CREATING A PROCESS-CENTRIC ORGANIZATION

White Paper

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Imagine working for a company where a strong focus on functional groups and activities is the norm. Imagine further that your CEO has assembled her key managers to announce a major restructuring—a restructuring that is sure to involve major changes. She has asked you to visualize an organizational model that features the widespread sharing of information, a flattened decision-making hierarchy, vastly different performance measures and, perhaps most importantly, a model that is centered around processes that are the source of value creation. In short, imagine being part of something that is about to be turned upside down.

One result from this scenario should be the identification of those processes that will have the greatest impact on value chain performance. This, unfortunately, is not as easy as it sounds. A second outcome should be the realization that the changes required by this transformation will allow attention to fewer rather than many processes. In fact, the late Michael Hammer once observed that hardly any company can manage more than ten or so principle processes.\(^1\) If organizations are in fact moving toward a process-centered orientation, and there is evidence that suggests this is the case, the challenge becomes one of identifying those processes that are the most likely to create value. But what are those processes?

Based on findings from several key research projects, case visits with dozens of companies, extensive literature reviews, and interviews with executive managers and leading academics, it is increasingly apparent the time has come to emphasize specific processes that have the potential to create unique kinds of value. The following discusses a shift towards a process-centric organization, identifies a set of value-creating processes
along with the characteristics that define process excellence, and presents the enablers that support the foundation of process-centric thinking.

THE SHIFT TOWARD PROCESS-CENTRIC THINKING

While the idea of a process-centered organization can be confusing, the reality is that processes, at least conceptually, are relatively straightforward. An organizational process consists of a set of interrelated steps, tasks, or activities designed to achieve a desired outcome or objective. These outcomes could include fulfilling customer orders, developing new products or services, or compiling financial reports. If we know our key objectives, and that is often easier said than done, then we begin to know the processes that must be in place.

Because processes create the output that should lead to desired outcomes, it makes intuitive sense to focus on the process steps and activities that create that output. Early proponents of total quality management, including W. Edwards Deming, Joseph Juran, and Phillip Crosby argued vigorously for focusing on the processes that create output rather than focusing on the output itself. Over time the application of process-centric thinking has expanded beyond the domain of physical processes and toward organizational processes.

Organizing work around processes makes sense for a number of reasons. Well-developed and understood processes accelerate learning as participants become experienced in applying a defined framework. Furthermore, processes can feature best practices and consistency that enhance the likelihood of success. And perhaps most importantly, organizations can document, measure, illustrate, and continuously improve
their processes. Taking a process perspective helps geographically diverse locations and units adhere to a consistent approach rather than developing, and probably sub-optimizing, individual approaches. Even decentralized organizations should benefit from the use of consistent processes across their decision-making units.

Taking a process view also helps manage the conflicts and trade-offs that inevitably occur as work crosses functional boundaries. (A trade-off is a balancing of factors, all of which are not attainable simultaneously). Left unattended these crossing points can easily lead to conflict, competition, and inefficiency. A process orientation, supported by performance measures that are broadly rather than narrowly focused, should promote the seamless movement of work and information across groups.

Numerous books and articles have been written touting the advantages of taking a process-centric view. Research evidence suggests that an often-predicted movement away from strict functional alignments is in fact occurring. One study revealed a clear link between organizations that are structured around major processes and the ability to attain their supply chain objectives. This study also concluded that process-centered design features, such as the use of cross-functional teams and executive positions responsible for overseeing processes rather than narrower functional tasks should show large increases in usage compared with more traditional design features.

While objective indicators suggest a growing shift toward process-centric thinking through organizational design changes, it is unlikely that corporations will ever disband their functional structures. Spreading expertise across full-time process teams would dilute the functional knowledge required to operate a business. The need to maintain a critical mass of functional knowledge ensures that some functional structure,
albeit a diminished one, will remain in place. The dramatic changes in design, measurement, and information that surround a shift from a functional to a process-centered organization also ensure that any changes will be gradual.

A SET OF VALUE-CREATING PROCESSES

Figure 1 presents a value chain model that illustrates the logic behind performing certain processes well. Michael Porter, who first articulated the value chain concept, argued that a firm’s value chain is comprised of primary and support activities that can lead to competitive advantage when configured properly. To reflect current thinking, this figure includes those enterprises that reside upstream and downstream from the focal organization, a concept referred to as “the extended enterprise.”

If we agree that organizations can benefit from taking a process-centered view, then the challenge becomes one of identifying those processes that are the source points for value creation. The following processes presented here are “source points” for four unique types of value that are essential for achieving differential advantage. While hundreds of processes and sub-processes populate complex organizations, the proposition is put forth here that integrated product development, supplier evaluation and selection, demand and supply planning, and customer order fulfillment should be at the top of almost everyone’s list, particularly for industrial companies. Service companies may perceive a different set of value creating processes.
The following presents some best-practice characteristics related to these four processes. Table 1, which can serve as a benchmark for comparison purposes, summarizes the best practices associated with each process. The one characteristic that must underlie every major process are well-defined process steps, activities, practices, and metrics.

**Table 1**

**Process Best-Practice Characteristics**

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<th>Process</th>
<th>Best-Practice Characteristics</th>
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| New Product and Process Development         | - Cross-functional teams focus on developing concurrently products and their required physical processes  
                                          | - Early involvement of customers and suppliers is routinely practiced during development  
                                          | - Development teams and participants have access to a wide range of software applications  
                                          | - The R&D process is formally linked to the new product development process  
                                          | - Participants develop target prices that are market driven  
<pre><code>                                      | - Development teams are accountable for meeting stringent concept-to-customer cycle times |
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| **Supplier Evaluation and Selection** | - Management practices subtle control over the development process  
                             - Development teams practice *Design for “X”*                               |
|                                 | - Supplier selection is viewed as an organizational rather than functional responsibility  
                             - Organizational leaders continuously search for innovative ways to reduce selection time  
                             - A higher-level executive and steering committee are responsible for overseeing the selection process  
                             - A segmentation process helps identify the appropriate supply strategy to pursue  
                             - Cross-functional teams are responsible for making the most critical selection decisions  
                             - A formal selection process with reporting milestones is practiced across the organization  
                             - International Purchasing Offices support selection tasks in different geographic regions  
                             - The selection process supports the needs of corporate and other functional groups |
| **Demand and Supply Planning**   | - Planning leaders rely extensively on systems and practices that help balance demand and supply, including S&OP and CPFR  
                             - Various organizational design features are in place that support planning capabilities  
                             - An executive or executive committee has accountability for forecasting success  
                             - Regular reviews of forecast accuracy and detailed assessment of the root causes of forecast error take place  
                             - Supply chain planners recognize that different forecasting models fit different products  
                             - Rigorous mathematical models identify the forecasting approach that best fits an historical demand pattern or product requirement  
                             - Demand management techniques are used effectively to influence demand |
| **Customer Order Fulfillment**   | - Organizations take a broader rather than narrower view of customer order fulfillment  
                             - Supply chain leaders understand the relationship between the quality of demand planning and the ability to satisfy customer orders  
                             - The removal of time from the fulfillment process is a relentless pursuit  
                             - Lean principles are applied extensively when improving the fulfillment process  
                             - A wide array of e-systems supports fulfillment and the removal of transactions costs  
                             - The important linkage between inventory control and satisfying customer orders is well understood  
                             - Customer lead times are the result of cooperative discussions with the customer  
                             - Accounts receivables is considered an important part of the fulfillment process |
Integrated Product Development

It is widely accepted that the successful development of products and services is an important part of what differentiates one firm from the next. In fact, a large body of literature has identified product development as a core process playing a major role that supports global innovation and competitiveness. The process of discovery, development, and commercialization of products and services is a major source for innovation and growth. It’s difficult to read respected business publications without hearing about the importance of innovation.

A well-designed development process can lead to many benefits, including shorter development times and first mover advantages that market-leaders rely on to capture market share or to create barriers to entry. While one analysis conducted by Industry Week revealed hundreds of ways to develop products and services faster, better, and smarter, experience with leading companies suggests that the biggest improvements are the result of a well-defined set of practices—(1) concurrent product and process development, (2) early involvement of customers and suppliers, (3) extensive use of information technology applications, (4) formally linked R&D and new product development processes, (5) the development of target prices, (6) subtle control of the development process, (7) measurement of concept-to-customer cycle times, and (8) Design for “X.” Each area requires a closer look.

Practicing concurrency during product development has two major dimensions. The first dimension is the simultaneous development of products along with the physical
processes required to produce them. The second dimension involves the simultaneous rather than sequential involvement of functional groups during development. Sequential development features a “handing off” of work from one functional group to another, something that requires a time-consuming learning period after each hand off. It also results in far too much work being handed back for revision when a later group receives a design or some output they find to be unworkable.

What is it about a concurrent approach with cross-functional teams that is attractive? A concurrent approach requires cross-functional agreement throughout the development process, which minimizes time-consuming and costly design changes at later development stages. This approach also supports the interaction of competent professionals, something that usually leads to better decisions. Furthermore, concurrency offers opportunities for early customer and supplier involvement, accelerated learning as cross-functional team members learn simultaneously rather than sequentially, and the establishment of organizational rather than limited functional goals. Some good reasons exist to pursue a concurrent approach to product and process development.

While we know that leading firms rely on cross-functional teams to concurrently design a product and its associated production process, the inclusion of external value-chain members early on during development is not as well established. In fact, North American firms, too often to their detriment, have lagged behind their Asian and European counterparts in supplier or customer involvement during new product and service development, our second characteristic of effective product development.

Leading firms recognize that external involvement during product and service development is an idea whose time has come. Most executive leaders recognize the
importance of increased external involvement during product development, and they further recognize the need to involve suppliers and customers earlier rather than later in the process. For the first time a leading maker of appliances has turned to a supplier to act as a system integrator for a complex module. The integrator assumed design leadership, selected the component suppliers, and managed those suppliers during ongoing production. For the first time the appliance maker did not suffer delays or other problems during product development related to this complex module.

A meaningful relationship exists between supplier involvement on teams, including product development teams, and a variety of desirable outcomes. Teams that involve suppliers, either as formal or informal participants, have reported greater average satisfaction with the exchange of buyer-seller information compared with teams that did not include suppliers. These teams also report fewer problems coordinating external work activity and had a higher reliance on suppliers to support a team’s goals. Perhaps most importantly, external evaluators rate teams that involve suppliers as more effective with greater effort put forth toward their assignments or projects compared with teams where supplier involvement was lacking.

While early involvement with suppliers sounds easy, widespread implementation is often a different matter. When pursuing supplier involvement confidentiality of information continues to be a major concern when involving external organizations in something as strategically important as product development. Other concerns include not knowing how to pursue early involvement, maintaining too many suppliers for a given requirement, or relationships that are adversarial rather than cooperative. Given the expected growth in new product teams that involve select suppliers and customers,
overcoming any barriers to early involvement must become a priority. Fortunately, none of these concerns violates the laws of physics.

Product development groups also rely extensively on software to accelerate and improve the development process, another best-practice characteristic. In fact, we could easily describe the use of software applications as the quiet revolution behind some radical improvements in product development. Software tools are available that support product and process design through design of experiments, quality function deployment (i.e., translating customer wants and requirements into design specifications), and the methodical assessment of design for manufacturability or assembly, something that is essential when taking a concurrent product and process development approach. And let’s not forget about the importance of CAD (computer-aided design), CAM (computer-aided manufacturing), and rapid prototyping applications. Keeping within the software theme, failure mode effects analysis (FMEA) tools support the assessment of potential failures in a design or process while TRIZ software supports a disciplined approach to complex problems that are encountered during development. Product development leaders are familiar with some or even all of these software applications.

The fourth element characterizing leading product development involves a direct linkage between R&D and product development. Far too often worthwhile innovations from the laboratory are not commercialized. Best-in-class companies have in place a process to develop and validate new technology and then link that technology to the product development process. While not all new technology emanating from R&D labs will be commercially viable, the linkage of one process to another ensures that market-
ready technology can be designed quickly into new products. When this comes together it can create a difficult barrier for less effective competitors to overcome.

Many product development efforts will benefit from target pricing (sometimes called target costing). With a traditional approach to product development, selling price is arrived at by combining product costs and adding a profit margin. Unfortunately, this approach often overstates the price a marketplace will bear or ignores what competitors are doing. It is an inwardly-focused approach that usually does not consider the voice of the customer. Traditional pricing also tends to minimize the importance of cost management during product design.

Target pricing is a complete reversal of traditional pricing. Under a target approach, product development teams, often with marketing taking a lead role identifies the price that customers are willing to pay for a product or service. After identifying a target price, profits margins are backed out to arrive at a product’s allowable costs. If allowable costs are below current cost levels, then the design team must identify ways to remove or lower costs (or accept a lower profit margin). With target pricing costs are something to manage rather than take for granted. And every survey of competitive pressures concludes that the need to manage costs is relentless and severe. Why not manage the costs early on during product development?

Product development leaders also rely on an important time-based metric called concept-to-customer (C-to-C) cycle time. This metric reflects the importance of being aware of the time it takes to develop products and their processes as well as acting as a superordinate target that no single functional group can unilaterally attain. Surprisingly, many companies do not measure their internal cycle times, making the development of a
C-to-C cycle time measure an especially attractive opportunity. Holding various functional groups mutually accountable for this measure sends a powerful message about the importance of collaborating during development efforts.

Years ago Taguchi and Nonaka conducted a study that identified some salient features of successful product launches.4 One of these features is something they termed “subtle control,” a powerful concept that executive leaders should routinely practice, particularly when using teams to develop new products. Simply stated, subtle control is a delicate balancing act that seeks to ensure that teams and processes proceed as expected but without the need for blatant control or micro management by executive leaders. Effective subtle control, which begins to resemble an organizational art form, is a product development best practice.

Executives have many ways to practice subtle control. They can identify which projects to pursue, select leaders and members for development teams, create and manage the development process that teams will follow, require performance updates at regular milestones, and establish broad performance targets that teams use when establishing their individual goals. Subtle control recognizes that while empowerment is an attractive notion, relinquishing control of product development is not quite as attractive.

A final practice mentioned here is something called Design for “X.” Industry leaders appreciate the power of the product development process to satisfy some important aspirations or objectives. The term “X” represents different aspirations the development teams consider even before beginning design work. Design for “X” aspirations can involve design for quality, reliability, serviceability, sustainability, end-of-life recycling, target price, assembly, cycle time, and postponement. This is a
powerful concept because it ensures that important objectives are considered early on during product development.

We know that integrated product development is a major source point for innovation and growth. And we also know that those companies that are world-class in their development efforts have endorsed certain practices that differentiate them from those that are not leaders. Fortunately, what makes up this set of practices has become fairly clear over time.

Supplier Evaluation and Selection

Supplier evaluation and selection is probably not what comes to mind when thinking about an essential set of value-creating processes. As a result, supplier selection has often been performed by buyers who are measured more by their ability to obtain a low price rather than the lowest total cost or highest value. While not equally true at all organizations, particularly service and financial firms, supplier evaluation and selection is increasingly becoming the major source point for the inputs that define important capabilities of a buying company, including quality, cost, responsiveness, flexibility, and cycle time performance. We have known for some time that buying customers are relying increasingly on their suppliers as major sources of technology and innovation.

Executive leaders have historically viewed suppliers and the process that selects them with relative indifference. However, a strategic focus on core capabilities and competencies, which often results in the outsourcing of non-core (but still essential) requirements and activities, along with a reliance on fewer suppliers makes supplier evaluation and selection a critical value chain process. When external suppliers receive
over half a buying firm’s total revenue the logic behind developing a world-class selection process becomes clear from a cost and financial perspective. Furthermore, a continuing reliance on suppliers to act as systems integrators within an OEM’s supply chain magnifies the importance of the selection decision.

The way that firms evaluate and select their suppliers can be a source of competitive advantage, particularly since many suppliers are taking on new responsibilities. For critical and high value goods and services best-practice firms evaluate first-hand a supplier’s financial stability, capacity, logistics capability, labor relations, logistical networks, design capability, supply management practices, process capability, environmental compliance, willingness to work with the buyer, design capability, ability to act as a systems integrator, and technology innovation. The selection process can also allow a buying company to use its first-tier suppliers to gain insights into its second and even third-tier suppliers.

Leading supply organizations know that not all selection decisions are created equally or warrant comparable time and effort. Those companies that excel at supply management categorize the selection decision based on the attributes of their sourcing requirements. The way they subsequently manage their suppliers and relationships will also differ across their requirements.

Figure 2 presents a tool that introduces a level of rigor to the selection process. This tool links the value or importance of supply requirements to the number of qualified suppliers within a supply market. Segmenting supply requirements begins to define the intensity of the search, the appropriate sourcing approaches and performance measures to employ, and the type of relationship to pursue with selected suppliers. Supply market
segmentation, something that leading companies routinely practice, should be an integral part of the supplier selection process.

**Segmenting Supplier Evaluation and Selection Requirements**

![Figure 2 Diagram]

While not always the case, many supplier evaluation and selection decisions occur during product development. Given that development times for new products and services are declining, sometimes at a dramatic rate, it seems logical that the cycle times for any supporting processes must also decline. Figure 3 identifies various ways that leading supply organizations accelerate the evaluation and selection process, ideally without sacrificing effectiveness. This figure also illustrates a generic process for evaluating and selecting suppliers. Gone are the days when supply managers can spend months to evaluate, select, and negotiate agreements with suppliers. Selection decisions often have to occur in weeks, perhaps even days.
Similar to new product development, important selection decisions are now made by cross-functional teams that report directly to corporate executives. The use of selection teams composed of members from purchasing, operations, finance, and engineering reflects the organizational rather than functional nature of major supply management decisions.

Supplier selection takes on added risk when international suppliers are part of the process. Best-practice companies recognize the importance of having local resources available to represent their interests abroad during supplier evaluation. To that end many firms have established International purchasing Offices (IPOs) that are responsible for, among other things, identifying and evaluating suppliers. Overwhelming consensus exists regarding the importance of IPOs. One study found that over 85 percent of companies that maintain IPOs say these offices are extremely important to their international success while 10 percent say IPOs are moderately important. About half of
all companies that maintain at least one foreign buying office say their IPO’s are more than meeting or exceeding expectations while one-third indicate their IPO’s are meeting expectations. Using IPOs to support supplier selection is clearly a best practice.

Companies that are effective at selecting suppliers almost always have a higher level executive and steering committee responsible for overseeing the selection process. Convincing evidence exists showing the connection between a higher-level supply executive and a company’s supplier evaluation, selection, and management capabilities. It is not the formal supply position per se that is important. Rather, it is the visibility, resources, and access to executive leaders that come with having a position in the corporate hierarchy that is on par with other functional executives that is critical. It is hard to imagine the development of a world-class supply base becoming a reality without an executive champion to make it happen.

Supplier evaluation and selection is not practiced in isolation from corporate strategy or other functional groups. Supply executives should never forget their role as a support activity, which means they have internal customers. If engineering requires a supplier that is on the cutting edge of a certain type of technology, then the selection team needs to factor this into its search. If the corporate strategy calls for a supply chain that is highly responsive to changing requirements, then suppliers must be responsive and flexible. And if a stated corporate objective is to be environmentally aware, then selection teams will want to stress working with suppliers with strong environmental records. Leading supply organizations know how to link their selection process with the needs of internal customers.
An effective selection process is an ideal way to prevent supply chain risks from becoming supply chain realities. One of today’s most talked about business topics, risk involves the probability of realizing unwanted or undesirable outcomes that lead to loss. Interestingly, most supplier development activities conducted by U.S. companies, another supply management process, have historically been reactive in nature. And what are these companies reacting to? They are usually reacting to supply issues and non-conformances that a rigorous selection process might have prevented. Select the right group of suppliers and life gets easier. Select the wrong group and be prepared to make life more interesting.

Few organizational leaders could reasonably argue that the inputs received from upstream suppliers do not affect their company’s downstream customers. And we know that producers are afforded minimal forgiveness when they fail their end customers. Developing a world class supply base, with supplier evaluation and selection as the foundation, recognizes that exceeding customer requirements demands attention to the inputs and relationships that originate far upstream in the supply chain.

**Demand and Supply Planning**

Perhaps the most important information that flows across a value chain are estimates of customer demand. Best-practice companies understand well the need to have a demand planning process that identifies the future claims on their output. And these companies know they must seamlessly link their demand planning capabilities with their supply planning capabilities.
If demand and supply planning is important, it makes sense to step back and explain what is meant by these terms. Demand planning includes the steps taken to arrive at the most vital information that moves across a value chain—estimates of anticipated demand. Demand estimates include all the claims on a company’s output for a particular period, including forecasted demand, actual orders for which commitments are already made, spare parts requirements to support aftermarket needs, and adjustments resulting from changes in inventory policies. It is surprising how many supply chain systems use demand estimates as a primary data input. One could argue persuasively that demand planning is a company’s most important planning process. Gain a strong understanding of demand and many good things follow.

The counterpart to demand planning is supply planning, which involves the steps taken to ensure that materials, components, and services are available to support the demand plan. Unfortunately, the coordination and hand-off of information between the demand and supply sides of the value chain, not to mention the trust between these two sides has historically been less than stellar. While most companies engage in some form of demand planning, the link to the supply side is often incomplete.

Best-practice companies demonstrate four major characteristics related to effective demand and supply planning—they have business processes and systems that promote the sharing of demand and supply information; they have in place organizational design features that bring together the demand and supply sides of the value chain; they are relentless in pursuing better forecasts and forecasting techniques; and they make demand management a fundamental part of demand planning.
The first characteristic involves the use of systems and practices that help balance demand and supply across a supply chain. Two of the more advanced systems to collaboratively align supply and demand are Sales and Operations Planning (S&OP) and Collaborative Planning, Forecasting, and Replenishment (CPFR).

Sales and Operations Planning is an internal, cross-functional process that creates a six to 18-month production schedule for product categories and families. The objective of S&OP is to develop an output plan that minimizes total costs given a specific demand plan. Given that cost minimization is a major objective of S&OP, finance must play a major role in any planning exercise. This system, which is conceptually similar to aggregate planning, routinely reviews customer demand and supply resources and updates plans quantitatively across a rolling time horizon.

CPFR follows a defined framework that combines the intelligence of multiple trading partners in the planning and fulfillment of customer demand. It has the stated objective of increasing product availability to customers while reducing inventory, transportation, and logistics costs. A key part of CPFR involves collaborative forecasting, which is the process of collecting and reconciling information within and outside the organization to come up with a single projection of demand. Demand and supply plan leaders routinely practice these more advanced planning techniques.

A second characteristic of effective planners is they stress organizational design features that support their planning capabilities. A central supply-chain planning group at a leading chemical company, for example, has responsibility for all the activities associated with demand and supply planning and execution except production. Using sophisticated algorithms, individual planners have responsibility for managing the flow
Another innovative feature is to make a single executive responsible for demand and supply planning activities. A leading U.S. company has created the position of vice president of supply chain management and charged that executive with responsibility for worldwide supply planning and replenishment; demand and finished good forecasting; inventory planning; primary customer order fulfillment and logistics; and integrating supply chain activities with operational positions. The primary objective here is to create a single point of accountability for satisfying end customer requirements at the lowest total cost. While other design features promote cooperation between demand and supply planners, these two are leading-edge.

A third characteristic of planning leaders is a relentless pursuit of improved forecasts and forecasting techniques. While many practices are associated with companies that excel at forecasting, the following ones are usually part of their portfolio.

Perhaps first and foremost, best-practice companies assign clear accountability of forecasting success to an executive or executive steering committee. This includes accountability for forecast accuracy as well as for continuously improving the forecasting system. It is difficult to overstate the importance between accountability and forecasting effectiveness. Forecast leaders also regularly measure forecast accuracy across their different products. A recent survey revealed that fully two-thirds of respondents reported forecast accuracy of between 50 and 80 percent, indicating some room for improvement.
Forecast accuracy, which is an important supply chain metric, should be computed regularly and compared against pre-established benchmarks.

A major part of continuous improvement involves regular reviews to identify the root causes of forecast error. Review teams should determine if errors are randomly distributed, if forecasts are consistently too high or too low, or if other techniques might produce better forecasts. Best practice companies apply six sigma and other quality improvement techniques when studying forecast error. Instead of improving the quality of a tangible product, they try to improve the quality of critical information.

Perceptive leaders recognize that different forecasting models fit different scenarios. A consumer products company that treats its hundreds of products essentially the same should not have been surprised, for example, at the inaccuracy of its product forecasts. A detailed analysis revealed that applying a single approach during forecasting is not such a good idea. Each product (and the company sells close to 1,000 unique products and configurations) could be placed into one of four categories—existing products with relatively stable demand; promotional items; export-only items; and new products with no historical demand patterns. Each segment presents its own set of forecasting quirks that requires unique forecasting attention. A “one size fits all” approach is usually not the best way to forecast demand.

Forecasting leaders also rely on quantitative systems to identify the forecasting algorithm and model that best fits their historical demand pattern, and these forecasts are updated frequently, often daily, as new information becomes available. Research evidence suggests that quantitative models are generally more accurate than qualitative or managerial forecasting techniques. This does not mean that managerial inputs to
forecasts are not considered when managers have contextual knowledge that is difficult to quantify or when managers are domain experts. On the other hand, best-practice companies are careful to avoid using salesperson estimates of demand to drive their planning efforts given the gamesmanship that often surrounds the setting of sales quotas. Knowing when and how to apply rigorous analytical techniques is a forecasting necessity.

A fourth characteristic of planning leaders is they do not simply react to changes in demand patterns—they try to influence these patterns by managing demand. Demand management attempts to influence customer orders while trying to reduce the uncertainty of when those orders will occur. Most observers would agree that even though a forecast is a projection into the future, most techniques rely on history as the basis of that projection. Demand management moves beyond demand estimation or planning, which at times is a reaction to demand changes.

Demand management can be a powerful way to promote a balanced flow of goods across a supply chain. An example here involves the aftermarket division of a major automotive company. This company’s distribution centers process orders daily for replacement parts ordered by the company’s vast dealer network. Unfortunately, the demand for replacement parts processed throughout the week is not consistent. Monday evening’s orders are usually heavy because they include dealer orders from Saturday, sometimes Sunday, and Monday (these facilities do not ship over the weekend). Orders received at the end of the week are usually lower than those received earlier in the week. This imbalance, if left unattended, affects labor, equipment, and transportation requirements, leading to waste and lower customer service.
These short-term demand fluctuations were addressed by creating different types of customer orders and pricing structures. Daily orders, the primary type or order processed by these facilities, are picked, packed, and shipped the day they are received. Dealers use this type of order when they have an immediate need and cannot satisfy that demand from their internal inventory. The regional facility has no direct control over these orders. They come when they come.

Stock orders, the second order type, receive a 15 percent discount and are submitted once a week by dealers to replenish their internal inventory. These orders help the distribution centers balance their daily workload from two perspectives. First, dealers are assigned the weekday when they can submit their order. Historical data helps these facilities determine when best to schedule each dealer’s stock-order day. Second, each center has up to two days to ship the order from the day it is received. On nights with lower daily demand a facility can pick some or all of any outstanding stock orders on their first day. On other nights, the facility might defer some orders until the second day if that helps balance the workload. While not totally leveling day-to-day orders, demand management goes a long way toward making volume fluctuations less erratic. This supports easier workforce management as well as the assignment of the proper sized delivery vehicle.

The bottom line is that life is good when you have a solid idea of your demand. Life gets even better when demand planners work well with supply planners. Effective supply and demand planning also makes the execution part of the supply chain—customer order fulfillment—that much easier.
**Customer Order Fulfillment**

Each process presented so far creates unique sources of value that are essential for competing effectively. None, however, creates any revenue. This brings us to customer order fulfillment, a process that can be viewed narrowly or broadly. The fulfillment process is too often a saga of broken promises—the seller seduces the customer, the sale is made, the order is transmitted—but where is the product or service? Even when a producer establishes a promise date, that date is often established for the producer’s convenience rather than the customer’s convenience. Best-practice companies know this does not have to be the case.

When viewed narrowly, fulfillment focuses largely on the acts of distribution and logistics. Those who take a narrow view will focus extensively on operational tactics to improve the pick, pack, ship, and return elements of fulfillment. Materials handling, storage, facility layout and flow, and picking and sorting technology will be prime topics of conversation.

When viewed broadly, fulfillment includes all the steps and activities from the sales inquiry to the delivery, and perhaps even the return of the final product or service. This involves order preparation, transmission, entry, filling (which may include production and purchasing), billing, shipping, tracking, and returns. Each of these subprocesses has its own set of steps and outputs. Some might even include after-sale service within their customer order fulfillment process, although this is usually important enough to treat as a separate process. Whether a narrower or broader view is taken, the ultimate objective of order fulfillment is to satisfy a promised delivery date at the right
quantity and condition while managing total costs. While demand and supply planning stresses planning customer order fulfillment stresses supply chain execution.

Companies that take a broader view of order fulfillment often extend their perspective to include the management of accounts receivable, making order-to-cash cycle time a key performance indicator. This stresses the financial aspects of the fulfillment process by not viewing the process as complete until customer payment is received.

Discussing customer order fulfillment is not nearly as easy as it may appear. One reason is that fulfillment is a broad value-chain process. Instead of identifying which groups are involved with fulfillment, it might be quicker to identify which groups are not involved. Second, companies practice a wide variety of order fulfillment models, including make-to-stock (MTS), make-to-order (MTO), assemble-to order ATO), and engineer-to-order (ETO) that approach order fulfillment differently. And to complicate matters further, the fulfillment process is usually different in business-to business and business-to-consumer environments. While no standard model of customer order fulfillment exits, there are some characteristics that reveal a desire to make order fulfillment a value-creating process.

One such characteristic is the recognition of the relationship between effective demand planning and the ability to satisfy customer orders. Fulfillment is the part of the supply chain where planning and execution meet directly. Performing demand and supply planning well makes customer order fulfillment that much easier.

Customer order fulfillment, like supplier selection and new product development, is a process that, if performed faster and more responsively can lead to competitive
advantage. A maker of beverage and ice dispensers in Eastern Pennsylvania, for example, forecasts and builds a base product in anticipation of customer orders. Final product configuration occurs only after actual orders are received, something that supply chain purists call “form postponement.” Final configuration takes only three days versus four to six weeks for competitors, providing a decided market advantage. Restaurants and other customers purchase beverage dispensers because they have every intention of employing them as a revenue producing asset. Speed wins new sales. In another example, high end U.S. furniture makers that are seeing their market share steadily taken by Chinese imports are responding by slashing customer order cycle times for custom-ordered furniture, something that furniture arriving via ocean carriers cannot match. They are also offering customers a wider selection of product varieties and colors. These companies see their future linked to speed, responsiveness, and product variety. General Electric now takes about half as long as its only competitor to deliver a locomotive to its rail customers. Quicker delivery of a revenue-producing asset has helped GE take a commanding lead in the locomotive market.

Companies that excel at customer order fulfillment rigorously apply lean principles as they improve their fulfillment process. In particular, they relentlessly attack wasteful and non-value-adding activities through process redesign. A small cable and wiring company located in the eastern U.S. began to see its customers migrating toward new foreign competitors. An influx of worldwide competitors, along with customers demanding lower prices caused this company to think about how to respond to these new threats. Instead of moving its production to China (the immediate reaction of many U.S. companies), this company concluded that providing customers with volume flexibility, a
high quality product, and shorter ordering lead times offered the best opportunity to challenge new competitors.

By redesigning its order fulfillment process, the cable and wiring company reduced its customer order lead time from 20 days to 12 days, or a 40% reduction. Customers responded favorably because a shorter lead time allowed them to shorten their planning horizons, something that helps reduce supply chain uncertainty. It almost goes without saying that it is easier to plan 12 days into the future than four months, which is a typical lead time when dealing with overseas sources. The redesign eliminated waste and minimized non-value added activities, resulting in costs being removed from the supply chain rather than shifted across the supply chain.

In addition to redesigning their fulfillment process, leading companies rely extensively on electronic systems to support their fulfillment efforts. A sample of these systems include electronic data interchange (EDI) with suppliers and customers, on-line ordering systems up and down the supply chain, the extensive use of advance shipping notices (ASN’s) and electronic funds transfers (EFT’s), and point-of-sale (POS) data to trigger upstream replenishment requests. Additionally, sales personnel who work directly with customers have visibility into internal production scheduling systems. This allows sales representatives to work directly with customers when establishing sales commitments. E-systems are ideal for removing time and transactions costs from the fulfillment process.

Any company that excels in order fulfillment will appreciate the importance of inventory control. And at the center of inventory control is something called record integrity. Record integrity is the result of activities and procedures that help ensure the
amount of physical material on hand (POH) is equal to the computerized record of material on hand (ROH). In short, record integrity exists when the physical inventory equals the electronic record, regardless of the quantity of inventory. (Inventory management is concerned with determining the right mix and amount of inventory to maintain).

Any difference between POH and ROH represents error that can affect costs and customer service. When physical inventory exceeds the amount the computerized system indicates is available (POH>ROH) the physical inventory cannot be sold or used to satisfy customer demand. When the record on hand is larger than what is physically available (ROH>POH) the risk exists that an item will be sold to a customer when in fact it is not available (unless generous amounts of safety stock are used to cover up any inventory control problems). This inevitably leads to backorder situations and dissatisfied customers, or in the case of safety stock, higher costs. When record integrity is lacking (i.e., discrepancies exist between physical quantities and electronic records) steps must be taken to identify the sources of error with corrective action expected.

Another characteristic of order fulfillment leaders is they rarely assume that a single lead-time applies to all customers. At times it becomes necessary to arrive at a promise date after consulting closely with internal participants and the customer. Leading companies know that the methods used to establish lead times and promise dates can be a way to offer flexibility to customers, enhance business-to-business relationships, and more closely align internal capabilities with external commitments. A rigid lead time policy that works to the benefit of internal operations may not be the lead time that benefits the customer.
Order fulfillment leaders also appreciate the importance of compiling a set of fulfillment-related measures. Indicators such as the perfect customer order, order fill rate, order cycle time, on-time delivery, inventory accuracy indicators, and order-to-cash cycle time all provide revealing insights into the fulfillment process. The perfect customer order, for example, provides insight into the percentage of orders delivered on time, accurately, and in the right condition. Perfect order measures provide a comprehensive measure of demand-fulfillment capability that quickly highlights the deficiencies in a company’s operations. Fulfillment leaders have a set of key performance indicators (KPI’s) that focus directly on how well they are meeting customer order expectations.

CREATING THE FOUNDATION FOR PROCESS EXCELLENCE

Gaining performance advantages from the four processes presented here is not simply a matter of buying into the notion of process centric thinking and then hoping good things will happen. A process orientation cannot become a reality until excellence is achieved within four enabling areas—performance measures that promote the desired behavior and results, human resources who have the ability to look at work holistically, systems that seamlessly move data and information across the value chain, and organizational design features that support a cross-value chain perspective.

Adopting performance measures that are customer and process focused is one way to send a message that an organization is serious about taking a process perspective. As mentioned, when thinking about customer order fulfillment no other measures can send this message better than the perfect customer order and order-to-cash cycle time.
Within product development, the tracking of concept-to-customer (C-to-C) cycle time becomes essential while measures of forecast accuracy will provide insights into the quality of the demand planning process. Measures of supplier performance will help validate the effectiveness of the supplier evaluation and selection process. And for an overall perspective of value chain performance it is hard to beat a return-on-assets measure. Each process presented here should feature measures that emphasize process rather than functional excellence.

The knowledge and skills required to excel within a process environment are vastly different from those required in a functional environment. Effective process management requires close collaboration and coordination between engineering, procurement, operations, logistics, marketing, suppliers, and customers to coordinate material and information flows across the value chain. A process focus also requires individuals who understand their company’s business model, can assume a holistic rather than narrow value chain perspective, and manage critical relationships with customers and suppliers. An ongoing challenge centers on the ability of functional personnel to fit within a process environment.

Tremendous growth has occurred over the last ten years in the systems that support value-chain process requirements. Regardless of the technology platform or software used, information systems should capture and share information across functional groups and organizational boundaries in a real-time or near real-time basis. This may involve transmitting the location of transportation vehicles using global positioning systems, using web-based systems to transmit customer orders, exchanging product designs electronically with suppliers, or using bar code or RFID technology to
capture supply chain data. Information technology is rapidly becoming the great enabler of value-chain processes.

The right organizational design comprises the fourth enabler. Design features that support process-centric thinking includes co-locating support personnel with internal customers, new product development teams that include external participants, full-time process management teams, cross value-chain planning groups, and buyer-supplier councils that feature executive to executive interaction. Leading companies are often quite creative when it comes to designing a process-driven organization.

Sophisticated process thinking requires a foundation that supports a new way of operating. And that means building a foundation that has the right measures, people, systems, and design. Failing to build this foundation will make it painfully clear why many organizations struggle when they pursue process-centric thinking.

CONCLUDING THOUGHTS

It would be naïve to suggest that a singular focus on the processes presented here guarantees market success. And it would even be more naïve to discount other processes that must be performed at world class levels, including those that support financial, marketing, and human resource needs. In addition, principal processes such as the four presented here require hundreds of supporting processes and thousands of distinct process variants, all of which require some level of management.7

With that said, it is hard to imagine being successful without paying close attention to those processes that are the source points for the kinds of value that help
differentiate one company from the next. And in today’s hyper competitive markets, any opportunity to differentiate oneself should be taken seriously.
Notes

7. Smith and Fingar, p.52.