A Paradigm Shift in Planning for the Connected Enterprise

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The rapidly evolving connected enterprise—which extends from the suppliers' suppliers to the customers' customers—has three distinct characteristics: It is more connected than ever before, it is intricately interwoven with information, and it is decidedly global in nature. These characteristics have produced a new type of marketplace—one where near–real-time (or "zero latency") information is critical, where consumers increasingly interact directly with manufacturers, and where supply chain effectiveness swiftly translates to heightened competitive advantage and enhanced shareholder value.

Companies are under intense pressure to get a better product in the hands of the consumer, in the right quantity, at the right time, and for the right price. To do this, they are expending considerable time and resources on planning their supply strategy to respond to consumer demand. Yet traditional supply planning, once a sound and logical approach, is no longer enough. It takes too long and costs too much in terms of lost opportunity and suboptimal marketing and sales efforts. There's also the problem of the underutilized production, distribution, and material resources.

This article addresses these issues. It presents a framework in which corporations will spend far less time on planning—while at the same time producing more accurate and dollar-optimal plans. The approach is called Constrained Resource Integrated Supply Planning, or CRISP.

This new methodology differs from conventional methods in a number of important ways. Traditionally, demand planning is followed by distribution planning, then by production planning, and finally by materials planning. (Exhibit 1 depicts the traditional planning process.) Yet this method results in plans that often are infeasible, unreconciled with actual variables, and overly time consuming. By contrast, CRISP integrates the supply planning function and handling constraints. And it does so earlier and simultaneously in the planning cycle. Early constraint management across the enterprise can improve the timing of marketing and promotional events significantly. This, in turn, enhances total sales volume.

Although the assumed end-goal of planning is revenue maximization, traditional planning methods hardly ever take into account the relevant enterprise cost levers. The result: A high potential for suboptimal, cost-intensive plans. CRISP avoids this trap by letting companies examine constraints simultaneously and meet the demand—while at the same time maintaining margin, optimally allocating funds and resources, more effectively planning sales/marketing events, and cutting supply chain costs. The resources freed by this planning approach can be applied successfully to increase value-added services, collaborate more closely with the extended supply chain, mass customize, and create 1:1 marketing over the Internet.

The Traditional Planning Environment

In the traditional scenario, companies devote days and sometimes weeks to the planning cycle, generating optimal plans for the different functional silos (marketing, manufacturing, distribution, logistics, and so forth). Yet although these plans may be optimal for each function, they are suboptimal—and maybe even infeasible—for the enterprise as a whole. To give a practical example, a company might develop a feasible optimal plan for distribution. Yet that plan is rendered infeasible because it failed to consider the corresponding production plan, which indicated maintenance shutdowns or material shortages at suppliers.

EXHIBIT 1

The Traditional Planning Process

As seen in Exhibit 1, in traditional planning, a forecast from the demand planning/forecasting function (for example, sales or marketing) is sent into the unconstrained Distribution Planning (DRP) function, which then calculates the inventory balance and creates production orders for the Master Production Planning (MPS). Production planning then must verify whether sufficient manufacturing capacity exists for these production orders and then attempt to match demand with the available capacity. The MPS sequentially sends the production quantities to a Material Requirements Planning (MRP) function, which generates the requisite purchase orders for procurement. This plan compares what has to be produced with the projected material availability. Only after the material plan is generated and found to be feasible can the supply plan be executed.

Throughout the process, information feeds back into the planning silos (the red arrows in Exhibit 1), creating a complex matrix of information inputs, outputs, and loops. Thus, it is possible to develop a feasible distribution and production plan, only to have a material constraint render the plan outdated and infeasible.

In the conventional approach, the final plan sent to production scheduling goes through a series of three constraint checks or planning "gates." These checkpoints usually are operated by different people in different systems and perhaps within different organizational silos—thereby making the process all the more complex. Furthermore, these activities usually extend over several days, since each planning silo must do several iterations of the plan to arrive at a feasible and optimal solution before passing it on to the next silo.

The individual planning silos rarely take into account cost levers such as production, distribution, inventory storage, or customer-service costs. Nor do they typically consider revenue levers such as pricing or profitability by market or customer. Further, although local constraints (that is, those particular to the planning silo) are accounted for, enterprisewide constraints are hardly

ever considered—much less accounted for. Enterprise-level constraints could include a critical material allocation for an industry or a multinational organization.

The following real-life example illustrates the problem with silo-oriented planning. In the early 1990s, two divisions of a consumer products company were planning the launch of their new product lines. Yet their independent planning processes failed to account for the fact that each was ordering a critical raw material from a common supplier. And only one producer worldwide supplied this material.

The supplier, who was constrained in the production of that material, had allocated product to the company as a whole, not to the divisions. But the divisions did not know this. Their silo-focused planning approach resulted in too much raw material being available to one division, and much too little for the other. Neither division realized that the material was available at the enterprise level and could have been easily transferred within the enterprise. The lack of integration resulted in a costly rescheduling of the product launch at the division.

The problems inherent in the example often result from divisional planning and incorrect alignment of metrics within and across the enterprise. And so, although the end plan may be feasible, it will probably not be the optimal plan from a profitability standpoint.

CRISP: An Enterprisewide Approach to Planning

Compared with traditional planning approaches, CRISP can reduce planning time significantly while optimizing the quantities and mix of products flowing through the supply chain. It simultaneously addresses all of the enterprisewide supply chain constraints (for example, production, supplier, transportation capacity), using supply chain cost factors (production costs, distribution costs, carrying costs, stock-out costs, storage costs, and so forth) and revenue factors (such as selling price, margin, profitability by customer, strategic value of customer). This integrated planning approach leads to an improved choice, mix, and flow of an optimized and feasible supply plan through the chain's various links.

EXHIBIT 2

Planning Process Flow Using CRISP

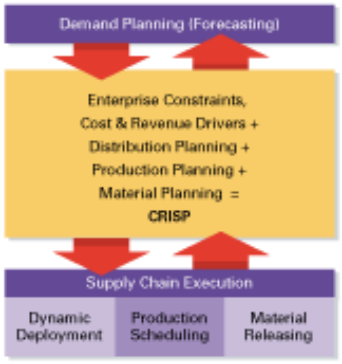

Exhibit 2 summarizes the schematic flow of information under CRISP. The graphic emphasizes the principle of integrated supply planning coupled with the early and simultaneous consideration of all the supply-oriented links of the supply chain. Using CRISP, the planner can constrain the plan for the entire chain to achieve an optimal supply chain solution.

The demand signal can consist of forecasts, orders, point-of-sale (POS) information—or a combination thereof. As shown in the exhibit, this

demand signal is fed into the planning process. CRISP then constrains the demand with respect to the corporate objectives (for example, profit, cost, due date, and customer priorities) subject to numerous enterprisewide constraints (such as material, production, and distribution capacity). The constrained signal then is passed on to the supply chain execution function.

The constrained demand now contains information on key decisions such as procurement quantities, timing and quantity of build schedules, product mix, and outbound sourcing to distribution centers and customers. That broad capability extends well beyond the scope and range of traditional supply chain planning. In addition, the constrained demand signal results in information about which customers will receive which products, how much they will require, and at what point. It also provides a complete profile of the facilities within the supply chain. Furthermore, order planning, dispatching, or third-party logistics systems can send order information to CRISP and initiate Available to Promise (ATP) or Capable to Promise (CTP) dates in a rapid fashion.

By taking time-phased costs and profitability into account, CRISP can help optimize the timing, frequency, and volume of promotions or sales events, thereby providing competitive advantage. The planning approach is particularly effective in determining the benefit/cost and timing of a marketing promotion or sales event.

It's important to note that collaborative planning through the extended enterprise can play a central role in transforming CRISP from a concept to reality. Collaboration between suppliers and customers—complemented by strong internal collaboration—will provide the comprehensive constraint base upon which to develop optimal plans. Collaborative efforts also will enhance the quality of data used. They will result in better relationships between the links of the extended supply chain as that chain becomes more efficient and effective.

In the connected enterprise, 1:1 marketing will be feasible only when near–real-time planning can occur. CRISP is well suited to such marketing strategies since it allows the consumer to obtain an availability date or an Available to Promise number faster and more accurately. Also, the marketing and sales function can get a better sense of profitability from promotions after netting out supply chain costs.

Defining the Value Proposition

By gaining visibility over the various supply chain constraints early in the planning process, CRISP can increase the value of planning. The value proposition extends out to eight different activities, as depicted in Exhibit 3.

EXHIBIT 3

Value Proposition for CRISP

Sales/marketing promotional event planning: CRISP enables the sales and marketing functions to plan promotional events based on optimum profitability, while more accurately informing customers of what will be available and when. This capability allows the customer to plan events better and avert stock-outs. It also gives retailers and other OEMs added confidence in your organization.

Reduced planning time: CRISP communicates a plan based on a comprehensive supply profile to manufacturing, distribution, and deployment functions that is feasible and involves a huge reduction in the number of iterations. The end result: major time savings in planning activities for everyone.

Optimal product allocation: This new approach allows the supply team to allocate product to customers when there is not enough to satisfy all the demand. This feature also helps to rationalize the customer base and determine the cost of customer service by identifying the true cost and profitability of supplying different customers.

Optimal product mix: The plan considers product substitutions and category/product mix based on a comprehensive list of cost and revenue factors as well as enterprisewide constraints. The result is a profit-centric product mix.

Consumer response flexibility: CRISP gives the planning functions greater visibility into enterprisewide supply chain bottlenecks earlier in the planning cycle—whether monthly, weekly, or daily. Increased visibility will enable them to plan more accurately. And it will improve the response time to consumer demand signals, while optimizing the supply chain.

Integrated optimal supply plan: CRISP develops a forecast that considers the major supply chain constraints across the enterprise—not simply in manufacturing or distribution. This approach ensures that you consider bottlenecks throughout the extended supply chain.

Enterprise constraint visibility: The CRISP approach enables the supply planning functions to alert suppliers and contract manufacturers to spikes in demand earlier in the planning process. This facilitates more proactive planning and collaboration, which helps to reduce stock-outs both at the supplier and at the customer levels. Taking time out of the business planning cycle

frees up resources for other activities, improving the efficiency and effectiveness of the planning function

Profit/cost-optimized planning: Finally, CRISP drives the organization toward more profit/cost-optimized planning that is based on enterprisewide cost/revenue levers and constraints. In this way it facilitates achieving the goals of lower total operating cost, improving operating efficiency, and higher profits.

Five Components of a Successful Launch

With a sound knowledge of the value propositions, a company can begin the process of implementing the new planning methodology. The process begins by identifying the major components of the CRISP implementation. Five of these are key: (1) the strategic framework of the implementation; (2) the impact on the organizational processes; (3) the impact on the people who drive these processes; (4) the tools and technology enablers; and (5) the core business knowledge that can brought to bear. (Exhibit 4 depicts these key components.)

EXHIBIT 4

Core Components of CRISP Implementation

The discussion below underscores the individual importance of each component as well as how they interact. Combined, the components can deliver value in a comprehensive manner and at an accelerated pace.

Component 1: Strategic Framework

This component provides the blueprint for what is to come in the other four components. The strategic framework enables us to identify what will be required from each of those components. It also details the interactions that will occur between them during the implementation. A business should augment current adroit practices with other leading practices and benchmarks to develop an overall strategy and identify end goals.

Understanding the strategic context of the implementation is critical. CRISP is but the first step toward "networking" or "consolidating" the extended supply chain. In examining this chain, CRISP deals with global demand and supply coordination. It then consolidates upstream, where the producer is collaborating with the suppliers. The extent of the integration is such that the boundary between the suppliers' plans and the manufacturers' plans seems invisible. This integrated process is replicated downstream between the customers and manufacturers.

The organization needs to be in a reasonable state of change-readiness to accommodate the significant process, organizational structure, and technological changes effected by CRISP. Because this new supply management concept will blur the lines between the different planning silos that exist today—taking down the "Berlin Wall" between departments, so to speak—

executives need to be ready to handle the brief period of uncertainty (and maybe even chaos) that is bound to occur after a successful transition.

Component 2: Organizational Process

The organizational process component establishes the current state of the planning process, develops the future state, identifies the gap, and draws up an implementation roadmap.

The CRISP approach essentially mandates that the manufacturing, logistics, and procurement functions be seamlessly integrated to create the plan. The integration can be accomplished in two ways: (1) realigning the organization so that all the planning silos merge into one larger silo or (2) coordinating the flow of information and actions so that the planning silos appear to be working as one virtual planning organization. The latter approach is the more difficult in terms of breaking down the internal barriers. Furthermore, competition for control may still remain, which could adversely affect the concept's quality, timeliness, and basic feasibility.

Importantly, professional performance goals and metrics should be tied to organizational performance metrics. Such alignment ensures that the CRISP initiative's participants are measured and rewarded against objectives over which they have some control.

Component 3: Human Resources

The human resources component considers the skill sets required for implementing Constrained Resource Integrated Supply Planning. It also addresses the change criteria and methodology needed for successful implementation. This component also encompasses organizational attributes such as role/job design, training and development plans, and measurements/performance metrics. The human resources component includes the communications plans between teams and departments as well.

For CRISP to work successfully, the people involved need to be well versed in all aspects of supply management (procurement, manufacturing, and logistics) as well as with the enterprisewide constraints and cost and revenue parameters. It is imperative to centralize as many planning functions as possible—or use cross-divisional synergy where centralization is not easily achievable.

Component 4: Tools and Technology

This component determines the optimum fusion of technologies to produce the best results. Throughout this activity, the organization needs to keep in mind that the overriding objective is to simplify and automate the planning process.

The plethora of supply chain technologies available today has resulted in some confusion for buyers. We have found that technologies designed to support the traditional supply chain planning silos are less likely to deliver robust CRISP solutions. By comparison, those developed to support simultaneous enterprise constraint management optimization are better positioned to support the CRISP methodology.

Component 5: Contextual Research

The contextual research component identifies leading practices in the industry, recognized benchmarks, and the organization's own experience in prior implementations of this nature. This represents the core of the organization's knowledge gained over time through past implementations and experiences. The contextual research enables the implementation to proceed at an accelerated rate because there are proven technologies, skill sets, and processes that can be drawn upon.

This contextual research component will form the basis of the performance metrics to be developed. Everyone involved in the integrated planning process must be working to the same metrics. To make sure that this happens, top managements for all of the entities involved in CRISP must give their buy-in to the new planning approach and to the common metrics employed.

The Implementation Steps

The five key components are incorporated into the implementation steps discussed below. Note that the steps involve both process activities and technology enablers.

STEP 1: Strategy Design

In this phase we recommend a dual team structure. The first team determines the overall supply chain strategy and identifies key processes. The second team performs a value diagnostic to quantify the potential size of the supply chain opportunity derived from CRISP and to determine associated measurements. These activities set the savings/gains target. This step establishes the Strategic Framework and develops the blueprint that ties together the other components.

Key Step 1 deliverables include the overall strategy statement, a high-level design of all critical business processes, identification of the interrelationships among the supply chain initiatives, and senior management's sign-off on performance and process measures.

STEP 2: Solution Definition

During this phase, typically executed by the process team (the first team), focused assessment of current operations is performed and a future-state blueprint developed. Based on the blueprint, the team constructs an implementation strategy to determine appropriate rollout of the solution components. It also sets the critical success factors and skill-set requirements for the Human Resource component. Along with the new performance metrics, the current-state and future-state assessments contribute to the Organizational Process component of the CRISP methodology. The process team also performs a gap analysis at this stage to identify any issues regarding the decision-support enabler, which contributes to the Tools and Technology component.

Key deliverables here include people and organizational environment assessment, current-state assessment executive summary, future-state flows for key processes, implementation strategy blueprint and related documentation, skill-set matrix, and gap analysis results.

STEP 3: Solution Development

The supporting decision-enabling software is tested and completed using a subset of the company's data. During this phase, the process owners establish and validate the detailed process flows as a part of the Organizational Process component. In addition, the CRISP-related roles/job descriptions are developed and candidates are identified to put into these positions. The Contextual Research component is used as a guideline to validate the process and identify the roles and responsibilities. The Tools and Technology component is applied in the pilot test of the technology (software) enabler.

Key deliverables include detailed process flows, data requirements, complete pilot models, and decision-support software configuration details.

STEP 4: Solution Implementation and Post-Implementation Support

In this phase the pilot models are completed, and the process and technology move into production. All pilot models go through final process, systems, and user testing. Data are loaded into the database or models. End-user training is conducted. All project documentation is completed. The Organizational Process component requires implementing the new process structure and adhering to the new business-process flows required by CRISP. The Human Resource component will make sure that the process owners actually take ownership of the new process and enforce both its usage and deliverable requirements. The owners also must coordinate with other teams as required by the process. Further, the Tools and Technology component requires that the software is used as prescribed.

Key deliverables in Step 4 include pilot rollout; end-user training; performance-measurement tracking; and process, system, and user testing.

STEP 5: Integration Architecture and Technology Environment Support

All technical aspects are accounted for in this step, including data mapping, interface development, hardware and software installation, batch job development, and systems testing for the Tools and Technology component. In addition, IT training on technology is done for the Human Resource part of the solution. Further, the Organizational Process and Tools and Technology components jointly address any process or technology-interaction issues and identify possible resolutions.

Key deliverables in the fifth step include data mapping, technical architecture diagram, integration design, interfaces and batch scripts, and a data warehouse (if needed).

Avoiding the Pitfalls and Realizing the Potential

As with any new process that has significant potential to improve the business, CRISP also can be misused. Do not use or position this planning approach as a control mechanism over the many key areas of the business it will touch—like manufacturing, distribution, and materials planning. If people view CRISP this way, they will not cooperate fully with the initiative. And an uncooperative attitude on the part of the groups that provide constraint information to the CRISP planners will hinder the process, resulting in an inaccurate and ineffective plan. Lack of consistent and reliable data—coupled with uncoordinated updates—could, in fact, derail the implementation.

If these kinds of pitfalls are avoided, Constrained Resource Integrated Supply Planning can provide tremendous advantage to many industry segments—high tech, consumer packaged goods, retail, automotive, pharmaceuticals, manufacturing, and more. It has the powerful potential to minimize supply chain operating costs and maximize profit across several business operations. CRISP can add significant value to the supply chain plan by helping to reduce time and increase cost efficiencies across the enterprise.

The CRISP approach is comprehensive in its constraint-management and optimization capabilities. As such, it is a valuable tool not only for the planning function, but also for sales and marketing.

CRISP is a flexible concept that can be implemented using a variety of decision-support software systems available today. The concept can bring great competitive advantage to any corporation that successfully implements it. Using the five key components for delivery of results—Strategic Framework, Human Resources, Organizational Process, Tools and Technology, Contextual Knowledge—positions the organization for a successful implementation.

As the marketplace evolves, corporations must become far more responsive to the consumer. How well they respond, in fact, will be the basis of sustained competitive advantage. CRISP lets you respond better and faster. This is a critical capability because as competition intensifies, supply chains increasingly will be competing against supply chains—rather than individual company against company. In this new environment, optimal cost/profit operations will be the prerequisite for prosperity and even survival.

We end with a quote from Kevin Kelly's New Rules for the New Economy1#: "The new economic order has its own distinct opportunities and pitfalls. If past economic transformations are any guide, those who play by the new rules will prosper, while those who ignore them will not."

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Footnote

1Kelly, Kevin. New Rules for the New Economy, Chapter "This New Economy," Penguin Group, 1998.

Sidebar:

One Example of a Successful Implementation

In our work on Constrained Resource Integrated Supply Planning, we've discovered that this planning approach can improve operating efficiencies in a number of industry verticals. One recent CRISP application was at a bulk commodity chemical manufacturer with revenues in excess of $2 billion. The company's supply chain consisted of a multitiered network. More than 80 percent of the business was direct shipments; the other 20 percent went through the regular retail channel. Prior to embracing CRISP, the company had inventory levels in excess of 70 days' worth of supply.

The biggest challenge during the implementation was change management—that is, gaining consensus and free-flowing communication between the managers responsible for forecasting and inventory and the various trading partners. They were used to optimizing their functional silos as opposed to optimizing across silos with complete visibility into all enterprisewide constraints (demand, production, material, and so forth).

The successful implementation resulted in the development of cross-functional metrics and a well-defined Sales & Operations Planning process. The company continuously monitors the plan to make certain that execution and planning do not get out of synch.

CRISP improved inventory levels by more than 125 percent and freed up tens of millions of dollars in working capital. These expected benefits helped gain top management's approval to proceed with the implementation beyond that business unit.