Getting IT right: Maximizing value for supply chain

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In the volatile environment in which pharmacos operate, supply chain IT must keep pace with the rest of the business. But for many IT organizations, seizing the necessary initiatives is a challenge given the complex technology landscape and its legacy of enterprise resource planning (ERP) implementations and acquisitions. Getting supply chain IT right, however, comes with a significant opportunity for value creation. We have seen improvements of service levels of 5 to 15 percentage points, inventory reductions of 20 to 40 percent, and logistics cost reductions of 10 to 15 percent in projects where supply chain IT enabled radical transformation. There are two prerequisites for capturing savings. First, pharmacos must make the correct basic choices on supply chain IT; and second, they must seek to exploit technology innovation. In this chapter, we examine three basic IT options and provide three examples of innovative technology advancements to exploit.

The dilemmas of pharma supply chain IT

There is a vision of integrated, IT-enabled supply chain management that constitutes an article of faith among true believers.

How much standardization is needed?

In an ideal scenario, IT provides complete transparency of demand, supply, capacities, and inventory from the beginning of the supply chain through to the end. Every step along the way is registered and recorded, from API production to formulation, filing, packaging, and distribution. Each global location and organization has access to a complete fact base for manual decisions and automated planning with time horizons as immediate as

several hours or as distant as several years. Transactions, planning, and optimization are highly automated in “no touch” processes that extend beyond company boundaries to encompass contract manufacturers and suppliers. Given perfect standardized information, processes can be standardized globally. Through these standardized processes, the business can exploit best-in-class ideas, simplify management, and create “apple to apple” comparisons between markets and organizations.

Such is the ideal, but reality paints a much different picture in the pharma sector. Instead of managing things from a rational center, a heterogeneous landscape of ERP systems, production planning, and logistics management systems is configured to suit the specific requirements of different business units and geographical locations. These components have been cobbled together to accommodate the legacy systems of acquisitions. In many instances, an Excel spreadsheet is the state-of-the-art application being used.

The obvious way to address this challenge would be to consolidate and standardize existing ERP and supply chain management (SCM) systems. To do this, however, would be costly and could take upwards of ten years or more for major companies. Despite these obstacles, the majority of pharmacos have embarked on this path.

Standardizing systems to a single software vendor might be necessary in this scenario, but it is not sufficient to remedy the problem. Even a single-vendor IT landscape could include instances of poor integration, different application versions, and quite different process templates. Ultimately, a single-vendor, single-instance approach is highly problematic for several reasons: acquisition will continue to reintroduce IT complexity, and the business benefit in going to single instance is not necessarily present.

In light of these downside risks, the pragmatic approach to gearing up supply chain IT is finding the middle ground where the right level of process and IT system standardization creates agility and real impact for the business. In proceeding toward this middle ground, a series of questions needs to be addressed to determine what most needs to be standardized and what is of less pressing priority. Standardization has three different dimensions, standardization of master data, process, and IT systems that can be treated independently.

While organizations face common considerations, there are situational specifics. In general, however, we believe that supply chain master data (all product data, approvals, customers, and suppliers) and demand data should be standardized.

Additionally, key processes need to be standardized, sales & operations planning (S&OP)/integrated business planning, global order promising, and capacity planning that enables global available-to-promise (Global ATP) should equally be standardized. Of less importance is the standardization of production scheduling, warehouse management, or local distribution truck loading and route optimization.

A pragmatic approach, therefore, is to decouple the above processes from timetables of ERP consolidation projects to allow processes like S&OP to be implemented much faster. This could be done on stand-alone platforms in advance of the consolidated ERP–SCM backbone platform. Other processes, such as production scheduling, might well prove to have considerably less, if any, need for standardization.

A leading pharmaco exemplifies this pragmatic approach, having successfully implemented an advanced supply chain planning solution on top of an unconsolidated manufacturing software landscape from the same ERP vendor. The company found the SCM business case to be much more compelling than waiting for a lengthy consolidation of operational systems.

Going outside the defined single-vendor approach can also prove beneficial. New technologies and SCM solutions outside the province of the single vendor have the potential to offer even faster implementation and more advanced functionality. Another leading pharmaco, for example, implemented planning software from a specialized SCM IT software vendor on top of its ERP and SCM landscape. In doing so, it gained the more flexible and user-friendly supply chain planning scenario simulation and optimization functionality that had hitherto been limited almost entirely to electronics companies. This solution provides complete supply chain transparency across regions and systems. Additionally, memory data technology enables sector-specific constraints (such as jurisdiction control) to be factored into instant simulation and “what if” analyses, thereby ensuring that only approved sources supply respective markets.

Another way to accelerate SCM system implementation is through cloud solutions that do not require on-site installation. One of the largest global pharmacos is using a cloud solution for product movement visibility, which quickly enables complete transparency of global product flows. The single system integrates internal manufacturing facilities with external contact manufacturers and logistics providers. New business partners can easily be linked into the existing information network.

In addition to improving the management of outsourcing service vendors, this newly won visibility helps meet regulatory requirements such as cold-chain assurance and documentation.

Nevertheless, fast-track SCM IT implementation requires certain prerequisites to avoid creating maverick solutions within the IT landscape. Processes and interfaces must be properly defined across systems and functions, and all data must first be harmonized. In all instances, implementing solid master data management is a prerequisite for integrated supply chain solutions. If addressed early on, this not only will enable faster SCM IT solutions but also will benefit future ERP rollouts.

How much system integration is needed?

ERP, supply chain, and manufacturing solutions typically are seen as one integrated operations system. However, tight integration also implies dependencies between applications and lost agility in terms of the ability to rapidly change or swap applications. Simultaneously implementing and changing these applications is not often the best solution. Instead, SCM and manufacturing system components should be successfully implemented, staged, or driven in parallel by individual value potential.

From a supply chain perspective, a minimum set of integration points is required to create end-to-end benefits and control in a mixed-vendor landscape. A prerequisite to implementing these supply chain integration points is a robust infrastructure for integration, something existing in nearly all pharmacos today as a result of other integration needs.

Companies commonly choose to integrate their SCM system with such manufacturing areas as aggregate capacity (to enable S&OP), production order status (to track schedule adherence), and agreed S&OP plans for manufacturing to use as the basis for production scheduling and regulatory compliance. Production order status, inventory levels, purchase orders, and sales orders are also common integration points that link manufacturing and ERP. Integration points between ERP and SCM are commonly inventory levels and production plans that enable global ATP.

Keeping integration to the above-suggested minimum can increase agility and enable the organization to more easily capture opportunities from best-of-breed applications. Over time, integrations can become more thorough. The main business impact, however, comes from getting the key integration points right

and also making sure that data quality is accurate for the data flowing through those integration points.

How do you "eat the elephant"?

Getting the basic backbone of the corporate-wide standard applications footprint right will generally result in long-term dividends. But before cutting that elephant into pieces, there needs to be a well-conceived plan. The amount of work triggered by ERP and APS (Advanced Planning Solutions) implementations and other global IT initiatives can be massive for a global pharmaco. Implementation timelines of 10 years or more are not unprecedented. Thus, an enterprise of this magnitude calls for careful prioritization and sequencing with a clear objective to maximize business impact. We believe that three key factors should be considered:

Identify value up front. It is vital that supply chain IT and ERP be anchored in supply chain and business strategy, with sources of value clearly defined in advance and serving as the governing principle for investment. The software landscape should be assessed with particular attention to identifying gaps that can impair the execution of the strategy. Potential solutions that satisfy strategic fit should be further examined for technology fit, volume capability, user-friendliness, and adaptability to future changes. Finally, there must be a clear link and value potential in terms of lowered inventory levels, increased sales, and reduced logistics costs. Targets need to be clear and measurable, with accountability for results.

Design solutions to create value. A common pitfall that we have observed is for customers to view IT in isolation and expect that an implementation, in and of itself, can drive radical improvements. Instead, solutions must have the bandwidth to create real value by combining aspects of supply chain and business strategy, process improvements, operating model, IT tools, data, and capabilities.

Technology selection needs to be unbiased in assessing key value drivers without favoring incumbent providers. ERP systems, for example, have varying degrees of functional richness and need to be compared with best-of-breed solutions. Implementation and rollout sequence needs to be designed using a staggered approach based on value delivery potential. Within this rollout, the introduction of modular domains is prioritized according to business benefit. High-impact pieces should be sequenced early in the implementation process in order to front-load their effect as much as possible.

Capture value from the start. Begin at once to capture value with interim solutions and pilots rather than waiting for the final system. Early pilots should not be viewed as deliverables in and of themselves, but rather as holistic business initiatives with IT as an embedded work stream.

Accountability for capturing value from early process changes increases responsiveness to needs, which speeds up both organizational learning and adoption of new ways of working. Control tower and war room approaches, for example, can accelerate value identification and solution requirements design. Focusing quickly on value capture serves to lessen normal organizational resistance to change, barriers that need to be removed. Training programs must be developed and rolled out, best practices instilled, and a rigorous project management office established to drive the change program.

New IT trends and value opportunities to exploit

Powerful emerging IT capabilities promise to significantly contribute to increased supply chain performance. A major opportunity awaiting pharmacos is to migrate from the individual planning of nodes to an end-to-end methodology where all production steps are planned simultaneously in one planning run. Another major opportunity is the ability to conduct simulations within the operational systems themselves, thereby providing richer insights than is currently possible. The prospect of integrating Big Data into forecasting processes is a third new trend with great potential.

From nodal to end-to-end planning

The predominant planning methodology in pharmacos today is nodal planning, where each node (API, formulation, filling, and packaging) is planned separately and, in the best-case scenario, is stitched together in an S&OP planning process. This creates a reactive planning environment with inherent latency as demand changes and supply problems are cascaded to the next level at the pace of the planning frequency (typically monthly). Improving business agility requires faster feedback loops so that the impact of demand-and-supply problems can be analyzed and acted upon much more quickly.

The nodal approach has resulted in latency and incorrect decision making. We have seen examples of API yield losses of 50 percent go unnoticed for several months

before any adjustments to supply-and-demand plans in subsequent production steps were made. Similar disruptions ultimately result in demand cuts, unbalanced supply plans, and a need to prioritize demand and markets on short notice.

The alternative to nodal planning is integrated end-to-end planning, where all production steps are planned simultaneously in one planning run. Such integrated planning cuts the latency in nodal planning, thereby enabling agility. While integrated-planning approaches have been possible in planning systems for years, they have rarely been implemented, owing to computational limitations, difficulties in modeling interdependencies, and a lack of discipline to manage the master data. With increased computational power and improved software solutions, these barriers now pose less of an issue, and the industry is well positioned to explore the benefits that could accrue from integrated planning.

End-to-end planning will first manifest itself in a more radically agile S&OP process, typically organized in a rigid monthly cadence. The next stage is to improve agility to weekly or even real-time decision making. This level of agility evolves the S&OP process into "supply chain control towers" that are able to support planning decisions and match demand with supply on a real-time basis.

Such applications have been successfully implemented in high tech, and vendors are currently in the process of transferring them to pharma.

From experience to science

Supply chain planning processes drive the entire behavior of the supply chain: how much is produced and when, how much is procured and when, and how transportation is organized. Planning frameworks are fully implemented in ERP and SCM systems, automating the back issuing of production orders, purchase orders, and transportation bookings. Although there is logic behind the setup of planning systems (for example, economic order quantity (EOQ) to defined batch sizes), much of the design is also based on experience. There is also a tendency not to touch planning rules unless a very visible problem needs to be addressed.

Simulations to optimize supply networks or to develop and test new SCM practices have typically been detached from operational systems. Instead, they are undertaken within the domain of dedicated projects and special software solutions. New approaches, however, can now conduct simulations challenging the prevailing status quo within the operational systems themselves.

A conspicuous benefit of this approach is that it allows simulations to be run retroactively and then be compared with actual results. Think about the richness of insight that could be obtained, for example, by "replaying" the last six months of an ERP or SCM system with different planning parameters and alternative logistics structures, or by imposing various disaster scenarios to see the impact on supply chain cost, lead time, and stockouts.

An example of this new breed of SCM IT solutions is a logistics command center from a leading ERP vendor. Sitting on top of the transportation management solution, it allows "what if" simulations to be executed in the real operational system. Within this context, simulations cease to be one-off projects with complex data requirements. Instead, they become a much more continuous activity that allows much faster adaptation of supply chain structure and parameters to changing circumstances and requirements.

Discovering the unknown

Demand for pharma products can be notoriously volatile. The increase in tender-driven business has further increased volatility, creating a more demanding environment for forecasters and demand planners. Decreasing forecast accuracy increases the risk for stockouts and triggers the need for more safety stock.

The advent of Big Data, however, presents opportunities for pharma to exploit. For example, the consumer goods industry has taken the lead in using Big Data to improve forecasts and provides a model to emulate. One example is the usage of weather data to improve forecasts of ice cream and beer consumption. Pharma could similarly predict seasonal influenza spikes from weather data.

Less obvious uses of Big Data might be to understand consumer sentiment through Twitter and Facebook postings. Volume changes of Google searches on specific medical conditions could be integrated into forecasting models. Advanced forecasting packages have the potential to integrate additional data streams. For additional data streams to improve forecast accuracy, though, they must go beyond noise to improve the demand signal.

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The pharma industry stands at a crossroads with complex IT systems like ERP and SCM implemented, but not yet fully rolled out or integrated. At the same time, the IT industry continues to offer fresh opportunities to improve supply chain performance.

The thoughtful approach to maximize impact is to make smart and selective choices on ERP and SCM, including what most needs to be standardized, integrated, and sequenced. At the same time, sufficient bandwidth should be secured to exploit new innovations that will continue to appear on the market. Getting this right will help pharma IT organizations become the enablers they truly should strive to be.

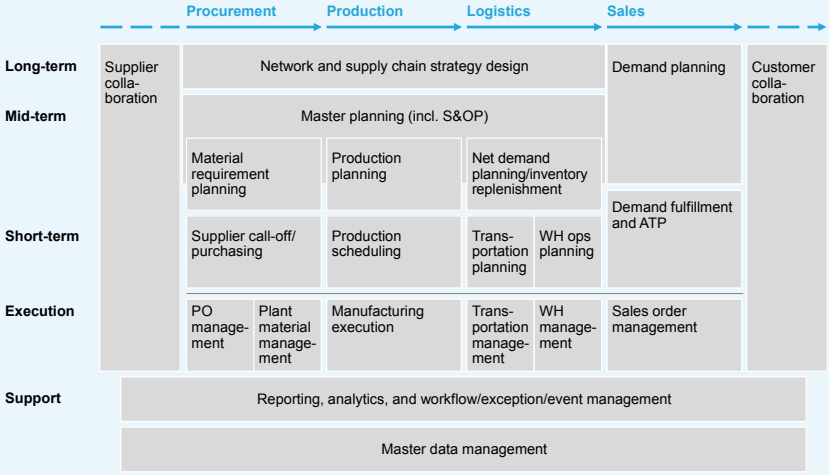
ERP and SCM IT defined

ERP (enterprise resource planning), coined by IT analyst company Gartner in 1990, originally was meant to describe enterprise-wide planning applications going beyond more narrow MRP (material requirement planning). However, ERP quickly became synonymous for software products that offer production planning and management, sales, distribution, and especially finance and human resources functionality in an integrated way. In that sense, ERP is commonly used to denote software products that were pioneered by SAP in 1979 with R/2, which later led to R/3 and SAP's current ECC (ERP Central Component) product.

Ironically, the core planning modules of ERP software have not fulfilled the original aspirations, particularly with respect to supporting supply chain management processes. Demand planning, for example, typically lacks required data manipulation and statistical functionalities. Supply planning components fail to plan across individual

Exhibit 1

SCM IT functional domain map



plants or distribution centers, and do not sufficiently consider capacity and material constraints. Inventory safety stock setting functions are so basic that they are hardly ever used in practice.

SCM IT solutions attempt to close this gap. Major vendors are again SAP, with its SCM product suite (which consists of far more than one product), JDA (having acquired, among others, SCM IT pioneers i2 and Manugistics), and Oracle—plus a large number of niche vendors. Exhibit 1 illustrates a structured overview of SCM IT functional domains:

ERP systems, contrary to what their name implies, primarily serve as solid financial and human resources systems and are integrated with transaction, execution, and data backbones along the supply chain. More advanced SCM functionality is piggy-backed onto it.

The importance of having a clear definition of scope and a high-level domain structure of SCM IT applications cannot be overesti-mated as a contributor to the success of an SCM IT project. Investing time at the start of a project to achieve a commonly accepted "one pager" of the ultimate functionality envisioned is a well-spent investment.