Definition: Integration of product development, manufacturing & supplier networks means integration of

- Product development AND manufacturing
- Supplier integration INTO product development AND manufacturing

Emphasis here: integration of supplier networks into product development as well as into manufacturing
Supplier Integration

Coordination of interactions between

- Product development and supplier network
- Manufacturing and supplier network
- Across supplier network
- through the creation of appropriate means (e.g.,
  - Governance mechanisms,
  - Practices, processes, contractual arrangements
- leading to efficient creation of customer-focused
- value for all enterprise stakeholders
As aerospace enters new era, supplier integration shifting rapidly from mastering mechanics of lean supply chain management to building Internet-enabled integrated value networks

➢ Improving efficiency through supplier integration is a necessary but not sufficient condition for value creation

➢ We need to move beyond seeking greater efficiency to evolutionary capability-building

➢ Fostering supplier innovation is key to dynamic capability building, stressing innovation & knowledge integration across supplier networks
Significant progress made in re-design and integration of supplier networks into both product development & manufacturing during the past decade.

As a result, industry has achieved considerable efficiency and performance improvements.

However, supplier integration efforts have been dominated by an emphasis on elimination of waste -- focusing largely on efficiency-seeking improvements.

There still remain many opportunities for greater efficiency gains through supplier integration.
Opportunities: Examples (1)

Based on current research on fostering innovation across supplier networks, concentrating on military avionics

➢ Program uncertainty significantly impedes innovation
  ➢ Fear to make long-term investments
  ➢ Lack of long-term commitment to suppliers
  ➢ Negative impact on intellectual capital development

➢ Anorexic lean worst enemy of long-term capability building
  ➢ More desire than ever before for collaboration, but fewer resources to do so
  ➢ Suppliers shut out of making creative suggestions
➢ Concern for secrecy and limited visibility into product system architecture a big barrier to innovative solutions by suppliers

➢ Need for requalification walls off product & process improvement initiatives by suppliers

➢ Lack of rewards for supplier-based innovations; few contractual incentives

➢ Short-term contracting extremely transaction-intensive, costly & diverts effort away from productive pursuits

➢ Multiple communications links causing chaos rather than enabling effective information flows & collaboration
Toyota took advantage of efficiency gains through lean manufacturing (kanban, just-in-time, kaizen)
- Supplier integration into manufacturing a strategic weapon
- Shifted primary competitive domain into product development

Integrated suppliers early into design & development
- Benefited from supplier-provided innovation
- Pursued proactive technology transfer across supplier network

Toyota’s business model: Value creation through continuous efficiency gains driving on-going organizational learning and innovation
- Affordable and high quality products offering best value
- Product differentiation through continuous innovation
- Optimizing supplier capabilities & innovation across supplier base
Lean Aerospace Initiative

**Framework**

**Supply chain design**
- Make-buy linked to corporate strategic thrust
- Differentiated supply chain strategy
- Align & develop supplier capabilities
- Open communications

**Supplier network efficiency**
- Effective differentiated relationships
- Supplier partnerships & alliances
- Common objectives
- Value stream mapping
- Continuous improvement

**Value creation**
- Enhanced supplier flexibility & responsiveness
- Early supplier integration into design & development
- Incremental, modular & architectural innovation
- Fostering innovation across supplier network
Implications

➢ Lifecycle perspective -- facilitate “cradle-to-grave” supplier integration in environment of variable technology clockspeeds to address technological obsolescence challenges

➢ Cross-platform perspective -- integrate supplier networks across multiple platforms
  ➢ Product architecture choices to benefit from supplier-based product and process innovations
  ➢ Parts standardization; standard interfaces; commonality of parts; interoperability -- touchstones for supplier integration strategies

➢ Meta value stream perspective -- align incentives to create “mutual gains” relationships throughout acquisition/product realization supplier value stream