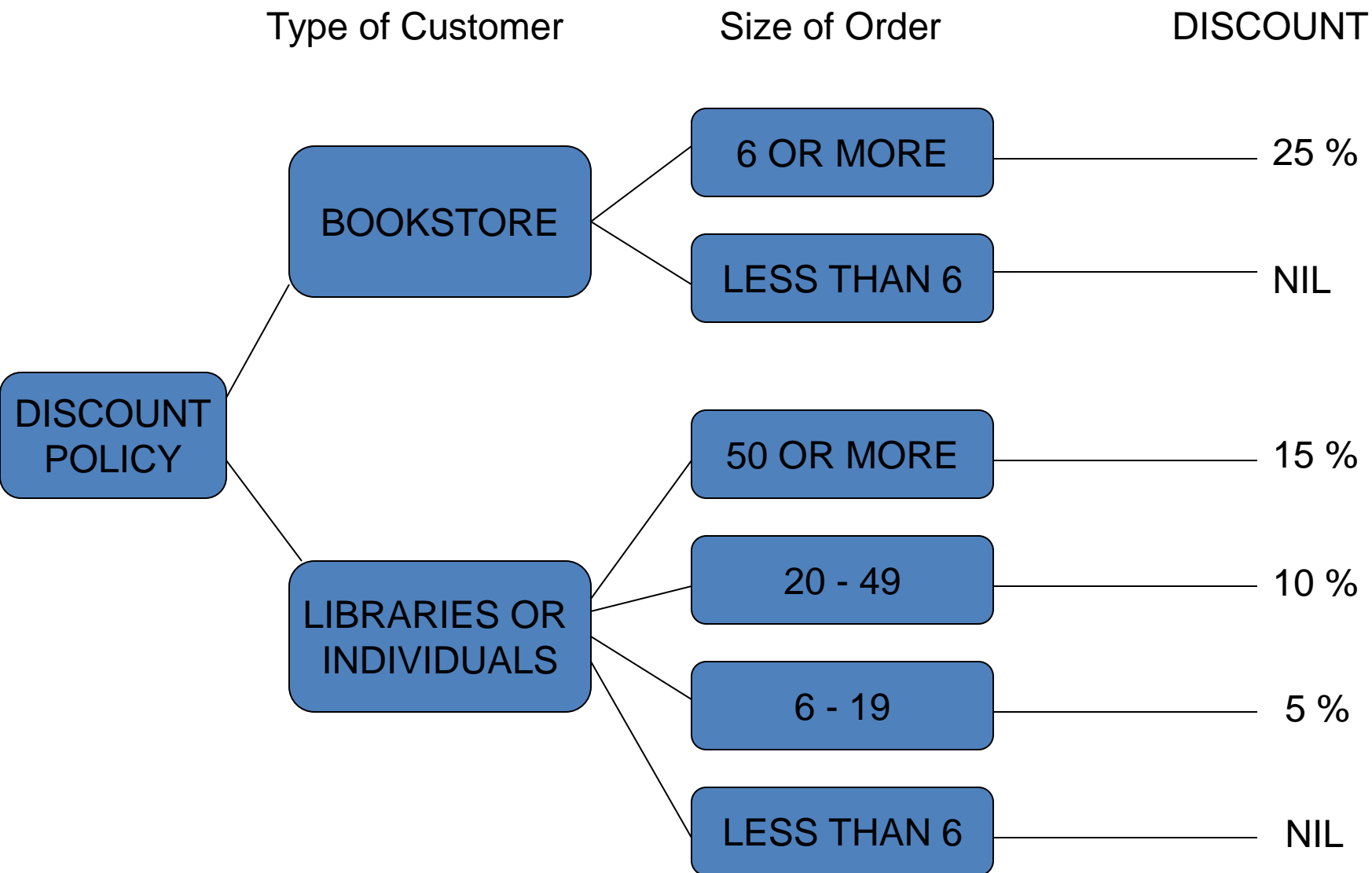
Customer Details

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

Condition Stub		Condition Entry					
		1	2	3	4	5	6
	Customer is Bookstore	Y	Y	N	N	N	N
IF	Order size 6 copies or more ?	Y	N	N	N	N	N
(Condition)	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
Then	Allow 25% Discount	X					
(action)	Allow 15% Discount			X			
	Allow 10% Discount				X		
	Allow 5% Discount					X	
	No Discount allowed		X				X
	Action Stub	Action Entry					