MGT804: VALUE CHAIN MANAGEMENT

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INDUSTRY INSIGHT : BARTON GOLDENBERG DISTRIBUTION CHANNELS

https://www.youtube.com/watch?v=TWli7z7wt8E

INDUSTRY INSIGHT : 5 SUPPLY CHAIN TRENDS EMERGING IN 2017

https://www.youtube.com/watch?v=rjXaPga6kQM

TOPIC 5: SUPPLY CHAIN NETWORK ANALYSIS AND DESIGN

- **Understand** the need to evaluate the structure and functions of logistics/supply chain networks, and to make changes and improvements as appropriate.
- **Identify** factors that may lead to redesign of a logistics/supply chain network.
- **Develop** an effective process for logistics/supply chain network design.
- **Understand** key locational determinants, both national / regional / global and site specific, and the impact they may have on prospective locational alternatives

INTRODUCTION

- As firms continue their searches for new ways to lower costs and improve service to their customers, the issue of where to **locate logistics and manufacturing facilities has become critical and complex.**
- In addition to enhancing the efficiency and effectiveness of a logistics/supply chain operation, the redesign of a **firm's overall network can help to differentiate a firm in the marketplace.**

THE NEED FOR LONG-RANGE PLANNING

- STRATEGIC IMPORTANCE OF NETWORK DESIGN
- CHANGING CUSTOMER SERVICE REQUIREMENTS
- SHIFTING LOCATIONS OF MARKETS
- CHANGE IN CORPORATE OWNERSHIP
- COST PRESSURES
- COMPETITIVE CAPABILITIES

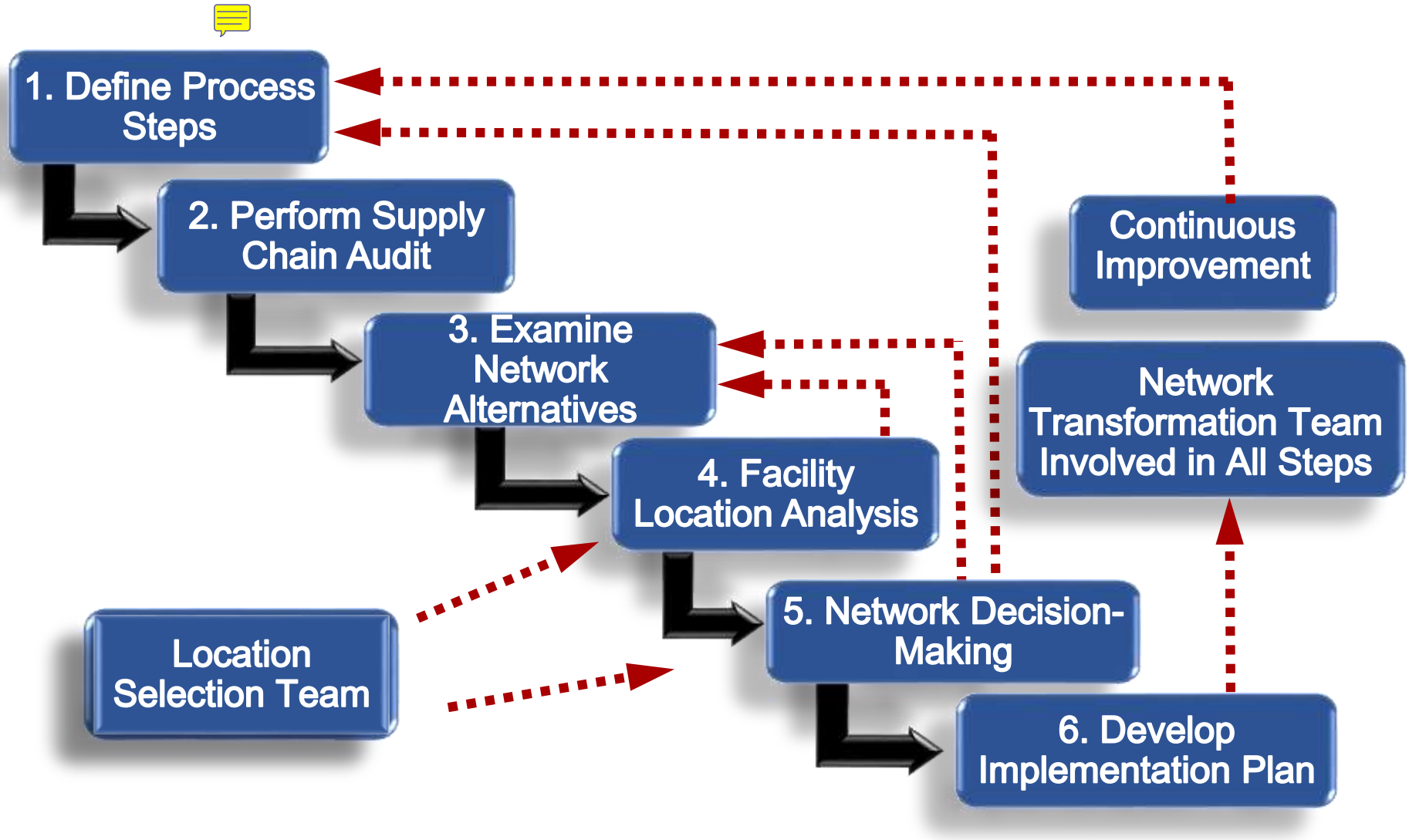
- **Strategic Importance of Logistics/Supply Chain Network Design**
  - All businesses operate in a **very dynamic environment in which change is the only constant.**
  - Each company needs to constantly review whether any existing logistics/supply chain network is up to date.

- **Changing Customer Service Requirements**
  - **Logistical requirements of customers are changing in numerous ways.**
  - Some customers have **intensified their demands for more efficient and more effective logistics services.**
  - Others are seeking relationships with suppliers who can take **logistical capabilities and performance to new, unprecedented levels.**
  - As a result, the need to reevaluate and redesign logistics/supply chain networks is of great contemporary interest.
  - **While customer service requirements may experience change, the types of customers served may also evolve over time.**

- **Shifting Locations of Customer and/or Supply Markets**
  - Service and cost requirements **moves to JIT-based manufacturing.**
  - the European Union.
  - **Constant search for lower-cost manufacturing**.
  - **Growing economic importance** of China and the Asia-Pacific.
  - **Sourcing of raw materials** from offshore suppliers.

- **Change in Corporate Ownership**
  - **Mergers, acquisitions, and divestitures are changing the landscape** and providing opportunities to integrate and improve logistics activities.
- **Cost Pressures**
  - **Removing costs from key processes is a major priority for firms today.**
  - Low labor rates have driven internationalism of production and increased the importance of logistics.
- **Competitive Capabilities**
  - To remain competitive or establish a competitive advantage, **firms should examine facility locations.**

SUPPLY CHAIN NETWORK DESIGN PROCESS

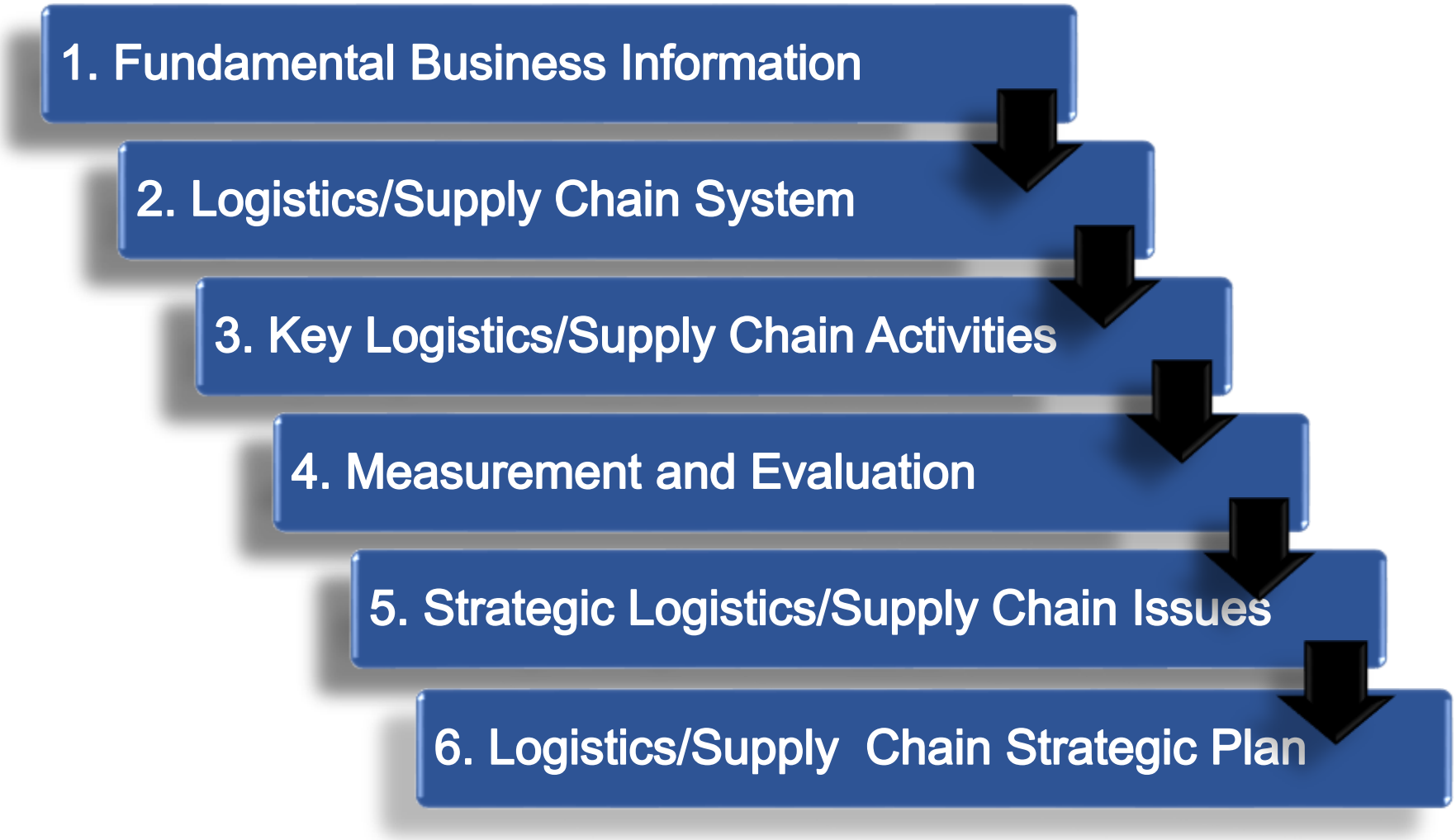


SUPPLY CHAIN NETWORK DESIGN PROCESS
STEP 1: DEFINE THE SUPPLY CHAIN NETWORK DESIGN PROCESS

- **Form** a supply chain network transformation team.
- **Establish** the parameters and objectives of the network design or redesign process.
- **Evaluate** the potential involvement of third-party suppliers of logistics services.

Image courtesy of DynamicCIO

SUPPLY CHAIN NETWORK DESIGN PROCESS
STEP 2: PERFORM A SUPPLY CHAIN AUDIT



Source: Figure 4-2

SUPPLY CHAIN NETWORK DESIGN PROCESS
STEP 3: EXAMINE THE SUPPLY CHAIN NETWORK ALTERNATIVES

- **Apply suitable quantitative models** to the current logistics system and to the alternatives under consideration.
- **Identify preliminary supply chain network design solutions** consistent with the key objectives identified during the audit phase.
- **Conduct "what-if" analysis** to test the sensitivity of recommended network designs to changes in key variables.

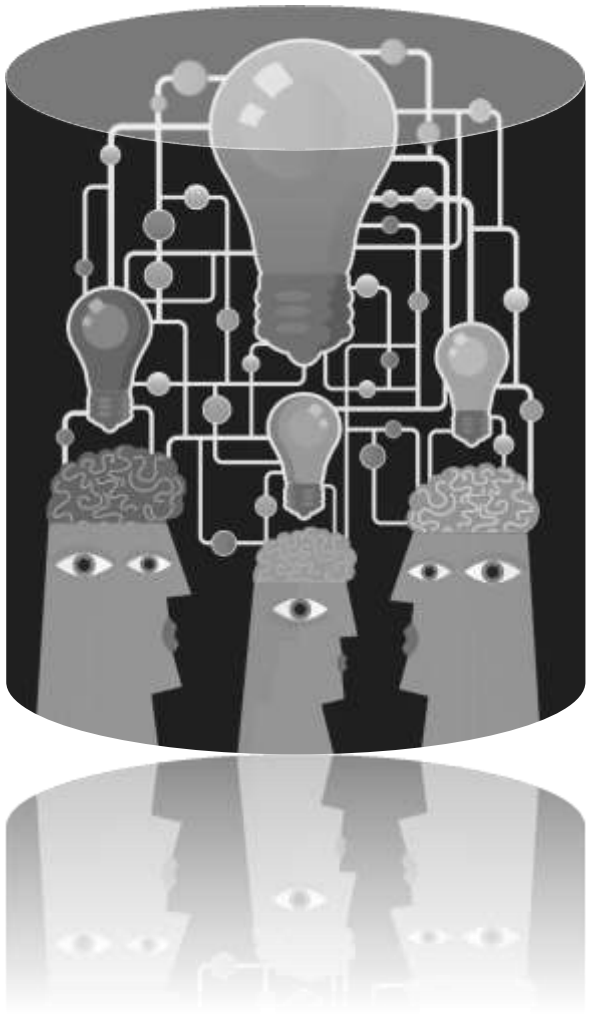


Image courtesy of line-of-sight

STEP 4: CONDUCT A FACILITY LOCATION ANALYSIS

- **Form** a location selection team.
- **Qualitatively and quantitatively analyse** the attributes of specific regions and locales.
- **Identify recommended specific sites** for logistics facilities.

STEP 5: MAKE DECISIONS REGARDING NETWORK AND FACILITY LOCATION

- **Evaluate the recommended network and specific sites for logistics facilities** (Steps 3 and 4) for consistency with the design criteria identified in Step 1.

STEP 6: DEVELOP AN IMPLEMENTATION PLAN

- **Develop a "blueprint for change"** as a road map for moving from the current supply chain network to the desired new one.
- **Commit the resources** necessary to assure a smooth, timely implementation, and the continuous improvement of the network decisions.

BROAD GEOGRAPHIC AND SITE-SPECIFIC LOCATIONAL DETERMINANTS

Global/National/ Regional Determinants

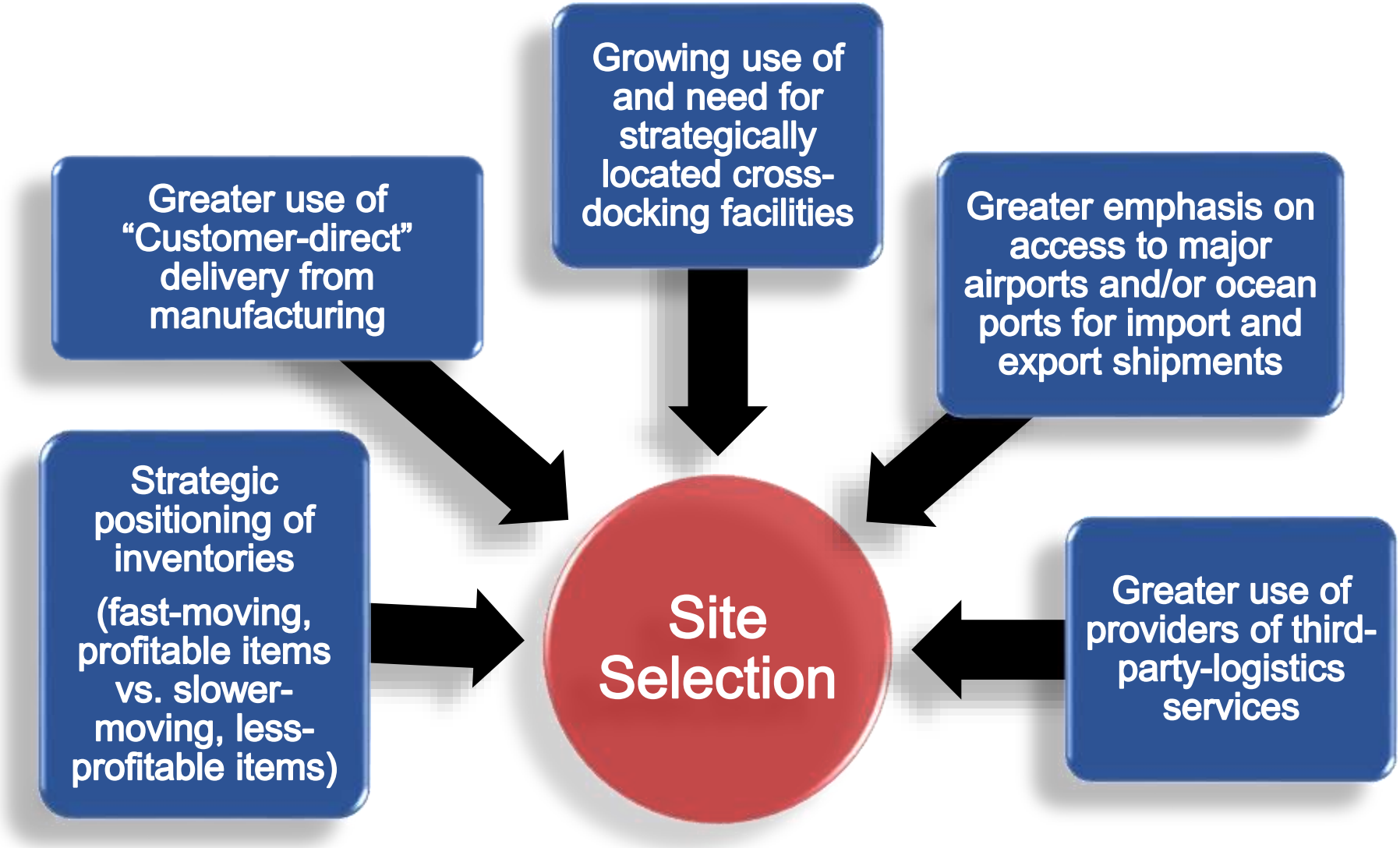
- Labor climate
- Transportation services and infrastructure
- Proximity to markets and customers
- Quality of life
- Taxes and industrial development incentives
- Supplier networks
- Land costs and utilities
- IT infrastructure
- Company preference

Site-Specific Determinants

- Transportation access
- Truck
- Air
- Rail
- Water
- Inside/outside metropolitan area
- Availability of workforce and needed skill sets
- Land costs and taxes
- Utilities

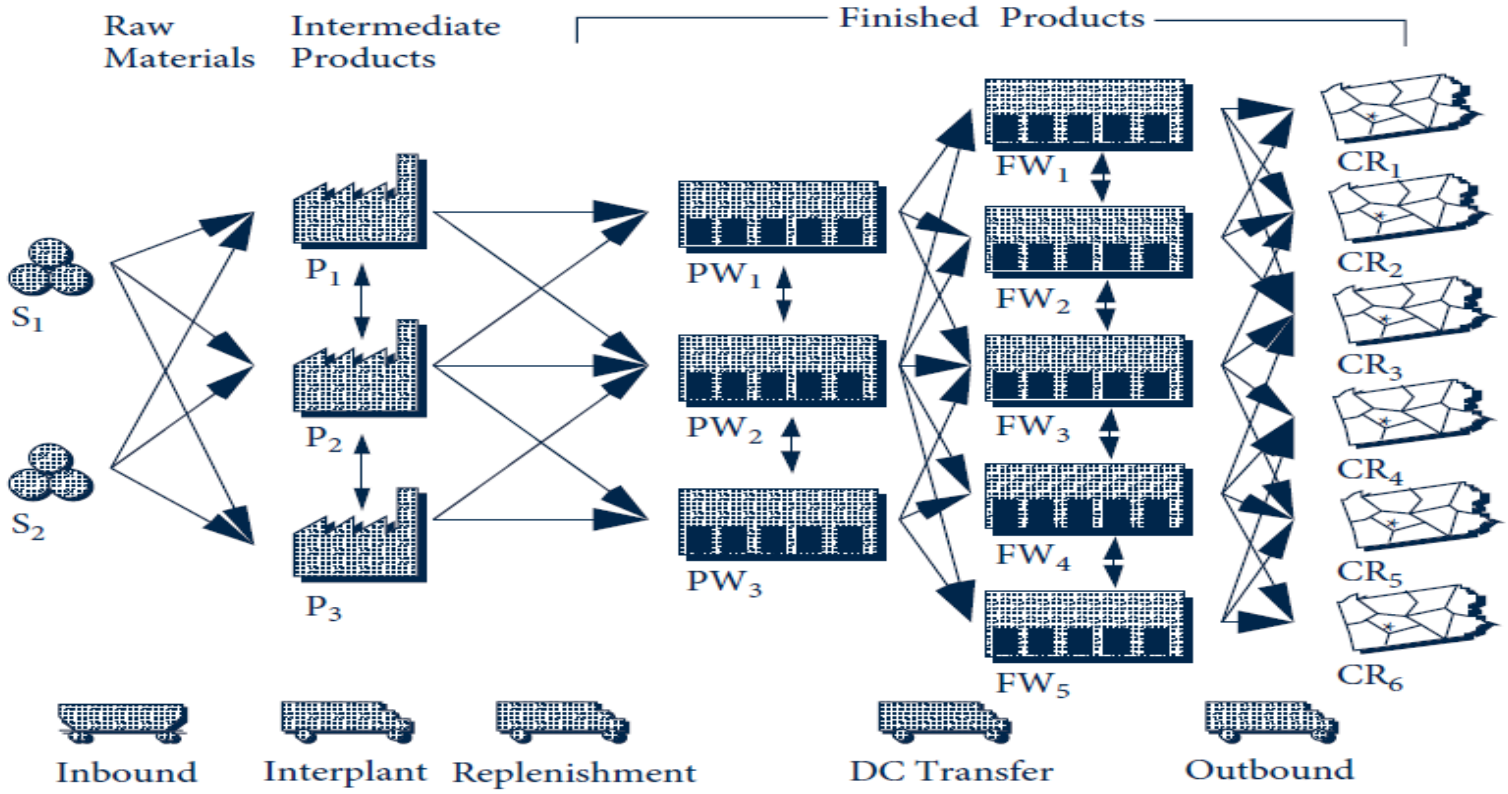
- **Key Factors for Consideration**
  - Labor market/climate.
  - Transportation services and infrastructure.
  - Proximity to markets and customers.
  - Quality of life.
  - Taxes and industrial development incentives.
  - Supplier networks.
  - Land costs and utilities.
  - Company preference.

CURRENT TRENDS GOVERNING SITE SELECTION



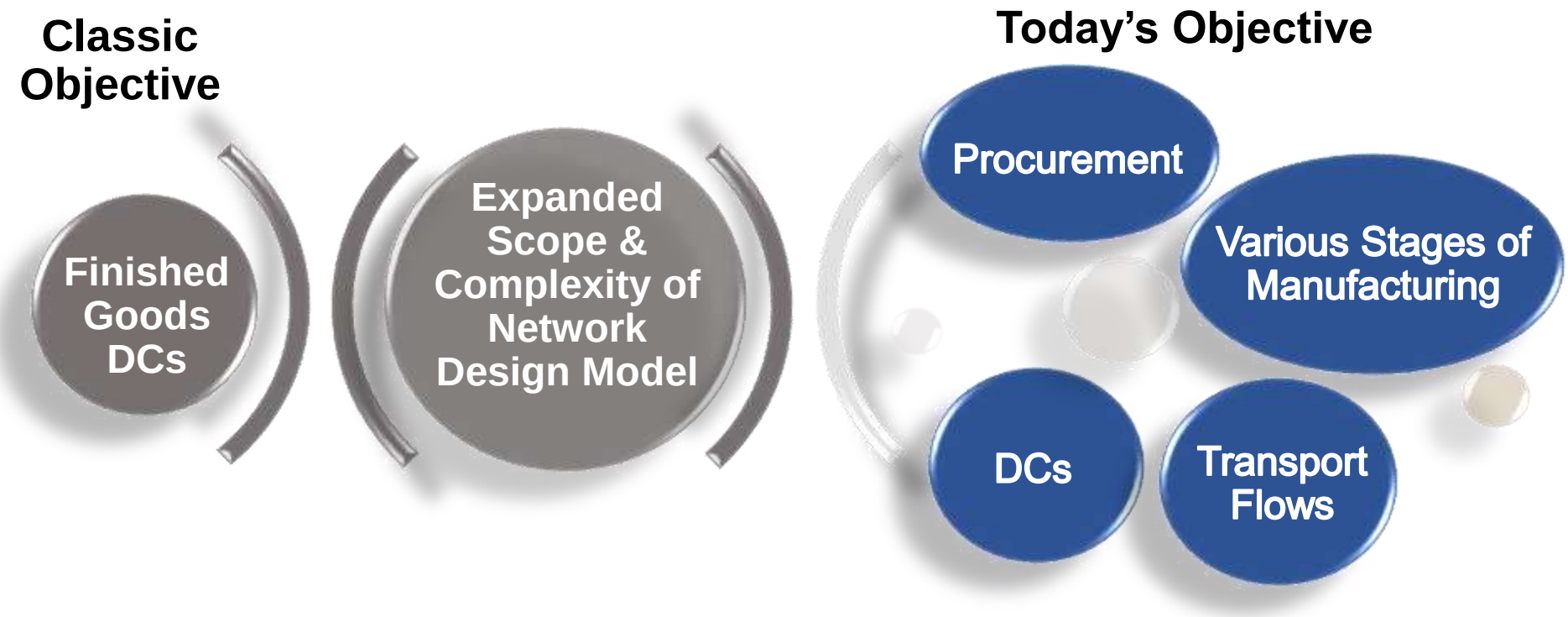
A NETWORK DESIGN MODEL
THE CHALLENGE OF SUPPLY CHAIN COMPLEXITY

Figure 4.4 Supply Chain Complexity



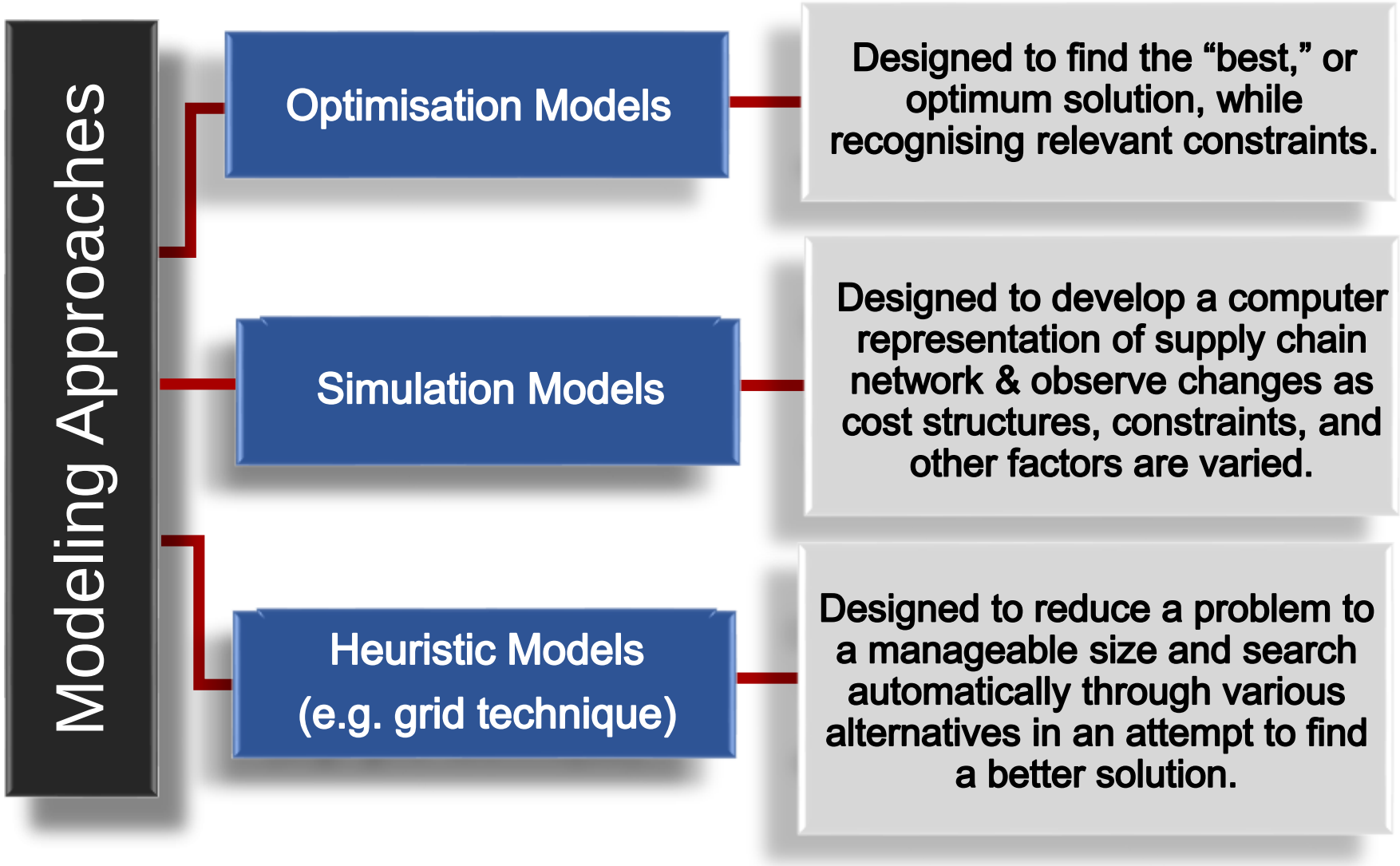
Source: SAILS: *Strategic Analysis of Integrated Logistics Systems* (Manassas, VA: Insight, Inc., 2006): 5. Reproduced by permission.

A NETWORK DESIGN MODEL OBJECTIVE AND NEED FOR DECISION SUPPORT TOOLS



Answering network design questions today is virtually impossible without the help of very powerful decision support tools.

TYPES OF MODELING APPROACHES



- **Optimisation Models**
  - **Precise mathematical procedures that are guaranteed to find the "best," or optimum, solution.**
  - Optimisation approaches essentially select an optimal course of action from a number of feasible alternatives.
- **Simulation Models**
  - Simulation – "**the process of designing a model of a real system and conducting experiments with it for the purpose of understanding system behavior or evaluating various strategies within the limits imposed by a set of criteria governing system operation.**

- **Heuristic Models**
  - **Heuristic models are able to accommodate broad problem definitions, but they do not provide an optimum solution.**
  - The use of a heuristic approach can help to reduce a problem to a manageable size and search automatically through various alternatives in an attempt to find a better solution.
  - **To reduce the number of location alternatives, the decision maker should incorporate into the heuristic program site characteristics considered to be optimal.**

POTENTIAL SUPPLY CHAIN MODELING PITFALLS TO AVOID

- Short-term horizon
- Too little or too much detail
- Thinking in two dimensions
- Using published costs
- Inaccurate or incomplete costs
- Fluctuating model inputs
- Use of erroneous analytical techniques
- Lack of appropriate robustness analysis

OMNI-CHANNEL RETAILING DEFINED

"A direct to consumer (D2C) business model where all sales channels ranging from online, mobile, telephonic, mail order, self-service, and physical retail establishments are aligned and fulfillment processes integrated to provide consumers with a seamless shopping experience in alignment with the company's brand proposition."

Three Important Elements

Omni-channel strategy must align with the firm's "go to market" strategy.

The fulfillment processes must be integrated regardless of order entry point.

"Ease of shopping" for the consumer is a priority regardless of where or how the order is placed.

INDUSTRY INSIGHT : IS YOUR SUPPLY CHAIN FIT FOR THE FUTURE?

https://www.youtube.com/watch?v=GWnc85-xmWE

SUMMARY

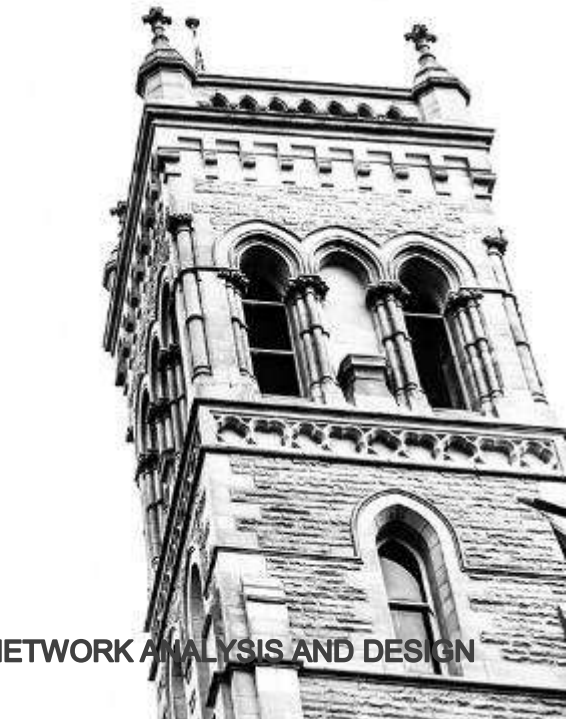
- **The logistics/supply chain network design decision is of great strategic importance to logistics**, the firm as a whole, and the supply chain.
- **This decision is becoming increasingly important** due to trends related **to globalisation of manufacturing, marketing, sourcing, and procurement**.
- **A number of factors** may suggest the need to redesign the logistics/supply chain network.
- **A formal, structured process for network design is preferable;** the potential impacts on cost and service justify a **significant effort toward following a sound process.**

SUMMARY

- **Numerous factors** may affect the design of a logistics network and the location of specific facilities within the context of the network.
- **Principal modeling approaches** to gain insight into the topic of logistics/supply chain network design includes**, simulation, and heuristic models.**
- **The "grid" method** represents a useful way to obtain a good, but **not necessarily optimal solution to a logistics facility location problem.**
- **The availability and cost of transportation** affect the location decision in a **number of significant and unique ways.**

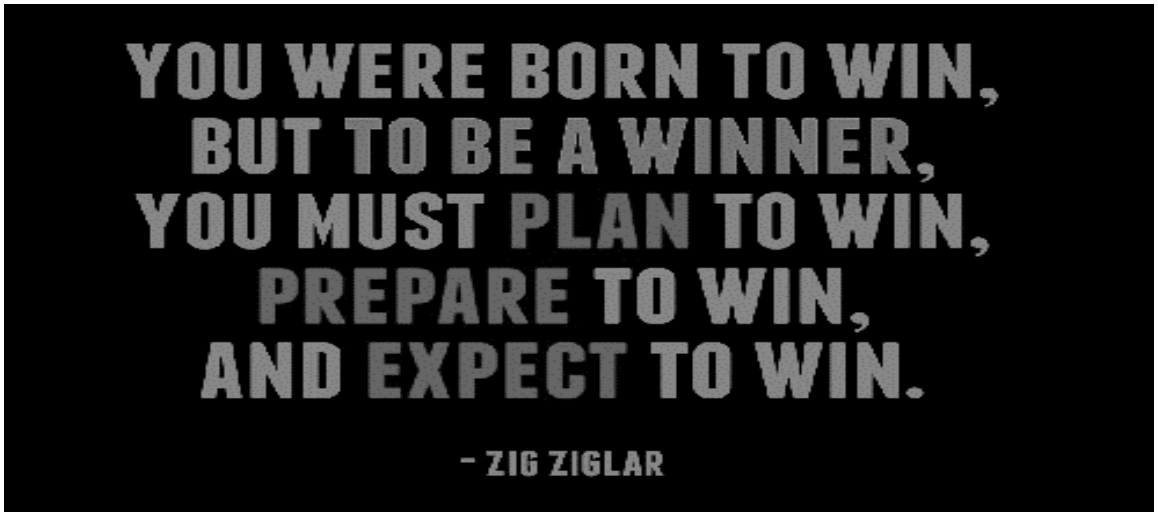
TOPIC 2: STRATEGY AND MANAGING THE SUPPLY CHAIN

TUTORIAL AND ASSESSMENT DISCUSSION



ASSESSMENTS

No	Assessment	Issued	Due	Weighting	Type
1	Company Case Study	Week 1	Week 6	25.00%	Individual Assignment
2	CSR and Value Chain Research Report	Week 1	Week 12	35.00%	Individual Assignment
3	Final Exam	Exam Week/s	Exam Week/s	40.00%	Final Exam



REFERENCES & ADDITIONAL READINGS

- Rezapour, S., Farahani, R. Z., & Pourakbar, M. (2017). ***Resilient supply chain network design under competition: a case study.*** European Journal of Operational Research, 259(3), 1017-1035.
- Zokaee, S., Jabbarzadeh, A., Fahimnia, B., & Sadjadi, S. J. (2017). ***Robust supply chain network design: an optimization model with real world application***. Annals of Operations Research, 257(1-2), 15-44.
- Govindan, K., & Fattahi, M. (2017). ***Investigating risk and robustness measures for supply chain network design under demand uncertainty:*** A case study of glass supply chain. International Journal of Production Economics, 183, 680-699.

REFERENCES & ADDITIONAL READINGS

- Eskandarpour, M., Dejax, P., & Péton, O. (2017). ***A large neighborhood search heuristic for supply chain network design.*** Computers & Operations Research, 80, 23-37.
- Varsei, M., & Polyakovskiy, S. (2017). ***Sustainable supply chain network design: A case of the wine industry in Australia.*** Omega, 66, 236-247.
- Urata, T., Yamada, T., Itsubo, N., & Inoue, M. (2017). ***Global supply chain network design and Asian analysis with material-based carbon emissions and tax***. Computers & Industrial Engineering, 113, 779-792.