The Process Industry Neurology Initiative

Rewiring the Brain of the Process Industries

Advances 2025
Chris Hamlin, HancockHamlin Ltd

HancockHamlin

Who Are We?

Penny Hamlin

MSc Sustainable Development

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HancockHamlin

CARBON CLARITY IN THE GLOBAL PETROCHEMICAL SUPPLY CHAIN

Chris Hamlin FREng

Visiting Professor

Fellow

Fellow

MBA & Visiting Fellow

Origin Story

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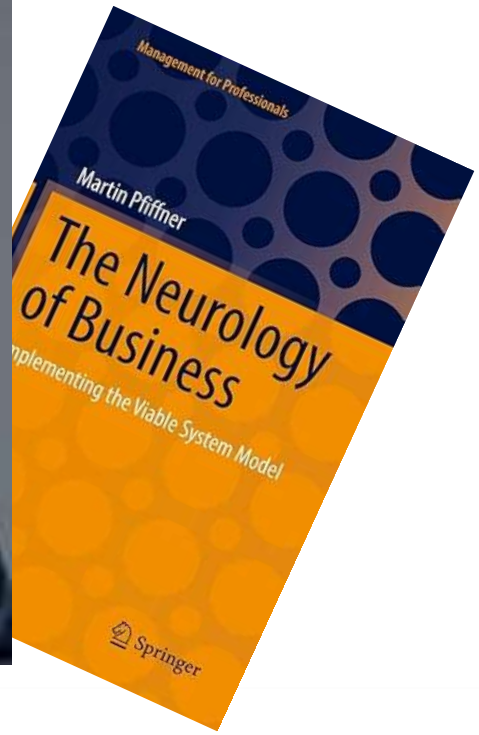
Influences & Inspiration

The Neurology of Business



VSM Coach Training

Why hasn't the Process Industry transformed?

Billions spent on digitalisation but…

…70% of digital transformations FAIL[1]

Why? Because the focus is wrong.

- We're trying to change *complex evolving systems* using *linear engineering logic*.

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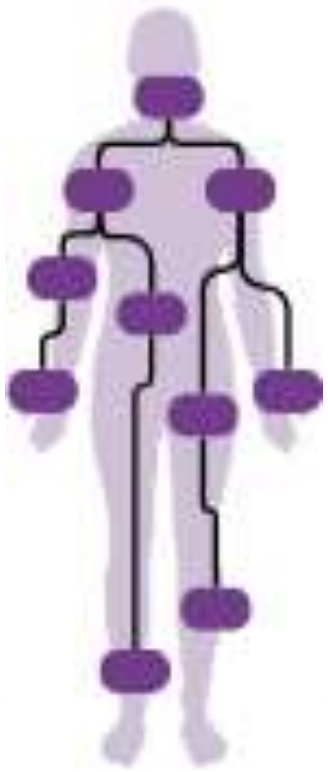
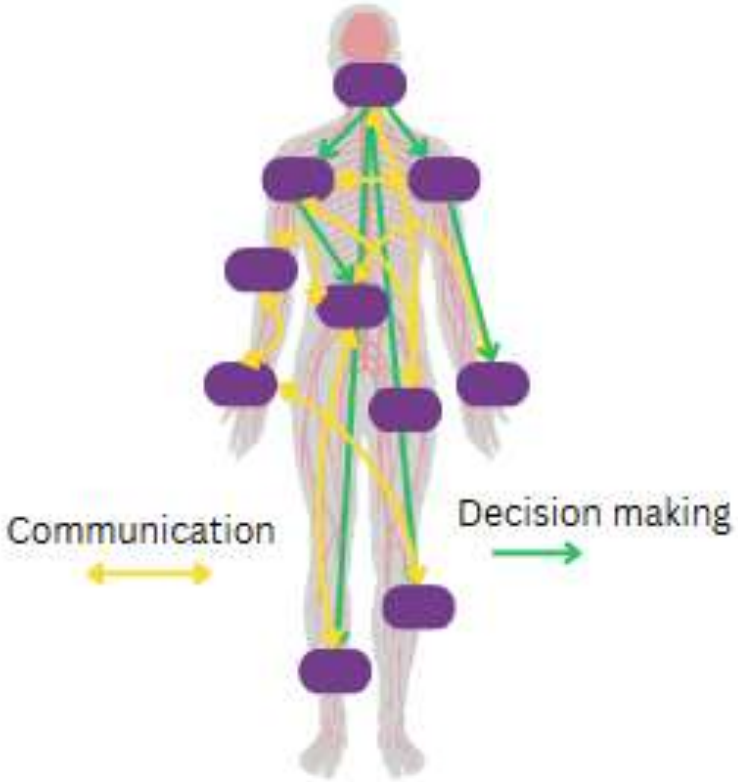
1. Dr Corrie Block, Forbes Coaches Council, 2022 "12 Reasons Your Digital Transformation Will Fail"

The Neurology Analogy

Organisational Structure
- Anatomy



Decision & Feedback Flows
- Neurology



Business Processes
- Physiology

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Purpose of today - Exploration with you all

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Exploring the VSM Connection

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Introducing the Viable System Model (VSM)

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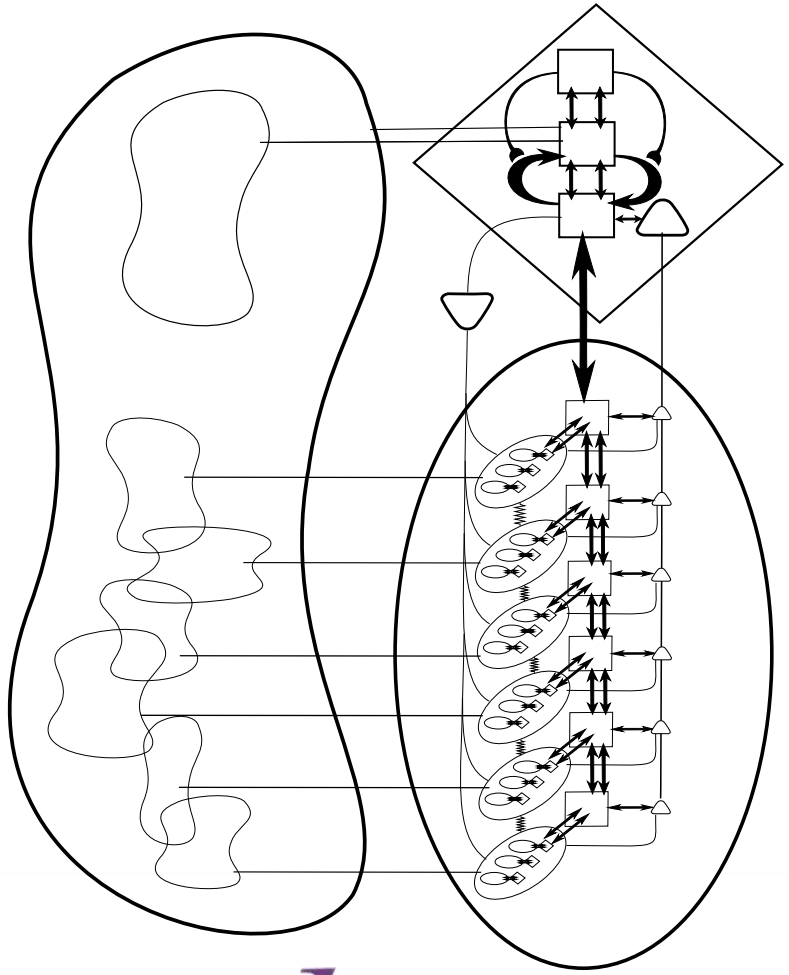

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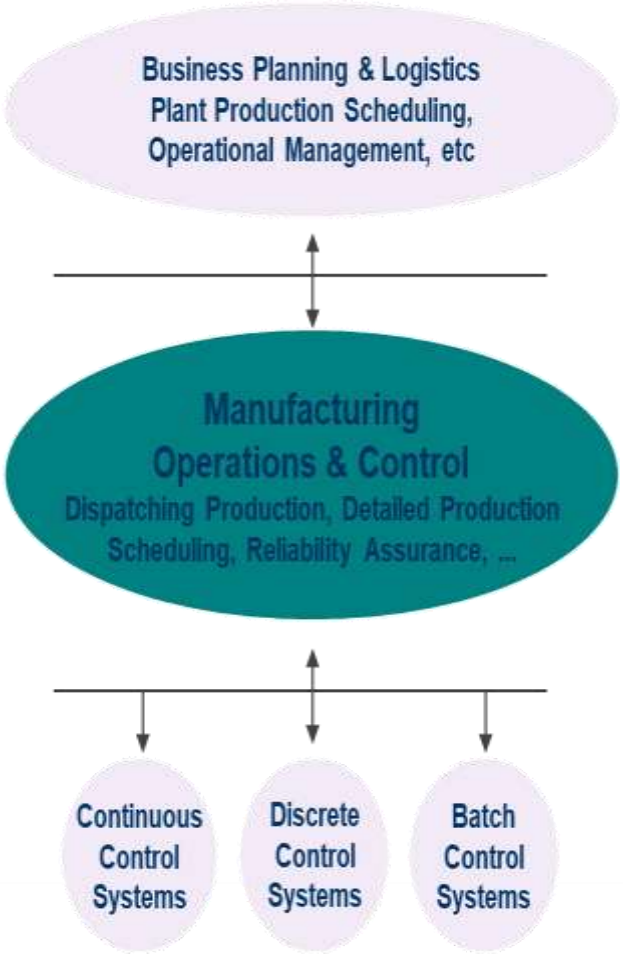
“Business Control Hierarchy”™



Risk Management *Coping with an uncertain World*

- Prices & markets; Supply and demand uncertainty; Plant availability & reliability

Agility Management *Responding to fluctuations and deviations*

- Alternate production and supply routes; Spot opportunities; Responsiveness & flexibility

Performance Management *Knowing what’s happening and what’s possible*

- Identifying deviations (in production performance, supply/demand patterns etc); Validation of planning models and assumptions; Driving continuous improvement

Conformance Management *Doing what’s wanted or expected*

- Staying on spec (quality control); Minimising costs (constraint control); Pushing appropriate limits (real-time optimisation)

Conservation Management *Keeping the process running*

- Basic regulatory control (closed-loop); Conservation of mass and energy

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Recursion – Business Control Hierarchy™ in Practice

Risk Management — Coping with an uncertain World

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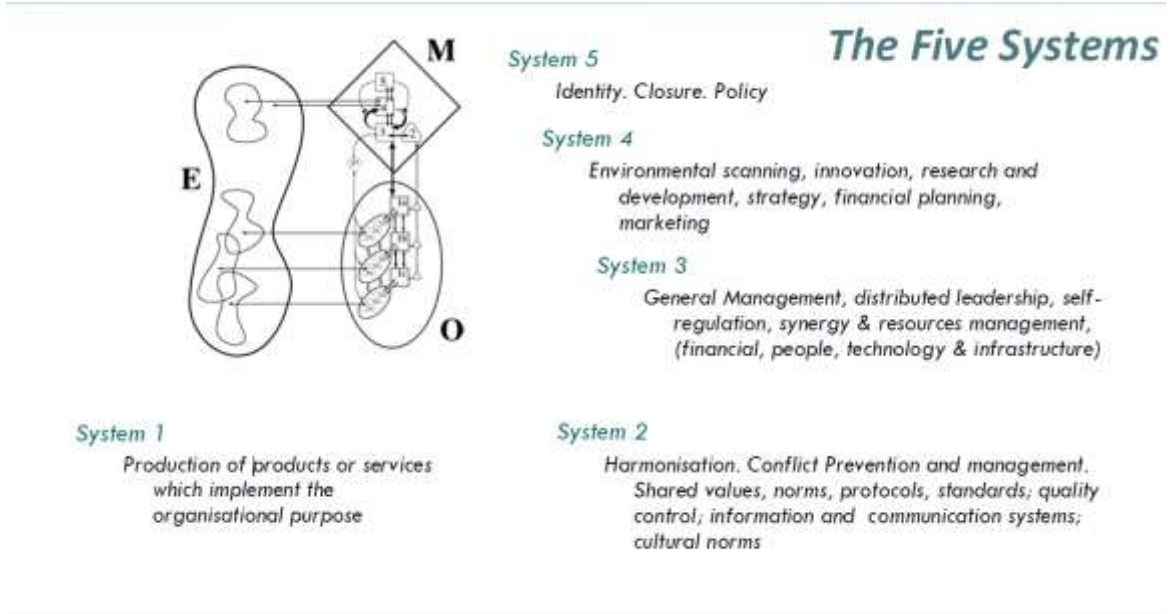
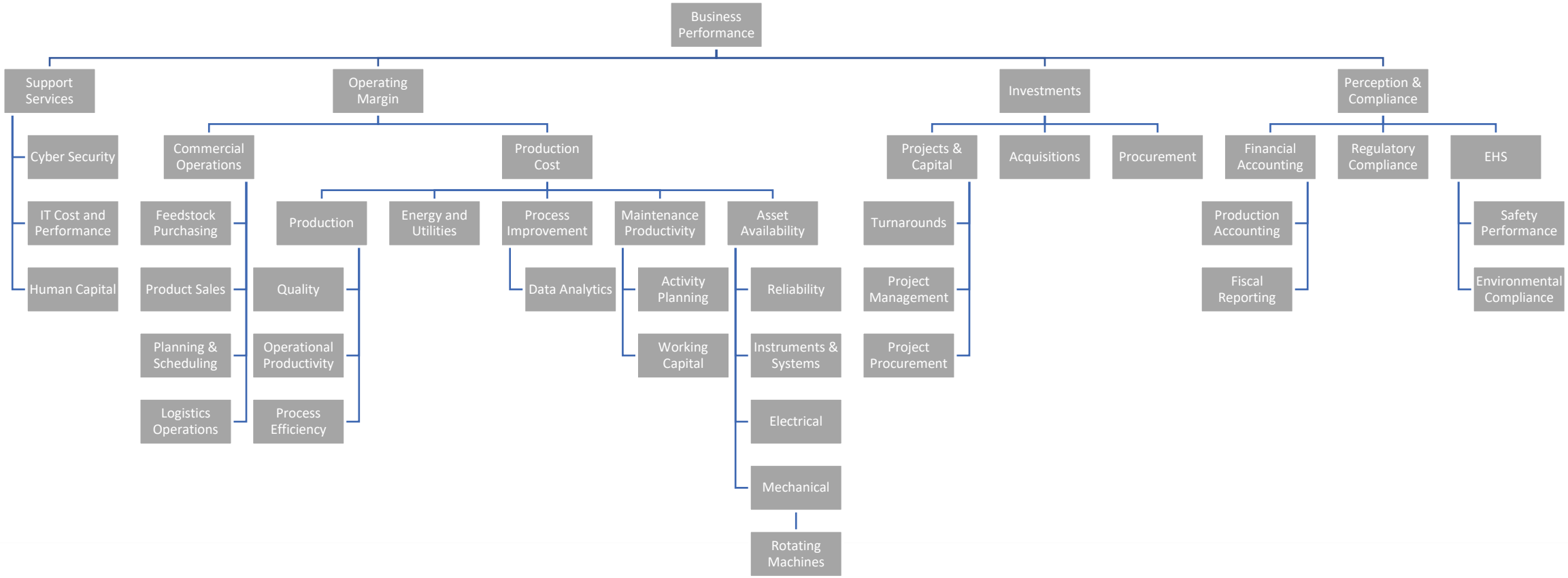
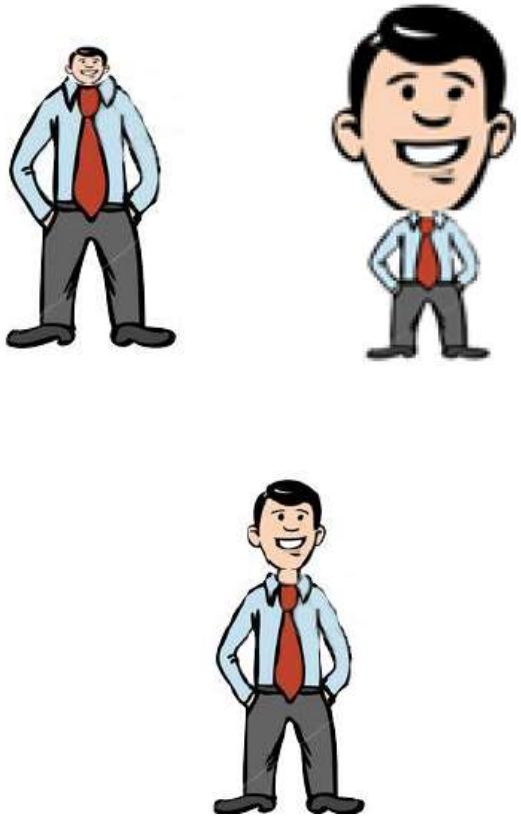


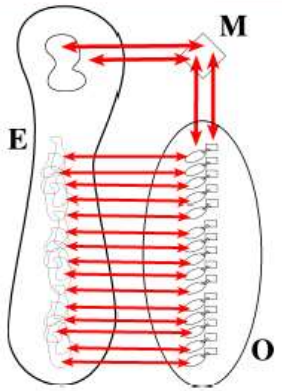
The Person Responsible™ for….
Is this a possible S1 & recursion model?



Meta-system not understood in any way



Un-balanced organisation?

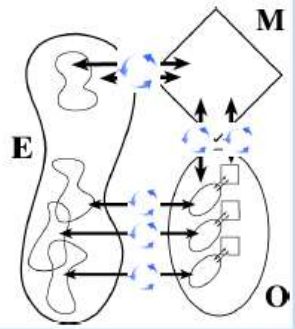


In businesses, you see:

- Over-work on the shop-floor while managers drink coffee
- Confusing lines of command - too many bosses.
- Long beautifully produced reports, accounts and planning documents while orders are lost through lack of operational capacity.
- Large turn-over of operational staff

In businesses, this results in:

- Lack of direction, strategy, optimised work plans
- Fragmented structures
- Lack of co-ordination
- Operating procedures are inefficient
- Chaos in the work-place.

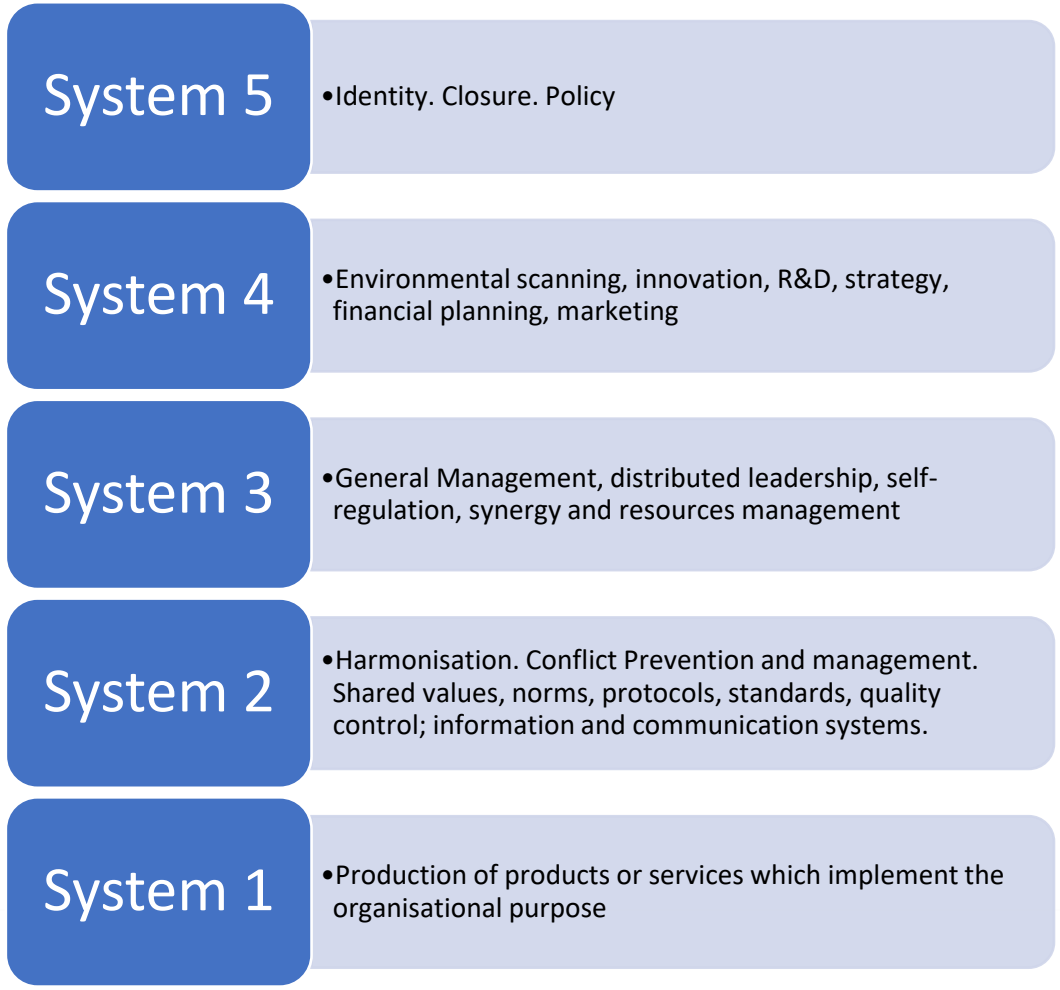


Images from Angela Espinosa's VSM Coach Course

Systems 1-5 not all fully present

- S1 is clear, and in some aspects has been digitised for decades at the shop floor
- S2 has historically been manually implemented through successive levels of scheduling and planning
- S3 is “Operations Management” and rarely appropriately autonomous at any level – consequential anarchy on shop floor
- S4 is only present at business level – predicting market demand
- S5 is confused with S3, and digitalisation has amplified the tendency for micromanagement in lieu of appropriate responsibility assignment

- Process industries – different archetypes are likely to have different emphasis and requirement of systems.
  - e.g. Compliance based will likely have stronger System 3* than some others



Motivation & Opportunity

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Why it matters

Process Industry's Current Approach

Image by WikiImages from Pixabay

Careful, Deliberate, Slow

What it could be…

Gorodenkoff/Shutterstock.com

Dynamic, Responsive, Immediate

Ancient Greece – Two Understandings of Time

Chronos

- Regular, linear progression - seconds, minutes, hours, days, weeks, months, years

- Quantifiable
- Measured
- Systematic
- Predictable
- **Rhythmic** action

Kairos

- Not bound by clock or calendar - focuses on the significance and quality of any particular moment

- Conditional
- Experienced
- Qualitative
- Opportune
- **Responsive** action

Image generated by DALL-E on ChatGPT Jan 2025

One Example - Measurement of GHG Impact in Upstream Industry

Types of Measurement

Standards Based	Retrospective, Actual	Run-Time Visibility, Actual
• universal • historic • generic • Tend to be aggregates or averages • Non-differentiating	• Periodic • Historic • Often aggregated, derived or inferred. • Lagging • Tend towards costs and penalties • Feedback is delayed	• continuously calculated, measured, or derived. • local and bottom-up • Information is immediate, verifiable and dynamic • enables proactive steps

Measurement & Targets for Climate Change Mitigation
Scopes 1, 2 & 3

Illustrative, imaginary industry transformation pathway - creating attractors and positive feedback loops

Shift 1

Scope 1 (then 2) reporting moves to a run-time basis

Shift 2

Scope 3 transitions from standards-based to retrospective actual reporting

Shift 3

Scope 3 upstream shifts to run-time reporting

Shift 4

Run-time visibility of entire value chain sows seeds of next cycle of innovation

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Image by Mabel Amber, from Pixabay

The Full Journey

	Starting Position	Step 1	Step 2	Step 3	Step 4
SCOPE 1	Retrospective Actual	Run-Time, Actual			
SCOPE 2	Retrospective Actual	Run-Time, Actual			
SCOPE 3 Upstream	Standards Based		Retrospective Actual	Run-Time, Actual	
SCOPE 3 Downstream	Standards Based		Retrospective Actual	Retrospective Actual	Run-Time, Actual

Image by Marek from Pixabay

Image by Nico Wall from Pixabay

Photo by Андрей: https://www.pexels.com/photo/green-plant-near-tall-trees-10981093/

Image by Kevan Craft from Pixabay

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Implications of Kairos-based Operations (Run-Time Enterprise)

Analagous to Maximisation of Autonomy at Lowest Possible Recursion Level

- Run-time visibility of deviation
  - Potential to intervene and mitigate/correct
- Validation and verification
- Certification and Quantification at facility/batch level
- Creation of economic premium for responsible production
- Transparency, quantification and awareness of acceptable standards
- Highlighting of laggards

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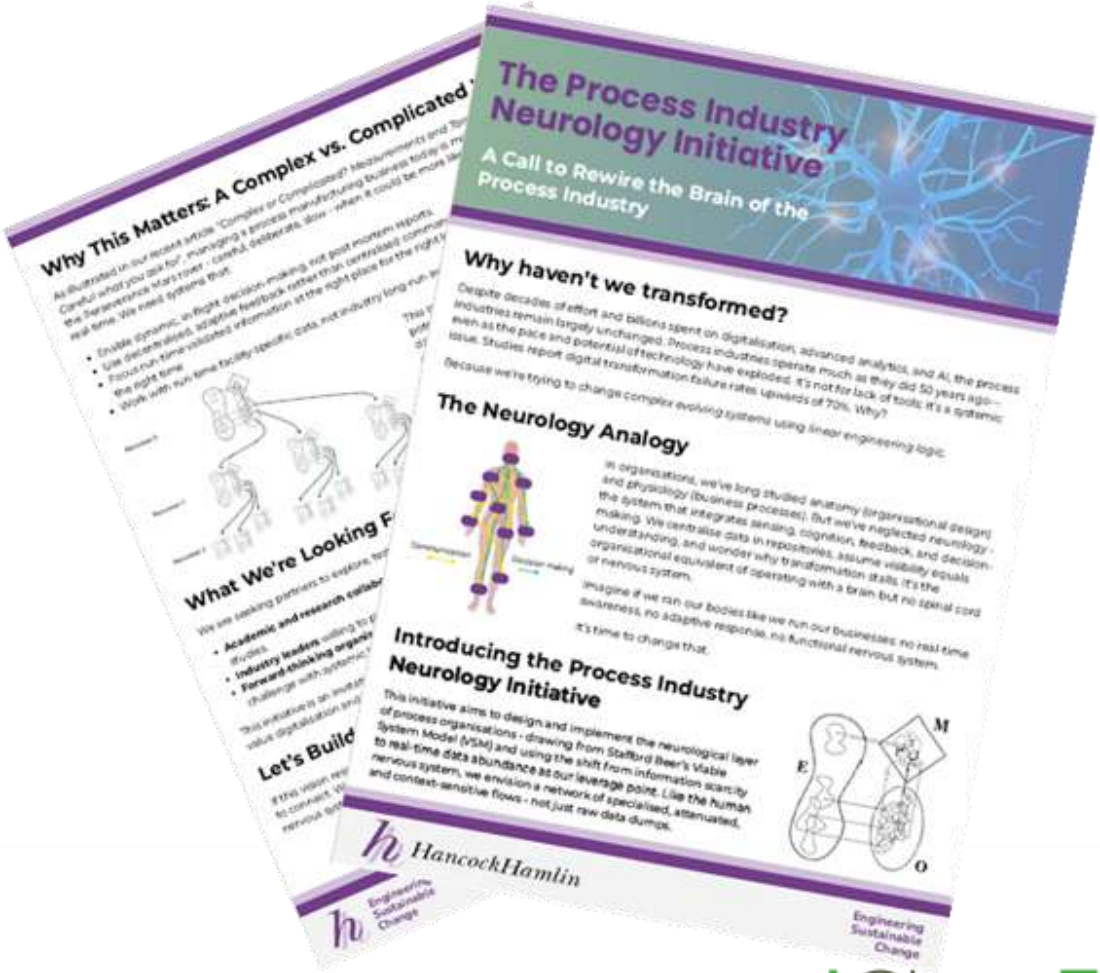
The Process Industry Neurology Initiative

- Using VSM and the shift from information scarcity to real-time data abundance as our leverage point to re-imagine the process industry and map generic transition pathways.

- Formalisation of concepts including:
  - Attenuation
  - Amplification
  - Homeostats



What we're looking for

Help Needed!

join us to pioneer the thinking and practice that might finally unlock the value digitalisation and AI have long promised but rarely delivered.

Academic and research collaborators - to help develop the frameworks and run comparative studies.

Industry leaders – to pilot new approaches within a live facility or business unit.

Forward-thinking organisations – to form a consortium to advance this as a shared challenge with systemic benefits.

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