From professional silos to a professional “system of systems”

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Complex systems require integration across boundaries (Montakhabi, et al. 2026)

- Commercial space stations are examples of tightly coupled physical, digital ("phygital"), and organizational ecosystems
- Our research on Axiom, Starlab, and Vast identifies three different approaches to developing and integrating these complex ecosystems:
  - Axiom (Borrow-and-Detach): Staged integration with existing infrastructure
  - Starlab (Big-Bang Integration): Extensive pre-deployment integration across ecosystem partners
  - Vast (Minimum Viable Ecosystem): Incremental development and learning before scaling.
- Each approach addresses different trade-offs amongst investment, integration, risk, and organizational learning
- Shared integration requirements: Orchestration, including managing technical interfaces, organizational interdependencies, information sharing, and governance across multiple partners
- Key implication: Successful systems integration requires both technical and organizational capabilities.

What does management research contribute?

- Strategy
  - What is the strategic objective? What are the key strategic choices (technical, organizational / scale and scope)
- Governance and orchestration of ecosystems
  - Mobilizing, aligning interests, enabling collaboration, facilitating joint learning for ongoing generativity
  - How do we align incentives, manage dependencies, and distribute risk across organizations?
- Innovation and ecosystem growth
  - How do organizations experiment, adapt, and scale new technological architectures?
- Organization design
  - How do we allocate authority, accountability, and decision rights across organizational boundaries?
- Leadership and behavior
  - How do people from different professions coordinate, build trust, and learn?
- AOM research and teaching strengthen the managerial capabilities needed to put these ideas into practice, preparing leaders to integrate technical, organizational, economic, and societal considerations.

Professional societies: Strong nodes, weak links? (cf. Helfat & Raubitschek, 2018)

- Professional organizations have historically been effective at developing disciplinary depth, professional identity, and standards
- But the systems workforce needs people who can cross those professional boundaries.
- There is a distinction between:
  - Disciplinary competence: Knowing your own field deeply
  - Boundary-spanning competence: Understanding neighboring disciplines sufficiently to coordinate with them
  - Systems integration competence: Making trade-offs and decisions across technical, organizational, commercial, and societal objectives
- Are our professional organizations producing excellent specialists but leaving integration capability to chance?

Three actions professional organizations can take together

- Develop a shared cross-professional competency map:
  - Identify essential boundary-spanning competencies across engineering, computing, management, and other professions
  - Preserve disciplinary depth while identifying common integration capabilities
- Pilot a reciprocal lifelong-learning passport:
  - Mutually recognize selected courses, micro-credentials, and continuing professional development activities
  - Enable professionals to acquire complementary competencies across professional societies
- Develop joint, challenge-based learning programs (e.g., AOM-AACSB Task Force):
  - Co-design multidisciplinary exercises around real systems problems (e.g., commercial space stations, AI[-enabled] infrastructure, energy systems)
  - Develop and assess integration capability through practical cross-professional teamwork
  - We benefit through collaboration and by facilitating joint learning (a core orchestration activity).

Can we become a “system” of professional organizations?

- These could be piloted by a small coalition of willing professional societies, perhaps AOM, AIAA, INCOSE, IEEE, and PMI
- Challenge: we could work on a defined set of competencies, reciprocal learning opportunities, and one shared systems challenge
- We do not need to create a new profession, and perhaps we do not need a new organization, we might need rather to make our existing organizations interoperable
- If the future of industry is a system of systems, perhaps the future of professional development can be a system of professional organizations!

Thank you!

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