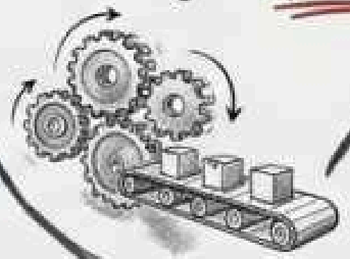
Operations & Management: Making Things Work

¶ 4.1

Three core questions drive this lecture.

Operations

Efficiently turning inputs to outputs with good quality.



Supply Chains!

Bringing goods to customers.



Value Creation!



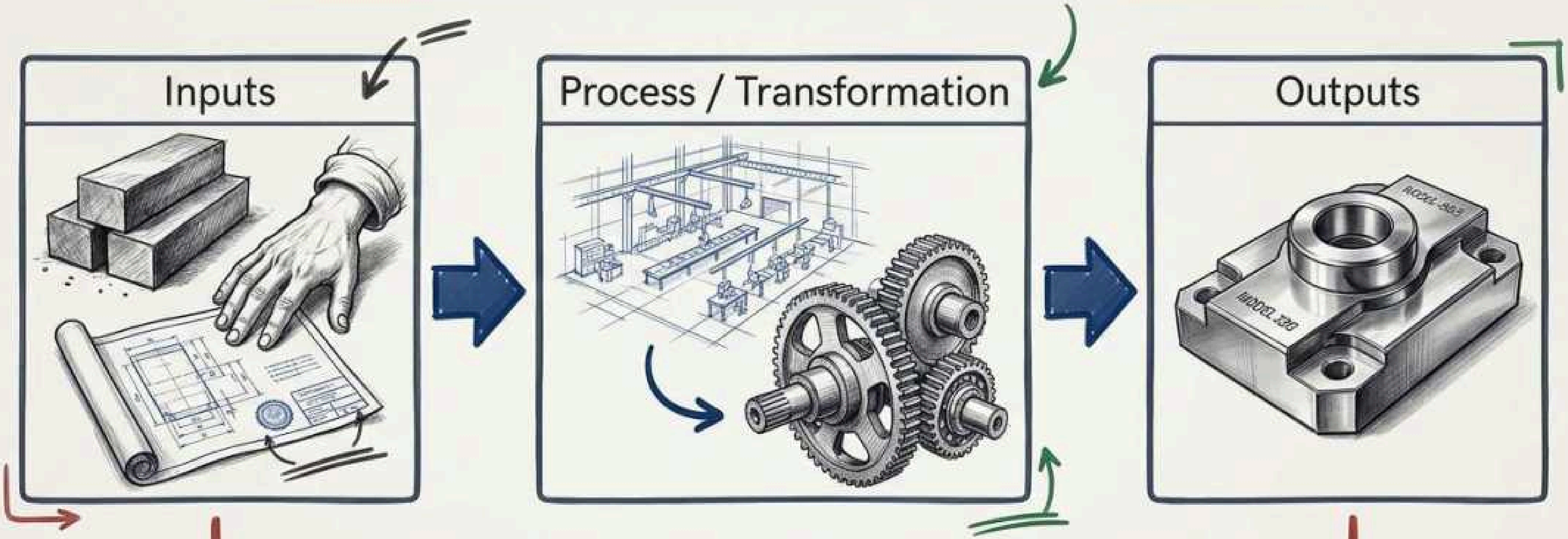
Management!

Planning, organizing, leading, and motivating the people doing the work.

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¶ 4.2

The Core Mechanism of Operations



Managerial Decisions

- Process Design
- Quantity
- Location
- Quality
- Cost Control

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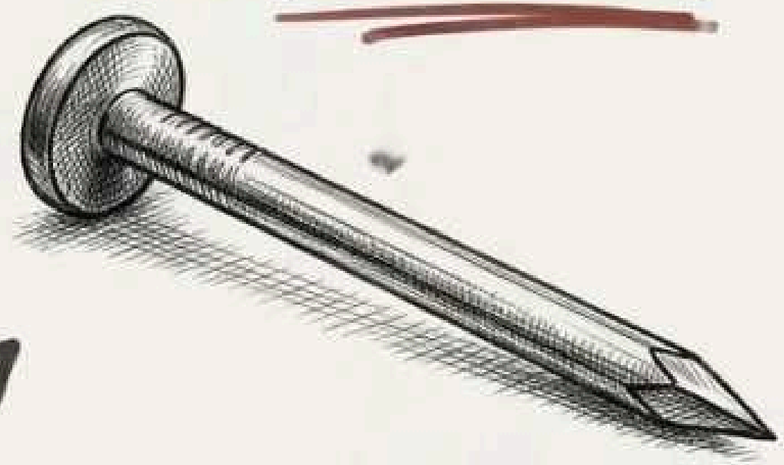
Measuring Productivity: The Historical Multipliers

¶ 4.3

$$P = \frac{\text{Output}}{\text{Input}}$$

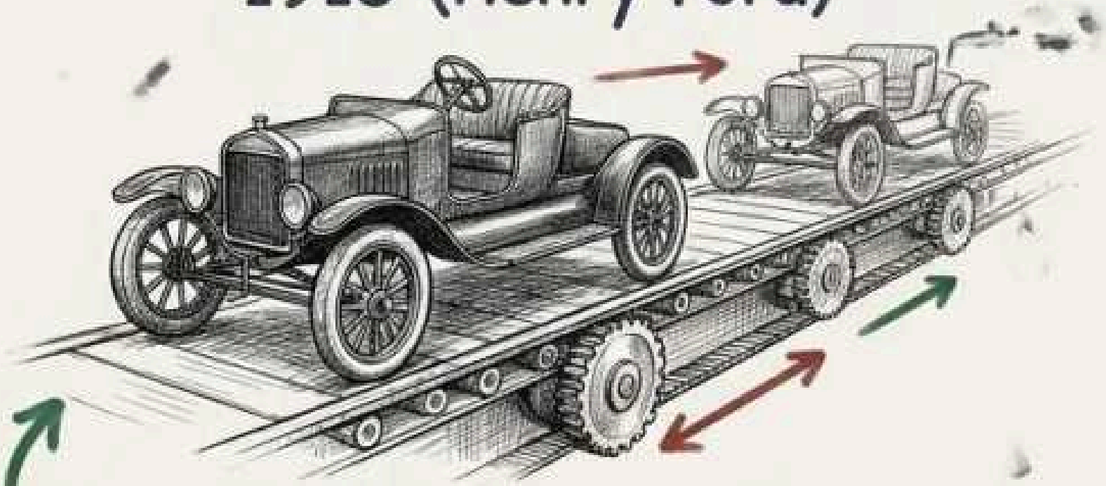
Central measure: Output produced per unit of input.

1776 (Adam Smith)



Division of labor among specialists multiplies output.

1913 (Henry Ford)

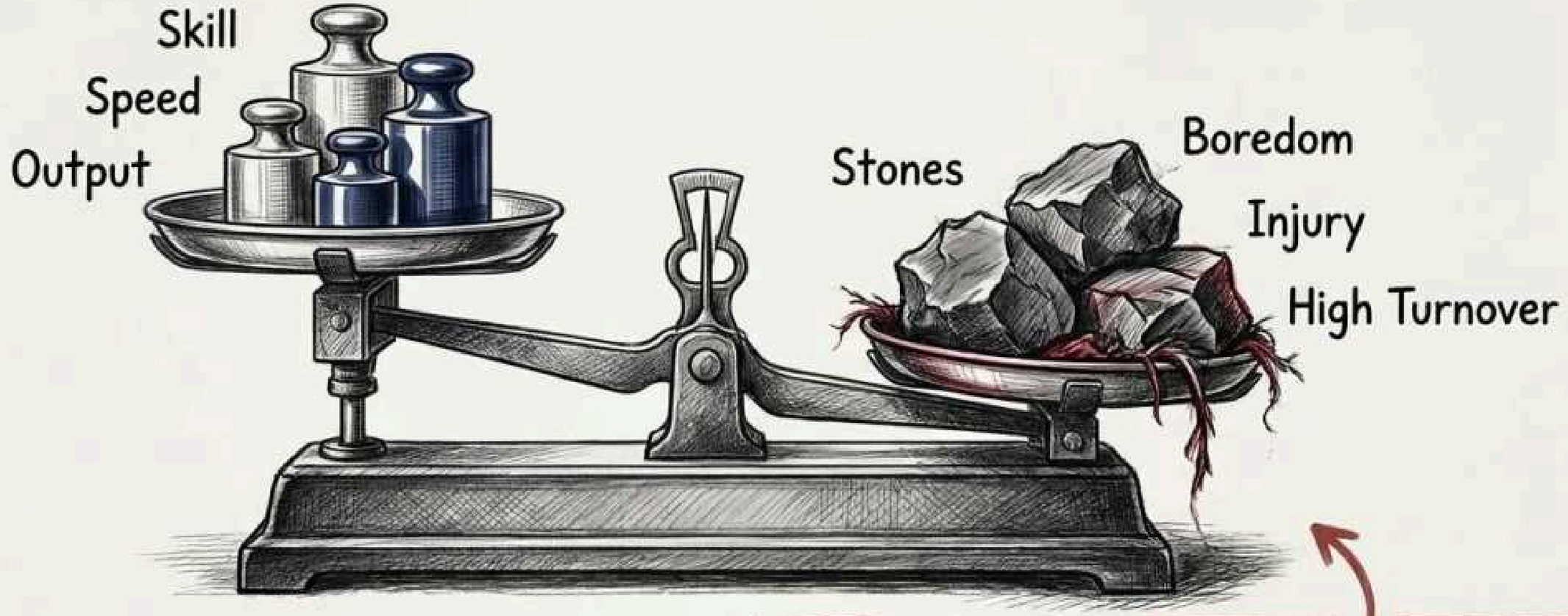


Moving assembly lines dramatically cut time, making goods affordable.

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¶ 4.4

The Human Price of Division of Labor



Repeating one small task raises speed but can break human morale.

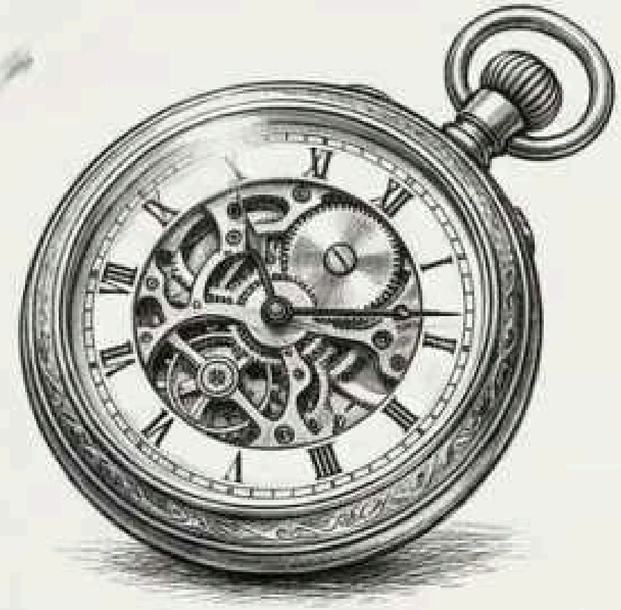
$5 / Day (1914) — Ford paid double the common wage purely because the line's monotony caused massive quit rates. Efficient design must account for the human beings doing the work.

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Two Eras of Early Management Theory

¶4.5

Taylor, c. 1911



Scientific Management

- Study tasks, find the best method, train, and pay accordingly.

↳ Critique: Treated people like machines.

Mayo/Hawthorne, 1920s-30s



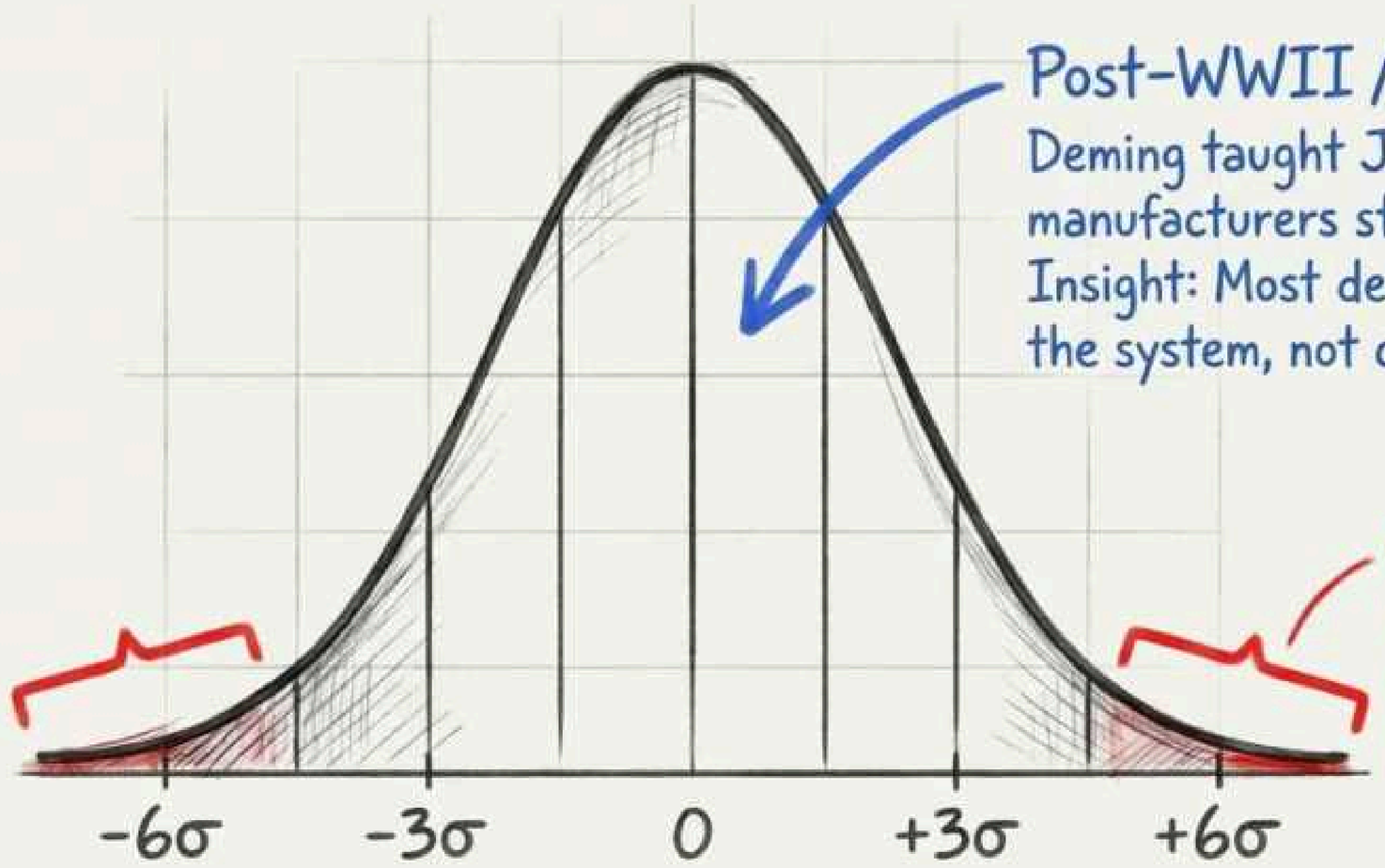
Human Relations Movement

- Drew attention to social factors, manager interest in workers, group norms, and morale.

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Quality as a Strategic Weapon

¶ 4.6



Post-WWII / Deming

Deming taught Japanese manufacturers statistical control. Insight: Most defects come from the system, not careless workers.

Motorola (1986)

Six Sigma: A method for cutting defects to very low rates.

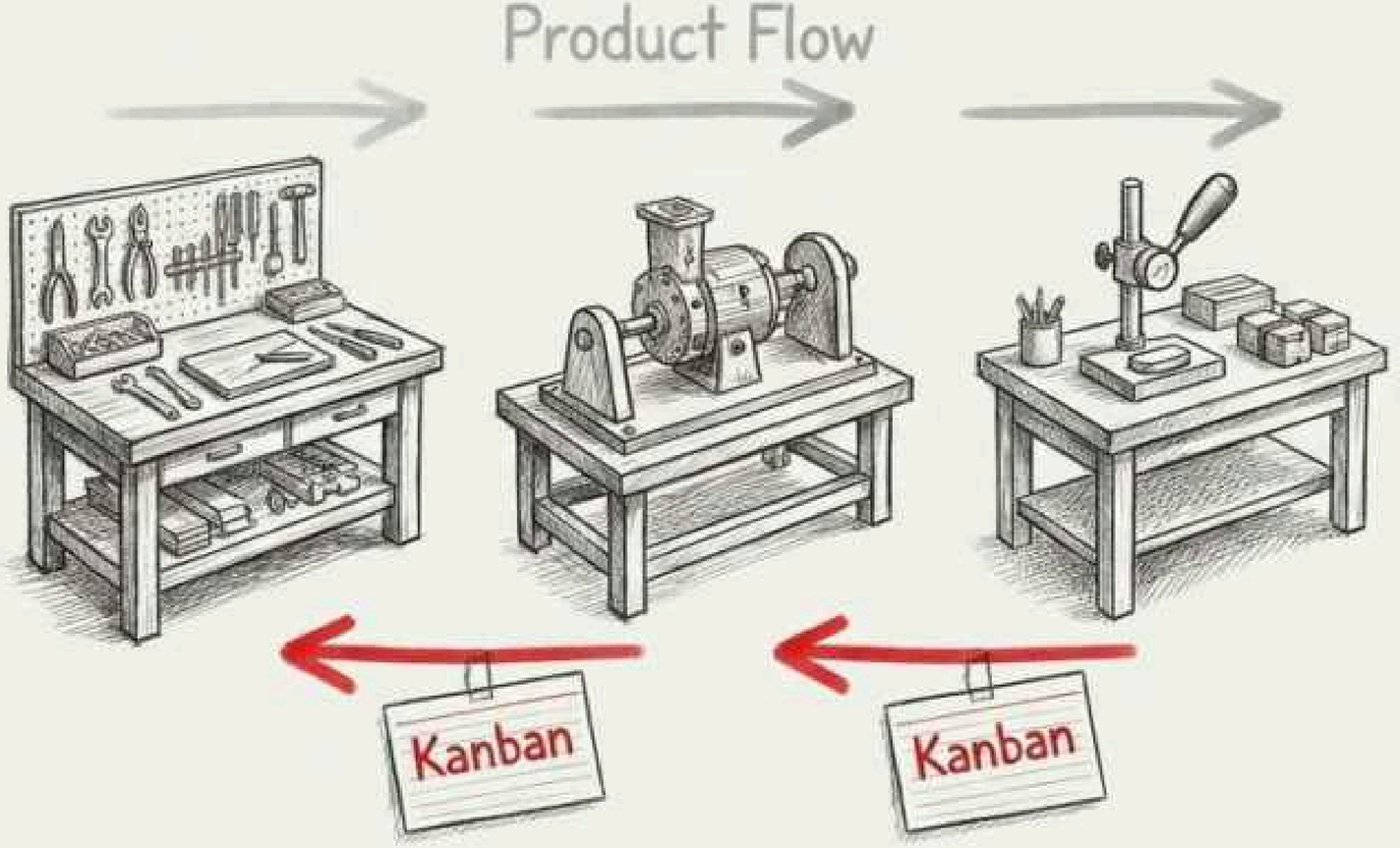
Total Quality Management (TQM): Quality is everyone's job.

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Lean Thinking & The Pull System

¶ 4.7

The Toyota Production System aims to remove waste (using resources without adding value).



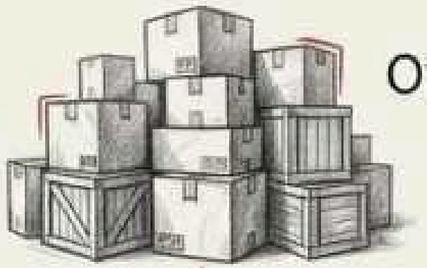
- Just-In-Time (JIT): Parts arrive only when needed.
- Kanban: Signal cards pull work backward through the process.

Lean has spread beyond cars to hospitals, software teams, and offices.

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Taiichi Ohno's Seven Forms of Waste

¶ 4.8



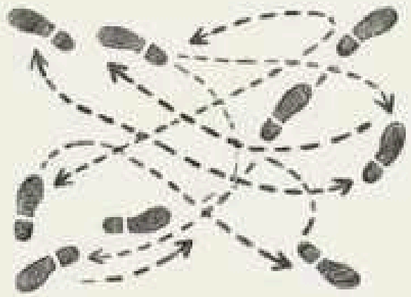
Overproduction



Defects



Waiting



Unnecessary Motion



The Manager's Walk

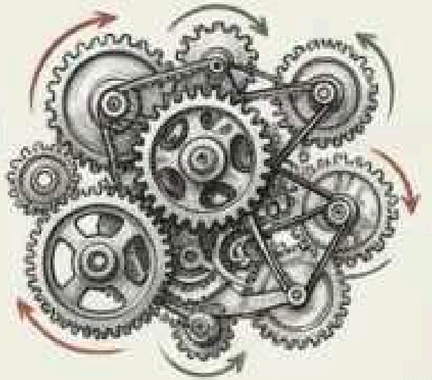


Unnecessary Transport



Excess Inventory

Over-processing



The Filter Question:

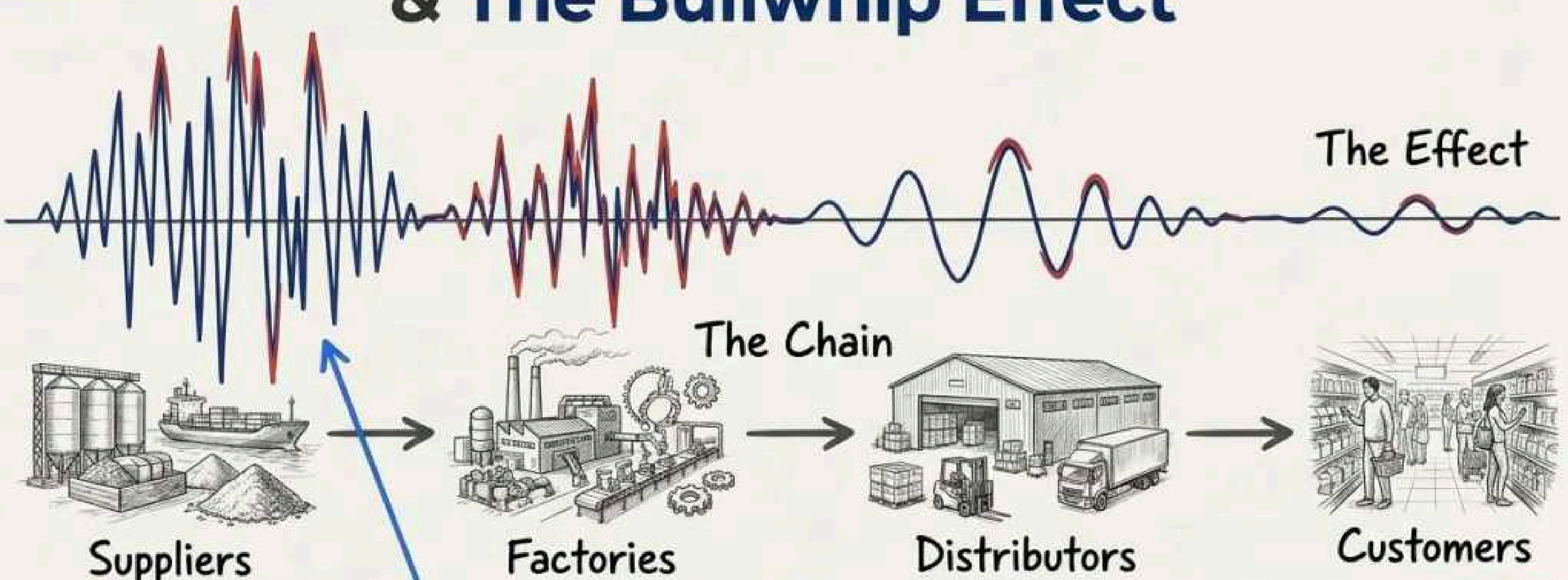
Would the customer pay for this step? If no, it is waste. Shrink or remove it.

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¶ 4.9

Managers must balance *Cost*, *Speed*, and Resilience.

Supply Chain Dynamics & The Bullwhip Effect



The Bullwhip Effect: Small orders passed back through the chain produce wild swings in upstream inventory.

Context: The 2020-2021 pandemic exposed the extreme fragility of long, thin supply chains.

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¶ 4.10

The Geometry of Operations Decisions

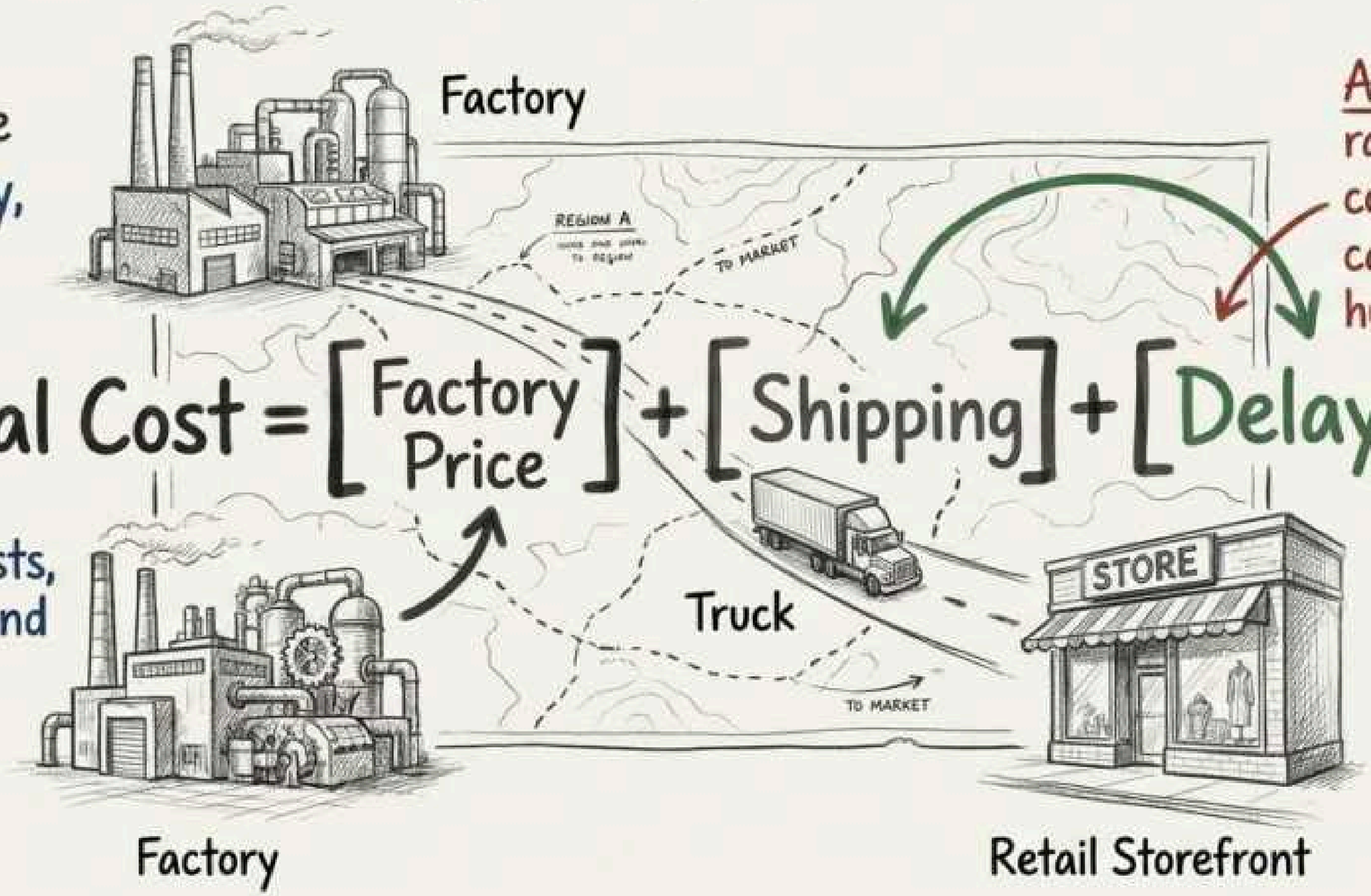
Managers choose location, capacity, and technology.

Automation: Robots raise output and cut costs, but require high capital and alter human jobs.

$$\text{Total Cost} = [\text{Factory Price}] + [\text{Shipping}] + [\text{Delay Cost}]$$

Variables weighed: Labor costs, transport, taxes, and nearness to customers.

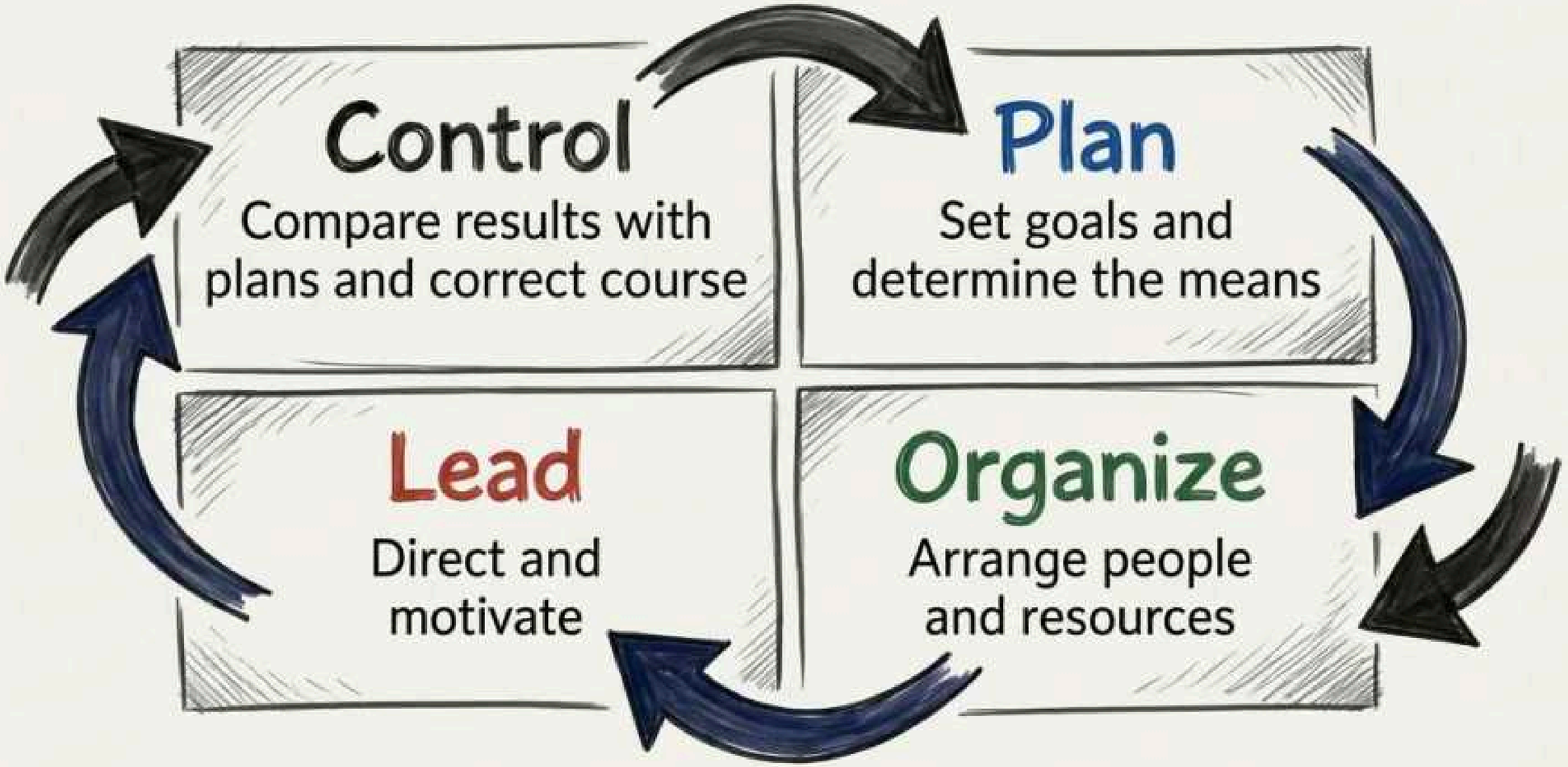
Firms track the whole cost of a product, not just the price at the factory door.



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¶ 4.11

The Four Functions of Management

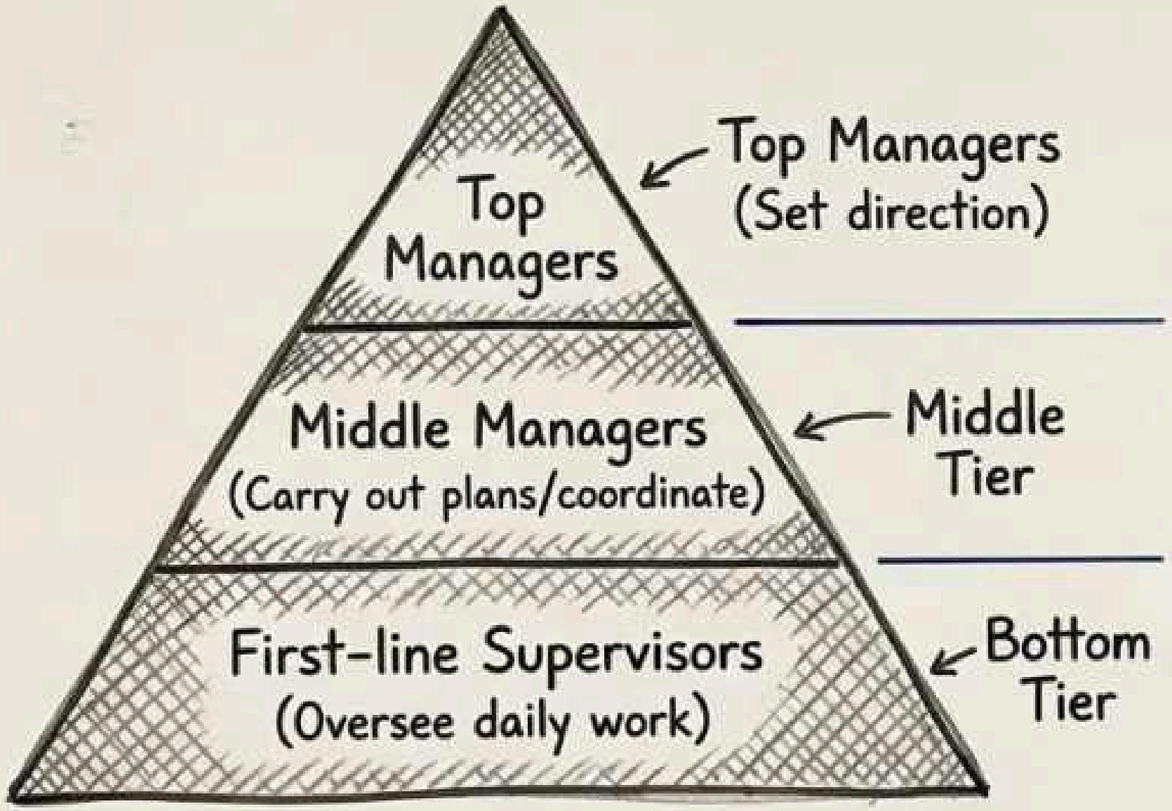


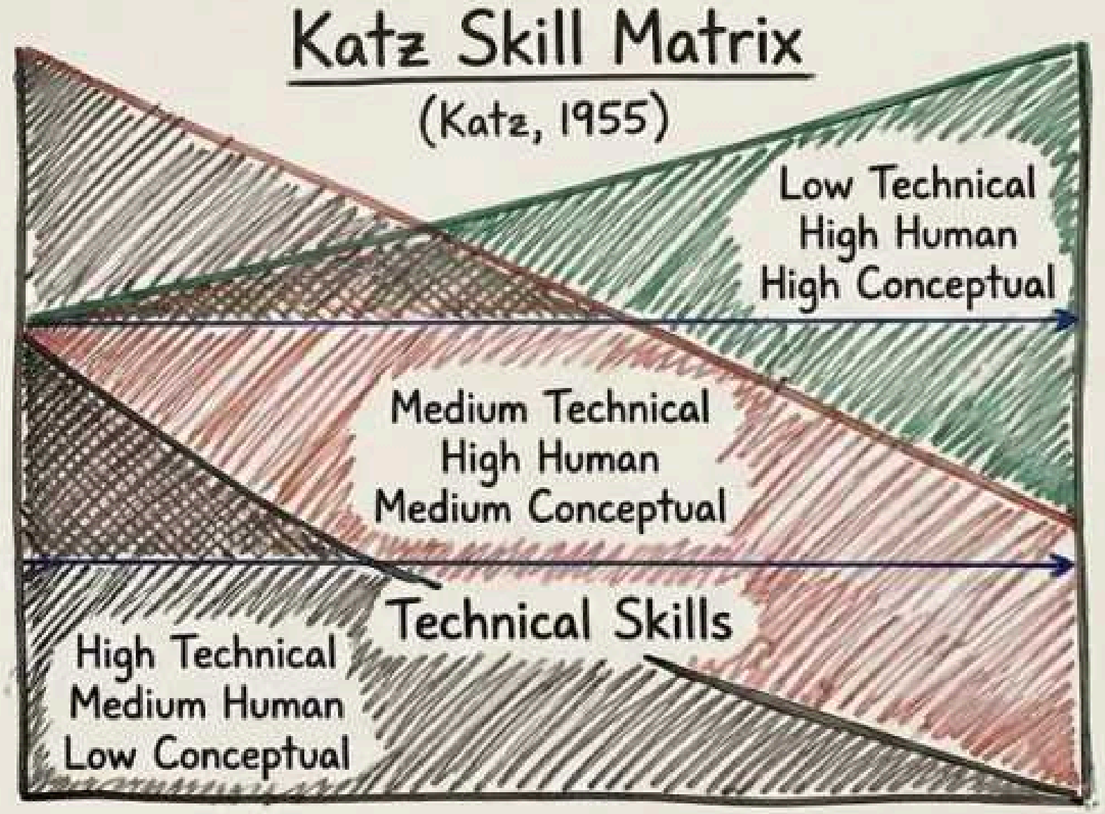
Originated by French executive Henri Fayol in 1916 as five steps (plan, organize, command, coordinate, control), compressed by modern texts into four.

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¶ 4.12

Managerial Levels & The Katz Skill Matrix





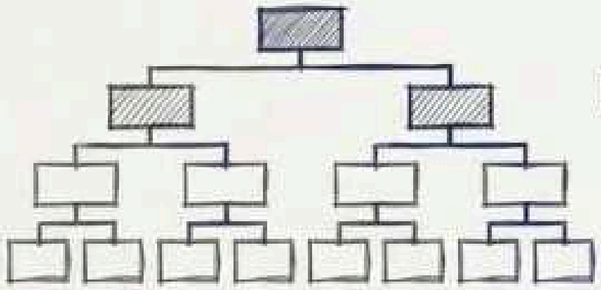
All managers need technical, human, and conceptual skills, but the mix shifts heavily toward conceptual skill as they rise.

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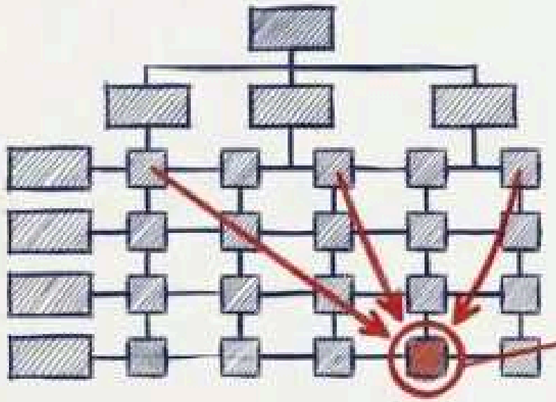
¶ 4.13

Structure & Span of Control

Structure



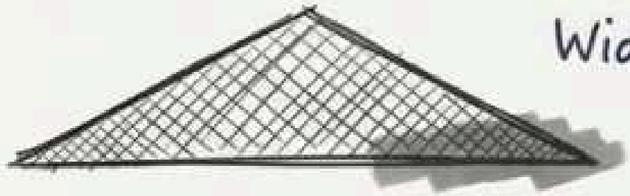
Functional / Divisional
(grouped by specialty, product, or region)



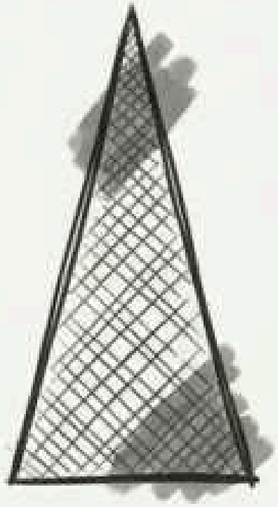
Matrix

Creates Two Bosses

Span of Control



Wide Span = Flat Org

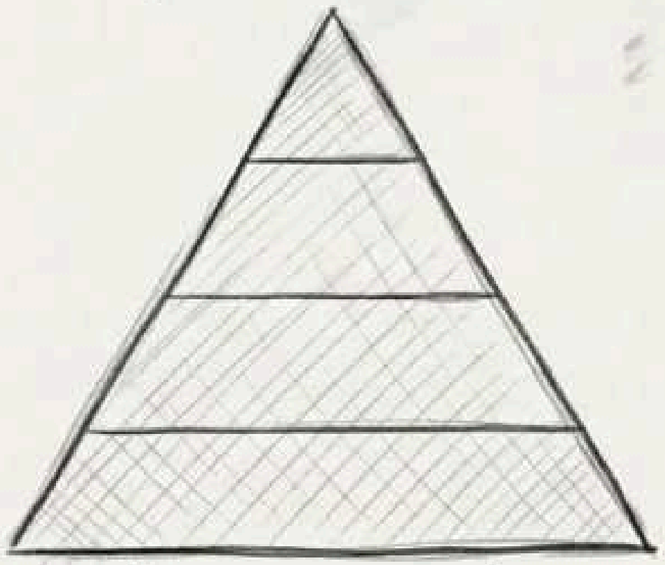


Narrow Span = Tall Org

Structure is how a firm divides work. Span of control is the number of people a single manager directs.

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The Mechanics of Motivation



→ Meaning & Recognition (true motivators)

→ Pay & Conditions (prevents dissatisfaction)

Herzberg's theory (1959)

$$\text{Motivation} = (\text{Belief that Effort} \rightarrow \text{Results}) \times (\text{Results} \rightarrow \text{Valued Rewards})$$

Expectancy Theory

People work hard only when effort leads to results, and results lead to rewards they actually value.

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When Incentives Backfire

Case Study:
Wells Fargo
(2016)



The Law of Incentives

People respond exactly to what is measured and rewarded.
Managers must design rewards that cannot be met by cheating.

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¶ 4.16

Leadership Styles vs. Daily Realities

- Leadership is the ability to influence others toward a goal.
- Styles:
  - Autocratic
  - Democratic
  - Laissez-faire
  - Transformational (inspiring toward a vision)

No single style works everywhere.

The Myth: Tidy Planning



The Reality: Fragmented days made of short talks, constant interruptions, and continuous relationship work.



(Mintzberg, 1973)

The Reality: Fragmented days made of short talks, constant interruptions, and continuous relationship work.

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¶ 4.17

Human Resource Management



HR covers acquiring talent: Hiring, training, pay, and evaluation.



The Goal: Good HR policies reduce turnover and help firms find and keep talent.

The Law: Civil Rights Act of 1964 bars discrimination in hiring and pay (race, sex, religion).

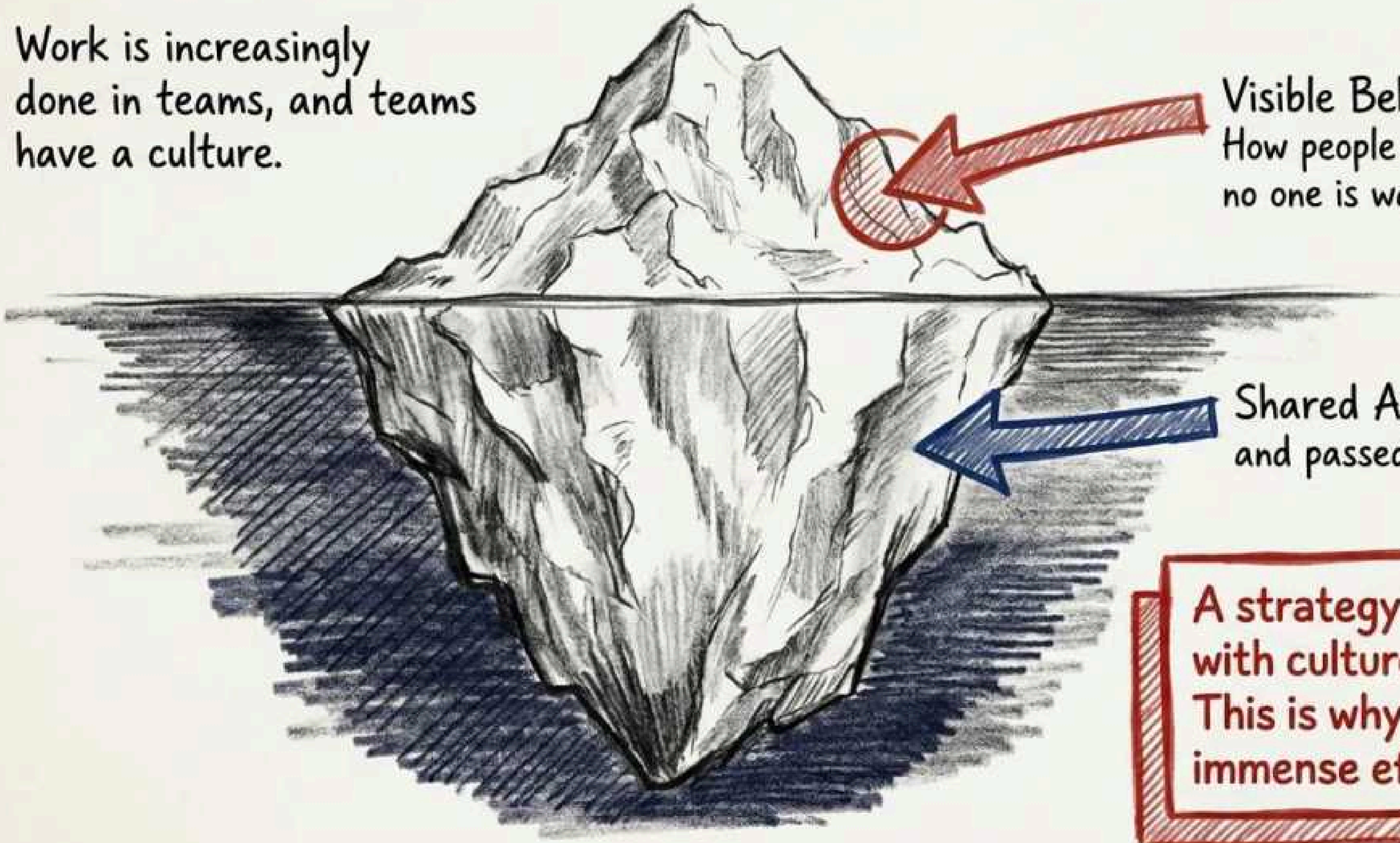
Unions: Collective bargaining for pay and conditions.

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The Organizational Culture Iceberg

¶ 4.18

Work is increasingly done in teams, and teams have a culture.



Visible Behaviors – How people act when no one is watching.

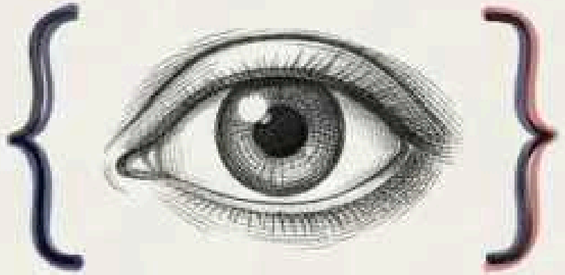
Shared Assumptions – Learned and passed on (Edgar Schein).

A strategy that clashes with culture is likely to fail. This is why leaders spend immense effort on values.

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¶ 4.19

Recap & Application



Managers (Plan, Organize, Lead, Control via Structure/Motivation/Culture)



Supply Chains
(Cost vs. Resilience)

Exercise: Describe one process in a workplace you know well, and name one specific source of waste within it.

Lecture 5 turns to Accounting and Finance.

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