

Multiplex Systemics: Toward a More Holistic Philosophy of Technology

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Technology and Humanity: An Evolving Partnership

*Homo Faber—
Human the
Tool Maker*

*Stone Tools
The Wheel*

PRIMITIVE
BEGINNINGS

*Printing Press
Steam Engine
Light Bulb*

DAWN OF
MODERNITY

*Internet
Smartphone*

DIGITAL AGE:
INFORMATION TECHNOLOGY

*AI and Robotics
ChatGPT*

ARTIFICIAL INTELLIGENCE

As technology exponentially grows in power and pervasiveness, it compels us to confront profound philosophical, moral, economic, legal, and political questions that will define the future of humanity

Technology optimists and skeptics

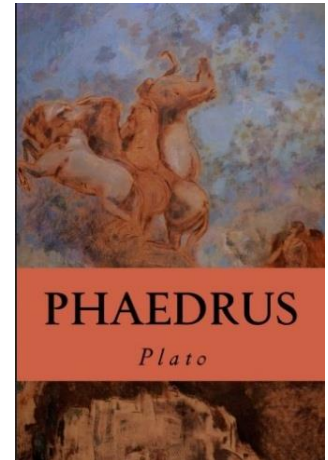
When it comes to technology, there are two opinionated camps:

(1) technological optimism (“this will solve everything”) and

(2) technological skepticism (“this will ruin everything”).



More than 2,000 years ago, Plato dramatized this tension in his dialogue Phaedrus, through the myth of **Theuth** — **the inventor of writing** — *and Thamus, the skeptical king.*



Technology does not work in only way



Theuth —Inventor & Tech Enthusiast

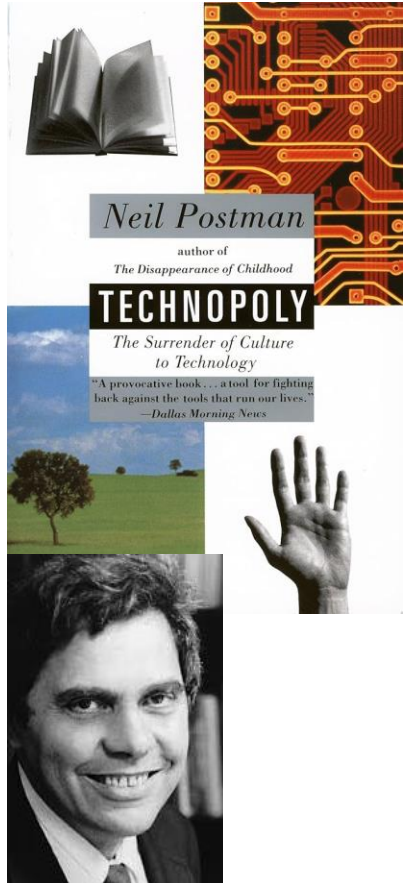
Theuth: “This invention [writing], O King, will make the Egyptians wiser and will improve their memories; for it is an elixir of memory and wisdom.”



Thamus – King, Technology Skeptic

“Theuth, my paragon of inventors, the discoverer of an art is not the best judge of the good or harm which will accrue to those who practice it. [...] Your invention will produce forgetfulness in the minds of those who learn to use it, because they will not practice their memory. [...] They will be hearers of many things and will have learned nothing; they will appear to be omniscient and will generally know nothing; they will be tiresome company, having the show of wisdom without the reality.”

*both of these protagonists had an important insight;
but they were wrong in thinking that technology only
works in a single way (either-or approach)*



Technology Is Neither Good Nor Bad—It's Both

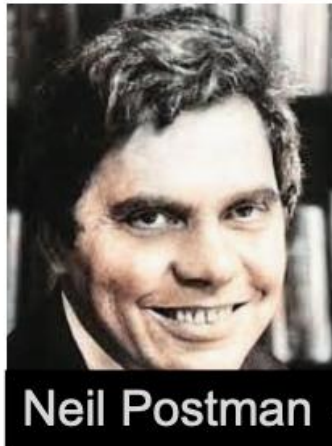


Melvin Kranzberg

Kranzberg's First Law of Technology

*"Technology is neither good nor bad;
nor is it neutral."*

"we shape our tools and thereafter our tools shape us."



Neil Postman

*"Every technology is
both a burden and a blessing;
not either-or, but this-and-that."*



Either/Or versus Both/ And

EITHER/OR (Traditional Approach) **BOTH/AND** (Systems Approach)

Assumes convergent problems

Cogito ergo Sum (I think thus I exist)

Focused on individuality & independence

Science for manipulating nature

Mechanises nature and makes it dead

Eliminates large swathes of knowledge and levels of being

Focuses on quantity and measurables

Assumes divergent problems

Ubuntu Philosophy (I am because we are)

Focused on dynamics & interdependence

Science for Wisdom & Understanding

Envisions nature as a living ecosystem

Recognizes human mind as weak but open-ended and capable of transcending towards higher and higher levels.

Focuses on quality and quantity.

Paradoxical Nature of Technology:

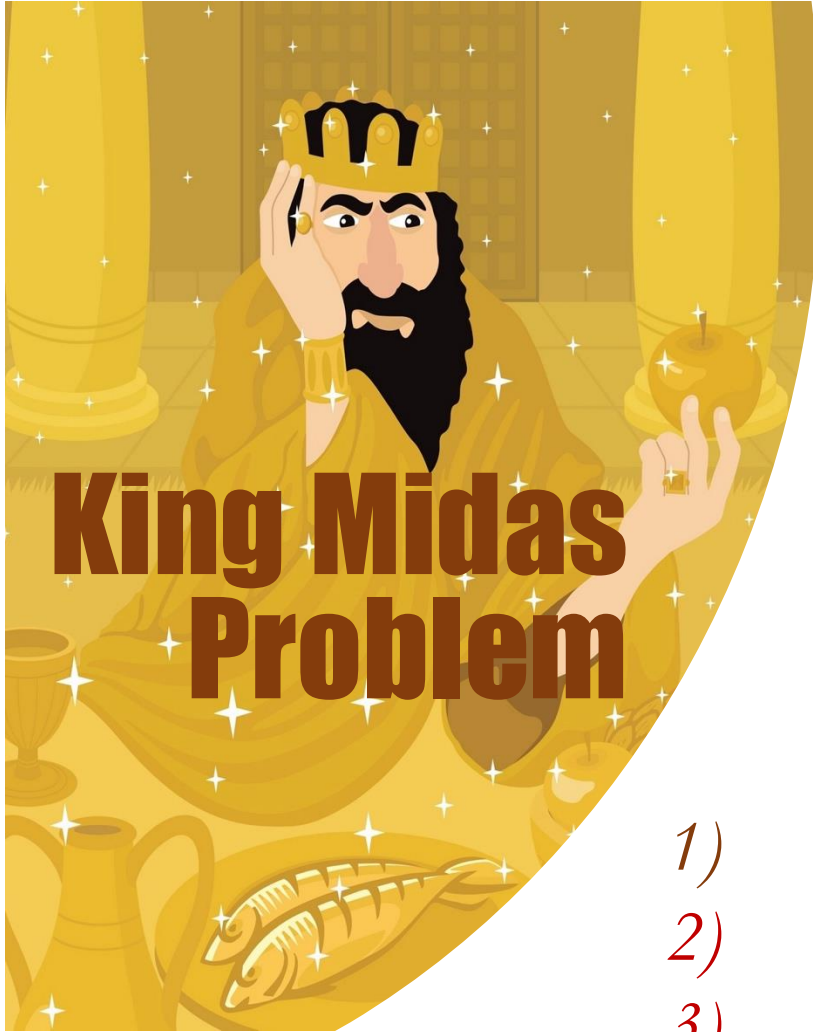
BOTH Blessing **AND** Burden



*For most of the UN SDGs, AI, paradoxically,
can act as **BOTH** an enabler **AND** an inhibitor.*

Vinuesa, Ricardo et al., "The role of artificial intelligence in achieving the Sustainable Development Goals." Nature communications 11, no. 1 (2020): 1-10.

Value Alignment Problem



Suppose we give AI the task of curing cancer “as soon as possible”

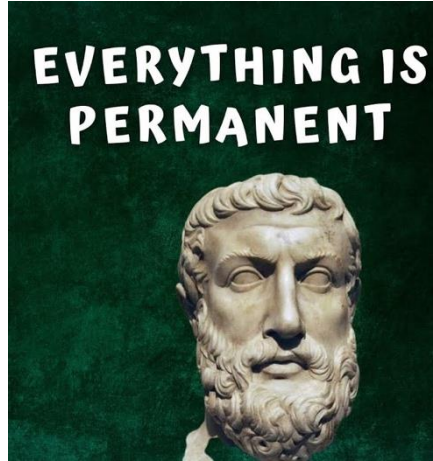


Conventional Common Sense:

- 1) *Something cannot be good or bad simultaneously.*
- 2) *The opposite of something desired must be something undesirable.*
- 3) *If something is good, we should try to have more of it.*

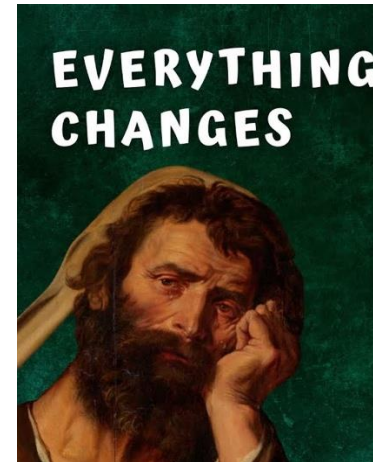
Can a thing and its opposite both be true? **YES**

Change is an illusion



PARMENIDES

No man ever steps in the same river twice, for it's not the same river, and he's not the same man.



HERACLITUS

There is nothing permanent except change

**SO WHICH
ONES OF THESE
ARE TRUE?
AND WHICH
ARE FALSE?**

Similarly, we often find opposing advice dispensed in proverbs:

Proverb: Two heads are better than one. *Opposite: Too many cooks spoil the broth*

Proverb: Tie yourself to the mast. *Opposite: Keep your options open*

Proverb: Actions speak louder than words. *Opposite: The pen is mightier than the sword*

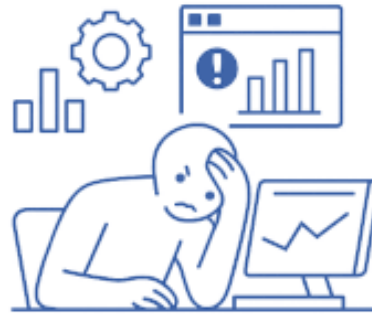
Paradoxes/ Contradictions/ Ironies of Technology

Technology empowers us.
Technology alienates us.

Every technology has a downside, the more powerful a technology, the more it will bite back

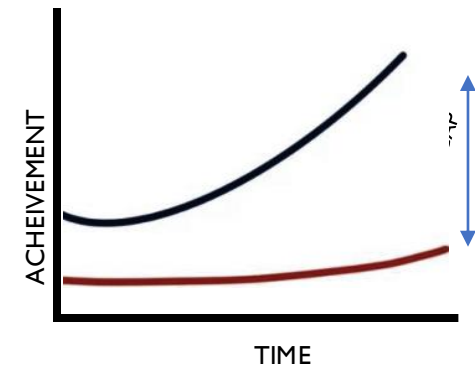
Productivity Contradiction & Irony of Automation

Automation may paradoxically demand more human oversight, increasing cognitive load.

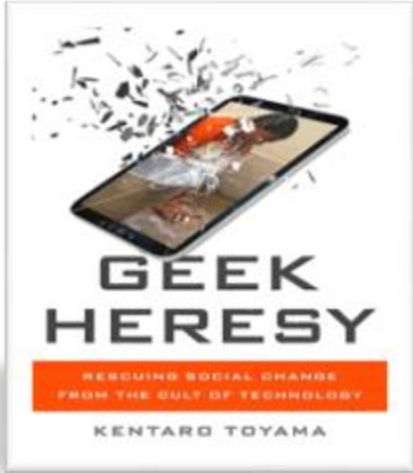


The rich get richer (Matthew Effect)

Those who are rich, more literate, have more capital, or any other privilege, tend to benefit more from technology.



Technology effects need to be balanced



Since technology is inherently an amplifier, it often magnifies existing imbalances rather than resolving them. This makes it imperative to focus on balancing interdependent values—working toward dynamic equilibrium between opposing polarities rather than favoring one side.

To keep technology balanced, we need to balance complementary values within an open society grounded in pluralism and inclusive political processes.

CONFLICTING YET COMPLEMENTARY VALUES:

EFFICIENCY AND EQUITY

Unchecked efficiency can marginalize vulnerable groups; balanced with equity, technology serves all.

Two very different kinds of problems

CONVERGENT PROBLEMS

1. *One correct answer.*
2. *Not dynamic (not complex).*
3. *Often resorts to mechanistic modeling.*
4. *Admit mechanical or algorithmic solutions; amenable to logic and discursive reason.*
5. **“Dead” problems:** *can be solved once and for all.*
6. *Do not require continuous use of wisdom or creativity.*
7. *Arise where there is no life, consciousness, or self-awareness (e.g., abstract domains like chess or mathematics).*



The greatest challenges we face—such as climate change, education, ethics, and justice—are divergent problems: they (1) evolve continuously over time, (2) involve deep conflicts between human values and interests, and (3) demand not just technical solutions but wisdom, dialogue, and a higher level of consciousness that can transcend instinctive reactions and reconcile opposing forces.

DIVERGENT PROBLEMS

1. *No single solution.*
2. *Dynamic (and complex)*
3. *Require dynamic balancing of opposites*
4. **Open problems:** *cannot be solved once and for all. Unique and contingent (different individuals and societies must find their own answers).*
5. *Require continuous use of wisdom and creativity*
6. *Cannot have final solutions, but with higher awareness, opposites can be transcended and harmonized (e.g., liberty, equality, fraternity).*
7. *Education is a divergent problem par excellence.*
8. *Requires dialectical (or dialogical) thinking.*
9. *Every society has to deal with them afresh.*



In divergent problems, no permanent solutions

“The chief cause of problems is solutions.”—Sevareid



“No problem stays solved in a dynamic environment.”—Russell Ackoff



Paradoxes of Internet Architecture

Srinivasan Keshav
University of Waterloo

The architectural elements of the Internet that led to its great success are now, paradoxically, the source of its severest problems. For example, the use of autonomous systems to distribute governance has allowed rapid growth and scaling but has made the network unmanageable and unable to provide end-to-end quality of service. This article examines this and other key design elements of Internet

Interventions that lead to success in the short-run can paradoxically cause severe problems in the long run

For example, in resource allocation, is Centralization a solution?

Decentralization?

We need to harmonize these two “solutions” by combining them in a BOTH-AND manner dynamically as per the context.

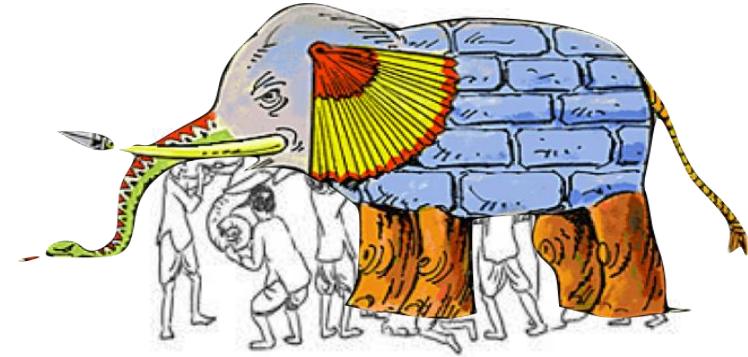
Complexity and Multiplexity

Procrustean Fallacy

Stretching or Constricting
Reality to Fit the Model



Six blind men and the elephant



When dealing with a complex phenomena such as human health and education, it is wise to adopt a “both-and” *multiplex mindset*, instead of a Procrustean reductionist “**either-or**” *mindset*.

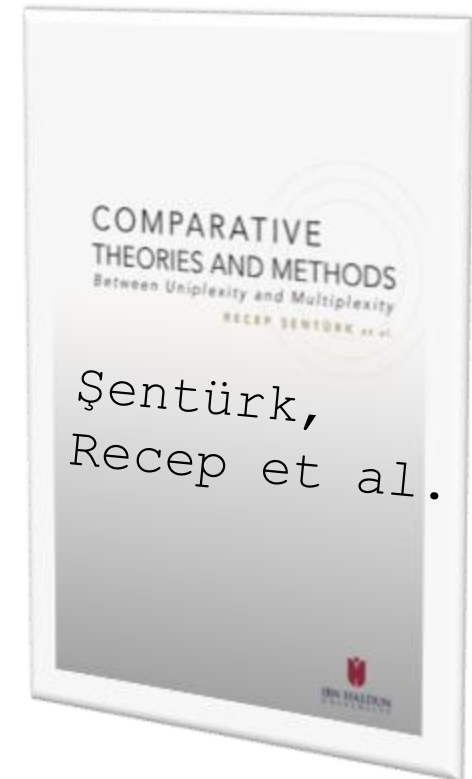
Multiplexity is the science of the one and the many, which fundamentally underlies reality. By admitting different levels of truth, it can be pluralistic without falling into relativism.

Argument for Multiplex Both-And Thinking

Multiplexity is a translation of the Arabic term “marātib”, which literally means hierarchy or levels.

Multiplexity provides a multi-layered understanding of reality, knowledge, and truth, and language.

Supports Both-And Thinking instead of Either-or Thinking.



*multiplex
ontology*

LEVELS OF EXISTENCE
(MARATIB AL-WUJUD)



*multiplex
epistemology*

LEVELS OF KNOWLEDGE
(MARATIB AL-'ULUM)



*multiplex
methodology*

LEVELS OF METHODS
(MARATIB AL-USUL)

Possible ways of doing health science

Dimension	Nomothetic  (Generalizing)	Idiographic  (Particularizing)	Multiplex  (Integrative, Layered)
<i>Core Aim</i>			
<i>Ontology</i>			
<i>Methodology</i>			
<i>View of Human Being</i>			
<i>Application Focus</i>			
<i>Epistemic Lens</i>			
<i>Health Example</i>			
			wellness models

The Opposable Mind/ Integrative Thinking



"The test of a first-rate intelligence is the ability to hold two opposed ideas in mind at the same time and still retain the ability to function."

F. Scott Fitzgerald



"Brilliant and utterly convincing." —Malcolm Gladwell

THE *Opposable* MIND

How Successful Leaders Win Through Integrative Thinking



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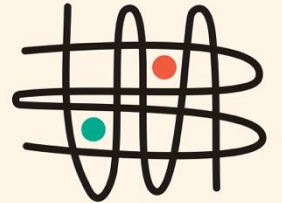
DIAMINDS

Decoding the Mental Habits of
SUCCESSFUL THINKERS

HARVARD BUSINESS REVIEW PRESS

**BOTH/AND
THINKING**

Embracing Creative Tensions
to Solve Your Toughest Problems



WENDY K. SMITH
MARIANNE W. LEWIS

WITH A FOREWORD BY AMY C. EDMONDSON

Using technology with wisdom

“We are now far too clever to be able to survive without wisdom.”—EF Schumacher.

CONTEXTUAL INTELLIGENCE



Wisdom is Contextual Intelligence

BALANCING OPPOSITES



Iqbal's Khudi as marshalling one's diversities

Multiplexity aligns with the dynamic Iqbalian concept of Khudi and Wholeness-Making (Kamāl), where one focuses on unifying multiplicities under the pursuit of ideals and objectives.



(Dr Rafiuddin, “Ideology of the Future”)

“Imagine a coach being pulled by a dozen horses each of which is free to move in any direction if likes. A coach of this kind will move sometimes towards the right and at other times towards the left and will occasionally come to a stop. Its movement will be fitful and haphazard.

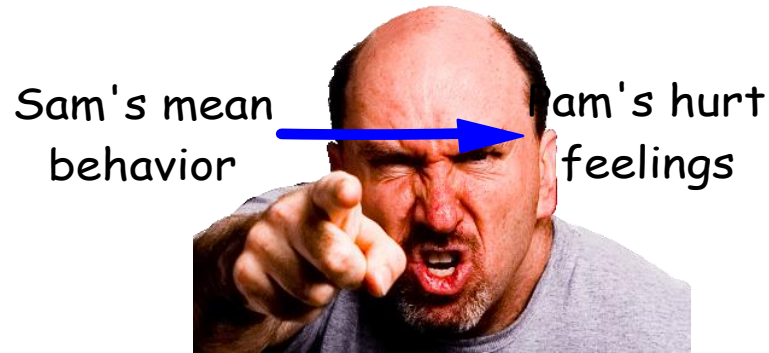
This happens if there is no driver inside the coach to direct and control the horses. If, on the other hand, the coach happens to be moving swiftly and smoothly in a definite direction, turning the corners and bends of its path easily and confidently, it will be right to conclude that there is a driver inside the coach who directs and controls the horses and keeps each of them in check to assure the swift movement of the coach in the direction of his own choice.

The animal is like driverless coach. [...] It cannot check, oppose or limit the satisfaction of any of its instinct for the sake of a higher and, indeed it has no higher end to pursue. [...] It is always the case of one instinct opposing another, the stronger taking the place of the weaker and the weaker yielding automatically to the force of the stronger.

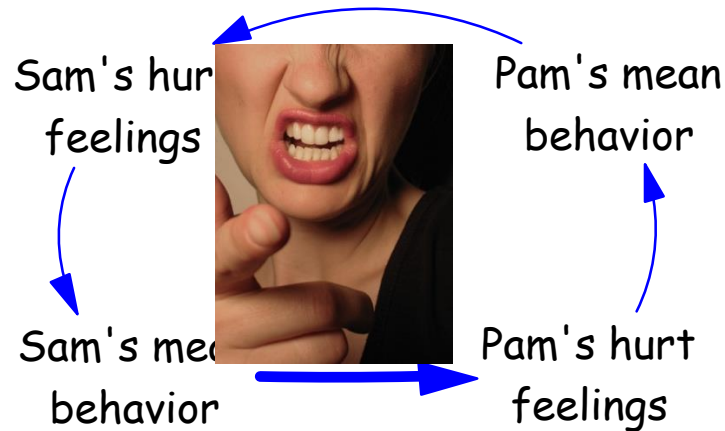
Such is not the case with man whose personality is like a coach which is being controlled by a driver.”

Systemic Thinking

“Systems are perfectly designed to achieve the results they are currently achieving.” —Edward Deming



Linear Causality



***Non-Linear or
Systemic Causality***

“If you are not aware of how you are part of the problem, you can’t be part of the solution.” —Bill Torbert

Critical Complexity

“Human beings are highly predictable, as physico-chemical systems, less predictable as living bodies, much less so as conscious beings and hardly at all as self-aware persons.”—E. F. Schumacher



Layered Reality & Limited Controllability

Humans are both physical and metaphysical, partly deterministic and partly free-willed.

- Predictable in part, but irreducible to mechanistic control.
- Overreliance on prediction results in dehumanization.



Plural Ways of Knowing

Multiple epistemologies offer complementary insights into layered reality.

- Different phenomena require different methods—chosen according to adequacy.
- No single method or model can grasp complex systems or predict and control it fully.



Context-Dependent, Reflexive, and Contingent

Complex systems shift with context and resist fixed predictions.

- Models must account for feedback loops and evolving conditions.
- Ignoring contingency risks distorting futures and reinforcing bias.

Complementary Opposites: Becoming Wholistic

Left Hemisphere



The '**Emissary**' is analytical, detail-focused, and prefers linear, mechanistic view of the world



Inclination towards **narrowing down**, categorising, and seeking control (*while useful, can lead to a reductive understanding of complex, interconnected problems*)



Right Hemisphere



The '**Master**' embodies a holistic, integrative mode of thinking

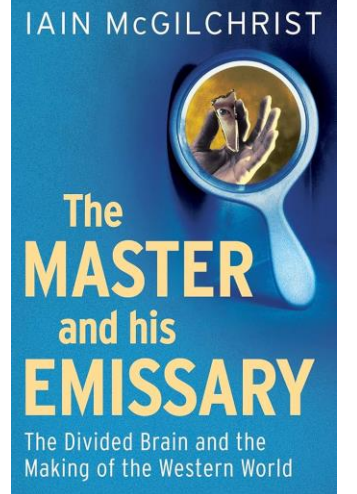
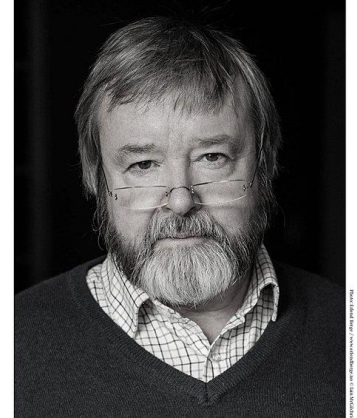


"Opens up to a possibility"

"Understands uniqueness"



Perceives the **world in its fullness**, appreciating the interconnectedness and complexity of life - where empathy, nuance, and the ability to hold multiple perspectives coexist



Here are some polarities where two complementary "opposites" combine to form a unity:

**POLARITIES
IN A
SINGLE UNIT**



- 1) Inhale AND Exhale
- 2) Activity AND Rest
- 3) Spirit AND Form
- 4) Quality AND Quantity
- 5) Teaching AND Research

A Polarity-Based BOTH/AND Multiplex Mindset

Greater Purpose Statement (GPS)

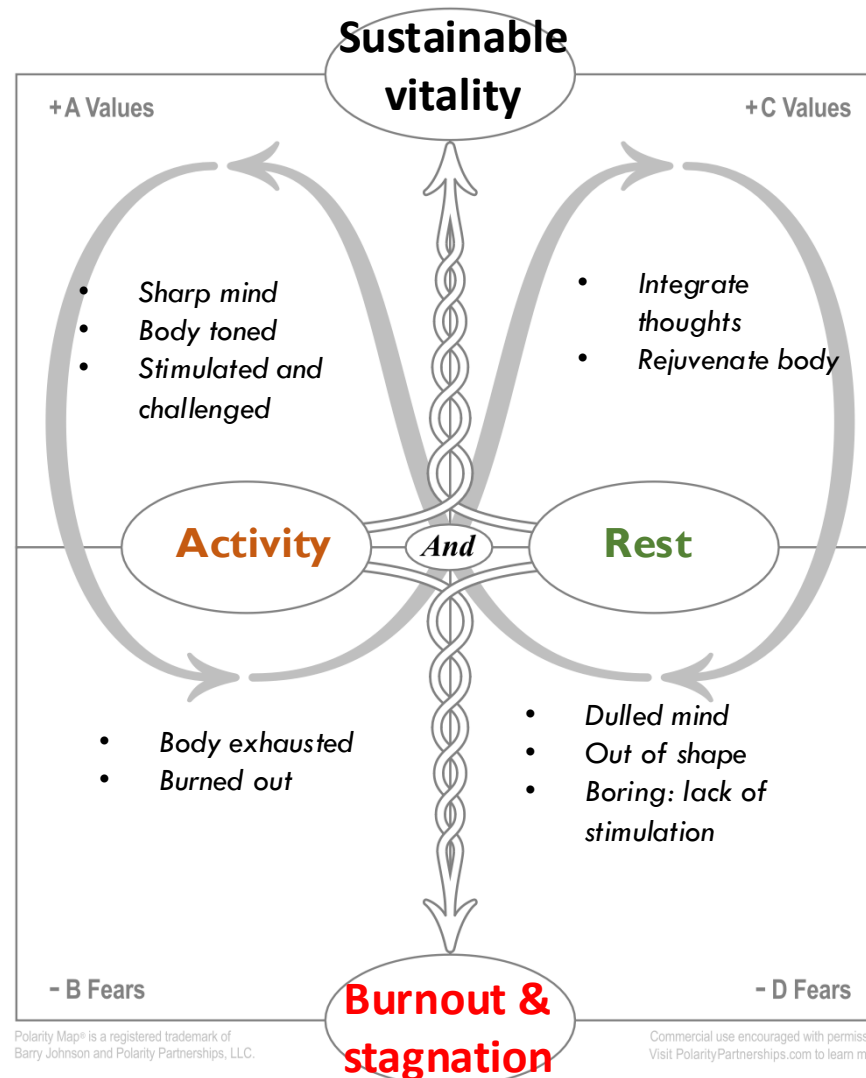
what we hope to achieve through the synergy of the two opposing poles. This is the WIN-WIN situation in which we leverage both the interdependent values.

+A positive results ..

what will be the good results if we do a good job of Pole 1.

-B negative results ..

what would happen if we overfocus on Pole 1 to the neglect of Pole 2 (we will have the opposite of the plus points of Pole 2).



+C positive results ..

what will be the good results if we do a good job of Pole 1.

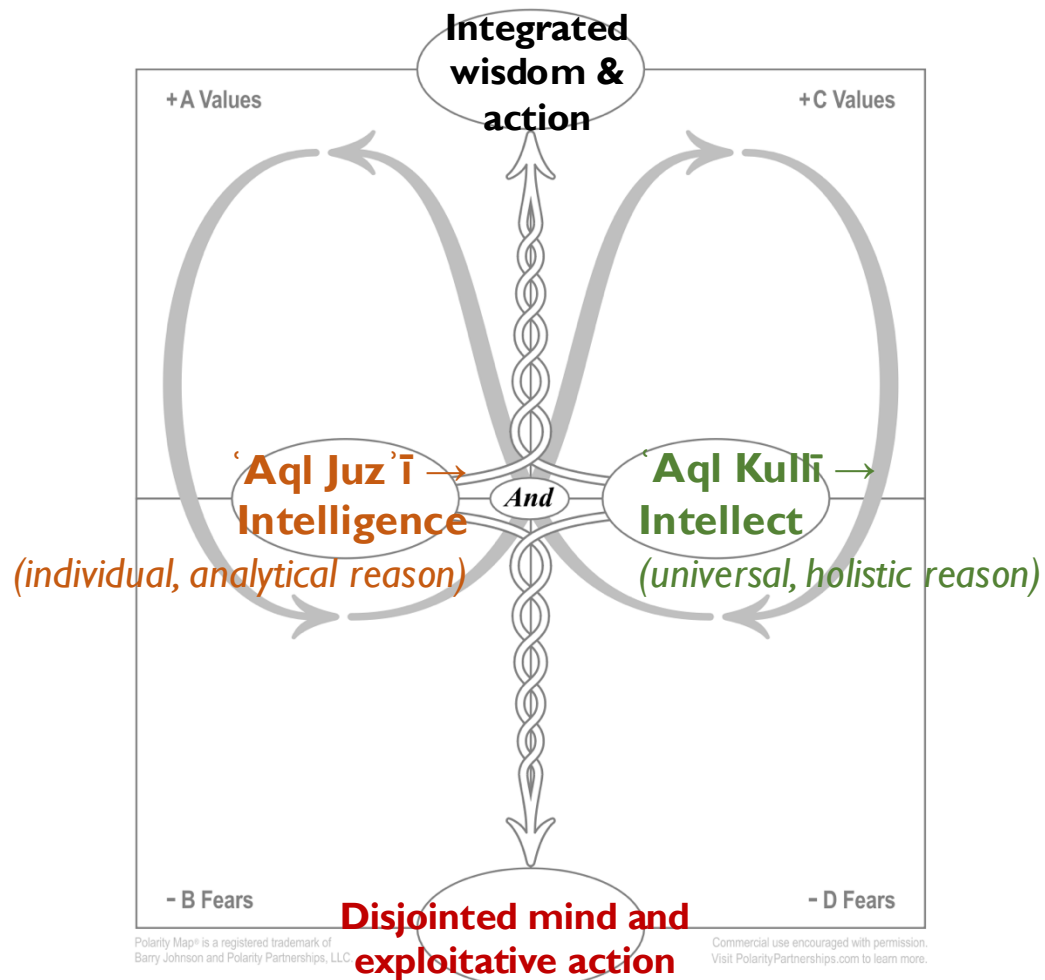
-D negative results ..

what would happen if we overfocus on Pole 2 to the neglect of Pole 1 (we will have the opposite of the plus points of Pole 1).

Greatest Fear

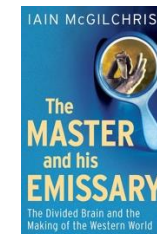
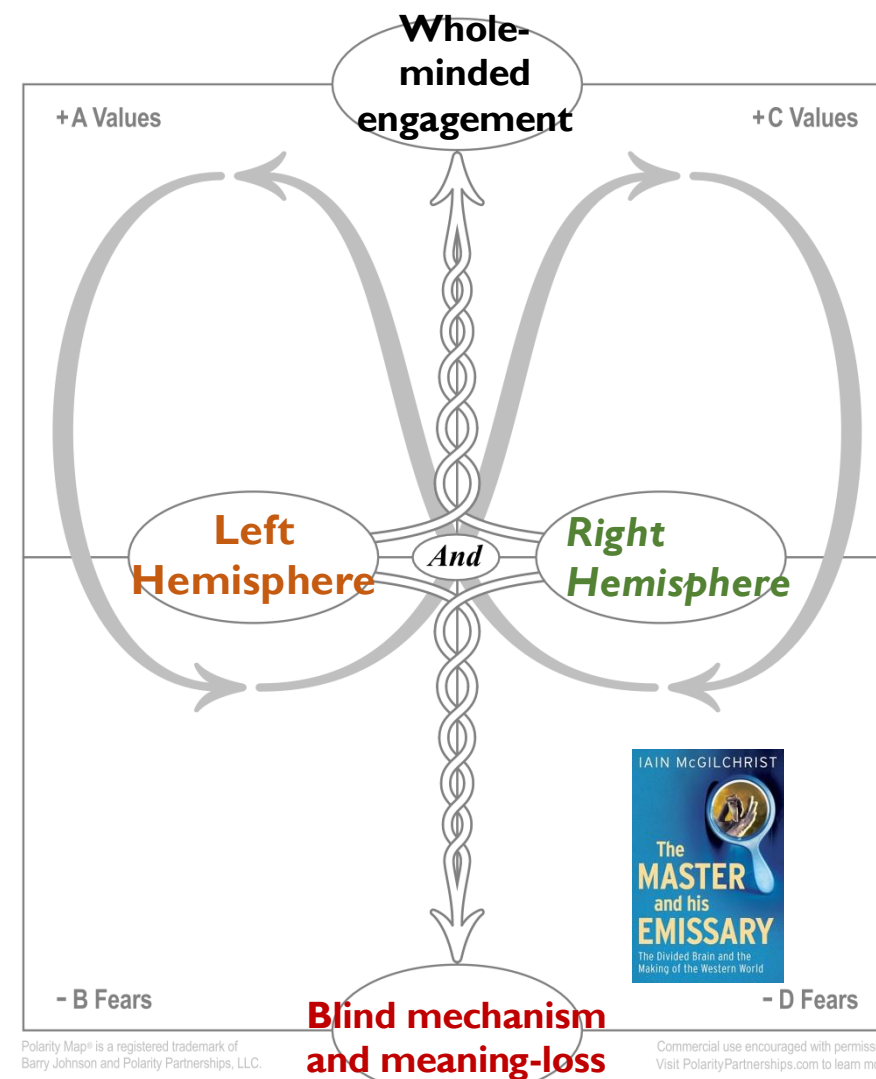
what would happen if we end up on the downsides of both the poles and end up with a LOSE-LOSE situation.

Other Polarity (where universal intellect must lead)

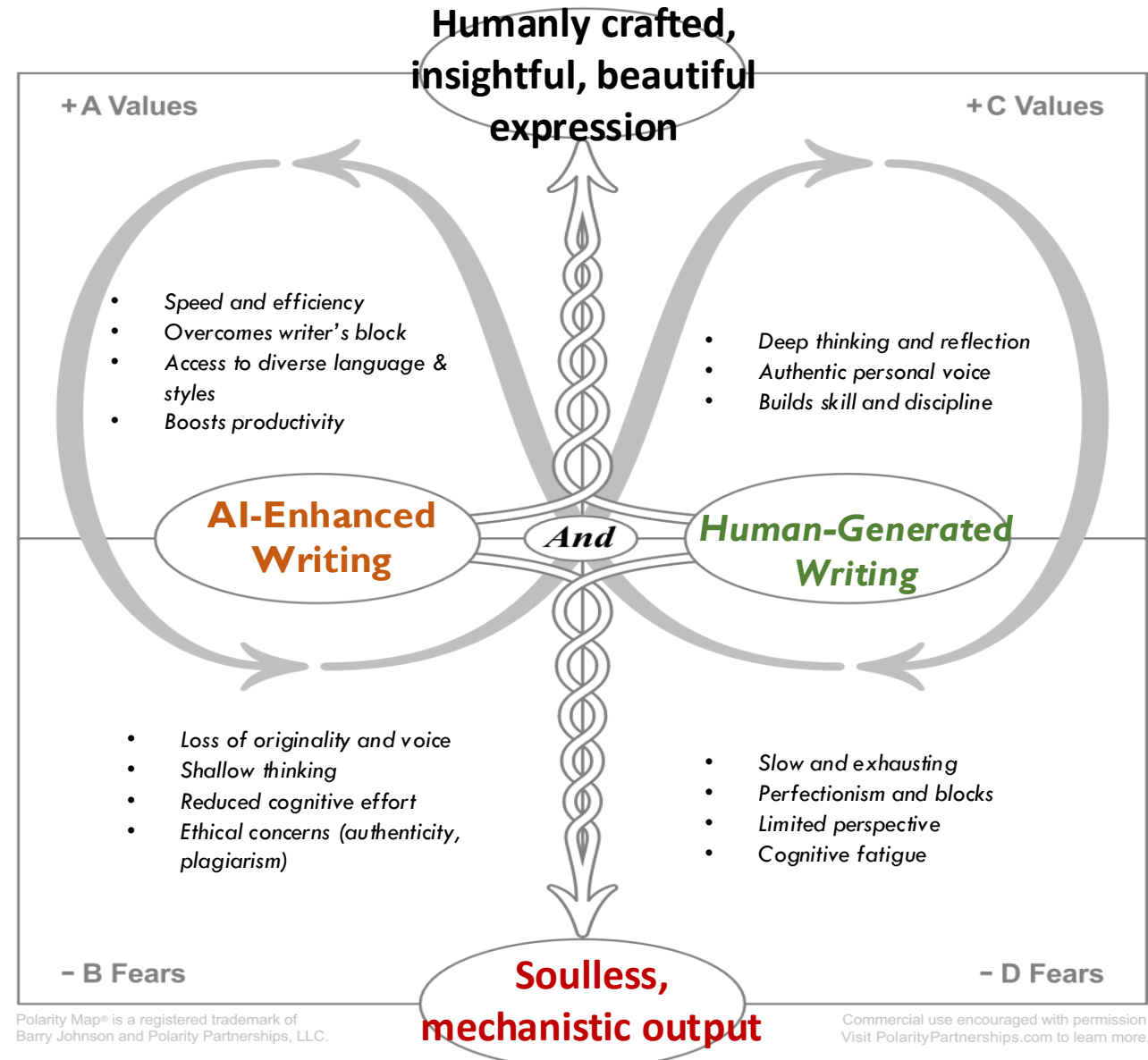
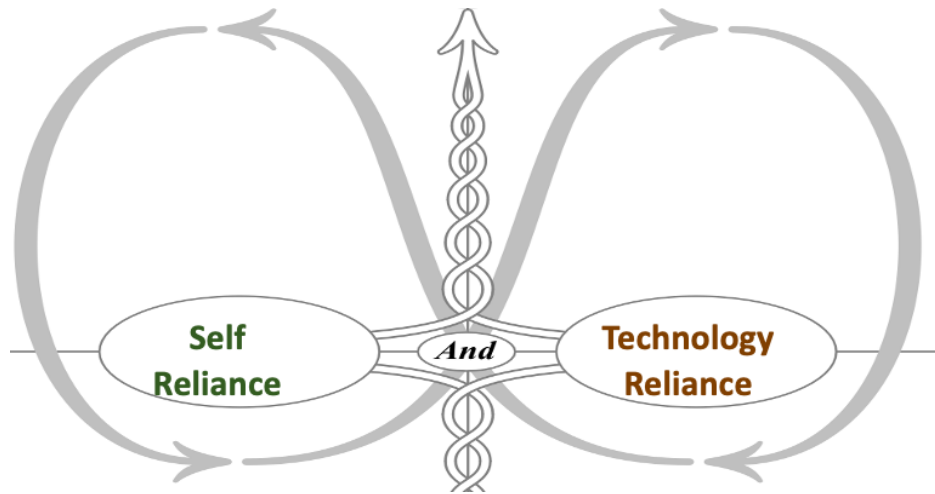


علم را بر تن زنی مارے بود
علم را بر دل زنی یارے بود

Fling it on the body, and knowledge becomes a serpent;
Fling it on the heart, and it becomes a friend.



Using AI to enhance human capabilities



Multiplex Systemics = OR with AND

Genius of Or with And

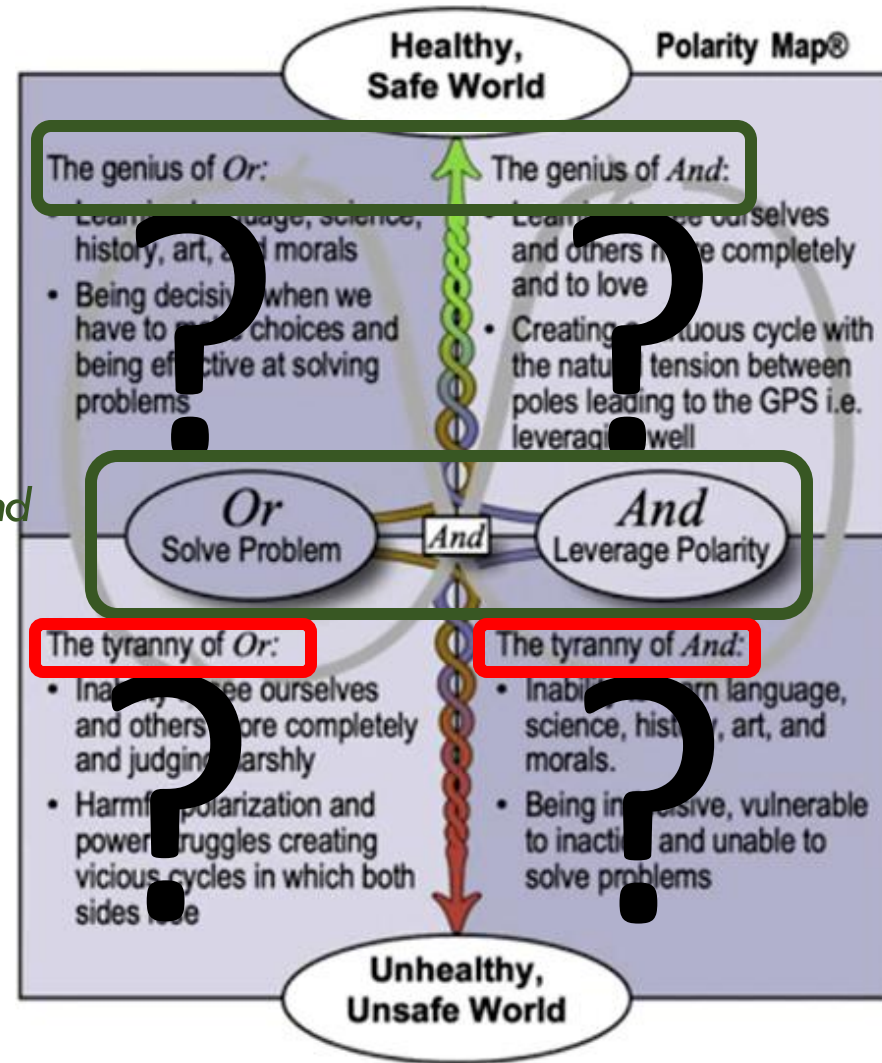
Action Steps (Genius of Or)

- Teach (convergent) problem solving

(We need both EITHER/OR and BOTH/AND)

Early Warnings (Tyranny of Or)

- Increased power struggles
- Increased identification of the opposition as “evil”
- Comments like, “You are either with me or against me.”



Action Steps (Genius of And)

- Teach everyone to identify and leverage polarities
- Supplement “either/or” thinking with “both/and” thinking when useful
- Listen to others’ stories with the desire to see them more completely

Early Warnings (Tyranny of And)

- Decreased agreement on what is right or wrong (relativism)
- Increased complaints about indecisiveness

Summary of Main Points

In this talk, I have articulated the basis of a holistic philosophy of technology—one that situates technology within a multi-layered philosophical worldview based on critical complexity and on polarity management and wholeness-making.



Multiplexity – Multiple interrelated layers; both/and logic; dialectical unity.



Systemics – Interconnections, dynamic relationships, feedback.



Technology – Affects and shapes human and social ontology, not merely a tool.



Whole Making (Developing Kamāl) – Unifying Opposites with Polarity management



Multiplex Systemics = OR with AND; the need for dynamic balance of both.