# PEMODELAN SISTEM

Materi 3

Problem Formulation

## Definition of A Problem

- There must be an individual (or a group of individuals), referred as the decision maker who:
  - Is dissatisfied with the current state of affairs
  - Knows when goals have been achieved
  - Has control over aspects of problem situation that affect the extent to which goals can be achieved



## Four Elements of A Problem

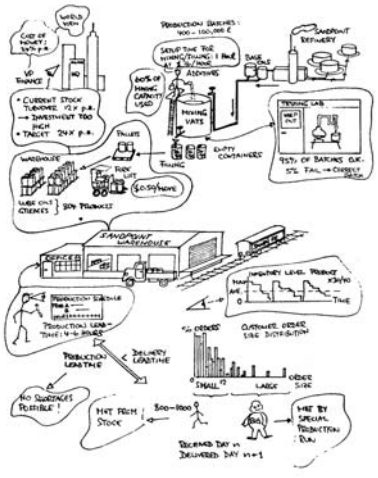
- The decision maker
- The decision maker's objective
- The performance measure for assessing how well the objectives have been achieved
- Alternative courses of action or decision variables for achieving the objectives



## Problem Elements:[LOD]

- **The decision maker**: the LOD manager
- **The objective**: keeping the cost of the LOD's operation as low as possible, subject to maintaining the same level of customer service.
- **The performance measure**: the total operating cost of the LOD
- **Alternative courses of action**: the size of stock replenishment batches and cutoff point for classifying customer orders as big or small.

Figure 5-2: A Rich Picture for the LOD





# System Relevant [LOD]

- The widest system: the company as a whole
- The refinery: one of its subsystem
- The LOD: a subsystem of the refinery system
- Within LOD system:
  - the production/inventory control operation form one of its major subsystem (i.e. the narrow system of interest)



# Components of the Stock Replenishment System

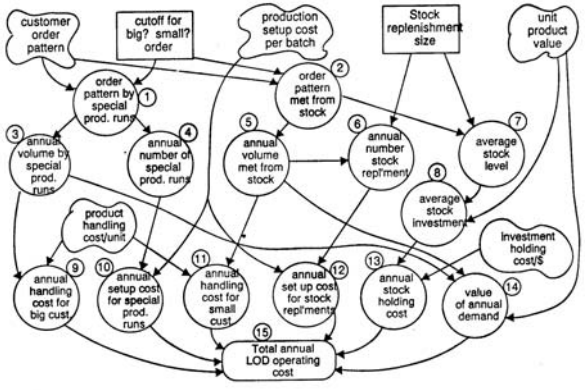
- See Table 5-1, page 110



# Influence Diagram [LOD]

- Influence diagram shows:
  - How the control inputs and other inputs affect the system variables for various system components, and
  - How these in turn affect the system outputs, in particular the performance outputs.
- Note: the easiest approach to draw an influence diagram is to go from control and other inputs via state variables to system outputs in a logical top-down sequence.

Figure 5-3: Influence diagram for LOD stock replenishment system








# Components of a Model

- Performance measure
- Uncontrollable Inputs
- Parameters
- Controllable Inputs:
  - The collection of all possible courses of action you might take
- Interaction among These Components
  - These are logical, and mathematical function representing the cause-and -effect relationships among inputs, parameters, and the outcome.
  - There are also set of constraints which apply to each of these
- Actions