Multi-methodology Approaches in Systems Thinking

SCiO

SCiO Open Meeting
Manchester
31st March 2025

Simon MacCormac & Patrick Hoverstadt
31st March 2025

e: simon.maccormac@systemspractice.org
patrick.hoverstadt@systemspractice.org

Multi-methodology: It's a game of two halves!

- First part: some frameworks to aid systems method selection in interventions (Simon)
- Second part: some practical examples from real cases (Patrick)

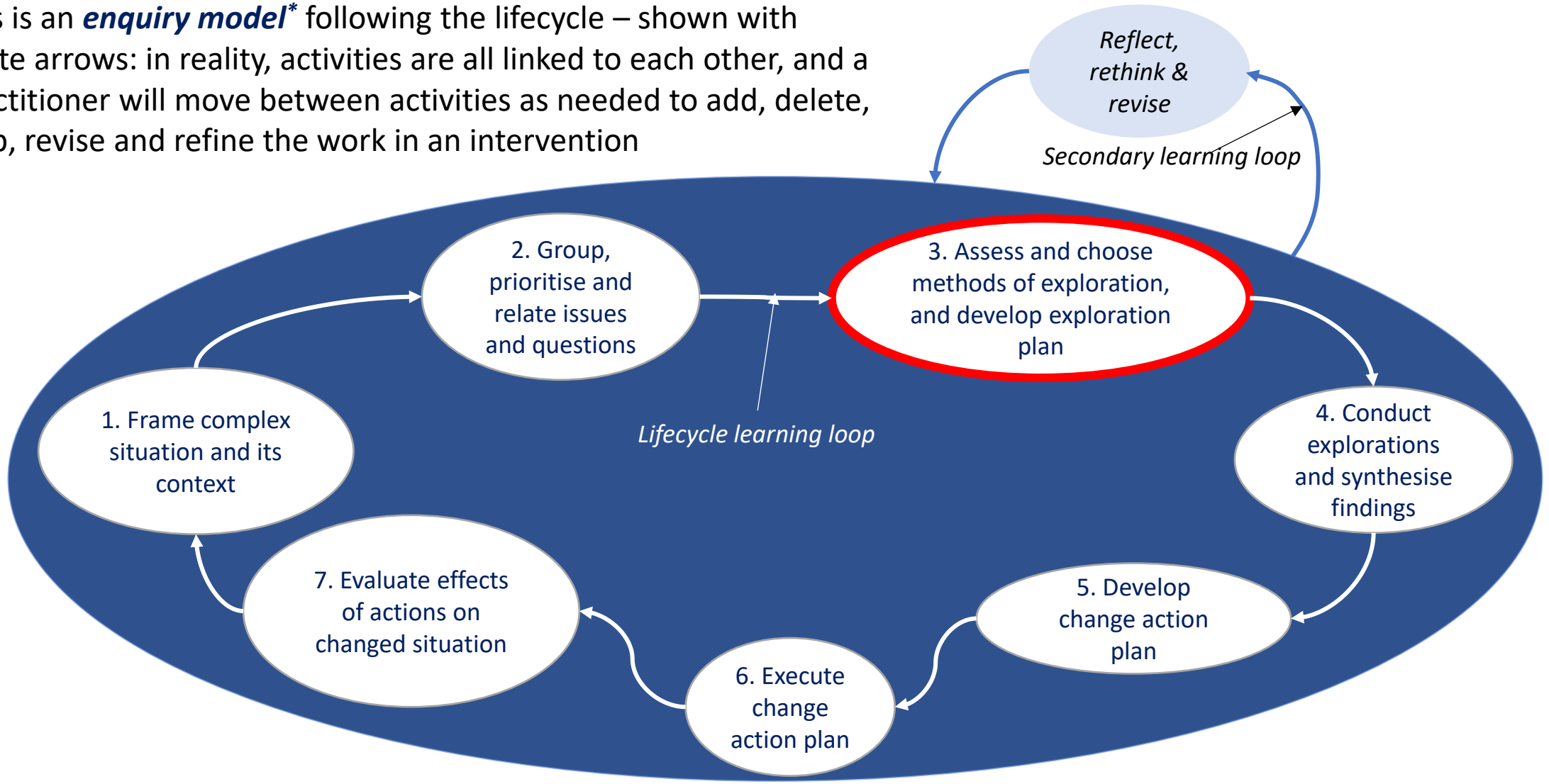
Oh, and some time for questions and observations!

Both parts are focused on practice

But first, like all good systems practice, we need to step up and back before diving in!

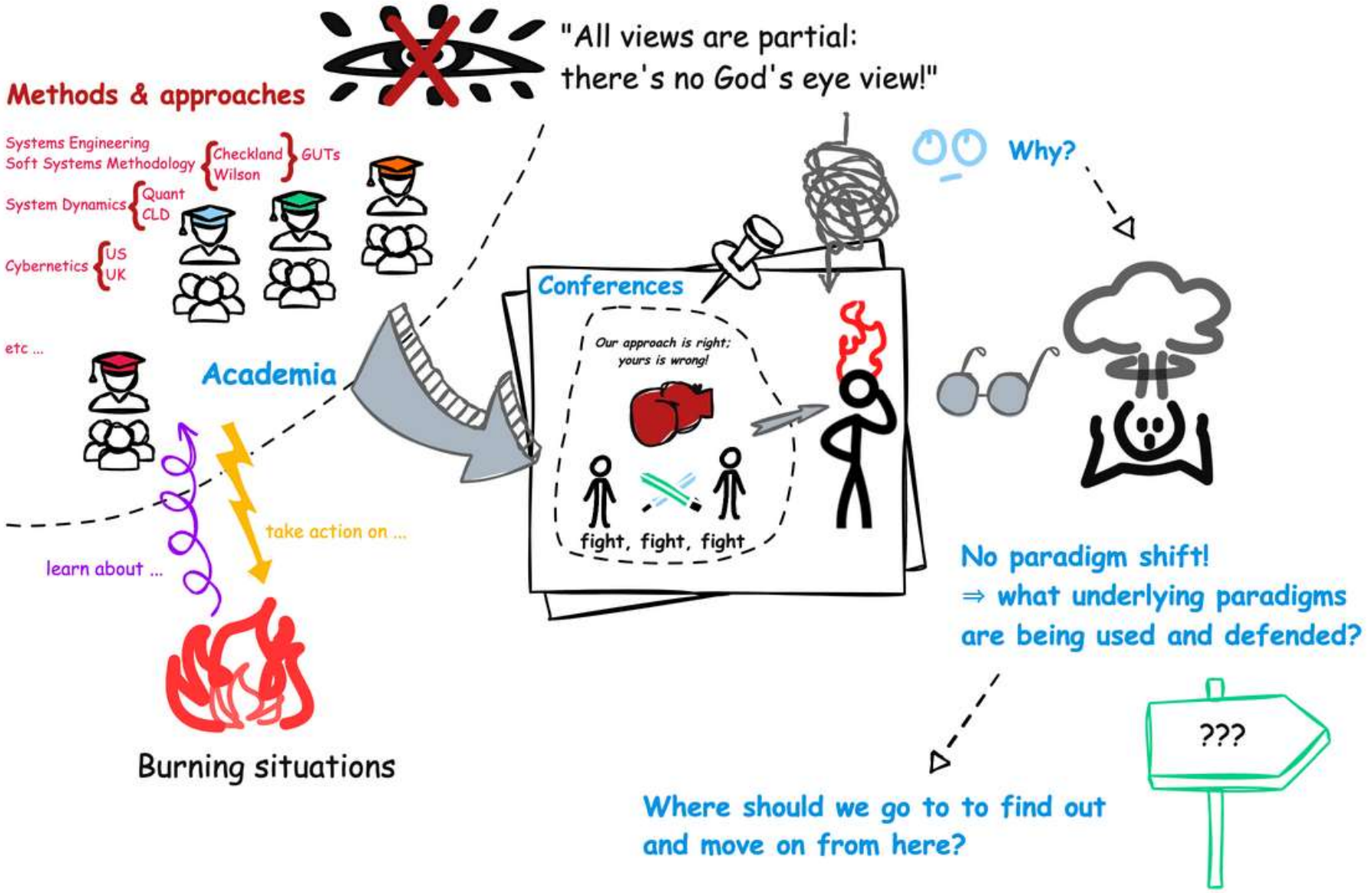
Stepping up: method selection as part of an intervention lifecycle

This is an ***enquiry model**** following the lifecycle – shown with white arrows: in reality, activities are all linked to each other, and a practitioner will move between activities as needed to add, delete, stop, revise and refine the work in an intervention



* George Box, 1976, "*All models are wrong, but some are useful*."

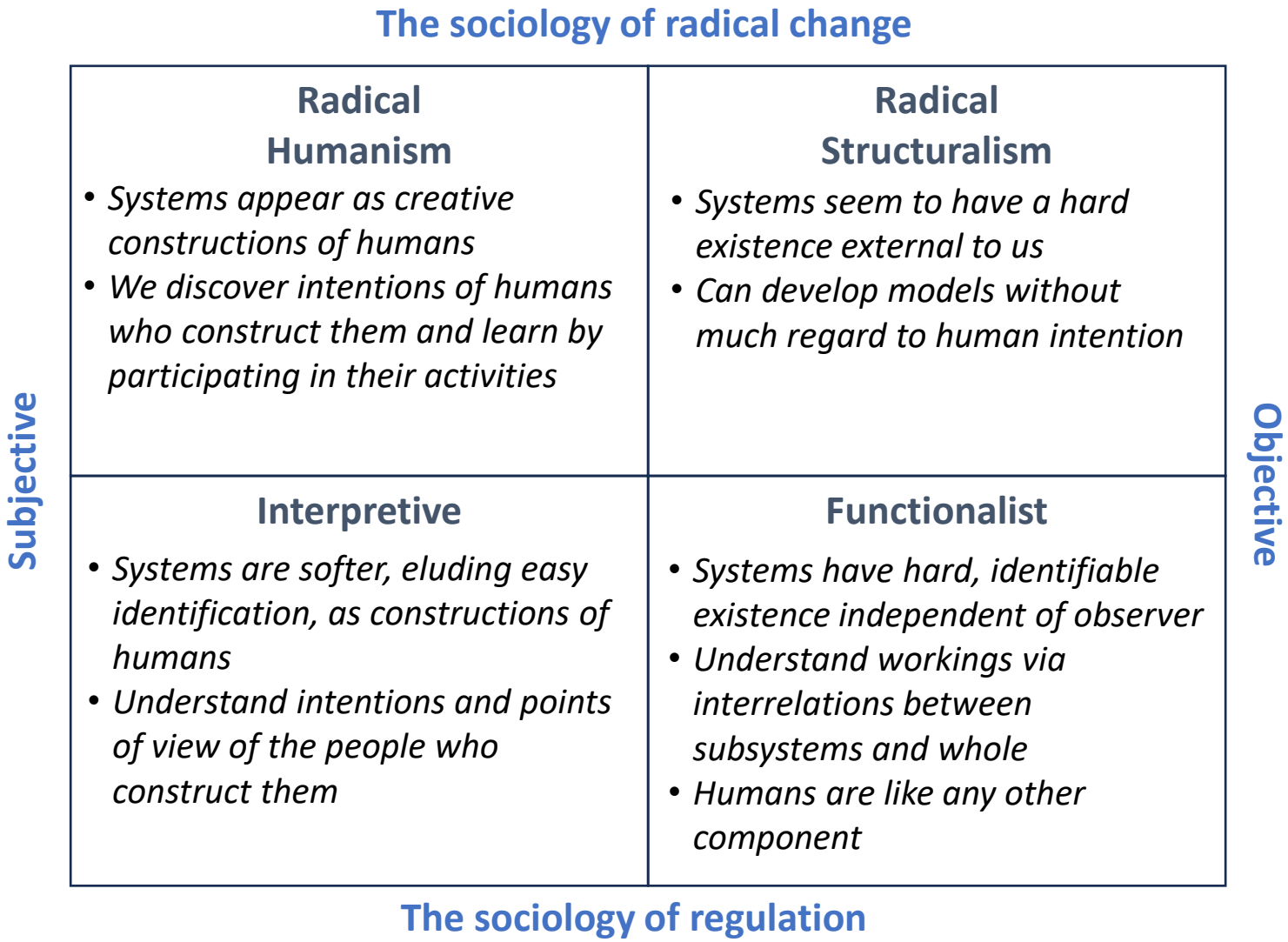
Stepping back: ST in the 90's - crisis, what crisis?



- Simultaneous attempts at integration (SE/SSM) & differentiation (within SSM, cybernetics & system dynamics)
- Grand Unified Theories (GUTs): can be too grand or unify too much; since all views are partial, pluralism might be best
- "Paradigm shift": from Thomas Kuhn (1962) - a non-linear shift in consensus positions, opening new modes of understanding
- The absence of paradigm shifts results in competing and irreconcilable accounts of reality

Situation in early 1990's - Simon's perspective!

Paradigms: placement of systems approaches



Burrell and Morgan (1985)

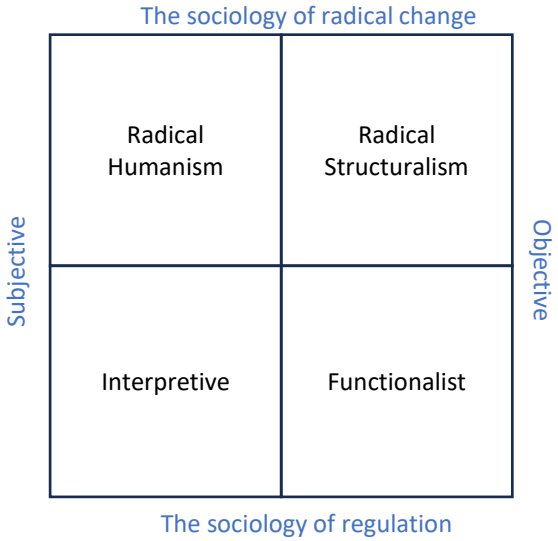
The grid allows us to relate systems approaches to different sociological paradigms & to learn about what they ***take for granted*** about social science and society in the 'frameworks' they employ

So, it can be used to ask: ***What does this approach reveal?***

But, more usefully: ***What doesn't this approach reveal?***

Evolution of multi-methodologies (mainly) at Hull University

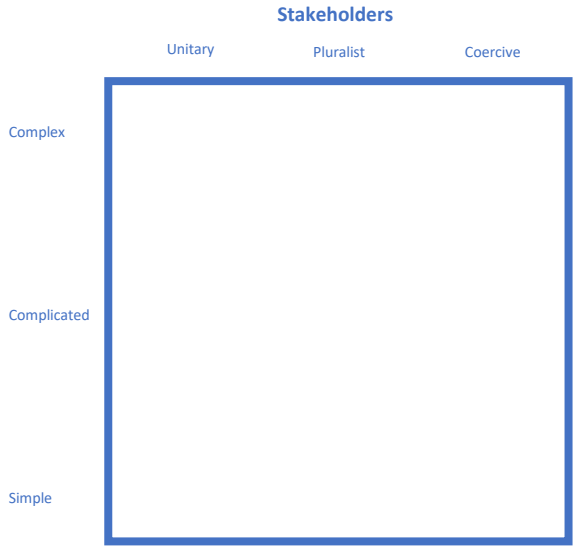
Four Paradigms Framework



Jackson (2000)

Mingers, Flood et al

System of Systems Methodology (SOSM)



Jackson (2019)

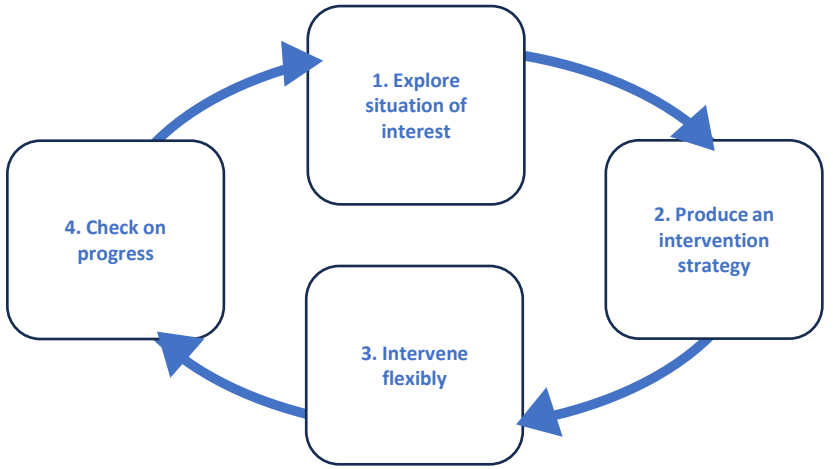
Flood & Jackson

Total Systems Intervention (TSI)

Systemic Intervention (SI)

Midgely (2015)

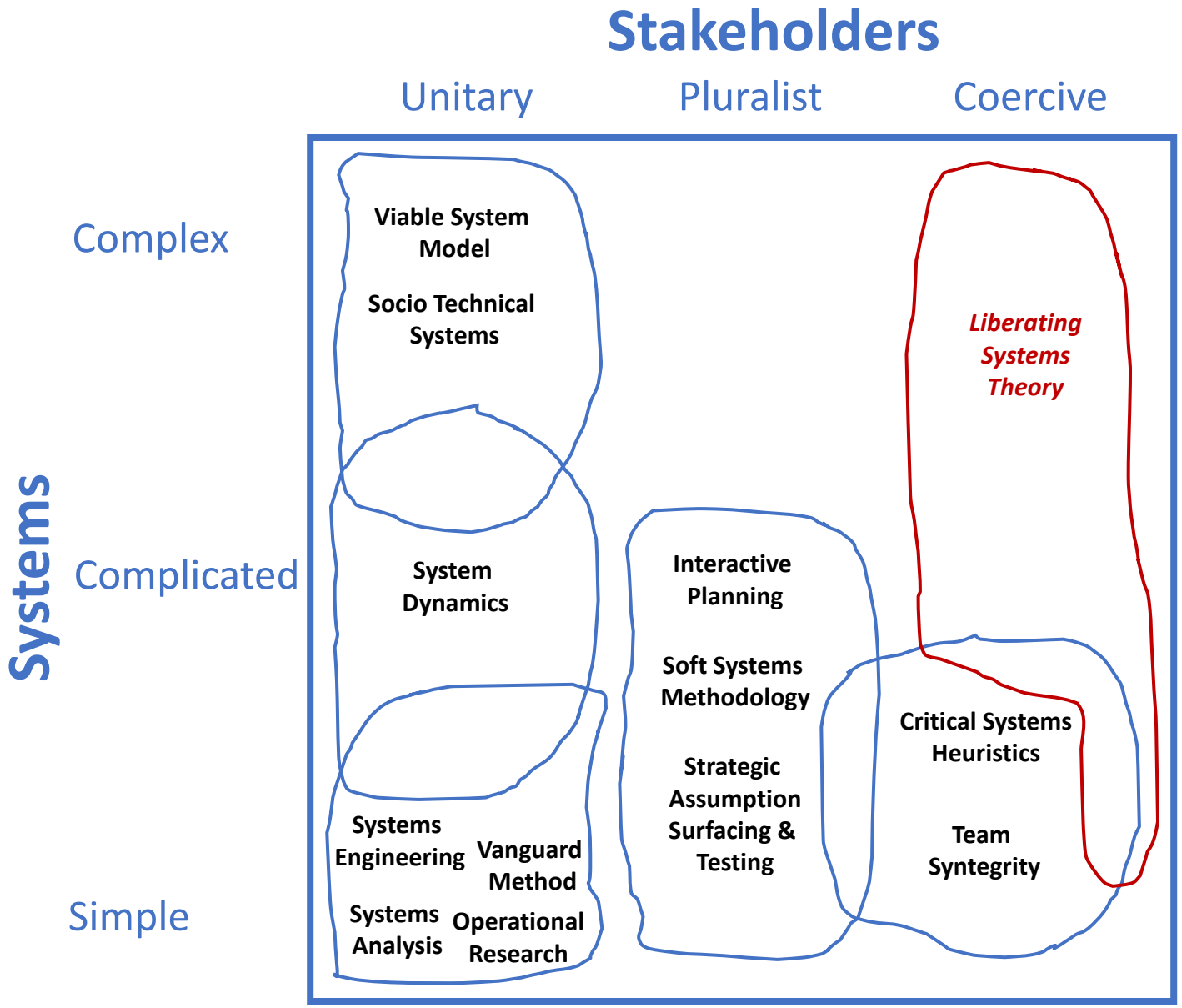
Critical Systems Thinking (CST)



Jackson (2024)

"The road to Hull is paved with good interventions!"

System of Systems Methodology (SOSM)

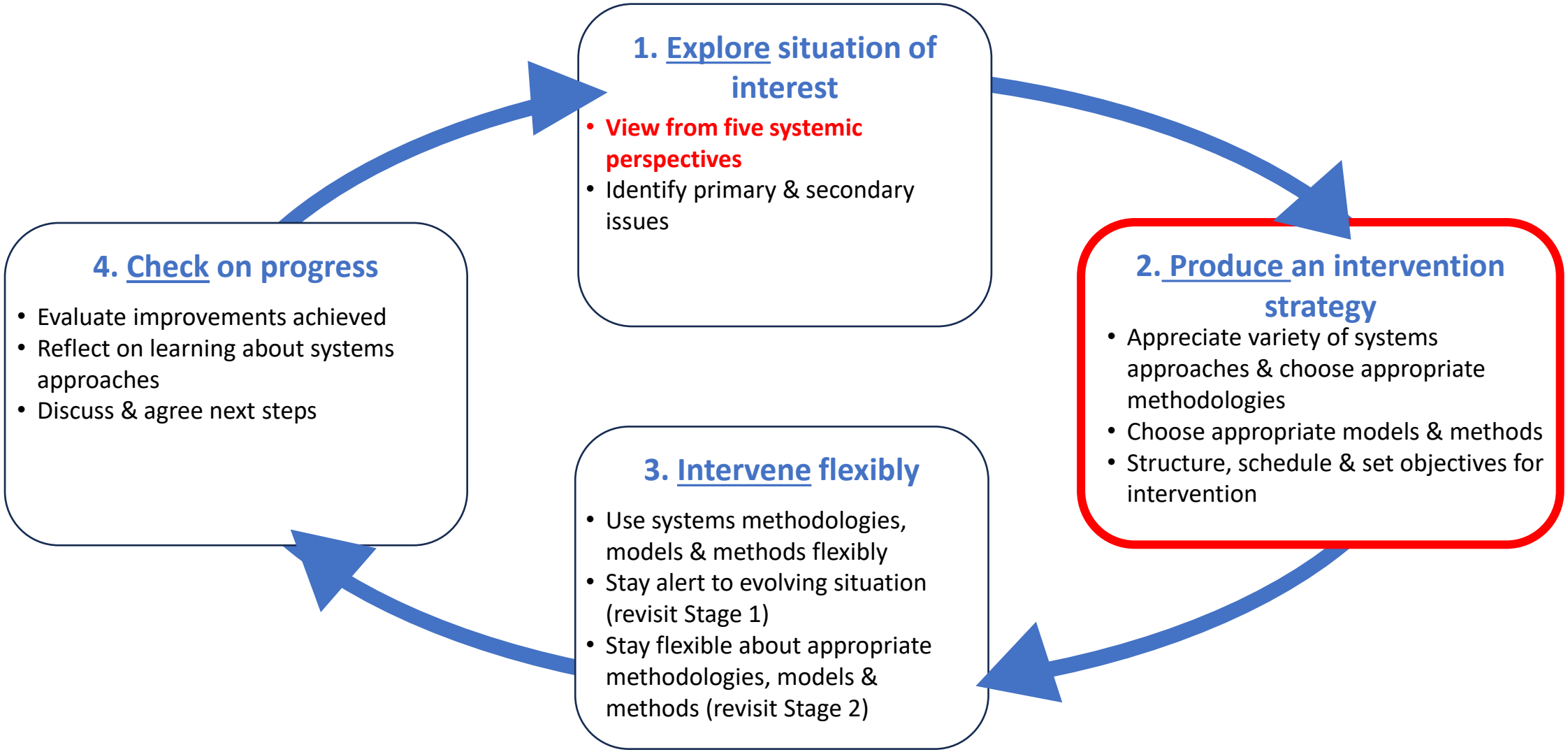


"Complicated" category added by Jackson after initial SOSM work with Flood

Gap for "Coercive" stakeholders filled by Jackson in CST, 2019

Jackson, Flood et al; from Jackson (2019)

Critical Systems Thinking: EPIC approach



Critical Systems Thinking: five systemic perspectives

View situation of interest from five systemic perspectives

1 Mechanical

- Goal seeking behaviour
- Input -> Transformation -> Outputs
- Engineering worldview
- Focus on efficacy & efficiency (economy)

2 Interrelationships

- Variables impacting behaviour
- Focuses on linkages and interactions
- Feedback loops
- Deep understanding of structure
- Favourable leverage in interventions
- Avoiding unintended consequences

3 Organismic

- Attention on viability & agility
- Interactions with environment
- Maintaining dynamic equilibrium with changing environment & between parts & whole

4 Purposeful

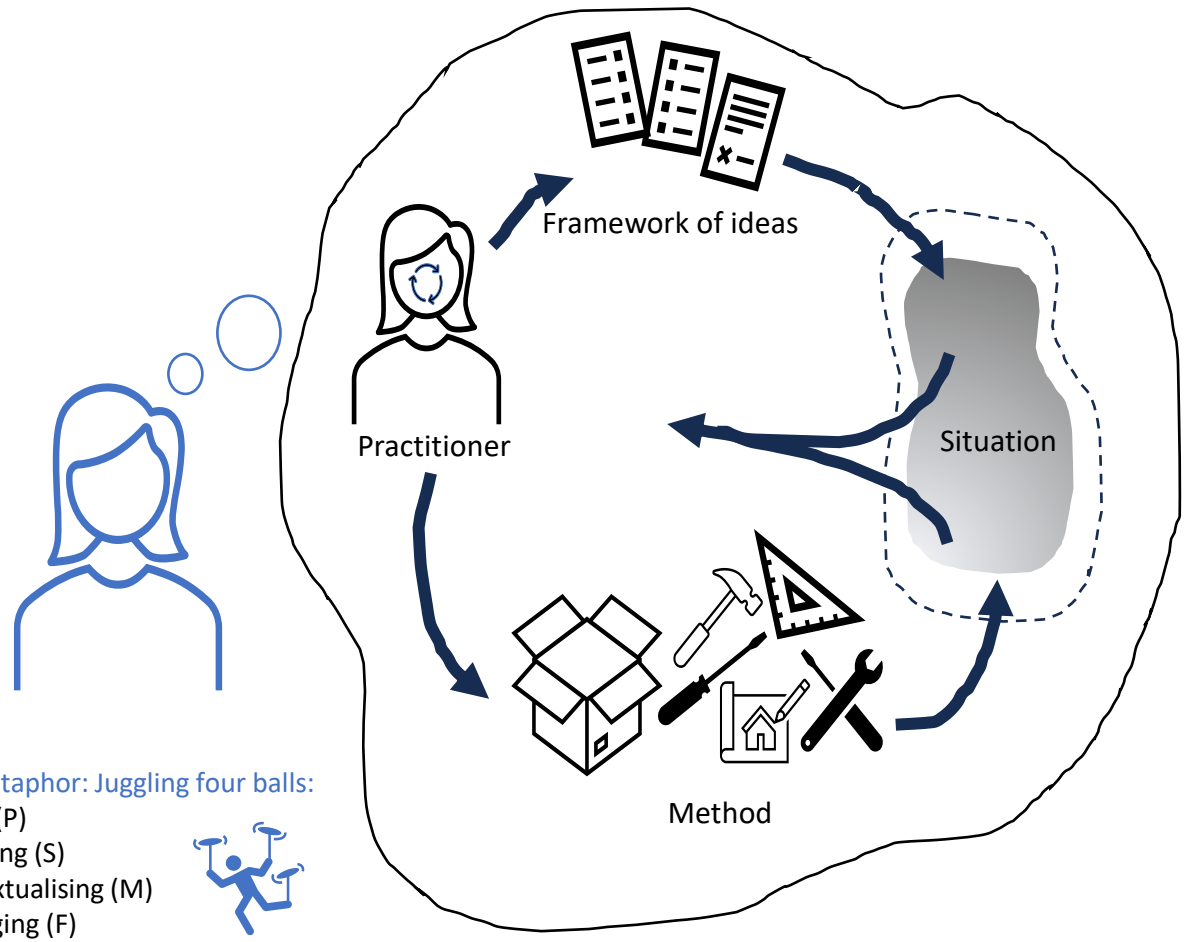
- Reveals unpredictability of changing, socially constructed reality
- Subject to multiple interpretations
- Cultural & political factors affecting emergence of shared purposes
- Accommodations are sought, albeit through healthy disagreement

5 Societal/Environmental

- Overcoming marginalisation & disenfranchisement
- Challenging whether powerful will listen and or act, even if debated
- Questioning about interests of all stakeholders, including marginalised
- Highlights issues of power, discrimination and inequality
- Focuses attention on whether sustainability and environmental matters are fully considered

Systemic enquiry at the Open University (OU)

1. Conceptual model of 'practice': PSFM



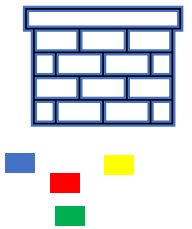
Isophor/metaphor: Juggling four balls:

- **Be**ing (P)
- **E**ngaging (S)
- **C**ontextualising (M)
- **M**anaging (F)

2. Systemic enquiry through "Design Turns"

- No prescription for systemic enquiry: need design
- Design involves many players
- Futures must be chosen
- Shifts in perspective & level from first to second order practice
- Iteratively redesigning interventions/enquiries through multiple intervention cycles ("turns")

3. Bricolage approach to method selection



- 'Bricolage': (in art or literature) construction or creation from a diverse range of available things
- Mixing of methodologies based on what is available
- 'Critically' assessed based on engaging (E) with the situation (S) and through contextualising (C) methods (M)
- Risk in over-relying on methods we already know & in mixing piece parts of methods
- Cf. with alternative use of 'critical': from critical theory - social approaches to overcome power

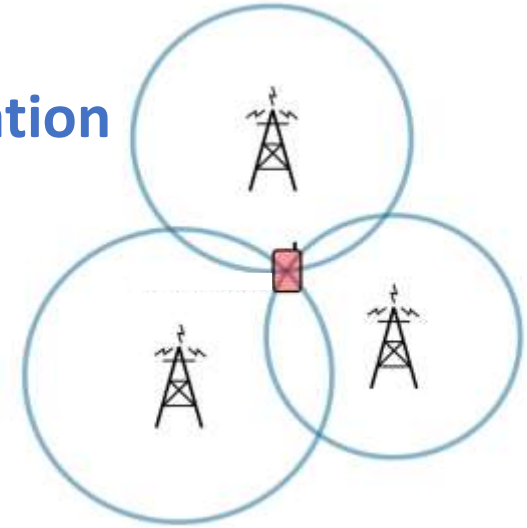
From: Ison (2010)

Practical mixing of methodologies: Jonathan Mingers' approach

Creativity

Completeness

Triangulation



From: Rosenhead & Mingers (2001)

References

For more on the four sociological paradigms, see:

G. Burrell & G. Morgan, 1985, *Sociological Paradigms & Organisational Analysis*, Gower Publishing Ltd

For a full understanding of paradigm shifts, see:

T.S. Kuhn, 1962, *The Structure of Scientific Revolutions*, University of Chicago Press

For material on the applicability of the four sociological paradigms to systems thinking, see:

M.C. Jackson, 2000, *Systems Approaches to Management*, Kluwer Academic/Plenum Publishers

For more on SOSM and CST, please refer to:

M.C. Jackson, 2019, *Critical Systems Thinking and the Management of Complexity*, J. Wiley & Sons Ltd

M.C. Jackson, 2024, *Critical Systems Thinking - A Practitioner's Guide*, J. Wiley & Sons Ltd

For more on the OU approach to systems thinking in practice, see:

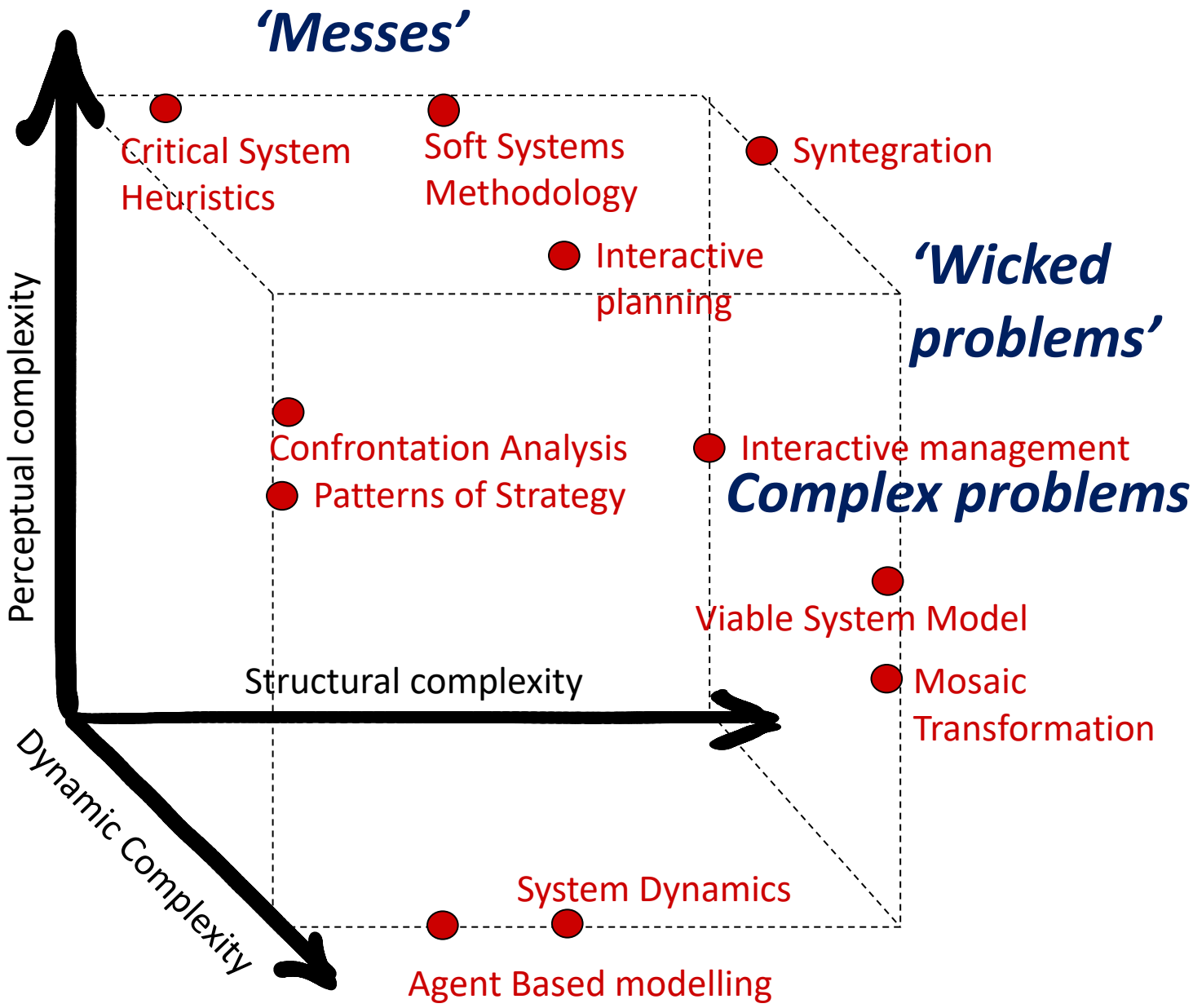
R. Ison, 2010, *Systems Practice: How to Act*, Springer

For more on Mingers' approach to multi-methodology, please see:

J. Rosenhead & J. Mingers, 2001, *Rational Analysis for a Problematic World*, J. Wiley & Sons Ltd

Choosing which approach(s)

- Complexity dimensions:
  - Perceptual
  - Structural
  - Dynamic
- *'In theory, there's no difference between theory and practice, but in practice there is'*
- 2 heuristics
  1. Which approach best fits what I need to do?
  2. Which can I actually do here?
- 9/13 systems approaches



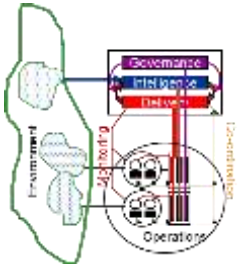
Combining VSM with other approaches

- Ways of combining approaches:
  - Sequential: *A after B*
  - Complementary: *A alongside B & says something different*
  - Nesting: *model A within methodology / model B*
  - Overlays: *A enriches B*

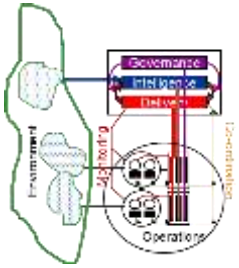
Personal experience, not all possibilities included

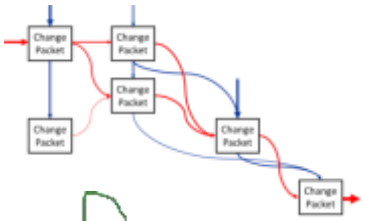
Sequential - *A after B*

Name system with SSM,
Design with VSM
Neuro network

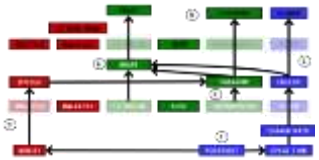


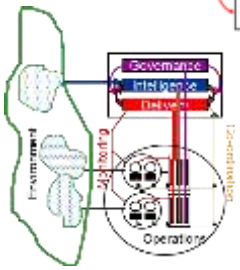
Design with VSM
Change with Mosaic
Pharma



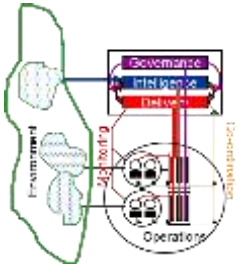


Strategy directs organisation
Design to enable strategy
Pharma

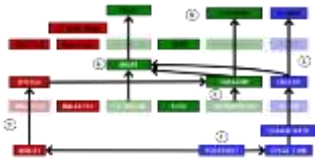


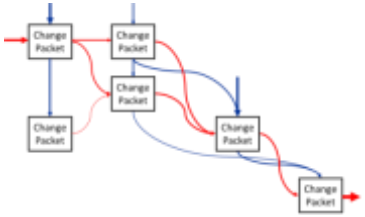


Syntegration directs VSM redesign
IT co.



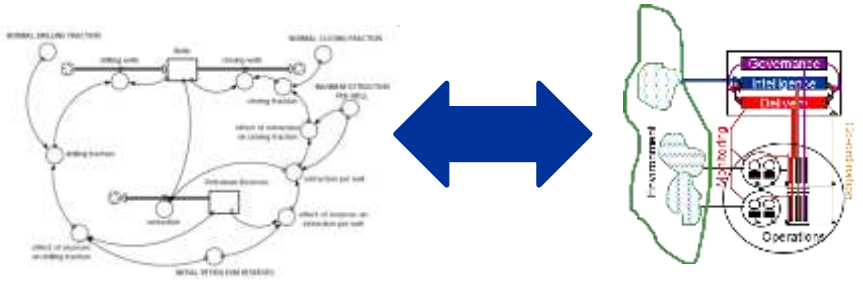
Strategy requires changes
Pharma



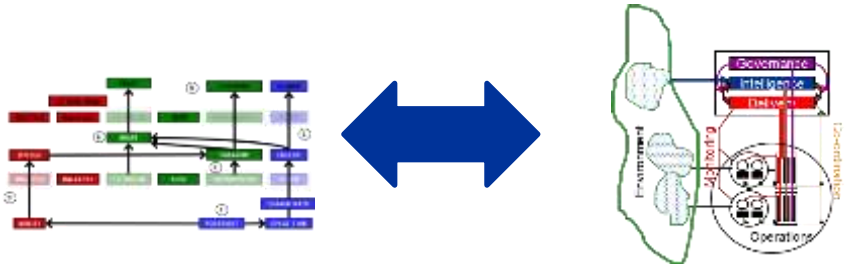


Complementary - *A alongside B*

SD identifies key leverage points
VSM identifies / designs brain and muscle to pull levers
Singapore

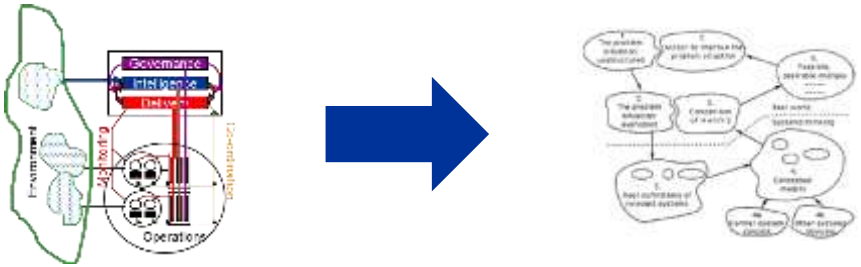


2 perspectives on System to Environment fit

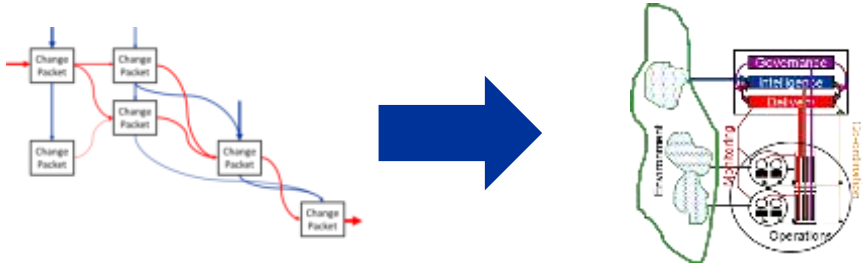


Nested - *A within B*

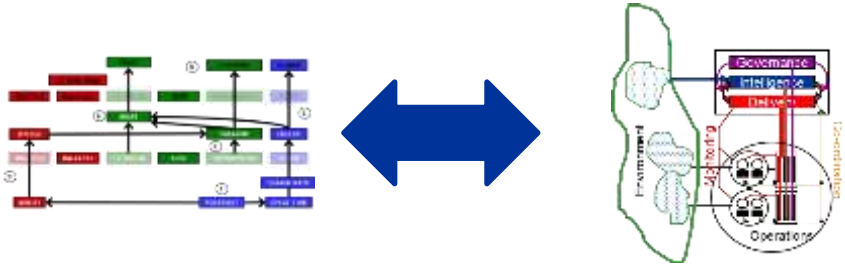
VSM as activity model in SSM
À la Brian Wilson



Mosaic as part of 3,4,5 homeostat, or as part of resource bargain



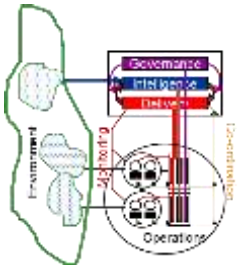
PoS within VSM
VSM within PoS (capability shifts)



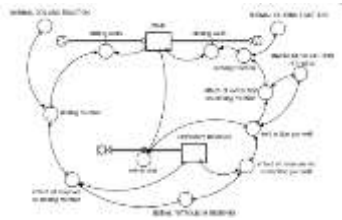
SD model of rates of change in strategies
SD model of connections / dynamics / Homeostats

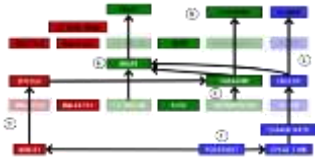
Nested - *A within B*

Syntegration – a model of 3,4,5 interactions
IT co.

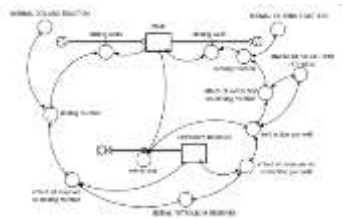


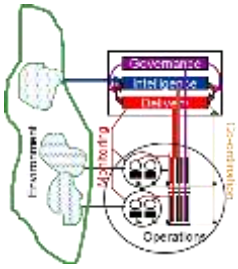
SD model of Δ in strategies
SD model of connections / dynamics / Homeostats



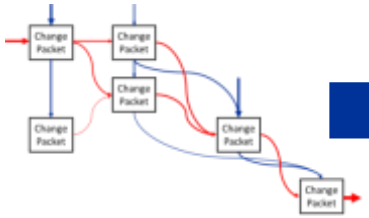


SD model of VSM
Homeostats / connections
Exam board



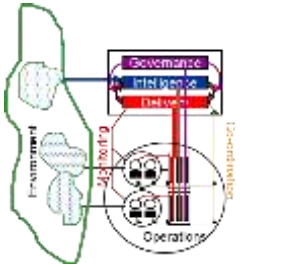


Mosaic as part of agility calculation

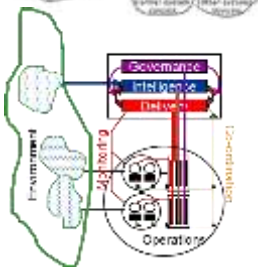


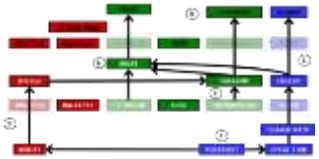
Overlays - *A enriches B*

SSM stakeholder / cultural model overlaid onto VSM

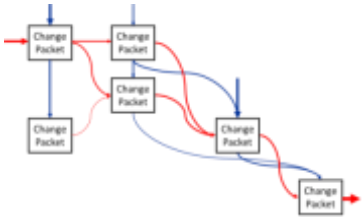


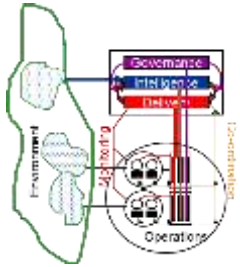
VSM enriches understanding of eg power or agility in PoS



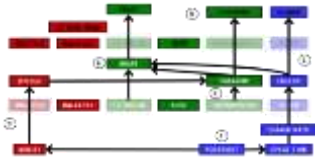


Mosaic energy + constraint as different dimension of subsystems





Mosaic energy + constraint as different dimension of subsystems



Understanding Syntegration improves understanding 3,4,5 interactions