

Enterprise Architecting: Enterprise Integration Strategies Across Virtual Extended Enterprises

Background

- No single company is in command of all of the technologies necessary to produce a modern aerospace system--it is too costly to do so in today's environment.
- Increasingly, companies are collaborating as partners on complex aerospace projects, and are forced to collaborate throughout many aspects of the project. Those who best integrate their product's value chains will have an advantage.
- IT/IS alone cannot -- and will not -- solve all enterprise network integration issues, but it can significantly lower the costs of collaboration.
- Effective enterprise network integration plans must address strategy, technology, and organizational concerns.

Key Questions

- What are the fundamental enterprise network integration issues within a virtual extended enterprise network?
- To what extent is enterprise network integration necessary and desirable across an virtual extended enterprise network?
- What are the key internal and external barriers to enterprise integration in virtual, extended enterprise?
- Are there overarching principles that can guide whether, to what extent, when, and how virtual extended enterprise might achieve integration?

Research Methodology

- Foundations of knowledge and theory in virtual extended enterprises were explored in the literature
- Based on the literature, a framework and taxonomy was developed to examine integration in enterprise networks
- An in-depth case study was conducted at the F-35 Joint Strike Fighter Program to explore the integration strategies pursued by this virtual extended enterprise
- Key personnel from program management, engineering, manufacturing, IT/IS, and materials procurements were interviewed

What does this research accomplish?

This research examines strategies for architecting integrated project-based, virtual, extended enterprises. It examines the people, processes, business models and technology associated with sharing and collaborating as much as possible to get the job done right while retaining core competencies and competitive advantage across business and national boundaries.

Who should use it?

This research should be used by those involved in architecting, implementing, or establishing policy for enterprise integration in companies participating in enterprise networks.

What are the benefits?

LAI consortium members should be able to gain insight into common problems and best practices encountered when creating and implementing enterprise integration strategies in complex enterprise networks.

Products / Knowledge Generated

- 2 or more published papers related to IT and Enterprise Architecture
- Master's Thesis in the Technology and Policy Program and Doctoral Dissertation in the Engineering Systems Division

Preliminary Findings/ Areas of Current Study

Integration Enablers

- Robust, flexible architectures feature a heterogeneous information storage/processing structure with a homogenous interface to data
 - Within the network, establish data exchange semantics which specify broad minimum requirements to participate in the network; avoid mandating systems across the network wherever possible.
 - Data exchange wrappers and mediators are key to leveraging the various competencies in the Enterprise Network.
- Focus on implementing security into the design environment.
- Involve all stakeholders throughout the creation of IT/IS systems to minimize organizational push-back
- Take efforts to match the architecture of the design organization with the technical architecture.

Barriers to Integration

- Socio-Organizational issues are often neglected
 - Trust and privacy concerns must receive top attention
 - Principle Agent Dilemma: allegiance to the project or the company? How should management be structured?
 - Ensure that incentives to participate in the network are properly aligned
 - Ethical dilemmas from inter-network cooperation/competition
- Lack of an Enterprise Network Reference Architecture
- Design on an Enterprise Network Architecture should be collaboratively developed across the value chain
 - Stakeholder analyses are sometimes overlooked, or network resources within the network go unutilized.
- Much of the technology is nascent or very quickly changing; it is difficult to pick standards *a priori*
- Managing the "brand" of the network may be problematic



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Timeline

