GST 106 — Persistence, Change and the Investigation of Systems

Formal Description

A system can persist while its components, connections and activities change. To judge continuity, we must specify the system and the period under study. Then distinguish three things: similarity of organisation, a causal history linking earlier and later states, and sufficient continuity of the relationships that constitute the system.

Similarity does not establish identity: two independently built installations can work alike. Causal descent is also insufficient by itself: parts from a completely dismantled installation can contribute to a later assembly even though the original organisation ceased to exist. Sufficient continuity concerns what remains organised through the change, at the level being studied.

By the end, the learner should be able to explain persistence through change and develop a causal account that identifies the evidence for its main claims.

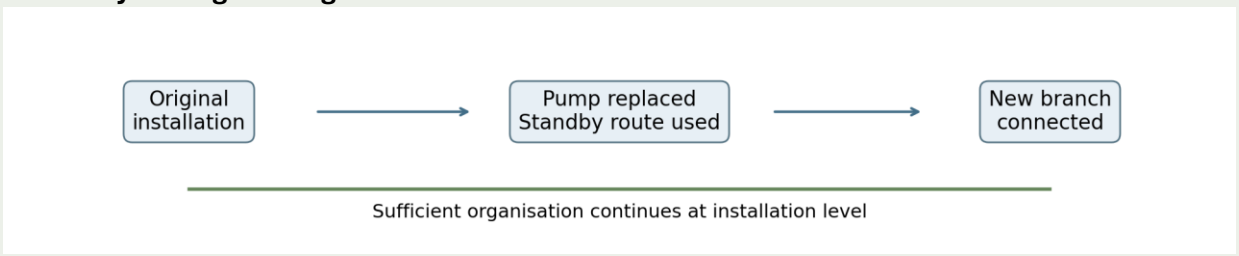
Plain English Explanation

Return to the drainage installation. A new branch extends the routes it can serve. Replacing a worn pump may instead restore a capability the installation already had. Both changes affect its organisation, but in different ways. If a standby route takes over during replacement, delivery can continue. If delivery pauses, the installation can still persist while its other defining relationships remain in place.

Now compare that installation with an independently built copy. The copy may deliver the same flow in the same way, but it has a separate history. Alternatively, suppose the original is completely dismantled and some of its parts are reused later. The later assembly has a causal connection with the original, but that connection does not bridge the loss of the original organisation.

Make the judgement at the level you specified. The installation may continue while the particular pump is replaced. A similar output alone cannot tell you whether a component, a process or the wider system persisted.

Continuity Through Change



In this example, the organisation of the wider installation persists while individual components and routes change.

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Example Investigation Worksheet

1. **Scope and formation.** Name the assembly, its boundary, its organisational level and the period you are studying. What interactions established its component relationships?
2. **Activity and maintenance.** Trace one input through the assembly to an output. Identify what keeps that route available between uses. Which transfers depend on the components working together?
3. **Change and continuity.** Record what was added, lost or replaced. Which relationships persisted? Did the change activate an existing capability, restore access to one or establish a different capability? What would count as breakdown at the chosen level?
4. **Evidence and alternatives.** For each main claim, record what you observed, what you inferred and what evidence could change your judgement. If output stayed steady during replacement, for example, did a standby route take over, did stored water meet demand, or did another source supply it? Compare records of valve positions, pump activity and flows to distinguish the explanations.

Provenance and Links

This final module draws together the course's accounts of causal transfers, boundaries, emergence, nested organisation and latent potential. Further work could use energy landscapes to examine possible configurations and transitions, or investigate how repair, regeneration and resilience depend on available resources and routes. Applying the account to how people form and revise knowledge raises further questions about the organisation supporting those processes.

Challoner, J. A. (2026). Causal assembly theory: Assembly and disassembly as causal processes. Rational Understanding. https://rational-understanding.com/efgst

Practical Exercise

Use the worksheet above to write a short causal account of an assembly you know. Cover formation, maintenance, activity, one change and a possible breakdown. Include a sketch of the relevant transfers and identify one observation or comparison that would help distinguish your account from a competing explanation.

Mark which parts of your account are established mechanisms, which are illustrative applications and which are hypotheses that still need testing.

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