



GST 24 Information as Recurring Causal Organisation

Formal Description

This module introduces an ontological definition of information as recurring causal or causally generated pattern. It explains how information arises from recurring patterns in physical reality and distinguishes information from transient structure or arrangement. The module also explains why information is independent of meaning or interpretation and establishes information as an objective feature of causally structured reality.

Information arises where recurring causal or causally generated organisation exists. It may therefore be understood as recurring causal or causally organised pattern.

Information may be expressed through:

- recurring structure; or
- recurring organised configuration.

This definition follows directly from the recurrence–causality principle. Because recurring organisation requires causal relationships or causal constraints capable of reproducing organisation across time, information is necessarily grounded in causal organisation.

It is important to distinguish information from structure or organised configuration more generally. Not all structures or organised configurations constitute information. Structures and organised configurations may exist transiently without recurrence. Only where recurring organisation exists does information arise.

Information, in this ontological sense, is independent of:

- observation;
- interpretation;
- or meaning.

It exists objectively as a feature of physical reality.

Recurring organisation therefore provides the basis for:

- predictability;
- persistence;
- and the emergence of more complex forms of organisation.

Plain English Explanation

We often think of information as messages, symbols, language, or knowledge. However, before information can be interpreted, there must first be something stable or recurring to interpret.

This module defines information at a deeper physical level. It exists wherever organisation recurs reliably across time. For example:

- the repeating structure of a crystal;
- the recurring organisation of DNA;
- repeating waveforms;
- and recurring planetary motion

all involve recurring organisation.

What matters is not meaning, but recurrence. A temporary arrangement that appears once and disappears does not constitute information in this ontological sense. Only recurring organisation capable of being reproduced or maintained across time becomes information.

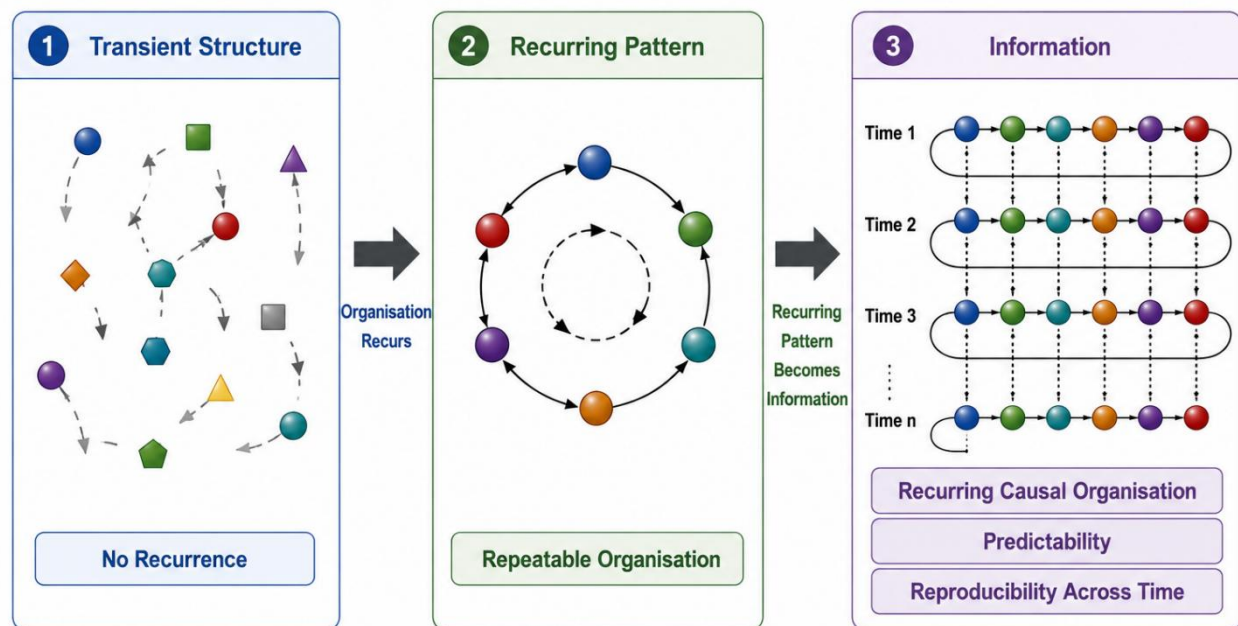


This idea is important because it separates:

- information as a physical feature of reality;
- from information as interpreted meaning.

Meaning arises later when systems capable of interpretation interact with physical information.

From Pattern to Information



Information exists where causal organisation recurs reliably across time.

Example 1 — Crystal Lattice

The repeating arrangement of particles within a crystal forms recurring organisation and therefore constitutes information.

Example 2 — DNA

DNA stores recurring molecular organisation that can be reproduced across generations and is frequently referred to as information.

Example 3 — Repeating Waveform

A repeating waveform contains recurring causal organisation that allows predictable recurrence.

Example 4 — Planetary Motion

Recurring orbital organisation provides predictable and recurring physical organisation across time.

Provenance and Links

The concept of information developed in this module draws particularly upon information theory, systems theory, thermodynamics, and physicalist ontology. Shannon's (1948) foundational work established information in terms of the organisation and transmission of signals, while later



philosophical and systems-theoretical approaches examined the relationship between information, physical structure, and organisation more generally (Bateson, 1972; Floridi, 2010). Thermodynamic perspectives, particularly those associated with Boltzmann (1877) and later Prigogine and Stengers (1984), further highlighted the relationship between recurring organisation, stability, and the persistence of physical structure over time. The present framework builds directly upon earlier discussions of configuration, structure, organised configuration, pattern, and recurrence by defining information ontologically as recurring causally organised pattern. In this view, information is not dependent upon meaning or interpretation, but exists objectively as a feature of recurring physical organisation grounded in causal processes and constraints. The module therefore establishes information as objective, physical, and causally grounded, while preparing the conceptual basis for later discussions of epistemic information, cognition, communication, symbolic systems, and the thermodynamic organisation of complex systems.

Practical Exercise

- Explain why not all structures constitute information.
- Give three examples of information understood as recurring causal organisation.
- Describe why information requires recurrence.
- Explain why information, in this ontological sense, does not depend upon meaning or interpretation.