

# Entropy

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**Entropy** as a measure of disorder and chaos in systems, defining the degree of energy dispersion and the probability of transformations in physical and informational processes.

In cybernetics theory, entropy is a fundamental concept describing the state of disorder and the possibilities for transformation in complex systems. Originally derived from thermodynamics, it has been adapted to a wide range of sciences, including information theory, physics, mathematics, and social sciences.

In a cybernetic perspective, entropy signifies:

1. A measure of the unpredictability of the system
2. The degree of energy dispersion
3. The level of informational diversity
4. The tendency for chaos to increase

Entropy is not solely a destructive phenomenon. It represents a natural mechanism for the evolution of systems, enabling their transformations and adaptation. In open systems, entropy can lead to the emergence of new, more complex organizational structures.

## Key Aspects of Entropy Include:

- Measurement of the probability of changes
- Determination of the direction of informational processes
- Analysis of possible energy transformations
- Examination of the limits of self-organization in systems

Understanding entropy as a tool for describing the dynamics of processes across various fields—from quantum physics to social communication—is particularly significant.

## **Examples of Entropy in Various Fields:**

### **Society and Communication:**

1. Gossip in organizations - how information distorts
2. Spontaneous development of street language
3. Breakdown of social bonds in crisis situations
4. Misinformation in social media

### **Psychology:**

1. Increasing stress in uncertain situations
2. Loss of motivation in monotonous environments
3. Burnout processes
4. Breakdown of interpersonal relationships

### **Economics:**

1. Dispersion of capital in unstable markets
2. Loss of currency value
3. Unpredictability of stock market changes
4. Company bankruptcies

### **Biology:**

1. Aging of organisms
2. Breakdown of cellular structures
3. Energy loss in metabolic processes
4. Genetic mutations

### **Technology:**

1. Degradation of information systems
2. Data loss
3. Dispersion of information in networks
4. Failures of complex technical systems

## Conclusions:

Entropy is a fundamental cybernetic concept that allows for understanding the mechanisms of change, predicting the directions of transformation, and describing the complexity of systems through their disorder and informational potential.

[more](#)

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