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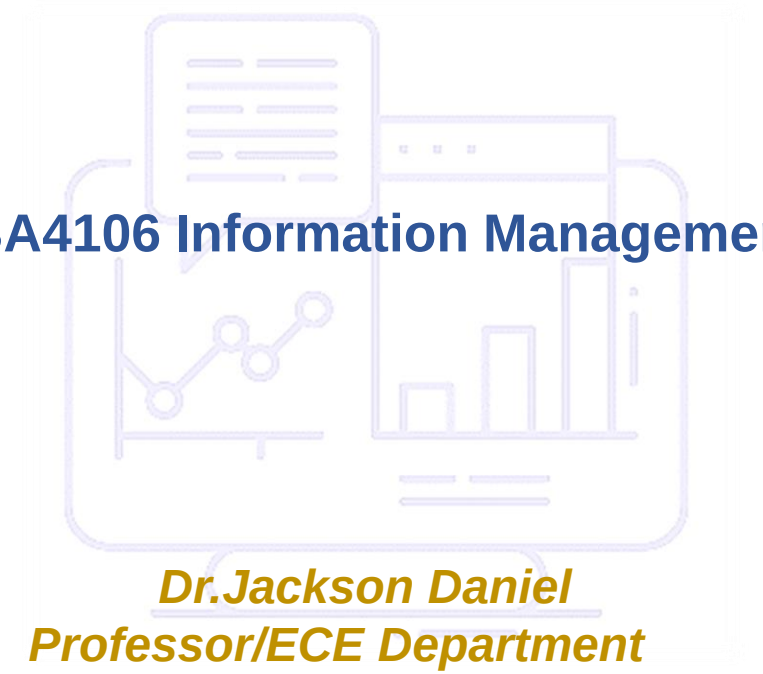
Department of Management Studies

MBA – I Semester

BA4106 Information Management



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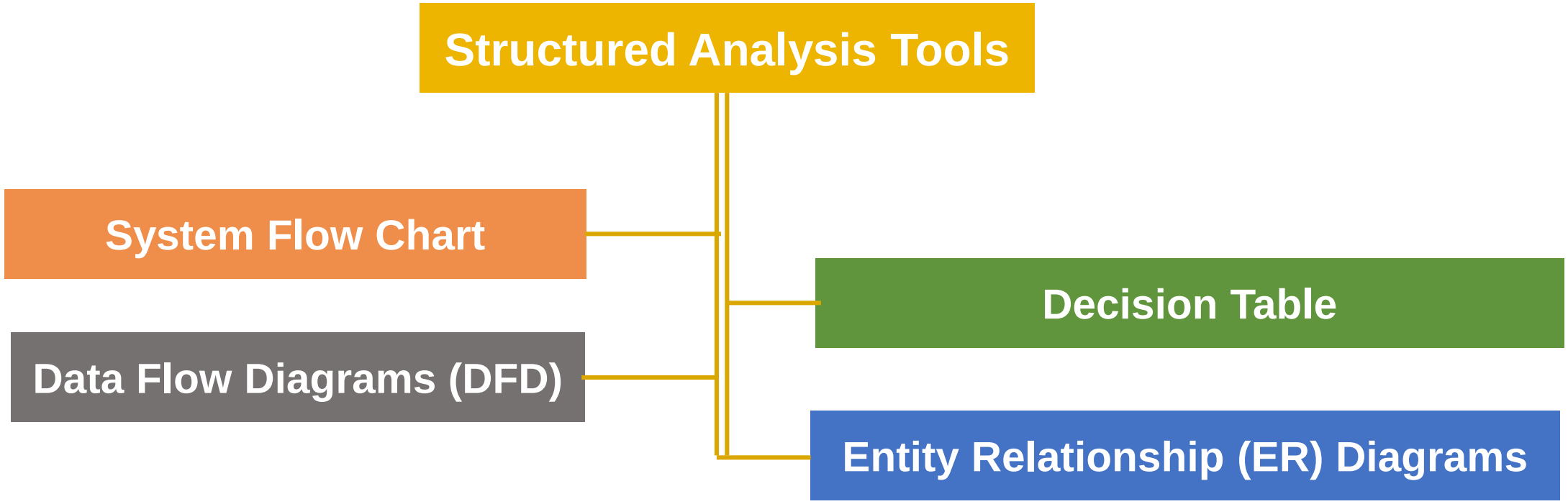
UNIT –II

2.3. Data Flow Diagram (DFD)

2.4. Decision Table

Structured Analysis Tools

- Focusses on logical aspects of existing system
- Individual can see logical/ physical components and its uses
- It is set of technique and graphical tools – analyst uses to develop design for a situation
- It will be easily understood by the user.
- It divides the processes so that it gives a clear picture of system flow



It is a systematic approach, which uses graphical tools that analyze and refine the objectives of an existing system and develop a new system specification which can be easily understandable by user

System Flow Chart

- Pictorial representation of the sequence of operation in system
- Common methods of describing procedures in Computer-based system
- Acts like road map for programmer.
- There are multiple symbols used in a system flowchart. All symbols are unique and represent a different process.
- Flowcharts are typically used to help people understand, communicate or improve upon a process or system.

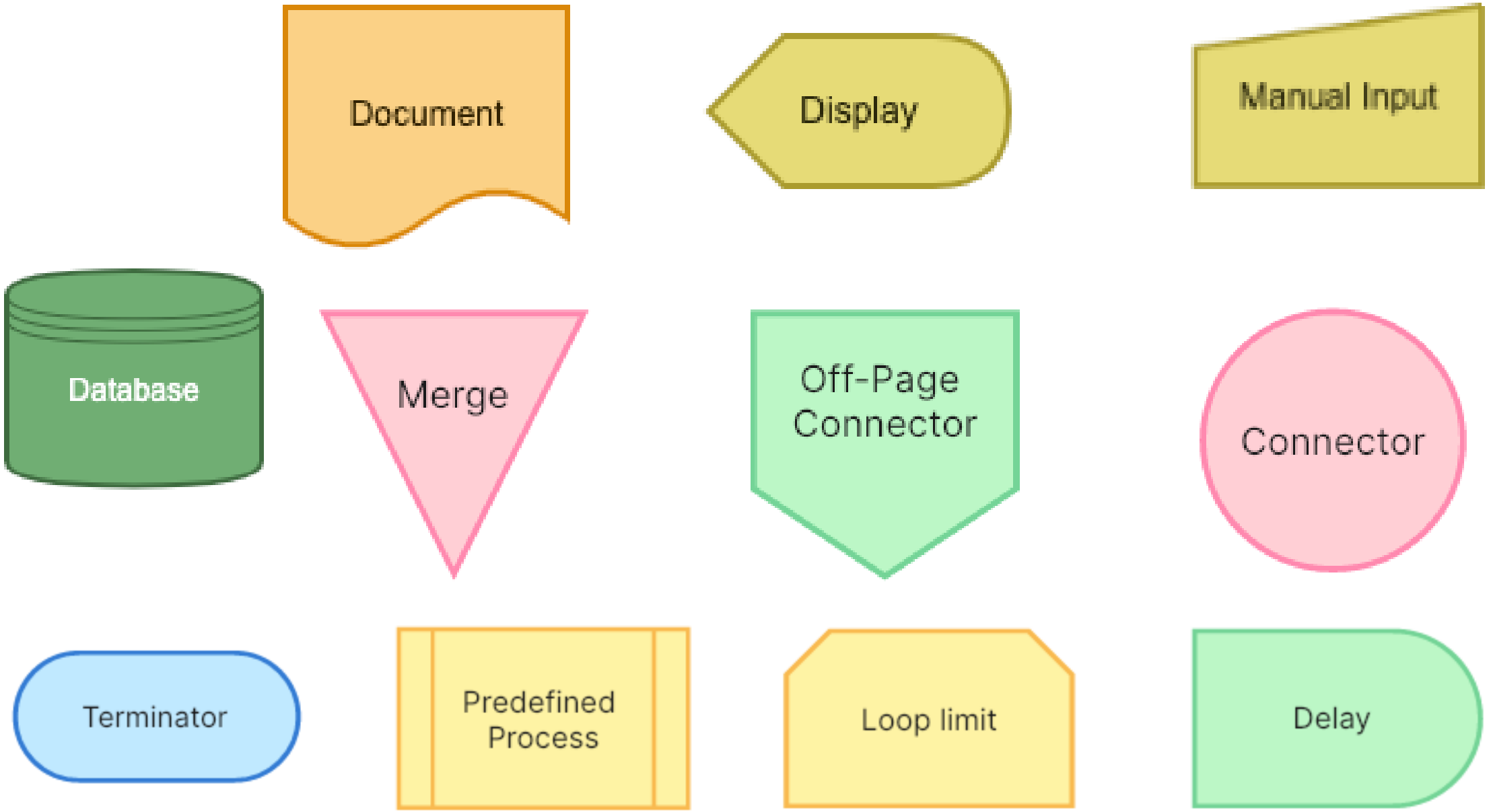
Flow Chart Symbols

Name	Symbol	Description
Process		Process or action step
Flow line		Direction of process flow
Start/ terminator		Start or end point of process flow
Decision		Represents a decision making point
Connector		Inspection point

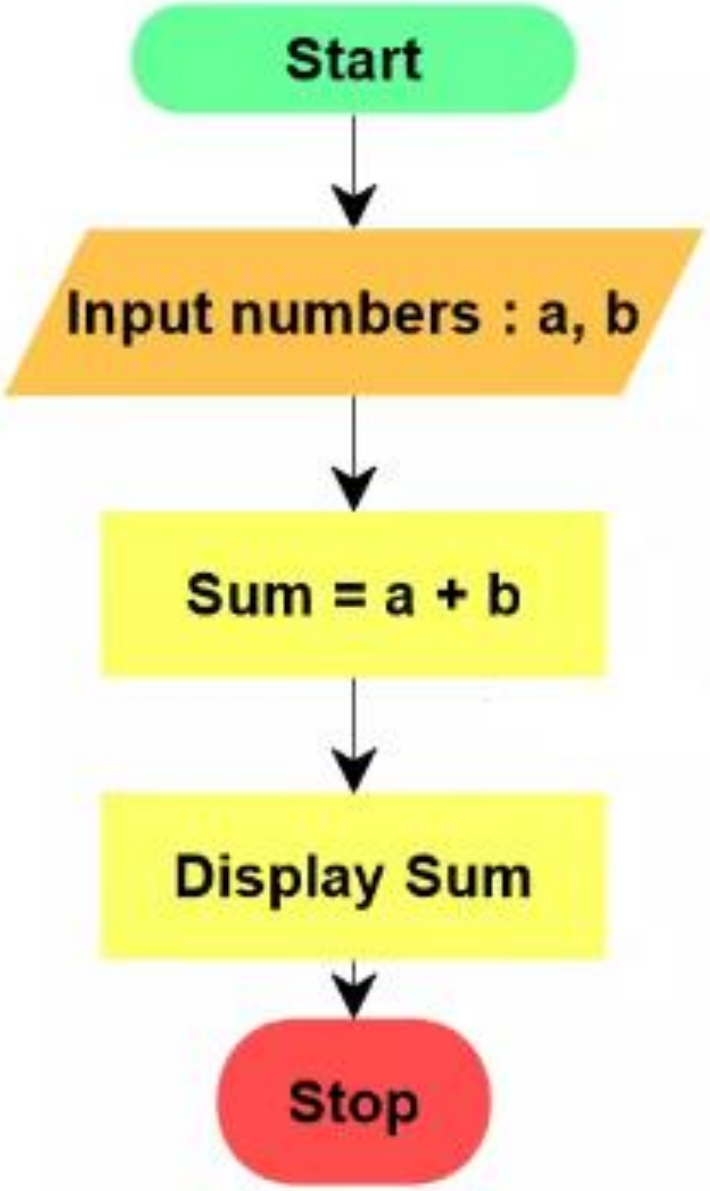
Flow Chart Symbols

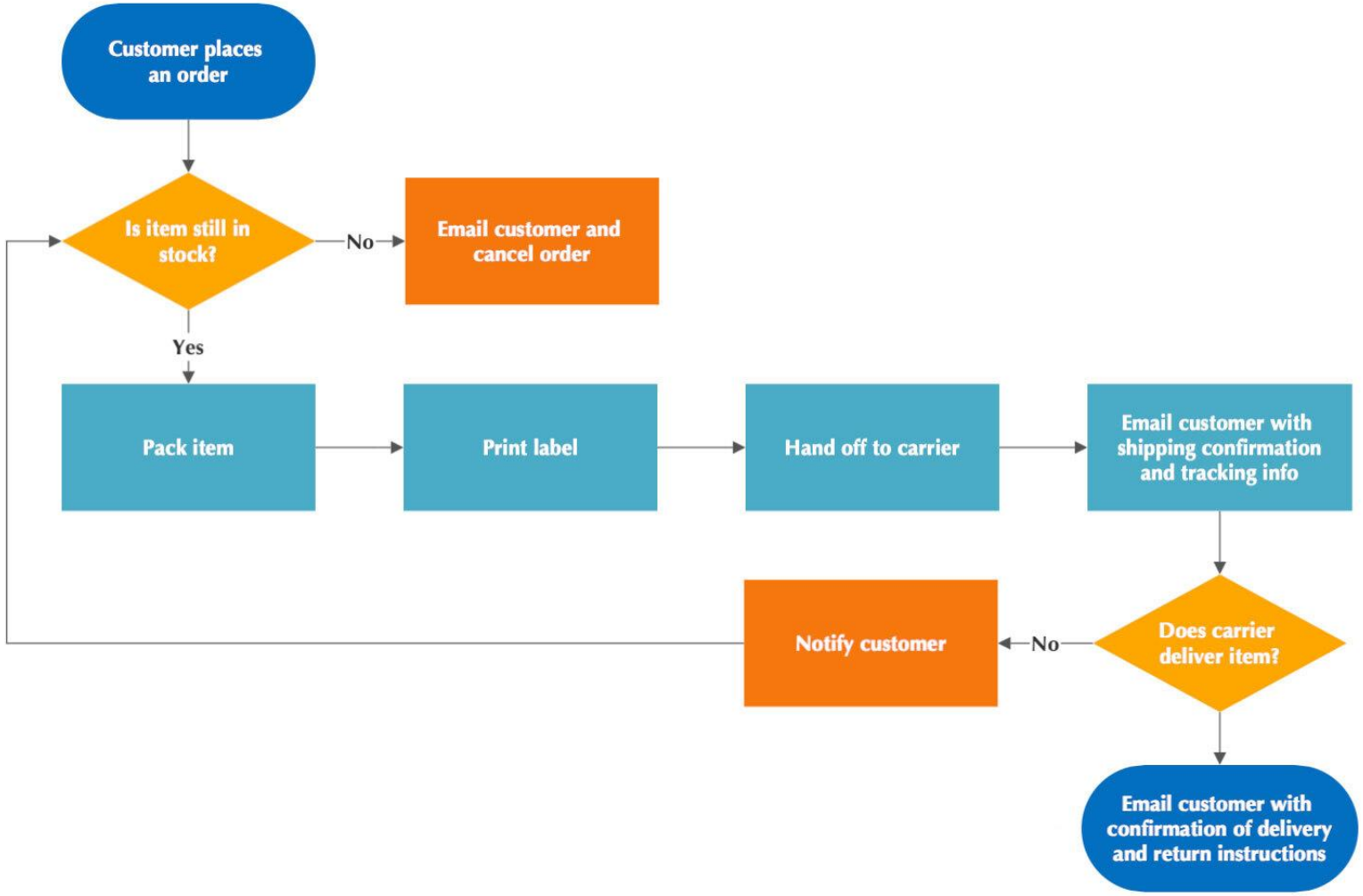
Inventory		Raw material storage
Inventory		Finished goods storage
Preparation		Initial setup and other preparation steps before start of process flow
Alternate process		Shows a flow which is an alternative to normal flow
Flow line(dashed)		Alternate flow direction of information flow

Additional Useful Flowchart



Example of Flow Charts





Decision Table

- The matrix representation regarding the logic of a decision is termed as “ decision table”
- The possible conditions and resulting actions are specified in the table
- A Decision Table is a table that shows the relationship between inputs and rules, cases, and test conditions.
- It's also known as a Cause-Effect table because it captures both causes and effects .
- A decision table contains rows and columns that work together to form rules

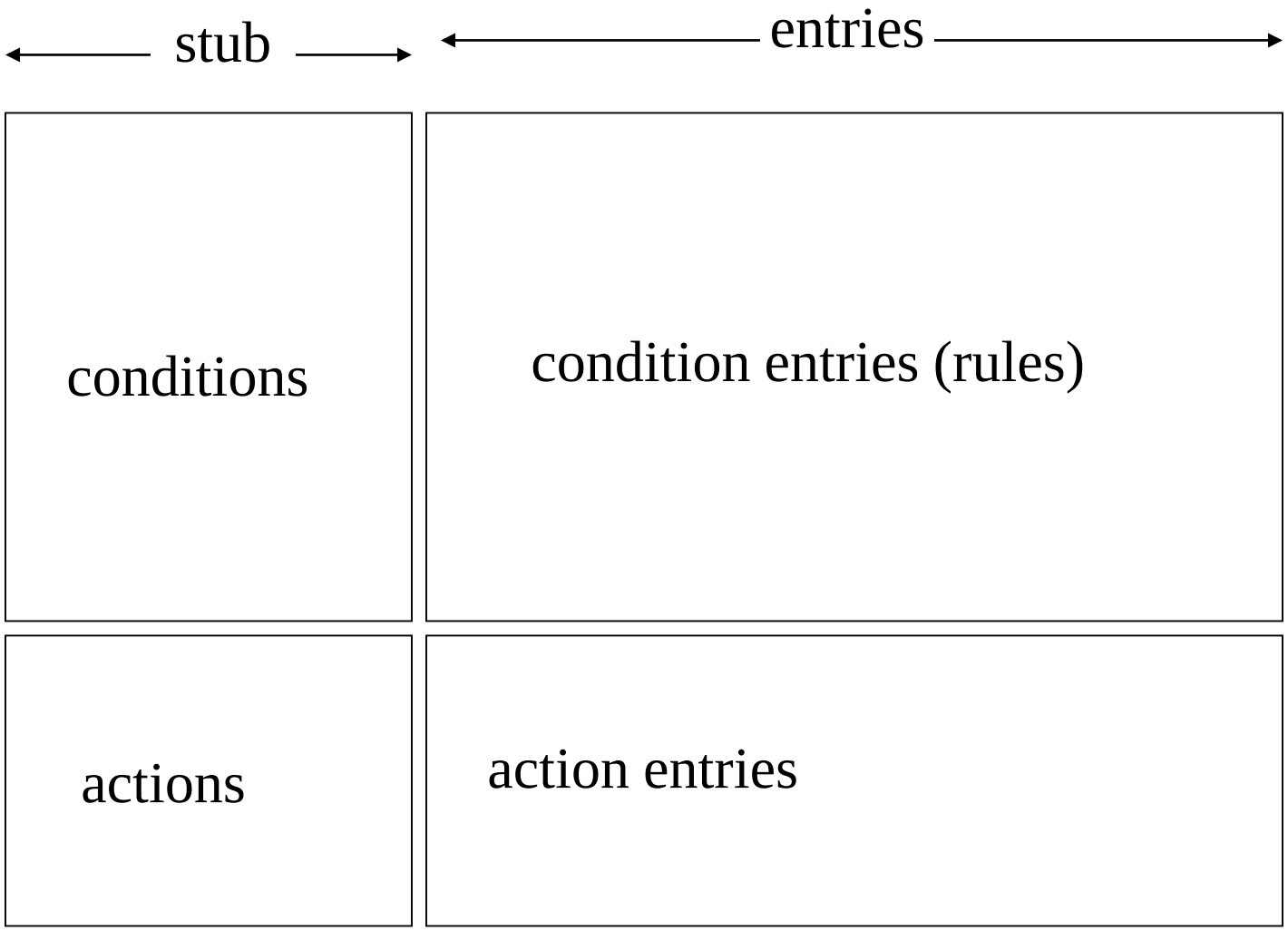
Decision Table - Examples

Condition	Rules		
	1	2	3
IS A>B	Y	-	N
IS A>C	Y	N	-
IS B>C	-	N	Y

Actions	Actions		
Print A	X		
Print B			X
Print C		X	

Conditions	**R1**	**R2**	**R3**
Withdrawal Amount <= Balance	T	F	F
Credit granted	-	T	F
Actions			
Withdrawal granted	T	T	F

Parts of Decision Table



Parts of Decision Table

Stub

- 2 Quadrants – upper and lower
- Upper Quadrant – Condition Stub
- Lower Quadrant – Action Stub

Entry

2 Quadrants- Upper and Lower

Upper Quadrant – Condition Entry

Lower Quadrant – Action Entry

The probable conditions are set forth in question form

The action to be taken to encounter each condition are drawn

Condition Stub	Condition Entry
Action Stub	Action Entry

The questions asked in the condition sub quadrant are responded

Appropriate actions to be taken in response to the conditions introduced by condition entry quadrant

1. Limited Entry Form

- There are only two possible states (i.e., True or False)
- Example: Limited entry decision table for book store

Condition Stub		Condition Entry					
		1	2	3	4	5	6
IF (Condition)	Customer in Bookstore?	Y	Y	N	N	N	N
	Order Size 6 copies or more?	Y	N	N	N	N	N
	Customer Librarian or Individual?			Y	Y	Y	Y
	Order Size 55 copies or more			Y	N	N	N
	Order size 20-49 copies				Y	N	N
	Order size 6-19 copies					Y	N
THEN (Action)	Allow 25% Discount	X					
	Allow 20% Discount			X			
	Allow 10% Discount				X		
	Allow 5% Discount					X	
	No discount allowed		X				X
Action Stub		**Action Entry**					

2. Extended Entry Form

- Condition stub has condition with more than two possible states.
- Example: 3 types of product and discount is 15% for product type 3
- Remaining conditions stays same.

	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5
PRODUCT-TYPE 1	Y	Y	N	N	N
PRODUCT-TYPE 2	N	N	Y	Y	N
PRODUCT-TYPE 3	N	N	N	N	Y
CUSTOMER-CATEGORY =1	Y	N	Y	N	-
CUSTOMER-CATEGORY =2	N	Y	N	Y	-
DISCOUNT 15%	X				X
DISCOUNT 10%		X		X	
DISCOUNT 20%			X		

3. Else Form

- Sometimes a decision table will contain an ELSE column at the far right.

- This is a single decision rule that essentially says that if any of the previous rules in table (to the left of the ELSE column) were not triggered, than take the action(s) specified in the ELSE column.

3. Else Form

	Rule 1	Rule 2	Rule 3	Rule 4	Rule 5	Rule 6	Rule 7
PRODUCT-TYPE 1	Y	Y	N	N	N	N	
PRODUCT-TYPE 2	N	N	Y	Y	N	N	E
PRODUCT-TYPE 3	N	N	N	N	Y	Y	L
CUSTOMER-CATEGORY =1	Y	N	Y	N	-	N	S
CUSTOMER-CATEGORY =2	N	Y	N	Y	-	Y	E
DISCOUNT 15%	X				X	X	
DISCOUNT 10%		X		X			
DISCOUNT 20%			X				X

Creating Decision Tables

Condition Stub	Condition Entry
Action Stub	Action Entry

Procedures to be followed while constructing Decision Tables

1) Draw boxes for the top and bottom left quadrants.

2) List the conditions in the top left quadrant.

When possible, phrase the conditions as questions that can be answered with a Y for yes and an N for a no.

3) List the possible actions in the bottom left quadrant.

4) Count the possible values for each condition and multiply these together to determine how many unique combinations of conditions are present.

5) Enter all possible combinations of values in the columns in the top right quadrant of the table.

6) For each column, that is, each unique combination of conditions, mark an X in the bottom right quadrant in the appropriate action row. The X marks the intersection between the required action and each unique combination of condition values.

Advantages of Decision Tables

- Testers can use decision table testing to test the results of several input combinations and software states
- It gives the developers to state and analyzes complex business rules.
- Decision tables are easy to understand, and everyone can use and implement this design and testing method, scenarios and test cases without prior experience.
- Compared to flow chart, it is easier to for alterations
- A small table can replace several pages of flow chart.

Disadvantages of Decision Tables

- Decision tables only present a partial solution
- Flow can not be illustrated
- Not possible to mention each and every substitute
- The total sequence is not clearly shown, i.e., no overall picture is given by decision tables as presented by flowcharts.

Data Flow Diagrams (DFD)

- Overview
- Elements of Data Flow Diagram
- Levels of Data Flow Diagram
- Types of Data Flow Diagram
- Steps to Develop Data Flow Diagram
- DFD – Rules
- Advantages of DFD
- Disadvantages of DFD
- Examples of DFD

Data Flow Diagrams (DFD)

Overview

- The graphical representation of data “flow” through an information system
- Also referred as “Data flow Graphs”
- DFD are used during problem analysis and understanding any system
- DFD captures the transformation that takes place from input to produce desired output.

Elements of Data Flow Diagrams (DFD)

Notation	Yourdon & De Marco	Gene & Sarson	SSADM	Unified
External Entity				
Process				
Data Store				
Data Flow				

Process: Work performed in response to the incoming data flows or input

Data Flow: Input of data to output of data . Represented by a solid line with arrow

External Entity: The Square symbol is used to represent the external entity like another department or business that can send or receive data from the system

Data Stores: Inventories of data which are represented by the symbol open-end box in a Data Flow Diagram

Levels of DFD

- The choice of DFD level depends on the complexity of the system and the level of detail required to understand the system.
- Higher levels of DFD provide a broad overview of the system
- while lower levels provide more detail about the system's processes, data flows, and data stores.
- A combination of different levels of DFD can provide a complete understanding of the system.

Different Levels :

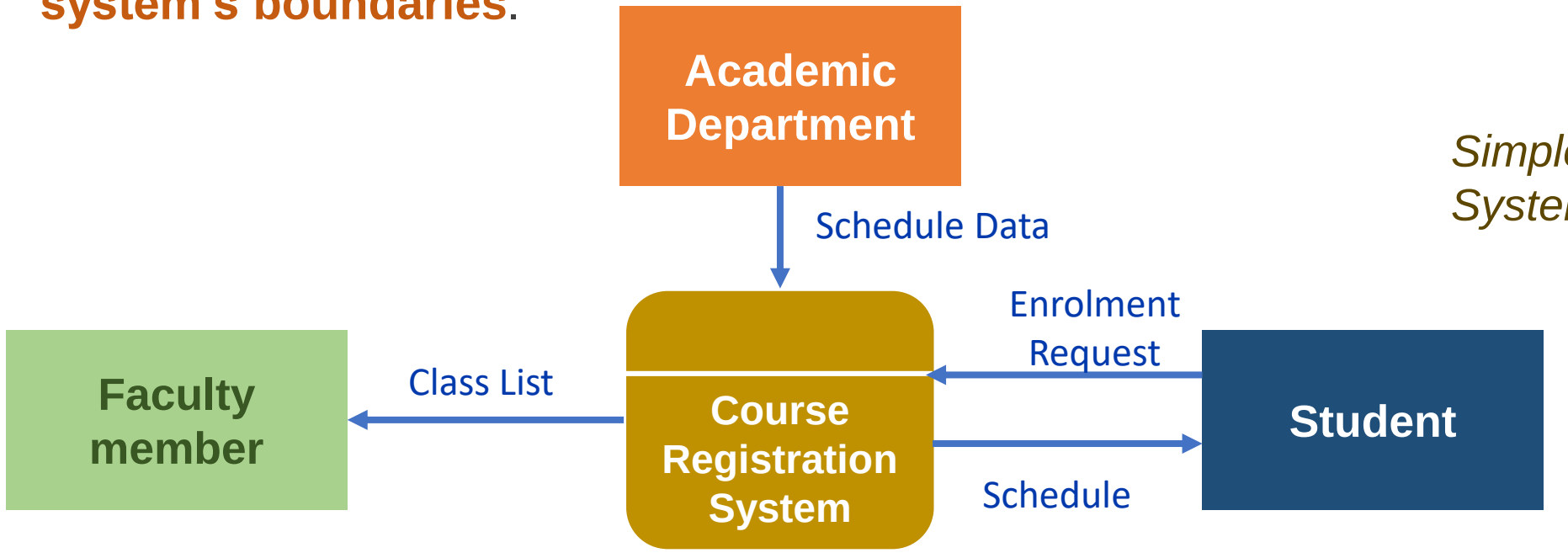
- **Context Diagram**
- **0-Level Diagram (Next Level)**
- **Level 1 Diagram, Level 2, …**

Levels of DFD | 1. Context Diagram

- The **starting point** of any DFD is the context diagram.
- It provides an **overview** of the entire system.
- A **single process** can represents the entire system
- Showcasing the **interactions** between the system and its external entities.
- External entities, inputs, and outputs are identified to create a clear representation of the **system's boundaries**.

Example:

Simple University Registration System – Context Diagram



Levels of DFD — 0 - Level Diagram

- These diagrams describe general **high-level processes** .
- It shows the **major processes**, data flows, and data stores in the system, without providing any details about the internal workings of these processes

- **How many sub-processes** should we make out of Process 0?

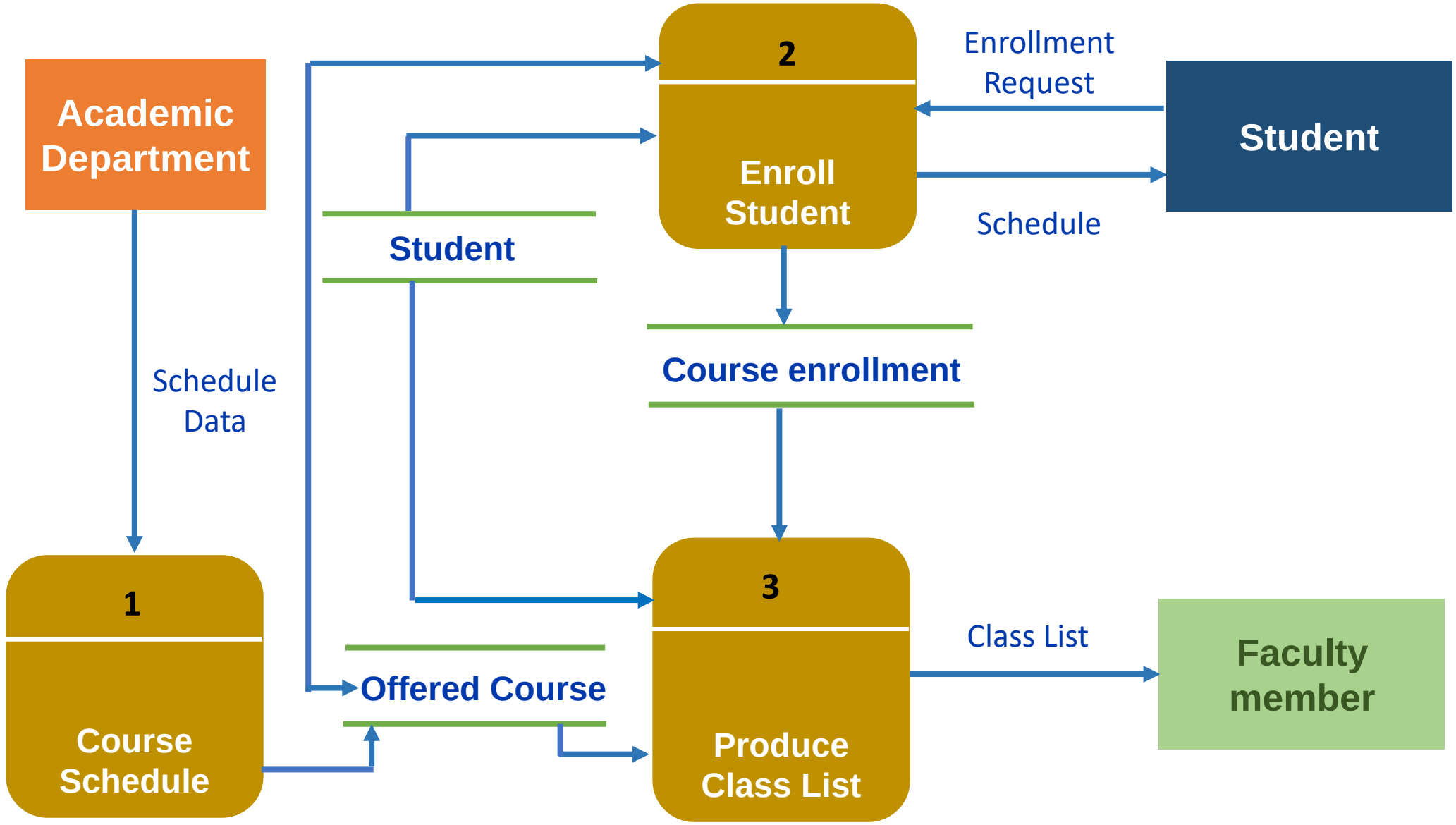
  There is no rule It all depends on the system.

- *Example:*

  Figure Represents 0-Level Diagram DFD of University Course Registration System

2.] 0 - Level Diagram

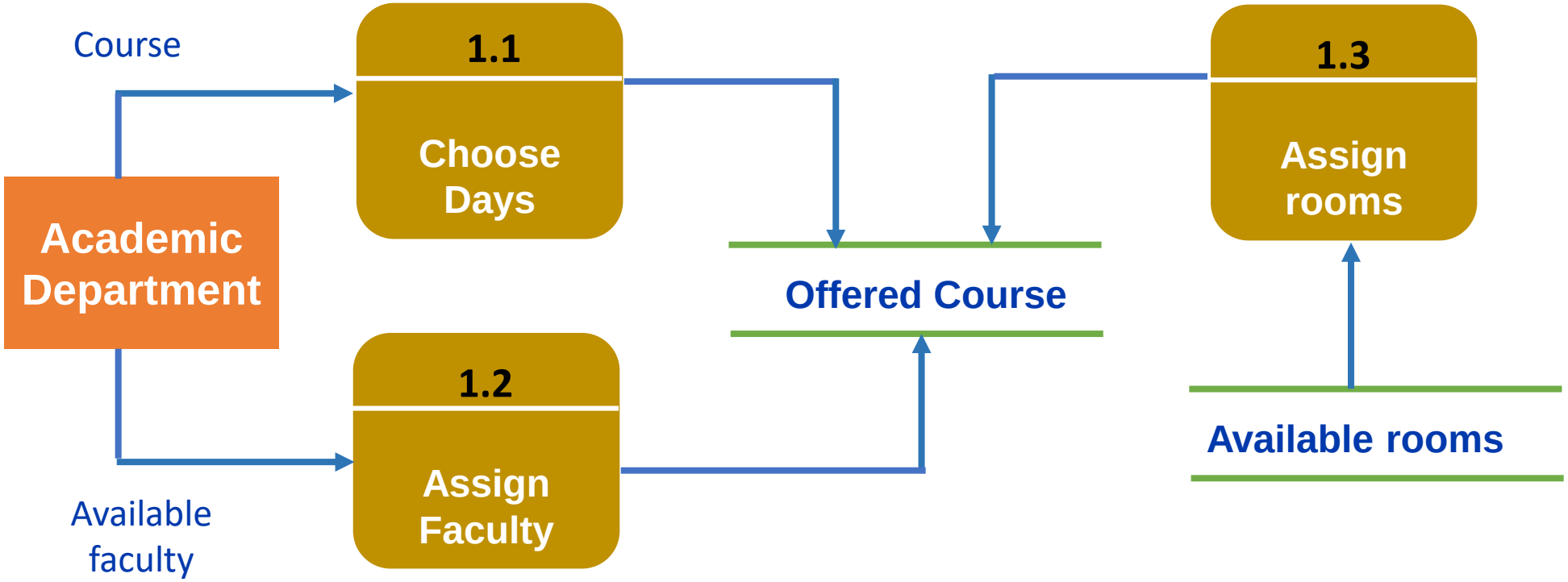
0-Level Diagram DFD of University Course Registration System



3.] Level 1 - Diagram

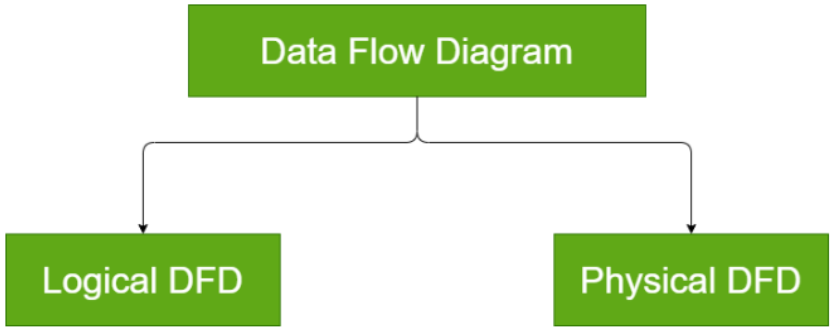
- Every Process on Level 0 DFD are **Disintegrated i**nto More explicit DFD
- This level provides a more detailed view of the system by **breaking down** the major processes identified in the level 0 DFD into sub-processes.

Example : Figure Represents Diagram-1 Or Level -1 of University Course Registration System

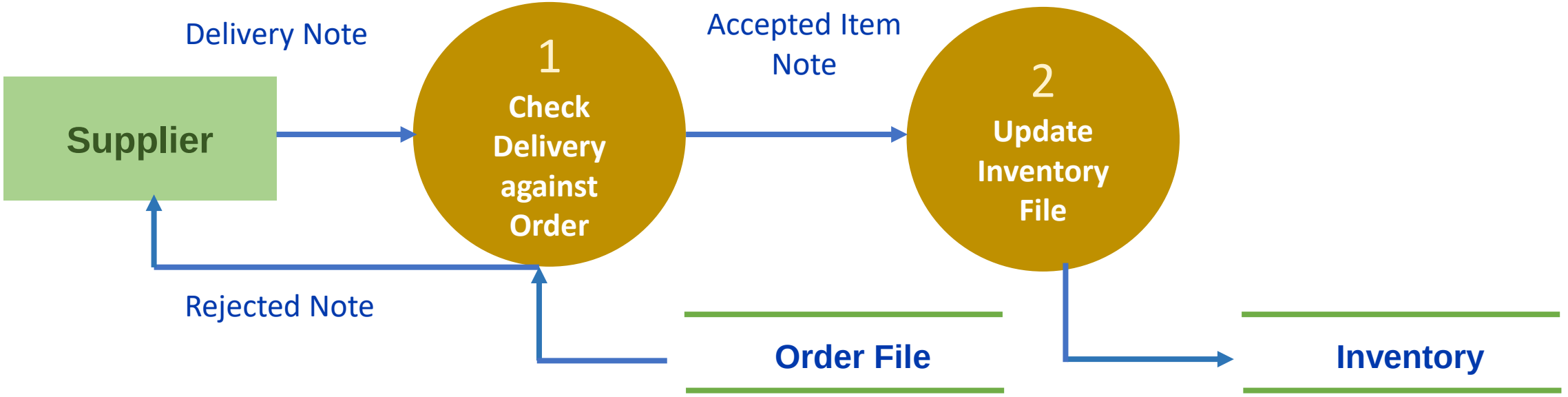


Types of Data Flow Diagram

Logical DFD



- Logical DFD depicts **how the business** operates.
- The processes represent the **business activities**
- It illustrates **how data flows** in the system
- Like in a **Banking software system**, it is used to describe how data is moved from one entity to another.

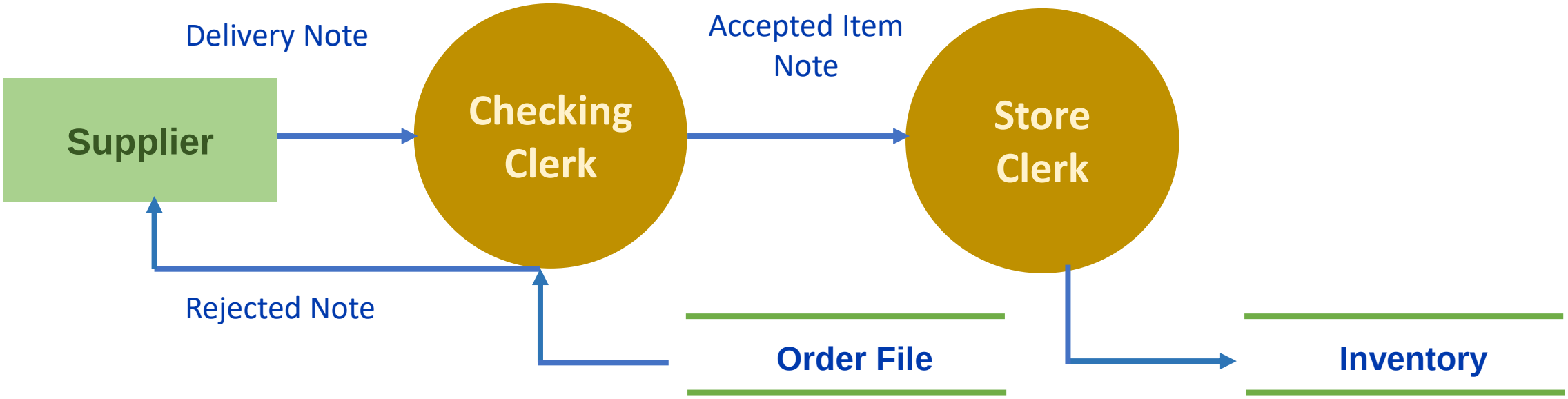


Types of Data Flow Diagram

Physical DFD

- Physical DFD depicts **how the system will be implemented**
- The processes represent the **programs, program modules, and manual** procedures.
- The data stores represent the physical files and databases, manual files.
- hardware, software, paper files and people involved
- Physical DFD is **more specific** and close to implementation

Figure : Physical Data Flow Diagram



Data Flow Diagram ….to be Cont’d