



28th Annual **INCOSE**
international symposium

Washington, DC, USA
July 7 - 12, 2018

Panel:
**Systems of Systems Engineering –
An Approach to Agile Systems
Engineering?**

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Contents

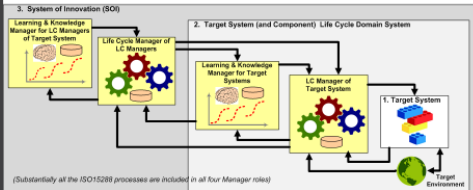
- Perspective shapers
- A context for analyzing SE, ASE, and SoSE
- The most common SoS we want to be agile
- Related challenges
- Related opportunities

A Perspective Shaped By . . .



26th annual INCOSE
International Symposium
Edinburgh, UK
July 18 - 21, 2016

Introduction to the Agile Systems Engineering Life Cycle MBSE Pattern



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Accelerating Innovation Effectiveness: Model-Facilitated Collaboration by Regulators, Technical Societies, Customers, and Suppliers



28th Annual INCOSE International Symposium
Delivering Systems in the Age of Globalization
July 7 - 12, 2018
Washington, DC

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27th annual INCOSE
International Symposium
Adelaide, Australia
July 15 - 20, 2017

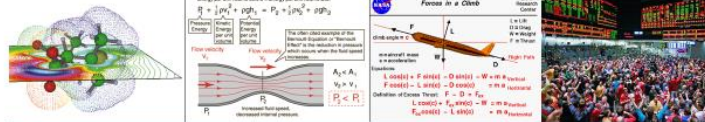


Innovation, Risk, and Agility, Viewed as Optimal Control & Estimation



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Got Phenomena? Science-Based Disciplines for Emerging Systems Challenges

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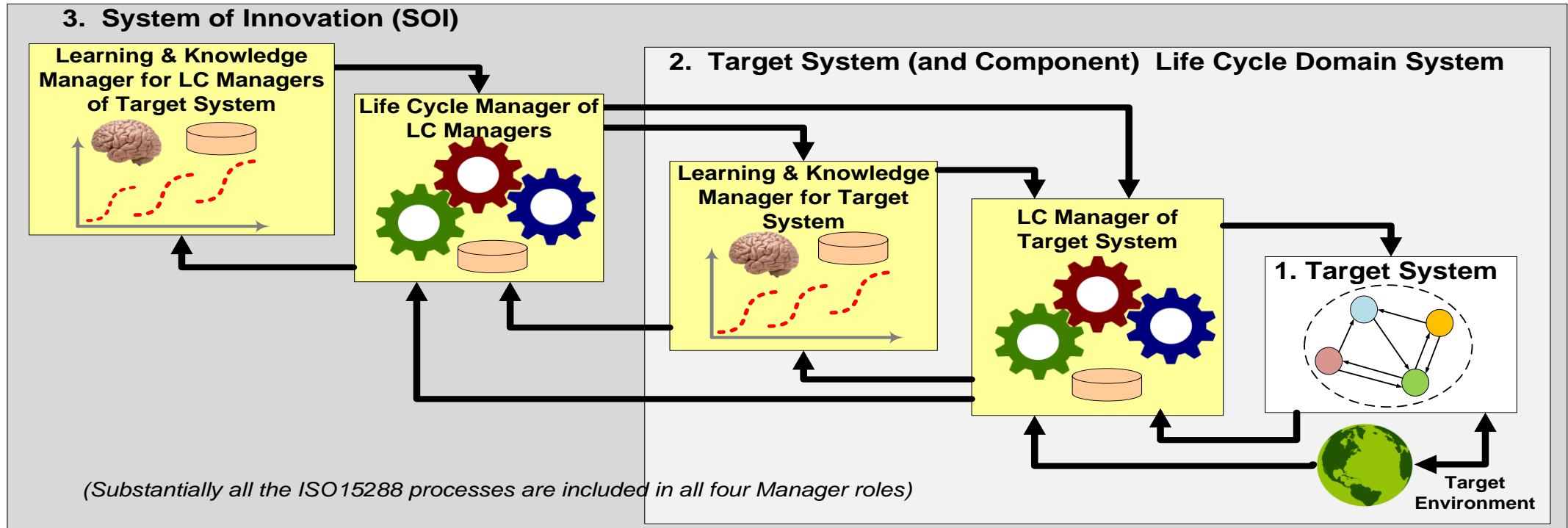
INCOSE Collaboration In an ASME-Led Standards Activity Standardizing V&V of Models

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www.incose.org/IW2018

A context for analyzing SE, ASE, and SoSE

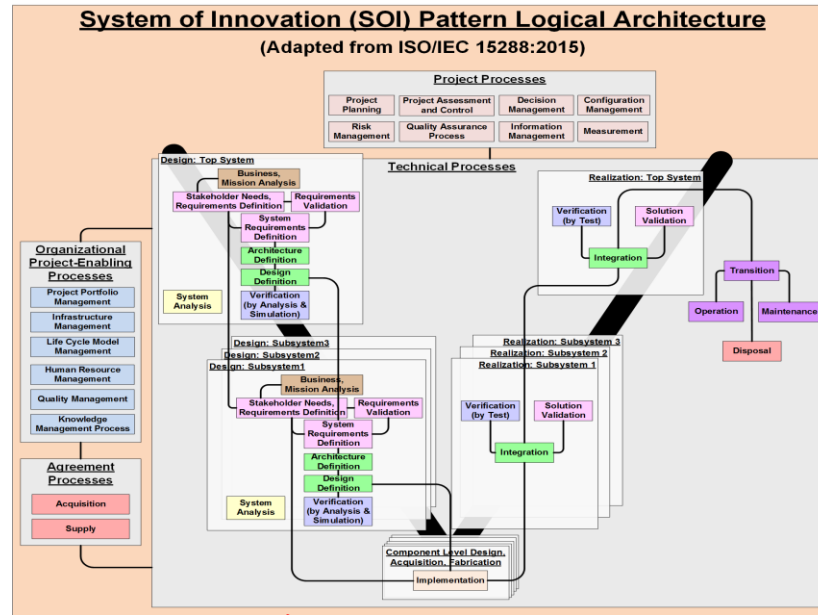
Innovation Life Cycle reference model used for INCOSE Agile SE Project, INCOSE CIPR WG, Health Care WG, etc.: Descriptive, not prescriptive.



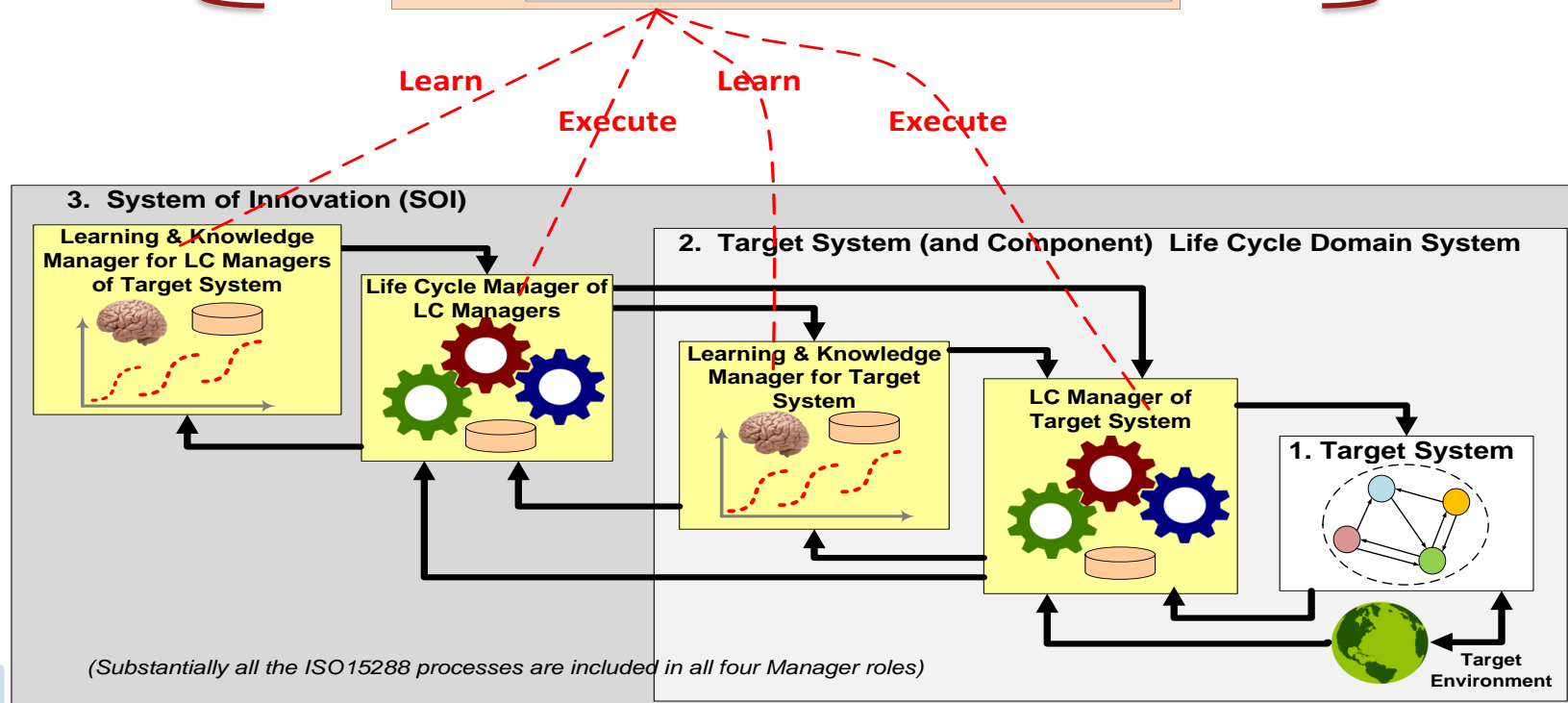
- System 1: Target system of interest, to be engineered or improved.
- System 2: The environment of (interacting with) S1, including all the life cycle management systems of S1, including learning about S1.
- System 3: The life cycle management systems for S2, including learning about S2.



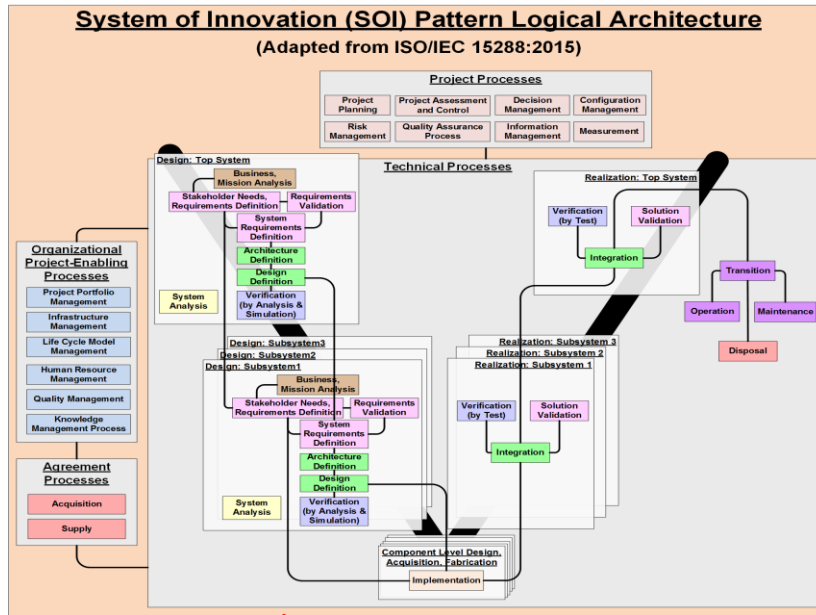
These are just the ISO15288 basics



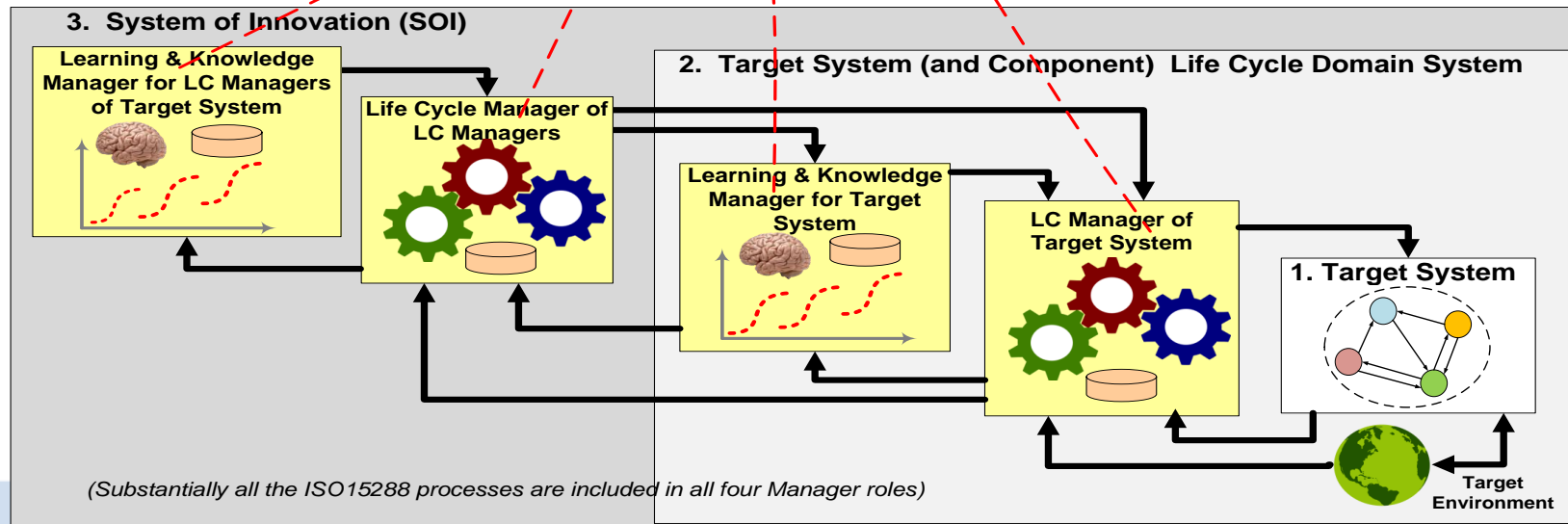
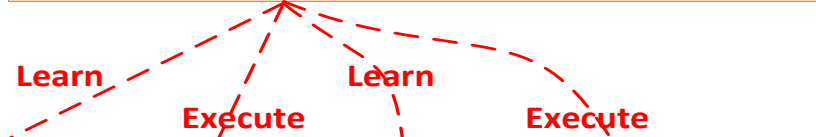
Substitute your favorite process model of ASE, SoSE

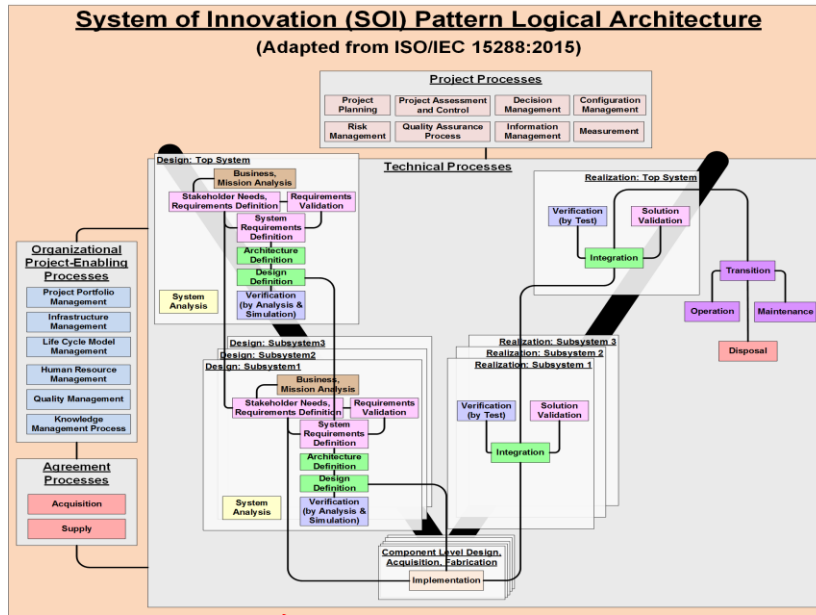


This view emphasizes learning vs. execution, across collaborators



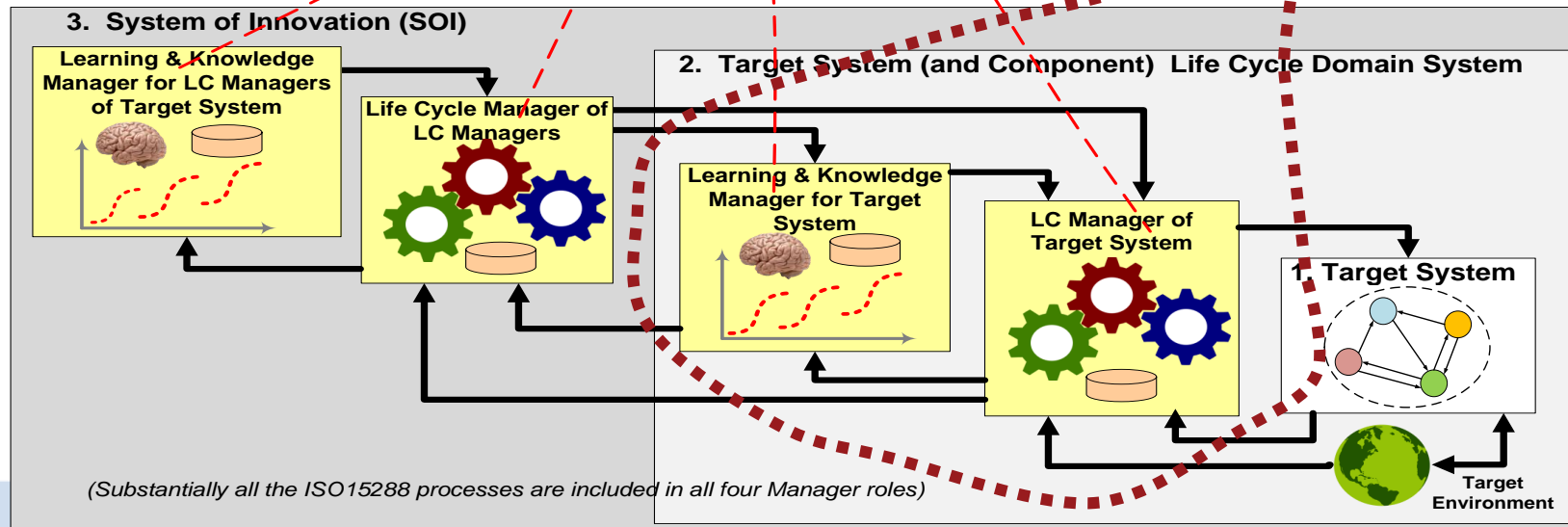
The most common SoS that we want to be agile is . . .





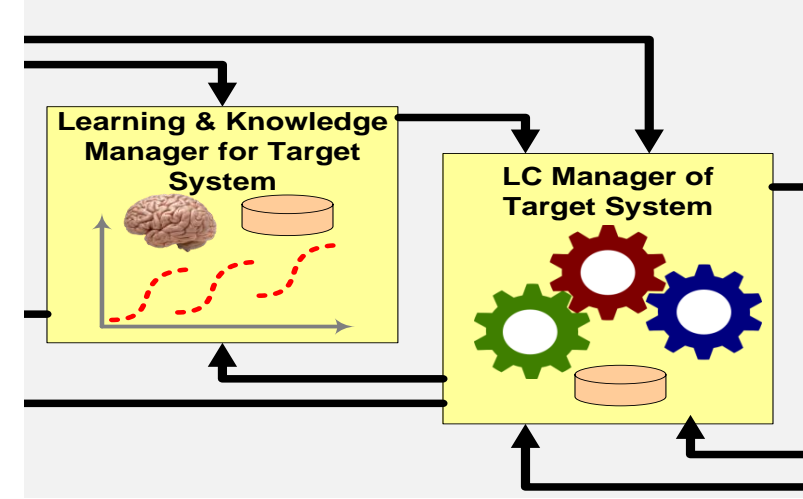
The most common SoS that we want to be agile is . . . System 2!

Learn Execute Learn Execute



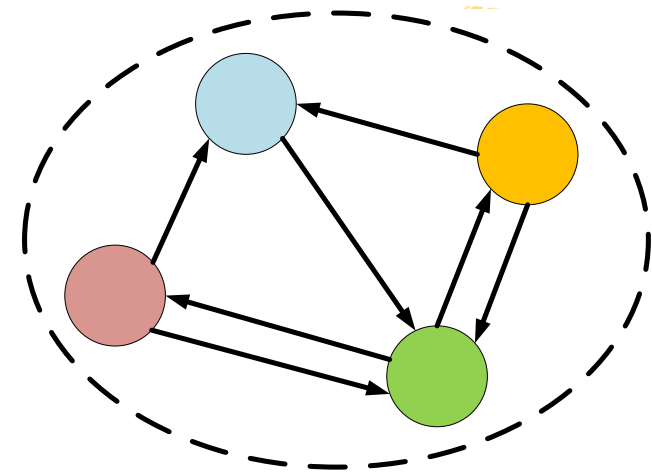
- Research
- Engineering, Development
- Production, Supply Chain
- Marketing
- Distribution
- Support, Sustainment

Related Challenges: Learning vs. Execution



- Organizational change management versus group learning: Lessons not learned
- Implicit knowledge & habituation versus acquired discipline
- Trust, credibility

Related Opportunities



- Understanding S2 as a first class system—a loosely coupled and managed SoS
- Explicit models, and Model VVUQ as a framework for group learning and coordination—building on the successful traditions of science
- Information balance sheet, information debt, intellectual capital of patterns



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