

State of the Art in Supply Chain - Overview -

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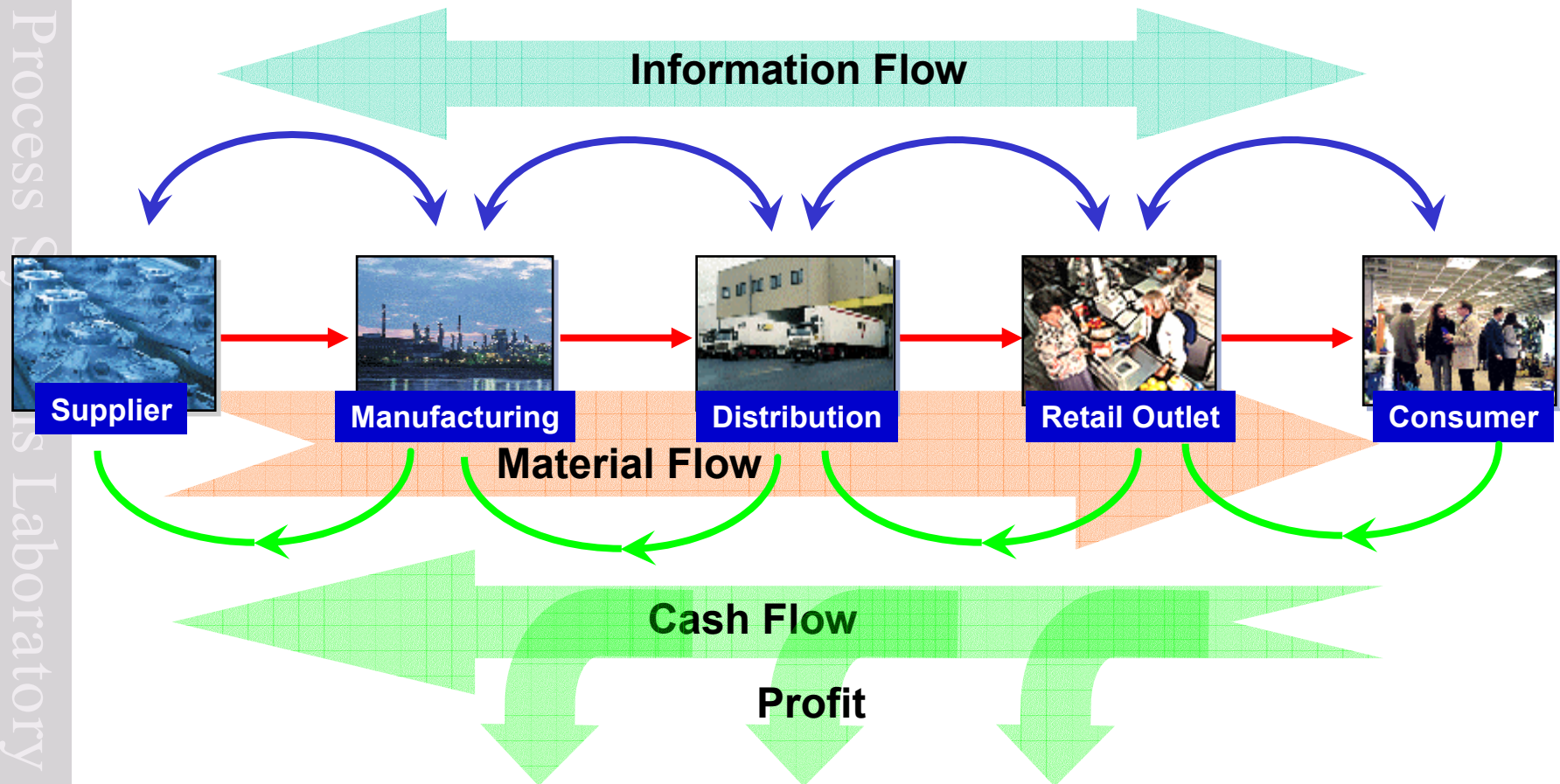
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What is Supply Chain Management?

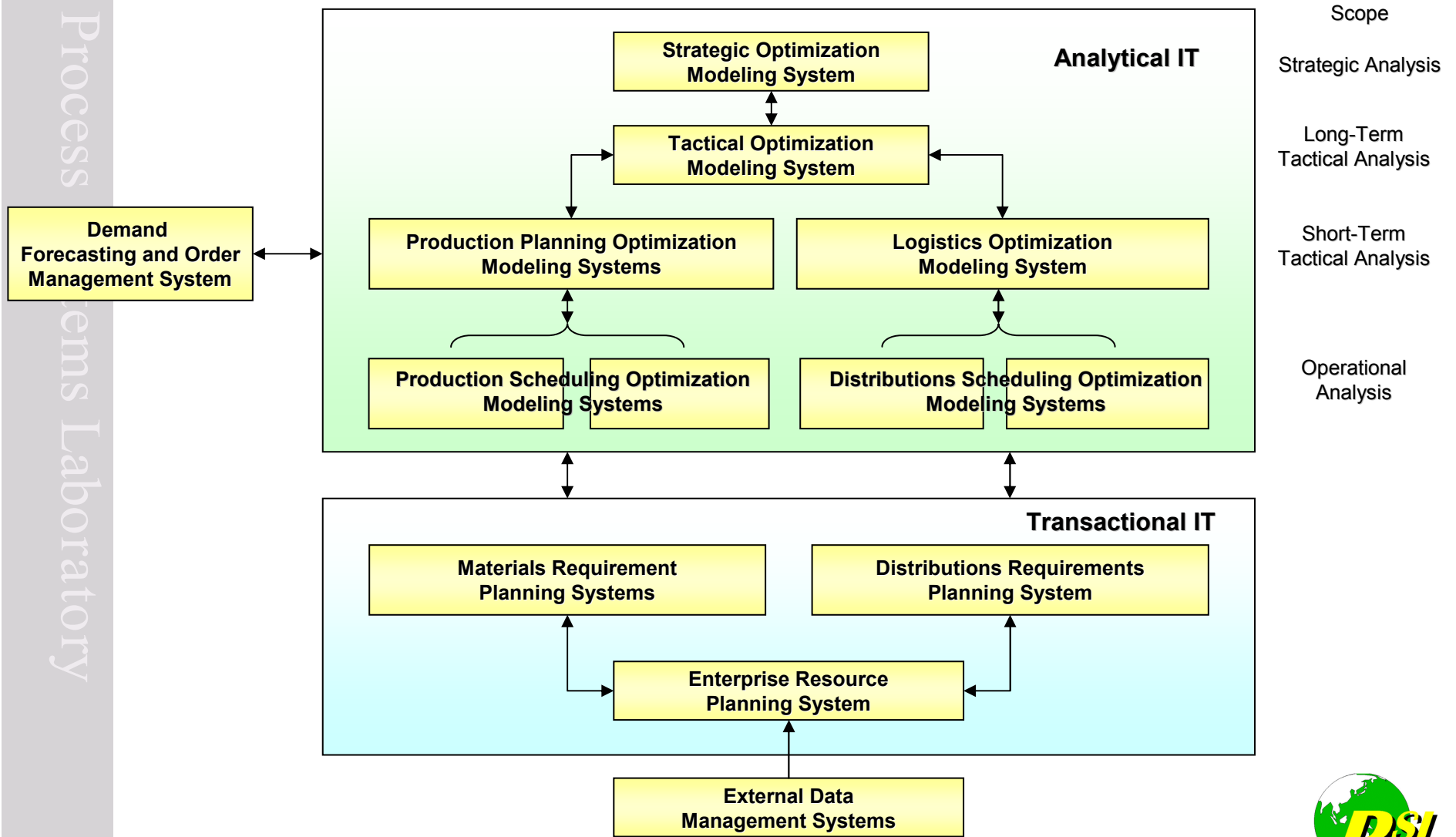


Supply chain management refers to integrated planning :

- **Functional integration** of purchasing, manufacturing, transportation, warehousing, and sales activities
- **Spatial integration** of activities across geographically dispersed vendors, facilities, and markets
- **Intertemporal integration** of activities over strategic, tactical, and operational planning horizons

Supply Chain System Hierarchy

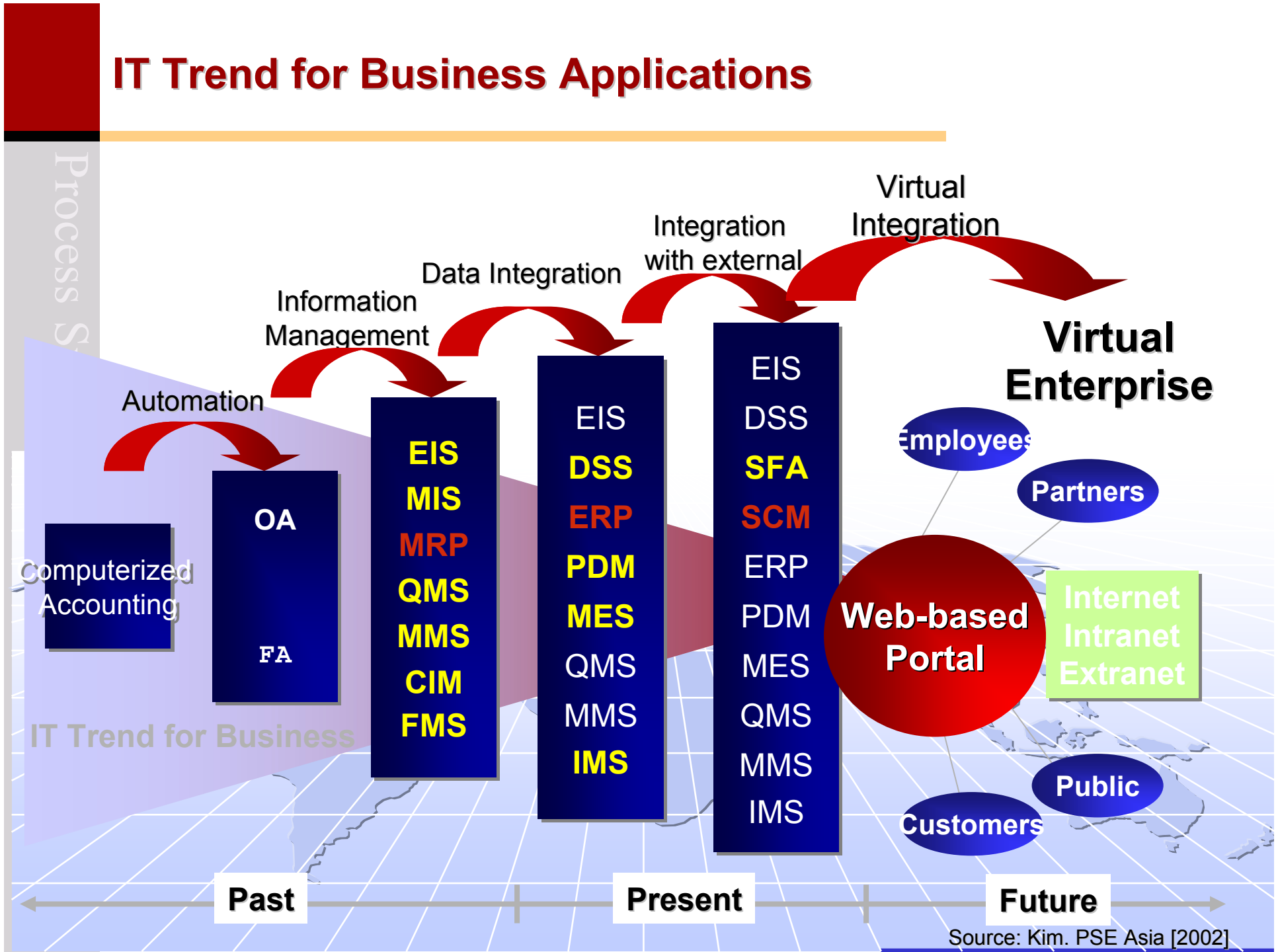
Process Systems Laboratory



Source: Tayur, et al. [1999]



IT Trend for Business Applications



Session Program

What is Missing to Enable
Optimization of
Inventory Deployment and Supply
Planning?

Sridhar Tayur
SmartOps and Carnegie Mellon University

Supporting Supply Chain Planning
and Scheduling
in Oil and Chemical Industry

Nort Thijssen
Shell Global Solutions International

Challenges of Strategic
Supply Chain
Planning and Modeling

Jeremy Shapiro
Slim Technologies and MIT



What is missing to enable optimization of inventory deployment and supply planning?

Sridhar

Tayur

Persistent drivers of inventory inefficiency

- Inherent and increasing supply and demand uncertainty
- Increasing complexity in multistage supply chain
- Uncoordinated decision-making within companies and across supply chains



Optimization of inventory deployment and supply planning are enabled by following approaches

- Stochastic approach directly accommodates supply and demand uncertainty, variability, and complexity.
- All inventory forms and components are simultaneously, holistically optimized.
- Supply chain interdependencies are accounted for and managed over time.
- Coordinating decisions across functions, echelons, and enterprises is used.

Challenges of strategic supply chain planning and modeling

Jeremy Shapiro

Enlarging the scope of strategic planning studies and models

Reflecting theories of strategy in data-driven optimization models

Formalizing scenario planning, applying stochastic programming and modeling risk

Expanding business processes to exploit fact-based analysis of strategic plans

Supporting supply chain planning and scheduling decisions in the oil & chemical industry

Nort Thijssen

Core requirements for an integrated tool set

Integration

- Complete horizontal integration
- Seamless system from feedstock trade through to product trading

Convergence

- Convergence of strategy, planning and scheduling
- Vertical systems integration

Modularity

- Phased implementation and scheduling

Scalability

- Application to the most simple and/or complex supply chains

Viewing

- Interactive, customized viewing
- Internet and workflow enabled viewing

Speed

- Real-time optimization speed

Link

- Direct links to online refinery/plant optimization

GMOS/NetSim

Accessing
best practice know-how
from supply chain
all over the globe

Getting
quick practical answer
with solving real problem

Enhancing
**business vision and
direction**

Speaker: Dr. Sridhar R. Tayur

Current position

- Prof. of Operations Management and Manufacturing, CMU
- President of SmartOps

Educational Backgrounds

- B.Tech, IIT, Madras
- Ph.D., Cornell Univ.



Research interests

Internet-enabled supply chains, supply chain management, managing product variety, plant management, JIT and logistics

Speaker: Dr. Jeremy Shapiro

Current position

- Prof. of Operations Research and Management Science Emeritus, MIT
- President of SLIM Technologies

Educational Backgrounds

- B.M.E. and M.I.E., Cornell
- Ph.D., Stanford

Research interests

Integer programming, large-scale programming on parallel computers, integration of mathematical programming and heuristic methods, supply chain management and portfolio optimization



Speaker: Nort Thijssen

Current position

- ☐ Senior Consultant
Shell Global Solution International

Educational Backgrounds

- ☐ M.S., Univ. of Technology, Eindhoven
Netherlands

Professional experiences

- ☐ Shell research center in Amsterdam, 1981~1988, Decision support system
- ☐ Shell refinery, 1988~1992, Refinery planning & scheduling
- ☐ Shell Global Solution International, 1993~present, Supply chain optimization services for the oil chemicals & gas industry

