



32nd Annual **INCOSY**
international symposium

hybrid event

Detroit, MI, USA
June 25 - 30, 2022

Culture of Inquiry: Forming the Systems Engineering Mind

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Agenda

- Forming the 'SE' Mindset
- Exploring Systems Thinking
- Mapping Systems Thinking to Leadership
- Connecting with Culture of Inquiry
- Questions



Forming the 'SE' Model Mindset



Where do you need individuals to actively seek out to change, innovate and ask critical questions ?

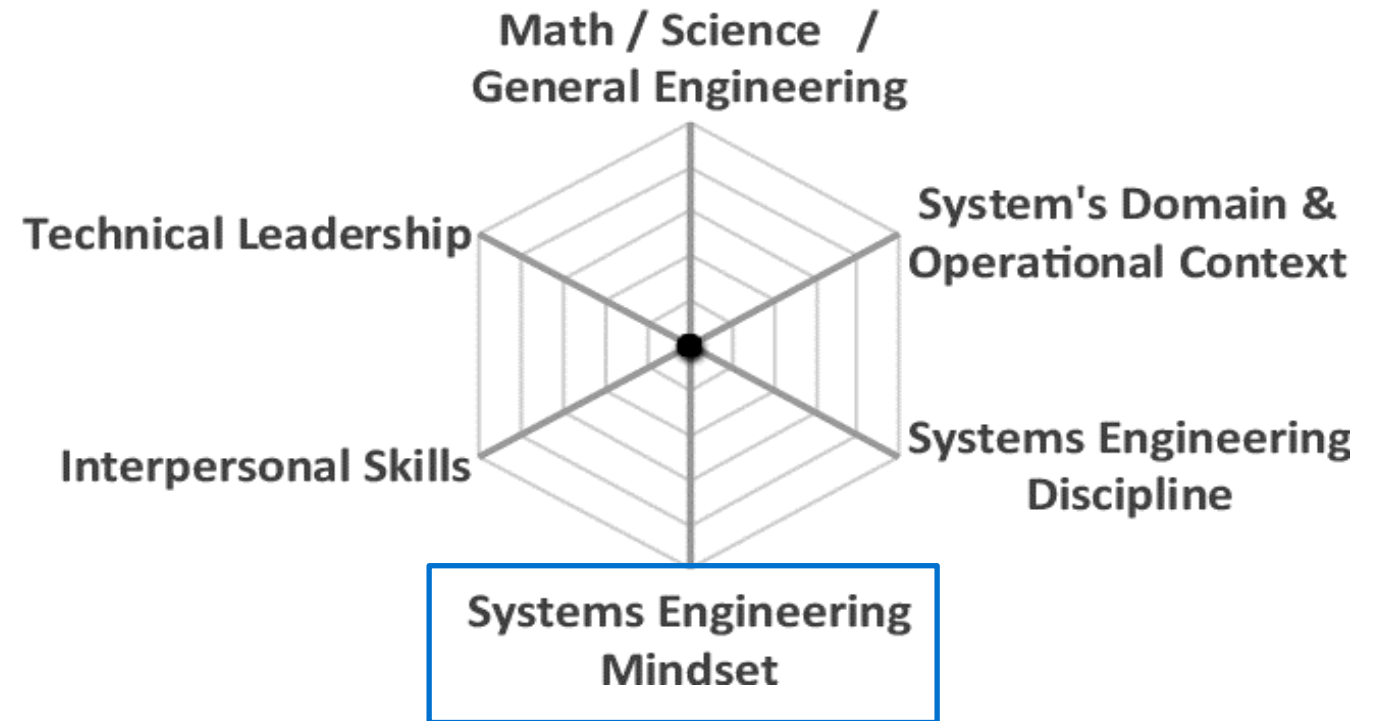
How can you empower individuals to be entrepreneurial and collectively drive competitive results?

Success demands a multi-layered approach that crosses organizational culture, domain expertise, agency, etc...



Forming the 'SE' Model: SE Layers

The **Systems Engineering Mindset** is representative of **problem-solving skills**, **behaviors**, and **cognition** abilities that can **navigate** design, processes, and organizational complexity to produce **optimal solutions**. (i.e. Systems Thinking).



(Hutchison, Henry, and Pyster, 2016).



Exploring Systems Thinking

Systems thinking is a discipline for seeing wholes rather than parts, for seeing patterns of change rather than static snapshots, and for understanding the subtle interconnectedness that gives living systems their unique character. - Peter Senge

Systems Thinking is a way of thinking used to address complex and uncertain real-world problems. It recognizes that the world is a set of highly interconnected technical and social entities which are hierarchically organized producing emergent behavior. – INCOSE UK

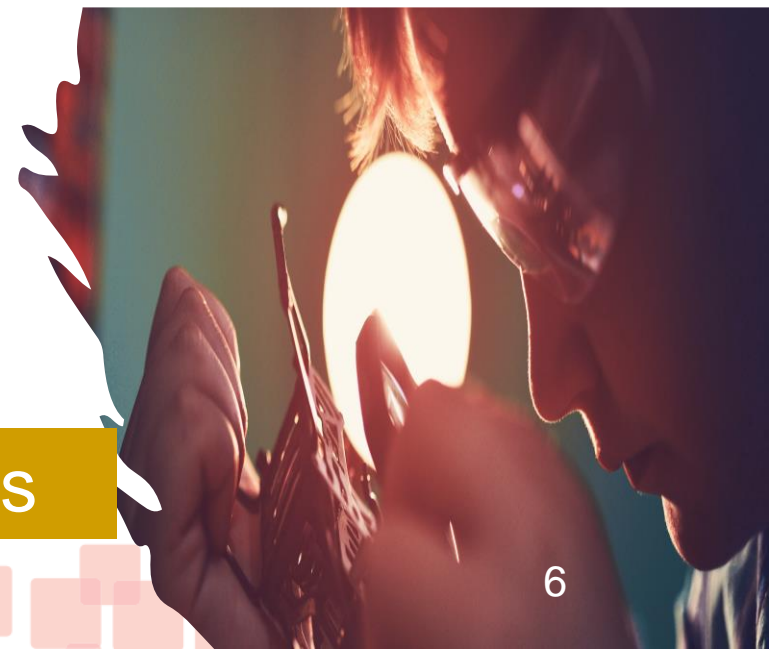
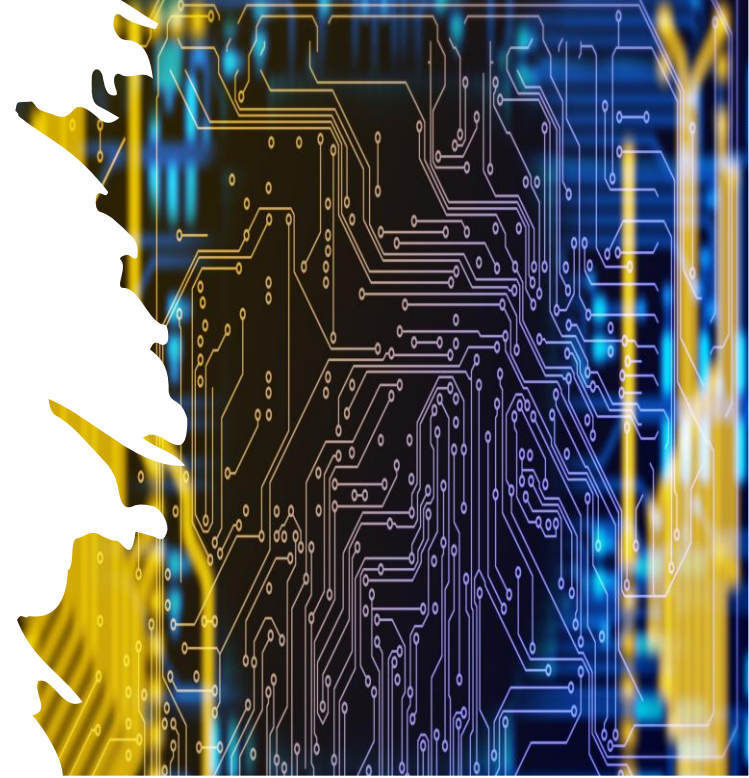
“Systems thinking expands the range of choices available for solving a problem by broadening our thinking and helping us articulate problems in new and different ways.” - Michael Goodman

Exploring Systems Thinking

A cross-functional mindset or team committed to understanding and anticipating patterns and barriers throughout the **life-cycle** of a product, system, or process

It **promotes increased sensitivity** to how systems and life interact for both **intended and unintended functions**.

Challenges and Inserts Entrepreneurial Insights





Exploring Systems Thinking

A cross-functional mindset or team committed to understanding and anticipating patterns and barriers throughout the life-cycle of a product, system, or process. It promotes increased sensitivity to how systems and life interact for both intended and unintended functions.

cross-functional mindset or team	committed to understanding and anticipating patterns and barriers	(1) Throughout the life-cycle of a product, system, or process, (2) both intended and unintended functions
Have the correct tools, functions, and instructions been deployed to the team? Are the stakeholders engaged?	What is the system being designed and deployed? Is there shared understanding on system performance, system boundaries, and data access?	What proactive verification and validation parameters are in place to confirm the design and predict emergent behaviors?



Exploring Systems Thinking

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cross-functional mindset or team	committed to understanding and anticipating patterns and barriers	(1) Throughout the life-cycle of a product, system, or process, (2) both intended and unintended functions
What is the teaming culture to unlock a cross-functional mindset or team?	What sensemaking skills are critical to understanding?	What proactive behaviors and tools promote emergence detection?

‘Right’ Leadership Approach and Culture



Mapping Systems Thinking to Leadership

A **cross-functional mindset** or team **committed to understanding and anticipating** patterns and barriers throughout the **life-cycle** of a product, system, or process.

It **promotes increased sensitivity** to how systems and life interact for both **intended and unintended functions**.

Transparency
Accountability
Empowerment
Partnership
Passion

Mapping Systems Thinking to Leadership



“A leader is one who knows the way, goes the way, and shows the way.” – John C. Maxwell

Aerospace (VP)

- Be Fair and Ethical
- Employ Vision Advocates
- Make Decisions
- Take Calculated Risks
- Have Senior Support
- Life-Long Growth Agent

Aviation Services (CEO)

- Community Service Extension
- Proper Relationship Investment
- Positive Results
- Partnership Beyond Business
- Don't see Dollars/Products – See People
- Be the Example

FinTech/Technology Services (VP)

- Be direct, open, ethical, and fair
- Protect the Team
- Examine Organizational Politics
- One on One
- Be the Example
- Create Long Term Growth
- Have External Outlets

Platform for a leaderful culture producing functional sustainable results



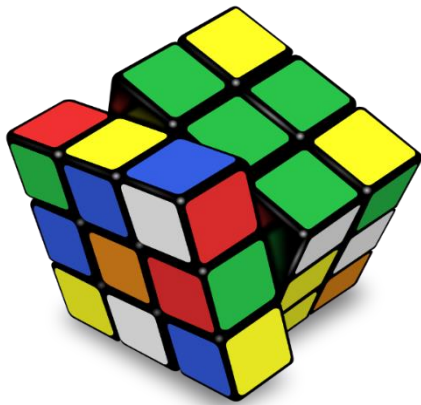
Mapping Systems Thinking to Leadership

Genuine Essence Leadership = Authentic + Spiritual

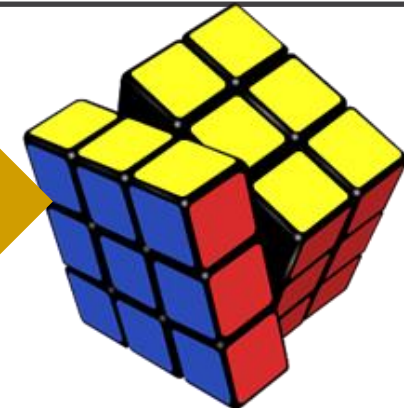
*Inspiring Partnership
Inspiring Follower Accountability
Fueling Innovation
Wearing a Shield of Integrity*

*Transparency
Accountability
Empowerment*

*Partnership
Passion*



**Move from
misalignment**



**To Unlocking
SE Potential**



Genuine Essence Leadership = Authentic + Spiritual

Inspiring Partnership
Inspiring Follower Accountability
Fueling Innovation
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Transparency
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Empowerment

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Passion

Judgement Framework Process

Preparation Phase

- Sense/Identify
- Frame/Name

Call Phase

- Mobilize/Align
- Call

Execution Phase

- Make it Happen
- Learn / Adjust

- Organizational Assessments
- Judgement Framework Assessment



Connecting with Culture of Inquiry

Trust

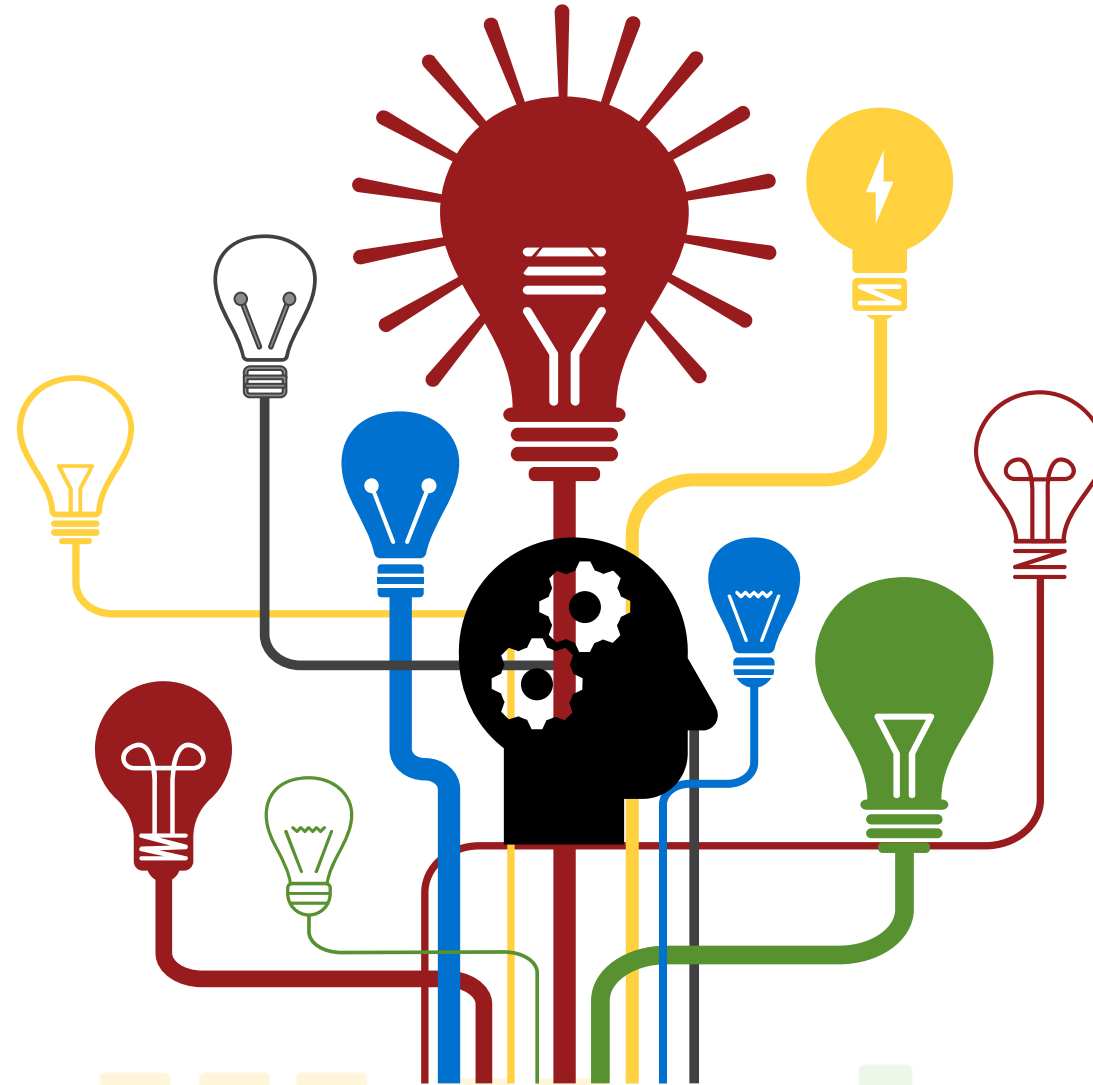
Organizational
Agility

Improving Mindset
Habits of Mind

Adaptive

Shared
Learning

Sensemaking
(Forecasting, Learning
Systems, Framing)



Connecting with Culture of Inquiry - Habits of Mind Assessment



‘Gathering data through all senses’

- ✓ challenges leaders and followers to seek out and utilize data from internal and external forces (Hyerle, 2008)
- ✓ data activates the ability to exercise reflective practice for continuous learning (Hyerle, 2008; Morris, 2017; Schon, 1984).

‘Responding with wonderment and awe’

- ✓ activates the mind's inquisitiveness and pathways for innovative thought and curiosity
- ✓ foster a culture of innovation or better designs (Adams, Turns, and Atman, 2003).
- ✓ generates positive organizational outcomes (Morris, 2017; Miller, 2015).

How Leaders and Members Response Impacts the Organizational Culture

Connecting with Culture of Inquiry - Habits of Mind Assessment



GEL Model



Habits of Mind Focus



Connecting with Culture of Inquiry: Implementation



Leadership Framework Implementation

Phase 1	GEL IMPACT	Phase 2
Created & Launched Innovation Circle Created & Launched Tech Talks Management Presenting Team Success Monthly Team Lunches	Fueling Innovation	Weekly Innovation Reviews / Community of Practice Increase Business Development Mindset
Creation of Project Engineers to Interface with Program Managers for Engineers Monthly Launched Business Unit Update Financial Reporting and Time Reporting	Inspiring Partnership	Skip Levels Business Unit SE Familiarization Training Integrate SE Deliverables into Key Decisions
Technical Risk Management Training Customer/Supplier Risk Reviews	Inspiring Follower Accountability	Integration into PM Risk Management Goal/ Role Setting Expectations Sessions Feedback Process
Leader Transparency on the Current State	Wearing Shield of Integrity	Leader Transparency and Gap Assessment, Shared Organizational Vision, Culture, and Mission Statements



Connecting with Culture of Inquiry: Implementation

KEY QUESTIONS

1. What key actions and communication is needed to create a culture of inquiry operating with high curiosity in the leader?
2. What key actions and communication is needed to create a culture of inquiry operating with high curiosity within the followers?

Questions



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References

- Atkinson, M. (2005). The development of an evaluation framework for partnership working. *The Electronic Journal of Business Research Methodology*, 3(1), 1-10.
- Caza, A., & Jackson, B. (2011). Authentic leadership. *The SAGE handbook of leadership*, 352-364.
- Costa, A. L. (2008). Describing the habits of mind. Habits of mind: Discovering and exploring. In A. Costa and B. Kallick, (Eds.), *Learning and leading with habits of mind: 16 essential characteristics for success* (21-40).
- Day, D. V., Harrison, M. M., & Halpin, S. M. (2012). An integrative approach to leader development: Connecting adult development, identity, and expertise. Routledge.



References

- DeRue, D. S., & Wellman, N. (2009). Developing leaders via experience: the role of developmental challenge, learning orientation, and feedback availability. *Journal of Applied Psychology*, 94(4), 859.
- Fry, L. W., Vitucci, S., & Cedillo, M. (2005). Spiritual leadership and army transformation: Theory, measurement, and establishing a baseline. *The Leadership Quarterly*.
- Gardner, H. (2011). *Frames of mind: The theory of multiple intelligences*. Basic books.
- Hyerle, D. (2008). Thinking Maps: Visual Tools for Activating Habits of Mind. In A. Costa and B. Kallick, (Eds.), *Learning and leading with habits of mind: 16 essential characteristics for success* (149-174).
- Hutchison, N., Henry, D., & Pyster, A. (2016). Atlas: understanding what makes systems engineers effective in the US defense community. *Systems Engineering*, 19(6), 510-521.



References

- Martin, G. (2006). *Managing people and organizations in changing contexts*. Routledge.
- Panteli, N., & Sockalingam, S. (2005). Trust and conflict within virtual inter-organizational alliances: a framework for facilitating knowledge sharing. *Decision support systems*, 39(4), 599-617.
- Raelin, J. A. (2005). We the leaders: In order to form a leaderful organization. *Journal of Leadership & Organizational Studies*, 12(2), 18-30.
- Raelin, J. (2011). From leadership-as-practice to leaderful practice. *Leadership*, 7(2), 195-211.
- Savolainen, T., & Häkkinen, S. (2011). Trusted to lead: Trustworthiness and its impact on leadership. *Open Source Business Resource*, (March 2011).



References

- Uhl-Bien, M., & Ospina, S. (2012). *Advancing relational leadership research: A dialogue among perspectives*. IAP.
- Woolley, L., Caza, A., & Levy, L. (2011). Authentic leadership and follower development: Psychological capital, positive work climate, and gender. *Journal of Leadership & Organizational Studies*, 18(4), 438-448.



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