System Analysis Course

Week 07: DFD (Data Flow diagram)

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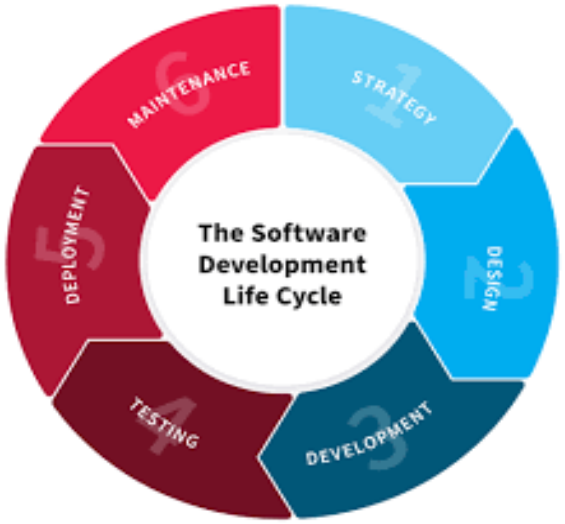


Outline

- DFD
  - Context Diagram
  - Level 0
  - Level 1
  - Level 2
- Practical Part – on Software Program

Introduction

- A **data flow diagram (DFD)** is traditional visual representation of the information flows within a system.
  - It uses defined ***symbols*** like ***rectangles***, ***circles*** and ***arrows***, ***plus short text labels***, to ***show*** data ***inputs***, ***outputs***, ***storage points*** and ***the routes between each destination***.

- By creating a Data Flow Diagram, you can tell the information provided by and delivered to someone who takes part in system processes, the information needed in order to complete the processes and the information needed to be stored and accessed.

Introduction Cont.

- The data flow diagram is a hierarchy of diagram consist of:
  1. ***Context Diagram***
  2. ***The Level-0 DFD***
  3. ***And possible Level-1 DFD*** and ***further levels*** of functional decomposition depending on the complexity of your system.
  - The **purpose** of a DFD is to show the scope and boundaries of a system as a whole.

DFD Diagram Notations

- ***1. External Entity:***
  - An external entity can represent a ***human***, ***system*** or ***subsystem***.
    - It is where certain data comes from or goes to. It is external to the system we study, in terms of the business process. For this reason, people used to draw external entities on the edge of a diagram.

DFD Diagram Notations Cont.

- ***2. Process***
  - A process is a ***business activity*** or ***function*** where the *manipulation and transformation of data takes place*.
  - A process can be decomposed to finer level of details, for representing how data is being processed within the process.

DFD Diagram Notations Cont.

- ***3. Data Store***
  - A data store represents the ***storage*** of persistent data required and/or produced by the process.
- ***4. Data Flow***
  - A data flow represents the *flow of information*, with its *direction represented by an arrow head* that shows at the end(s) of flow connector.

Symbols and Notations Used in DFD

Notation	Yourdon and Coad	Gane and Sarson
External Entity		
Process		
Data Store		
Data Flow		

DFD rules and tips

- Each ***process*** should have at ***least one input and an output.***
- Each ***data store*** should have at ***least one data flow in and one data flow out.***
- ***Data stored*** in a system ***must go through a process***.
- All processes in a ***DFD*** go to another process or a data store.
- ***DFD levels and layers***: From context diagrams to pseudocode.

DFD levels and layers

- A data flow diagram can dive into progressively more detail by using levels and layers, zeroing in on a particular piece.

- DFD levels are numbered 0, 1 or 2, and occasionally go to even Level 3 or beyond. The necessary level of detail depends on the scope of what you are trying to accomplish.

DFD levels and layers

- ***Context Diagram*** is a basic overview of the whole system or process being analyzed or modeled. It's designed to be an **at-a-glance** view, showing the system as a single high-level process, with its relationship to external entities.
  - Context diagram is a simple representation of the whole system.
  - Context DFD is the ***entrance of a data flow model***.
    - It contains one and ***only one process*** and ***does not show any data store.***

DFD levels and layers (DFD Level 0)

- **DFD Level 0** provides a ***more detailed breakout*** of pieces of the ***Context Level Diagram***.
- You will highlight the main functions carried out by the system, as you break down ***the high-level process of the Context Diagram*** into its ***sub processes***.

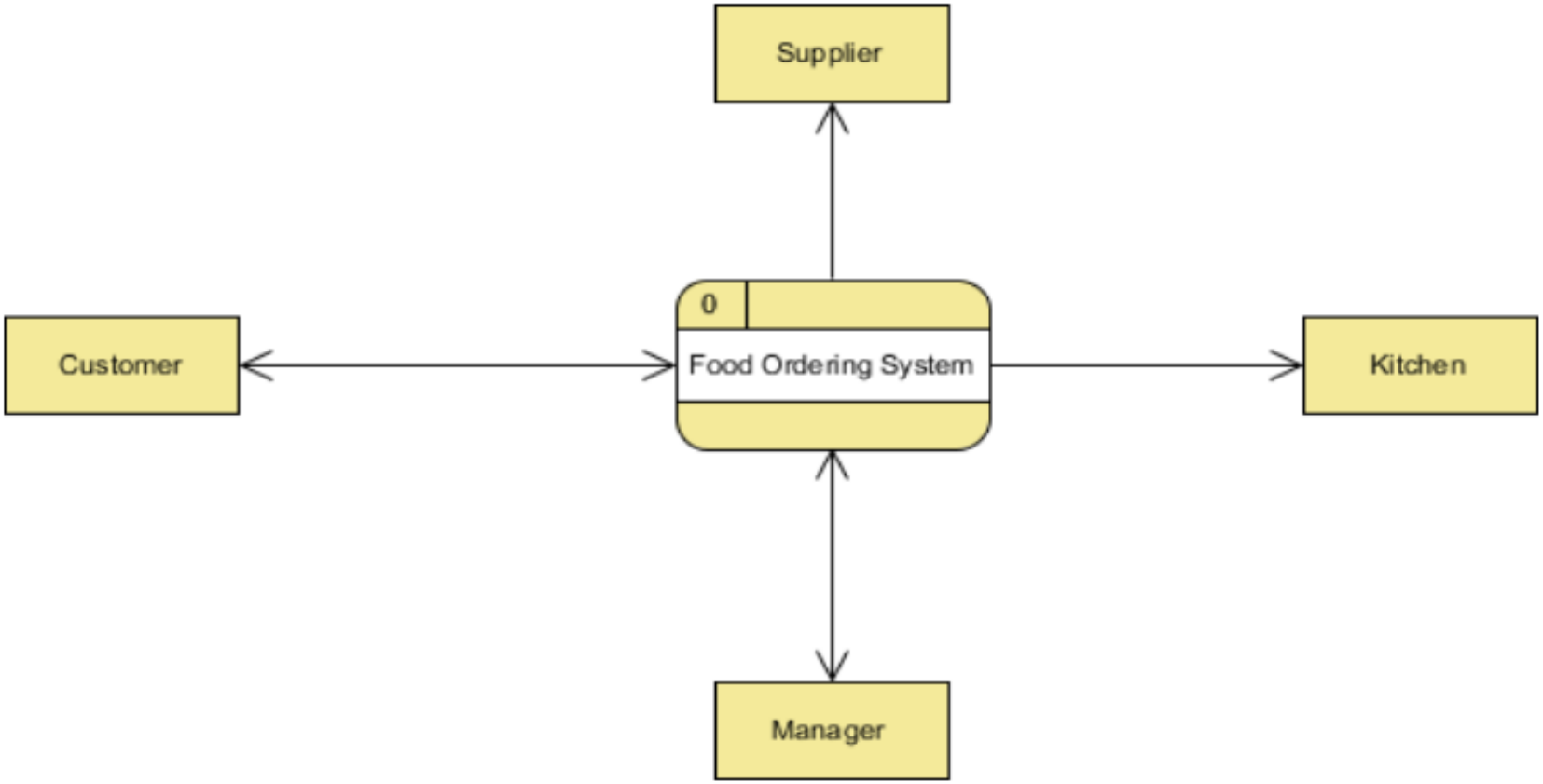
DFD levels and layers (DFD Level 2)

- **DFD Level 1** then goes ***one step deeper*** into parts of ***Level 0***.
- It may require more text to reach the necessary level of detail about the system's functioning.

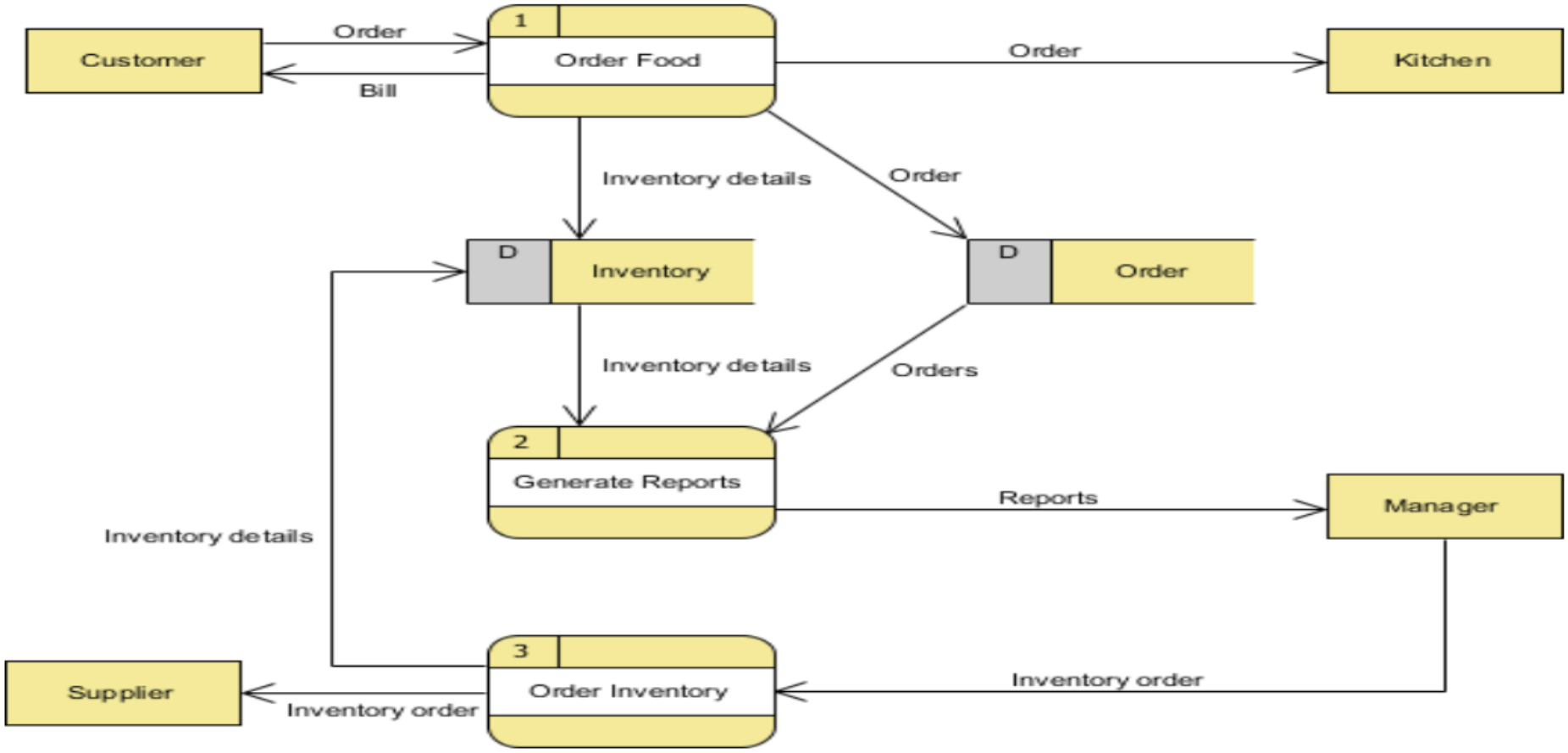
- **Progression to Levels 2, 3 and beyond** is possible, ***but going beyond Level 3 is uncommon***. Doing so ***can create complexity*** that makes it ***difficult to communicate***, compare or model effectively.

General Examples on DFD Level 0, 1 and 2.

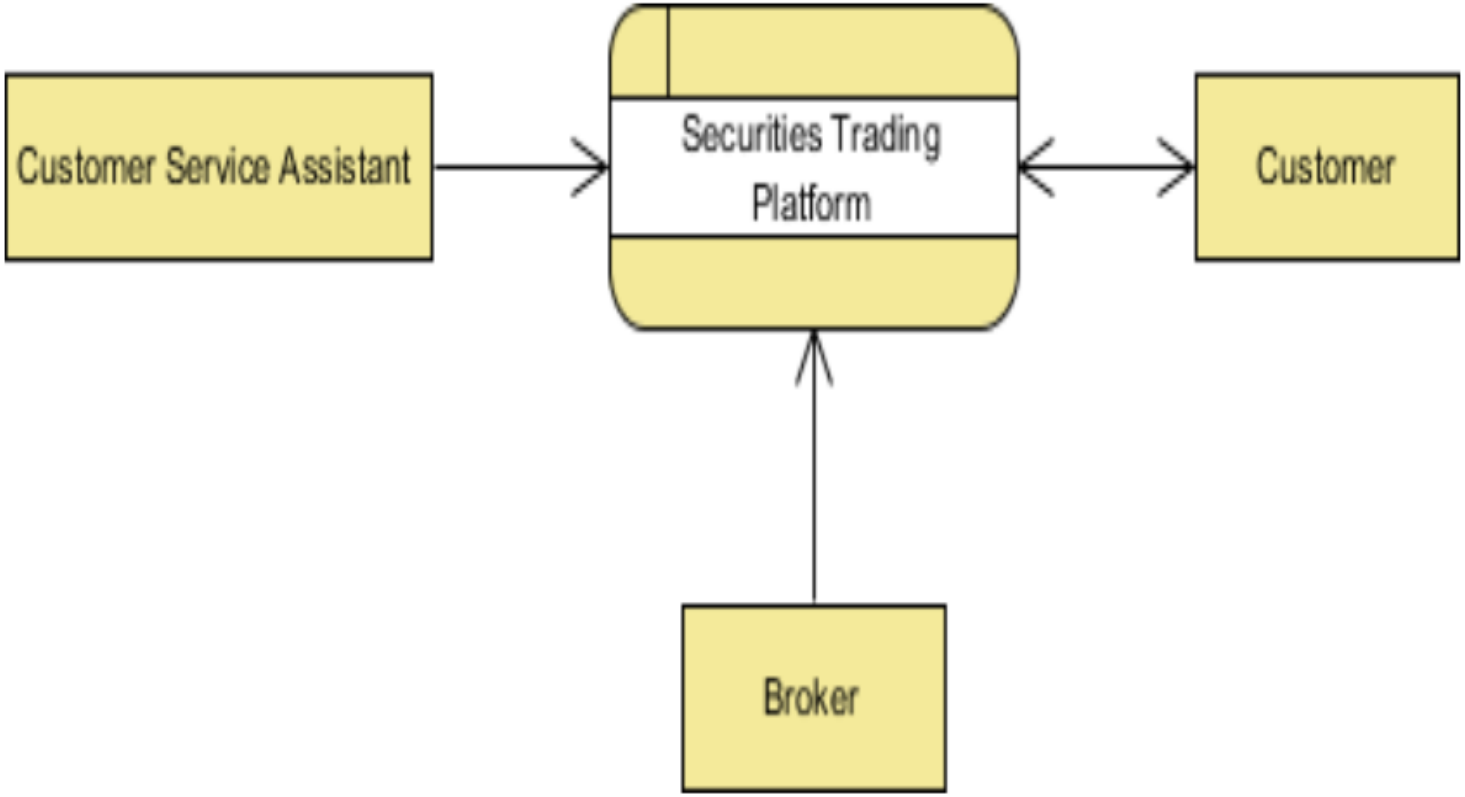
Context diagram Example 1



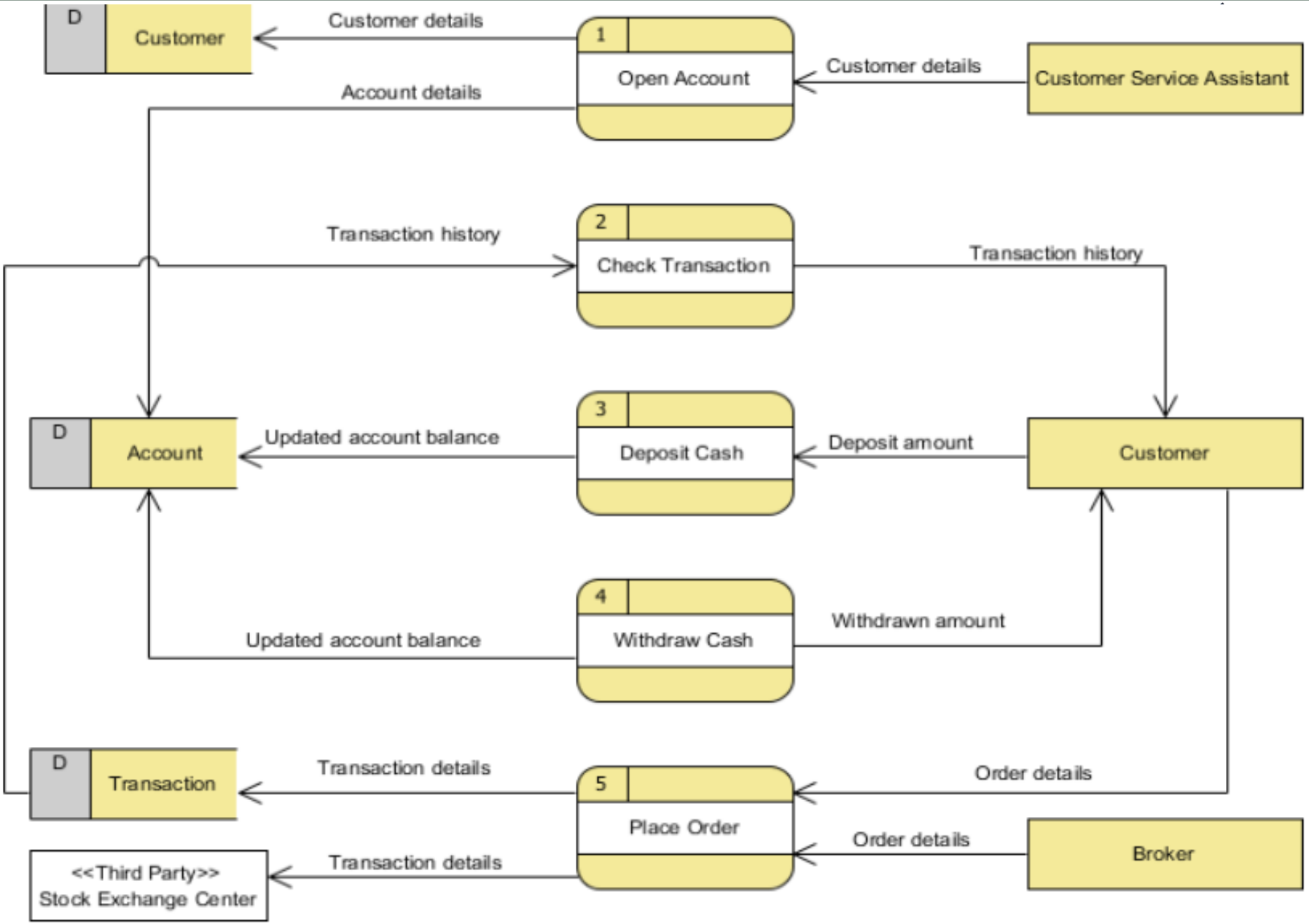
DFD Level 0 Example 1



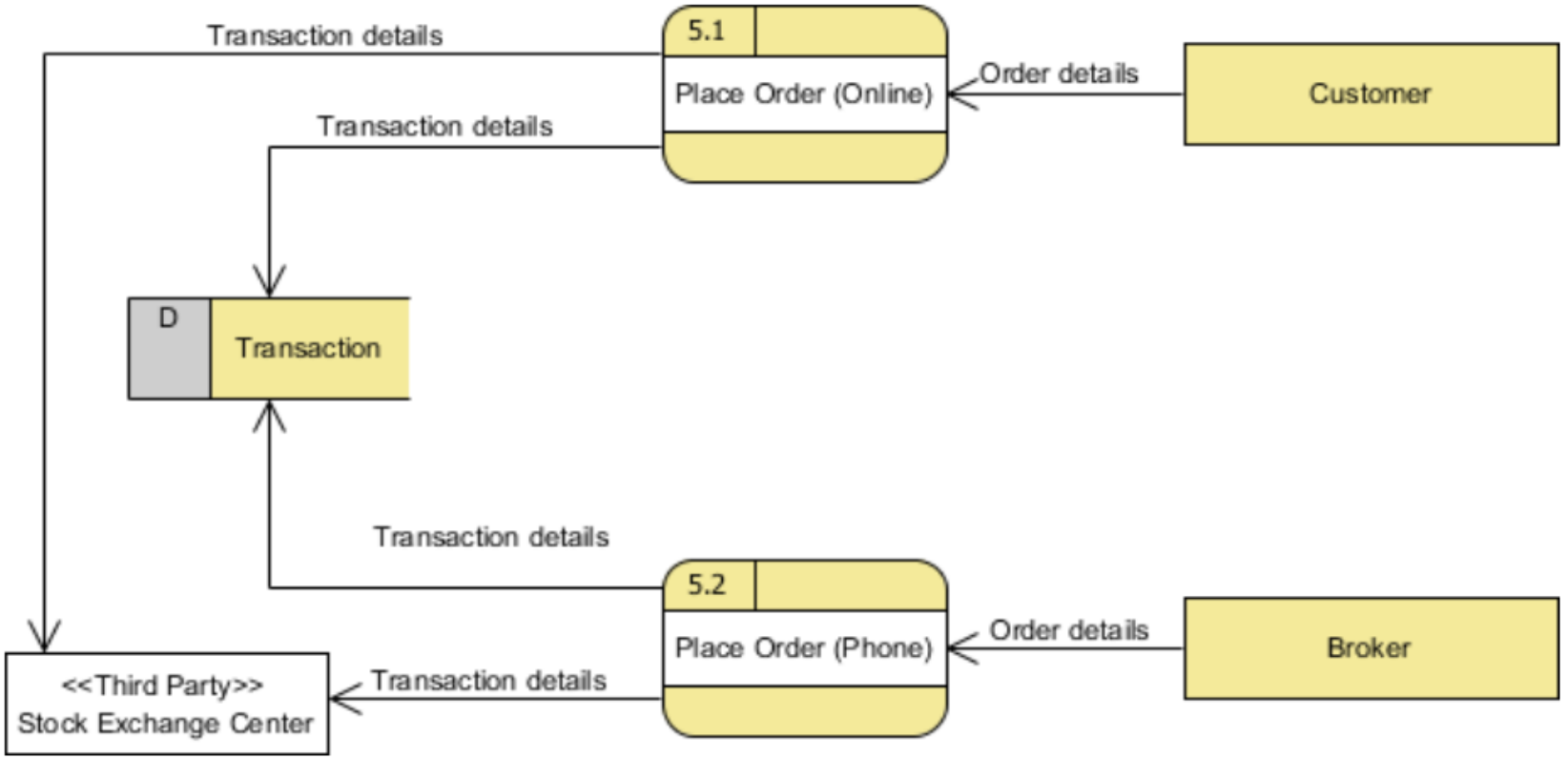
DFD Context diagram Example 2



DFD Level 0 Example 2

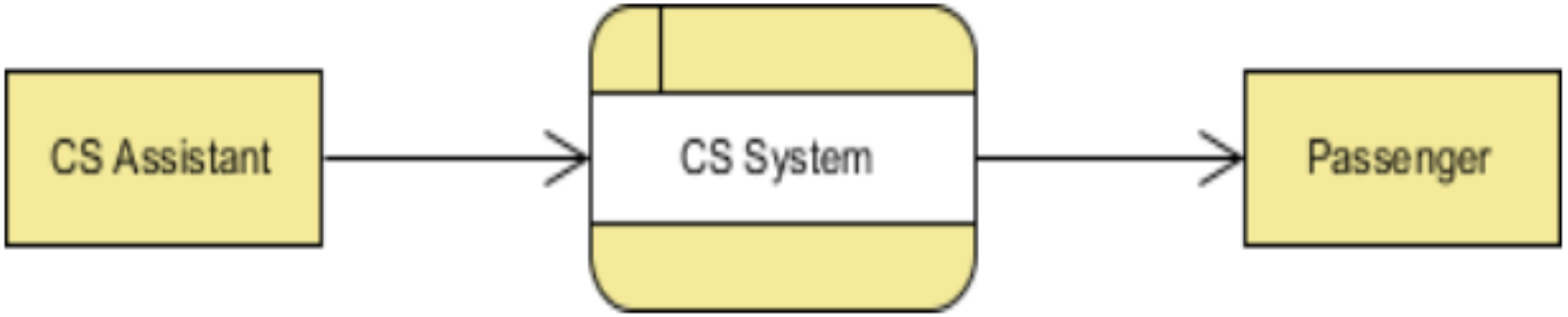


DFD Level 1 Example 2

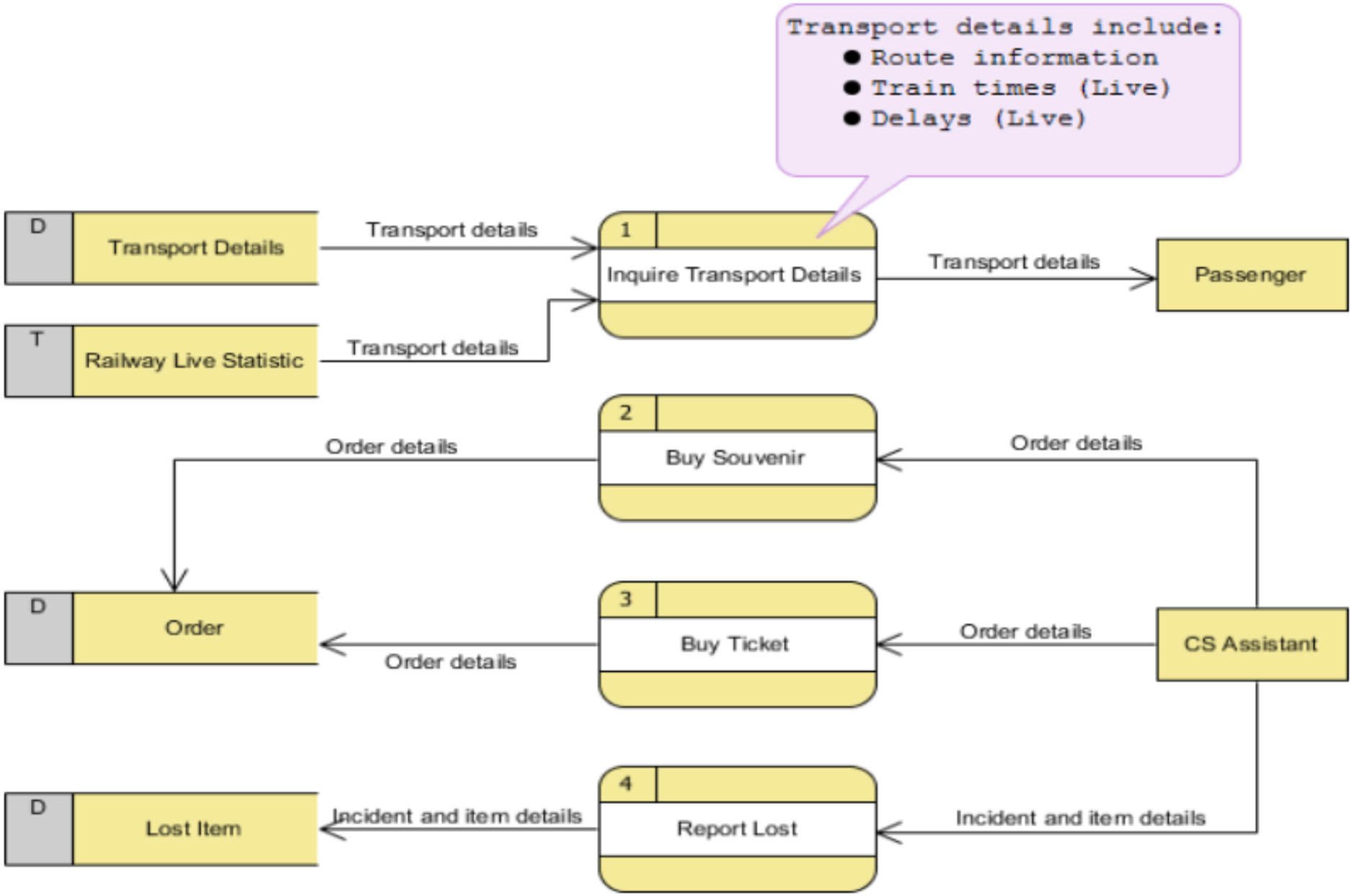


Self-Study

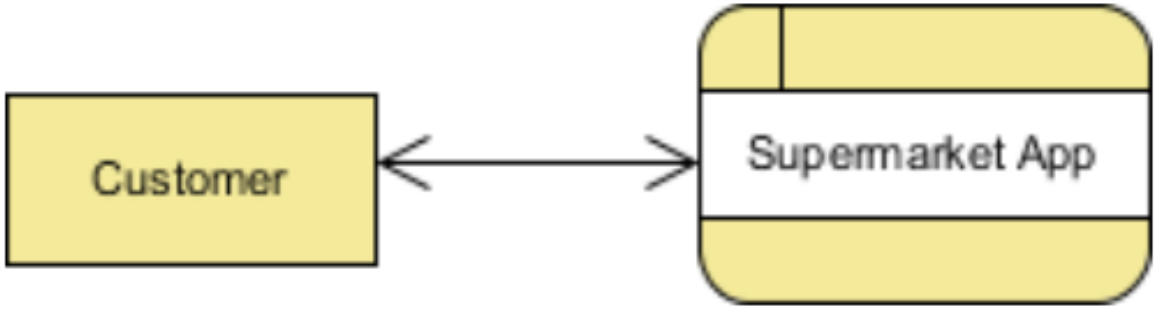
DFD Context diagram Example 3



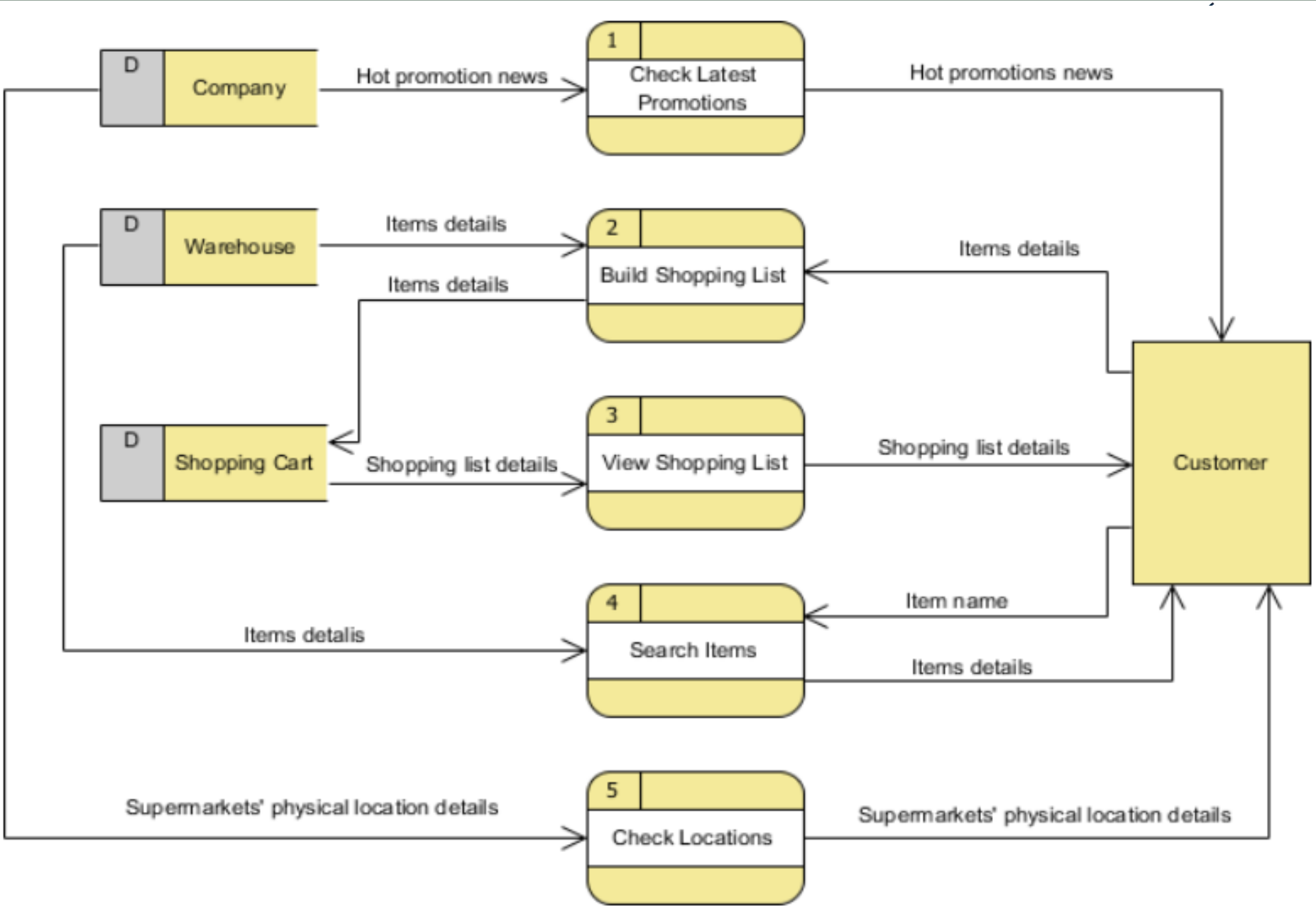
DFD Level 0 Example 3



DFD Context diagram Example 4



DFD Level 0 Example 4



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Thank You