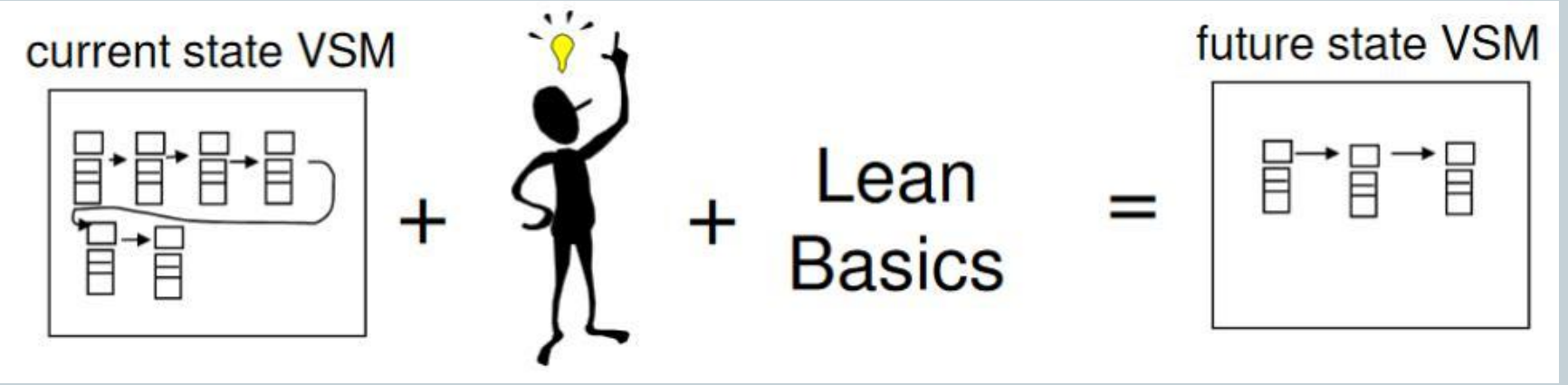
Value Stream Mapping

AN EFFECTIVE WAY OF CAPTURING THE CURRENT SITUATION, IDENTIFYING THE LONG-TERM LEAN VISION, AND DEVELOPING A PLAN TO GET THERE.

The journey toward lean manufacturing

- For a journey, you must know:
  - Destination
  - Starting point
- For the journey toward lean manufacturing
  - The destination (future state mapping)
  - The starting point (current state mapping)



Value Stream Mapping

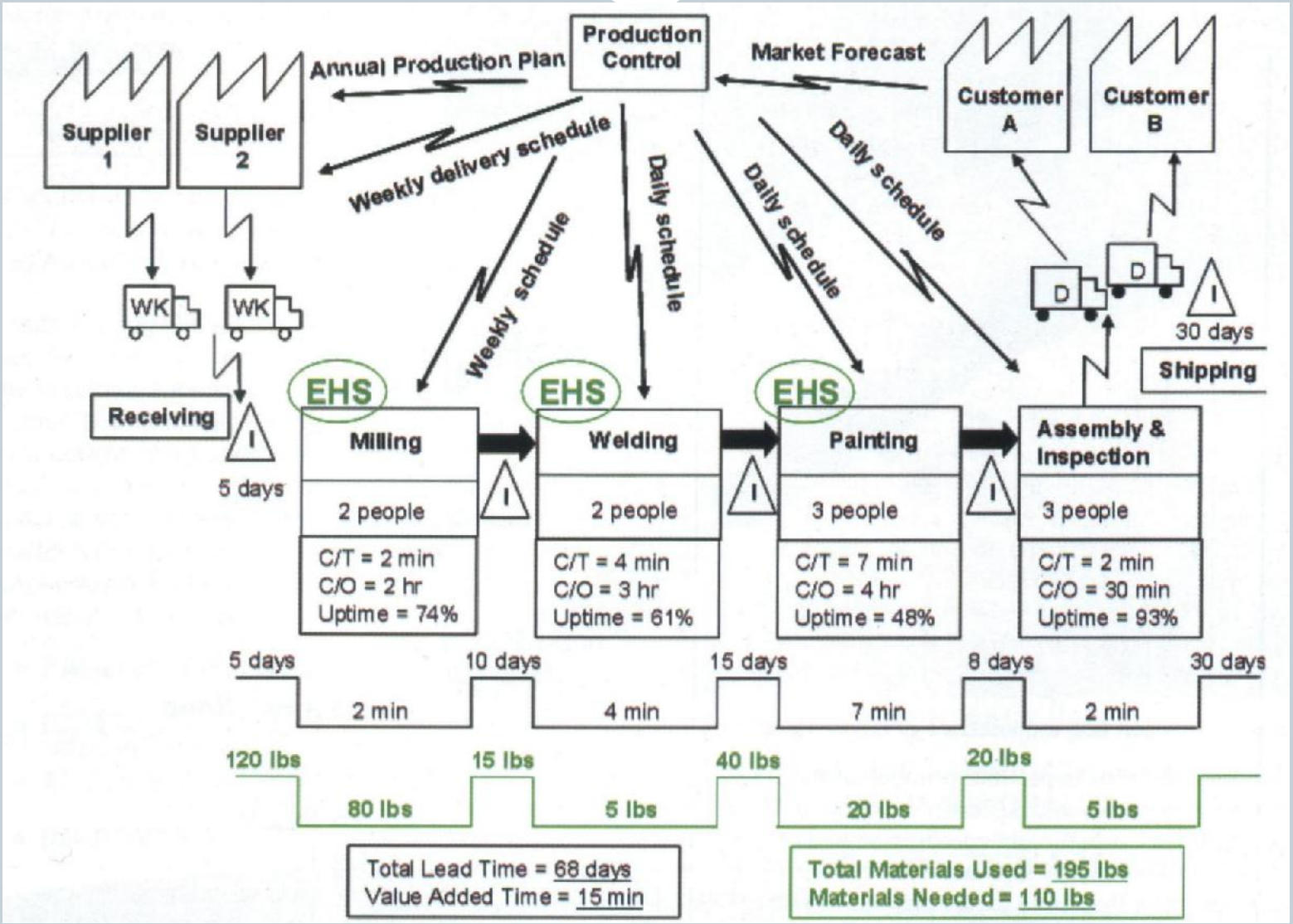
- Examines and records all activities
  - From raw material to a finished product
  - Include both value added and non-value added activity
- Captures the current situation (current state)
- Identifies the long-term lean vision (future state)
- Develops a plan to get there

Find the “true north”

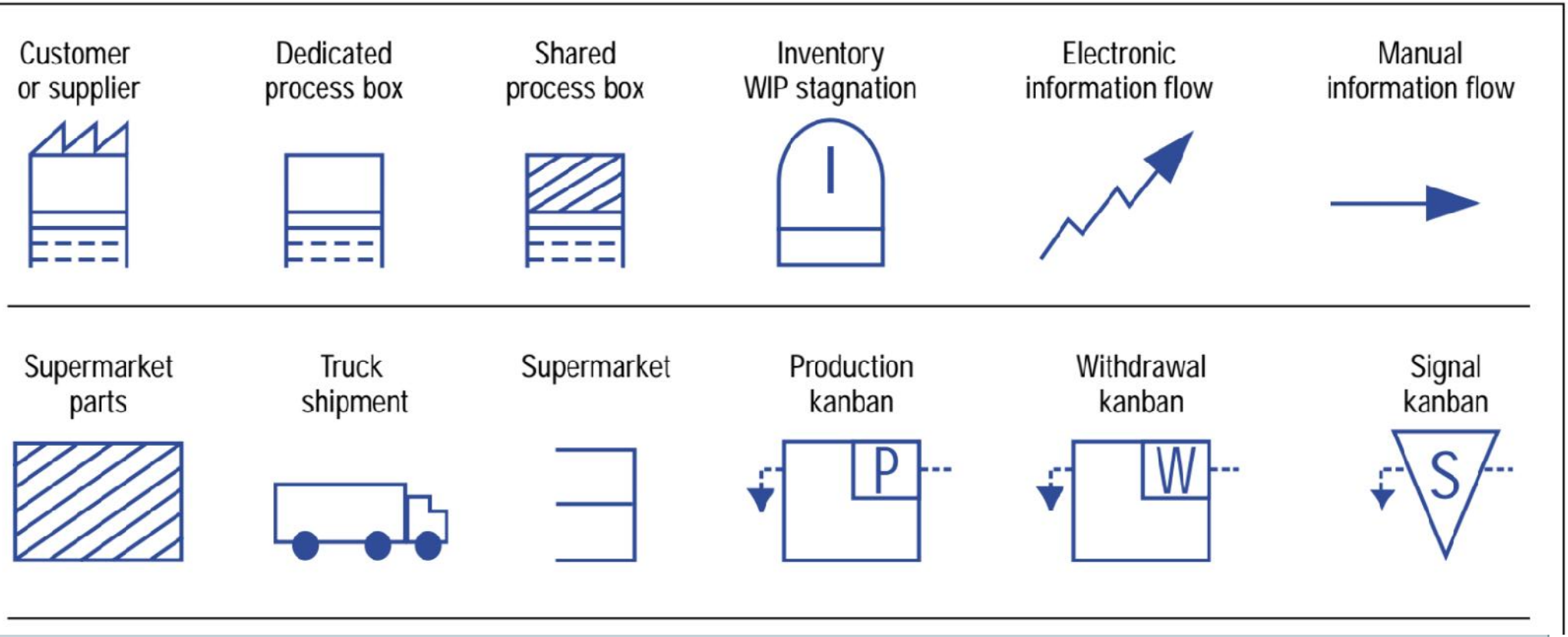
Why Value Stream Mapping

- Learns to “see”
  - *“The problem is not elimination of waste, but identification of waste. Any reasonable person will eliminate waste if he can only see it in the first place.”* --- Shigeo Shingo
  - Many companies don’t see “hear no evil, speak no evil, see no evil.”
- Links together people, lean tools, metrics, and reporting requirements to achieve a lean enterprise.
- Allows everyone to understand and continuously improve his or her understanding of lean concepts.
- Generates an actual lean design and implementation plan.
- Requires a lean coordinator to make the process go smoothly.

An example of current state mapping



Icons to Be Used



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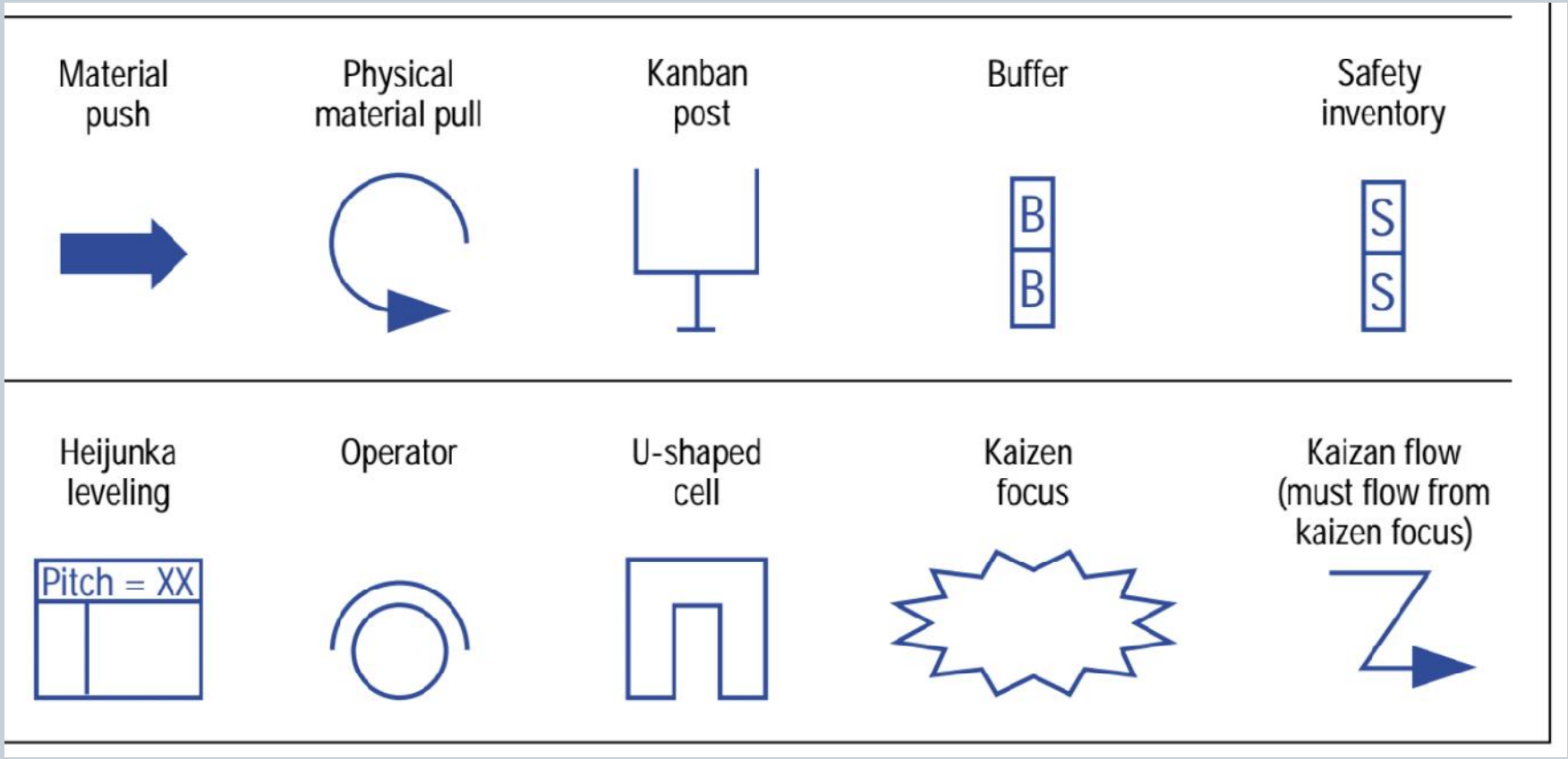

Current state mapping (CSM)

- A graphic depiction of what is currently happening on the floor
- Should be conducted by a cross-functional team of people
- Data must be gathered from existing conditions on the floor

To gather the information, the cross functional mapping team must walk the floor, door-to-door, following the product as it is manufactured. CSM is a pencil-and-paper process intended to get employees involved, as well as gain a better, more intimate understanding of the product, process, and information flow. The mapping team must resist the urge to use a computer for this process.

Current state mapping (CSM)

CSM maps include three flows:

- Product flow: the path the product takes during production, before being shipped to the customer.
- Information flow: how information is shared and communicated during the production process.
- Material flow: how incoming material is moved and replenished, and in what quantities during production.

Current state mapping (CSM)

Examples of attributes to be gathered from the shop floor

- Manpower – the number of operators in the process
- Work hours and schedules – the number of hours available per day, the number of shifts per day, and the number of shifts per week
- Changeover times – the amount of time it takes to change from product to product, from the last good part to the first good part
- Machine cycle times – the actual cycle time of each machine
- Inventory levels – the amount and location of all parts, including raw materials and finished goods
- Scrap rates – the percentage of parts produced that are not salvageable

Analyze the Current State

- Demand
  - What is the demand? In other words, what is the takt time?
  - Do you need buffer stock? Where? How much?
  - Do you need safety stock? Where? How much?
  - Will you ship finished goods right after the final operation or use a finished-goods supermarket?
  - What improvement tools will you use to improve your ability to fulfill customer demand?

Analyze the Current State

- Flow
  - Where can you apply continuous flow?
  - What level of flow do you need?
    a. “Move on, make one” (one-piece flow)?
    b. Cell design? What type?
  - How will you control upstream production?
    a. In-process supermarket?
    b. Kanban?
  - What other improvement methods will help to achieve continuous flow?
    a. Quick changeovers?
    b. Autonomous maintenance?

Analyze the Current State

- Leveling
  - What types of kanban cards will you use?
  - How will kanban cards be distributed?
  - Will you use a heijunka box?

Creating The Future State Map

Simple goal of lean manufacturing

Produce the highest quality at the lowest total cost in the shortest lead-time, with flexibility to respond to changes

The challenge in developing the future state is to meet the customer's requirements (within specification) in the shortest lead-time and at the lowest cost.

Lead-time consists of non value-added time and value -added time. Preventing overproduction to reduce the lead time

- Takt time
- Kanban

HW4 – Current State Mapping

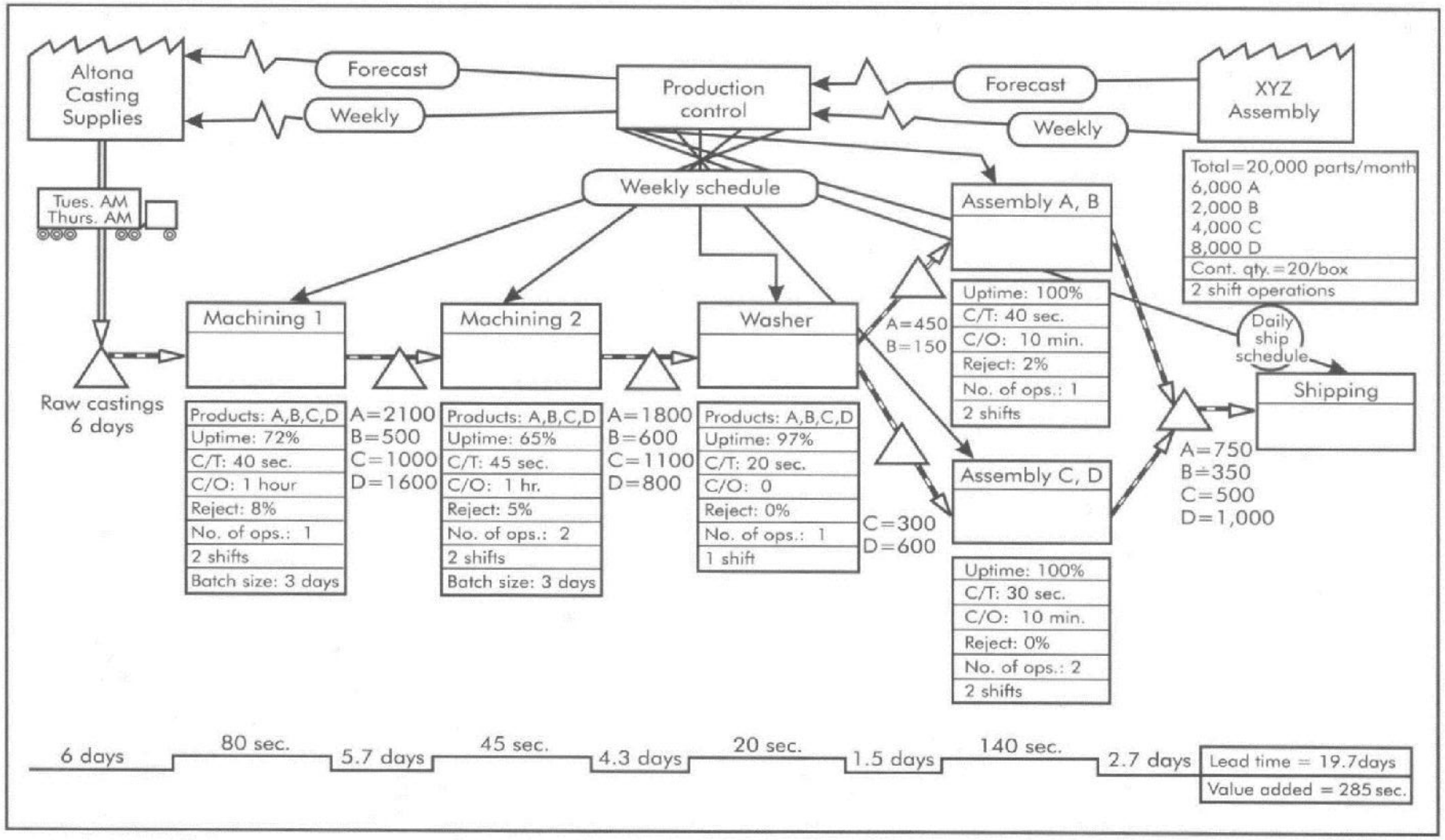

Figure 4-1. Current state map—case study example.