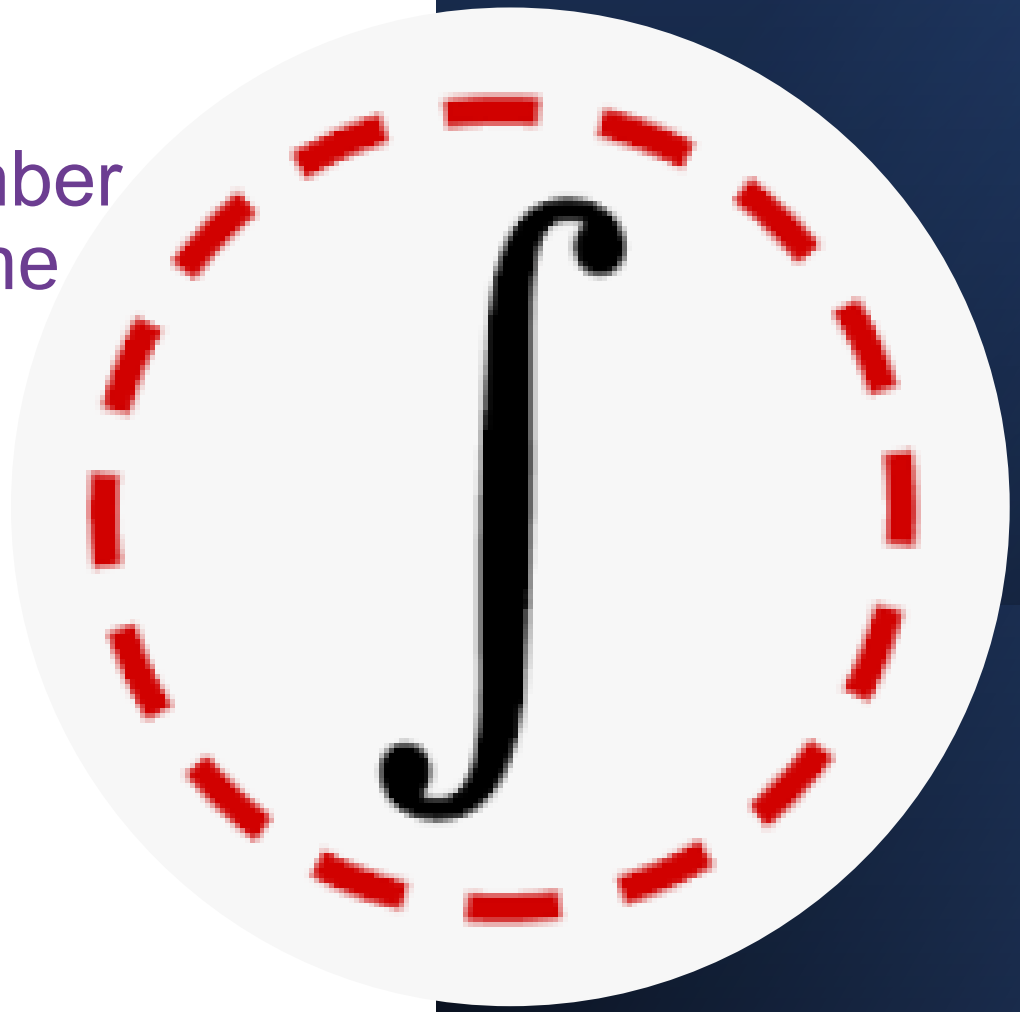
Ian Glendinning

“Observations” from a New Member (Applying Systems Thinking to the domain of Systems Sciences?)



Chair: Bill Smith

Sat 19th November 2022

Create Knowledge Together: Emergence

- Embracing the idea of the totality of conditioned realities:
  - Aim is to understand conditioned realities / perspectives of others
  - Embracing Diversity
  - Discuss to learn, not to convince
- Role of the Zoom session
  - To have a video on a topic WITH A STATED PURPOSE
  - To have an interactive clarification to better understand the topic
  - We value consideration of others.
- Role of the Facilitator is to manage discussion to support the purpose. Please allow facilitator to speak when they have a raised hand. This indicates that the current argument needs to be moderated.
- Role of the Chat function is to present ideas and to develop understanding
- Role of the Message board is to continue the discussion as the facilitator will explain
- Invitation to Open Mic Session.
  - Attendees are invited to contribute a 15 min presentation in the open mic session at the end of each month. Please contact Roelien at President@isss.org if you want to book your spot.

Agenda

- My systems engineering *trajectory* – new to ISSS – more bio than credentials.
  - Engineering rooted in human ingenuity.
    (Even in a physical context – engineering is only 20% “STEM” and 80% Anthropology).
  - Systems Thinking as *the original* Cybernetics
    Better *organisation & governance* of human affairs in the wider environment / cosmos.
    (of “Life, the Universe and Everything”)
  - Systems Thinking (like Evolution) “ubiquitous” - a “given”
    A resource - *not* the topic or subject of my work.
- Focus (today for ISSS) mainly about Language.
  - A little concerned hearing of different people inventing their own ontologies and terminologies and suggesting this was an area widely overlooked? An area I have first-hand experience / knowledge - meta / layered language, beyond the ”linear” …
  - But also language bridging the mechanistic and the humanistic / naturalistic
- (My ongoing subject / thesis in 21st C is philosophical, even metaphysical.)
  - (A systems approach to consciousness and free-will – evolved human decision-making.
    A computational monism. Nothing new under the sun.)

My Systems Trajectory

- **1970's to 1990's** - Aeronautical & Process Plants Engineer – Industrial (from Need to O&M)
  - Physical Systems - Fluid, Pressure, Energy, Structural, Process & Control AND
  - Human Systems - People, Organisation, Process, Methods, Procedures
- **1988-1991** - MBA - Cultural Aspects of Managing Organisational Change.
- **1990's to 2010's** - ICT Systems Engineer – Architect & Implementation – Users & Providers
  - Focus - Information Architecture & Semantics for Digital Twins, etc - **NOT** the technology
  - International Standards (eg ISO15926) on Ontologies and Libraries - Generic "System Engineering (Meta)-Language"
- **2010 - 2022** independent Information Management Architecture Consultant.
  - Most recently in UK Nuclear projects - "Systems Thinking" as a response to complexity.
  - And eg using BIM / CDBB (Centre for Digital Built Britain) - exploiting ISO Systems Language Architecture Standardisation.

- **2000 to Today** - Epistemological Research – Large-scale human decision-making "going wrong".
  - Mainly blogging "What, Why and How do we Know?" under a "Cybernetics" umbrella (Wiener)
    True/original cybernetics ie from 1946 Macy Conferences onwards - post-war **organisation of human society** as a whole, with engineered "homeostatic control" systems (ie "first cybernetics") as ONLY a small subset (Maruyama)
  - Philosophical > Increasingly Metaphysical - Ontology and Epistemology involves "more than" reductive science of a 4D deterministic world. (Strong Emergence, Evolved Autonomy, Affective Perception, Ergodicity, etc)

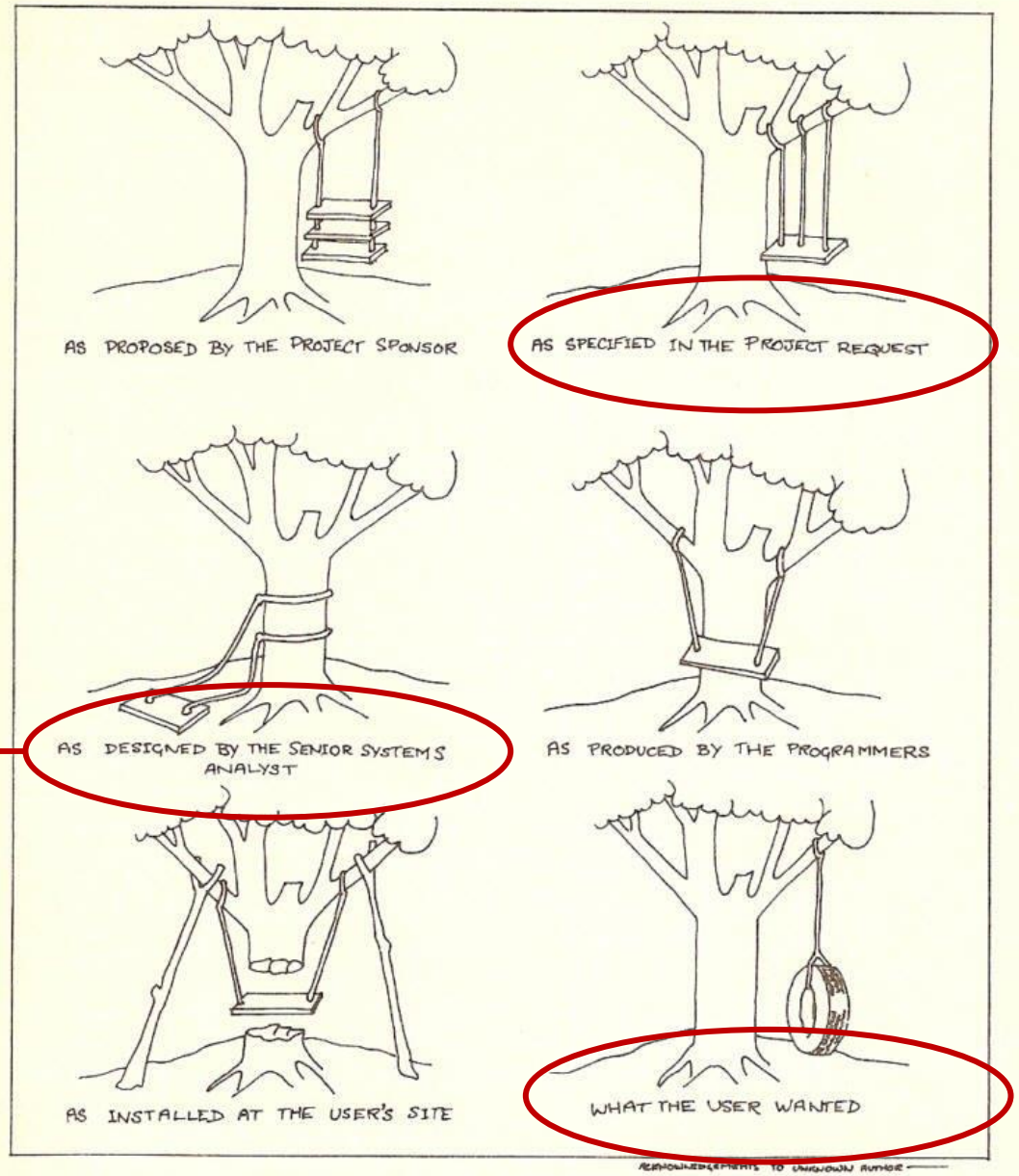
Engagement with Systems as a “Discipline”

Working with "smart" systems thinkers along the way.

- with BCS – Cybernetics Group (2004) w Peter Rowlands (2007)
- with INCOSE Members
  since 2007 in Russia via Viktor Agroskin and Anatoly Levenchuk and
  since 2017 in UK Nuclear
  - explicitly Systems Thinking as a response to complexity
  - general & project management UK conferences adopting ST
- with Hull CSS
  in 2021 on Bogdanov via Rovelli & Mason w Mike Jackson & Orsan Senalp
- with AII (Active Inference Institute)
  since 2021, via Friston, Solms, Fields and Levenchuk)
- with EEMI (Russian ex-INCOSE / Management School, via Levenchuk)
- with ISSS (only in 2022 via Dennis Finlayson et al)

We've all seen versions of this?

I've had this role in 90's & 00's, but never realised the whole meme was as old as 1973 (if not earlier)



From the *University of London Computer Centre Newsletter* No. 53, March 1973

I've written a lot of specifications in my time, asset-technical, organisation-procedural, solutions-technical ***AND*** for Models, Ontologies, Languages & Class Libraries / Dictionaries.

They're typically full of definitions. I know a thing or two about definitions … ☺

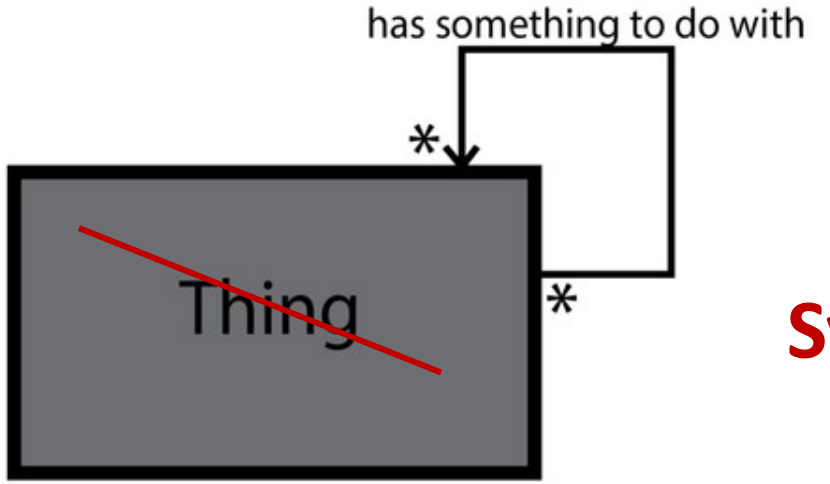
From detailed & prescriptive
To functional & fit-for-purpose
(hybrid in reality)

Less is more?
"Definition as a Coffin"
"Good Fences"

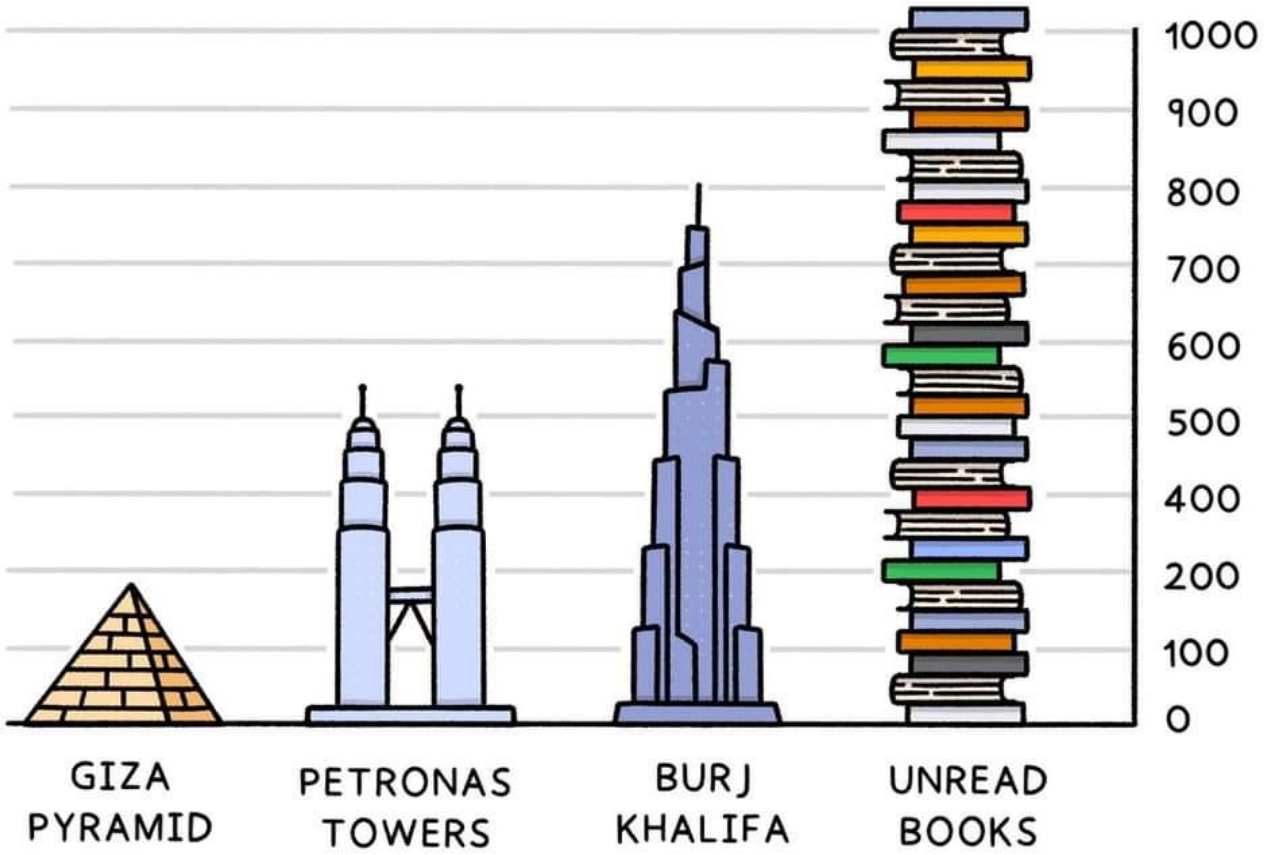
- A system as *any thing* considered in terms of its functional relations with other things. We could be talking about any and all conceivable things. “Life, the Universe and Everything?”

- This “Systems Thinking” is applicable to any situation sufficiently large & complicated or novel, or formally complex or chaotic – ie not already adequately described by good / best practice.
- We’re talking about the whole of knowledge (!) – all necessary descriptions of anything.

- An old joke … ?



System



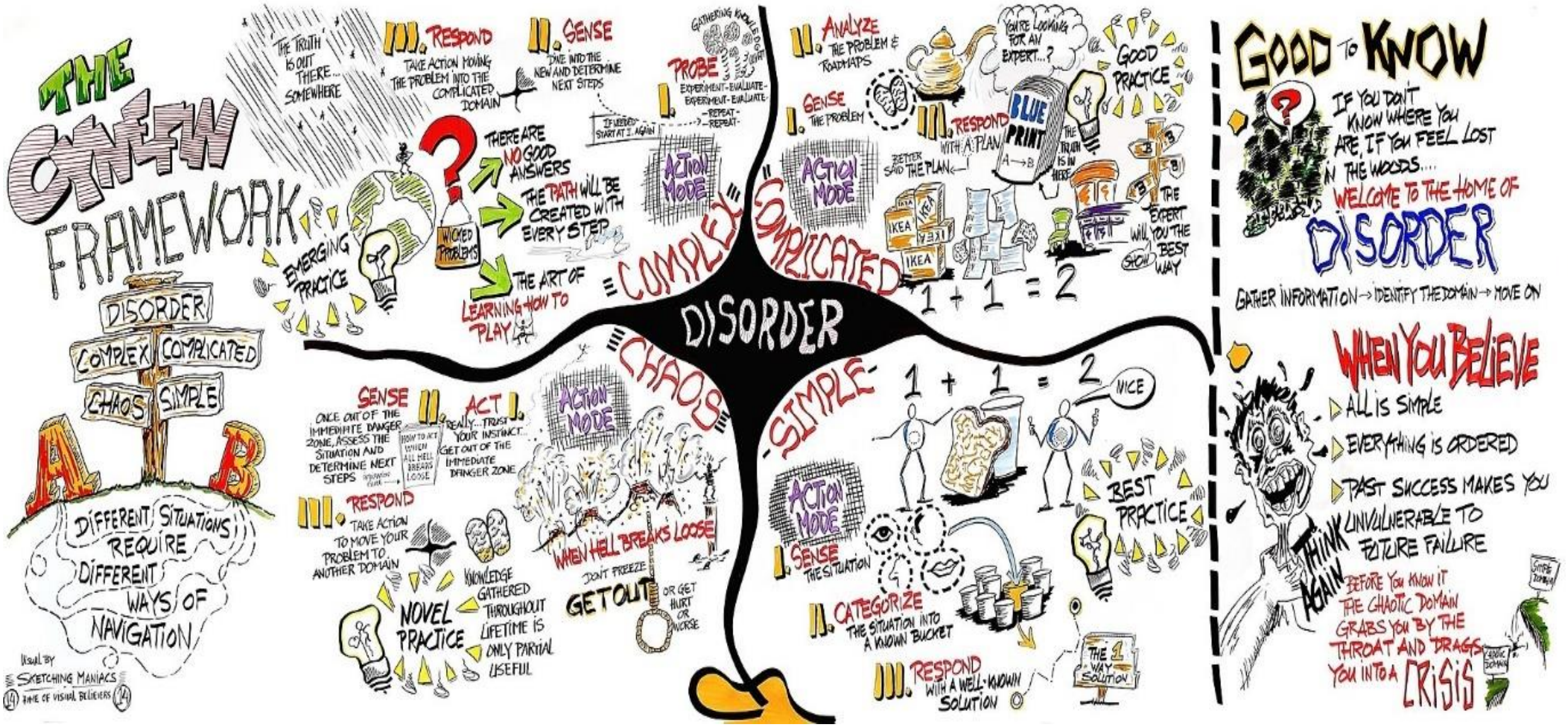
Impossible to document the whole of systems knowledge as a single project or programme or resource at any given point in time.

Impossible to even read, let alone know and properly consider, all the existing documented knowledge. Many valiant efforts ☺

The Library of “Unread Books” as a virtue. (Eco)

The right strategy involves having the right model / architecture / meta-language to organise ***what’s important at the right levels***. Within which federated content “evolves”.

Levels implies Hierarchies?


THE CYNEFIN FRAMEWORK
DISORDER
COMPLEX
COMPLICATED
CHAOS
SIMPLE
A
B
DIFFERENT SITUATIONS REQUIRE DIFFERENT WAYS OF NAVIGATION
Visual by
SKETCHING MANIACS
THE TRUTH IS OUT THERE... SOMEWHERE
EMERGING PRACTICE
WICKED PROBLEMS
THERE ARE NO GOOD ANSWERS
THE PATH WILL BE CREATED WITH EVERY STEP
THE ART OF LEARNING HOW TO PLAY
RESPOND
TAKE ACTION MOVING THE PROBLEM INTO THE COMPLICATED DOMAIN
SENSE
DIVE INTO THE NEW AND DETERMINE NEXT STEPS
IF NEEDED START AT 1. AGAIN
PROBE
EXPERIMENT - EVALUATE - EXPERIMENT - EVALUATE - REPEAT - REPEAT
GATHERING KNOWLEDGE
ACTION MODE
= COMPLEX
= COMPLICATED
DISORDER
= CHAOS
- SIMPLE -
SENSE
ONCE OUT OF THE IMMEDIATE DANGER ZONE, ASSESS THE SITUATION AND DETERMINE NEXT STEPS
HOW TO ACT WHEN ALL HELL BREAKS LOOSE
ACT
REALLY... TRUST YOUR INSTINCT. GET OUT OF THE IMMEDIATE DANGER ZONE
ACTION MODE
WHEN HELL BREAKS LOOSE
DON'T FREEZE
GET OUT
OR GET HURT OR WORSE
RESPOND
TAKE ACTION TO MOVE YOUR PROBLEM TO ANOTHER DOMAIN
NOVEL PRACTICE
KNOWLEDGE GATHERED THROUGHOUT LIFETIME IS ONLY PARTIAL USEFUL
ANALYZE
THE PROBLEM & ROADMAPS
SENSE
THE PROBLEM
RESPOND
WITH A PLAN
ACTION MODE
BETTER SAID THE PLAN
BLUE PRINT
A → B
YOU'RE LOOKING FOR AN EXPERT...?
THE TRUTH IS IN HERE
GOOD PRACTICE
THE EXPERT WILL TELL YOU THE BEST WAY
SHOW
IKEA
1 + 1 = 2
1 + 1 = 2
NICE
ACTION MODE
SENSE
THE SITUATION
CATEGORIZE
THE SITUATION INTO A KNOWN BUCKET
RESPOND
WITH A WELL-KNOWN SOLUTION
THE 1 WAY SOLUTION
BEST PRACTICE
GOOD TO KNOW
IF YOU DON'T KNOW WHERE YOU ARE, IF YOU FEEL LOST IN THE WOODS...
WELCOME TO THE HOME OF
DISORDER
GATHER INFORMATION → IDENTIFY THE DOMAIN → MOVE ON
WHEN YOU BELIEVE
ALL IS SIMPLE
EVERYTHING IS ORDERED
PAST SUCCESS MAKES YOU INVULNERABLE TO FUTURE FAILURE
THINK AGAIN
BEFORE YOU KNOW IT THE CHAOTIC DOMAIN GRABS YOU BY THE THROAT AND DRAGS YOU INTO A CRISIS
CHAOTIC DOMAIN
SIMPLE DOMAIN

DEWEY DECIMAL CLASSIFICATION
LIBRARY OF CONGRESS
WASHINGTON, D. C.

Dec. 2, 1949

Dr. Norbert Wiener
Mass. Institute of Technology
Cambridge, Mass.

My dear Dr. Wiener:

The publication of your book on Cybernetics has caused the editorial staff which is in charge of the revision of the Dewey Decimal Classification considerable difficulty. We are in the position of being asked by sincere inquirers as to how to classify the book and by less sincere people who like to confront supposedly expert classifiers with problems which they are quite certain are beyond our capabilities. Quite frankly, cybernetics is. We have read and reread reviews and explanations of the content of your book and have even tried to understand the book itself, only to become more uncertain as to what field it falls into. I am appealing to you as the one person who should be able to tell us.

Possibly you already know that the Dewey Decimal Classification attempts to assign a number to the subject content of books. Generally speaking, a book can only be assigned one number and consequently we cannot take care of the many aspects that certain works cover. The problem must be simplified and consequently, is your book such as to place it in psychology? Does it belong in the field of electronic computation devices or does it belong in mathematics?

If we were not somewhat desperate about this particular problem, I should hesitate to bother you with it.

Cordially yours,

Esther P Potter

Esther P. Potter
Director

epp;lm

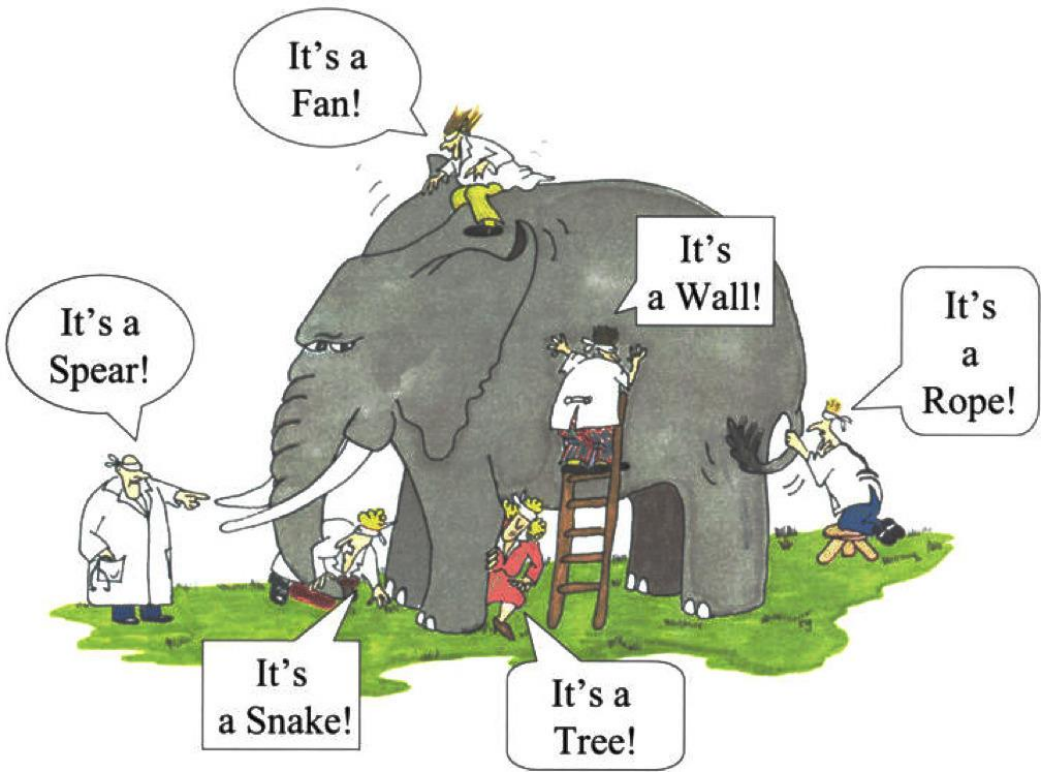
Library of Congress spotted the problem back when Wiener published “Cybernetics”.

How do you classify something that applies to anything and everything?

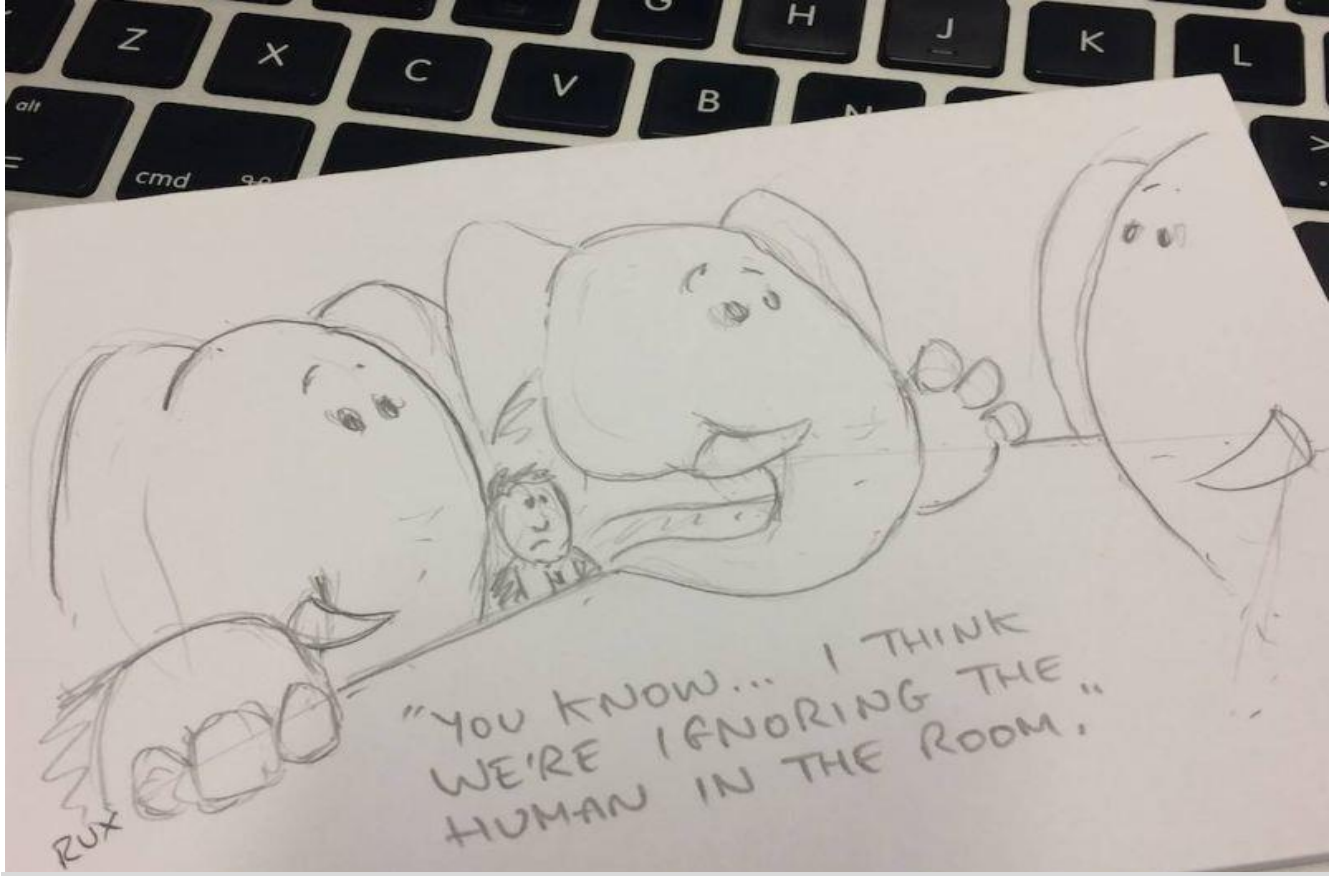
They suggested a few existing pigeon-holes, – psychology, mathematics or computing – but were “desperate” about having to change their “Dewey Decimal” classification systems to fit Cybernetics and at a loss how to do it.

Cornflowers [by Marianne Jones]

My axioms were so clean-hewn,
The joins of 'thus' and 'therefore' neat
But, I admit
Life would not fit
Between straight lines
And all the cornflowers said was 'blue'
All summer long, so blue.
So when the sea came in and with one wave
Threatened to wash my edifice away
I let it.



"Seeing" many aspects of the same thing.
Many different bases to slice and dice.
Ontology: Hierarchical "trees"- Taxonomy (specialisation and classification ***on any number of overlapping bases***) – Mereology (Whole-parts on any number of dimensions)
Heterarchical "networks" – Any number of other types of relationship between any number of types of components.
Always analytic, reductive and binary.



Unlimited mechanistic reductivity of detail parts and relations?
But also any number of wholes appropriate at the human scale.
"Deflationary" - OK to talk at the *inherited* levels of abstraction.

"Good Fences" – all ontological "divisions" have their value, but they don't need to be divisive of the human scale activity.

Devil in the details. Angels in the abstractions.

Mechanistic and Humanistic / Naturalistic?

Recurring problem / fear – continuing from previous slide.

- Talking in terms of functional relationships between “bits” of information representing our ontology – language of computation – Turtles all the way down to the foundations of nature. Isomorphism – systems of systems of systems …
- Evolved system objects emergent from mechanistic fundamentals have their own higher level properties, qualities, relations, behaviours and histories.
  Not wholly deterministic and non-Ergodic.
- Friston, Solms, Levenchuk, Vanchurin, Doyle, etc
  - Complex Adaptive systems defined by “Active Inference” managing free-energy vs entropy – allostasis – across their emergent / evolved “Markov Blanket” boundaries / fences.
  - Knowledge fundamentally “affective” - felt qualitatively from the subjective perspective of our human-level system object(s) [“Radical Empiricist” James, Whitehead, Pirsig – Perception as “Valueception” McGilchrist. “Crossing the Rubicon” Solms.]
  - Augmented Humanity – system dynamics, different resonances & time-constants in different layers. [Doyle, Levenchuk]

Round-Up

- Language beyond the linear? “Large” Predicate form vs Natural language(s)
  - (System objects can be poetic / rhetorical / artistic as well as logical / prosaic. System Objects can be natural / human subjects. Information in any “sensible” form.)
- Latest Russian EEMI School - “State of the Art”
  - Almost bleeding edge and open-ended in terms of theories used. (so-called “3rd Generation” eg incorporating non-Darwinian evolution, ergodicity and active inference. Genome, phenome and memome levels. Strange Loops rather than lifecycles.)
  - Nevertheless pragmatic – aimed at practitioners, not philosophers.
  - Important distinction between methodologies and best practices (top-down) for the “Systems Thinking” itself and those for the discipline-specific engineering and management (bottom-up) – which are unlimited and the proper domain of those specialists.
- Thinking out loud. Meta-meta-meta … Fn(Fn(Fn(…))) – many layered. Applying systems thinking to the domain of systems science / theories?

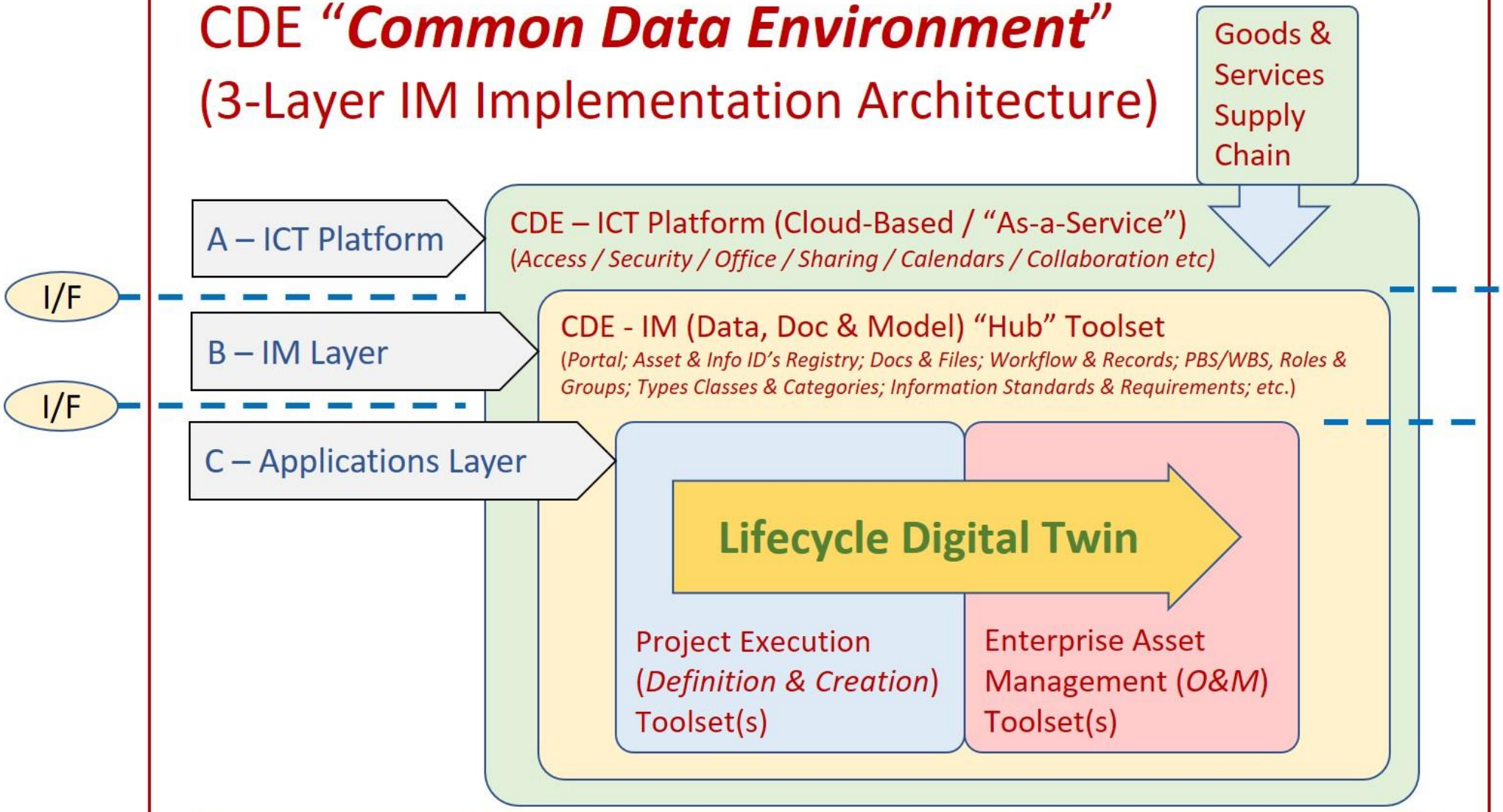
Refs & Links

- Me ian.glendinning@gmail.com / www.psybertron.org
  (eg http://www.psybertron.org/archives/16480
  and https://www.psybertron.org/archives/16613)
- Russian EEMI https://eem.institute/about/
- Levenchuk "3rd Generation" Systems Ontology
  https://ailev.livejournal.com/1657040.html
- Active Inference Institute https://www.activeinference.org/

End

– additional ref / discussion slides follow.

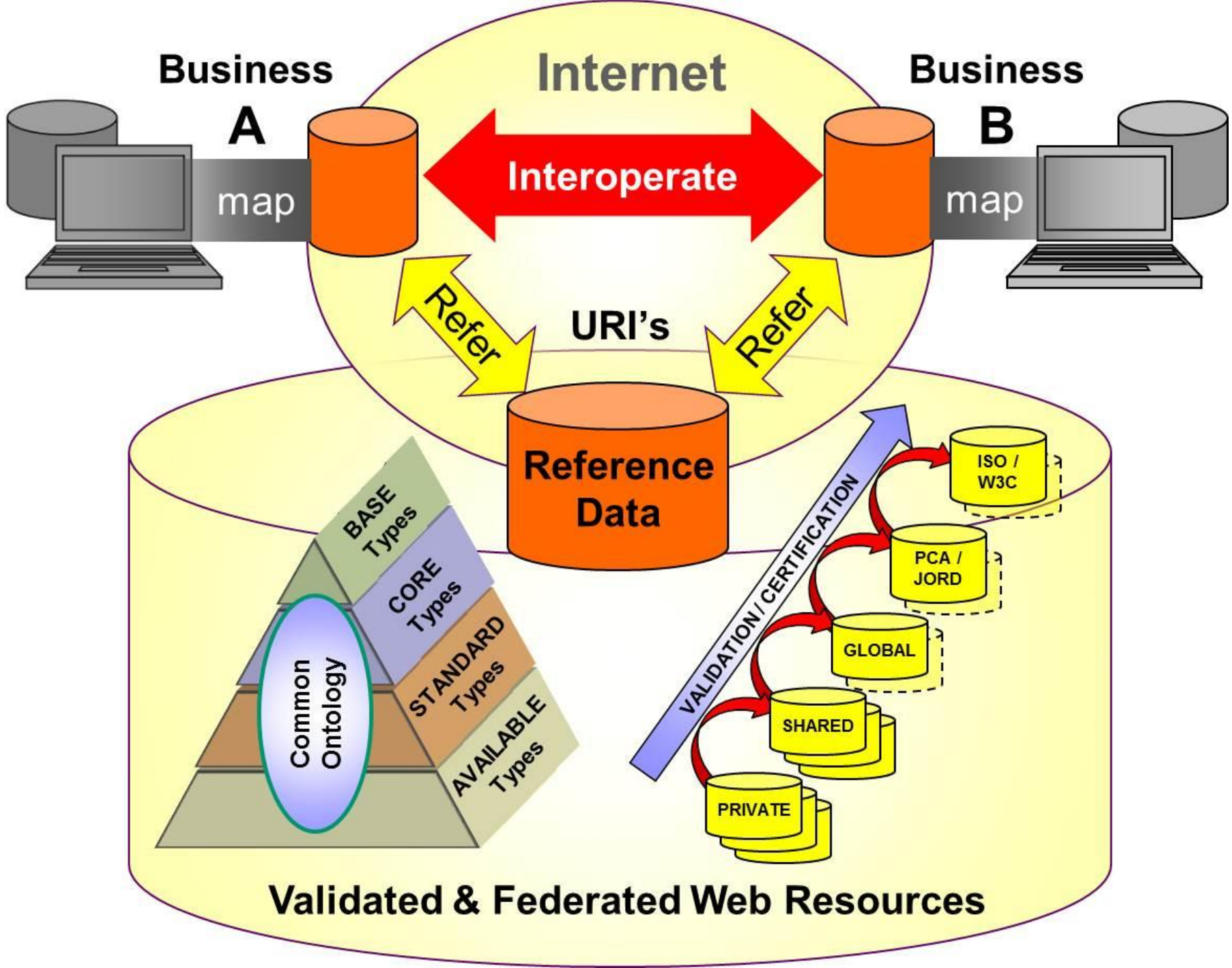
CDE "*Common Data Environment*"
(3-Layer IM Implementation Architecture)

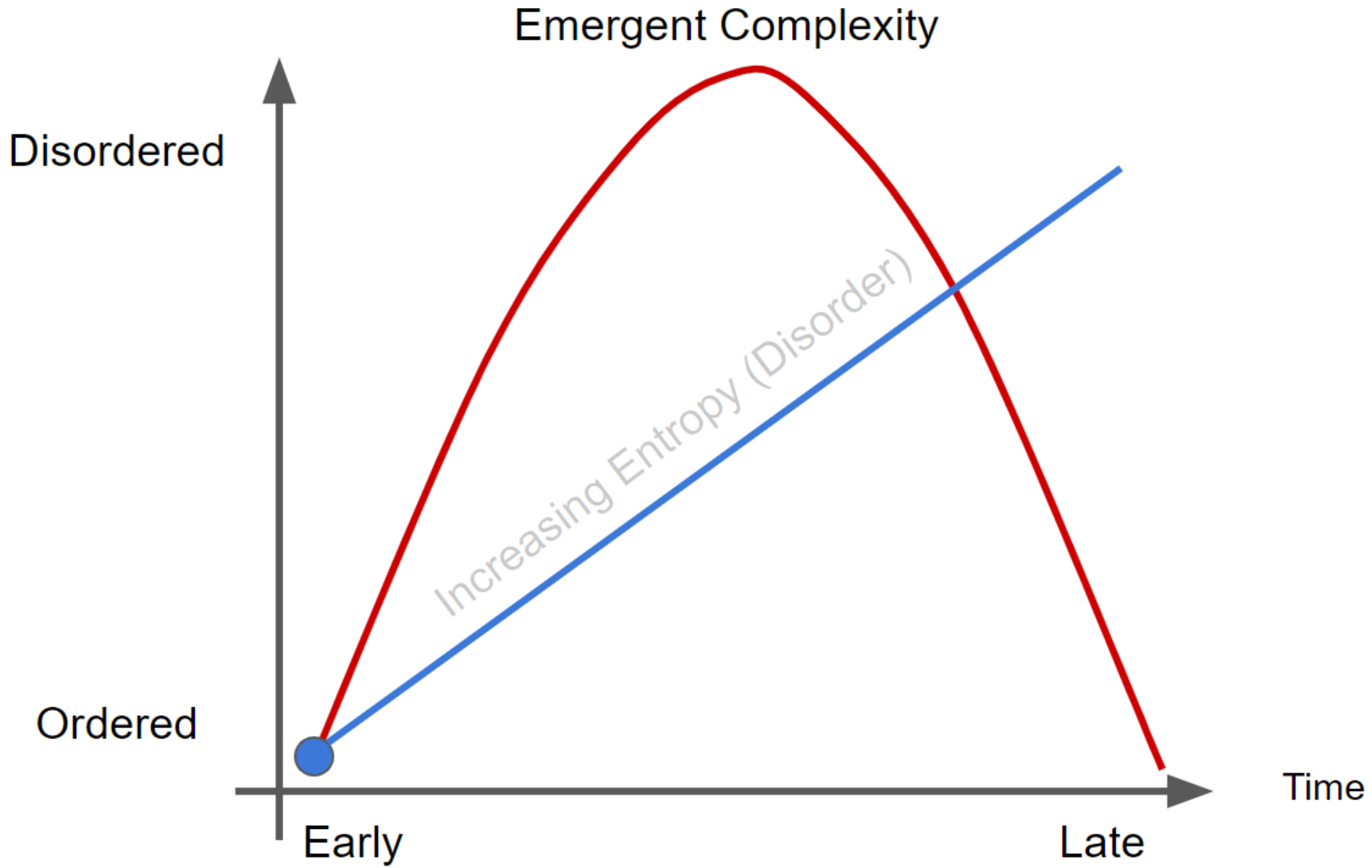


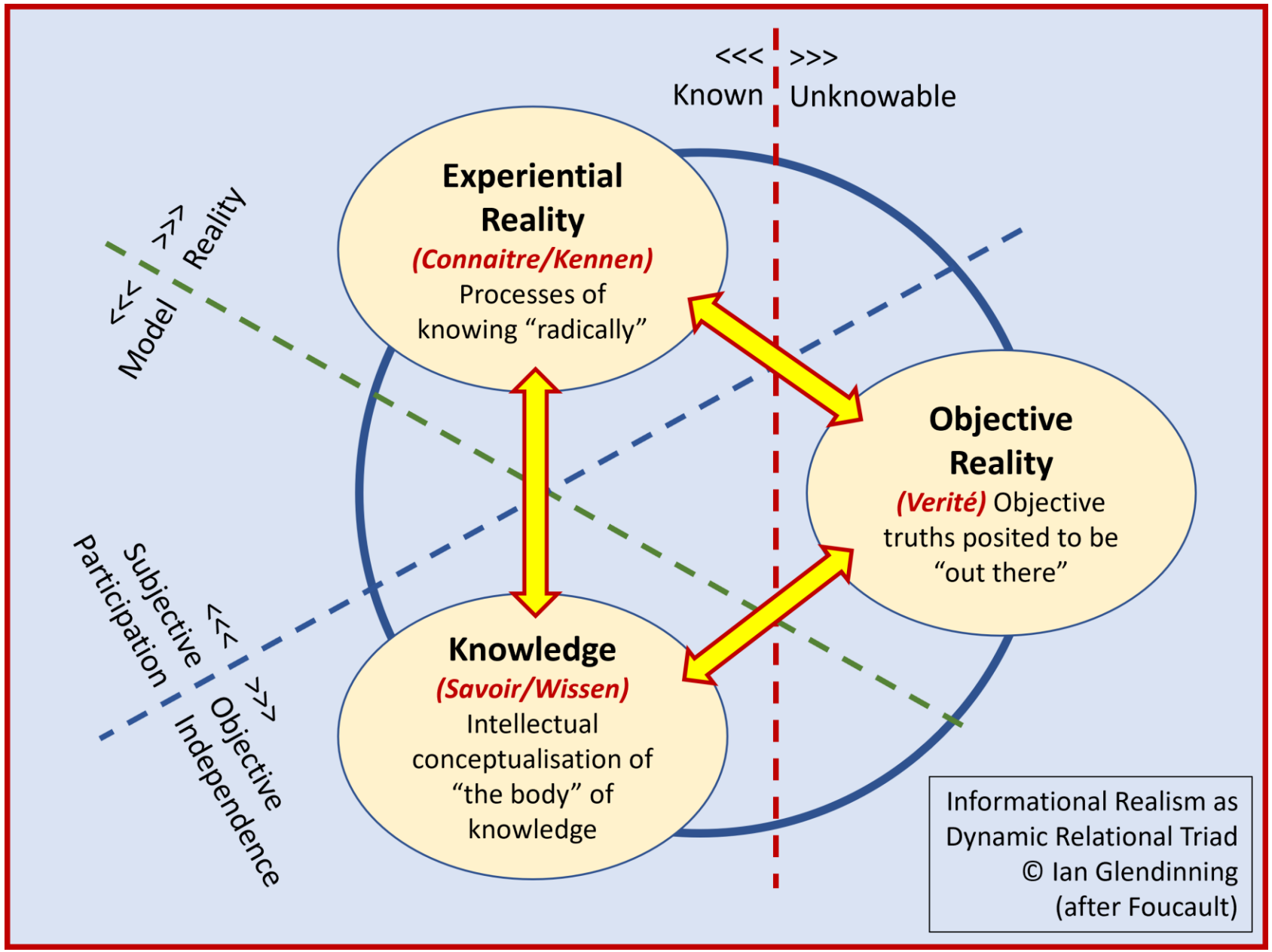
View on a standard "TOGAF" / "BDAT" Enterprise Architecture Model.

Independent layers enable agile deployment, maximum flexibility & continuous evolution for management of shared info standards across definition / creation / O&M asset lifecycles

Glenco IS Ltd – Tools & Technologies come and go, Lifecycle Information lives on forever.


Business
A
map
Internet
Interoperate
Business
B
map
Refer
URI's
Refer
Reference
Data
BASE
Types
CORE
Types
STANDARD
Types
AVAILABLE
Types
Common
Ontology
VALIDATION / CERTIFICATION
ISO /
W3C
PCA /
JORD
GLOBAL
SHARED
PRIVATE
Validated & Federated Web Resources


Emergent Complexity
Disordered
Ordered
Increasing Entropy (Disorder)
Early
Late
Time



If the medium is information
The processes are computation.

The fundamental nature of Computation-101 in the "Registry Assembly Programming" exercise.
(~1973 at school for me, see Dennett later and John Stein / Charles Ross project.)

Ref Modern panpsychism – post-Strawson?
I'm more pan-proto-psychism, where the proto information stuff is the stuff of both physics and psyche / mental. No hard problem. No combination problem.