

# Adaptation

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2025-08-07

Cybernetic adaptation: a system's ability to dynamically adjust, modify structure and behavior in response to external and internal stimuli, ensuring optimal functioning and survival.

**Adaptation** is a key concept in cybernetics theory, referring to a system's ability to dynamically adjust to changing environmental conditions. It is a process in which a system modifies its behavior, structure, or operational parameters in response to external stimuli or internal changes.

## Main Features of Adaptation:

1. **Behavioral Variability**
2. **Self-Regulation**
3. **Learning Ability**
4. **Response to Stimuli**

## Types of Adaptation:

- **Structural:** Change in the internal structure of the system
- **Functional:** Modification of the way the system operates
- **Parametric:** Adjustment of parameter values

## Examples of Adaptation in Various Systems:

- **Biological Organisms:** Adaptation to the environment
- **Information Systems:** Machine learning algorithms
- **Neural Networks:** Change in connection weights
- **Organizations:** Adjustment of strategies to the market

### **Mechanisms of Adaptation:**

- **Feedback**
- **Self-Regulation**
- **Learning**
- **Information Gathering and Analysis**

### **Importance in Cybernetics:**

Adaptation allows systems to:

- Survive in changing conditions
- Optimize their performance
- Reduce uncertainty
- Increase efficiency

### **Model Example:**

An organization implementing remote work during a pandemic is a classic model of social adaptation, where the following occurs:

- Change in communication structure
- Transformation of work tools
- Modification of collaboration norms
- Adjustment of management strategies

The concept of adaptation originates from systems theory and is fundamental to understanding complex, dynamic systems in the natural, technical, and social sciences.

[more](#)

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