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MIT's Yosef Sheffi

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# The world in a computer window

## *Technology places the logistics universe in the supply manager's hands*

By Peter Bradley / Transportation Editor



"The most important thing [in transportation management] is the revolution in information technology. It overcomes time and space. It allows measures of performance. And what you can measure, you can manage," Sheffi says. For instance:

- Truckload carriers use satellite tracking and decision support systems to follow customers' freight, track the speed and location of their trucks, monitor and alter trailer temperature, route drivers home more frequently, and improve asset use.

- Carriers in all modes have systems to manage the flow of freight through hundreds of terminals and breakbulks from a single central control. They are developing shipment profitability systems that help them decide what business to

Yossi Sheffi believes managing the flow of goods and materials around the world will someday be akin to managing a job shop.

The job-shop manager looks through his office window to see everything that's happening on the plant floor. He can step through the door to manage events.

For a logistics manager directing a worldwide supply and distribution chain, the equivalent of that job-shop window is the computer screen. The equivalent of the doorway—a keyboard.

Sheffi, the director of the Center for Transportation Studies at the Massachusetts Institute of Technology, contends that a world-at-your-fingertips is fast becoming critical to manufacturers competing in global markets. Superb logistics, he believes, are a key to a successful supply management strategy.

"Virtually any product can be contracted out at low cost," he says. "The barrier to entry is not manufacturing, but world class logistics. Excellent management of orders and inventories will differentiate the excellent companies from the good ones."

Sheffi, a recognized expert on logistics management systems, contends that information and communications technologies are the driving forces for a revolution in logistics that is already well under way.

take—and what business to decline.

- Railroads use automated train control systems to efficiently manage train movements from a central location. They are now implementing a system that will allow them to manage virtually every individual railcar in the country.

- Companies linked with their carriers, suppliers, and customers can instantly see the status of their materials on order, in transit, or in storage and use their systems to manage how it's handled. The flow of material can be tied to the manufacturing schedule.

- Products now being launched promise to give logistics managers a window on each shipment in every mode through a single universal information and communications system. Such systems can help level the playing field by giving managers a clear comparison of rates and services.

"It's getting to the point that a materials manager can dial in a part number and get a worldwide profile," Sheffi says. "He can know that two are on a truck, three are in port, five are on a ship—with the coordinates of the ship and the weather at sea—and that five are on order from a supplier in Hungary. He can get the entire picture of when his materials will arrive while it's moving."

The goal, Sheffi says, "is to bring

information in real time to the decision maker's desk."

This access to information begins to change the way procurement managers think about the whole supply chain.

Shippers historically referred to the transportation system as a "black hole," where products and materials fell out of sight until they reappeared at some time in a plant, store, or warehouse. As such, goods in transit were of little use. Now, access to accurate information is as good as the ability to put hands right on the goods.

"When coupled with an information system, the transportation system becomes the warehouse," Sheffi says. Instead of physically accumulating orders in a warehouse, they can be consolidated in the computer and carriers can be coordinated to arrive at the dock at close to the same time.

And the links among various entities—suppliers, buyers, carriers, Customs—open up opportunities for joint decision making. The rapid exchange of information helps each party plan more effectively.

It is through such joint effort that the opportunities for future cost reductions must come, Sheffi believes. He says, "It's clear that transportation buyers aren't going to get much further improvement by beating down rates. To get better rates, you have to reduce costs."

Sheffi believes current fuel prices are artificially low. When they climb, so will rates. "The cost of transportation will be moving up," he says. "The costs of information and technology are coming down." The way to control transportation costs is through technology.

For instance, Sheffi says, a load control center operated by a third party, linked to shippers and carriers, could receive daily shipping requirements and equipment availability via EDI. Decision management systems could match carriers to hundreds of shipping locations, based on a variety of criteria—origin, destination, special handling, shipper's contracted core carriers, rates available that day, and so on. Such a system could reduce

## Real world results from the ivory tower

The MIT Center for Transportation Studies, established in 1973, proves the adage that the whole is greater than the sum of its parts. The center brings together 50 world class experts from such fields as management, economics, political science, and engineering to tackle questions beyond the scope of any one discipline.

"The idea was that some of the challenges facing engineers and society don't fit into any one department," says Yossi Sheffi, who became the Center's director a year ago. "Solving transportation problems takes more than an engineering solution."

Research areas include logistics, computer systems, intelligent vehicle/highway systems, geographic information systems, health and safety, labor issues, and infrastructure. Projects range from broad conceptual planning to the specifics of equipment design and operations analysis. Best known for its research in passenger transportation, the Center is focusing increasingly on

freight transportation issues.

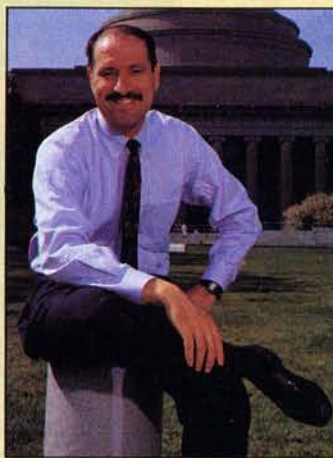
The Center also sponsors academic programs leading to interdisciplinary masters and doctoral degrees.

Another function of the Center, and one Sheffi considers crucial, is its Affiliates Program. Founded in 1981, it brings industry into close contact with MIT's academic community. The program currently has 30 shipper and carrier members.

The program supports research that is of particular interest to private sector organizations. It also sponsors seminars on a variety of topics. An example: CTS recently organized a seminar on the JIT II system, developed and implemented

by Bose Corp., which strengthens links between suppliers and the purchasing firm (PUR: Sept. 12, '91; p. 60).

The Center sponsors the Executive Program in Transportation, offering continuing education to transportation practitioners. It also has an advisory board, composed of logistics executives from major corporations.



empty miles for carriers while meeting buyers' service requirements at potentially lower rates.

Reynolds Metals already operates a continuous moves program for its truckload carriers through its Central Dispatch system. When a truck makes a delivery at a Reynolds facility, the Central Dispatch system finds another load at the same plant or nearby. The longer the truck is kept loaded, the lower the per-mile rate Reynolds pays (PUR: Mar. 19, '92; p. 46).

Sheffi believes a new type of software will expand communications links further. At least two are already on the market, Encompass, produced by a joint venture between AMR Corp. and CSX Corp., and Consolidated Tracking System, produced by GE Information Systems Co.

The idea: To create a program that can link data from all the other systems into a single integrated global management system to help perform such functions as shipment load planning, mode and route analysis, booking and confirmation, in-transit tracking and tracing, and operations analysis. Sheffi says these first generation global systems are not complete, but offer enormous promise.

Finally, though, technology is only as good as the managers who use it. "Those who aren't ready, who don't understand the organizational relationships and alliances that need to take place will be behind," Sheffi says. "Technology is moving so fast, it's hard to imagine the possibilities. But it will impact every facet of transportation and logistics."