



32<sup>nd</sup> Annual **INCOSE**  
international symposium

hybrid event

Detroit, MI, USA  
June 25 - 30, 2022

# Culture of Inquiry: Forming the Systems Engineering Mind

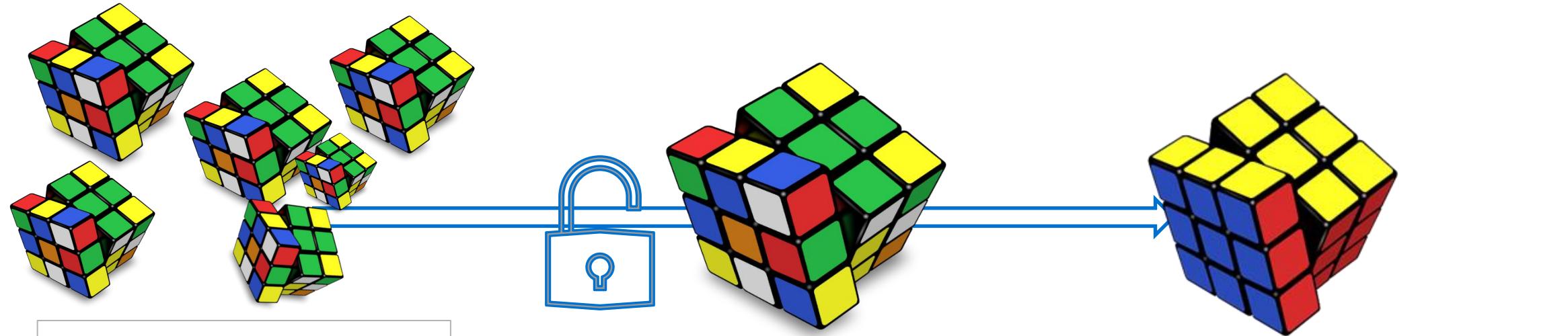
Enanga Daisy Fale - Northrop Grumman | University of Charleston



# 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 ?

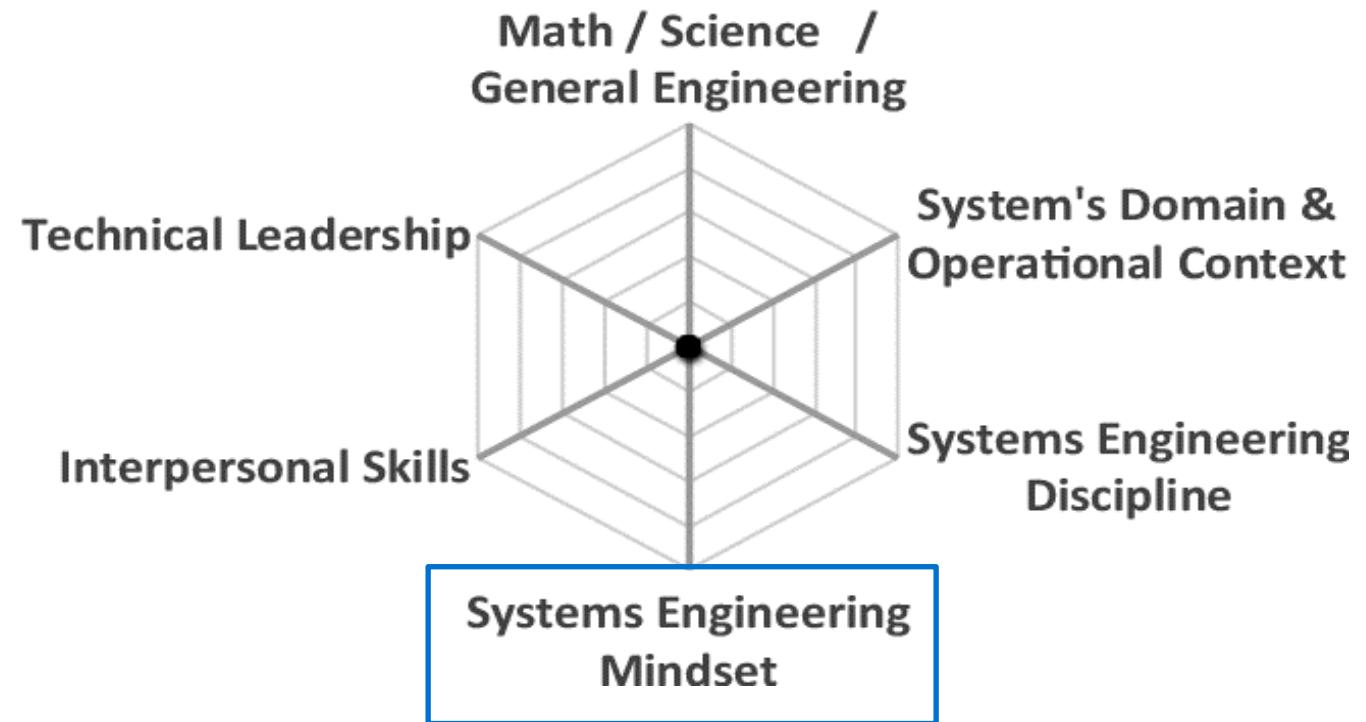
How can you empower individuals to be entrepreneurial and collectively drive competitive results?

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 Insights 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.

<b>cross-functional mindset or team</b>	<b>committed to understanding and anticipating patterns and barriers</b>	<b>(1) Throughout the life-cycle of a product, system, or process, (2) both intended and unintended functions</b>
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**.



# 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*

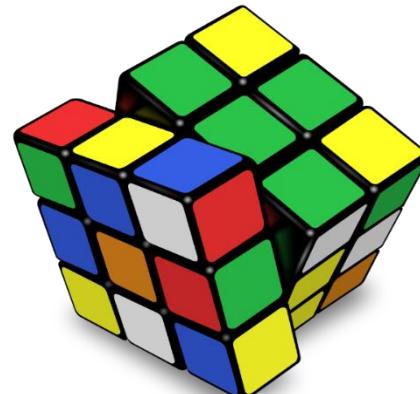
*Transparency*

*Accountability*

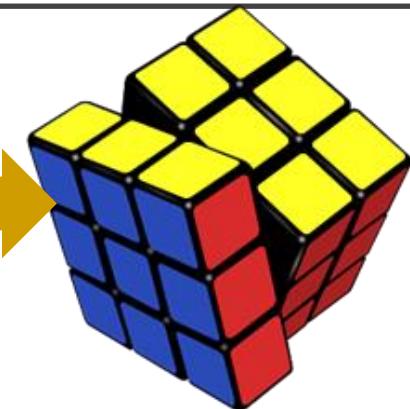
*Empowerment*

*Partnership*

*Passion*



**Move from  
misalignment**



**To Unlocking  
SE Potential**



# Genuine Essence Leadership = Authentic + Spiritual

*Inspiring Partnership*

*Inspiring Follower Accountability*

*Fueling Innovation*

*Wearing a Shield of Integrity*

*Transparency  
Accountability  
Empowerment*

*Partnership  
Passion*

## ***Judgement Framework Process***

### *Preparation Phase*

- Sense/Identify
- Frame/Name

### *Call Phase*

- Mobilize/Align
- Call

### *Execution Phase*

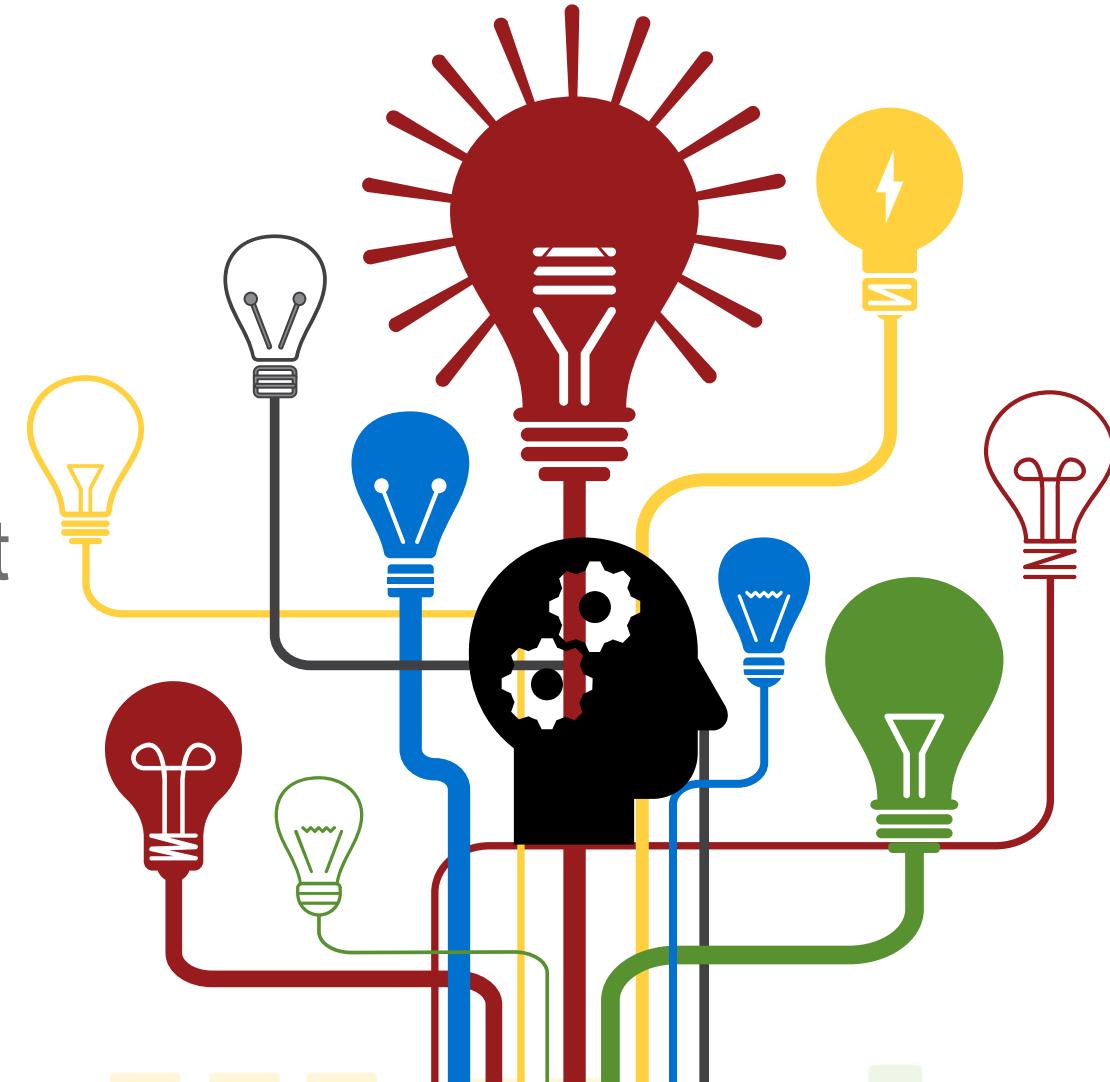
- Make it Happen
- Learn / Adjust

- Organizational Assessments
- Judgement Framework Assessment



# Connecting with Culture of Inquiry

Trust  
Improving Mindset  
*Habits of Mind*  
Shared Learning



Organizational  
Agility

*Adaptive*  
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

Fueling Innovation

Inspiring Partnership

Inspiring Follower Accountability

Wearing a Shield of Integrity

## Habits of Mind Focus

‘Responding with wonderment and awe’

‘Gathering data through all senses’

‘Responding with wonderment and awe’

‘Gathering data through all senses’

# 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	<b>Fueling Innovation</b>	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	<b>Inspiring Partnership</b>	Skip Levels Business Unit SE Familiarization Training Integrate SE Deliverables into Key Decisions
Technical Risk Management Training Customer/Supplier Risk Reviews	<b>Inspiring Follower Accountability</b>	Integration into PM Risk Management Goal/ Role Setting Expectations Sessions Feedback Process
Leader Transparency on the Current State	<b>Wearing Shield of Integrity</b>	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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