

Laws and Principles of Scientific Management*

*as discussed in these collected works

Law of Inertia of Habits: “as important as the law of physical inertia” (Adamiecki)

Law of Counteraction (applied to scientific management, Adamiecki referenced le Chatelier and Van’t Hoff)

Le Chatelier’s principle: When a simple system in thermodynamic equilibrium is subjected to a change in concentration, temperature, volume, or pressure, (1) the system changes to a new equilibrium, and (2) this change partly counteracts the applied change.

2. The Van’t Hoff factor can be defined as the ratio of the concentration of particles formed when a substance is dissolved to the concentration of the substance by mass. The extent to which a substance associates or dissociates in a solution is described by the Van’t Hoff factor.

Law of Contrariness (Newton’s third law): “for every action (force) in nature there is an equal and opposite (contrary) reaction.” Applied to organizations, this describes the correlation between pace of change and resistance to it from individuals or groups.

Laws of economy

1. **Law of Division of Labor** (Adam Smith)
2. **Law of Concentration or Integration** (biological law. Applied to organization by Henry le Chatelier): cells of the same type or similar function join together for common action creating cooperation and even whole organs serving a purpose.
3. **Law of Harmony** (Adamiecki)
 - a. **Harmony of Selection:** selection of work cells
 - b. **Harmony of Operation/Action:** coordination and timing of operation
 - c. **Harmony of Spirit:** Human factors and “psychotechnics”

Revised Laws of Economy (Adamiecki, Prague, 1924)

1. **Laws of Division of Labor alongside Concentration of Labor**
2. **Laws of Optimal Production**
 - a. **General Law of Nature:** “all phenomena of energy and matter transformation always have a strictly defined speed at which they occur most economically”
3. **Laws of Harmony**

Law of Minimum: growth of plants depends on many nutrients, but the yield is dependent on the one that is the least present.

Law of Least Effort: concerns efficiency and return on natural energy

Law of Supply and Demand

Law of Cost Flow in Unit Time

Law of Expenditure and Income

Law of Causality: Adamiecki applied this to the future direction of technical education. If students are taught correctly, businesses run according to principles of scientific management, and economic life will improve

Purpose of the enterprise:

1st - Exchange of goods needed by people at an affordable price

2nd - Profit and well-being of employees

*Note, Adamiecki stated the goal of the organization is NOT profit above all else

General Principles

1. Harmonization
2. Cooperation and collaboration
3. "Cheap, but dissatisfied worker is lethal to the profits of the enterprise"
4. Obtain the greatest useful output with the least input (law of least effort)
5. Gradual Progress/Gradual Introduction of Improvements
 - a. (laws of inertia of habits, counteraction, contrariness, harmony of human spirit)
6. Cycle of Organization (after understanding the vision/goal)
 - a. Analysis
 - b. Planning
 - c. Execution
 - d. Control (as in control of experiments and responding to variation to plan)
7. Private Initiative
8. Free Competition
9. Selection
10. Economic Life Development

Value Stream Principles see 1924 article: The position of an Engineer as a Manager of Manufacturing Plants)

1. Expenditure – costs of producing certain quantity of product
2. Income – sum obtained by sale of the product
3. regulating these flows is the main task of the plant manager

*for value stream map see figure 7 in the article