

Reconciling Perspectives in Futures Research and Systems Thinking

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Nov 28, 2012, at University of Turku

Current research



Open source, private source: foundations
An excerpt from a forthcoming dissertation titled
"Open source with private source: coevolving architectures, styles
and subworlds in business"

David Ing
Aalto University
Department of Industrial Engineering and Management
Arctic Workshop, November 15, 2012



Rethinking Systems Thinking:
Learning and coevolving with the world

David Ing
President, International Society for the Systems Sciences
July 16, 2012, at San Jose State University



Is that affordance essential?
Pathology in service systems and redesigns for
sustainability

David Ing
Aalto University
July 24, 2012, Human Side of Service Engineering



- Open source with private source:
coevolving architectures, styles and subworlds in business
- Ph.D. Dissertation, monograph manuscript by 1Q2013
 - Supervisor: Eila Jarvenpaa
 - Inductive study of 9 cases, multiparadigm inquiry (3 perspectives)

Rethinking Systems Thinking: Learning and coevolving with the world

- Plenary presentation, International Society for the Systems Sciences, San Jose, CA, July 2012
- To be published in *General Systems Yearbook (Systems Research and Behavioral Science 2013, #5)*.

Is that affordance essential? Pathology in service systems and redesigns for sustainability

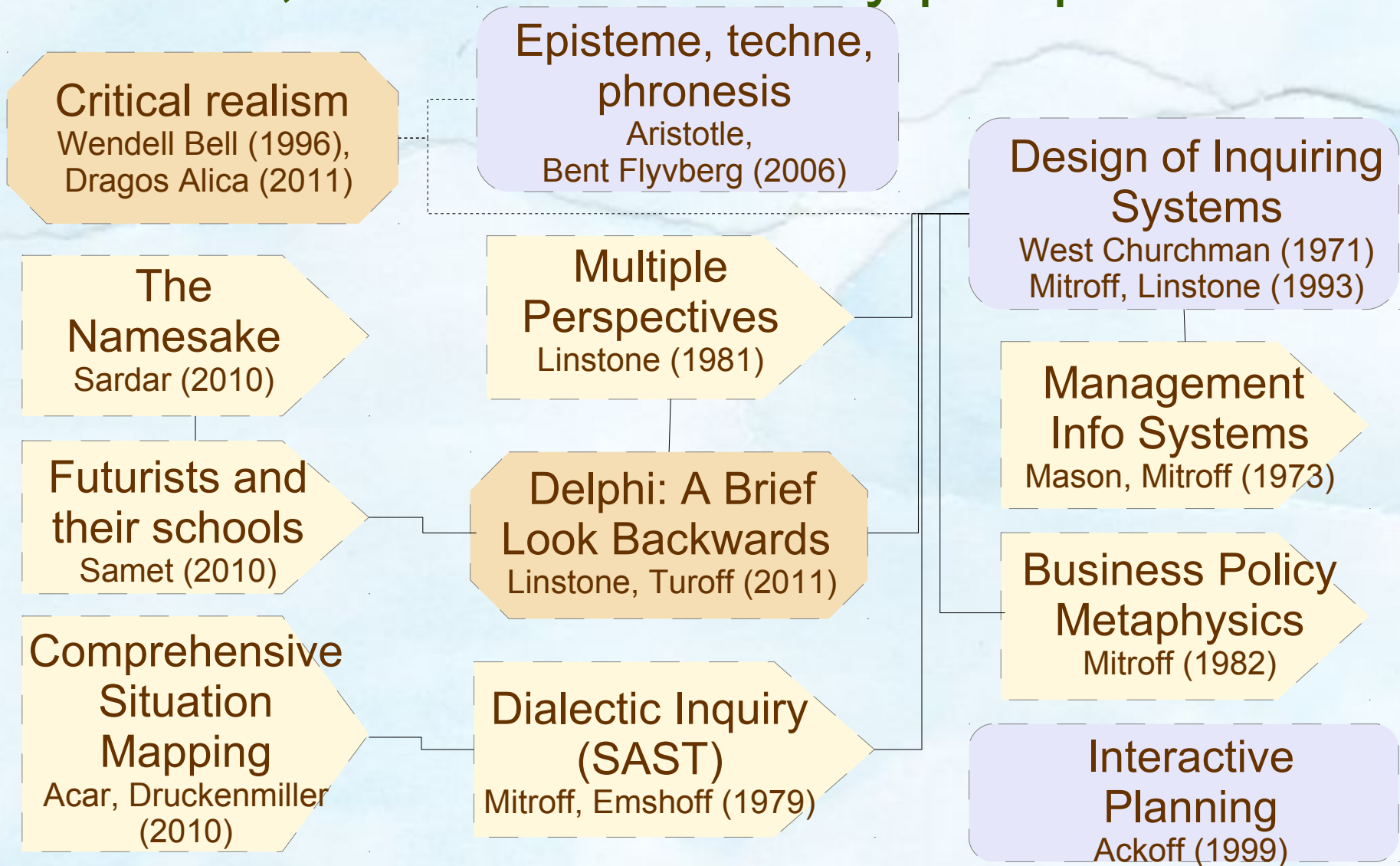
- Presentation outline at the Human Side of Service Engineering, San Francisco, July 2012
- Further development for ISSS 2013, Hai Phong City, Vietnam

Next?

Turbulent environments and inquiring systems in the era of mediated social interactions?

- Dialogue, dialectic, meaning?
- Artifacts, boundary objects, identity?

Based on the prescribed literature in futures research, how do I define my perspective?



Positivism → Post-positivism → Critical realism

Positivism, defining features	Post-positivism	Critical realism
1 A focus on science as a product, a linguistic or numerical set of statements;	... concentration of science either as an activity or a development history	Science is a body of linguistic or numerical statements about the nature of reality, and also contains an interest in the activities of scientists and the history of science and its institutions
2 A concern with axiomatization, that is, with demonstrating the logical structure and coherence of these statements	...believe that theories do not have “tidy deductive structures”.	Science includes a concern about the logical structure and coherence of these statement and, also, a special concern about their utility in manipulating the world to achieve human goals.
3 An insistence on a least some of these statements being testable, that is, amenable to being verified, confirmed, or falsified by the empirical observation of reality;	... facts alone don't overthrow a theory; ... Facts ... are theory-laden.	Science rests on the assumption that ... how the world really is plays a decisive role in the achievements of science; truth can be known within the limits of human senses and intellect ...
4 The belief that science is markedly cumulative;	... science proceeds by revolutionary jumps.	Science is cumulative to an important degree ...
5 The belief that science is predominantly transcultural;	Scientific knowledge is not culture-free.	Science faces a threat to its validity because of possible cultural biases that can distort the truth.
6 The belief that science rests on specific results that are dissociated from the personality and social position of the investigator;	... scientific results are influenced by the personality and social position of the investigator.	... biases, cultural, personal and social – can be self-consciously guarded against more or less effectively; ... objectivity ... can often be achieved.
7 The belief that science contains theories or research traditions that are largely commensurable;	... even if two theories used the same term, the meaning of the term [is] not necessarily the same.	... theories or research traditions ... generally overlap enough so that some contradictions among them can be noted and critically tested.
8 The belief that science sometimes incorporates new ideas that are discontinuous from old ones;	... new ideas are discontinuous from old ones.	Science incorporates new ideas both by small continuous additions, and ... discontinuous ideas ...
9 The belief that science involves the idea of the unity of science, that there is, underlying the various scientific disciplines, basically one science about one real world (Hacking 1981:2)	... science does not constitute a unity	Science may involve a basic unity of science, whereby the less profound sciences can be reduced to more profound ones, or it may not ...

Source: Wendell Bell, *Foundations of Future Studies: History, Purposes and Knowledge*, Volume 1, 1997 (new version 2003)

Defining systems science(s) → science?

Primary

intellectual virtue:

Episteme

Techné

Phronesis

*Translation /
interpretation:*

Science (viz.
epistemology)

Craft (viz.
technique)

Prudence, common
sense

Type of virtue:

Analytic scientific
knowledge

Technical
knowledge

Practical ethics

Orientation:

Research

Production

Action

Pursuits:

Uncovering
universal truths

Instrumental
rationality towards a
conscious goal

Values in practice
based on judgement
and experience

*Colloquial
description:*

Know why

Know how

**Know when,
know where,
know whom**

Defining systems science(s) → science?

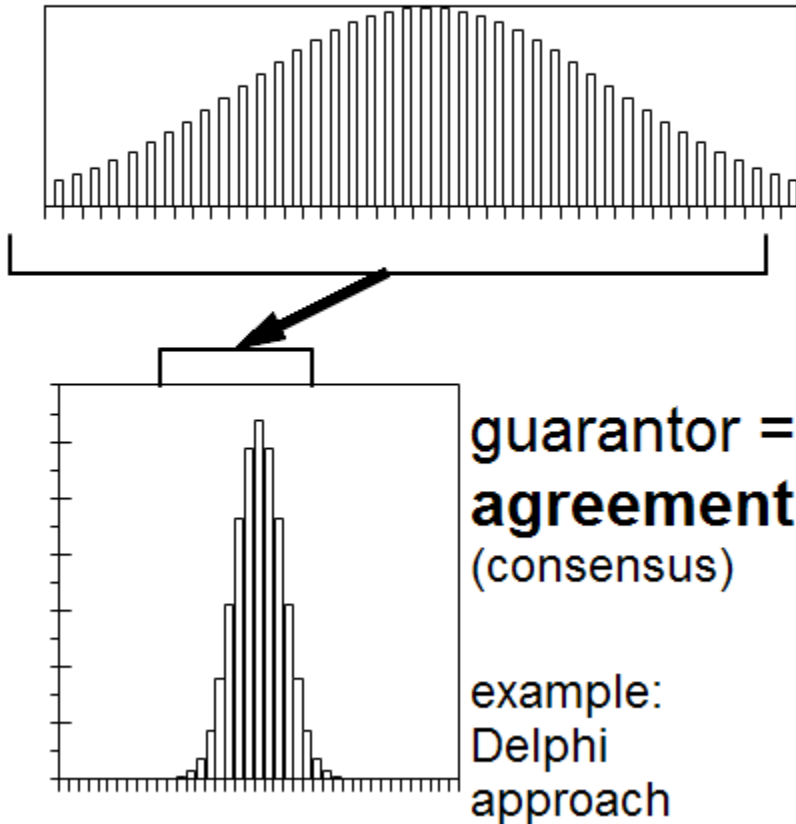
<i>Primary intellectual virtue:</i>	Episteme	Techné	Phronesis
<i>Translation / interpretation:</i>	Science (viz. epistemology)	Craft (viz. technique)	Prudence, common sense
<i>Type of virtue:</i>	Analytic scientific knowledge	Technical knowledge	Practical ethics
<i>Orientation:</i>	Research	Production	Action
<i>Nature:</i>	Universal	Pragmatic	Pragmatic
	Invariable (in time and space)	Variable (in time and space)	Variable (in time and space)
	Context-independent	Context-dependent	Context-dependent
<i>Pursuits:</i>	Uncovering universal truths	Instrumental rationality towards a conscious goal	Values in practice based on judgement and experience
<i>Colloquial description:</i>	Know why	Know how	Know when, know where, know whom

Domains of systems thinking

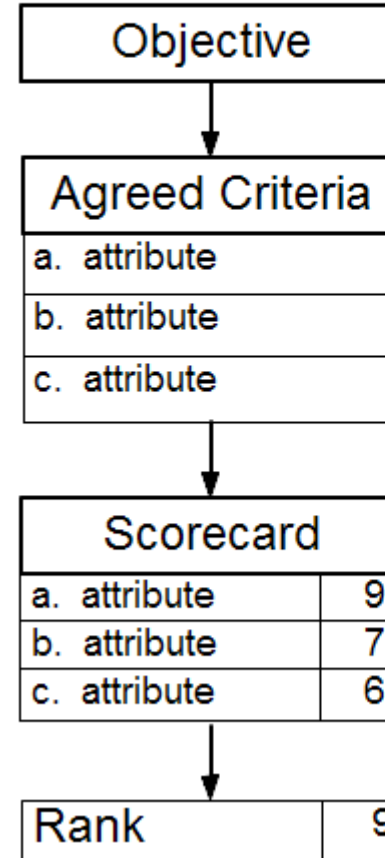
<i>Categories of systems thinking:</i>	Systems theory	Systems methods	Systems practice
<i>Primary intellectual virtue:</i>	Episteme	Techne	Phronesis
<i>Colloquial description:</i>	Know why	Know how	Know when, know where, know whom
<i>Systems thinking domains:</i>	<ul style="list-style-type: none"> • Living systems theory • Hierarchy theory • Open Systems Theory • Viable System Model • Inquiring Systems • Critical Systems Theory • Panarchy and ecological resilience 	<ul style="list-style-type: none"> • System dynamics • Soft Systems Methodology • Interactive Planning • Action Research • Structured Dialogic Design • Strategic Assumption Surfacing and Testing • Search Conference • Deep Dialog 	<ul style="list-style-type: none"> • Language Action Perspective • Appreciative Systems • Evolutionary Development • Systems Intelligence

Design of inquiring systems: Ways of knowing (1, 2)

The first way of knowing Inductive-Consensual IS



The second way of knowing Analytic-Deductive IS

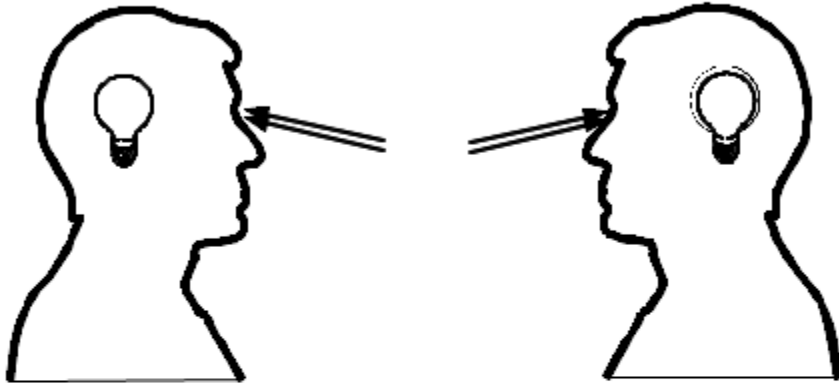


guarantor =
logical consistency
(fact nets)

example: finding the "best man" for the job

Design of inquiring systems: Ways of knowing (3, 4)

The third way of knowing Multiple Realities IS

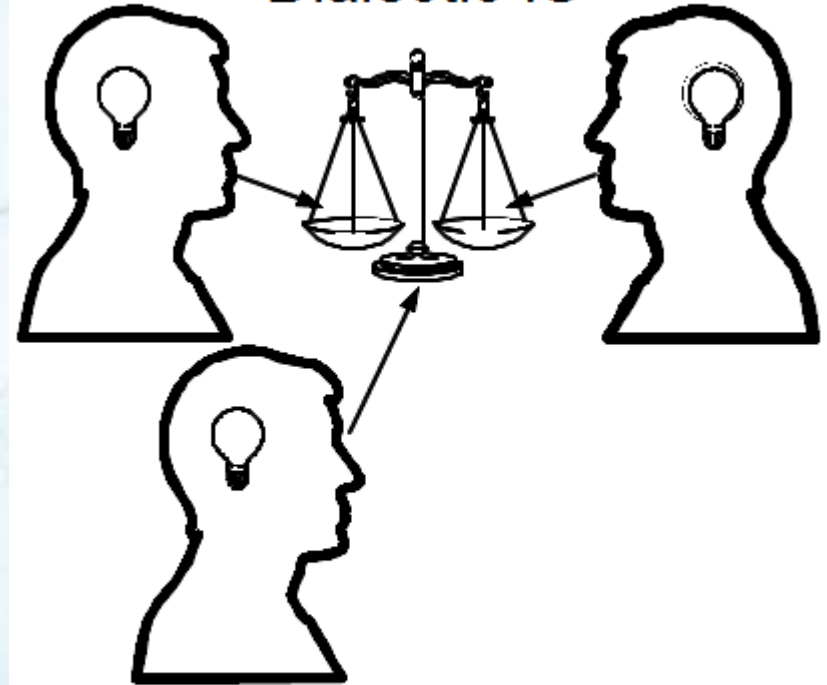


model + data as inseparable whole
For human beings to have experience or gain knowledge about the external world, something must be built into the internal structure of their minds ...

guarantor = (ability to see)
range of views (representations)

example: disciplinary views of the causes of the drug problem

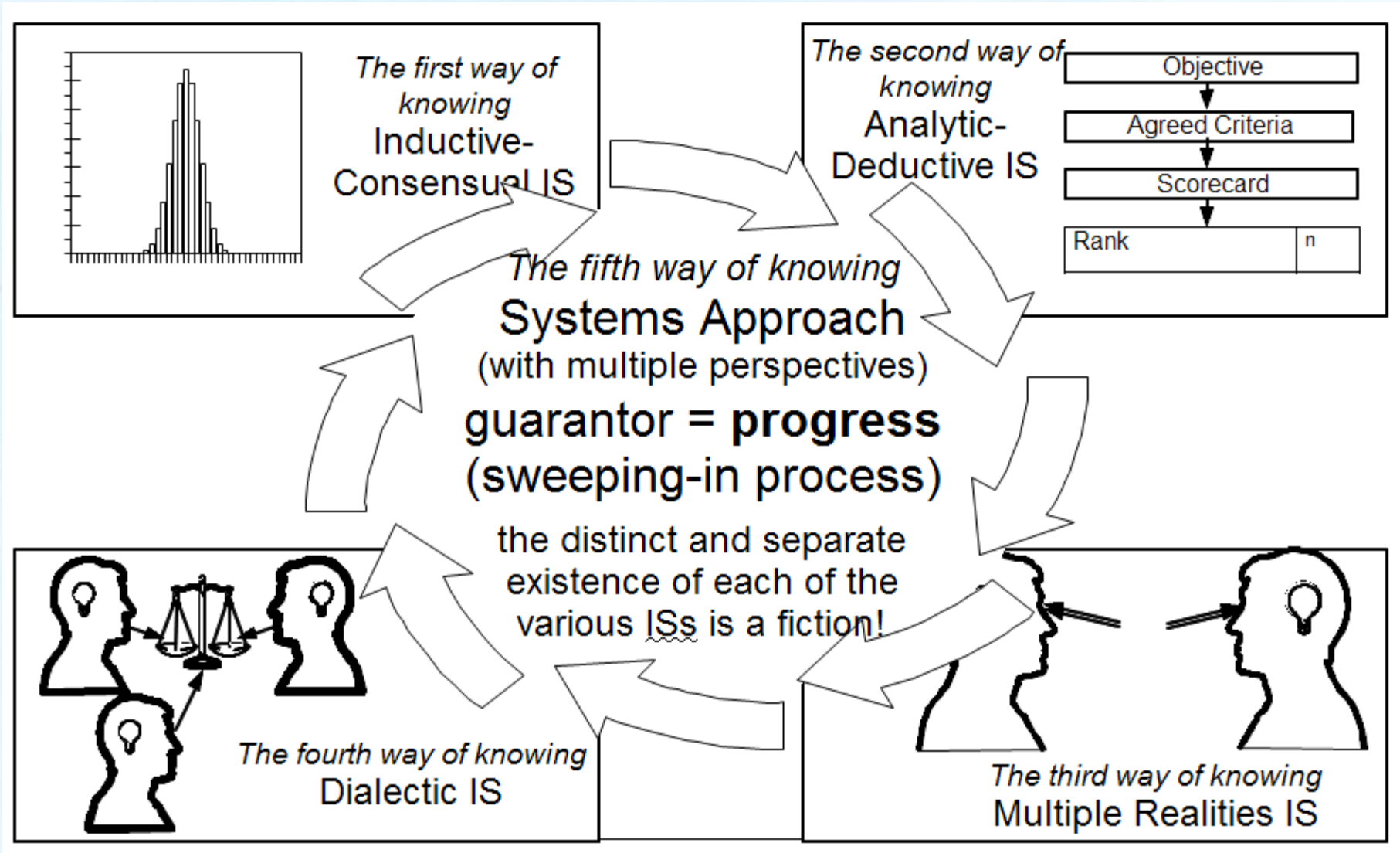
The fourth way of knowing Dialectic IS



guarantor = conflict

example: challenging assumptions of what skid row housing should be

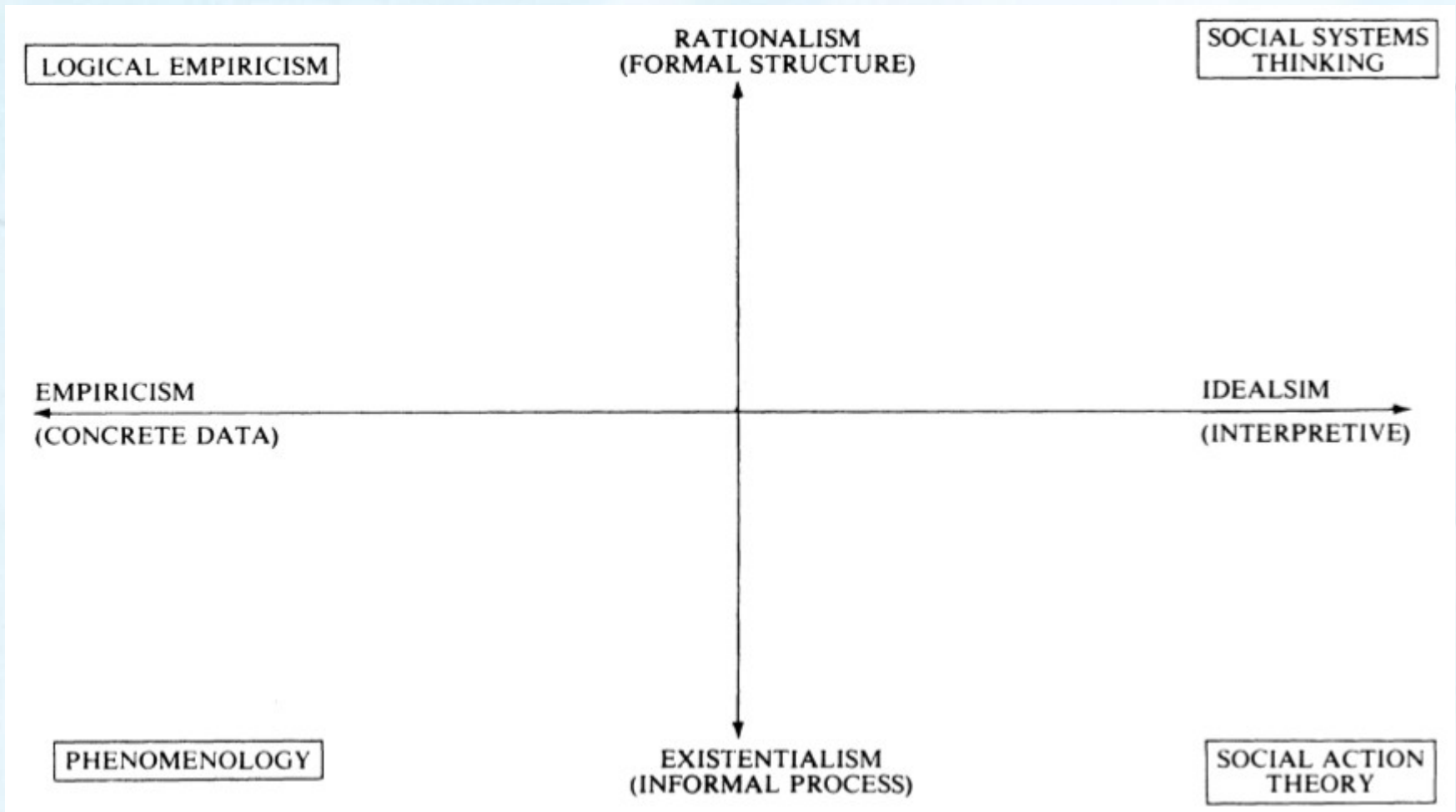
Design of inquiring systems: Ways of knowing (5)



Source: Ian I. Mitroff, and Harold A. Linstone. 1993. *The Unbounded Mind: Breaking the Chains of Traditional Business Thinking*. Oxford U Press.

Business Policy Metaphysics (Mitroff and Mason 1982)

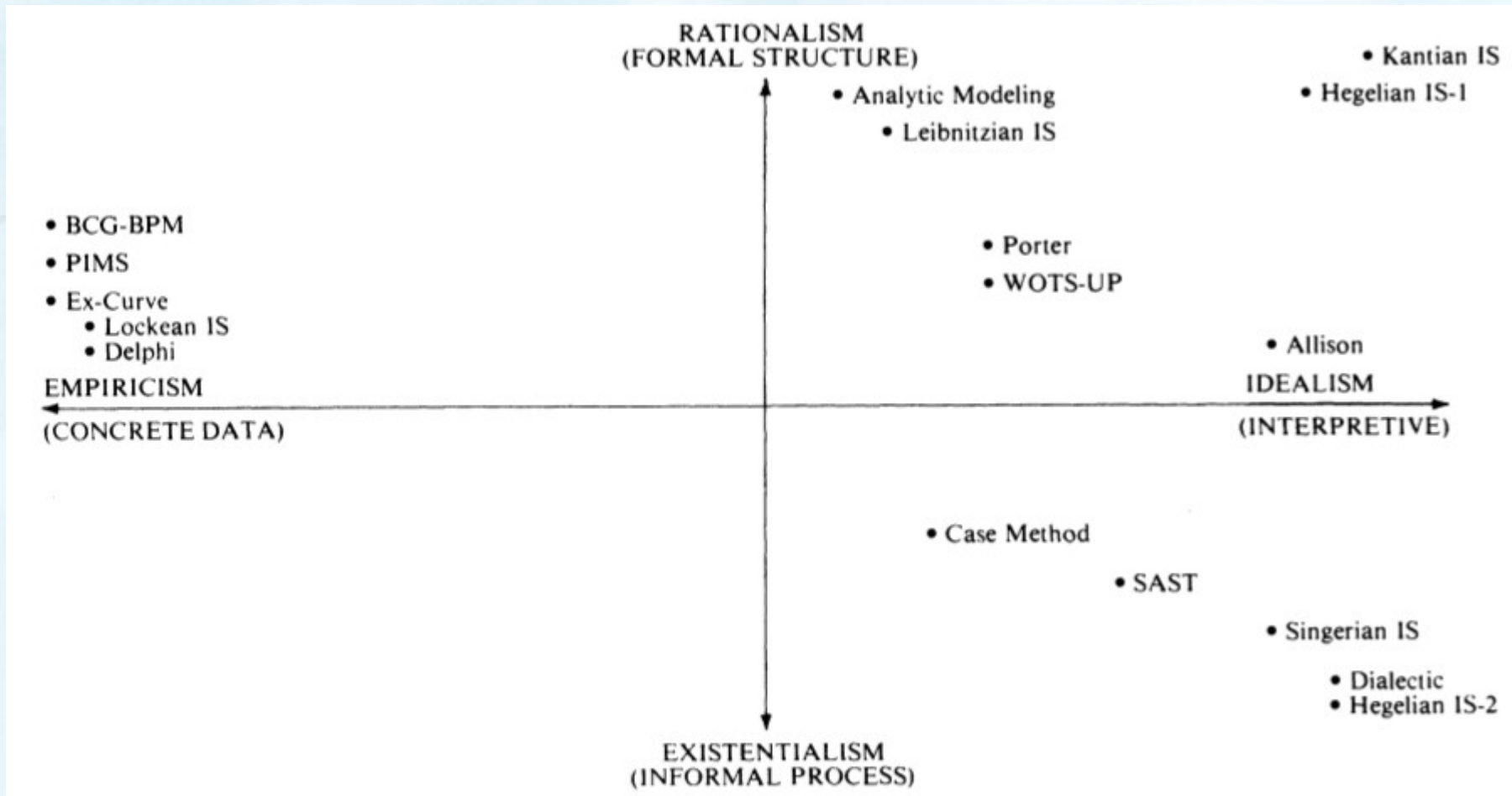
Figure 1: Basic Philosophical Stances



Source: Mitroff, Ian I., and Richard O. Mason. 1982. "Business Policy and Metaphysics: Some Philosophical Considerations." *The Academy of Management Review* 7 (3) (July 1): 361–371. doi:10.2307/257328. <http://www.jstor.org/stable/257328>.

Business Policy Metaphysics (Mitroff and Mason 1982)

Figure 2: Some Approaches to Policy as Applied Metaphysics



Source: Mitroff, Ian I., and Richard O. Mason. 1982. "Business Policy and Metaphysics: Some Philosophical Considerations." *The Academy of Management Review* 7 (3) (July 1): 361–371. doi:10.2307/257328. <http://www.jstor.org/stable/257328>.

The Namesake: Futures; futures studies; futurology; futuristic; foresight

How the Canadian Association for Futures Studies (CAFS) changed into Foresight Canada

1. The field needed (and still needs) a huge dose of conceptual clarification. Even today, many working understandings of serious futures work include, essentially without any serious distinctions, all of these practices—foresight, strategic foresight, forward looking, outlooks, forecasting, strategic planning, long-range planning, technology assessment, technology foresight.
2. ‘Foresight’ implies action in the present, in light of anticipated future states of affairs.
3. ‘Foresight’ seems to be understood by both the lay public and managers.
4. ‘Foresight’ has the problem that it is an infinite practice that includes virtually every human activity from eating cereal for breakfast, to crossing the street, to handling nuclear waste, to . . .
5. Ours is a time of both ontological and epistemological revolution. We are slowly changing our minds about the nature of reality, the earth and ourselves as persons in relationship to both of the above. [Nelson Rubin}

Sardar’s laws of futures studies

1. Futures studies are wicked

Almost all the problems we face nowadays are complex, interconnected, contradictory, located in an uncertain environment and embedded in landscapes that are rapidly changing

2. Futures studies are MAD (Mutually Assured Diversity),

Mutually assured diversity is the proposition that full preservation of our humanity requires that this diversity is assured, that it not only survives but thrives in any desired future, and that future generations mutually recognise and appreciate each others’ diversity.

3. Futures studies are sceptical

... sceptical of simple, one-dimensional solutions to wicked problems as well as of dominant ideas, projections, predictions, forecasts and notions of truth to ensure that the future is not foreclosed and colonised by a single culture. ... directed towards certain ends: opening up pluralistic potentials.

4. Futures studies are futureless

... since we can have no true knowledge of the future, the impact of all futures explorations can only be meaningfully assessed in the present. We can look back on predictions and forecasts and see how right or far off the mark they were. But we cannot assess how right or wrong they actually are from the future itself.

Source: Ziauddin Sardar (2010). “The Namesake: Futures; Futures Studies; Futurology; Futuristic; foresight—What’s in a Name?” *Futures* 42 (3), (April): 177–184. doi:10.1016/j.futures.2009.11.001. <http://dx.doi.org/10.1016/j.futures.2009.11.001>.

Futurists and their schools: A response to Ziauddin Sardar's 'the namesake'

... depending upon the eye of the beholder, futures research has been classified as a social science, a systems science and also an evolutionary science.

The biologist Ludwig von Bertalanffy was the father of general systems theory (1947), and with economist Kenneth Boulding, physiologist Ralph Gerard, and mathematician Anatol Rapoport founded the Society of General Systems Research (1954). The society was renamed the International Society for Systems Science in 1988.

However the evolutionary sciences, such as astronomy, geology, ecology, anthropology and archaeology have an historical evolutionary path, in which a series of events have been interpreted retrospectively into a pattern to provide an explanation of the phenomena.

	Assessment of the number of futures researchers (10 + years)
2.1 Environmental and geosciences (embracing ecosystems, geophysical systems, climate, marine life and wildlife, natural resources, land-use, natural hazards and pollution).	1500–2250
2.2 Infrastructure systems and engineering technology (dealing with hardware such as urban systems, energy systems, transport systems, telecommunications systems, water systems and weapons systems).	2250–3000
2.3 Social, political and economic science (dealing with soft systems such as national and local government, politics, international relations, demographics, economics, justice, crime, sociology, culture, media and religion).	2500–3250
2.4 Human life, mind and information science (dealing with life and mind sciences such as medicine, neuroscience, genomics, biotechnology, education, research, publishing, library science, information and computer systems, artificial intelligence, and transhumanism).	1250–1500
2.5 Business and management science (encompassing sectoral categories such as agribusiness, mining, construction, manufacturing, banking, insurance, distribution, retail tourism and leisure).	7500–10,000
Total	15,000–20,000

Source: Robert H. Samet 2010. "Futurists and Their Schools: A Response to Ziauddin Sardar's 'the Namesake'." *Futures* 42 (8) (October 1): 895–900. doi:10.1016/j.futures.2010.04.026. <http://dx.doi.org/10.1016/j.futures.2010.04.026>.

	Technical (T)	Organizational (O)	Personal (P)
Worldview	Science-technology	Unique group or institutional view	Individual, the self
Objective	Problem solving, product	Action, process, stability	Power, influence, prestige
System focus	Artificial construct	Social	Genetic, psychological
Mode of inquiry	Observation, analysis: data and models	Consensual, adversary bargaining and compromise	Intuition, learning, experience
Ethical basis	Logic, rationality	Justice, fairness	Morality
Planning horizon	Far (low discounting)	Intermediate (moderate discounting)	Short for most (high discounting for most)
Other descriptors	Cause and effect Optimization, cost-benefit analysis Quantification, trade-offs Use of probabilities, averages, statistical analysis, expected value Problem simplified, idealized Need for validation, replicability Conceptualization, theories Uncertainties noted	Agenda (problem of the moment) Satisficing Incremental change Reliance on experts, internal training of practitioners Problem delegated and factored, issues and crisis management Need for standard operating procedures, routinization Reasonableness Uncertainty used for organizational self-preservation	Challenge and response, leaders and followers Ability to cope with only a few alternatives Fear of change Need for beliefs, illusions, misperception of probabilities Hierarchy of individual needs (survival to self-fulfillment) Need to filter out inconsistent images Creativity and vision by the few, improvisation Need for certainty
Criteria for “acceptable risk”	Logical soundness, openness to evaluation	Institutional compatibility, political acceptability, practicality	Risk aversion
Scenario typology	Probable	Preferable	Possible
•Criterion	analysis (reproducible)	value (explicative)	image (plausible)
•Orientation	exploratory (extrapolative)	normative (prescriptive)	visionary
•Mode	structural	participative	perceptual
•Creator	think-tank teams	stakeholders	individuals
Communications	Technical report, briefing	Insider language, outsiders’ assumptions often misperceived	Personality, charisma desirable

Source: Harold A. Linstone, and Murray Turoff. 2011. “Delphi: A Brief Look Backward and Forward.” *Technological Forecasting and Social Change* 78 (9) (November): 1712–1719. doi:10.1016/j.techfore.2010.09.011. <http://dx.doi.org/10.1016/j.techfore.2010.09.011>.

Management Information Systems (with a broader view of knowledge, effectiveness, action, and purpose)

Psychological Type

- (a) Thinking-Sensation
- (b) Thinking-Intuition
- (c) Feeling-Sensation
- (d) Feeling-Intuition

Class of Problems

- (a) Structured
 - (1) Decisions under certainty
 - (2) Decisions under risk
 - (3) Decisions under uncertainty
- (b) Unstructural-"Wicked" Decision

Organizational Context or Organizational Class of Problem

- (a) Strategic planning
- (b) Management control
- (c) Operational control

Method of Evidence Generation and Guarantor of Evidence-Inquiring Systems (IS)

- (a) Lockean IS (Data Based)
- (b) Leibnitzian IS (Model Based)
- (c) Kantian IS (Multiple Models)
- (d) Hegelian IS (Deadly Enemy-Conflicting Models)
- (e) Singerian-Churchmanian IS (Learning Systems)

Modes of Presentation

- (a) Personalistic
 - (1) Drama – Role Plays
 - (2) Art – Graphics
 - (3) One-to-One contact group information
- (b) Impersonalistic
 - (1) Company reports
 - (2) Abstract models – computerized information systems

Source: Richard O. Mason and Ian I. Mitroff. 1973. "A Program for Research on Management Information Systems." Management Science 19 (5) (January 1): 475–487. doi:10.2307/2629445. <http://www.jstor.org/stable/2629445>.

Strategic Assumption Surfacing and Testing

I. ASSUMPTION SPECIFICATION

Original Strategies → Data → Assumptions

II. DIALECTIC PHASE

Counter Strategies ← Data ← Assumption Negation

III. ASSUMPTION INTEGRATION PHASE

Strategy Pool → Data → Assumption Pool

IV. COMPOSITE STRATEGY CREATION

“Best” Strategy ← Data ← Acceptable Assumptions

By working backwards to underlying assumptions, the proposed process ... requires that each strategy contain in addition to supporting data a list of assumptions (i.e., given conditions, events, or attributes that are or must be taken as true) which implicitly underlie the strategy.

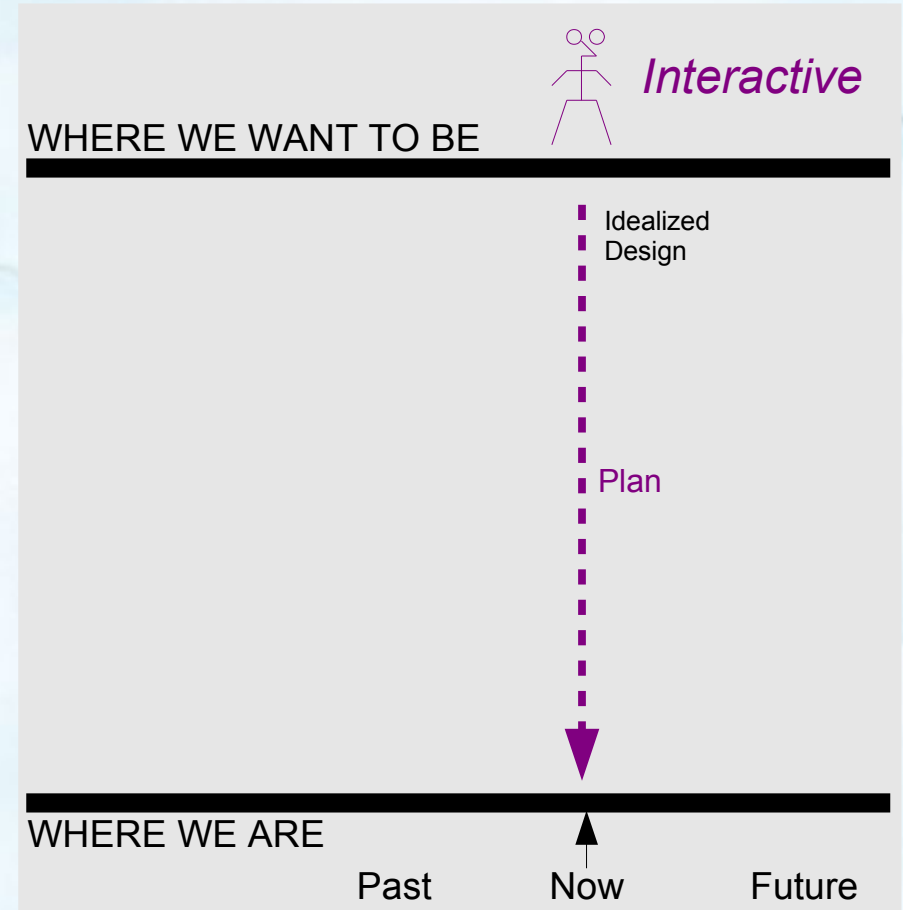
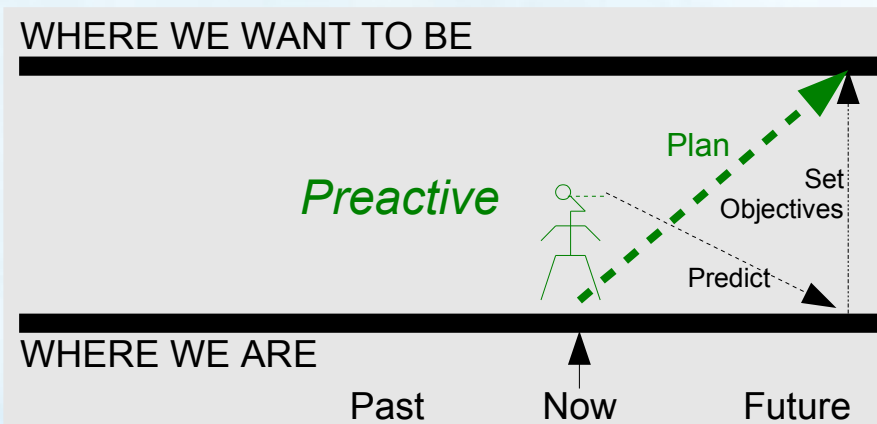
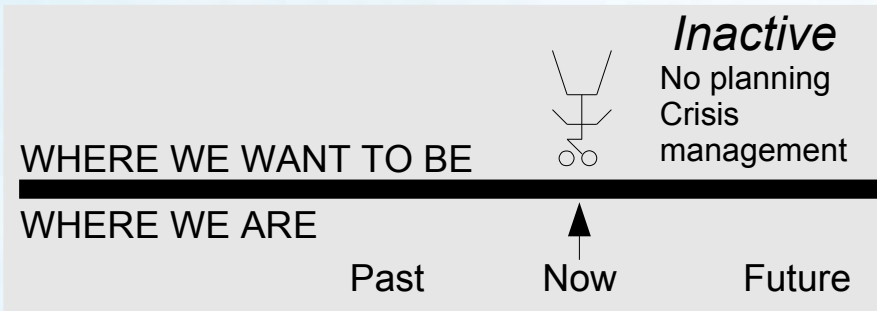
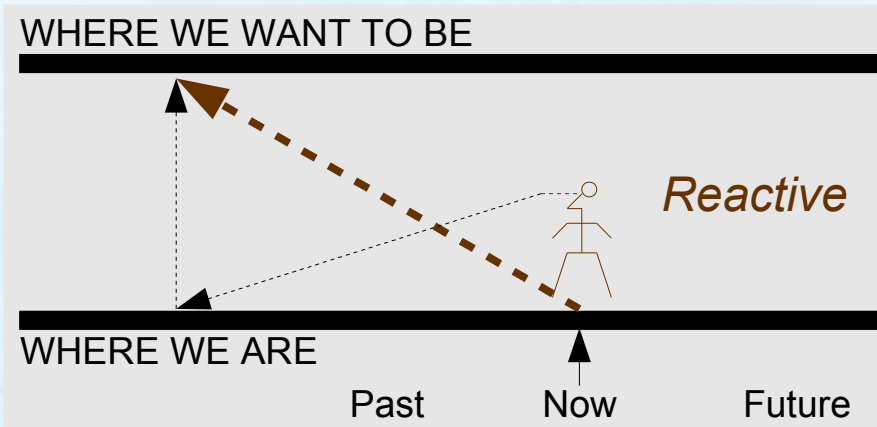
... each assumption previously identified is negated and reformulated as a counter-assumption that negates the spirit of the original statement. If the counter-assumption is implausible, it is dropped. Those counter assumptions which one can conceive of as being true or plausible in some circumstances are then examined individually and collectively to see if they can be used as a basis both for defining and deducing an entirely new strategy.

Instead of trying to resolve differences in strategies directly at the resultant level of strategy, the process concentrates on negotiating an acceptable set of assumptions that the decision makers are prepared to take as given conditions for the formulation of the problem.

... development operates on a more rational basis as defined in traditional problem solving and decision theory terms. The composite set of acceptable assumptions can be used as an explicit foundation upon which the problem can be defined.

Source: Ian I. Mitroff and James R. Emshoff. 1979. "On Strategic Assumption-Making: A Dialectical Approach to Policy and Planning." *The Academy of Management Review* 4 (1) (January): 1. doi:10.2307/257398. <http://dx.doi.org/10.2307/257398>.

Reactive, inactive, preactive, interactive (Ackoff, 1999)



Source: Russell L. Ackoff. 1999. *Re-creating the Corporation: a Design of Organizations for the 21st Century*. Oxford University Press. <http://books.google.ca/books?id=xyIRdiAbpr8C>.