Systems-of-Systems

A Different Paradigm for the Systems Workforce

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Collaborating independent systems

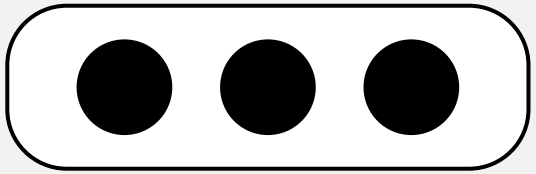
Integrated product

Not an SoS: parts cannot leave and join another aircraft

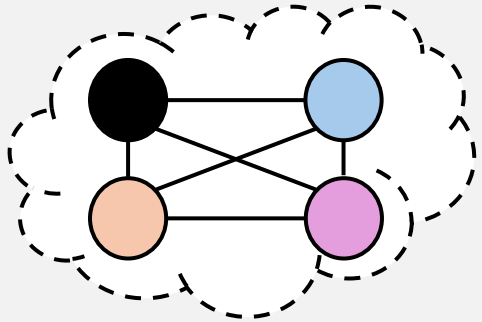
System-of-systems (SoS)

Independent constituents, each with its own owner and goals

ICT + autonomy + AI agents push towards more SoS
Knowledge on handling them lags behind

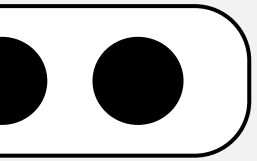


Becomes part of



Two views on a system-of-systems

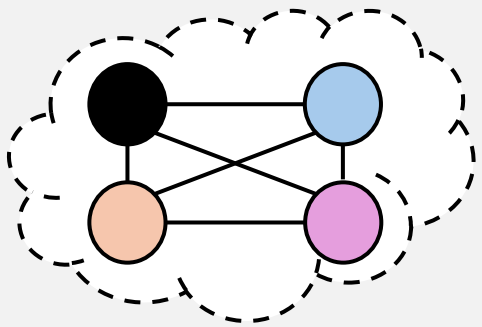
product



Micro-view

How constituents collaborate

- Must integrate, adapt and reason
- Exchange plans, intentions and capabilities
- Skills: SW, AI, interoperability, information representation



Emergence

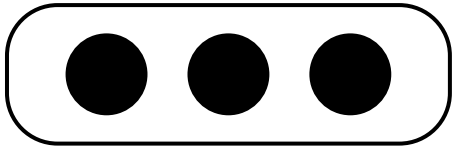
Macro-view

Properties of SoS as a whole

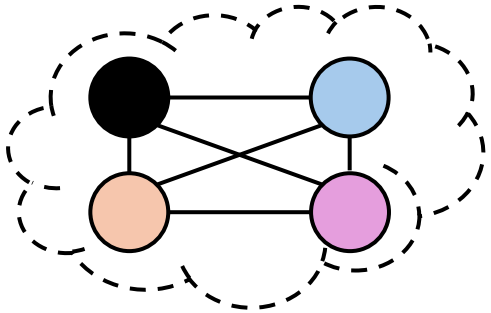
- Intervention from within, not design from outside
- Requires rules, standards, policies, incentives, mediation
- Skills: soft systems, cybernetics, complexity, social sciences



A different mindset



Integrated systems



Systems-of-systems

Stance	Designed from the outside	Changes itself from within
Boundary	Clear and physical	Nebulous, contested
Owner	One organization	Often nobody
Approach	Systems engineering	Systems thinking, soft systems, cybernetics
Artifacts	Requirements and design	Rules, standards, incentives