

“Smart Pharmacy” Master Blends Integrated Supply Chains with Patient Care to Uphold Regulatory Compliances

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Abstract—Hospitals require better information connectivity because timing and content of the information to be traded is critical. The imperative success in the past has generated renewed thrust on the expectations and credibility of the current enterprise resource planning (ERP) applications in health care. The desire to bring improved connectivity and to match it with critical timing remains the penultimate dream. Currently, majority of ERP system integrators are not able to match these requirements of the healthcare industry.

It is perceived that the concept of ERP has made the process of segregating bills and patient records much easier. Hence the industry is able to save more lives, but at the cost of an individual's privacy as it enables to access the database of patients and medical histories through the common database shared by hospitals though at a quicker rate.

Businesses such as health care providers, pharmaceutical manufacturers, and distributors have already implemented rapid ERPs. The new concept “Smart Pharmacies” will link the process all the way from drug delivery, patient care, demand management, drug repository, and pharmaceutical manufacturers while maintaining Regulatory Compliances and make the vital connections where these Businesses will talk to each other electronically.

I. INTRODUCTION

“Smart Pharmacy” is a wireless pharmacy and a new concept that we are building to connect patient care, drug delivery, and repository all the way to pharmaceutical manufacturing through a simple ERP pipeline. Wireless Pharmacies will be the next big stride in the ERP industry that will integrate automated drug delivery, data accuracy, efficiency, and tight inventory control through simplified, hand held devices to scan prescription barcodes to ensure system enabled delivery of drugs to patients. In ERP terminology, the system will control prompt goods receipt, bin transfers, and also enable shipping for on-line drug prescriptions. Stock levels will be monitored and shelf-life maintained through remote operations by top vendors. Shipping multi-media data formats will also be supported in the case where pictures of a palate on the shipping documents are needed to decrease the number of lost packages that traditional pharmacies and healthcare businesses occasionally encounter.

This concept is still under detailed purview and will be discussed in the conference. Please refer to figure 1.1 for detailed architectural level analysis. The paper discusses these ERP functionalities and their impact on the “new”

integrated system.

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II. SHELF LIFE COCKPIT

The Shelf Life Cockpit is a plug and play solution package that is currently applicable only with SAP ERP. This monitor analyzes the stock and requirement lists to identify those amounts of drugs that could expire. The cockpit contains conflict indicators for expiring quantities of material, as well as detailed information about the corresponding expiration dates. For further analysis of these conflicts, a drill-down function is available to support the user in detail. This ERP feature will be integrated with “Smart Pharmacy”, thus utilizing what is already available as best of the breed. Please refer Figure 1.1.

III. CONTROLLED COSTS

Multi-functionality healthcare units are already enjoying the benefits of implementing ERP and the subsequent efficiency and cost benefits while also achieving the status of “Elite hospital”. Reduction in expensive IT staff and subsequent cost benefits constitute one of the important deciding factors for Managements.

IV. BUSINESS IMPACTS ON ACQUISITIONS AND AMALGAMATIONS

Hospitals are an emerging drift in the commercial sector since they have started to occupy all the characteristics of a business entity. The corporate atmosphere stands true not only in rules and regulations but also in the above said operations. In this context it becomes difficult for hospitals to integrate the operations irrespective of whether or not they have already gone for ERP. The maneuvers and restructuring will not only be a twinge to the administration and chartered

accountants or company secretary but also for the ERP vendors that will be made easy through the plug-in-play “Smart Pharmacy” concept.

V. WORK CULTURE

The working pattern of ERP software is intricate and requires a high level of expertise for managing healthcare and pharmaceutical manufacturing processes. Therefore, new generations of System Integrators and Practitioners have evolved that have hands-on configuration experience on ERP systems specific for US Food and Drug Administration (FDA) controlled planning and manufacturing to bridge this vital gap (refer Figure 1.1).

The nature of operations for “Smart Pharmacy” requires “24 hours and 365 days” of consistent planning and execution capabilities. This requires a motivated obligation to work at any time to feed the hungry and to provide medicines to the deserving.

VI. ELECTRONIC SECURITY FOR PATIENT’S CONFIDENTIAL INFORMATION

The databases of patient records helps in treatment for any doctor and in any hospital as a part or of the ERP system. This has raised lot of questions on the basis of confidentiality. It has been misused by medical institutions for commercial purposes. “Smart Pharmacy” overcomes this drawback in the integrated system design.

VII. IMPACTS OF “SMART PHARMACY” ON PHARMACEUTICAL MANUFACTURING AND DISTRIBUTION ERP PROCESSES

Pharmaceutical manufacturers and distributors face significant challenges such as increasing costs, government regulation, safety concerns, margin pressures, traceability, constant changes in drug discovery, and managing Supply Chains to maximize profitability, and reduce product recalls. Other inherited challenges include complying with the Bioterrorism Act and managing expiration dates that are being addressed by the new “Smart Pharmacy”.

Pharmaceutical manufacturers are realizing that ERP can aid to integrate recipe management, inventory control, regulatory reporting, production, QA/QC, purchasing, sales, costing, accounting, serial numbers, and decision support system (DSS) - in one structure. Features such as bar coded lot tracking, material requirements planning, and automated labeling can help pharmaceutical manufacturers and distributors to reduce costs, increase product quality, improvise safety, and reduce wastage. All these aspects will be linked through the efficient “Smart Pharmacy” into an integrated system as shown in Figure 1.1.

a. Flexibility and efficiency are critical

The product cycle changes constantly because of trends in

drug consumption. The retail customers often demand changes in packaging, content, and label within weeks. Being able to change manufacturing process for producing multiple products without losing efficiency is crucial. Low Turn-around-times (TaTs) is a challenge as many products have a limited shelf life, mistakes could be expensive and result in much wastage. “Smart Pharmacy” connects the integrated pipeline and eliminates this speculation.

b. Responsive to patient demands

Goal of this new technology is to reduce lead times, cut costs and become more responsive to patient demands. Business benefits include a greater control and forecasting capabilities. Material Requirement Planning (MRP) tool is ideally resourceful. Since the Orders are booked continuously, challenge is to how often run MRP because the process utilizes all critical resources during the cycle. ERPs need to be strong on recipe management, which is at the core of MRP for process industry, in which liquids flow through pipes and go in different directions according to customer demand. Please refer Figure 1.1.

c. Real-time information about hospital needs

“Smart Pharmacy” will update real-time information on changes in demand and stock levels arriving via electronic data interchange (EDI). Information on products and ingredients will be available at each stage of the manufacturing process so that changes in production schedules can be assessed in realtime. “Smart Pharmacy” will simplify dispatch routines, thus reducing delivery lead times, improving patient service levels and overall responsiveness of the integrated system as shown in Figure 1.1. The system will create invoices as soon as items are dispatched electronically for effective accounting and cash flow management.

VIII. SEAMLESS INTERFACE TO OTHER BEST OF BREED APPLICATIONS

“Smart Pharmacy’s” ability to interface easily to other systems and process control equipment will provide the freedom to pick best-of-breed applications to fit other parts of the business. One of the biggest benefits of this new system will be that the staff would react more quickly when problems or errors are identified because the system will be quick to draw their attention to the problem.

IX. PRODUCT INFORMATION FOR ENHANCED PATIENT SERVICE

Another advantage of “Smart Pharmacy” system will be the inherited Quality Management module, with its capabilities in defect tracking, usability decisions, and tracing ingredients throughout the entire manufacturing

process, dramatically reduces the need for paper. This new ERP system links corporate offices to the production floor. It helps towards the purchase of common packaging, and the flow of raw materials into the factory can be much better controlled. Thus enabling rapid awareness of product dispatch to assist in producing accurate invoices.

X. CONCLUSION

“Smart Pharmacy” is a concept that we are building currently at architectural level that was discussed in this paper. The paper also discusses about the relationship this pharmacy will have with available ERP functionality at the hospital, drug prescription, repository, and pharmaceutical manufacturing levels (refer figure 1.1). The complexity and volatility of the health care management industry demand specific solutions to integrate the prescription, patient care, and drug delivery processes at optimum cost that was analyzed in this paper. Shelf-life monitoring, regulatory compliances, and new dimensional threats such as bio-terrorism can be simply handled by adapting to this New Generation ERP Concept to serve the patients.

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