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hybrid event
Dublin, Ireland
July 2 - 6, 2024



Leadership for Systems Engineers

Perspective and Influence and Leverage, Oh My!

2-6 July 2024

www.incose.org/symp2024 #INCOSEIS

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Raise your hand
if you are a
systems engineer

Raise your hand
if you are a leader



Driving the Big Picture across the Project

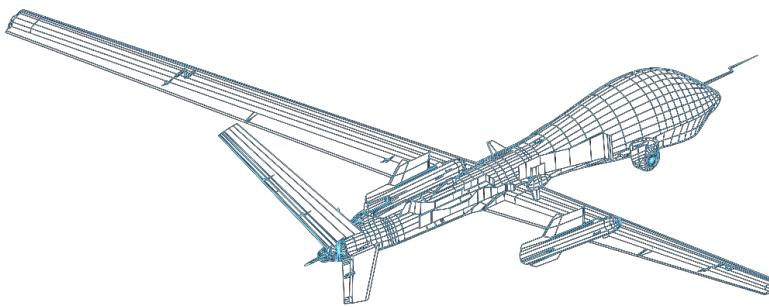
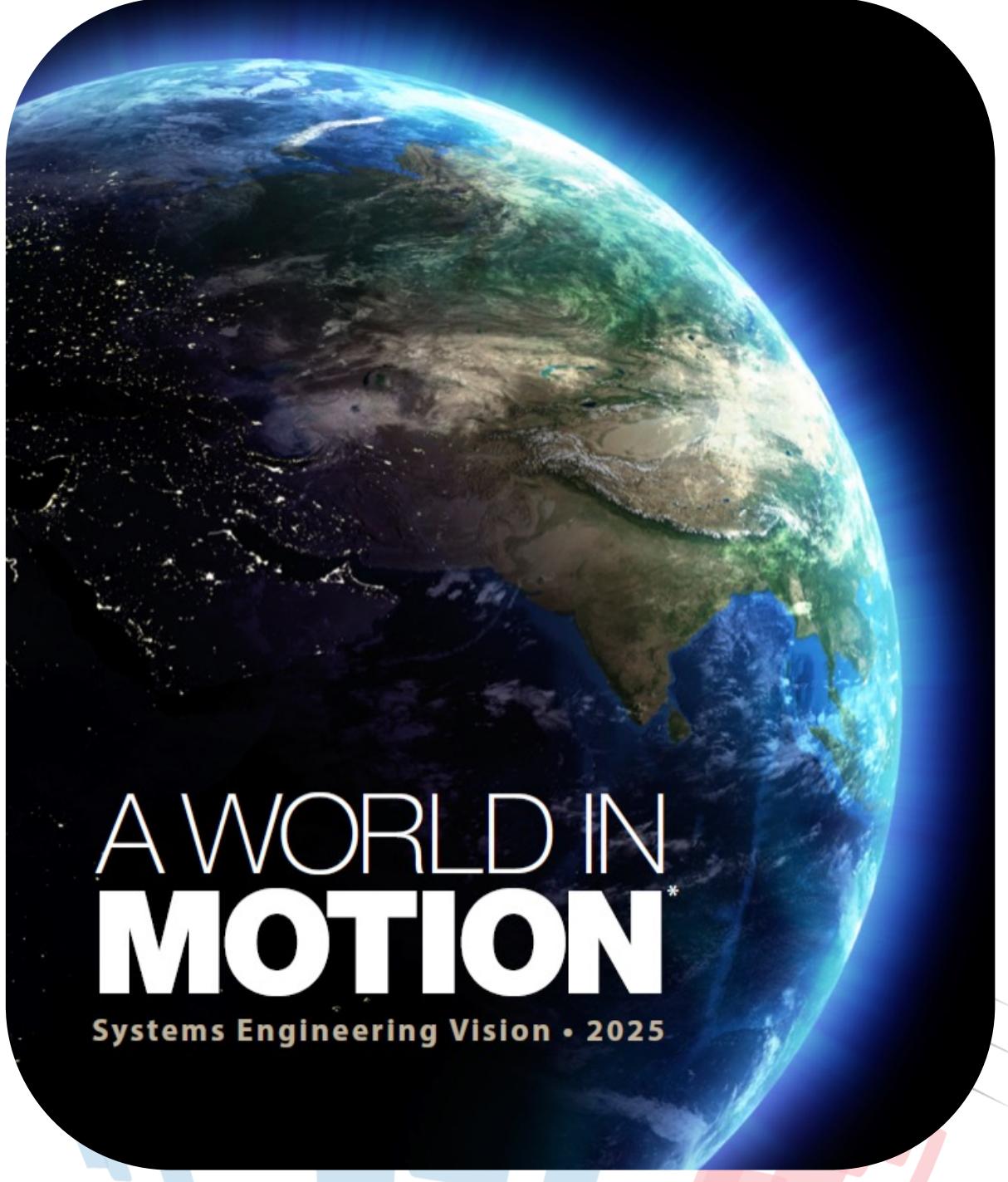
In Our Comfort Zone Identifying Context, Defining Parts, Connecting Roles



One cannot understand a part of a system without at least a rudimentary understanding of the whole.

Functioning in an interdependent environment requires that every team possess a holistic understanding of the interaction between all the moving parts.

People can only be empowered if they have enough context to make good decisions.



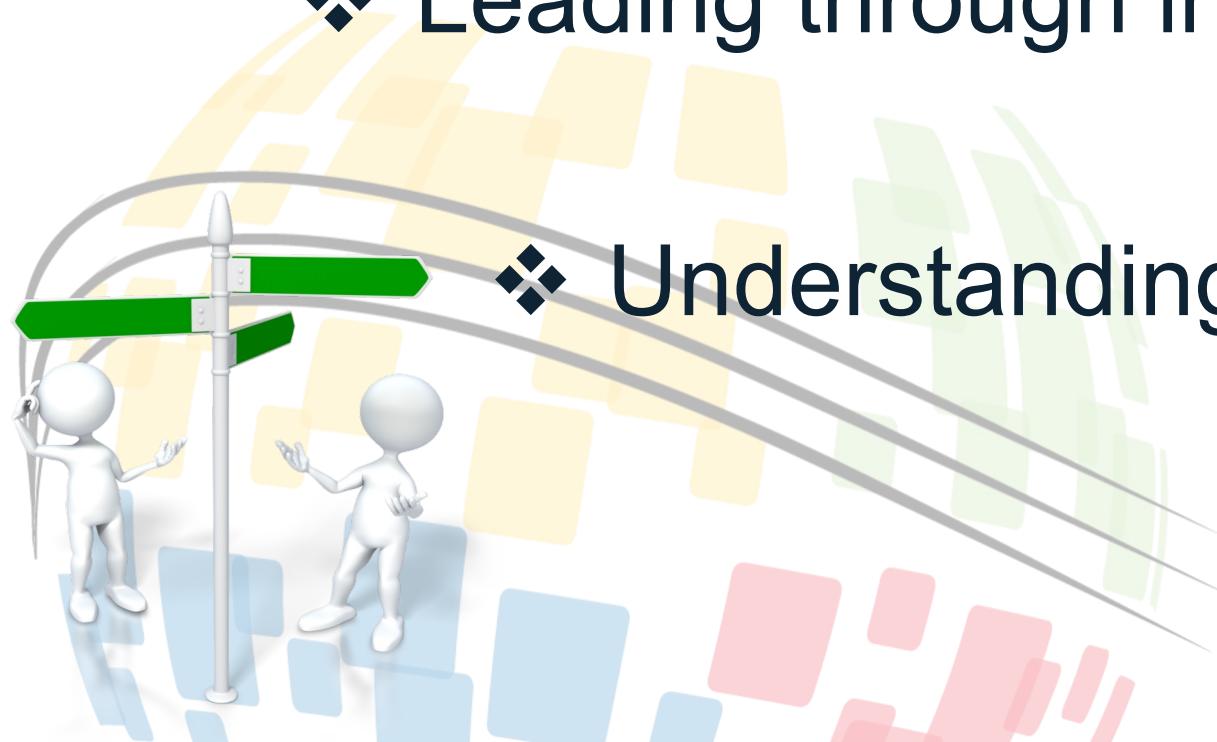
Embracing our Leadership Responsibilities

Transdisciplinary and Integrative Opportunities

❖ Applying the power of perspective

❖ Leading through influence

❖ Understanding our points of leverage



Embracing our Leadership Responsibilities

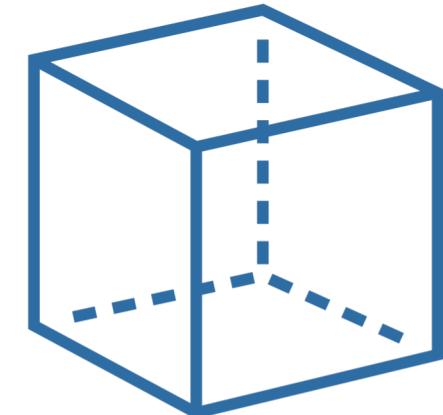
Transdisciplinary and Integrative Opportunities

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Recognizing Perspectives to Collectively Understand

The Importance of Empathy



Mechanical Engineers

Electrical Engineers

Software Engineers

Subject Matter Experts

Human Factors

Social Scientists

Verification & Test

Production

Program Managers



Customers

Users (in context)

Business

Regulators

Stakeholders



Political

Economic

Social

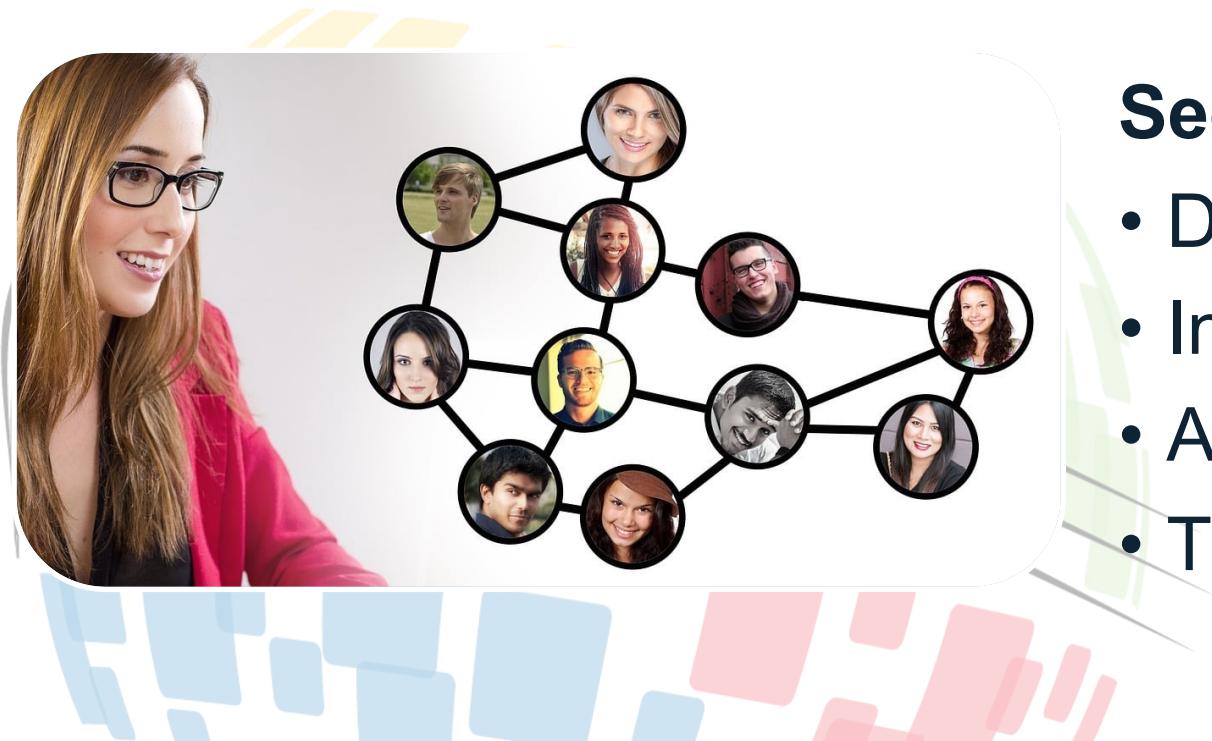
Environmental

Legal

NGOs

Thinking Vertically and Horizontally

Unlocking Collective Intelligence



Seeing further together

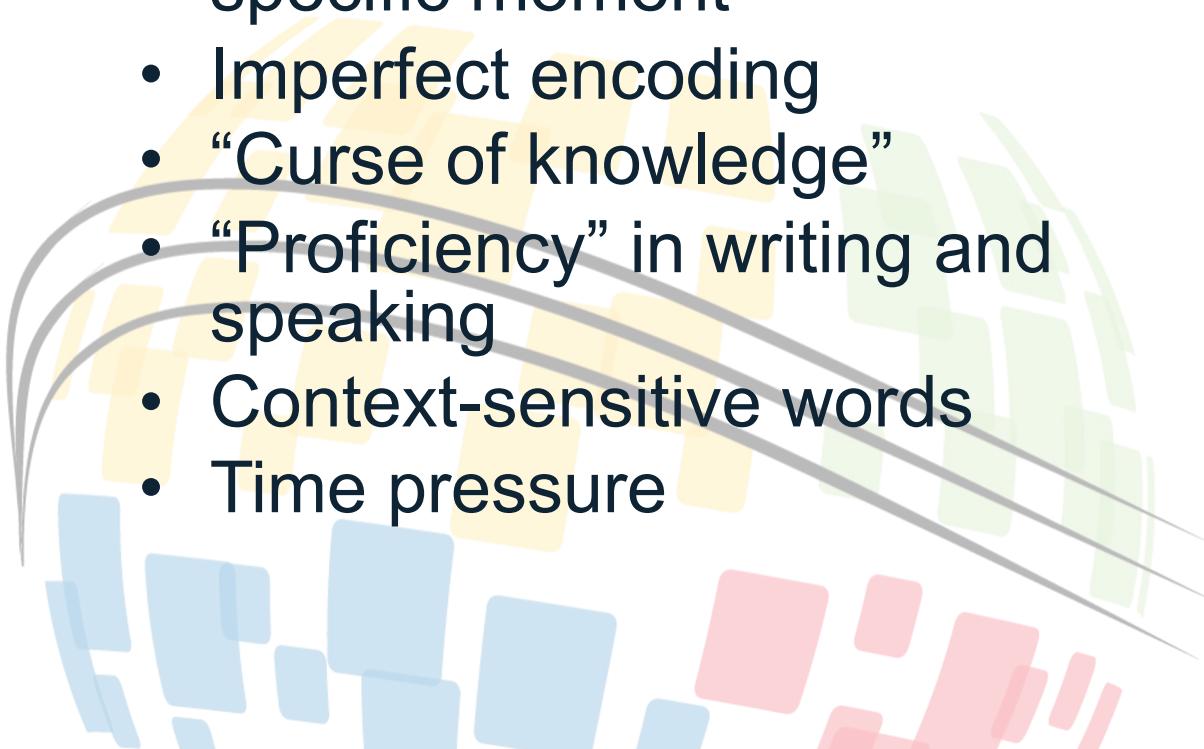
- Diversity of perspectives and thought
- Inclusive, holistic, systemic mindset
- Across concerns
- Through life

Appreciating the Challenge of Communicating Effectively

A Problem in Two Parts and a Two-Party Problem

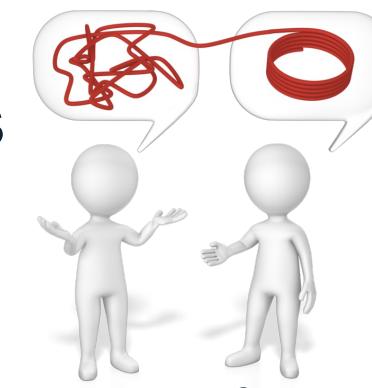
Sender

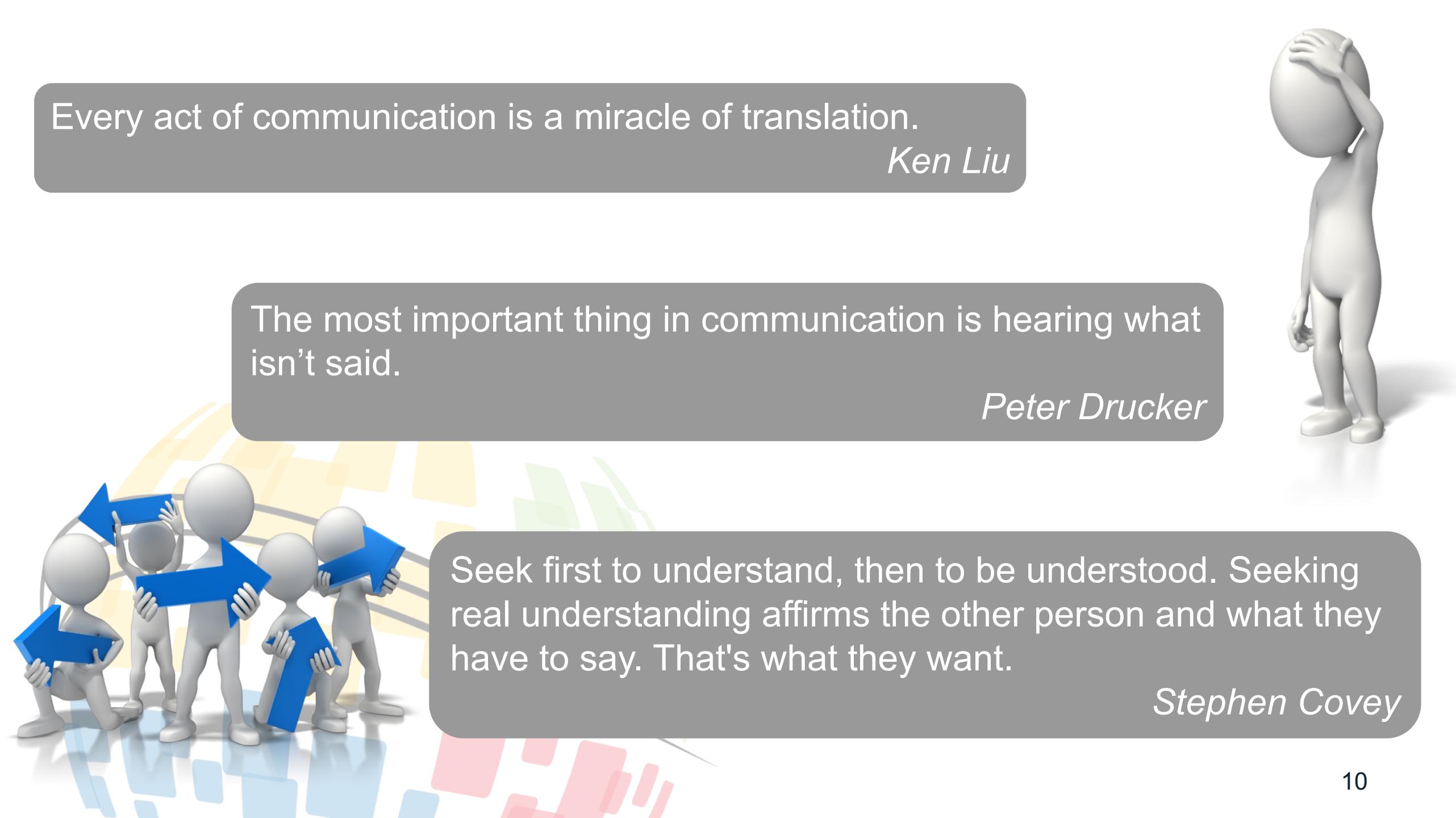
- A lifetime of experiences
- A role
- A specific mindset at a specific moment
- Imperfect encoding
- “Curse of knowledge”
- “Proficiency” in writing and speaking
- Context-sensitive words
- Time pressure



Receiver

- A *different* set of experiences
- A *different* role
- A *different* mindset at a *different* time
- Imperfect decoding
- What was broadcast
- “Proficiency” in reading and listening
- Context-sensitive words
- Time pressure





Every act of communication is a miracle of translation.

Ken Liu

The most important thing in communication is hearing what isn't said.

Peter Drucker

Seek first to understand, then to be understood. Seeking real understanding affirms the other person and what they have to say. That's what they want.

Stephen Covey



Applying “Two Ears, One Mouth”

Seeking to Connect as a Systems Engineering Leader

- Remember “why” is not an engineering decision
 - The why behind your system is business, social, or political
- Listen with your ears, eyes, heart, and brain
 - Listen to understand rather than listening to respond or rebut
 - Be present in the conversation and the moment
 - Suspend prejudgment of appearance, background, language barriers
 - Look beyond words to tone, body language, and emotion
 - Understand cultural context and cues



Applying “Two Ears, One Mouth”

Seeking to Connect as a Systems Engineering Leader

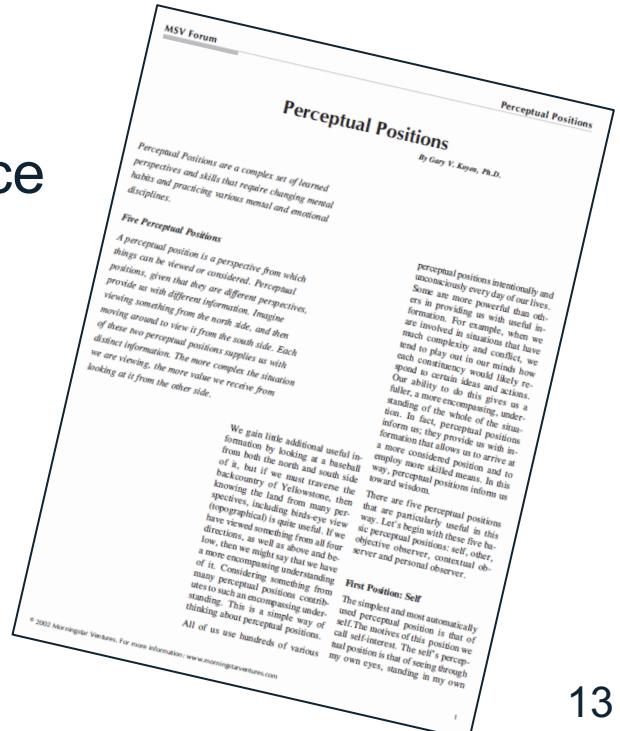
- Demonstrate consultation
 - The only way you get permission and engagement
 - Requires engaging the other party on their terms, both perspective and notation
- Leverage the plane of action, the plane of observation, and reflection (especially during conflict)
- Practice humility
 - Ask more questions and make fewer assertions; stay in the problem space as long as possible
 - Seek to understand before seeking to be understood
 - See as the user and stakeholder perceive through their eyes not how you would perceive from their perspective



Going Further to Maximize the Power of Many

Applying All Five Perceptual Positions (Gary Koyen)

- **Self**
 - Bring your insights as a member of the team
- **Other**
 - Empathize as you elicit requirements, dependencies, concerns, value frameworks, and corresponding worldviews
- **Objective Observer**
 - Value diversity of thought and seek collective intelligence rather than herd mentality
- **Contextual Observer**
 - See the big picture and understand who to trust when
- **Personal Observer**
 - Champion the lifecycle perspective and consider all phases of development, production, operation, maintenance, evolution, retirement, and disposal



Embracing our Leadership Responsibilities

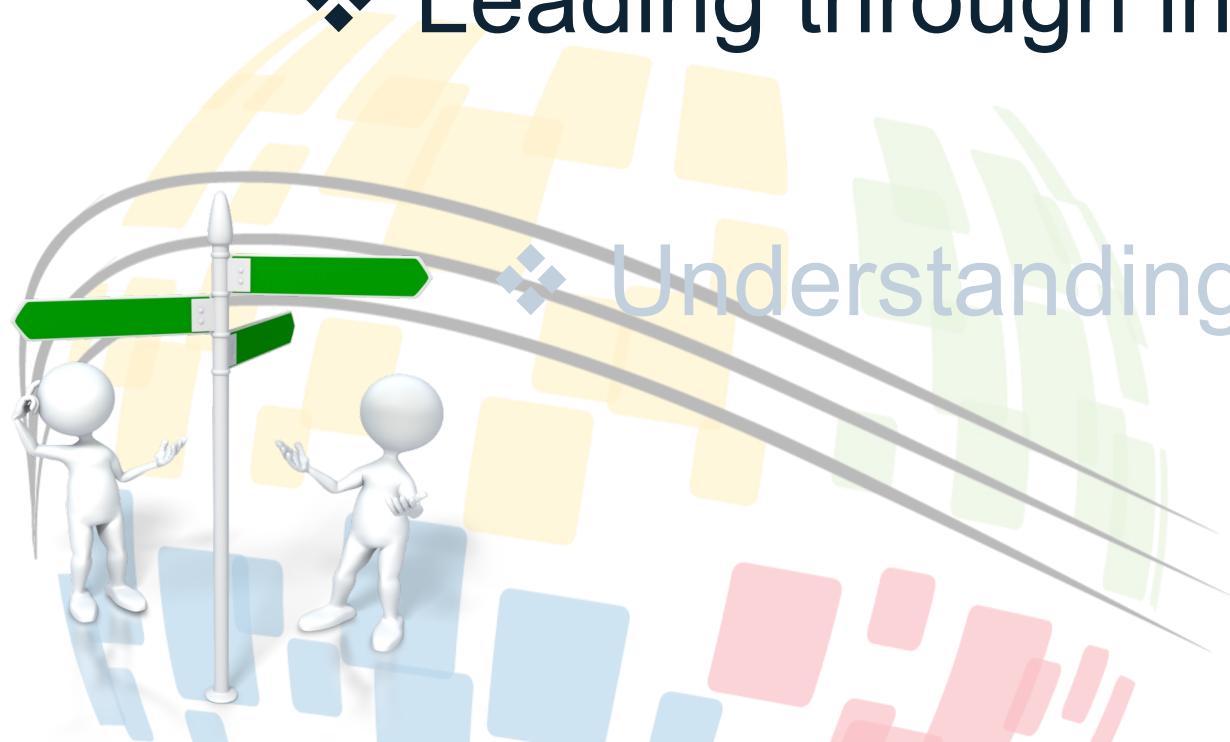
Transdisciplinary and Integrative Opportunities

❖ Applying the power of perspective



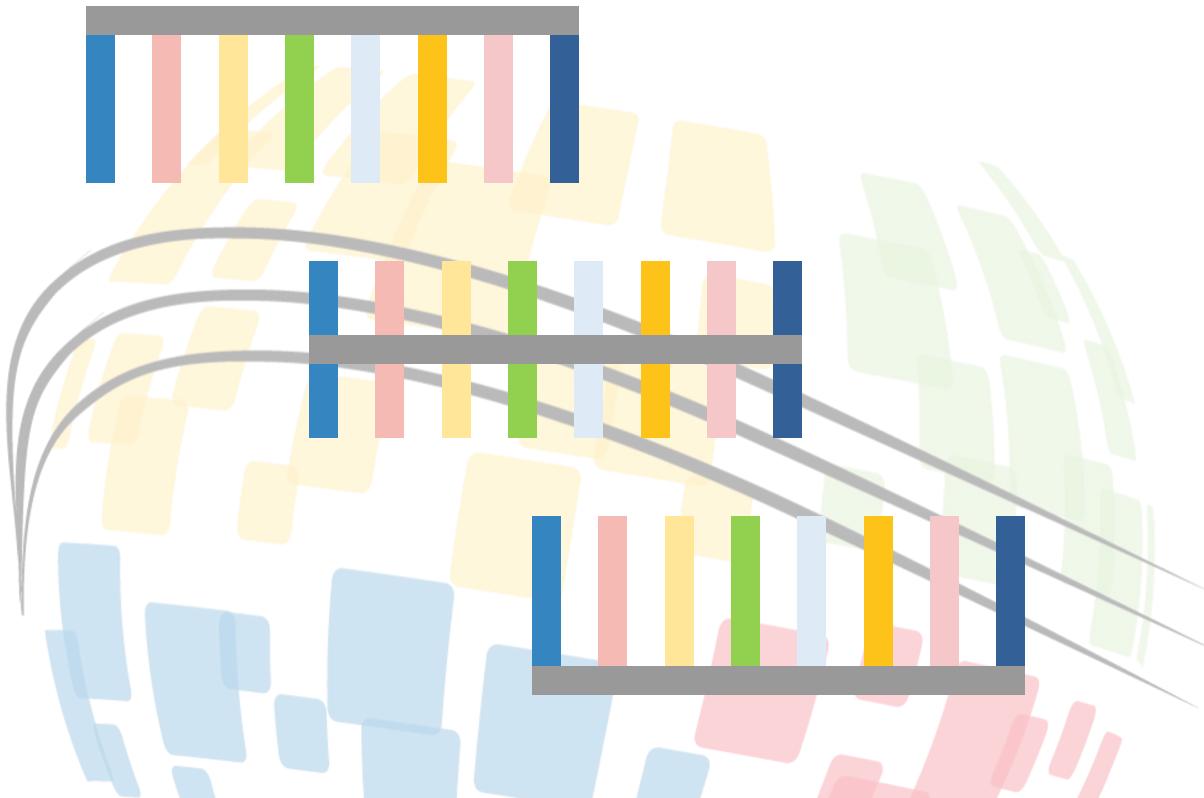
❖ Leading through influence

❖ Understanding our points of leverage



Positioning Ourselves Correctly

Does it matter where we position the ourselves and the transdisciplinary bar?



Towards a meta-model of SE practice



- Comprehension - understanding
- Communication – translator services
- Coordination – harmonious functioning
- Cooperation – work toward a goal
- Collaboration – stakeholders, partners
- Continuity – over system life cycle
- Catalyst – champion for change and innovation

www.incose.org/emeawsec2023

Credit: Cecilia Haskins, *Systems Engineering support for Industry to meet UN SDG*, 2023

Leveraging a Different Style of Leadership

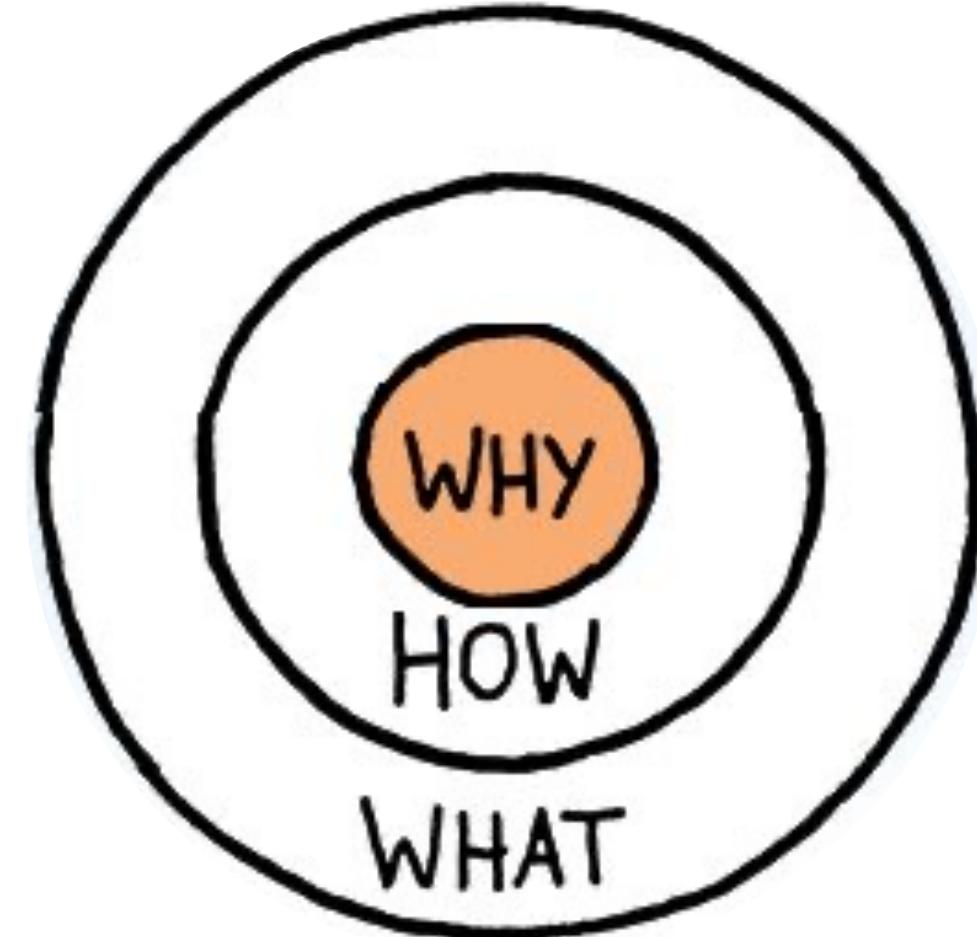
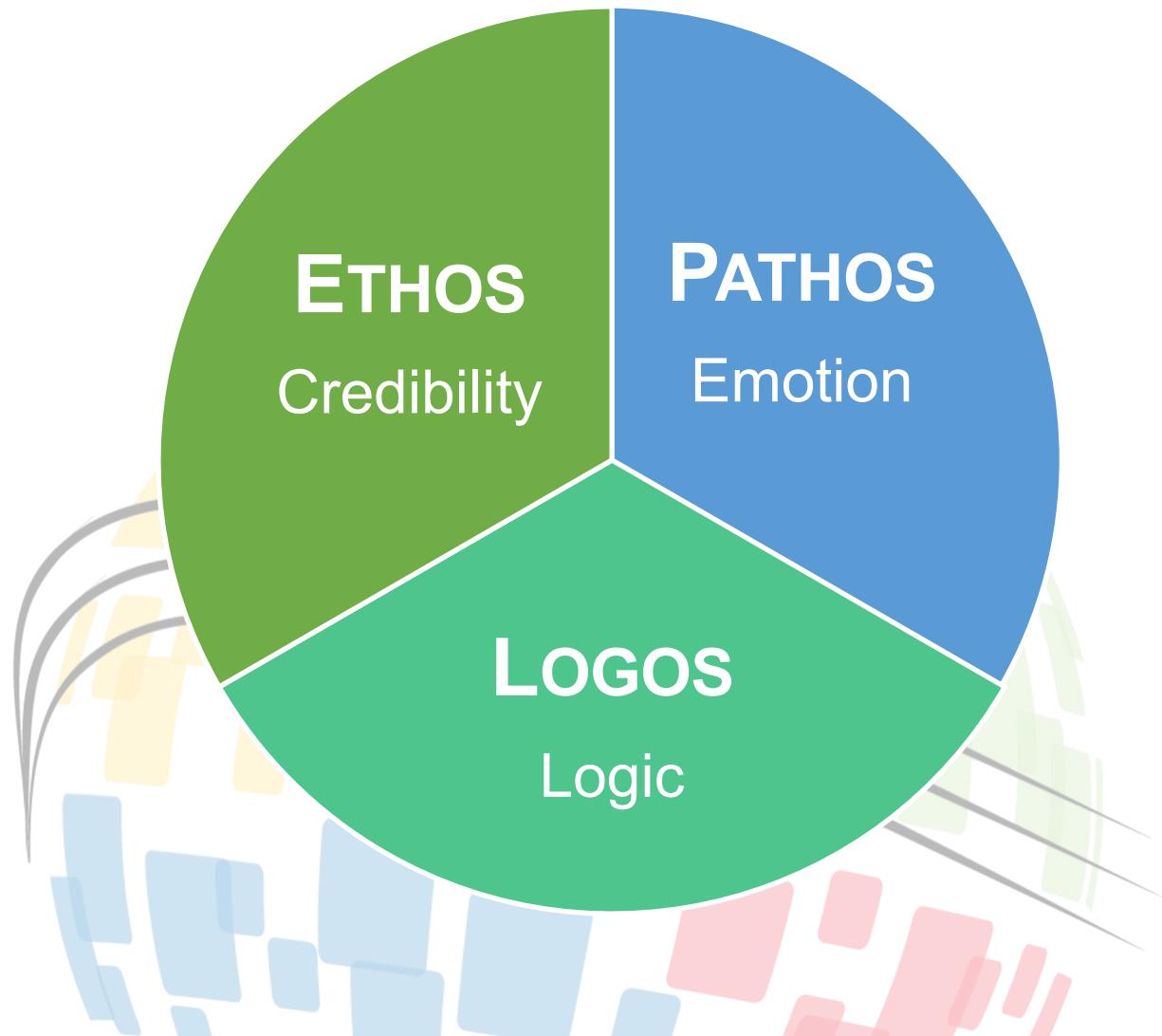
Leading In, Out, and Up

- **Physical power** is self-evidently primitive and, unfortunately, often ultimate power, as expressed in fighting and in war
- **Resource power** is that which derives from one person having a resource that the other wants or needs – usually but not always money
- **Positional power** is an authority awarded to a person by the organization
- **Expert power** is that which derives because you have knowledge or a skill that is needed
- **Personal power** is that which derives from the personality of an individual

Influence: the process by which you have an effect on the character, development, or behavior of someone or something

Connecting through Motivation and Belief

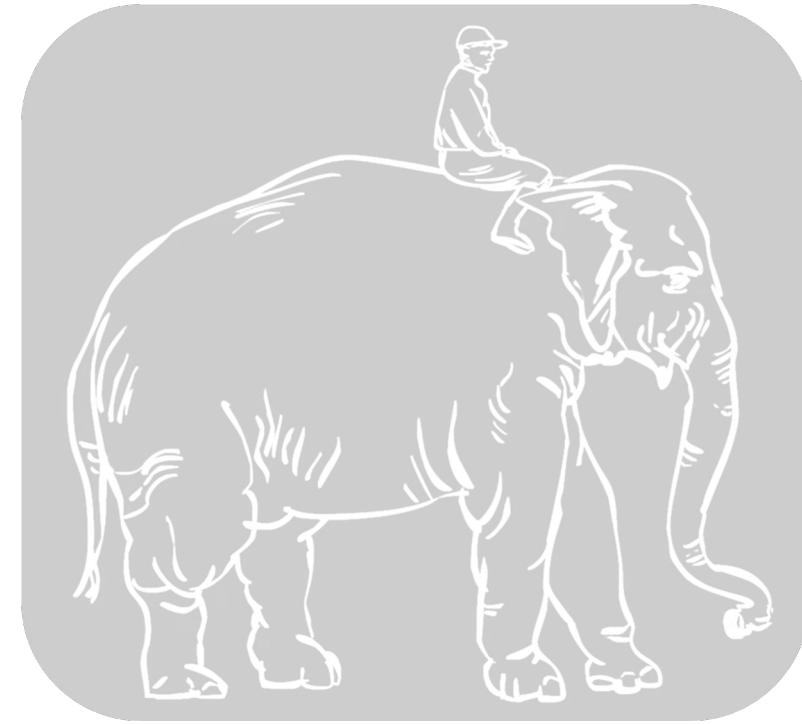
Emotion and Rational Thought



Leading from the Middle – Inward, Outward, and Upward

From Team Members to Customers to the C-Suite

- Drive better solutions through holistic understanding of problem and context
- Honor and leverage diversity for greater insight
- Move beyond positions to interests
- Sell through attunement, buoyancy, clarity –
To Sell is Human (Pink)
- Highlight (but don't apply scare tactics)
 - Complexity, interactions, and interconnectedness
 - Through-life considerations and concerns
 - The risk of unintended consequences
- Seek elegance over brute force
 - “Elegant solutions resolve complex problems”
 - Brute force often delivers local gain at the expense of systems concerns
- Champion systemic considerations



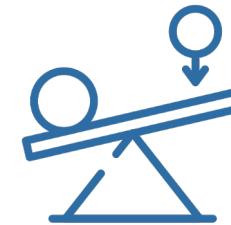
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Defining the Right Problem Right the First Time

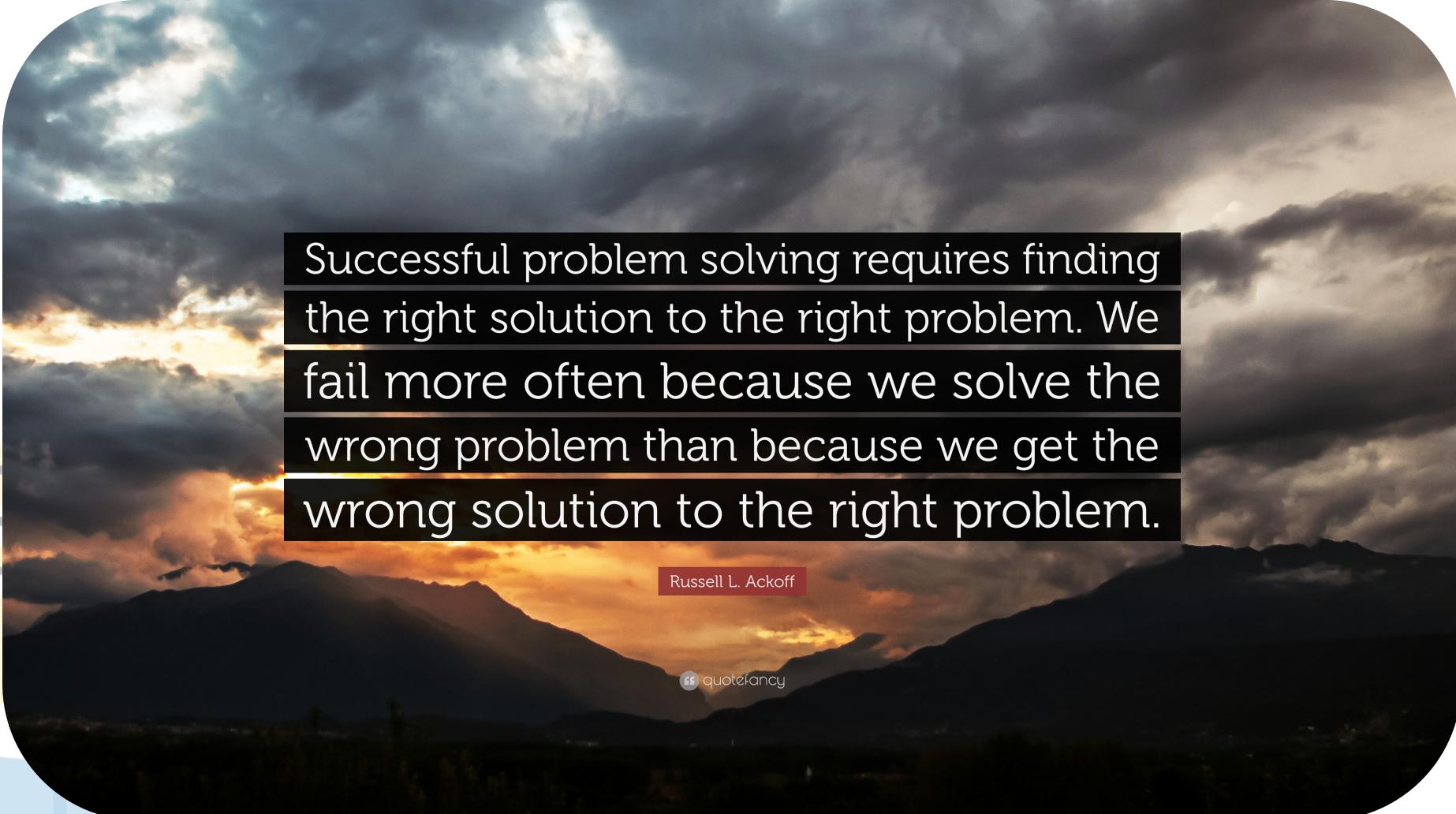
Users and Stakeholders, Awareness and Empathy

- Engage stakeholders (those who care and those who understand)
- Identify who will use the system and how it will evolve over time (both context and perception of value)
- Analyze gaps between the as-is and wish-to-be
- Think operationally, both “a day in the life” and through the lifecycle
- Consider sunny and rainy day scenarios
- Agree and validate assumptions about “the world”



Defining Success Properly

Moving from Verification to Validation



Successful problem solving requires finding the right solution to the right problem. We fail more often because we solve the wrong problem than because we get the wrong solution to the right problem.

Russell L. Ackoff

quotefancy



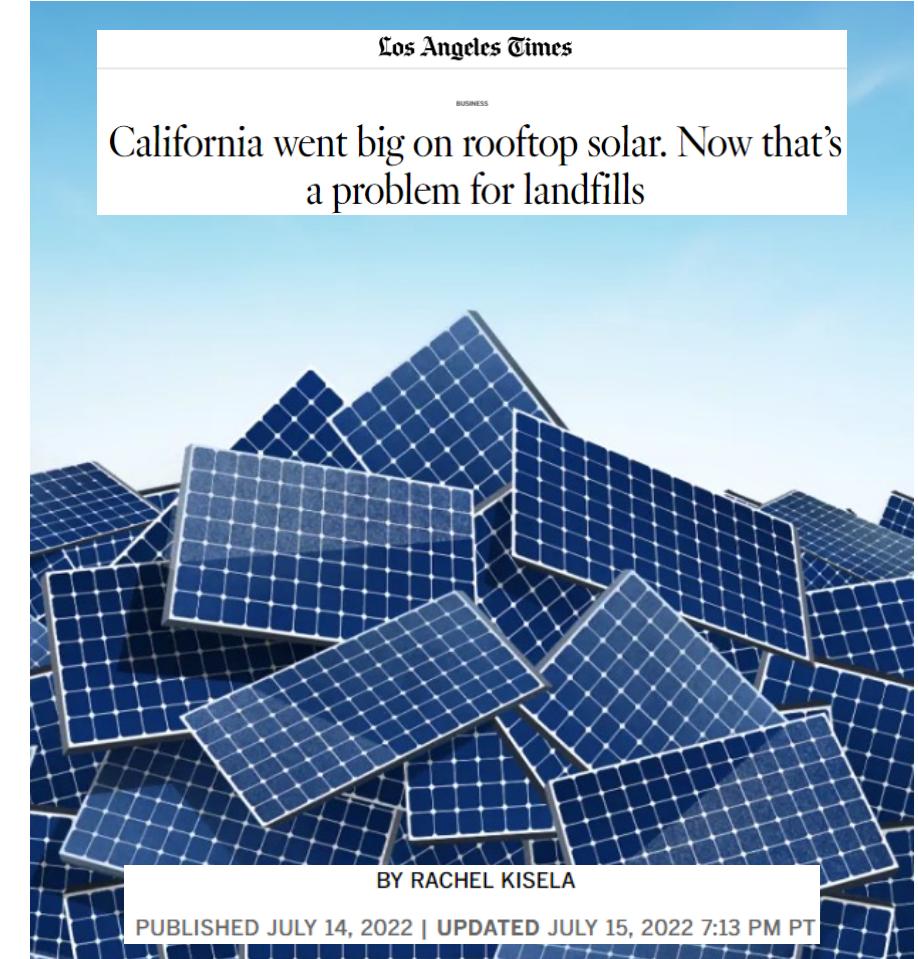
Thinking across Time

Embracing an Expanded View of “Omega Alpha”



Systems Engineering is an engineering discipline whose responsibility is creating and executing an interdisciplinary process to ensure that the customer and stakeholder's needs are satisfied in a high quality, trustworthy, cost efficient and schedule compliant manner ***throughout a system's entire life cycle.***

- INCOSE



Thinking across Complexity



Complex

the relationship between cause and effect can only be perceived in retrospect

probe - sense - respond

emergent practice

Complicated

the relationship between cause and effect requires analysis or some other form of investigation and/or the application of expert knowledge

sense - analyze - respond

good practice

novel practice

no relationship between cause and effect at systems level

act - sense - respond

Chaotic

best practice

the relationship between cause and effect is obvious to all

sense - categorize - respond

Simple

Thinking across Scale

Interests



Interactions



Interfaces



Global



Macro



Micro



Problem



Innovation



Solution



Leading for a Better Tomorrow

Perspective and Influence and Leverage, Oh My!



For every complex problem, there is an answer
that is clear, simple, and wrong.

H.L. Mencken



Whenever I run into a problem I can't solve, I
always make it bigger. I can never solve it by trying
to make it smaller, but if I make it big enough, I can
begin to see the outlines of a solution.

Dwight Eisenhower

Questions and Discussion



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Director for Strategic Integration
Past President (2014/2015)
Fellow

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