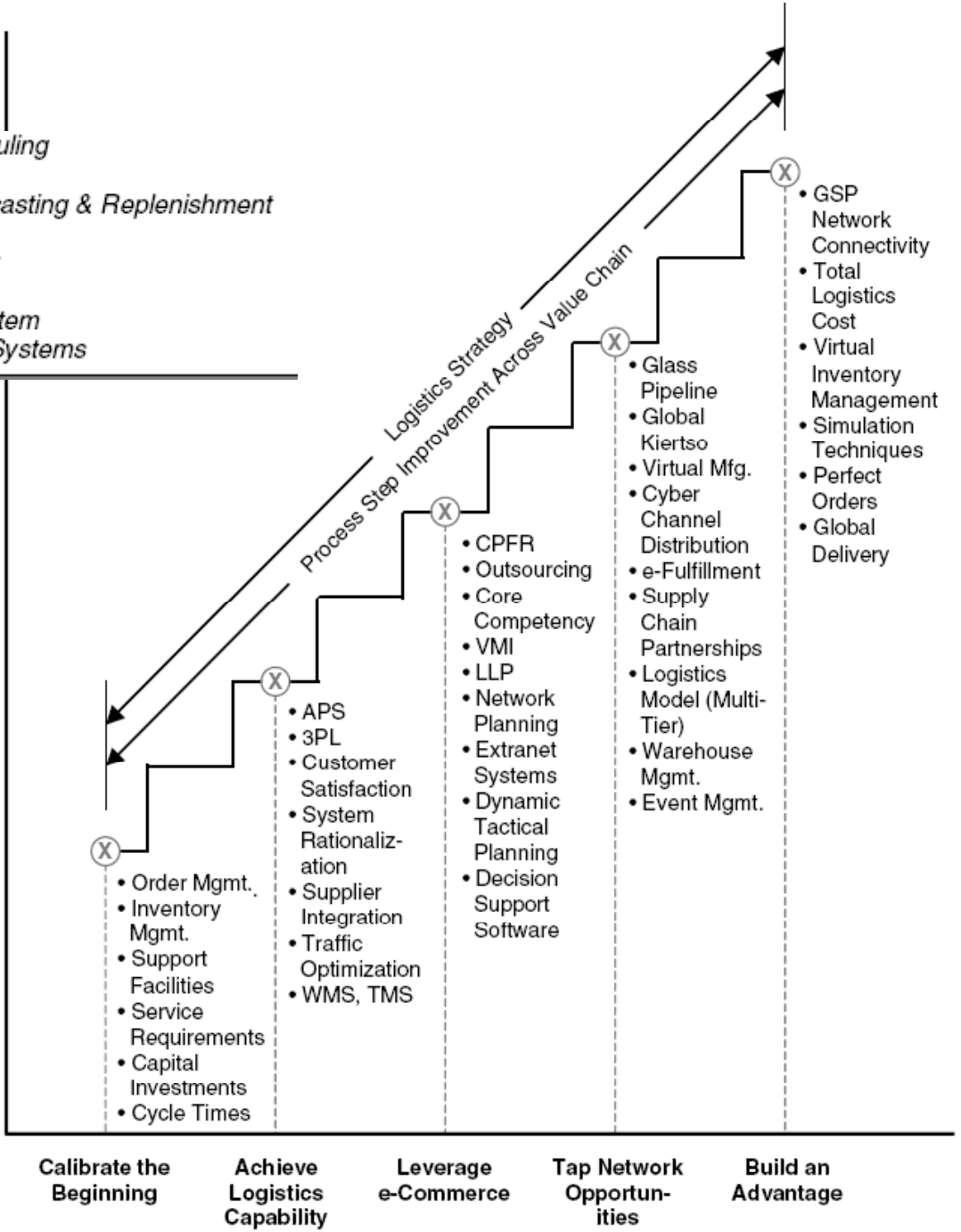


# SUPPLY CHAIN , LOGISTICS & DELIVERY

- APS    *Advanced Planning & Scheduling*
- GSP    *Global Satellite Positioning*
- CCPFR *Collaborative Planning, Forecasting & Replenishment*
- VMI    *Vendor Managed Inventory*
- 3PL    *Third Party Logistics Provider*
- LLP    *Lead Logistics Provider*
- WMS    *Warehouse Management System*
- TMS    *Transportation Management Systems*



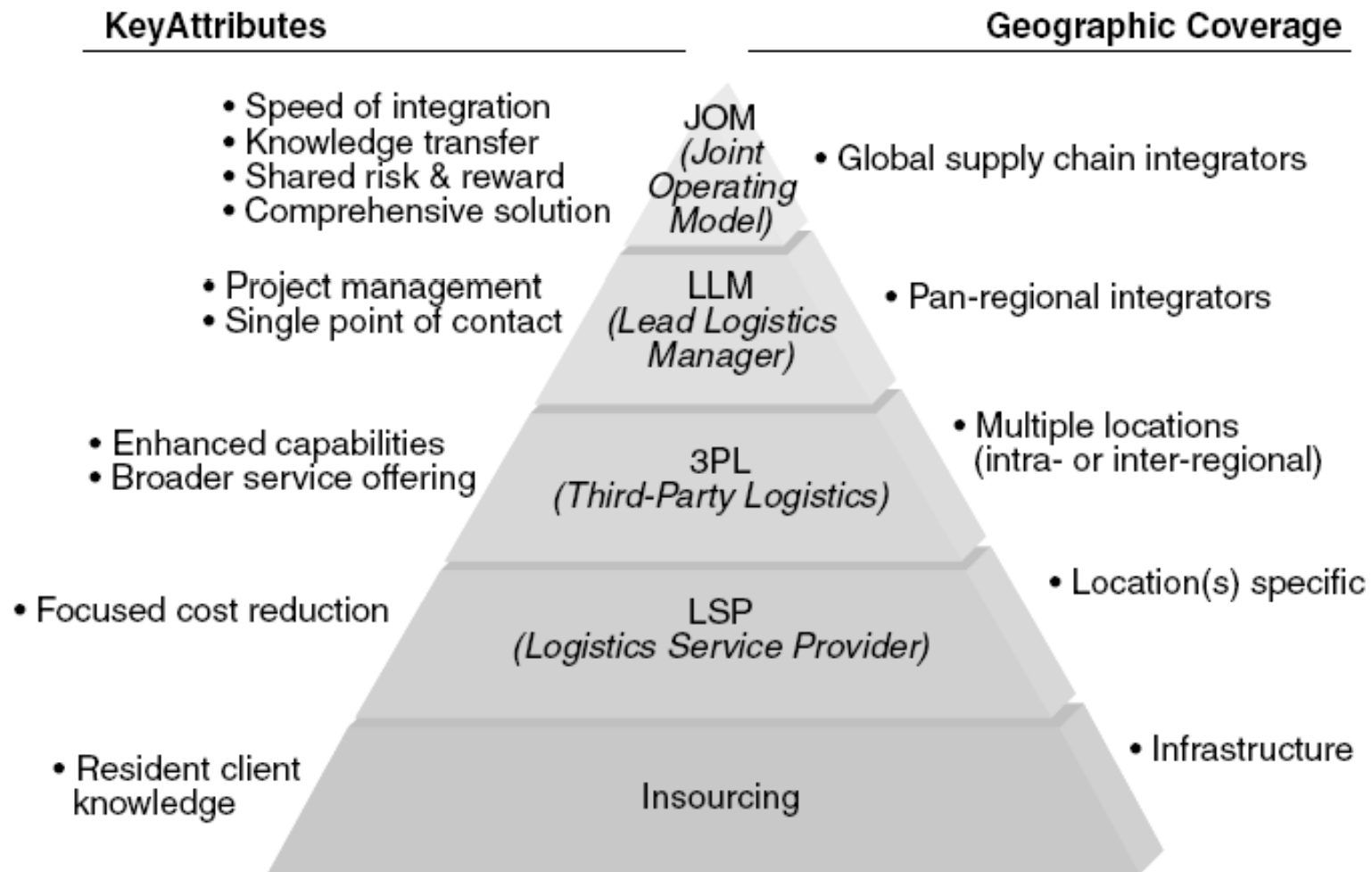
- In Level 2, dubbed *achieving logistics capability*, firms establish a *logistics center* where the total organizational costs are evaluated.
- As the firm begins to consider its ability to leverage transportation and storage in the same way as purchasing volume, it moves closer to traffic optimization turning attention to how the overall capability can be improved.
- Service requirements are examined, on both the inbound and outbound side of manufacturing, to determine if another supply chain partner can make the deliveries on a more economical and efficient basis.
- Leasing equipment to keep maintenance costs fixed and conserve cash becomes an option.

- Dedicated carriers with responsibility for heavy traffic routes are used.
- Work is most often performed in this level as a special *study*, frequently done with the help of a third-party advisor. Significant, more comprehensive data collection typically accompanies these studies.
- Attention is paid to where the key suppliers are and how they make shipments to the firm's operating facilities and storage depots.
- This focus is intended to ensure a reliable flow of incoming materials and supplies, while minimizing the inbound freight costs and handling.
- Where trucks can be sent to a supplier as part of an empty back haul, pickups become a viable alternative to having the supplier ship directly.
- As the analysis extends to the firm's total system, involving intra-company transfers and shipments to customers, the potential to better utilize assets (with fuller loads) increases.

•Most firms find ways here to significantly reduce these investments without harming delivery capability. Software programs are applied to determine where the warehousing should be located, how much space should be involved, and which company should own the facility. Using data on where suppliers are located, where the manufacturing plants are situated, and where key deliveries must be made, this analysis includes how much inventory is required to meet demand, as well as how the goods should be stored and retrieved, and often leads to rationalization of the total system and the installation of a warehouse management system (WMS) where it is deemed important. Working with many firms through this level, warehouse space reductions of 30 to 50% were not uncommon as the software revealed more economical alternatives.

- Third-party logistics providers (3PLs), companies skilled at taking over the responsibility for equipment, maintenance, and drivers, and arranging transportation across the system, are brought in to discuss transferring ownership of this function.
- Advanced planning and scheduling (APS) begins to occur at this time, as these providers are given access to actual planning schedules so they can have the right equipment available at the right point of need. In short, the logistics function becomes a serious part of the firm's strategic framework.
- As supply chain strategy is fused with the business strategy and operating plans at this level, the elements required in order to attain logistics excellence are fused to the supply chain strategy.

- Dynamic tactical planning tools are applied in Level 3 to match manufacturing and delivery schedules with actual consumption and come up with executable plans.
- This planning is set up on a quarterly, semiannual, or annual basis, and allows the firm to track results against a more reasonable budget.
- As implied, the tactics are adjusted as market conditions change and special needs with key customers arise. Extranet systems come into existence as the firm begins serious collaboration with its best suppliers and customers, often including some key distributors.
- Together, these partners look at network planning and delivery as a means of distinguishing the collaborating firms in the eyes of the final customer or end consumers.



- When the firm crosses over the cultural barrier and moves into the third level of the evolution, it enters the area termed *leverage e-commerce*.
- The intention is to use Internet technology and cyber-based tools, internally and externally, to enhance logistics processing. Now the company takes advantage of its internal data analysis and, with the help of external advisors, starts its move toward the virtual logistics network. With some of its trusted allies, a firm develops the end-to-end visibility so important to a contemporary logistics model.
- The logistics function considers decision support software that includes real-time data transmission on order and shipment conditions and requires the involvement of supply chain partners to coordinate shipments and deliveries with demand data.
- Internally integrated modeling pulls the total needs together in a manner that allows the firm to consider many more options than previously accessed. Event tracking of shipments versus what the business plan called for becomes an attribute.

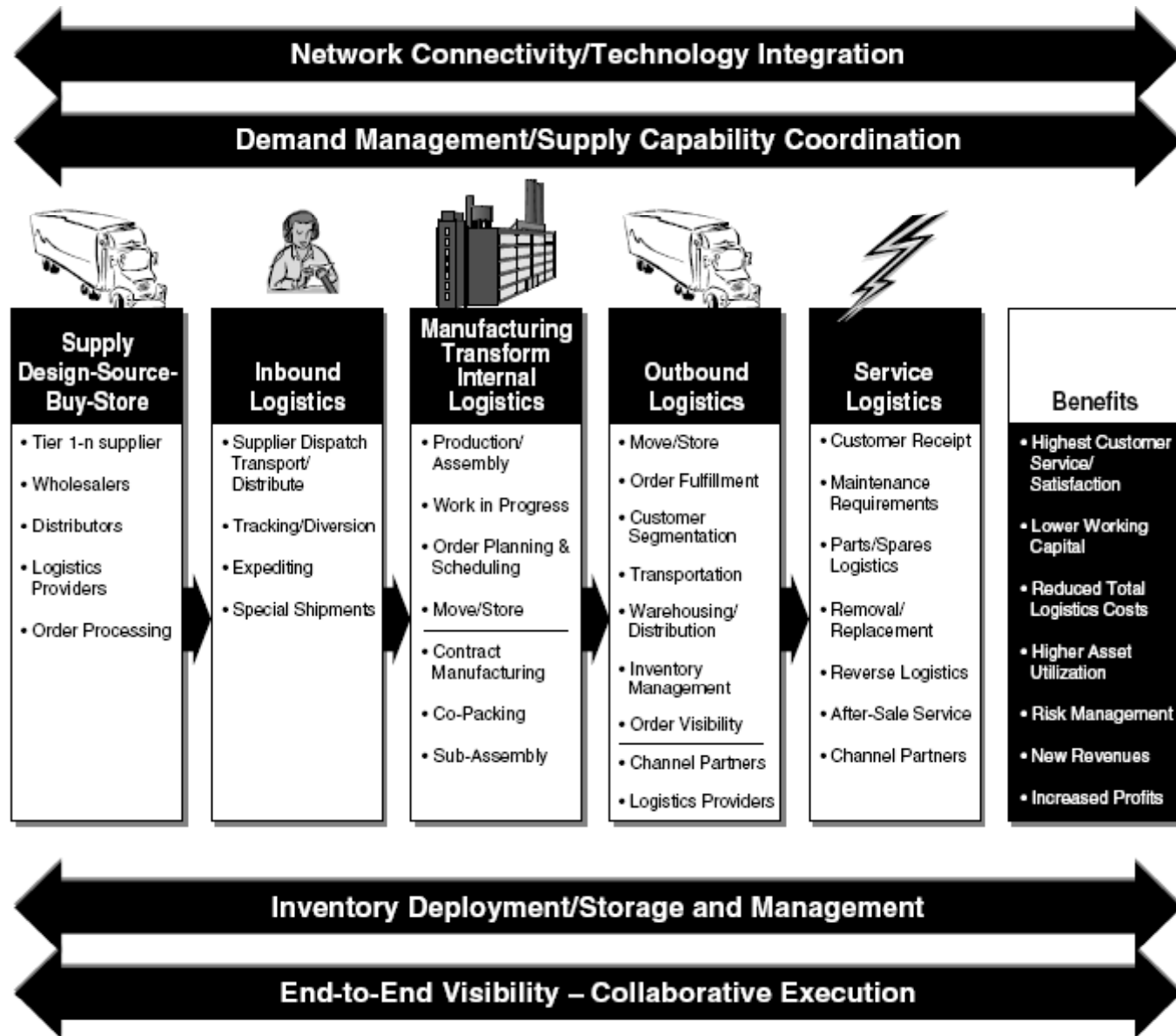
- In Level 4, logistics strategy truly becomes a network experience with integration of efforts extending to multi-tiers of partners. Now the firm enters an area called tap network opportunities. With the assistance of key allies and data readily accessed internally and externally, the focus moves to the extended enterprise and the shipments and storage occurring across many organizations.
- The major feature of this level is the “glass pipeline” that develops through which the partners can view the entire supply chain flow, from the earliest important supplies to final consumption. Global satellite positioning (GSP) devices are used to track shipments and stored products. Radio-frequency equipment is mounted on warehouse trucks to link the communication right to the point of picking the correct items for any order.
- All inventories of merit are online, accessed through an extranet on a 24/7 basis. Virtual inventory management becomes a reality rather than a dream as the partners operate closely to meet delivery needs without excess inventory.

- The overall focus is on the *perfect order* with all partners working back from consumer and customer needs to provide the best possible solutions.
- Metrics are established to measure these perfect orders and used to solicit new business from other customers. A key element in this level is jointly developing an analytical framework to guide the building of the network supply chain model.
- Using key data inputs from suppliers and distributors, the nucleus firm begins constructing a supply chain model to represent the existing and possible future (enhanced) state of conditions. This model could be very complicated for a large-scale operation such as automobile and aerospace delivery.
- It must include quantitative and qualitative data to evaluate performance and include service maps covering the entire enterprise.
- Figure 4.4 describes a useful analytical framework to facilitate the building of this model.

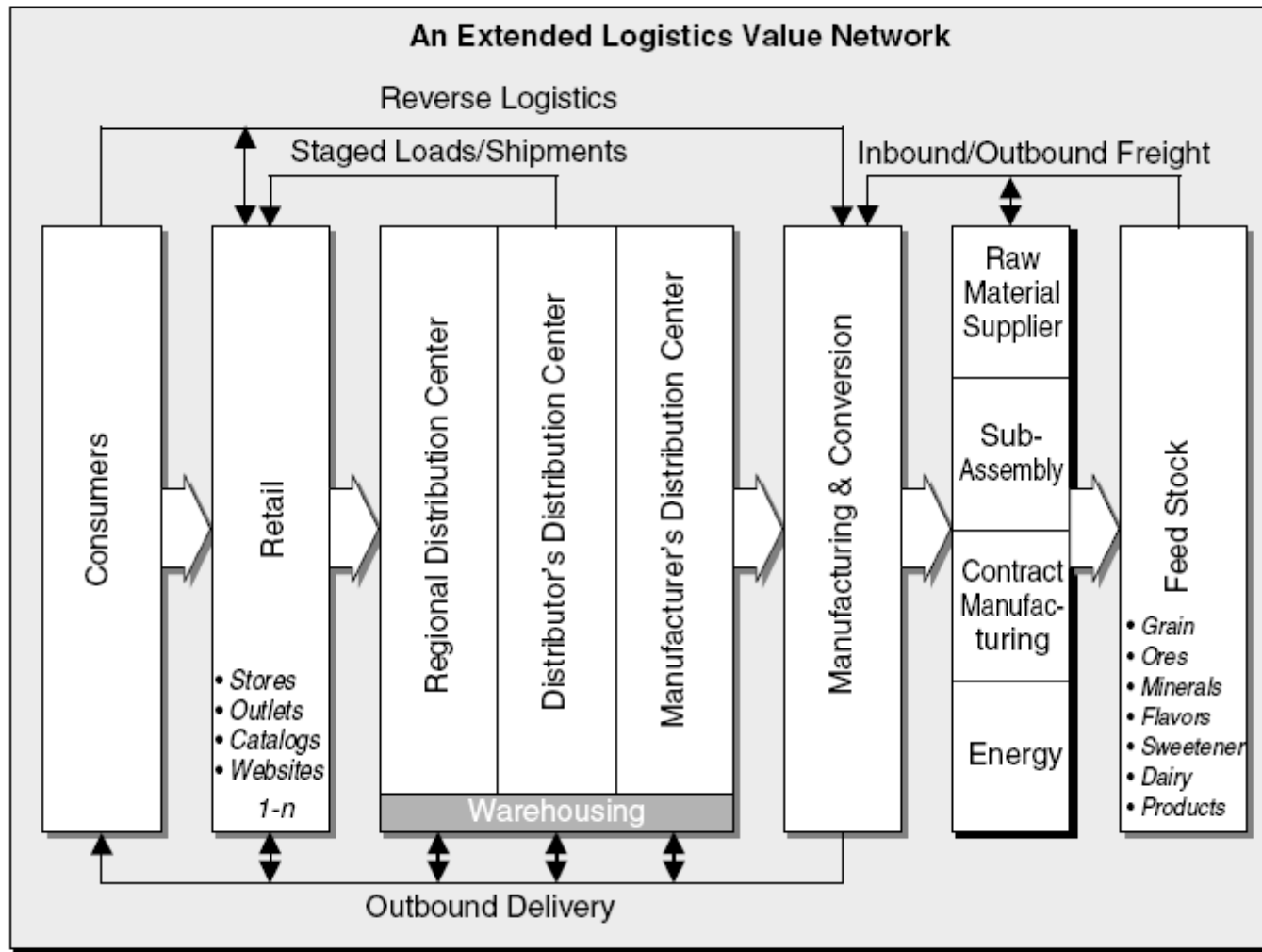
*Network Model Outputs*


| Network Alternatives                                 | Fixed Operating Costs  | Variable Operating Costs | Inbound Transportation Costs | Outbound Transportation Costs | Average Cycle Days |
|--|--|--------------------------|------------------------------|-------------------------------|--------------------|
| Baseline Calibration                                 | Serves as the point of comparison against new alternatives   |                          |                              |                               |                    |
| Consolidate Assets and Inventory in...               | Comparison of the total logistics costs and service levels for each network alternative and associated scenarios against the baseline costs and service levels |                          |                              |                               |                    |
| Full-Line Distribution Centers in...                 | Comparison of costs and service levels between alternatives  |                          |                              |                               |                    |
| Increase/Decrease the Number of Distribution Centers | Analysis of key model cost and volume drivers along with the imposed constraints to understand overall model results and network dynamics                      |                          |                              |                               |                    |
| Etc...   |  |                          |                              |                               |                    |





- Not all firms need to progress as far as Level 5, which has been termed *build an advantage*, but the opportunity to achieve more benefits, particularly in terms of customer and consumer satisfaction, occurs in this level.
- This area is for the most sophisticated of networks, requiring the formation of joint logistics models and involving full connectivity across the extended enterprise. Total logistics costs are evaluated through the connecting extranet communication system.
- Since the firms have applied activity-based costing and balanced-scorecard techniques to determine the costs per unit across the end-to-end network, they work together on the most cost-effective methodology while keeping customer ratings at industry best standards.
- A robust, integrated, multi-tier capability is what distinguishes the linked players, as all key members are working together online on a real time basis to match deliveries with actual demand.
- Simulation techniques are applied to study, evaluate, and test alternative delivery scenarios, and alert partners of relevant changes occurring within the system. Tight upward and downward propagation with regard to plans and changes are an element that brings further advantages.



 Demand signal