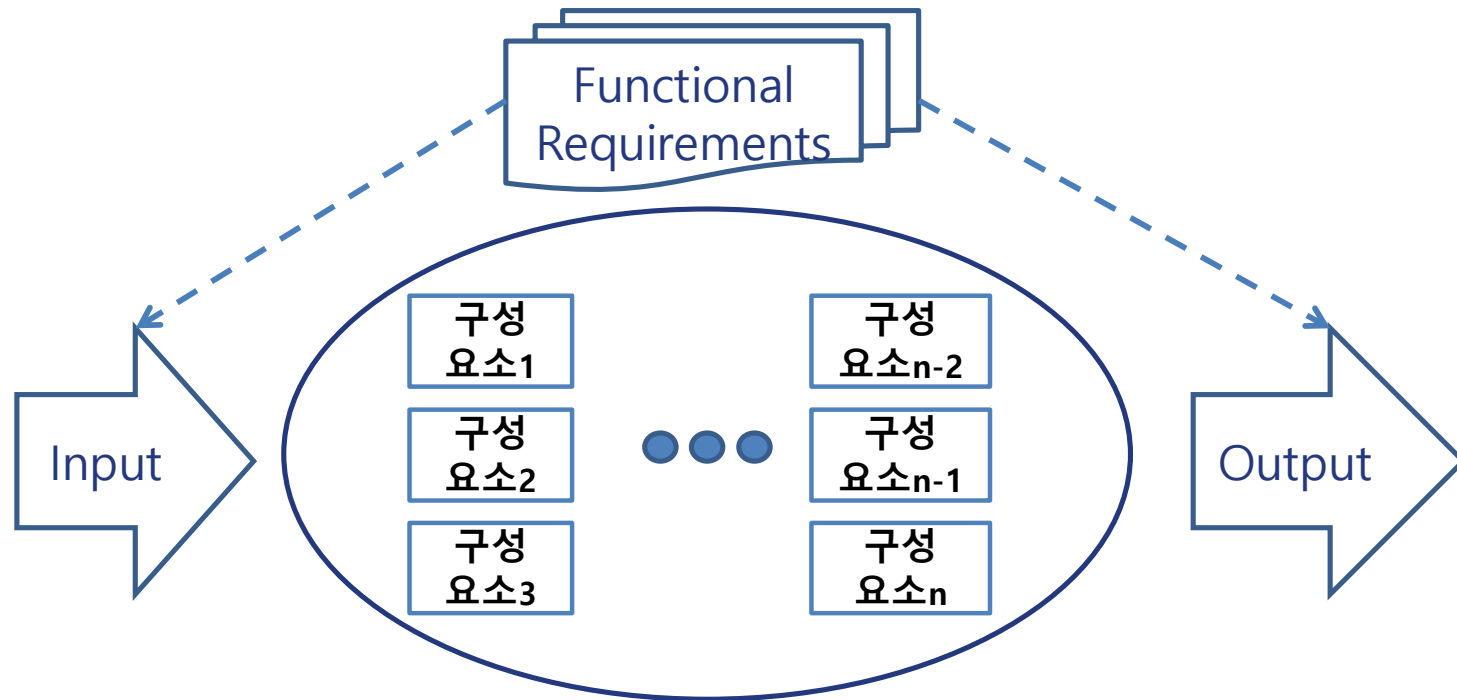# Analysis - Introduction

Goal of Analysis

❖ Analysis aims at defining system elements that can fulfill the specified functional requirements

Functional Requirements
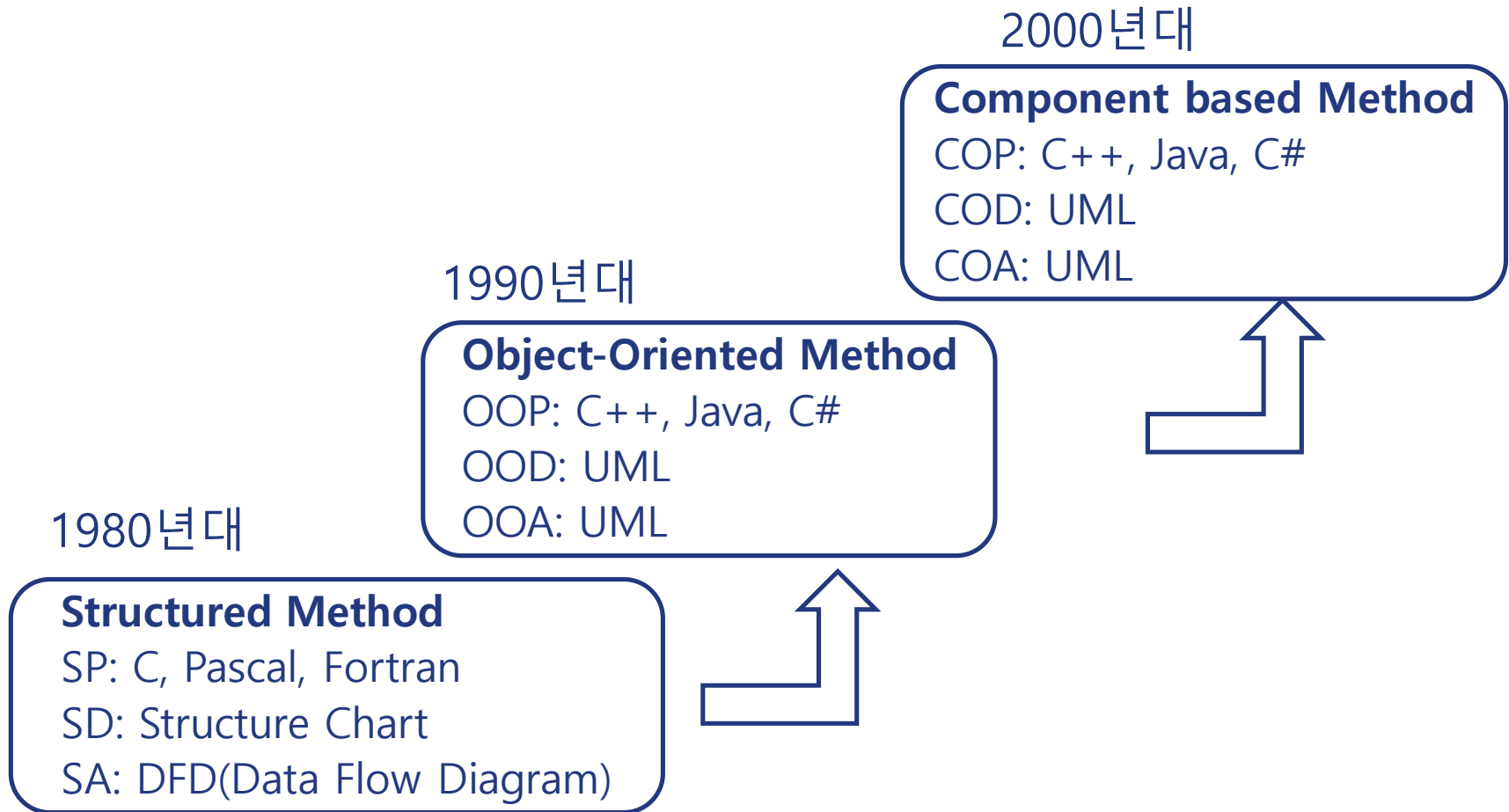
Input

구성 요소1	구성 요소n-2
구성 요소2	구성 요소n-1
구성 요소3	구성 요소n

Output

System Element

❖ 시스템을 구성하는 요소는 적용되는 개발 방법론에 따라서 달라질 수 있다.

개발 방법론	시스템 구성 요소
구조적 방법론	모듈(함수, 프로시져)
객체지향 방법론	클래스
컴포넌트 기반 방법론	컴포넌트

Software Development Method: History

2000년대

Component based Method
COP: C++, Java, C#
COD: UML
COA: UML

1990년대

Object-Oriented Method
OOP: C++, Java, C#
OOD: UML
OOA: UML

1980년대

Structured Method
SP: C, Pascal, Fortran
SD: Structure Chart
SA: DFD(Data Flow Diagram)

응용 소프트웨어와 플랫폼 소프트웨어

	노드	
응용 소프트웨어 계층	응용 컴포넌트	특정 시스템 기능 제공
플랫폼 소프트웨어 계층	미들웨어	분산 통신, 데이터베이스 연동, 보안, 성능 등
	운영체제	프로세스 관리, 메모리 관리, 파일 관리, 네트웍 등
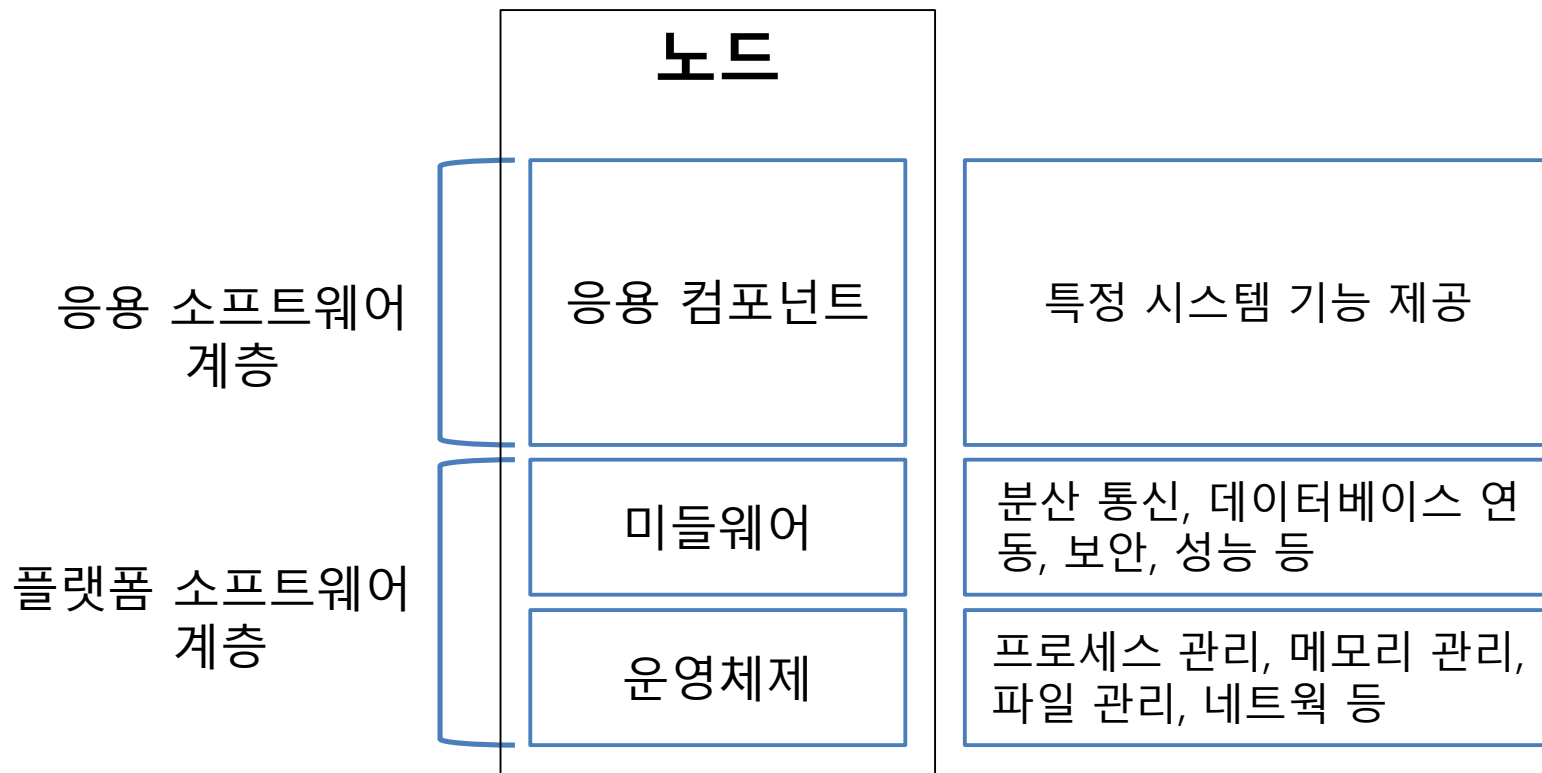
분석 vs. 설계

❖ 분석 단계는 응용 소프트웨어 계층만을 대상으로 한다.

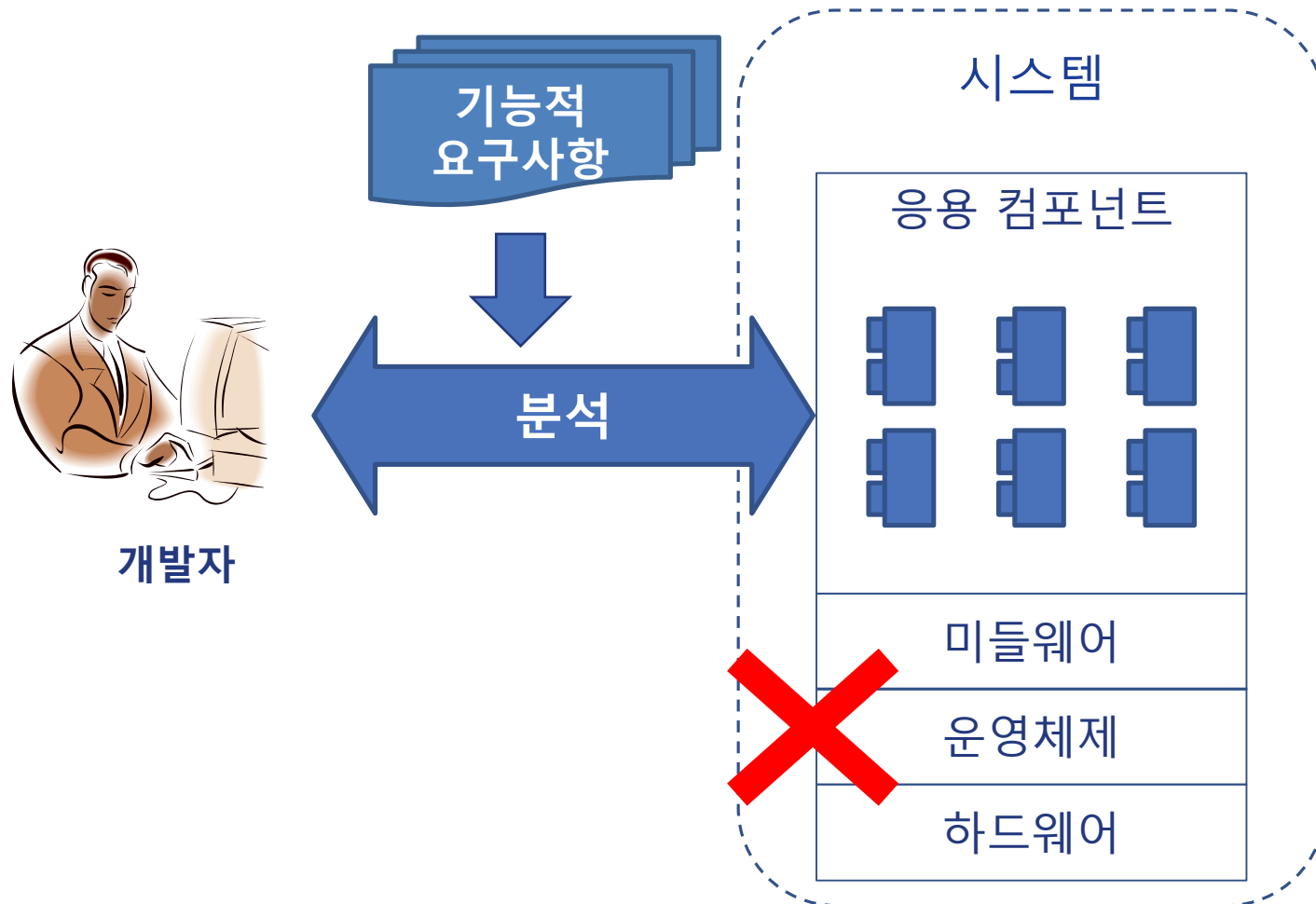|	분석	설계
응용 소프트웨어 계층	**구성 요소**	응용 소프트웨어
플랫폼 소프트웨어 계층		미들웨어
		운영체제
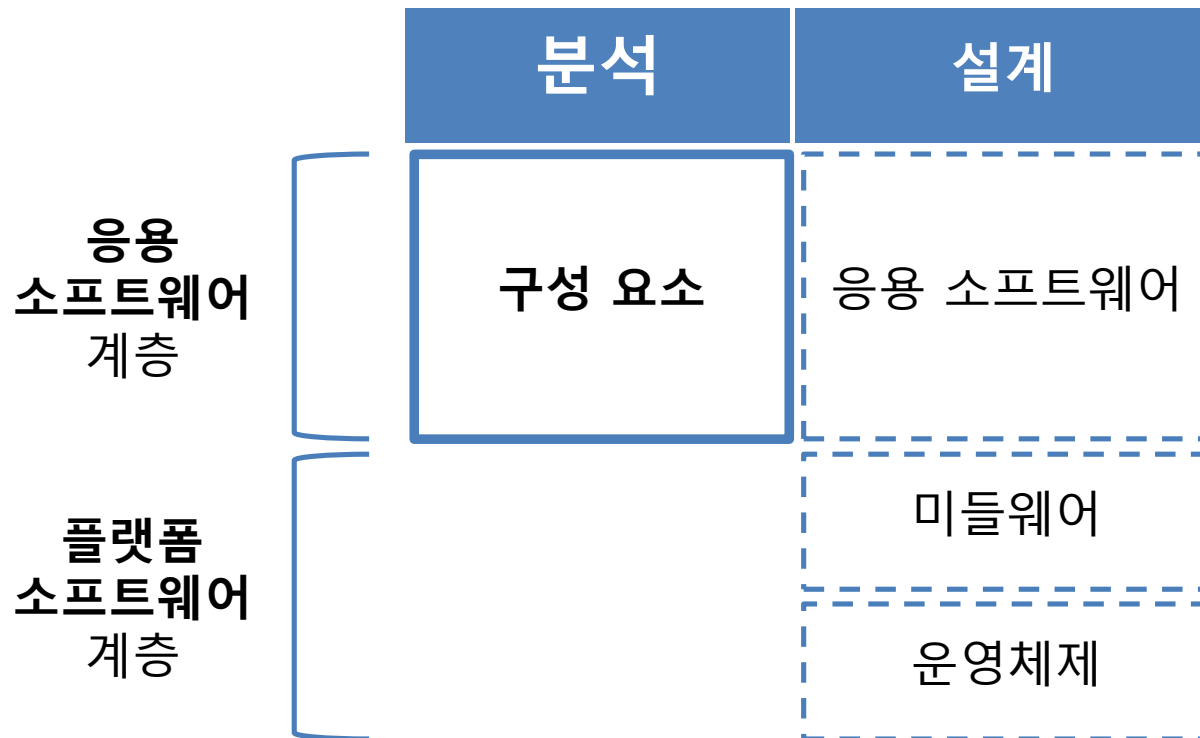
분석 vs. 설계

❖ 분석은 기능적 요구사항만을 고려하여 수행된다
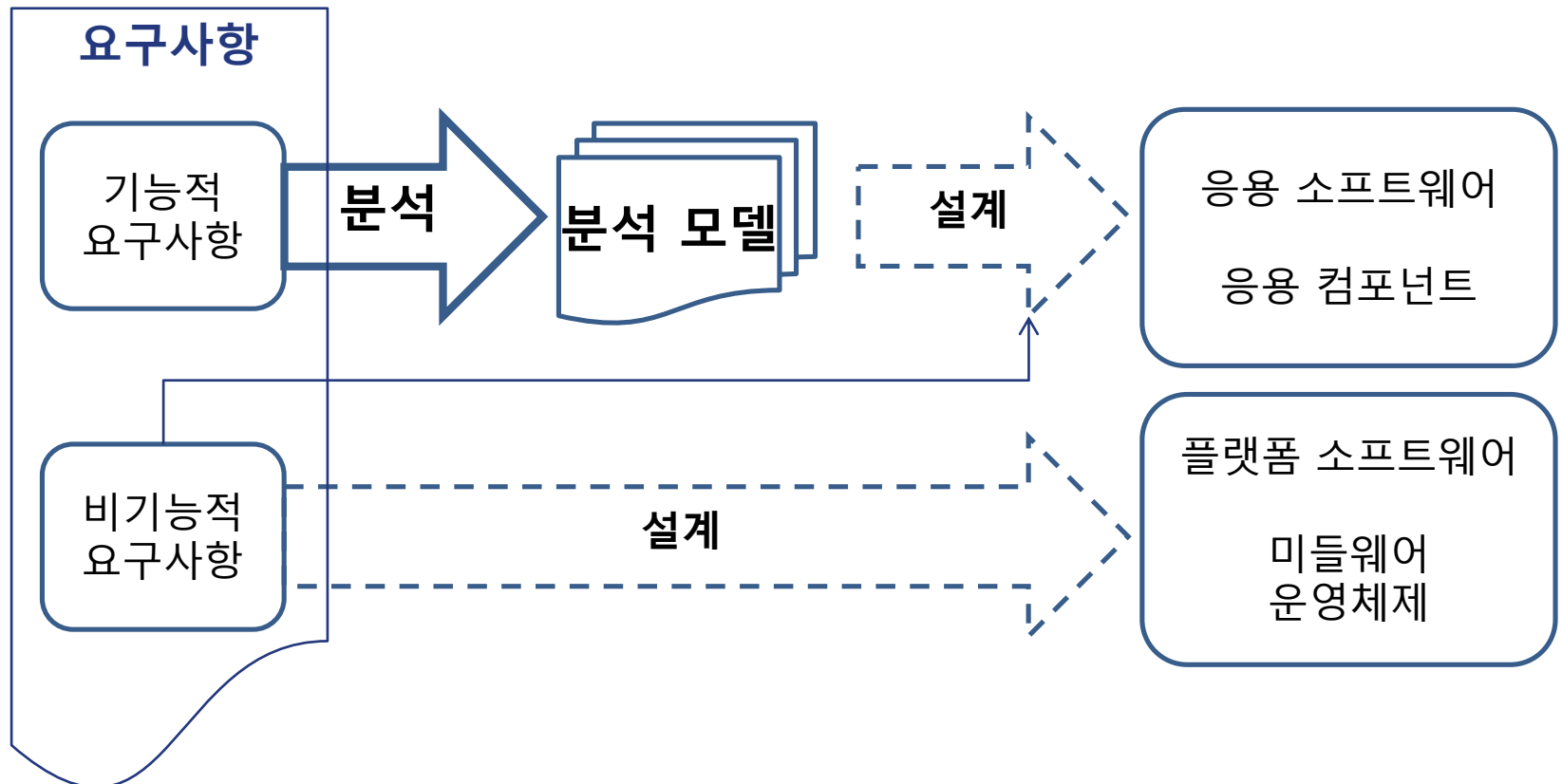
분석 단계의 특징: 요약

구조적 분석
(STRUCTURED ANALYSIS)

Typical Operation of Software System

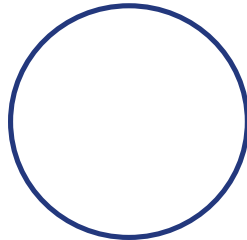Every computer-based system provides an information transformation that …

Structured Analysis Modeling
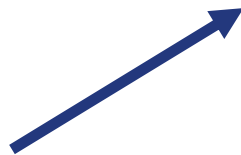
❖ Data Flow Diagram (DFD)

External Entity
(Terminator)

Process
(Bubble)

Data Flow

Data Store

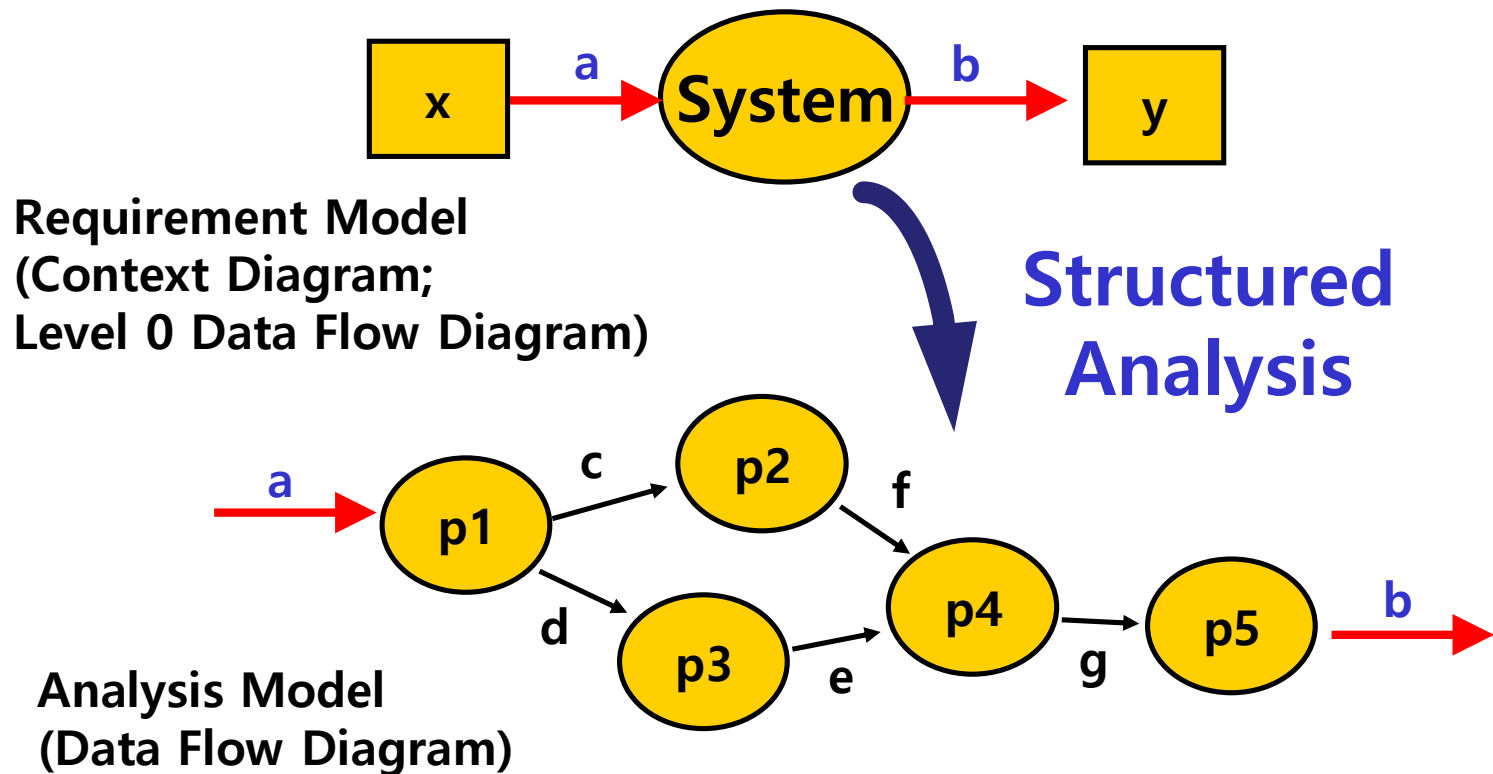# Structured Analysis
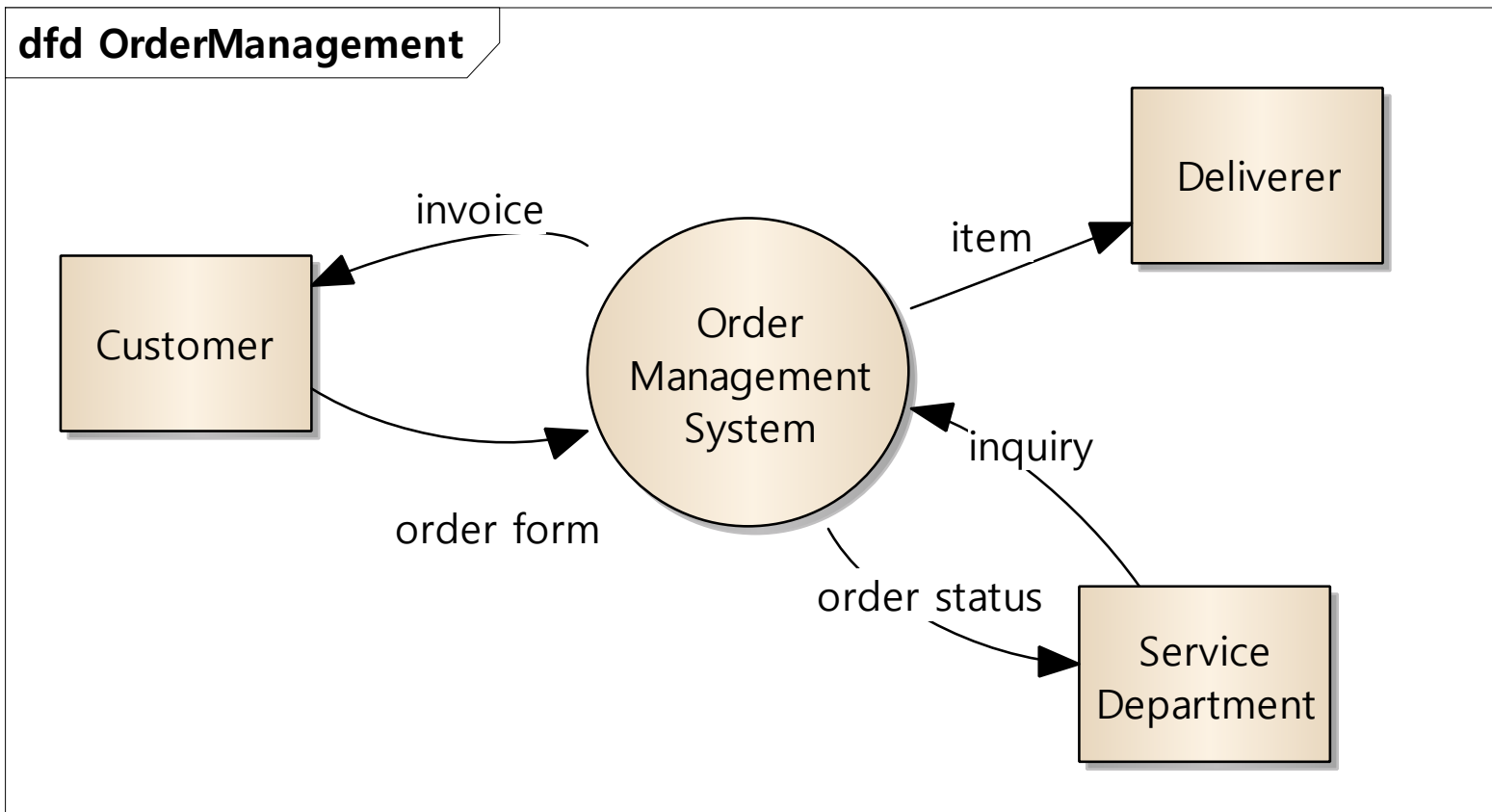
❖ Refine and decompose the system by identifying its basic functions.

Requirement Model
(Context Diagram;
Level 0 Data Flow Diagram)

Structured Analysis

Analysis Model
(Data Flow Diagram)

Context Diagram, Level 0 DFD

Data Dictionary

❖ Data dictionary contains the definitions of all data

❖ Elementary data: Defined in terms of the meaning of each of the values

❖ Composite data: Defined in terms of its components
- By sequencing data types
- e.g.) telephone number = area code + office code + number
- By repeating data types
- e.g.) passenger list = {passenger name}
- By selecting one from several types of data
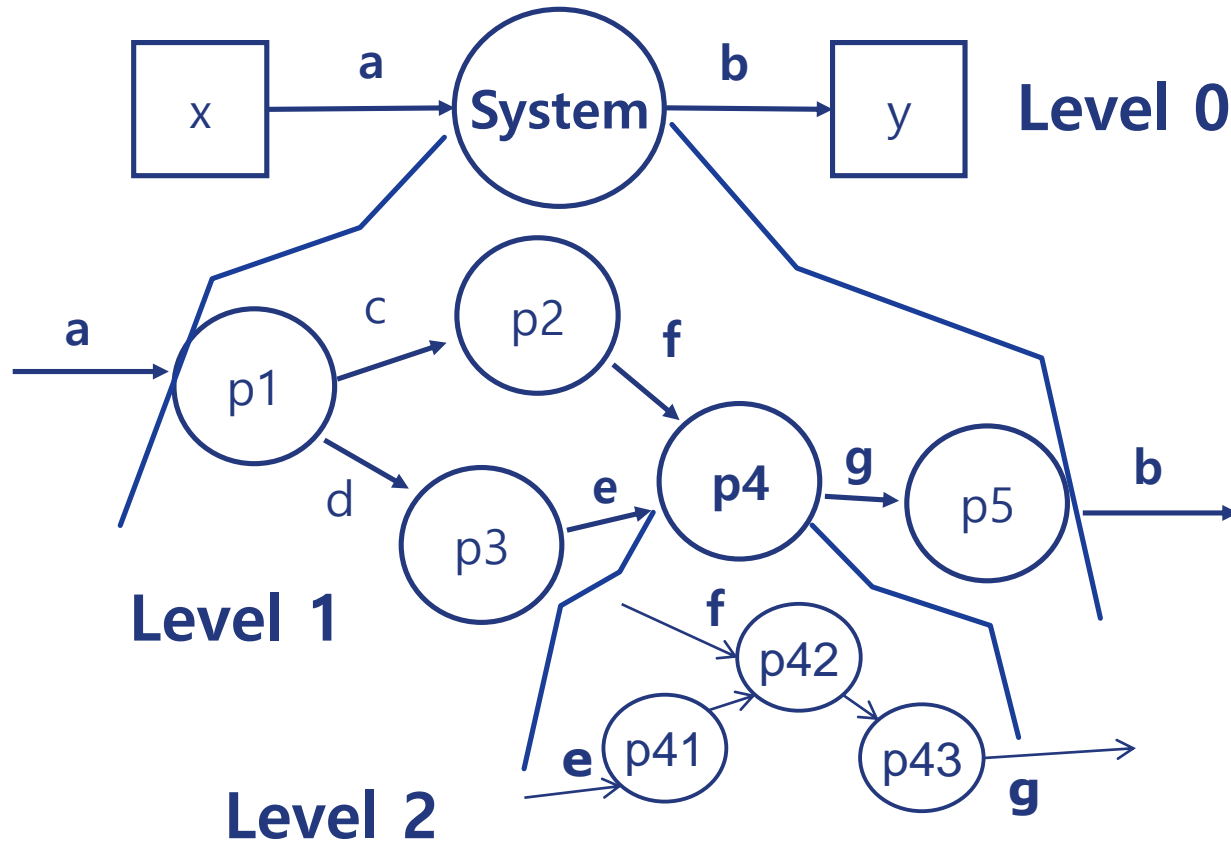- e.g.) customer order = [vacuum cleaner order | jet engine order]

Level 1 DFD

dfd Order Management System

- Customer → order form → Receive Order
- Process Order → invoice → Customer
- Process Order → item → Deliverer
- Receive Order → order → Orders
- Orders → order → Process Order
- Process Order → order status → Orders
- Orders → order → Review Order
- Review Order → order status → Orders
- Orders → order status → Respond to Inquiry
- Respond to Inquiry → order ID → Orders
- Service Department → order ID → Respond to Inquiry
- Respond to Inquiry → order status → Service Department

Refinement

❖ Each bubble is refined until it does just one function

Level 2 DFD

Customer — invoice — Process Order — item — Deliverer

order form

order

order status

Receive Order — order — Orders

dfd Process Order

Customer — Invoice — Produce Invoice

discount rate

Discount File

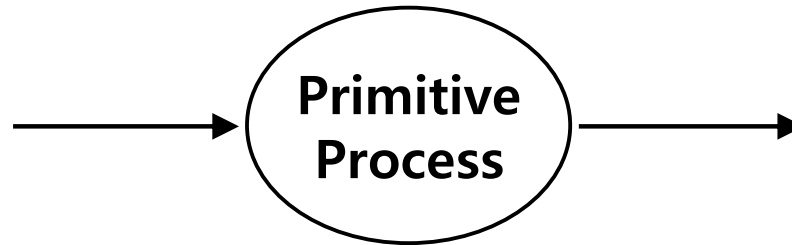Order Status — order — Orders

Ship Item — item — Deliverer

order — Order Status
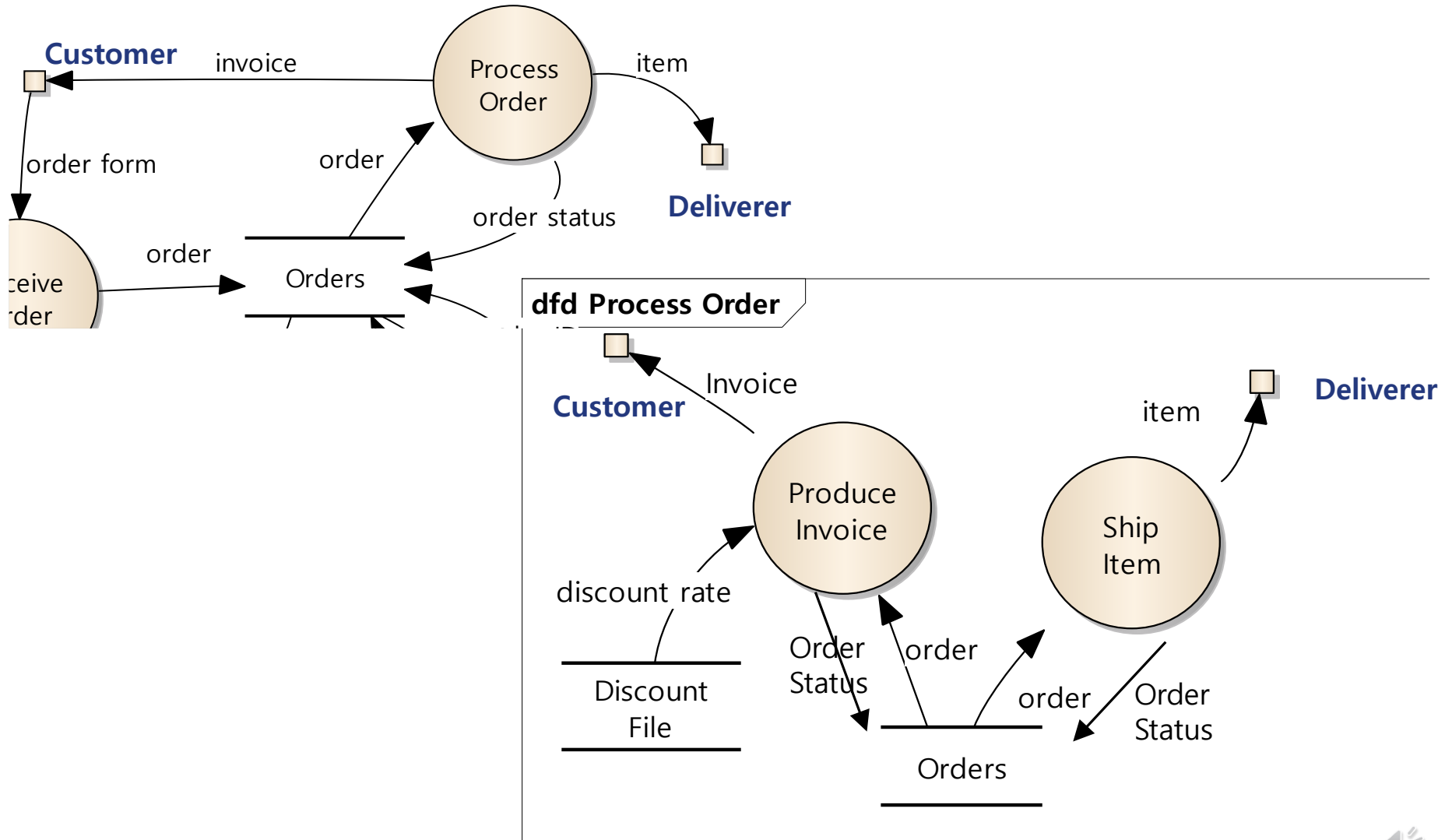
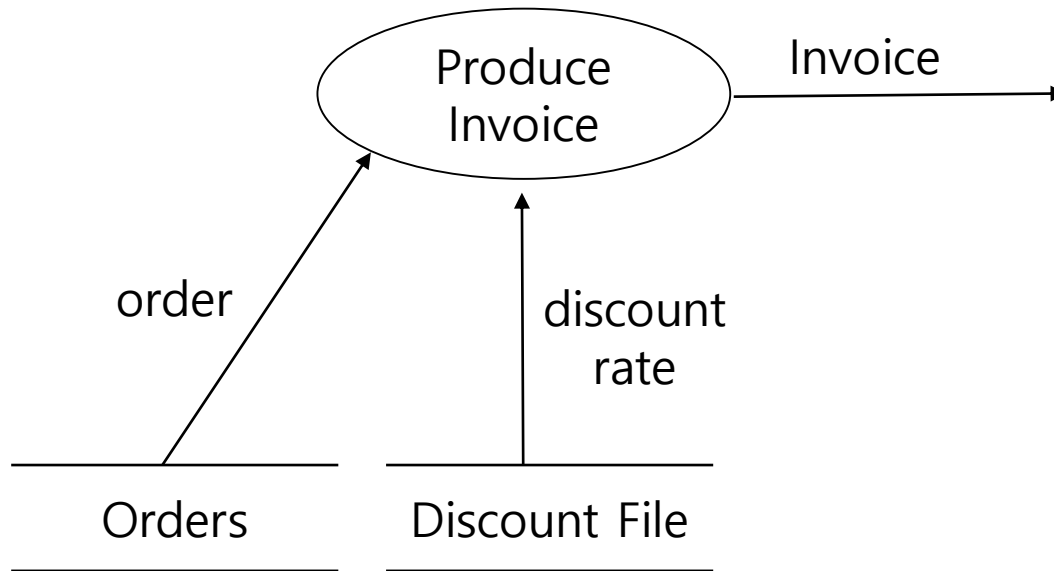# Process Specification (PSPEC)

- Describe each primitive process

PSPEC
- ❏ narrative
- ❏ program design language (PDL)
- ❏ equations
- ❏ tables
- ❏ diagrams and/or charts

PSPEC – Example Process

Process Specification - Example

Produce Invoice

Input: Order

Output: Invoice

Specification:

  If the customer category is "SPECIAL"

    Get the discount rate from the discount file using a customer class

  Else //ordinary customer

    Set discount rate to 0%

  End if

  For each sales item on the Order

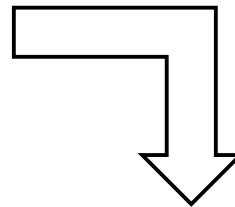   unit subtotal = unit price $\times$ quantity $\times$ (100 – discount rate)%

    total = sum of item subtotals

  End For

Process Specification – Input and Output

Order			
Name			
Category		Class	
Items			

No	Stock Number	Quantity	Unit Price

Invoice				
Name				
Items				

No	Stock Number	Quantity	Unit Price	Sub Total
Total				

Q&A