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INVESTIGATE SOME OF
THE FEATURES OF THE
LATEST SUPPLY CHAIN
PLANNING SOFTWARE

PLANNING

FOR THE NEXT GENERATION

gile operations have come of age. All businesses today need to listen to the customer to survive and the customer is getting much more demanding. Rapid response to demand, rapid replanning to meet sudden changes in the market place, accurate prediction of delivery date and time, short replenishment times – those are the challenges of the manufacturer in today's business climate. It has become clear that, without appropriate IT-supported planning and scheduling tools, it is almost impossible to meet these challenges. Over the last 10-15 years supply chain planning (SCP) software products have been developed to meet these challenges – often based on clever mathematical optimisation techniques.

As a business becomes larger and more complex, it becomes increasingly difficult to control costs and meet ever-

higher expectations for customer service. Cost reduction and customer service improvements are the primary drivers for adopting SCP. Studies show that these are complementary areas, and improvements in one are often accompanied by improvements in the other.

IMPROVED SCP
Fig 1 shows the benefits derived from improved SCP. Where do these benefits come from? Growth and complexity can lead to distorted information. It's not just whether a forecast is accurate. It must be usable by all business functions, or else people create their own, inconsistent views of future demand. This applies to other key data sources as well.

Decision-making fragments across a business as different functions become entities in themselves. Sales, procurement, manufacturing, and distribution act as separate silos and make decisions based on their own objectives, incentives,

and locally available data. Each business function also protects its ability to respond to surprises, from business partners and each other, by hedging, i.e. keeping additional inventory in store, padding lead times, or holding production capacity in reserve. These hidden buffers accumulate across the business, and they all have significant opportunity costs.

Quick response to customer requests allows companies to capture new business and protect existing accounts. Silo-based interactions preclude rapid response. Something as mundane as a change to a customer order triggers a round of collaborative interactions. Sales and customer service departments must verify that this request does not disrupt commitments to high priority customers. Production schedulers need to see how this new commitment affects the current schedule, and what additional costs are incurred. Transportation planners must price out any new or special aspects of the product movement, and verify the availability of transport resources.

This need for efficient collaborative processes becomes more acute as companies grow through market success or acquisitions. In that situation SCP benefits come from two sources, a shift to a broader perspective from a local, silo-oriented one, and analysis such as what-ifs and optimisation that improve the quality of decision-making.

A broader perspective means using both consistent data and more of it, and considering the global impact of decisions. It accelerates response, exposes hidden buffers so they can be controlled, and provides a mechanism for resolving conflicts between local perspectives. The improvement in decision quality comes from how people work. Decisions are heavily influenced by past experiences, whether they are relevant or not. In complex situations, people make things manageable by excluding parts of the problem and only utilising a subset of the available data. People fall into the pattern of making the same decisions repeatedly, even as the business changes.

Modern analytical techniques utilise all available data in exploring the full set of possible options. They use financial measures to evaluate the quality of solutions. They suggest solutions based on where the business is now, not where it has been.

SCP ISSUES

Although many SCP successes are documented in Fortune 500 companies, most organisations still use manual methods, outdated systems or spreadsheets. Companies of all sizes hesitate in pursuing SCP because of the risk and cost. Stepping through a typical first generation SCP implementation shows how the risk and cost elements accumulate.

Typically a company purchases first generation, "packaged" forecasting and planning modules from a leading SCP vendor for a seven figure license fee and such pricing makes this technology unaffordable for all but the largest companies. Shipping data is fed into the forecasting

10%	Reduction in total supply chain cost
15%	Improvement in on-time delivery performance
25%-35%	Reduction in order fulfillment lead times
15%-20%	Improvement in asset utilization
40%-65%	Advantage in cash-to-cash cycle time over average companies
20% 30%	Reduction in inventory

Source: PRTM 2000 Supply Chain Benchmarking Study

FIG 1 SUPPLY CHAIN PLANNING DELIVERS SIGNIFICANT BENEFITS

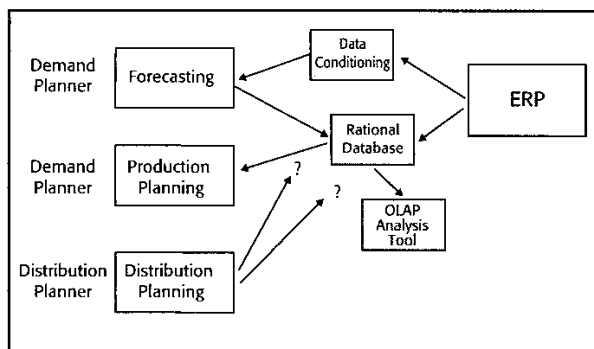Manufacturers from all industries will benefit ...supply chain planning
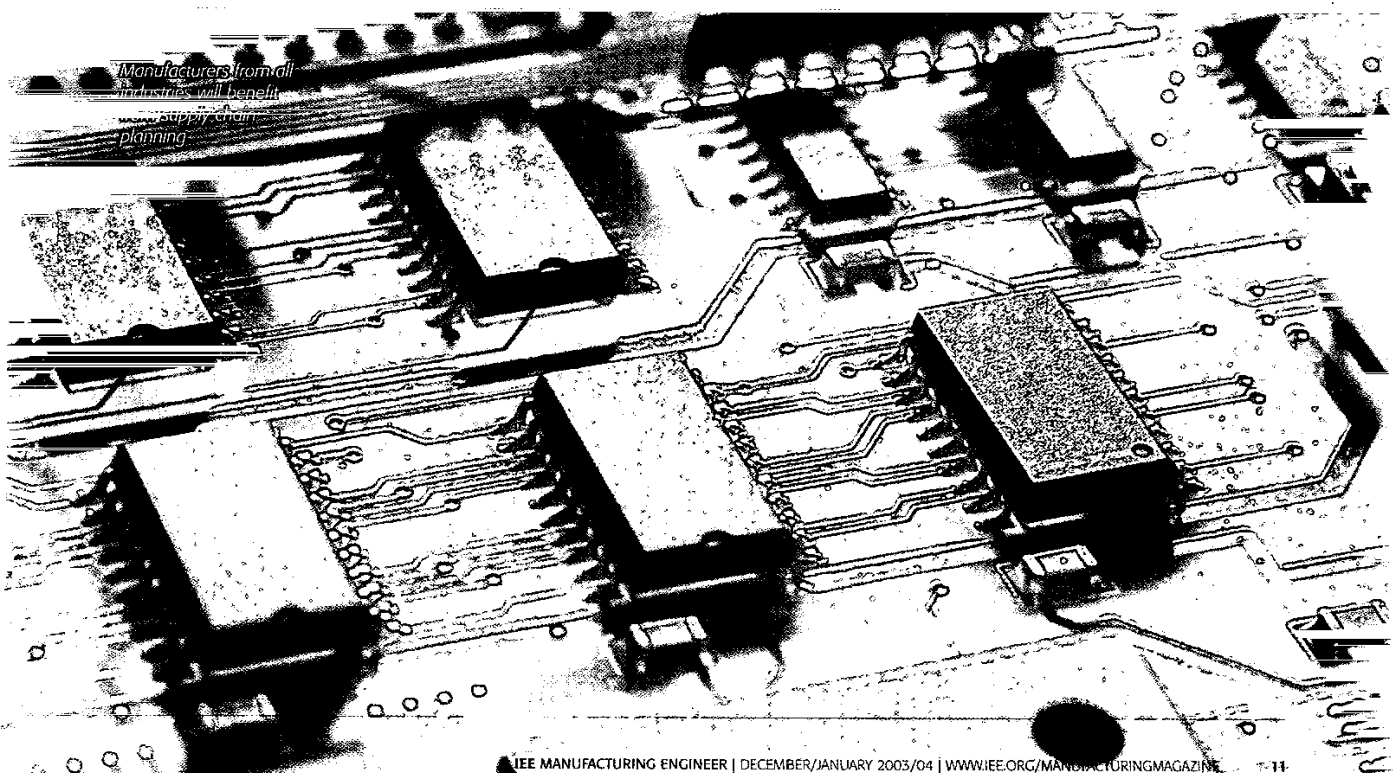
module, with inconsistent results. Initial analysis indicates data problems. Since the forecasting package does not provide tools for analysing and conditioning data, another product is used to identify and correct data problems.

Data issues also occur with the planning module. ERP data on products and manufacturing processes is adequate for costing, but lacks detailed production planning needs. Other data required for planning doesn't fit into the ERP system. The solution is to license a relational database, and build a supplemental supply chain database.
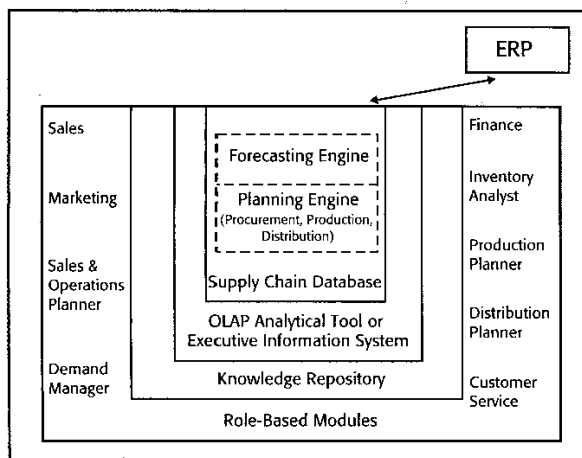
There are change management issues as well. The mix and relative priority of procurement, manufacturing, and distribution issues vary across the business units in this company. The planning module is usually very manufacturing centric. Does the company force all of the business units to use this preconfigured tool, whether it fits or not? Does it pay the vendor to configure this for a better fit? Does the company buy a distribution-planning module? If so, how does it connect the planning tools?

FIG 2 FIRST GENERATION SCP REQUIRED OUTSIDE SOFTWARE TO WORK (SHADED BOXES)

FIG 3 NEXT GENERATION SCP INCLUDES ALL OF THE FUNCTIONS NEEDED PLUS ROLE-BASED USER INTERFACES FOR EVERYONE LIKELY TO COLLABORATE IN THE PROCESS

Change management issues also occur because these modules are designed for a single user in a specific functional silo. How does SCP output get to the other participants in collaborative processes? Manufacturing and distribution departments need consistent views of the forecast. Customer service representatives need to see how planning has allocated production capacity to customers. Companies answered these issues in a variety of ways. Some pushed the data back into ERP. Others expanded the supply chain database, building appropriate interfaces for users. Still others used email or intranets to share results. A

> **THE NEED FOR EFFICIENT COLLABORATION BECOMES MORE ACUTE AS COMPANIES GROW LARGER**

drawback is that most of these solutions were view only.

In these SCP applications the company must subsequently purchase additional executive information system (EIS) functionality to monitor supply chain performance. EIS tools use online analytical processing (OLAP) technology to let users slice and dice across different views of data. An example would be an inventory analyst determining where inventory is accumulating by quickly creating ranked lists of inventory volumes by products, locations, intended customer, or quality status. OLAP also lets manufacturing and distribution create the views of demand they need from a common sales forecast.

There are also sustainability issues. First generation SCP tools are proprietary products. The specialised skills required for support and implementation must be developed in house, or obtained from the vendor.

First generation SCP tools are not stand-alone solutions; they require other applications (in addition to ERP), as shown in fig 2. How do the other participants get the access they need? This requires the development of interfaces for the other business functions, in the relational database or EIS application.

If we add a distribution-planning tool, all of the issues associated with data conditioning, data management, and user interfaces must be revisited. These issues arise even if the company works with a single vendor. In the rush to expand the range of functionality they offered, SCP vendors often acquired additional functionality. Although all of these products were offered under a single marketing umbrella, they utilised different technologies and data models. Even today, interfaces in many products are incomplete or application specific.

The early adopters of SCP overcame these obstacles, but they created a patchwork quilt of applications to do so. This

expanded the skills required for implementation and support, and increased cost. It also created change management challenges, both in designing workflows that spanned these applications, and in training.

The size of the early adopters of SCP let them absorb these additional costs. Business units in major companies might well carry £100m or more in inventory. An SCP initiative that cut inventories by 20% also reduced working capital tied up in inventory by £25m, and annual inventory carrying costs by £5m. Even expensive projects provide attractive returns in large companies, but SCP implementations must become more efficient to be attractive to companies of all sizes.

NEXT GENERATION SCP

Next generation SCP products have been designed with two objectives that directly mitigate these elements of risk. Firstly, they maximise the use of generic components to reduce the cost of product development, allow more aggressive pricing, and reduce the cost of ownership. Secondly, they provide end users with all of the required capabilities in a single, self-documenting, role based module.

Next generation SCP typically utilise standard industry components, for example based on Microsoft technology, with the SQL Server relational database as a foundation. SQL Server provides a natural platform for collaborative interaction. Other Microsoft components provide role based user interfaces, link to the Microsoft Office products, or connect across the web. The use of Microsoft components also reduces the cost of ownership, since implementation and support no longer require proprietary skills.

Next generation SCP solutions provide all of the functionality needed for successful implementation. Analytical capabilities, the forecasting and planning engines, are layered on top of the supply chain relational database. The system also includes role-based modules for users. As shown in fig 3, these are truly integrated capabilities, not a collection of disparate point solutions under a common marketing umbrella.

SQL Server's scripting and query capabilities check and condition data drawn from the ERP system. The database also stores supplemental data and SCP output, and provides multi-user access. An extension to SQL Server provides the "slice and dice" capabilities associated with EIS. A knowledge repository provides an interactive environment for design, documentation, training, and workflow management. This eases implementation, and improves sustainability. User interfaces are role based, web enabled, and combine the analytical, database, and EIS capabilities needed for a specific job function. The collaborative capabilities and user interfaces with a familiar look and feel ease change management.

Configuration of next generation SCP applications is data driven, not predefined. The planning engine easily addresses the required mix of procurement, manufacturing, and distribution issues. Next generation SCP provides true supply chain exception management. Early SCP products offered these capabilities working only off historical data. This is like having a system that puts out an alert after the house has burned down. Next generation SCP uses current data and its analytical capabilities to make future projections, and can warn of future problems while users still have time to react.

Next generation SCP helps customers define an implementation path that maximises their return. The business analysis capabilities identify key problem areas, whether they are in customer service, purchasing, inventory management, production, or distribution. Each SCP implementation can then first address the areas of highest return.

In a world of tight margins and operating challenges, companies need a fast return on their investments. Next generation SCP delivers a lower cost of entry and faster implementations, so up-front ROI is strong and independent of company size. Lower cost-of-ownership improves that equation – supply chain planning makes sense.

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THE PROBLEM WITH SCP
The experiences of the early adopters with the first generation SCP solutions created three primary areas of concern:
- Costs – seven and eight figure license fees, along with war stories of overruns on consulting services and schedules
- Change management – the ability of the business to assimilate and effectively utilise this technology
- Sustainability – the ability to adapt SCP tools as the business changes, without being at the mercy of a single vendor