



**Healthcare ERP and SCM Information Systems:
Strategies and Solutions**

**A White Paper by the HIMSS Enterprise Information Systems
Steering Committee**

Table of Contents

Healthcare ERP and SCM Information Systems, Strategies, and Solutions	3
Enterprise Resource Planning	3
Financial Management Information Systems Functionality	4
Human Capital Management Information Systems Functionality	5
Supply Chain Management Information Systems Functionality	5
Service Oriented Architecture	5
Healthcare ERP and SCM Trends	6
Conclusion	7
Bibliography	7

Healthcare ERP and SCM Information Systems, Strategies, and Solutions

The delivery of quality clinical care is a goal for every healthcare provider, requiring the tools and supporting systems for the desired outcome with consistent and expected results. As institutions grow and provide more services under tighter and more integrated fiscal and operational environments, the demand has become far greater for current and correct information in the Order-to-Cash, Procure-to-Pay, and General Financial Reporting cycles. Healthcare enterprise resource planning and supply chain management technology initiatives are aligned with corporate objectives in a highly integrated and complex set of modules because they support the enterprise's business processes and procedures. Despite the fact that those working in finance and supply are not directly responsible for patient care, the reality is that their work is extremely important to supporting quality patient care and clinician competency.

Healthcare is far different in its expectations for enterprise-wide systems and solutions due to the nature of the business. The concern that errors in the processes and technology can lead to severe and undesired outcomes has far greater impact than any other industry with ERP and SCM needs. That is why it is alarming that while clinical systems and medical devices continue to evolve, thus contributing to greater and more positive outcomes, the current ERP and SCM solutions are built on 20- to 40-year-old technologies, programming languages, and architectures.

Every technology department has experienced integrating their ERP and SCM information systems with proprietary and cumbersome clinical systems, which are defined in specialties and single purpose roles. In addition, the information remains separated requiring several databases and stores, which are incompatible and not designed to work together. The crisis in healthcare has moved from the operating room to the server room with a need for greater response from the ERP and SCM IS vendors. The healthcare environment and the systems that support it have become too difficult for users to fully utilize all the system capabilities. With constrained budgets and limited resources, the entire system to support the hospital's business administrative needs becomes a conglomeration of excel, post-it notes, e-mails, and bytes.

Enterprise Resource Planning

ERP is defined as the set of applications supporting the business functions in accounting and human resources. SCM are those applications which support the operational functions in several department: materials management, supply chain, purchasing, nursing, pharmacy, lab, linens, dietary, and clinical engineering. Training is typically performed to meet the needs of the specialty departments because those systems are specific in their language and use, requiring greater focus on patients' needs, whereas ERP systems training is less frequent and not as thorough, leaving the users to their own means in performing their functions.

All ERP and SCM tools are designed for the same needs without regard to the size of the organization. The vast HCA integrated network of providers uses the same ERP and SCM systems as a small 200-bed regional-based hospital. The lack of technological sophistication and increased complexity in the business office not only burdens the clinical and medical staff, but anyone responsible for patient care—from birth to death. It is not just an enterprise problem but a life cycle one, too. It takes great vision and operational fortitude to understand the vast requirements to implement the ERP and SCM systems, strategies and solutions needed to support the healthcare industry. The leading ERP and SCM vendor in the United States, based on

number of installations, is St. Paul, Minnesota-based Lawson. With a 75% share in the healthcare industry, Lawson developed its healthcare industry solution by modifying its service-based software and increasing its healthcare offerings to address the industry's enormous data and processing needs. Since late 2005, Lawson has embarked on a complete redesign of its ERP and SCM systems which will decrease source code and simplify implementing their solution from the user perspective. In addition, Gartner has redefined the healthcare systems map and identified that the solution set for ERP and SCM belongs to the family of applications called corporate and institutional administration. Within this application set belongs human capital management, payroll, and benefits; financial and accounting management; supply chain management; and infrastructure and security.

Defining what systems solution is appropriate is not Gartner's domain, but nearly all Tier 1 and Tier 2 ERP and SCM vendors have the functionality as described by Gartner's map.. What is more important is to identify the systems strategy and road map that will allow the integration of disparate smaller technological solutions that attach to the much larger ERP and SCM systems because the reality of every hospital is that there will be a core solution with ancillary specialty-specific solutions.

The core ERP and SCM solution should be able to send and receive data from any other system to allow a seamless flow of information and processes from one end of the supply chain to the other, as well as from one end of a business cycle to the other. The evolving business needs are a result of the ever changing demands of the healthcare market driven by patient, regulatory, government, financial, and environmental conditions which seem to be getting more difficult for the industry. There is not one vendor solution to address the needs of each hospital and that is the technological reality of aligning to the vast business needs in healthcare.

Financial Management Information Systems Functionality

Healthcare is a service industry and no ERP vendor has addressed the needs of this industry better than Lawson. With its focus on the services industry and SMB market with subsequent acquisitions to fill out its SCM offerings in healthcare, Lawson positioned itself as the premier healthcare ERP and SCM vendor starting in 1996 through the re-deployment of its product solutions. Other vendors, such as Oracle, SAP, Ormed, Meditech, and McKesson have the same functionality, but only Lawson's Healthcare Solution, Oracle's E-Business and PeopleSoft Enterprise Financial, and McKesson's Pathway Financial Management product have been consistently identified by KLAS Enterprises as a core solution in Financial and Accounting Management.¹ SAP has targeted the healthcare market, but software licensing and maintenance expense is cost-prohibitive to the market. Healthcare providers determine their budgets based on expected patient census and the ability to forecast is as difficult as any other business.

Uncertainty in connecting all the comprehensive financial processes and systems pervades all of healthcare technological solutions. Thus, detailed planning is a crucial step in managing the financial health of all healthcare providers. Within financial and accounting management, the needs are operational and analytical with very large shoes to fill in creating a model that can drive daily operations. The core financial applications are general ledger, accounts payable, accounts receivable, and asset, grants, and cash management. As the population grows over the

¹ Top 20: 2006 Mid-Year Report, June 2006, pg. 30 www.healthcomputing.com, KLAS Enterprises

next 10 to 15 years, hospitals will need to fund construction and building projects to meet market demands. This requires a project accounting and management tool set. Chief financial officers and their planning staff will need to have business intelligence and performance benchmark tools to support the execution of their annual strategies. Change is creating enormous opportunities but also causing a change in how hospitals are managed.

Human Capital Management Information Systems Functionality

Within human capital management, the healthcare industry has talent acquisition and retention needs that are highly demanding in managing the personnel, training, position, payroll, benefits, and absence information needs of providers with thousands of employees. An average hospital in the United States has approximately 100 beds requiring as much as 1,500 employees working 24/7. With declining operating margins since 2003, the need for efficient operations underscores the talent management requirements which are becoming increasingly difficult with as many as 72 percent of the providers claiming a shortage in skilled resources. By 2020, more than 88% of the states will experience a shortage of nurses or RNs. The objectives over the next decade will be in the identification, acquisition, retention, and training of as many skilled clinical and administrative resources as possible. With the increased aging of Baby Boomers, the largest generational group in history, the demands will be even greater on hospitals to provide round-the-clock care and support to a diverse and challenging patient segment. Talent and skills inventory assessments must be highly comprehensive to identify all potential resources.

Supply Chain Management Information Systems Functionality

Any SCM information system should have the ability to support the following functions: store room and warehouse, inventory control, demand planning and forecasting, requisitioning, purchasing and receiving, distribution and replenishment. The need for greater operational efficiencies is being driven by financial pressures to reduce costs. With supply costs as high as 25% of the budget, there is a demand for SCM systems to not only procure supplies, but to analyze the periodic spend and use the supply data in value analysis and forecasting programs. SCM systems are the least integrated of all the systems. The supply needs of any hospital are supported by as many systems as there are specialties and departments creating a hodge-podge of technology with very little transfer of data. This scenario does not allow for planning as the data is not coordinated or shared. The primary item master has tens of thousands of supplies but accounts for as little as 10% of the total number of items used in patient care. With all this disparate and incongruous data, the ability to manage supply costs and processes is difficult, with no end in sight. Every SCM is designed as a proprietary system with its own data store or database. The incompatibility can only be addressed by having a core SCM with the ability to receive and send data seamlessly. Lawson has developed several import and export utilities which allow integration to its SCM IS with many of the department specific SCM solutions, such as Omnicell and Pyxis. In looking for right core SCM solution, the ability to integrate with all other SCM solutions in the market is a requirement.

Service Oriented Architecture

A key architecture consideration with ERP and SCM IS is the ability to integrate at any level from the database to the application to the user interface. This allows greater flexibility in the decisions to integrate the processes, procedures, and tools. As a result, many of the vendors are migrating to a service-oriented architecture (SOA) which is a mechanism for defining business

services and operating models, providing a structure for IT to deliver against the actual business requirements and adapt to the business, and properly presenting the business view. The original ERP and SCM solutions had this intent but the execution seemed to get away from them under the enormous complexity of the original architectures. Many ERP and SCM solutions contain hundreds of tables and forms. Much of the solutions are under-utilized due to their complexity and lack of training.

SOA benefits are flexibility and reusability, but what does that mean for patient care and meeting the needs of the healthcare industry?. Key business considerations are that SOA generates new revenue, optimizes the cost/margin advantage, and enables a zero-integration enterprise specifically through Web services—all areas of need for the healthcare industry. However, any technological change requires a view into the organizational and cultural changes that precede it. SOA is a highly ambitious and difficult goal to achieve and requires that the architectural changes occur first in an enterprise-wide technological solution such as ERP and SCM.

The componentization aspects of SOA follow the need for the healthcare industry to adopt single points of entry for its processes that are shared between many departments and functions. How this is achieved is through a complete understanding of the healthcare value chain, which starts at the strategic view of the enterprise and decomposes to the task level. In this analysis, the organization is better able to identify duplicate processes and systems. In one mid-size hospital, there can be as many as 90 ERP and SCM systems and functions. The amount of duplication is untenable and requires multiple resources to maintain the same data and similar systems. With an SOA, service reusability increases systems interoperability, communication, and standardization. Data transformation is seamless between service producers and consumers.

Healthcare ERP and SCM Trends

With the enormous changes and market demands facing healthcare providers, it will be necessary for the tools and technology to evolve and align strictly to the corporate objectives and high-levels of clinical quality. The teams needed to implement these changes will need to transcend departmental barriers and instead of function processing, providers will need to create solution processing. Integration of services will eliminate single-task processes and re-define work flows into a seamless cycle eliminating functional silos. The procure-to-pay cycle currently involves a costly mix of resources and procedures that for many organizations can cost more than the item being purchased. Acquisition costs on a per order basis can be over \$100 for what is essentially a paper process in many organizations. The need to cut costs will require a new supply chain with less links and more efficient tools and techniques and one that appears to be one system but with many solutions. Through SOA, ERP and SCM will eliminate redundancies, providing proactive transformation of data for better, informed decision making. The business rules are changing and the need to transform systems and technology on the fly by the solutions team instead of the technology team will create better utilization of information-based resources. Technologists will change from data manipulators and data entry workers to service managers with an eye toward empowering users with the technology and tools needed to meet business needs within days rather than months or years. ERP and SCM vendors that comply with this technological transformation will be long-time partners and facilitate healthcare's paradigm shift toward a more superior business model.

Conclusion

The changes in the healthcare industry are enormous, requiring vast transformations in the value chain and the provider's ability to deliver quality clinical care. Gartner has indicated that ERP software for the healthcare industry will grow 8.8 percent worldwide through 2009. In North America, the market will grow 8.7 percent. Organizations unable to meet the demands of the market are suffering from information overload, lower patient census, increased supply costs, decreased Medicare reimbursements, and shortages in skilled labor—leading to bankruptcy or financial ruin. Enterprise technological solutions can greatly mitigate or eliminate cost and productivity problems. As cross-functional teams address process flow and systems integration problems, SOA-based ERP and SCM information systems will be tools in the drive to increase quality and safety through seamless integration and coordination of the procure-to-pay, order-to-cash, and financial reporting cycles. Providers need to have enhanced solutions and technological innovation to meet their annual objectives and long-term strategies. It should not take an 18-month re-implementation of their ERP and SCM systems to do so. Quick and agile changes by the users should be the norm, not the exception. To enable the intended outcome requires executive support, trained resources, dedicated cross-functional teams, and an effective relationship with the ERP and SCM IS vendors.

Bibliography

Zelman, William N., Michael McCue, and Alan Millikan. *Financial Management of Health Care Organizations: An Introduction to Fundamental Tools, Concepts, and Applications*. Maiden: 1998.

Marks, Eric A., and Michael Bell. *Service-Oriented Architecture: A Planning and Implementation Guide for Business and Technology*. Hoboken: 2006.

Brady, Joseph A., Ellen F. Monk, and Bret J. Wagner. *Concepts in Enterprise Resource Planning*. Boston: 2001.

Ptak, Carol A., and Eli Schragenheim. *ERP Tools, Techniques, and Applications for Integrating the Supply Chain, Second Edition*. Boca Raton: 2004.

Burns, Lawton R. *The Health Care Value Chain: Producers, Purchasers, and Providers*. New York: 2002.

Schneller, Eugene S., and Larry R. Smeltzer. *Strategic Management of the Health Care Supply Chain*. San Francisco: 2006.

Porter, Michael E., and Elizabeth Olmsted Teisberg. *Redefining Health Care: Creating Value-Based Competition on Results*. Boston: 2006.

Eschinger, Chad, and John-David Lovelock. *ERP Market Share and Forecast Executive Summary*. Stamford: 2006.

Top 20: 2006 Mid-Year Report, June 2006, pg. 30, www.healthcomputing.com, KLAS Enterprises, LLC.