

MMIS

(Manufacturing Management Information System)

*Department of Industrial Engineering
Sharif University of Technology*

Session# 6



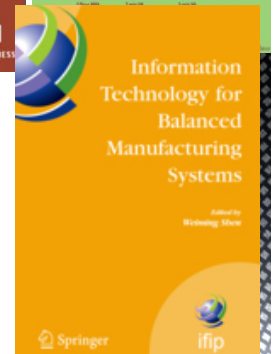
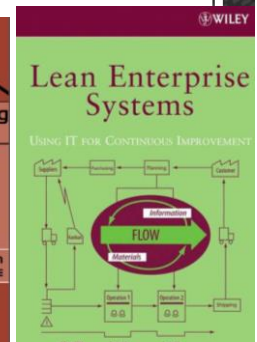
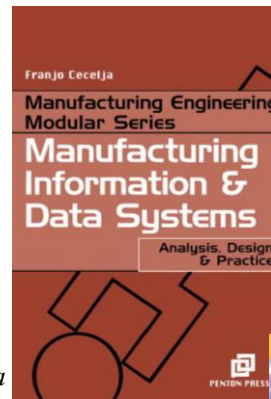
Course Description

- *Instructor*
 - *Omid Fatahi Valilai, Ph.D. Industrial Engineering Department, Sharif University of Technology*
 - *Email: Fvalilai@sharif.edu, Tel: 021-6616-5706*
 - *Website: <http://sharif.edu/~fvalilai>*
- *Class time*
 - *Saturday* *15:30~18:00*
- *Course evaluation*
 - *Mid-term* *(30%)*
 - *Final exam* *(40%)*
 - *Quiz* *(10%)*
 - *Exercise* *(20%)*



Course Description (Continued ...)

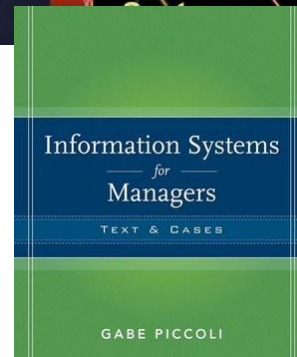
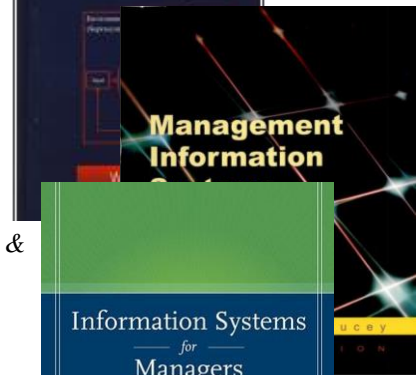
- **Mid-term session:**
 - N/A
- **Final session:**
 - N/A
- **Reference:**
 - Franjo Cecelja, “*Manufacturing Information and Data Systems: Analysis, Design and Practice*”, 2002, Elsevier
 - Shen, Weiming; “*Information Technology for Balanced Manufacturing Systems*”, 2004, Springer
 - Steve Bell; “*Lean Enterprise Systems: Using IT for Continuous Improvement*”, 2005, Wiley



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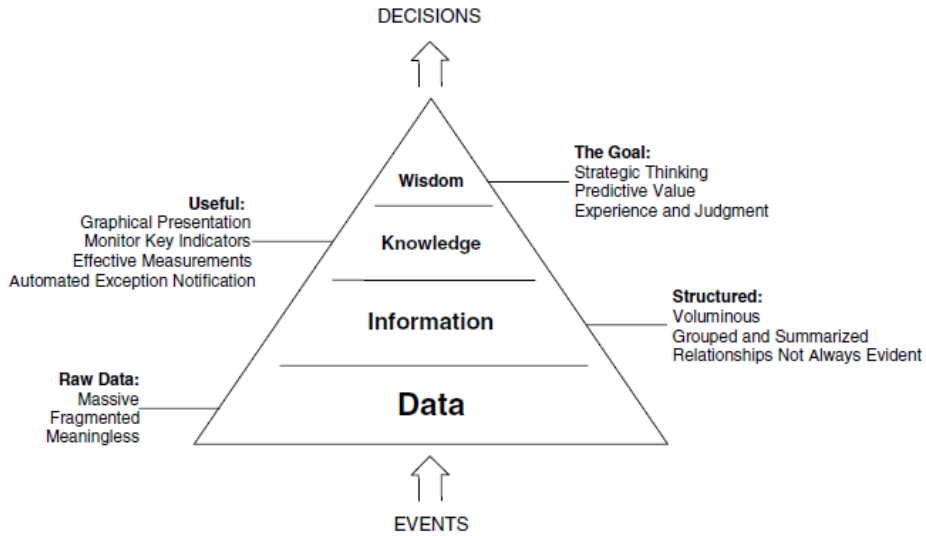
Course Description (Continued ...)

- **Reference:**
 - William S. Davis, David C. Yen, “*The information system consultant's handbook: system analysis and design*”, 2010, Taylor and Francis
 - Terence Lucey; “*Management Information Systems*”, 2004, Cengage Learning EMEA
 - Gabriele Piccoli; “*Information systems for managers: texts & cases*”, 2007, John Wiley & Sons Inc



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Lean Paradigm

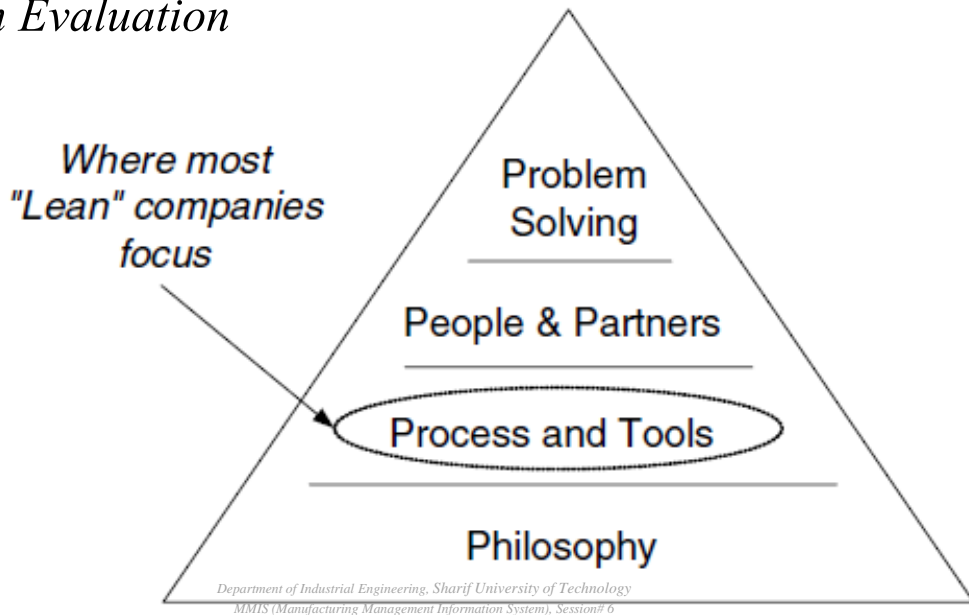


Lean & IT

Attribute	LEAN	Traditional IT
Change Management	Organic, incremental and continuous	Engineered and planned large events
Organization	Cross-functional teams	Central command and control
Measures	Top-down and bottom-up performance measures linking improvement initiatives to strategic goals	Cost containment and uptime
Knowledge Management	Generalization	Specialization
Education	Process focus	Task focus
Definition of Success	Speed and Agility	Stability

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Lean Evaluation



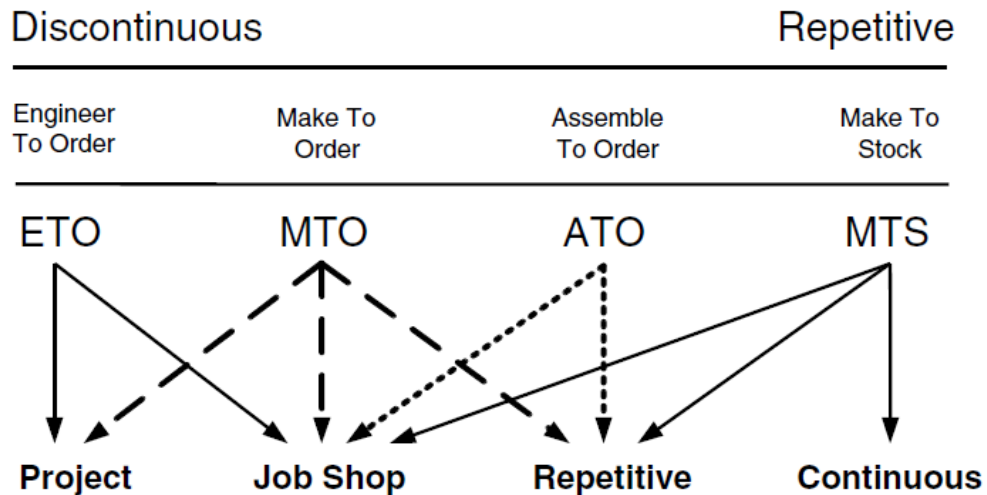
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Lean Evaluation

- There are three stages most organizations will encounter on their journey to Lean:
 - *Lean Operations*—the elimination of waste and continuous improvement of production and service operations. “Lean Manufacturing”.
 - *Lean Enterprise*—the elimination of waste and continuous improvement throughout the internal value stream of transactions and activities encompassing engineering, marketing, purchasing, planning, production, quality, distribution, service, finance, human resource, and administration.
 - *Lean Network*—the elimination of waste and continuous improvement throughout the dynamic, global, electronic, demand-driven “supply chain.”

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Lean Evaluation



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Lean Evaluation

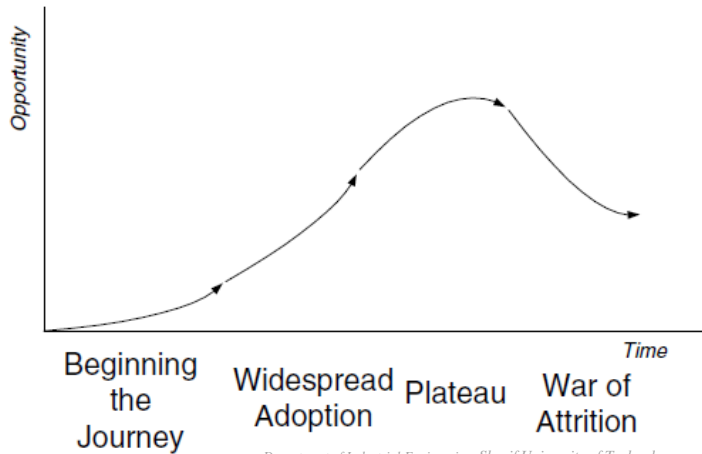
- *The Lean Development life cycle*
 - *There is a natural life cycle to every product, process, and system, and the evolutionary development of Lean Manufacturing within an organization is no exception.*
 - *Four phases that a company may experience if it does not properly integrate information systems into its Lean program:*
 - *Beginning the Journey,*
 - *Widespread Adoption,*
 - *Plateau, and*
 - *War of Attrition.*

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Lean Evaluation

- *The Lean Development life cycle*



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Lean Evaluation

- *The Lean Development life cycle*

- *To achieve sustained Lean Manufacturing performance over the long run, it is important to emphasize a holistic systems perspective from the boardroom to the shop floor.*

- *This takes us to the Lean Enterprise.*

- *Similar to the enthusiastic adoption of Lean Manufacturing in the West, during the 1990s there was an emphasis on Business Process Reengineering (BPR) popularized by Michael Hammer and James Champy.*

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Lean Evaluation

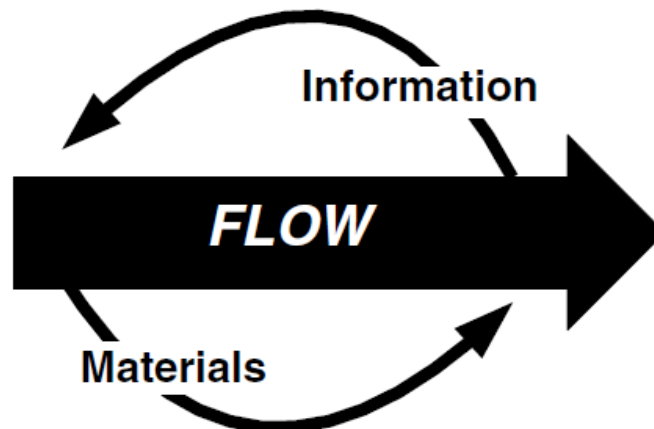
- *The Lean Development life cycle*
 - *BPR strives for new levels of productivity, breaking the rigid and hierarchical management and work methods of the past, by emphasizing the following points:*
 - *Process orientation*
 - *Rule breaking*
 - *Hybrid centralized-decentralized operations*
 - *Workers making decisions*
 - *Work is performed where it makes the most sense.*
 - *Checks and controls are reduced.*
 - *Jobs change from simple tasks to multidimensional work.*
 - *Individual roles change from controlled to empowered.*
 - *Job preparation changes from training to education.*
 - *Focus of performance measures and compensation shifts from activity to results.*
 - *Values change from protective to productive.*

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Lean Evaluation

- *The Lean Development life cycle*



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Lean Evaluation

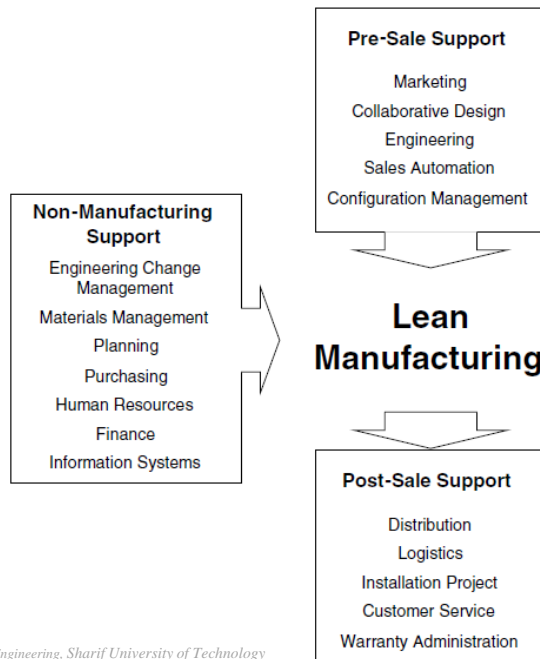
- *The Lean Development life cycle*
 - *“Material and information flow are two sides of the same coin.*
- *Lean and BPR similarly focus on the elimination of waste by improving the overall value stream.*
- *To improve we must understand the existing business processes, which are often guided by the functional and departmental silos and local optima institutionalized within the culture, compensation policies, procedures, and information systems of an organization.*
- *By helping systems and people communicate more effectively, Enterprise Integration smoothes the flow of information as the value stream crosses system boundaries.*

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Lean Evaluation

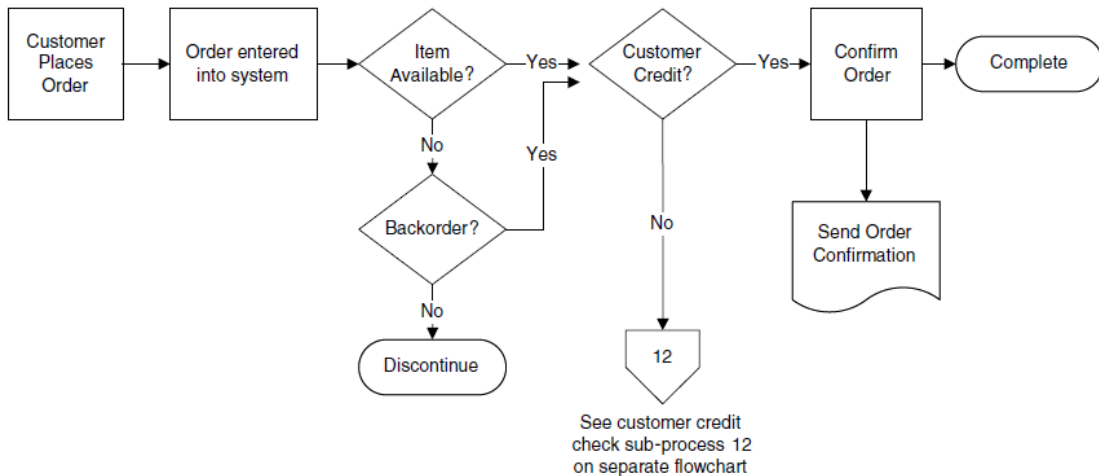
- *The Lean Development life cycle*



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Lean Evaluation

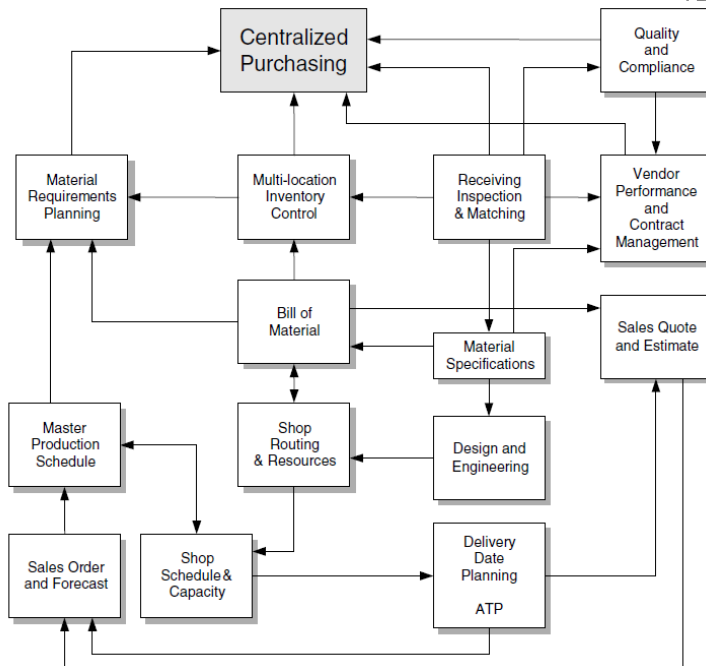


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Lean Evaluation

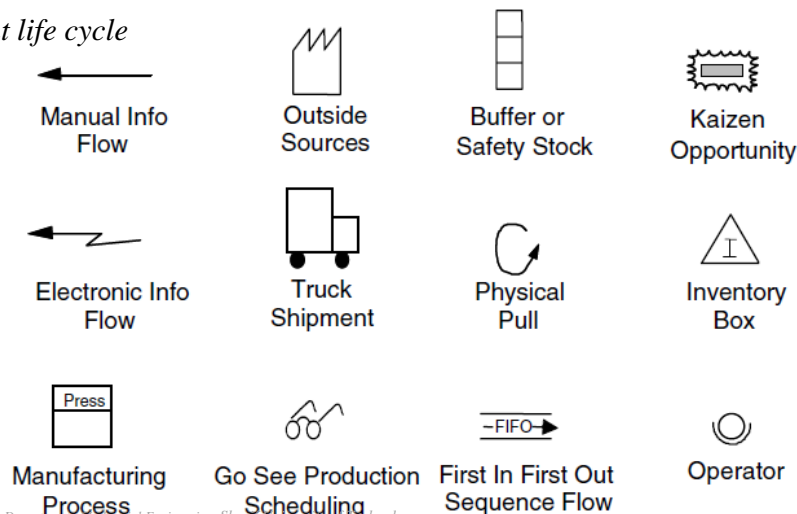
- The Lean Development life cycle



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Lean Evaluation

- The Lean Development life cycle

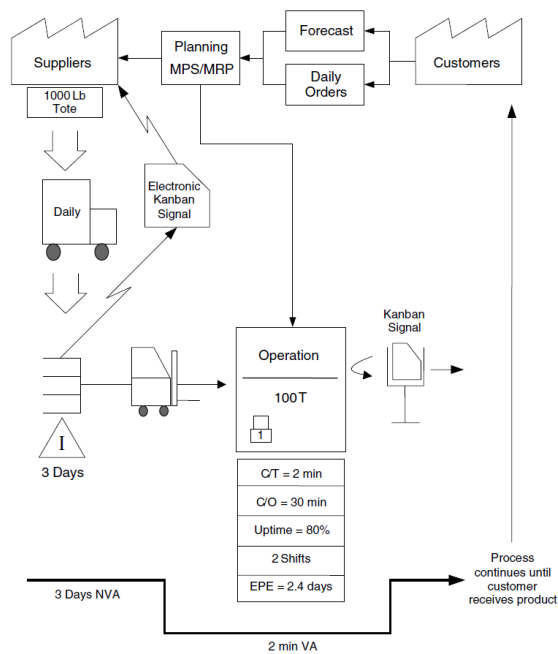


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Lean Evaluation

- The Lean Development life cycle



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Lean Evaluation

Order Receipt and Processing	Distance (feet)	Time (min)	Operation	Transport	Wait	Inspection
Delay until order is picked up from fax machine		30			NVA	
Carry from fax machine to desk	20	1		NVA		
Wait until convenient to process order in batch		30			NVA	
Enter order, verify pricing and credit		5	VA			
Send copy to legal department for review		5		NNVA		
Legal department review (4 hours)		240				NNVA
Order release to scheduler		5	VA			
Total	20	316	10	6	60	240

	Total	%
VA	10	3%
NVA	61	19%
NNVA	245	78%

Lean Evaluation

- *The Lean Development life cycle*
 - *Lean network*
 - *The Lean Network is commonly called the Supply Chain; however, there are two connotations:*
 - *The Lean Network isn't about "supply," it's demand driven.*
 - *This new business model isn't a chain, it's a network. A chain is linear, sequential, and slow.*
 - *Lean Network relationships are fluid, organic, and multi-nodal.*

Lean Evaluation

- *The Lean Development life cycle*
 - *Lean network*
 - *Although many early EDI initiatives may have been focused on waste elimination from a segment of the supply chain, they often resulted in waste transference to the smaller trading partners.*
 - *The same is true in many cases with SCM today, where smaller suppliers build ahead inventory for Just-In-Time (JIT) customers, holding large stocks just waiting for a kanban signal.*
 - *The same may also be true of many Vendor-Managed Inventory (VMI) relationships.*

Information Technology

- *The contribution of communications*
 - *The firm must be connected electronically with customers and suppliers.*
 - *One rapidly growing technique for this type of interconnection is EDI.*
 - *Detroit auto manufacturers were among the first companies to encourage suppliers to accept orders electronically.*
 - *Because each firm has its own formats for each of the paper documents used prior to EDI, there are problems of compatibility.*
 - *The American National Standards Institute (ANSI) has developed a standard known as ANSI X.12 to specify common document formats for the transactions involved in ordering, receiving, and paying for merchandise*

Information Technology

- *The contribution of communications*

- 1 Order Series (ORD)
- 2 Materials Handling Series (MAT)
- 3 Tax Services Series (TAX)
- 4 Warehousing Series (WAR)
- 5 Financial Series (FIN)
- 6 Government Series (GOV)
- 7 Manufacturing Series (MAN)
- 8 Delivery Series (DEL)
- 9 Engineering Management & Contract Series (ENG)
- 10 Insurance/Health Series (INS)
- 11 Miscellaneous ANSI X12 Transactions Series (MIS)
- 12 Mortgage Series (MOR)
- 13 Product Services Series (PSS)
- 14 Quality and Safety Series (QSS)
- 15 Student Information Series (STU)
- 16 Transportation
 - 16.1 Air and Motor Series (TAM)
 - 16.2 Ocean Series (TOS)
 - 16.3 Rail Series (TRS)
 - 16.4 Automotive Series (TAS)

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Information Technology

- *The contribution of communications*

- *Manufacturing Series (MAN)*
 - 196 Contractor Cost Data Reporting
 - 830 Planning Schedule with Release Capability
 - 844 Product Transfer Account Adjustment
 - 846 Inventory Inquiry/Advice
 - 849 Response to Product Transfer Account Adjustment
 - 852 Product Activity Data
 - 861 Receiving Advice/Acceptance Certificate
 - 866 Production Sequence
 - 867 Product Transfer and Resale Report
 - 869 Order Status Inquiry
 - 870 Order Status Report
 - 894 Delivery/Return Base Record
 - 895 Delivery/Return Acknowledgment or Adjustment

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Lean Evaluation

- *The Lean Development life cycle*
 - *Lean network*
 - *In contrast, the Lean Network looks beyond local improvement, aspiring to eliminate waste and enable smooth flow of material and information across the entire supply chain for everyone's benefit.*
 - *After all, a customer usually pays for waste in its supply chain, directly or indirectly.*
 - *If a supplier is forced to carry the burden of excess inventory, this makes the relationship less profitable, resulting in small compromises that add up to diminished innovation, quality, service, and longevity.*

Lean Evaluation

- *The Lean Development life cycle*
 - *Lean network*
 - *Many enterprises have been building the foundation for the Lean Network for years.*
 - *They have invested massive resources in improving their information technology infrastructure, often in conjunction with BPR, to replace fragmented transactional systems with a centralized system of record.*
 - *It is the ERP system that automates, records, and integrates the core financial and operational events within a single transaction database model.*
 - *Customer Relationship Management (CRM) and Product Lifecycle Management (PLM) systems have also received considerable investment, integrating marketing, sales, design, engineering, and customer service processes with the ERP core.*

Lean Evaluation

- *The Lean Development life cycle*

