



SAP White Paper
SAP for Consumer Products

THE ADAPTIVE BUSINESS NETWORK IN CONSUMER PRODUCTS INDUSTRIES

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EXECUTIVE SUMMARY

As competitive pressures on consumer products (CP) companies mount from increased consumer expectations, more demanding retailers, and the efficiencies made possible through new technologies such as radio frequency identification (RFID), the CP industry is reaching the boundaries of business as usual. Becoming a larger company, making existing processes more efficient, and optimizing the cycle of planning and forecasting are strategies approaching a limit beyond which improvements will be hard to come by.

From here on out, CP companies must look to increased collaboration with retailers, partners, and suppliers of all sorts as a way to build and improve on the core cycles of planning and forecasting. The adaptive business network is the blueprint for this expanded collaboration and increased automation both inside the company and across the industry.

The adaptive business network is an entire suite of business strategies for the reorganization and synchronization of your business. The adaptive business network helps CP companies first get their house in order by improving processes for product development, sales and marketing, and supply chain automation. Then, bringing key partners closer into all these processes helps further improve the efficiency, through more visibility and increased application of analytic techniques. Across the entire industry, standards for global data synchronization (GDS) promise even more possibilities for squeezing out costs and making adjustments to avoid out-of-stock situations.

SAP® software supports this evolution by building on the foundation of the mySAP™ Business Suite family of business solutions through the Enterprise Services Architecture blueprint; increased support for industry standards at all levels; and systems for real-world-awareness techniques such as RFID. The SAP NetWeaver® platform is the technology engine that binds everything together and powers the network.

GETTING YOUR HOUSE IN ORDER: PREPARING FOR AN ADAPTIVE BUSINESS NETWORK

Size Won't Save You

When Procter & Gamble (P&G) announced it would purchase Gillette, creating the largest CP manufacturer on earth, the presumed rationale was easy to understand: size matters. But as any CP company will tell you (and P&G, especially), not even a new-and-improved behemoth possesses the pure size or brand portfolio to answer every challenge facing a brutally competitive industry. At least not without help, it can't.

Whether you're P&G, a giant in your own right like Kimberly-Clark, Nestlé, Colgate-Palmolive, Unilever, Nike, or ConAgra Foods, or a midsize manufacturer either competing or cooperating with the heavyweights, size may play a part in finding space for your products on the shelf at Wal-Mart, Target, Tesco, or Metro, but it won't help you deliver your products there. And it certainly won't help you if your brand of toothpaste (or chocolate or sneakers) isn't what customers are clamoring for. Having your brand on the shelf when customers pause to look for it is all that matters.

CP companies are about to be caught in a perfect storm of capabilities and demands. The former – such as demand signals that arrive from RFID and point-of-sale (POS) data, or effective distribution and analysis of this information to make better informed and faster decisions – is colliding with a lengthening list of demands. These demands include customers' desires for new products and new categories; retailers' demands for still greater efficiency from their suppliers (this means you); and shareholder demands for growth. The threat to CP manufacturers – and the impetus for P&G to purchase Gillette – doesn't stem from any one of these demands alone. But such manufacturers can't confront one challenge without opening themselves up to the others.

The “Wal-Mart effect” describes retailers' insatiable desire for efficiency and their outright demands that CP companies implement the processes and technology to make it happen. These demands can be met, but not without eating away at your margins. The resources and effort needed to launch new brands can disrupt the maintenance and promotion of existing, profitable ones. Traumatic events, such as a mad cow disease outbreak, or sudden swerves in customers' tastes, such as the craze for low-carbohydrate foods, can disrupt entire industries and scuttle the best-charted forecasts. Global CP companies, especially those in Europe, struggle with these challenges, as well as the added complexity of selling goods across multiple borders, in multiple currencies, under the regulations of multiple governments, in multiple languages, and so on. And even success becomes a challenge when hit products or effective promotions lead all too quickly to out-of-stock situations.

Size still matters, but the CP business today is a struggle for speed – the speed to recognize, respond to, and seize opportunities hidden within the challenges outlined earlier. To move faster, CP companies need their partners, suppliers, and customers to begin moving in tandem with them. And before they can do that, they need to get their own houses in order, reconfiguring business processes and the supporting IT to speed up decision making. They need to become more demand driven, embracing and adapting to the new business processes and new IT-generated data. This data, which comes at the point of sale, from customers, from warehouses, and from the shop floor, must first be harnessed internally, then across formerly disconnected operations and divisions, and then among retailers, manufacturers, supply chains, and an entire emerging network of companies.

CP companies are laying the foundation for improved business processes by first linking their own business processes and the underlying IT and then turning to their closest partners for

help. They're bringing everyone closer, sharing information about the design and rollout of new products, about their supply chains, and about marketing strategies and research. And they are preparing for the eventual connection of their collective IT infrastructure.

CP organizations are hoping to meet the list of demands in front of them and to create a lasting strategy capable of meeting any demand, via cooperation, visibility, and newfound abilities to collaborate and change. Those abilities will begin at home and then expand out into the world.

Pressures Leading Toward the Adaptive Business Network

The increasing pressures to improve financial performance, innovate, create and shape demand, integrate the supply chain, and work more closely with partners are moving companies toward the ideal of the adaptive business network. (See Figure 1.) When fully realized, the processes of design, planning, and execution are seamlessly integrated inside the network, and the network's participants are newly able to respond smoothly and in real time to sudden change, such as shifts in consumer demand, emerging competitors, and new government regulations.

The adaptive business network is not a piece of software or a system to be installed. It ultimately can't be implemented by even just one company. It's a business strategy – actually an entire suite of strategies – for the reorganization and synchronization of your business, then that of your partners, and then that of your partners' partners.

It's an ideal, but the gains to be realized in getting even halfway there are tangible and explain why the consumer goods manufacturers and retailers exercising the most influence within these emerging networks are already asking their closest partners to prepare for the ultimate sharing of information.

As the networks of these organizations evolve, this information will be synchronized, aggregated, and sent directly to the decision makers who need it at right that second. Enterprise applications will also pass along this information for analysis, use, and reuse, and then feed it back into business processes to inspire further optimization. CP companies will cope with shrinking product life cycles and straitjacketing costs by being able to see farther and more clearly into their own processes, the processes of their partners, and to an extent, the processes of anyone in the CP ecosystem. The companies will also be able to react faster than ever before to demand-driven signals.

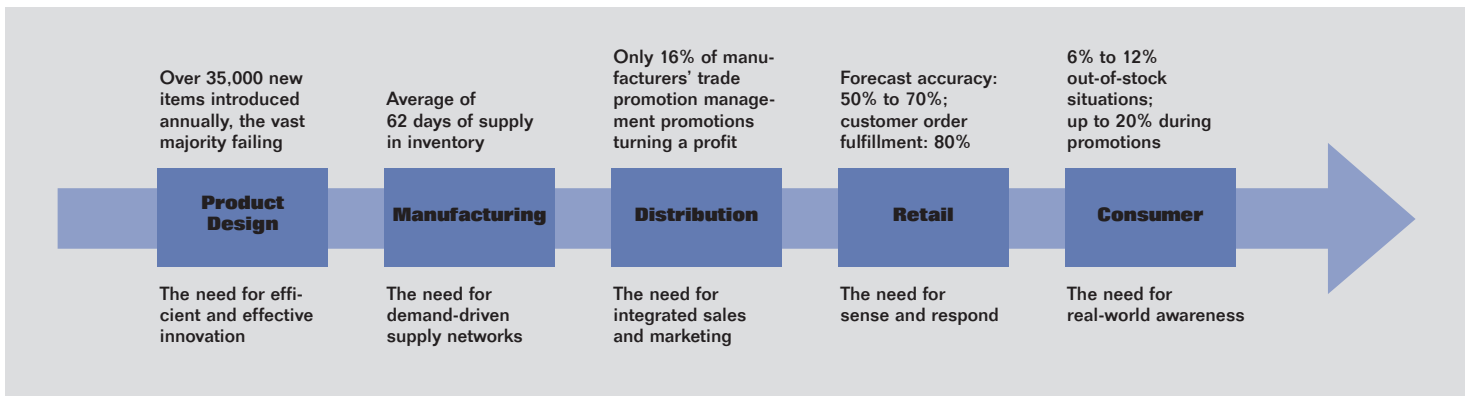


Figure 1: Trends Leading to the Adaptive Business Network

More Work to Be Done

There's still so much work to be done. Just ask P&G. Because of its size, it's up against the entire laundry list of obstacles and challenges that confront every CP manufacturer to some degree. Consider these challenges:

- **The balance of power has shifted decisively to retailers and continues to move toward the consumer, especially in the United States.** The Wal-Mart effect is used to describe the consolidation of shelf space in the hands of a few, super-efficient retailers. They're squeezing costs and waste out of their supply chains – and expecting their partners to do the same. Analysts and industry observers agree that P&G responded to this challenge in part by purchasing Gillette. But will they have enough clout together to resist retailers' demands? Probably not. And neither does anyone else. Surviving in this retail climate means squeezing inefficiency out of your own chains just as fast, if not faster, than those of your competitors, and you need to follow the lead of those competitors in doing so.
- **Customers are increasingly willing to test new brands and are a more fragmented audience.** The continuing fragmentation of the fondly remembered mass market introduces a raft of new challenges for brand managers. Demand curves are changing shape all the time; bell curves have become well curves, in which consumers gravitate toward high- and low-cost goods. Entire categories (such as low-carbohydrate foods or immune-strengthening yogurt drinks) spring into existence, flourish, and flatten in just a few years (or months). And the residual power of brands – even brands such as Tide or Tylenol – is fading, requiring more innovation, promotions, and other aggressive tactics.
- **Brand proliferation and brand extensions are driving growth but can be mismanaged.** Single brands such as Crest now fill almost entire retail aisles, with brand extensions built around flavors, colors, scents, and packaging, while brand spin-offs into different categories (such as Crest Whitestrips) have become reliable engines of growth. But how will manufacturers cope with an accelerating cycle of designing, introducing, promoting, and managing a mushrooming product portfolio, especially when the vast majority of new products fail?
- **The current generation of IT solutions is essentially commoditized.** Almost all CP companies of significant size have installed enterprise resource planning (ERP) implementations of some kind. Guaranteeing a competitive advantage via IT in the current landscape doesn't call for deeper functionality necessarily, but rather for the integration of existing software across siloed business processes. Enterprise software is needed to serve and optimize processes, not substitute for them.
- **CP companies need to collect and understand a rising tide of POS data flowing from retailers.** As Wal-Mart and its rivals turn to real-world-awareness technologies – most notably, RFID – to generate more frequent POS data, manufacturers will need to add and integrate more powerful analytical tools to collect, process, and distribute the data to decision makers within their companies and across their networks. This data represents an opportunity to drastically improve demand forecasting over both the short and long runs, but only if manufacturers have the processes and IT in place to collect and make sense of it.
- **CP companies must learn to lessen the effect of supply shocks stemming from demand spikes and overly successful promotions.** Whether arising from rare, albeit traumatic demand spikes (such as prehurricane or preblizzard hoarding) or more run-of-the-mill promotions, out-of-stock situations result in lost sales and irritation on the part of both consumer and retailer. How can CP companies gain greater visibility into their supply chains to reduce this risk and ensure the continual resupply of their best channels?

- **CP companies must strike an effective balance between having too little inventory on hand and too much.**
Having too little inventory on hand or already en route to your retailers can result in the out-of-stock situation outlined earlier. But having too much (in the form of safety stock) is wasteful and expensive. Even industry leaders with highly compressed supply chains have 65 to 75 days of inventory on hand but still experience out-of-stock situations 10% to 12% of the time. How can companies further improve those numbers, which already represent a dramatic improvement from the recent past, by getting everyone involved working together?
- **CP companies must comply with government regulations.**
Whether it's the threat of terrorism, the guarantee of food safety, or the meeting of environmental concerns, government stipulations for more documentation and more accountability puts pressure on CP manufacturers to track the origins not only of their own goods, but also of those of their suppliers and their suppliers' suppliers.

WHAT THE ADAPTIVE BUSINESS NETWORK MEANS FOR CONSUMER PRODUCTS

What It Means for Your Business

Successfully building an adaptive business network ultimately depends on a CP manufacturer's understanding of architecture. This is not necessarily IT architecture, because building an adaptive business network is never just some software fix. But this is architecture in a more fundamental sense: how people use and interact with space, whether that space is their house, their neighborhood, an urban core, or the virtual spaces we use to envision IT.

Architecture and urban planning may actually provide the best metaphors for how adaptive business networks will be built, will function, and will interact with the world outside a CP company's warehouse door. Building an adaptive business network begins at home, inside a company's **house**. This house is made up of the four metaphorical walls that contain the business processes and IT infrastructure that drive supply chains, product launches, promotions, and so on. The true worth of a real house is understood only within the context of its community; are there power, plumbing, phone lines, and most of all, a neighborhood?

Our metaphorical house is no different. To confront the challenges facing their industry, CP companies are seeking closer connections to their **neighborhoods** of partners and suppliers. But doing so first demands some extensive renovations; the walls currently dividing increasingly dependent processes – such as new product development or sales and marketing – are being torn down in favor of an open floor plan where business units connect and overlap where necessary to increase efficiency, speed decision making, and boost overall adaptiveness.

Participating in the world outside – in the networks of your close partners, suppliers, and customers – requires having your house in order. Are your processes integrated and ready to receive the torrents of RFID data due to arrive at any minute from retailers? Does your IT configuration reflect the reconfiguration of those processes' postrenovations? And have you already adopted the standards for GDS, Web services, and other utilities that will deliver that data to your house?

Once you have adopted such standards, your company is ready to join your neighborhood. The ability to effortlessly send and receive data to and from partners, and to peer inside their windows for a real-time glimpse of the state of business, is key to the competitive advantage granted by an adaptive business network. As neighbors themselves, manufacturers play two roles. They coordinate their own networks of suppliers, logistics partners, packagers, contract manufacturers, and so on; and they're also participants in the networks of their large channel partners, such as the Wal-Marts, as well as the Ciscos, and Intels, to name a few examples inside and outside of the CP market. In the name of being neighborly, CP companies are being asked to open and integrate operations in order to boost efficiency at their partner's end. They're being asked for, and sometimes ordered to make, new investments in IT and process changes in order to streamline and automate operations down the supply chain.

To meet those goals demanded by the large channel partners and to increase your wallet share, your company needs to be able to say yes at every step, and you'll need your own neighbors to do the same when asked. When the retailer with the largest house in your neighborhood wants the latest information on the introduction dates of your next brand extension or a real-time accounting of your warehouse inventory, you'll need to say yes. By being the neighbor that integrates its operations at the lowest cost, in the least time, with the tightest collaboration and the most information, your company will rise to the top of your retail partner's list of preferred partners. And every time a competitor says, "I can't," when asked the same question, your company will accrue that competitor's former market share.

All of this will happen within the grid of the **city**, the IT framework that makes possible the transfer of data and communication between neighbors and neighborhoods. Just as urban planners

lay street grids, lay water and gas pipes, and string electrical wire through each neighborhood, emerging industry standards for GDS and Web services will both pave the streets and provide the conduits for RFID and other data to flow between neighbors and cities in their own right, such as between Wal-Mart and P&G.

Participation in this cityscape demands seamless integration – internal, external, and even global. That, in turn, drives adaptiveness. Being a good neighbor means getting your house in order and thus having the power to support and enhance relationships with current partners, support and quickly bring on board new ones, optimize processes using information residing in partner systems, and thus be ready to meet your retail partners' demands.

Plan, Execute, Sense, Respond

The steps of plan, execute, sense, and respond describe how companies become more demand driven as their business processes are transformed by the adaptive business network. The steps may comprise a new model for sharing information and improving processes, but no company will achieve improvement by tearing down its house and starting over.

Traditionally, CP manufacturers have used the plan-and-execute paradigm, in which production programs and short-time schedules set out the forecast and then companies measure performance according to adherence to the plan. Companies have asked themselves, “Did we make what we planned?” instead of, “Did we make what was required?” They have created customer campaigns based on historical campaign data, executed the campaigns, and analyzed the key performance indicators (KPIs). Again they have asked, “Did we sell what we wanted to sell?” versus, “Are we selling the right products?”

There is a natural limit to planning accuracy. Making a better model or forecast will help only so much. Sense and respond can actually provide the improvements that go beyond the limits of the best possible planning and forecasting.

With the addition of sense and respond to a paradigm, companies can close the gap between plan and reality. Sensing signals from the real world (such as retail off-take, consumer product rating, and so on) and then responding to them allow a company to adapt its fulfillment and new product innovation. You can break up the plan-and-execute mind-set, focus on more meaningful metrics, and become adaptive.

Let's look at the plan, execute, sense, and respond model:

Planning has historically taken place inside the four walls of the house, drawing upon data residing in the transactional enterprise applications that consumer manufacturers depend on, such as ERP, customer relationship management (CRM), and supply chain management (SCM). These fundamental applications remain the foundation of our metaphorical house and will remain an important part of your business. However, as internal walls come down and as new streams of data arrive from partners in the neighborhood, new and composite applications will be in place for you to share data and extend functionality between rooms of the house and with neighbors.

Within an adaptive business network, spotting the opportunity to introduce a new brand of toothpaste or snack chips or deodorant or beer might start by analyzing customer data stored in one neighbor's CRM application, while designing, planning, and adding suppliers would be handled by the SCM capabilities of another. And understanding how it would fit into your brand portfolio would be the responsibility of your own company's integrated ERP system. The CP company can understand which systems are necessary and which ones are redundant in an incremental fashion, adding value and reducing costs at every step and freeing the participants to reinvest in the abilities of the network.

Execution is a matter of refining your business process steps to maximize the potential of the neighborhood around you. Best practices adopted within your house are amplified within the neighborhood as they're applied to and optimized for dynamic processes. That means reassessing, with newfound visibility, your forecast models, supply chain steps, and manufacturing runs, as first your internal operations and later your partners' operations begin to link up product databases and inventory tracking.

Automated systems receiving a constant stream of data from RFID will **sense** your products' presence on retailers' shelves or will follow every step of your latest product's development process. This brings the information to managers' attention when new market research arrives or when a product's listing percentage suddenly plummets as the result of a retail partner's canceled order.

KPIs previously difficult to measure because of the transactional data involved – such as answering the question, “Did my order-fill and case-fill levels achieve their target rates of 95%?” – will be easier to measure. You will measure those KPIs with real-time analytics that bypass traditional, all-purpose data warehouses and will be instead routed directly to cubes or other data structures that analyze and present the freshest data to decision makers.

Your newfound ability to **respond** to this stream of data is what ensures adaptiveness and a lasting competitive edge for you and your neighbors over the long run. Data harvested from the

neighborhood or from elsewhere in the city during the course of business will be used to further refine forecasts and processes or give rise to new ones, the latter via composite applications.

As the adaptive business network matures, houses in the neighborhood will begin to manage by exception. Automated systems will collect, parse, and sort data to transactional applications, needing human agency only when the unforeseeable happens. Management's time and energy will be freed to focus on developing new opportunities and boosting the organization's competitive edge rather than dealing with routine decisions. And by building on an IT foundation of standards-based, service-oriented, flexible, tightly coupled, and event-driven software, along with using an integration platform, adaptive business network participants will be able to extend and modify their current business models to cope with whatever competitive shocks they encounter in the future.

The Foundations of Your Network

The foundations of an adaptive business network are the traditional ERP applications that span the entire organization. (See Figure 2.) These are enterprise-level applications that nearly all CP companies have implemented over the past decade. Building an adaptive business network doesn't require ripping out and replacing any of these systems. On the contrary, it's an incremental process; you add functionality only as needed or as demanded by the needs of business processes. IT is an enabler, not the driver of the adaptive business network.

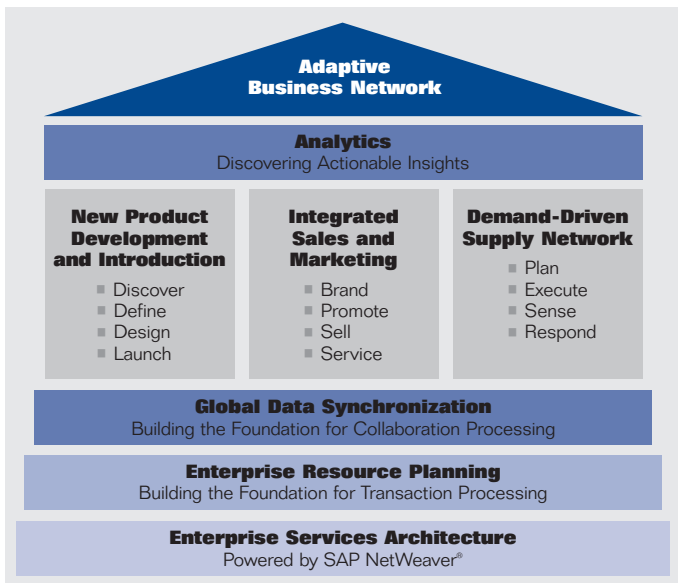


Figure 2: The Architecture of an Adaptive Business Network for Consumer Products

ERP serves as the base, and the implementation of GDS standards provides the infrastructure for the complex exchange of data and information across business processes and corporate boundaries. Fundamental systems like ERP and GDS provide the foundation, but not the differentiation.

CP companies create the differentiation – that is, the strategy that decides where and how you want to be better than your competition – by focusing on key business processes in the areas of innovation, demand creation, and demand fulfillment. Creating an advantage in these areas amplifies a company’s key strengths.

To build differentiating processes, the three pillars especially relevant to CP manufacturers are then erected: NPDI, integrated sales and marketing (ISM), and Demand-Driven Supply Networks (DDSN). Added to these pillars are adaptive manufacturing, sourcing, and procurement, supported by capabilities such as GDS and analytics. These are just a few of the sorts of processes that change inside an adaptive business network and have to be supported. Down the road, there will be many others.

The task of integrating and enabling communication between this main trio of business scenarios is the task of analytical engines capable of storing, reconciling, and sharing the information generated by each. With a strong set of analytical capabilities in place, a network participant grants itself the ability to see further into its own and its partners’ business processes and actively manage the performance of the network to make better informed and smarter decisions.

For a more detailed look at the workings of the adaptive business network, see SAP’s white paper on the general concept: “Adaptive Business Networks: A Strategy for Mastering Change and Efficiency in Manufacturing.”

BUILDING AND MANAGING THE NEXT GENERATION OF BRANDS: NPDI

Making Sure New Products Don't Fail

Up to 90% of all new products fail, and your company needs to make sure your new product isn't one of those failures. Identifying customers' desires and introducing a continual stream of new products to satisfy them is the number one concern of CP manufacturers. As much as one-third of CP companies' profits stem from products launched within the past two years. As consumers increasingly discard brand loyalty and become more fickle in their tastes, the ability to leverage successful products into equally successful sequels or spin-offs becomes a central pillar supporting the roof of your house.

With that in mind, stop to ask why such a high percentage of the more than 35,000 new consumer products launched each year fail. This is because the complicated, cross-company processes that comprise NPDI can prove to be massively disruptive and inefficient for any CP manufacturer that has failed to effectively integrate the business units needed to recognize an opportunity, validate that it is real, design a product to fulfill it, coordinate a manufacturing and supply chain to create it, and manage it after its launch. The intra- and intercompany communication and cooperation that could enhance market visibility and reduce the overall risk is simply missing.

Consider everything that can go wrong at the beginning of the NPDI process, which is the collection and validation of ideas for new products. CP companies are never at a loss for new ideas; they're constantly being inundated by customer comments, market research, prototypes by R & D teams, and so on. The challenge is to capture, validate, evaluate, and prioritize ideas to determine the fate of those prototypes and move forward or not. It's all too easy for the marketing department to press ahead with one idea while the R & D team independently develops something similar. The opportunity for synergy is there but is lost because the walls in the organization stymie efforts to connect the two. Instead, the departments are

competing for resources and attention, attempting to win the approval of executives who lack a strategic view of how either one would affect the larger brand portfolio or aren't sure whether it's even feasible, considering manufacturing and supply constraints. Lacking a formal and efficient stage-gate process for evaluating and approving ideas at every step, an idea that should have been stopped earlier in the development process is ultimately introduced instead – and promptly fails.

Within an adaptive business network, the integration among departments begins to happen. After knocking down walls within the house, connecting processes, and recombining the underlying IT to support them, companies can link information generated by market research to ideas from R & D, with initial cost projections arriving from the suppliers and promotion ideas arriving from the sales and marketing staff. Brand managers, meanwhile, now have a cross-silo perspective of the entire process. Ultimately, an integrated view makes it possible to decide the true scope of the opportunity, the viability of the product, and the resources, incentives, and supply chain processes needed to quickly get the product into retail channels and then into consumers' hands. And should those conditions change during middevelopment – for example, new market research points to a flaw in the packaging or a key supplier experiences a breakdown at one of its plants – that information is flagged and distributed to every participant in the process, allowing for fast adaptation to the new conditions.

SALES AND MARKETING AFTER HIGH/LOW STRATEGY

Managing, Promoting, and Shaping Brands in a Brand-Unfriendly World

Has there ever been a tougher time to be a brand manager? Retail giants like Wal-Mart, Target, and Tesco have done their best to undermine brands with “everyday low prices” and private-label products that squeeze every brand besides the market leaders off the shelves. This seems to be fine with consumers, whose spending patterns are shifting from the traditional bell curve (bulk spending on middle-market brands) toward the well curve (opting for either luxury or the lowest price). At least that’s become somewhat predictable over the past five years. Who could have anticipated the Atkins-fueled low-carbohydrate craze, which forced food manufacturers to invent a new category overnight? And who would have guessed that sales of low-carbohydrate pasta would slump so badly after only a year on the market?

Brand managers and sales and marketing teams are in a bind. The products in their portfolios are multiplying exponentially at the same time consumers are swearing off their allegiance to brands. It hasn’t helped that the ongoing consolidation of power by retailers has slowly stripped CP manufacturers of their most reliable tool. Take the **high/low strategy**, which involved three weeks of premium pricing each month, for example, followed by one week of discounting. This strategy was rendered moot by Wal-Mart’s decision, since adopted elsewhere, to offer everyday low prices. This in effect consigns all of the brands on its shelves to price-based trench warfare. It’s actually a war being fought on two fronts: against one another on the shelves (where the lowest cost wins) and for the cash in customers’ wallets. Preparation for this war requires sound consumer research, positioning, messaging, and promotional strategies, the integration of which has become a continuous task.

Faced with mushrooming product portfolios, how can brand managers and marketers ensure a cohesive approach to a brand’s position in the marketplace, on shelves, and inside the overall strategy of the brand’s parent when consumer demand, retailers’ desires, and the brand’s price point are changing from

minute to minute? How can managers and marketers ensure internal cohesiveness about a brand’s positioning and messaging so consumers won’t be hit with a dissonant image – for example, luxury goods dumped into discount channels to ensure they’ll sell, thus hurting sales and damaging the brand simultaneously? How can managers reliably connect the units responsible for driving consumer demand to the units gauging consumer behavior, and optimize their attempts at a collaborative effort?

Some relief will come from the surge in POS and RFID-created data about to arrive. Wal-Mart’s Retail Link already sends manufacturers updated sales data, sometimes to the level of individual stores, every seven minutes. What happens when that data relay becomes instant and automatic to the shelf level? Manufacturers who have begun building an adaptive business network and have their houses in order will have already laid a foundation to ensure that data is collected, distributed, and aggregated within the house and throughout the neighborhood, giving priority to brand managers and sales and marketing teams that need just-in-time data aggregated, analyzed, and delivered directly for better decision making. Armed with real-time data and the proper analytics, these teams can infinitely fine-tune their long-term forecasts with RFID/POS-powered demand-driven ones, while trying to compensate for deviations from those forecasts (over- or underperforming promotions, demand shocks, and so on) in the short term.

Real-time data being pumped into the neighborhood and house will also aid marketers attempting to cope with dramatic supply constraints and demand spikes. For example, a sudden outbreak of mad cow disease in the United States would cause the supply and demand of American beef exports to plummet instantly. A food manufacturer within an adaptive business network could begin planning its strategy for the aftermath almost immediately. Conversely, a bottled-water manufacturer experiencing an overwhelming demand spike during a hurricane could use the real-time data to redirect trucks to the affected area.

SERVING CONSUMERS WITH A DEMAND-DRIVEN SUPPLY NETWORK

Bearing the Brunt of the Wal-Mart Effect

In most consumer industry segments, retailers own and control the last 100 meters to the consumer, but unless the entire chain of companies from raw materials suppliers to the retailers are constantly aware of consumer behavior, things can and will go wrong. Wal-Mart takes its commitment to consumers quite seriously and has brought its full power to bear on the supply chains of its partners, most notably in its RFID mandate, to which the majority of its suppliers are still struggling to comply. In the United States, Wal-Mart's mandate effectively transformed RFID into a standard built into the utility grid of every adaptive business network—inspired neighborhood that is connected, no matter how distantly, to the retail giant. The combination of Wal-Mart's irresistible size and implacable desire to cut costs and eliminate waste means CP companies will have no choice but to invest up-front in real-world-awareness technologies and the intelligent systems needed to make sense of the tidal wave of data that item-level tagging will eventually generate.

Unless watching their margins disappear is acceptable, the only choice for U.S. manufacturers is to embrace the standard created by fiat from Wal-Mart, Target, and other large retailers and begin augmenting their forecast-driven supply chains with a demand-driven set of processes. If your house is in order, the advent of real-time POS data, which manufacturers will use to drive new product launches and aggressively manage mature ones, is also an opportunity to integrate and synchronize your own neighbors into your design, launch, and marketing processes.

A demand-driven supply network being built now using UPCs and the proposed GDS standards, has a tremendous potential to slash safety-stock inventory levels while still reducing the number of out-of-stock situations. Even highly efficient companies in the CP space face significant out-of-stock rates, and industry research indicates this figure can rise to 20% for most retailers during promotions, when companies are not only losing sales and inviting consumers to sample competing products, but also paying the retailers dearly for the privilege.

Further advancements in real-world-awareness technologies hold out the promise for auto-replenishment. These include technologies such as item-level RFID tagging and “smart shelves,” which can produce an alert broadcast from the point of sale to the manufacturer and down through the supply chain if a product is taken off the shelves, for example. In a demand-driven supply network, automated processes would begin the necessary steps to replenish retailers' stocks, ideally with a minimum amount of human oversight.

Europe: More Fragmented and More Collaborative

In Europe, large retailers such as Tesco and Metro have yet to wield influence of their American counterparts, leading to a more fragmented supply chain landscape that includes additional complications such as multiple currencies, languages, government regulations, and even packaging sizes.

As a result, European consumer manufacturers have an even greater need for the capabilities of adaptive business networks, especially the heightened visibility into and collaboration with their multinational neighborhoods. However, the absence of powerful and motivated retail partners has stunted manufacturers' efforts to build such networks. Many manufacturers have been slow to exchange traditional vendor-managed inventory approaches for the marginally more efficient collaborative planning, forecasting, and replenishment (CPFR) approach.

Because of CPFR's own difficulties – a high degree of manual effort is required to reconcile shared information and resolve exceptions – it has barely been able to outpace the complexity it was supposed to solve.

But the collaboration of European manufacturers and their retail partners, especially in Western Europe, has led to several supply chain evolutions that could be accelerated inside an adaptive business network. The proliferation of transportation options, with retailers employing multiple drop shipments to stores – or, conversely, retailers handling the transport themselves in exchange for factory-gate pricing – points to intrinsically flexible supply chains that can be augmented with a response-replenishment model once real-time POS data is available.

As the adaptive business networks of both American and European manufacturers begin to evolve, the next step in becoming more demand driven will be tools that analyze streams of demand data and automatically select the most accurate forecast at any given moment, based on continuous analysis of the forecasts versus the eventual results. Real-time adjustments to forecasts can be useful, at least within an organized house, to the company's sales and marketing efforts and provide a consistent integrated demand picture across the horizon.

ADAPTIVE MANUFACTURING AND SOURCING AND PROCUREMENT

Adaptive Manufacturing

The increased visibility offered by POS, RFID, and other real-time data streams flowing into the house represents an opportunity for manufacturers and distributors to begin collapsing the time and distance between their customers, their neighboring suppliers, and the rooms in the house that represent their manufacturing capabilities. Doing so requires a real-time stream of supply data into the house and a real-time decision-support stream through the house to the plant floor.

As consumer manufacturers begin augmenting manufacturing forecasts with new demand-driven data, the classical long-run, high-efficiency manufacturing model will begin to lose some value because demand-driven supply networks will be reducing the need for stockpiles of detergent, bleach, or the consumer good of your choice. Shorter, more adaptive manufacturing runs will start to take their place. Plants will receive replenishment orders from sense-and-respond systems closer to customer demand. Conversely, the manufacturer might be alerted if the plant in question were to suddenly lack the capacity to meet that demand, because of technical malfunction, for example. Ultimately, executives at the parent company, having implemented digital dashboards and other control mechanisms as part of their adaptive business network preparations, will be able to step in. Thus, the executives can optimize the mix of products being produced at any given moment and decide whether that means the detergent should take priority over the bleach, whether 100 units of the new, extra-extra-extra-strength Tide in a purple bottle needs to be rushed through and drop-shipped to China immediately to fulfill a priority order, or some other task needs to be done.

Sourcing and Procurement

Sourcing and procurement processes will also evolve hand in hand with supply chains inside an adaptive business network. Considering that the cost of goods sold for the average CP manufacturer ranges between 40% and 70%, any reduction in procurement costs is an excellent first step in reducing the overall costs of a product's life cycle. The introduction of real-time POS data offers an opportunity to optimize procurement processes and hold down their costs by balancing long-term demand creation and planning and short-term demand response.

Armed with increasingly accurate forecast data, a manufacturer's procurement team is then able to better deploy sophisticated analytical software for spend analysis and supplier performance measurement, supplier selection, and supplier evaluation for squeezing costs out of the procurement process. Continually on the lookout for the best price in the neighborhood, and cognizant that the best price is usually due to a confluence of factors such as timing, quantity, and so on, a manufacturer with significantly improved long-term forecasting tools can make more accurate procurement commitments, thus driving down the price.

In fact, the visibility that stems from a DDSN unlocks another potentially significant benefit by improving the ability to plan and forecast more closely with suppliers or to build better purchasing plans, procurement plans, and contracts.

UNDERSTANDING THE SAME LANGUAGE: GLOBAL DATA SYNCHRONIZATION

The City Grid: Global Data Synchronization

As ERP and other enterprise applications are to the house the foundation that makes all other capabilities possible, so emerging GDS standards are to the city grid. These standards are the phone lines, plumbing, or postal service that need to be in place before all of the real-time data that's been promised can be delivered. Without these standards, conversations are garbled, the kitchen sink explodes, or the mail ends up in the trash.

Or, to be more literal: electronic business transactions will fail when basic master file data is in error, not aligned, or out of synch between a manufacturer and its suppliers or any other neighbors within the adaptive business network. Reconciling data into a single version of the truth and ensuring its accuracy and integrity as it flows – not only across the neighborhood, but literally anywhere in the world – is of paramount concern.

Realizing this, a consortium of industry leaders called the Global Commerce Initiative (GCI) has proposed a detailed set of standards for a single system for GDS: the Global Data Synchronization Network (GDSN). The key elements of the GDSN include global standards, a global registry, and interoperable data pools. GS1, also an industry consortium, has developed the Global Trade Identification Number (GTIN) and the Global Location Numbers (GLN) to harmonize existing regional standards and provide a global city grid for CP companies. The GTIN contains the **what** of product data, and the GLN communicates the **who** and the **where** of any house within the city grid. The GTIN and GLN are the new standards that power the global registry, which functions as the city's phone book for the coordination, publication, and subscription of master file information, using a new class of applications, the "data pools." Data pools support the standard information requirements, the standard business processes, and the standard message choreography to exchange and synchronize information globally.

While the business case for the GDSN is compelling, deployment of the GDSN has been slow; manufacturers have so far been reluctant to publish data to the data pools, and many of the product attributes outlined in the specifications for GTIN and GLN have yet to be supported by many IT organizations.

The GCI is a mix of retailers and suppliers. The consortium continues to lobby both the Uniform Code Council in the United States and the European Assistance Network to work together and create global standards to eliminate regional barriers to trade and to lower costs and complexity for the community.

While the tipping point for the adoption of these standards has yet to happen, any manufacturer interested in building an adaptive business network or participating within a partner's neighborhood should begin the adoption of these standards and should be preparing to publish data about its own products to GDSN's data pools in the near future. Consider it a critical step in getting your house in order.

READY AT THE MOMENT OF DECISION: ANALYTICS

Data Flowing Where It Needs to Go: The Importance of Analytics

If those theoretical torrents of data spewing from real-world awareness technologies were to start flowing into your IT systems immediately, as you were reading this, they likely wouldn't do much good for your business. Your existing analytical tools would quickly be overwhelmed by the flood of raw, unaggregated data that RFID and similar technologies promise to generate. Multiply the number of GDSN attributes by the number of items in your warehouse, and then multiply that again by the number of times those items are scanned for an update of those attributes. It would be as if you went to pour a glass of water and found yourself standing knee-deep in a flood instead.

With that data already on the way, it's time to upgrade your house's plumbing – that is, reexamine how your data flows within your house and supports your business processes. The first step is harmonizing data already inside the house and reconfiguring it so that it flows automatically and at the appropriate level of aggregation to decision makers.

If NPDI, ISM, and DDSN compose the three pillars supporting a CP manufacturer's house, then analytical tools are the pipes hidden within the walls, receiving data from within the house, as well as without, aggregating that data into useful forms, and then piping it to the right person, whoever and wherever they might be. Thus, the second step of examining how your data flows involves aggregating and sharing data between two sets of connected processes, whether those are NPDI and ISM, ISM and DDSN, or some other connected process.

The third step occurs when RFID and POS data begins rushing through the pipes. As that data arrives, the challenge for CP manufacturers is to rework the traditional data warehouse model, in which reams of data are chewed and slowly digested for the benefit of the CEO and similar power users. The reworking involves supplementing these warehouses with new analytical tools that route data directly from the store shelf to the

person who needs to act upon that data. Imagine a category manager who needs to know immediately when the company's chocolate cake mix, which is currently the subject of a major promotion, has less than 20% of its original stock remaining at the Wal-Marts in the manager's region. What that manager needs is a single alert, personally delivered to him or her, when that potentially apocalyptic scenario occurs. What does the manager need, then, in terms of analytical support? The manager needs a tool that can aggregate only the relatively small, discrete piece of data arising from the shelf, a KPI that sets the circumstances under which an alert should be issued, and a personalized interface that renders the alert.

The most critical step is neither the collection nor the final rendering of the data in question, but the parameters that decide when the data should be collected, how much should be collected, how critical the data is, and who the data should be collected for. Does it need to be collected every five seconds or every hour? Does it need to amount to a flashing alarm signal or a detailed report? And who should receive that report? How many managers within the company need to know that data, and at what level of priority? Typical data warehouses lack this ability. Pouring all of your data into the backyard pool of your house and then attempting to distill it isn't conducive to real-time decision making. Thus, you require a new set of tools.

A house that is in order seamlessly integrates analytics directly into business processes, removing analytics from the domain of business warehouses and applying their abilities as needed to any process or combination of processes within the house or neighborhood, whether that's monitoring supply chain performance, calculating up-to-the-second cost projections of launching a new product, or recognizing when a given quantity of chocolate cake mix isn't enough.

PROCESS TRANSFORMATION WITHIN THE ADAPTIVE BUSINESS NETWORK

The Evolution of the Adaptive Business Network

As companies like Procter & Gamble and Colgate-Palmolive have shown, some of the functionality and the IT necessary to build an adaptive business network following those principles currently exist in IT products and solutions.

But as the functionality is reused and recombined in the service of an adaptive business network, or reused inside new composite applications driven by new process steps, the network itself will evolve and change to answer its most fundamental challenge: realizing its ideal form.

A fully realized adaptive business network balances push and pull by employing demand-driven tactics where they will be most effective. Whether customer demand signals are flooded by some trauma, boosted by an effective promotion, or are as steady as ever, these signals flow to every partner in the network, triggering a response within each. That response is manual at first and then increasingly automated, keeping supply chains moving, inspiring new products, and pointing all participants toward a more efficient process. This defining aspect of the network provides a much-needed boost to forecasting, offering a real-time element to measuring forecast accuracy and an early warning should deviation occur.

Recognizing those deviations and executing the steps that follow will be the responsibility of systems possessing **distributed intelligence**, a structure that keeps the ability to react and communicate in many places as needed around the enterprise in order to increase the response time and adaptability. By the time the adaptive business network has been fully achieved, manual intervention will have been eliminated from most process steps. Human minders will manage by exception, allowing the network to parse potentially millions or billions of signals and assemble them into appropriate forms for the appropriate actors. Those forms might be digital dashboards for the CTO, fresh data flashed to handheld devices of your sales staff in the field, or the similarly intelligent system monitoring your operations for Wal-Mart at the end of your supply chain.

In order to parse that data and make those decisions, your adaptive business network will need to have the metrics and protocols already in place to measure those billions of signals. The technologies that will do so comprise **targeted performance monitoring**, which is the assembly of huge amounts of information into precise metrics that have meaning for a business. Before intelligent systems automate the processing and distribution of critical data, they'll need to be supplied with definitions of failure and success. You know that an order of toothpaste or beer or shoes arrived at one of your warehouses at 2:44 p.m. today. But what you really want to know is this: Did I need them today, or will they languish in my warehouse? Does that shipment have every unit I need? Too many units? Or too few? You'll need new infrastructure and decision-support intelligence in place to judge that data before acting upon it.

And where will those signals ultimately come from? Emerging real-world-awareness technologies such as RFID, sensors, and smart tags will one day automatically harvest the data that will comprise those signals from warehouses, manufacturing plants, store shelves, and the point of sale – the raw material that will make the real-time aspect of the network possible. And existing technologies such as the ubiquitous UPC and the next-generation GDS standard form a bridge to real-world awareness that CP manufacturers can begin to establish and benefit from right now.

The first recognizable adaptive business networks have already arrived at this last step, thanks to the mandates and efforts of network-orchestrating retailers such as Wal-Mart, Target, and Metro. Increasingly sophisticated and powerful networks, made possible by new technology and standards for global data exchange, are not too far off. Every step toward the ideal of an adaptive business network delivers significant value; you pick where you want to start.

INTEGRATION IN THE ADAPTIVE BUSINESS NETWORK

To imagine an adaptive enterprise requires a new vision for business processes and a new form of IT to support them. But thinking is easy; living is not. To create an adaptive enterprise requires a tortuous climb up a mountain of integration challenges.

Becoming more adaptive is, in many ways, another form of the age-old battle to support the businesses in a timely manner. Consider a typical challenge: Someone in a line of business – say, manufacturing – has a need for more timely information about product inventory that must be collected from several different systems on the shop floor and from suppliers distributed all over the world. But IT cannot easily assemble the data, portal views, and analytics to support the business need. Frequently, what starts out as a simple request for some information becomes a frustrating project that stretches out for months.

Why is this so often the case? The ugly truth for IT departments is that enterprise software has achieved great victories in automating transaction processing and providing certain types of standard information. But when it comes to turning on a dime, IT frequently trips over itself. The problem is the amount of integration required to cobble together different systems and the difficulty of performing that integration and subsequently making changes.

The goal is to perform two sorts of integration as fast as possible. Most businesses are now at the stage where many processes have been automated by standard enterprise applications for ERP, CRM, SCM, and so on. The first challenge is to create end-to-end business processes such as order to cash that start in one application – CRM, in this case – and then end in another – ERP, in this case. The next step is extending this application-to-application integration across the boundaries of the enterprise. Business-to-business integration requires connecting all the partner, supplier, and customer applications through transaction formats and gateways that both sides understand.

Standards usually play an important role. For example, a business-to-business integration of the order-to-cash process might include receiving an order through an agreed-upon electronic data interchange protocol.

Once both the internal and external applications are connected for a specific end-to-end business process, the second type of integration is integrating technology components to the applications and to each other. Integration technology provides the visibility into the business processes and brings information to the people who need it. IT must construct reports. It must design analytical frameworks and metrics. It must monitor events and thresholds and allow automatic alerts to make people aware of problems. IT must create portal views that assemble just the right picture to support decision making and quick execution of a response. Integration of technology tools and applications requires many other similar sorts of tasks, including some complex problems such as cleaning, synchronizing, and harmonizing master data.

None of this is as easy as it should be, which is why SAP has spent so much effort in creating the SAP NetWeaver® platform and the Enterprise Services Architecture blueprint to make less integration necessary and to make that which is required simpler and easier to change.

WHY SAP SOLUTIONS?

SAP has lived with the challenges of integration for years and has gradually, after much design, research, and trial and error, created an approach based on SAP NetWeaver that dramatically reduces the integration burden compared with using third-party integration tools. Even if your own network isn't built on SAP® products, one of your partners' networks likely is. Unlike most other software companies, SAP creates both the applications and the integration technology – that is, the mySAP™ Business Suite family of business solutions and the SAP NetWeaver platform.

The challenges of end-to-end process integration are reduced because mySAP Business Suite solutions are powered by SAP NetWeaver. The work of integration required by processes such as order to cash is performed as part of mySAP Business Suite using SAP NetWeaver. In other words, the integration to connect CRM and ERP, which would be a custom project with a third-party integration tool, comes out of the box. It has become productized.

The integration of the technology components with the applications and with each other to provide visibility is also productized. SAP NetWeaver comes with preconfigured business content such as portal iView windows, reports, dashboards, and process templates for CP business processes.

For companies with SAP applications as part of a heterogeneous landscape, using SAP NetWeaver means that most of the work to meet the core challenges mentioned earlier is accomplished out of the box. The amount of work to complete the integration consists of making the connections between SAP NetWeaver and non-SAP applications. This is a far lighter burden to bear than the task of creating all the connections.

In addition to productizing much of the integration needed at a company, SAP NetWeaver also increases adaptability through a deep commitment to standards. SAP NetWeaver is based on open standards such as Java, Web services, and many others. Interfaces to CP industry standards for GDS are supported through the SAP Exchange Infrastructure component, which is used to provide mappings and gateways needed to fulfill the promise of interoperability.

ENTERPRISE SERVICES ARCHITECTURE

SAP has created a new blueprint for IT called Enterprise Services Architecture that further enhances the reusability and flexibility of both mySAP Business Suite solutions and SAP NetWeaver. Enterprise Services Architecture is the idea of breaking apart enterprise applications into a set of smaller services, called enterprise services, which become reusable building blocks. Enterprise services are defined at a high level, a level meaningful to both business and IT executives, to allow quick assembly and reassembly to create new business processes. The general term for using services as the basis of architecture is called service-oriented architecture. The most popular way to implement services is called Web services, the new standard form for services that is interoperable across every computer platform. These are powerful concepts, but SAP has made them even more powerful by adapting them to the needs of enterprise computing.

To achieve adaptability while maintaining efficiency – the key challenge of the adaptive business network – SAP has rethought how it builds the applications in mySAP Business Suite on the basis of the concept of Enterprise Services Architecture using SAP NetWeaver as the technology foundation.

For the adaptive business network, Enterprise Services Architecture closes the gap between business and IT, providing the ability to change business processes at the speed of business while reducing cost and maintaining efficiency. SAP NetWeaver is the key agent of this transformation, and for companies with SAP applications as part of their infrastructure, the transformation will be delivered automatically in each new product release.

The beauty of Enterprise Services Architecture is that the evolution takes place while leaving intact the efficiency and automation of traditional business processes, the ones for which SAP has become famous. Users keep working through the stable user interfaces they are used to, while in the background enterprise services appear that allow the company to change and support new business processes faster than ever before with the lowest possible total cost of ownership.

MAKING CHOICES, TAKING ACTION

The adaptive business network is an ideal form that will never be implemented to perfection. But huge rewards await those able to get even a small fraction of the vision working correctly. The path forward is not a complete retooling of IT, but rather a coordinated series of incremental improvements to existing enterprise applications that supports the changes to business processes needed to achieve the internal and external coordination, collaboration, and flexibility that an adaptive business network can offer.

Like the proverbial “journey of a thousand miles,” the journey to become more adaptive, more demand driven, begins with a single step, but it need not be a giant step. Companies can begin by making changes to existing business processes, focusing on new metrics, and leveraging existing tools to do so. When the existing tool set begins to yield diminishing returns or simply fails to support new processes, new tools that enable portions of the adaptive business network (such as new product portfolio management or responsive replenishment) can be implemented quickly. Companies can implement these tools with real ROI that can create a self-funding path to continue to integrate islands of expertise into end-to-end business processes.

With SAP as a partner providing solutions in every business process area that takes large steps forward toward the adaptive business network, companies can accelerate their progress toward sustainable, profitable growth. SAP provides the tools. Applying the vision is up to you. SAP will be there with you in the short term and in the long term.

To learn more about how SAP can help your CP company develop an adaptive business network, call your SAP representative today or visit us on the Web at www.sap.com/consumer.

www.sap.com/contactsap