Chapter 3. Holonic homeostatic levels of complexity

Introduction

This chapter gives us a simple way to see complexity. Most things we care about are wholes that sit inside larger wholes. Arthur Koestler called them holons: a whole in its own right and, at the same time, part of something larger.

The idea has deep roots. Ludwig von Bertalanffy argued that systems have to be understood as organised wholes, not as isolated parts (1950). Kenneth Boulding described levels of systems, with different capabilities appearing as complexity rises (1956). Arthur Koestler brought these ideas together in *The Ghost in the Machine* (1967), introducing the term *holon* for something that is simultaneously a whole and part of a larger whole. Later, Ken Wilber developed the idea of holons and nested levels across human and social development, while Elliott Jaques' Stratified Systems Theory applied a related levels logic to the increasing complexity of work and organisation. I worked directly with Elliot Jacques and applied and extended his ideas for 40 years.

Civilisation itself can be seen this way. Individuals sit inside families. Families sit inside larger groups. Companies sit inside economies. Nations sit inside a wider world. Higher levels appear when lower-level parts learn to cooperate, restrain themselves, reciprocate, reflect and build trust over time.

Those whole stay viable through homeostasis: they sense change, exchange information and correct drift. When correction fails, the system can fall, fragment or reorganise.

AI now enters this nested architecture. It can strengthen a part, strengthen the whole, or strengthen one part while damaging the whole. To understand what AI changes, we first need to see the architecture it is entering. The architecture matters, but human beings decide how competition, cooperation, restraint, trust and power are actually expressed.

How this chapter unfolds

1. **We've been through six civilisational levels already** — Civilisation has repeatedly climbed by building larger wholes around smaller ones, and Technology has often helped force the move.
2. **Evolution moves through five phases** — Systems emerge from chaos, stabilise, grow, lose the ability to correct, and return to chaos when the old architecture no longer holds.

3. **Holons are everywhere** — A holon is a whole that is also part of a larger whole, and the same nested architecture appears across living, social and organisational systems.
4. **Holonic architectures follow rules** — Holons recur because the same basic relationships keep appearing between the parts, the whole and the levels above and below.
5. **The C^2-R^3-T^2 dynamic** — C^2-R^3-T^2 describes how separate human holons can move from competition towards cooperation and form a higher-level whole.
6. **Holons and levels** — Levels describe differences in scale and work; they do not imply that one person is worth more than another, but they do imply an increasing ability to meet human needs and wants.
7. **Rising complexity** — As holons climb, complexity changes along eight dimensions.
8. **Homeostasis, levels and perturbation** — Homeostasis is how a holon stays viable while the world around it changes.
9. **What this means for humans** — Humans live inside nested wholes, so what we do in one part always affects something larger.
10. **What this means for AI** — AI will enter every level of this nested architecture, so we have to judge it by what it does to both the part and the whole.

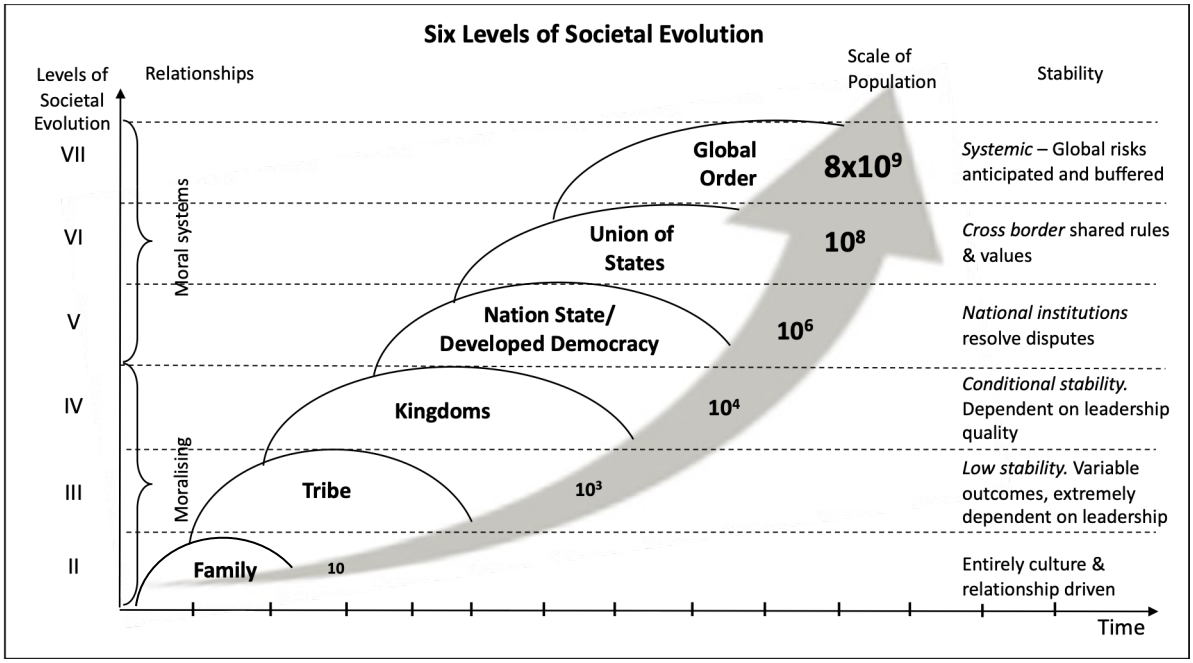
A. History leading to the present

1. We've been through six civilisational levels already

Civilisation has repeatedly climbed by building larger wholes around smaller ones, and technology has often helped force the move.

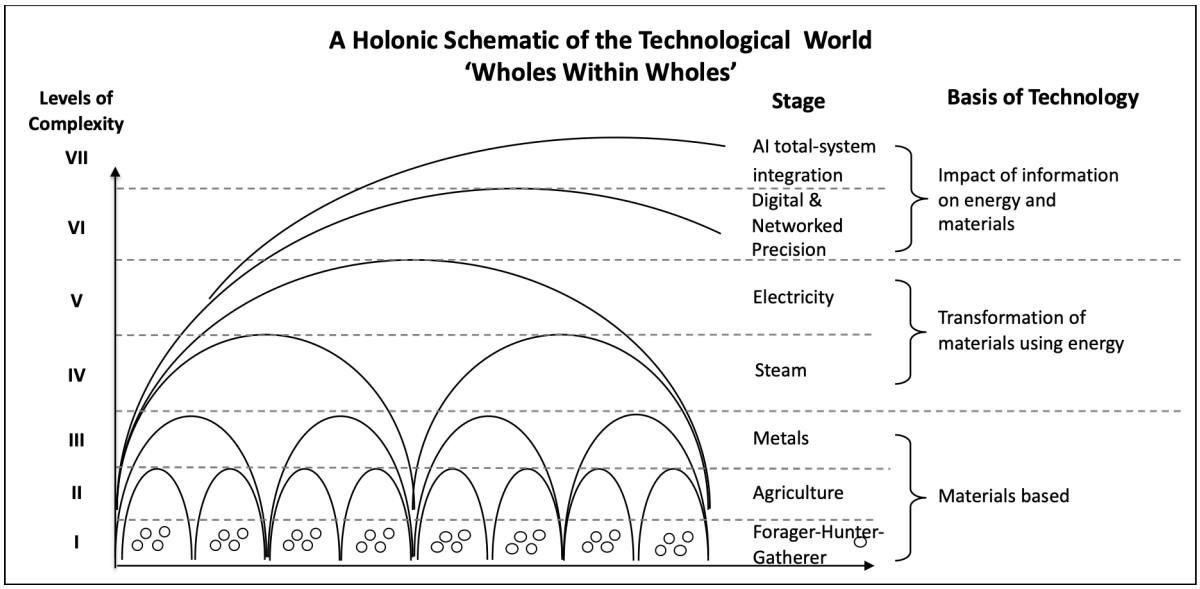
Individuals sit inside families, families inside tribes and communities, communities inside kingdoms and states, and states inside wider arrangements. Each new level does work the level below cannot do alone.

Six levels of societal evolution. Exhibit 3.1



Technology has often pushed evolution. Agriculture changed food and settlement. Metals changed production and war. Steam, electricity and digital networks expanded what larger systems could coordinate. AI now increases capability again, and it may increase the pressure to build at a higher level. The overall trajectory is towards meeting the human needs and wants.

Technology is one of the drivers of evolution: social architecture which we will deal with at length is the other. Exhibit 3.2.



2. Evolution moves through five phases

Systems emerge from chaos, stabilise, grow, lose the ability to correct, and return to chaos when the old architecture no longer holds.

The five phases are: emergence from chaos, stable growth, institutional decline, loss of adaptive capacity, and chaos. We are now at the edge of chaos because several large pressures are arriving together:

- Climate change
- US-China competition
- The rise of AI
- The retreat of the United States from its post-war role in global security and trade

Five phases of societal evolution. Exhibit 3.3

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Dimension	**Emergence from Chaos**	**Stable Growth**	**Institution Decline**	**Loss of Adaptive Capacity**	**Chaos**
Deliberative processes	Reopened bargaining and settlement	Structured collective decision-making	Positional debate and slowing learning	Polarisation and blame	Collapse or bypass of deliberation
Governance	Reconstitution of authority	Competent rule-based coordination	Procedural drift and politicisation	Defensive fragmentation	Coercive control
Problem solving	Immediate stabilisation capacity	Cumulative systemic problem-solving	Patching and symptomatic fixes	Reactive constraint and exhaustion	Crisis management only
Solution-seeking processes	Restorative search and experimentation	Option testing and institutional scaling	Narrowing solution space	Blocked adaptation	Immediate loss under solutions
Technology	Repair and continuity tools	Scaling, integration, and efficiency	Institutional lag behind tools	Rapid amplification	Loss of control over technical systems

We are here

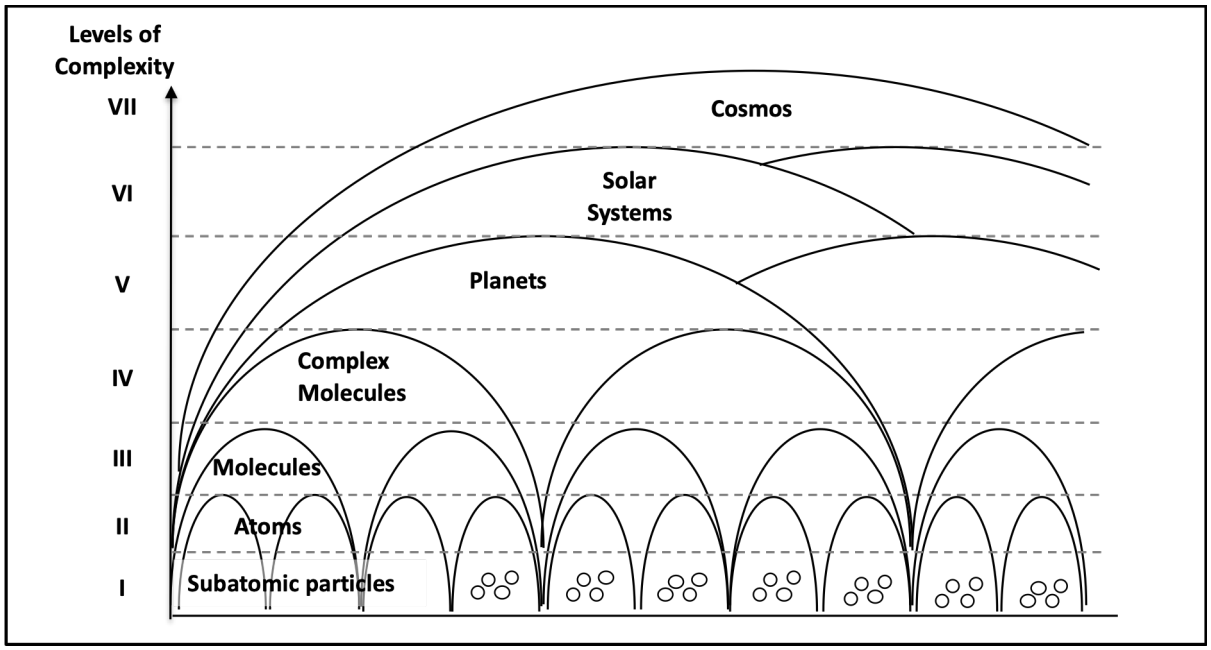
3. Holons are everywhere

A holon is a whole that is also part of a larger whole, and the same nested architecture appears across living, social and organisational systems.

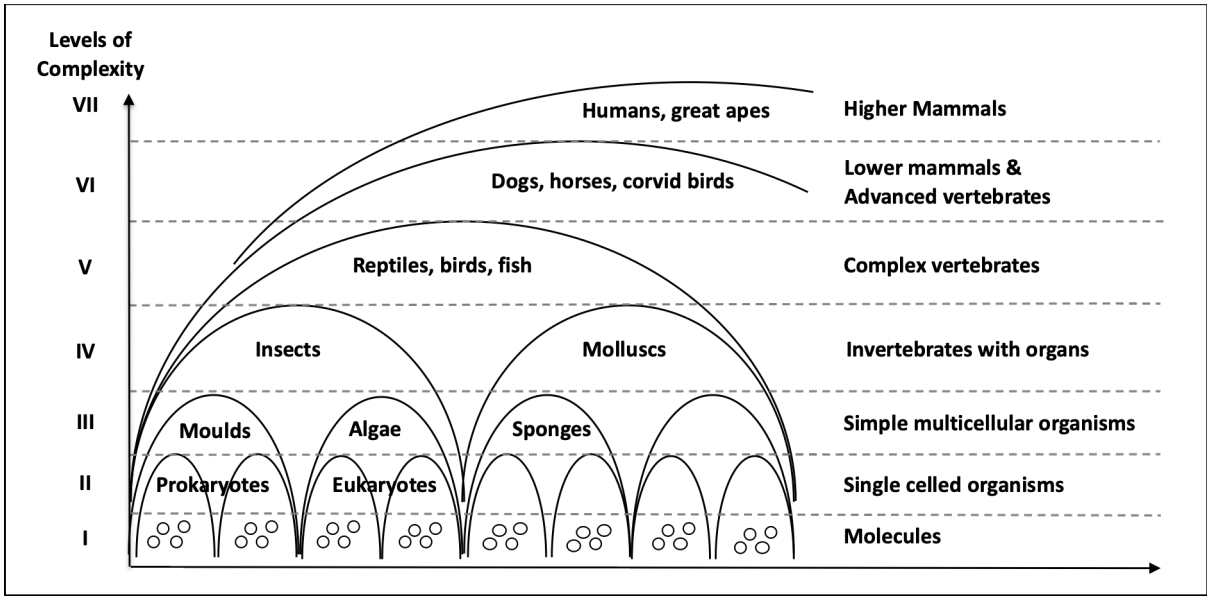
We can see it in the material world, in living things, in governments, in companies and in civilisation itself. Exhibits 3.4, 3.5, 3.6, 3.7

The same broad pattern appears again and again: include and transcend. The lower level does not disappear. It remains a whole, but it also becomes part of something larger. A family contains individuals but sits inside a community. A department contains teams but sits inside a company. A nation contains institutions, communities and families but also sits inside trade, security and other international systems. The next question is simple: what allows these parts to hold together as a larger whole?

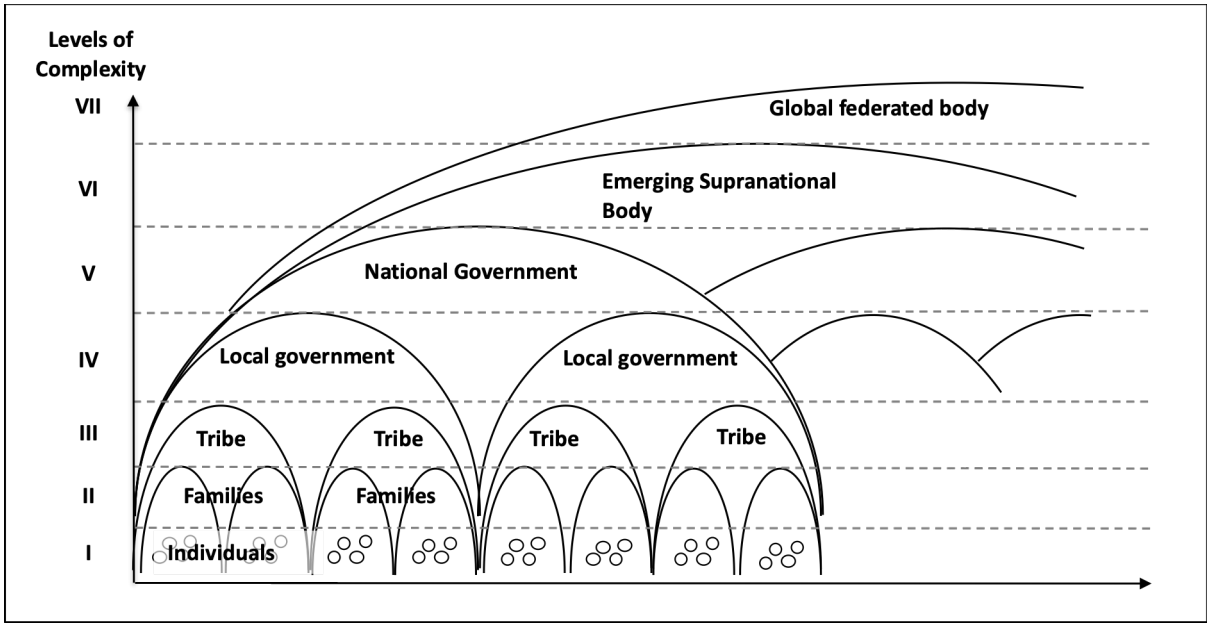
A holonic schematic of the material world. Exhibit 3.4



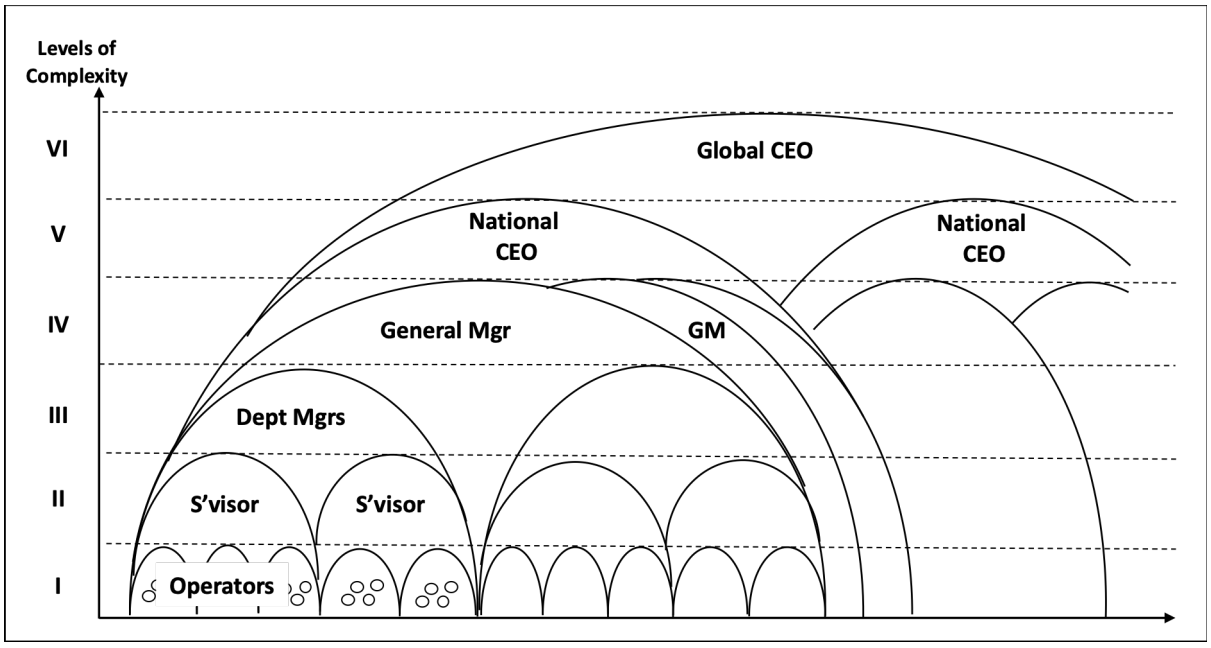
A holonic schematic of living things. Exhibit 3.5



A holonic schematic of government. Exhibit 3.6



A Holonic schematic of corporations. Exhibit 3.7



B. Holonic architecture follows rules

4. Holonic architectures follow rules

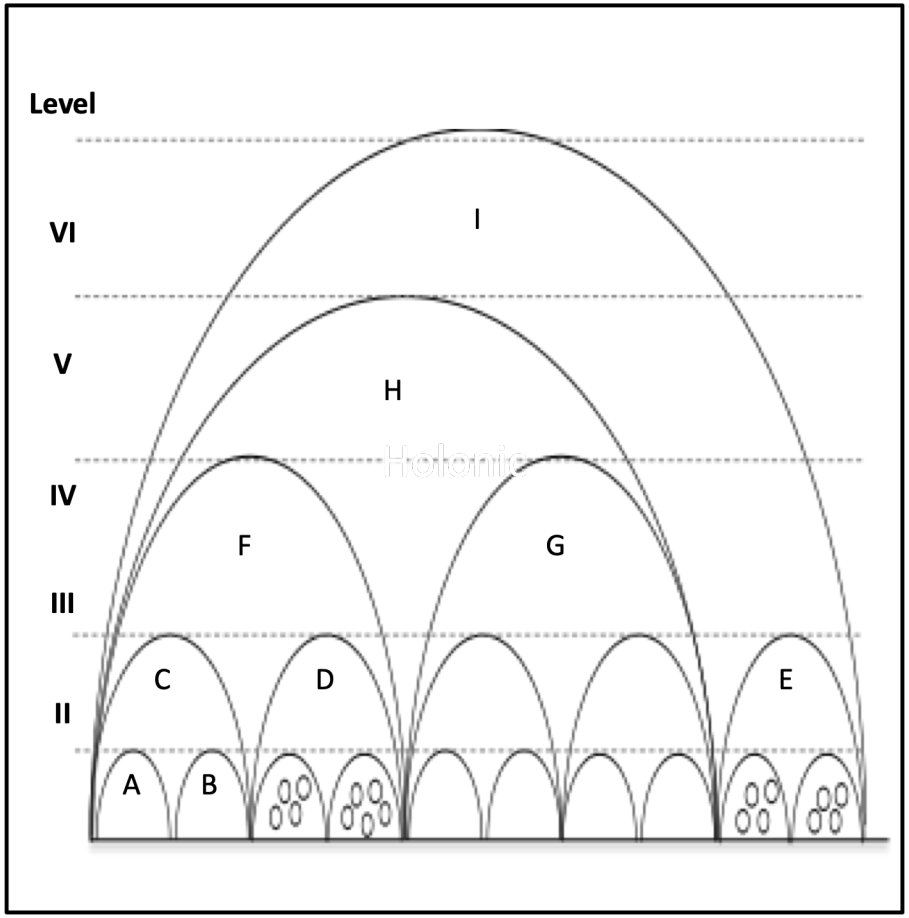
Holons recur because the same basic relationships keep appearing between the parts, the whole and the levels above and below.

Each part keeps some independence. Each part also depends on other parts. The higher level coordinates relationships the lower levels cannot coordinate on their own. The whole survives only while all the parts remain viable.

Exhibit 3.8 makes those recurring relationships visible.

Holonic architecture and the rules of holonic location. Exhibit 3.8

Holonic Ordering



Rules of Holons

1. (A) is different from (B) but integrated by (C) which is again has a different emergent quality than either (A) or (B);
2. (C) can't exist without (A) or (B) but without (C) both (A) and (B) are some how diminished;
3. (A), (B), and (C) are simultaneously in cooperation and competition with each other;
4. If (C) becomes an apex holon it invites further integration this time with (D) to form emergent (F);
5. Each level contains and honours all lower levels;
6. Mechanics/narrow purpose exist at the lower level, inclusive purpose at the Apex;
7. Events at any level impact all other levels vertically and horizontally; and
8. Truth or more specifically "felt truth" is different at each level.
9. Design Constraints set at apex level propagate down through every level below

5. The C^2-R^3-T^2 dynamic – the drum of ascent

C^2-R^3-T^2 describes how separate human holons can move from competition towards cooperation and form a higher-level whole.

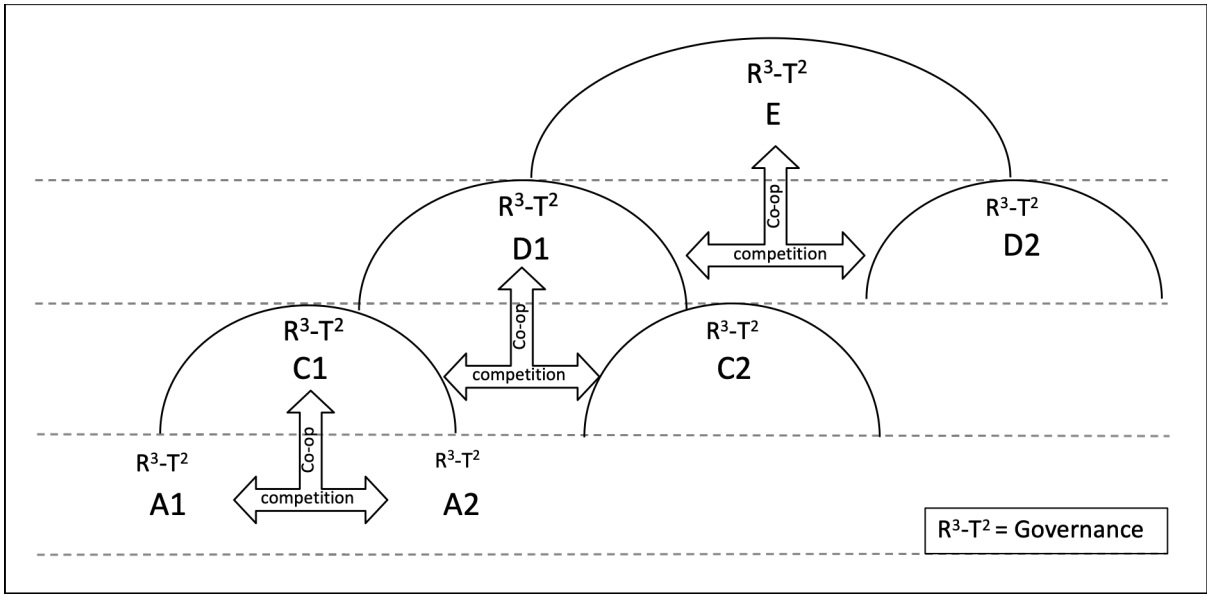
Competition creates energy between people and groups. When unrestrained competition becomes too costly, survival starts to require cooperation.

Cooperation cannot hold by goodwill alone. It requires restraint, reciprocation and reflection. When those behaviours hold over time, trust can grow. That trust makes wider cooperation possible.

Competition. Cooperation. Restraint, reciprocation and reflection. Trust and time. That is C^2-R^3-T^2. The R^3-T^2 elements are much of what we normally call governance: the rules and behaviour that keep competition and cooperation inside a viable range.

When this works, the parties do not need external enforcement for every exchange. The cooperative rules have begun to be internalised. A new higher-level holon has formed. When restraint, reciprocation, reflection, trust and time weaken, the higher-level whole can start to fall apart.

Recursive C^2-R^3-T^2 dynamic driving human societal evolution. Exhibit 3.9



Note: as levels rise, the nouns stay the same. The verbs change.

Nouns of C^2-R^3-T^2 defined. Exhibit 3.10

Normative noun	Description
Competition	The pressure between individuals or holons to secure resources, position, advantage or survival. Competition generates energy, differentiation and adaptation, but becomes destructive when unconstrained.
Cooperation	The capacity of separate individuals or holons to work together where joint action produces greater survival, capability or benefit than acting alone.
Restraint	The limitation of immediate self-interest, power or action so that cooperation and the larger system can remain viable.
Reciprocation	The exchange of contribution, benefit and obligation that allows cooperation to become mutually reinforcing rather than one-sided.
Reflection	The capacity to examine behaviour, consequences and relationships, learn from experience and consciously adjust future action.
Trust	The expectation that others and the institutions governing interaction will behave sufficiently reliably for cooperation to continue without constant enforcement. In similar terms trust that you will place your interests second to mine and vice versa
Time	The period over which repeated interaction allows restraint, reciprocation and reflection to demonstrate reliability, enabling trust and higher-order cooperation to develop.

C. Holonic levels express complexity

6. Holons and levels

Levels describe differences in scale and work; they do not imply that one person is worth more than another.

People can be equal in worth while the systems they work inside carry different responsibilities, time horizons and consequences. The challenge is to make hierarchy serve human flourishing rather than power for its own sake.

As a holon climbs, the work changes. The aim becomes broader and often less clear. More parts have to be brought together. Legitimate aims can conflict. Information becomes less complete. Judgement matters more. The time horizon grows. The consequences of success or failure spread further and become harder to reverse. Higher-level work is therefore not simply a harder version of lower-level work; it is different work.

Levelled view of C^2-R^3-T^2 model. Exhibit 3.11

Level	Competition	Cooperation	Restraint	Reciprocation	Reflection	Trust	Time
VII	Steward competition for the whole	Unify action across global systems	Safeguard the wider human order	Universalise obligations across humanity	Reframe the architecture itself	Entrust responsibility across boundaries	Think across generations and civilisation
VI	Balance competition with systemic consequences	Integrate diverse interests and institutions	Self-limit power for legitimacy	Generalise reciprocity beyond direct exchange	Reconsider assumptions and established settlements	Institutionalise trust through legitimate systems	Anticipate long-term systemic consequences
V	Regulate competition through formal rules	Coordinate differentiated organisations and functions	Constrain behaviour through law	Formalise reciprocal rights and obligations	Evaluate evidence, outcomes and performance	Systematise trust through dependable institutions	Plan across extended time horizons
IV	Contest for authority and resources	Organise cooperation through recognised hierarchy	Enforce restraint through recognised authority	Exchange benefits for corresponding obligations	Review conduct and immediate results	Authorise trust through defined roles	Sequence activities through ordered plans
III	Rival with competing groups	Ally through loyalty and belonging	Conform to custom and expectations	Return favours and fulfil obligations	Remember experience and shared history	Recognise trusted members and allies	Prepare for foreseeable future needs
II	Compete for immediate personal needs	Assist familiar people directly	Obey family authority and rules	Repay personal help and support	Notice immediate effects and consequences	Rely on known, familiar people	Respond within the immediate future

7. Rising complexity

As holons climb, complexity changes along eight dimensions.

The eight are aim, problem type, parts and levels to integrate, conflict between legitimate aims, clarity of information, basis of decision, time to reach the aim, and consequences of success or failure.

Eight dimensions of complex systems. Exhibit 3.12

Dimension	Description
Aim	What the system is trying to achieve, and how clear, singular or contested that aim is.
Complexity versus complication	Whether the problem can be solved by analysis and expertise, or requires judgement across interacting, changing and paradoxical factors.
Dimensions / levels to integrate	The number and variety of functions, actors, systems and subordinate levels that must be brought together.
Conflict between dimensions	The extent to which legitimate goals, interests or requirements pull against one another and require balancing or settlement.
Clarity of information	How complete, direct, reliable and interpretable the available information is for understanding the problem.
Basis of decision-making	The kind of reasoning required to act: from visible facts and experience through evidence, judgement and legitimate collective settlement.
Time to reach aims	The time horizon over which actions must be sustained before the intended outcome can be achieved or assessed.
Consequences of success or failure	The scale, reach and reversibility of the effects produced when the system succeeds or fails.

D. Levelled systems are homeostatic

Every holon has to keep itself and its parts within a viable range. That continuing work of holding together under pressure is homeostasis.

8. Homeostasis, levels and perturbation

Homeostasis is how a holon stays viable while the world around it changes.

A holon is not held at one fixed point. It moves inside a viable range and keeps correcting as conditions change.

The human body makes this easy to see. The heart moves blood. The lungs exchange gases. The digestive system turns food into usable energy. The nervous system carries information. The immune system detects and responds to threats. Each part does different work, but the body survives only because the parts stay connected.

The parts can be identified separately, but they do not operate independently. A change in one part changes the conditions faced by others. The body survives because the parts keep adjusting to one another.

That active capacity is homeostasis. Living systems are never still. Temperature, blood pressure, energy, hormones and immune activity keep moving.

What matters is the range. Body temperature moves as activity, weather and illness change. The body senses the movement and acts to bring conditions back inside a viable range.

Homeostasis is continuous correction, not a fixed position.

The system moves. It is disturbed. It responds. It moves again. Stability comes from correction, not from stillness.

Every functioning system is hit by perturbations. A perturbation is simply something that pushes the system away from its current condition. In the body it can be a virus, injury, dehydration, extreme heat or lack of food.

When a virus enters the body, the immune system responds. Temperature may rise. Heart rate may change. Energy moves to the response. The body leaves its normal condition for a time because that helps it deal with the threat.

The response can create a second problem. Fever can help fight infection, but too much fever becomes dangerous. The body has to correct both the original disturbance and the effects of its own response.

A homeostatic system does not simply resist change. It sees change, judges whether it matters and corrects without destroying the larger whole. This is the beginning of cybernetic control.

Correction moves both ways. Higher levels set aims, rules, limits and coordination. Those limits can restrict lower levels, but they can also create room to move. Lower levels send information, performance, stress and failure back up.

The higher level survives only while the lower-level holons remain sufficiently healthy. If the parts fail, the whole loses the capability it depends on.

Correction therefore moves in two directions:

- Downwards: aims, rules, resources, coordination and design limits.
- Upwards: information, performance, warning, resistance and failure.

The higher level limits and enables the lower. The lower level informs and sustains the higher.

Neither direction is enough on its own. Control only from above becomes blind to what is happening below. Movement only from below loses the coordination needed to hold the larger whole together.

Most perturbations can be absorbed. Small disturbances need local correction. Larger disturbances pull in more parts and sometimes higher levels. But every system has limits.

When homeostasis fails, the system does not disappear. It can fall to a lower level or reorganise into a different form.

A company can fall back into silos. A nation can fall back into regional, tribal or family loyalties. A rules-based institution can fall back into personal power. The parts remain, but the higher-level whole no longer holds.

That is regression in holonic terms. The higher-level structure disappears because it can no longer make the corrections needed to keep its parts together.

The other path is adaptation. A large disturbance can show that returning to the old range is no longer enough. The system may need new rules, a new operating range or a higher level of coordination.

Homeostasis therefore does two things:

- Restore the existing holon when correction is still possible.
- Create the conditions for reorganisation when the old form can no longer hold.

This is where we are now.

9. What this means for humans

Humans live inside nested wholes, so what we do in one part always affects something larger.

Climbing has a human requirement. Competition has to become cooperation. Cooperation needs restraint, reciprocation and reflection. Those behaviours have to hold long enough for trust to grow. If they fail, the larger whole can begin to break down.

Homeostasis adds another lesson. Healthy human systems do not avoid disturbance. They see it, respond to it and correct. Sometimes correction restores the old range. Sometimes the disturbance tells us the old arrangement no longer works and we have to reorganise.

That changes the way we see everyday life. The family is linked to the company. The company is linked to the nation. The nation is linked to the wider world. Civilisation is held together by millions of ordinary acts of cooperation, restraint, reciprocation and trust.

It also makes fragility visible. Trust can break. Cooperation can shrink back to the group. A higher-level system can fall when its parts stop accepting the rules that hold it together.

Holons give us the architecture. Humans animate it. To understand why systems climb, hold, drift or fall, we have to understand the animal operating inside them.

10. What this means for AI

AI will enter every level of this nested architecture, so we have to judge it by what it does to both the part and the whole.

AI can make a local holon much stronger. It can make a person more capable, a team faster, a company more productive or a government better informed. But a stronger part does not automatically create a stronger whole.

AI can also increase the disturbance hitting the system. It can speed competition, move power, change work and connect decisions across boundaries before the existing architecture has time to correct.

At the same time, AI can strengthen homeostasis. It can help a system see stress earlier, connect information across levels, show where one part is damaging another and help people correct before drift becomes breakdown.

The level therefore matters. We should not ask only, “What can AI do?” We also need to ask: at what level is it acting, which holon gains, which holon carries the cost, and what happens to the wider whole?

The aim from the Introduction still sits above the technology: More Mores for More. More capability is useful only if it helps create more physical and relational abundance for more people over more time.

AI is not outside the architecture. It becomes part of it. The opportunity is to use AI to help human systems climb, see and correct through shared visibility. The danger is that it makes individual parts so powerful, and change so fast, that the larger whole can no longer hold.