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IMPLEMENTING HEALTH INFORMATION TECHNOLOGY for **RHIO SUCCESS**

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Overview

Healthcare communities across the United States continue to adopt new approaches to better serve an increasingly complex patient population. Improved patient safety, streamlined provider workflow, more rapid and distributed access to medical information and better clinical audit all place strains on healthcare infrastructures that were originally designed for a single entity approach. With the maturation of electronic health records and Regional Health Information Organizations (RHIOs) to address these business challenges, the focus most recently has shifted to patient-centered healthcare that requires a new level of integration between services and IT systems. As a result, clinical and business transformation of healthcare infrastructures has become central to the U.S. political agenda, aiming to involve consumers, physicians, payers and employers as never before.

The Department of Health and Human Services has responded with a "Framework for Strategic Action" to deliver fundamental transformation of healthcare IT and information services through three interrelated objectives. Its impact is being felt across the entire healthcare continuum:

- Clinicians are integrating their independent record and technology assets to create agile, patient-centered electronic health records to realize new levels of patient safety and information exchange through regional and national ways of working.
- RHIOs are bringing together distributed enterprises and investing in standards for data sharing and integration across care settings.
- Clinical transformation and interoperability of health information technologies on a national level is rapidly advancing health information exchange and driving public health initiatives such as the Public Health Information Network for disease surveillance.

The Integration Challenge

For a number of years, leading hospitals have been using integration technology to capture and control the flow of important patient and procedure information across departments such as Patient Administration, Radiology, Pharmacy, Laboratory and Emergency. The benefits of this approach are well documented and include faster and more accurate service delivery, reduced errors in diagnosis and treatment, and a reduction of administrative workload. However, the participation in HIT programs was limited to local or inter-system use, creating fragmented patient information and redundant, inefficient efforts as shown in Figure 1. Information sharing has historically consisted of manual record requests, time consuming test result investigations, inefficient claims processing and payment cycles, and laborious administrative processes that cut into business agility and market capture.

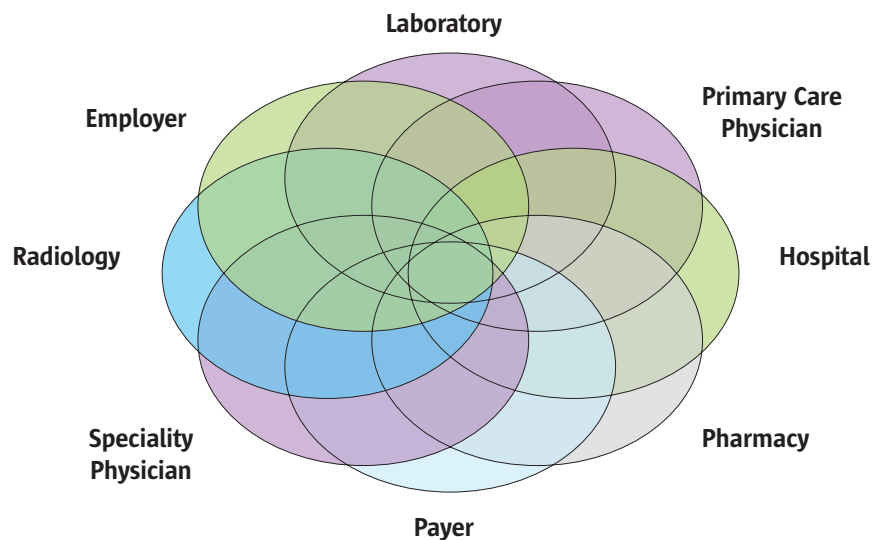


Figure 1. Redundant Information Management

In the past, healthcare organizations have taken a siloed approach to the maintenance and storage of patient record information. As such, competitive concerns, organizational mandates and privacy or security roadblocks have prevented the sharing of patient information within the health community.

To eliminate the barriers to accessing a comprehensive, 360° view into a patient's medical history, regional healthcare providers must rely on integration and single patient view technology to create a unified picture of patient identification and care episodes across their respective geographic areas. Information coordination between and across regional organizations is essential in ensuring that care providers work together effectively to support integrated care initiatives that deliver the highest levels of service and efficiency.

This interconnected electronic health information network must also capitalize on the investment made in existing legacy systems, such as provider electronic medical records and payer benefit administration systems, while allowing for the creation of new information views and processes. At the same time, remediation of duplicate records with best match and unique patient identifiers is central to delivering accurate, reliable information at the point of care. As growth must be accounted for, today's RHIOs will surely expand, and with national interoperability mandates and standards, information technology must be scalable and designed to support it.

Clinical and Business Transformation

Today, healthcare organizations are learning that patient safety and cost reduction pressures demands information be shared at the point of care and as appropriate, with payers and employers. RHIOs are central to this clinical and business transformation, offering payers and providers access to Web-enabled, secure longitudinal views of electronic health records across disparate technology environments. Creating such a common framework for connecting community health organizations requires robust health information technology that can:

- Leverage existing systems and utilize an incremental deployment approach
- Be built without a national patient ID – Supports remediation of social security numbers and various identifiers
- Safeguard privacy – Controlled access to sensitive information per HIPAA guidelines
- Interoperability - Standards-based common framework that is deployable via the Web
- Patient information - Remains decentralized, residing at source systems and is accessible via an information "spine" on demand
- Data-sharing - Initiatives have local sovereignty but follow federal standards and policies to enable interoperability and future mandates

In fact, the introduction of an integrated, Service-Oriented Architecture (SOA) for regional health information exchange can have a dramatic impact on the cost of healthcare delivery by preserving and extending current system investments. The availability of composite application development technology further enables rapid implementation of new solutions for the enterprise and eases adoption of the solutions for users. With SOA and composite applications, RHIOs can be rewarded with a rapid return on investment and lowered total cost of ownership for systems already in place, reduced administrative costs, improved physician and staff workflow and the ability to meet evolving legislative, regulatory and accreditation compliance.

Healthcare is now in the process of re-adjusting to the brave new world that is to come, where health technology suppliers, providers and payers must adapt or go out of business. The most important aspect of this adaptation is developing the capability to support the interoperability road map of sharing common data and communications standards as defined through regional and national health transformation initiatives. Going forward, this evolution of clinical and administrative processes will depend on combining information from local, regional and national systems. The introduction of business process management and composite application technology can provide the needed control to enable these "end to end" processes. The future of healthcare will certainly change for the better, eliminating the redundancy in place today and creating a centralized information management exchange as shown in Figure 2:

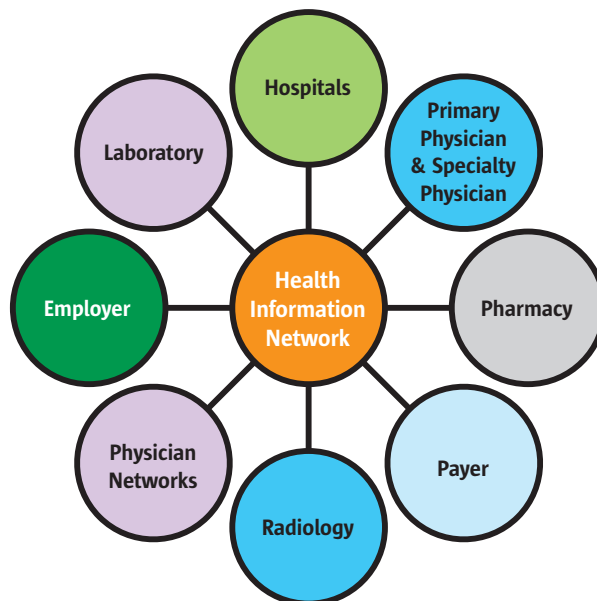


Figure 2. Centralized Information Management

SOA-based Composite Applications for RHIO Success

Beyond integration, utilization of a Service-Oriented Architecture (SOA) can enable the RHIO to integrate previously siloed, redundant and inflexible information systems while rationalizing and extracting greater value from existing technology assets. The way to unlock this value and dramatically improve operations is to assemble the appropriate pieces of existing technology to create new, flexible, integrated composite applications. Composite applications are enterprise-scale, interactive, end-user applications that span multiple, cross-organizational business processes to provide the right data to the right people, systems and devices at the right time.

Beyond enterprise application integration (EAI), SOA-based composite applications bring together people, processes and systems as never before. People are able to visualize and control business processes and identify opportunities for automation and exception escalation. Processes can be optimized through business process design and execution, thereby streamlining and coordinating people and processes within and outside the enterprise. At the same time, SOA enables organizations to leverage existing systems to support new and existing business processes. In essence, composite applications facilitate RHIO success by unlocking the value of existing IT infrastructures and human assets for business adaptability and flexibility.

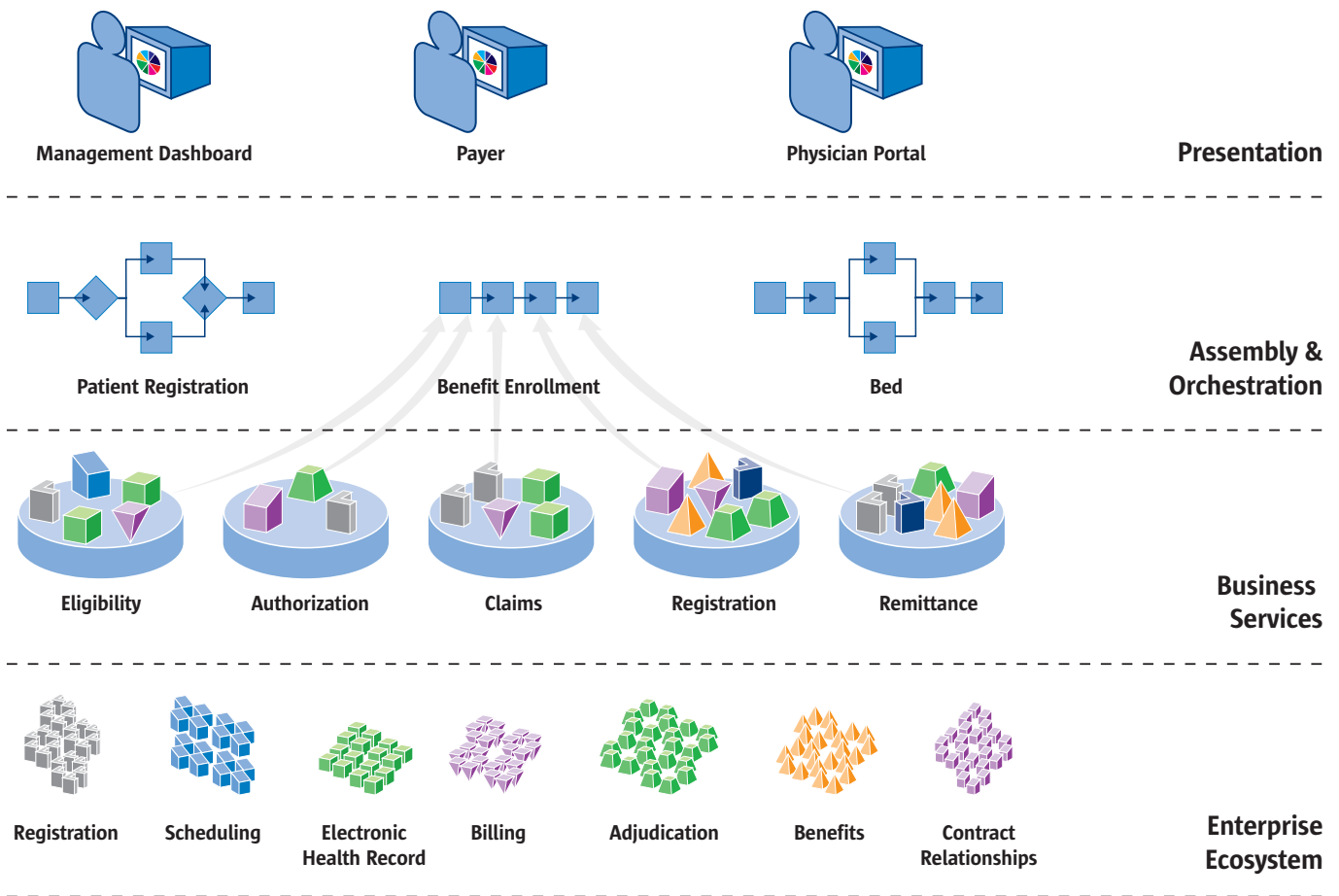


Figure 3. A Service-Oriented Architecture for Healthcare

Creating a single view of the patient is at the center of many of the new regional and national initiatives, whether to support integration of clinical processes across departments, integration of clinical processes at a regional or national level, or emerging initiatives such as member self service across multiple channels. A key premise of many of these initiatives is that patient information, once captured, should be available for use across all potential care processes. This can prove to be very challenging as patient information is stored differently in each IT system and the patient identifier conventions used are often not the same.

Creating the single patient view is only the beginning of how a RHIO can contribute to the overall success of the healthcare entities it represents. Additional business objectives such as HIPAA transaction management, Electronic Health Records and Physician Portals lend themselves to RHIO-specific composite applications that offer a flexible and reliable means for the collection and exchange of disparate data. The management of HIPAA claims with accuracy and proficiency within a single gateway provides tailored Business Activity Monitoring (BAM). Subsequently, electronic health records and physician portals connect multiple information systems and clinical applications to deliver an effective resource for on-demand patient information sharing amongst clinicians, hospitals and health systems. Further, business process improvement and workflow-based composite applications make the most of Web services, systems, people and organizations while saving tens of millions of dollars in new system investments. By creating a technology environment that is flexible and responsive, control can be given to the RHIO, its clinicians and business partners.

Because each RHIO is unique, the solution for creating this foundation for healthcare IT infrastructure must be responsive and adaptable to each organization's specific business requirements. The creation of composite applications to meet those requirements is not a vision for the future. Rather, customized and comprehensive information views to match specific RHIO needs are available today.

The Sun Java™ Integration Suite, formerly the SeeBeyond Integrated Composite Application Network™ Suite (SeeBeyond ICAN Suite) is a highly productive, scalable and open platform for developing, executing and managing end-to-end, integrated business processes as composite applications for Regional Health Information Organizations.

The Java Integration Suite is the first business integration platform to go beyond the traditional realm of EAI. Sun's innovation in providing rapid access to customized management of information across all systems, applications, and enterprises on a regional, national and global basis is paramount to the RHIO mission.

As seen in Figure 4 below, Sun enables the management of information across the continuum of care and brings value to the Regional Health Information Organization by facilitating business activities and communication.

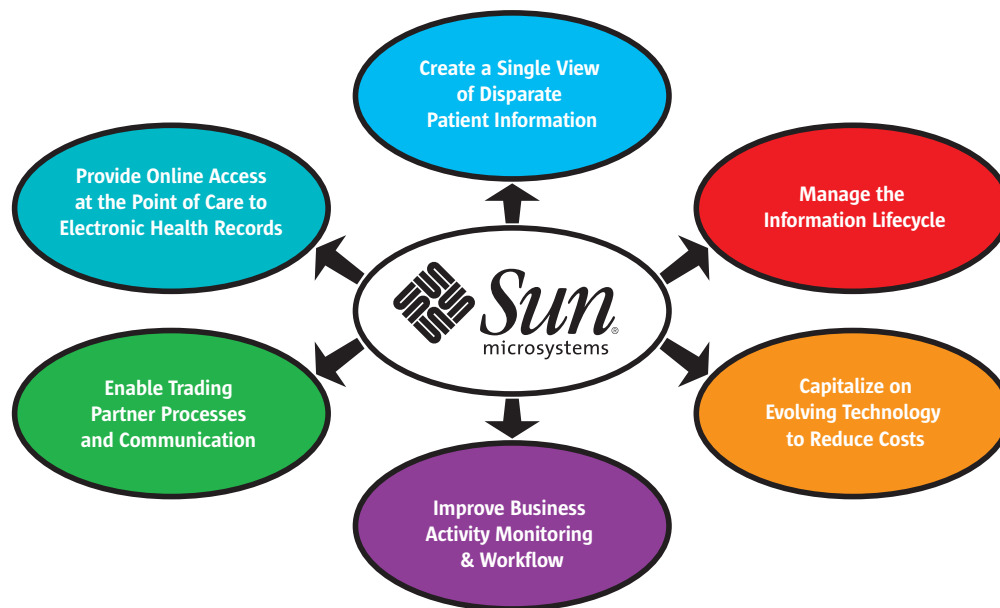


Figure 4. Enabling Information Management

Expertise in Regional & National Health Initiatives

A leading supplier to the healthcare community for many years, Sun delivers SOA-based composite application solutions that produce real results. Sun solutions have become the standard for healthcare infrastructures worldwide. In the U.S., Sun solutions are used in over 800 hospitals and regional EMPs (Enterprise Master Patient Index). In Europe, Sun is used by over 450 hospital sites and trusts. Most notable is the use of Sun as part of the United Kingdom's National Health Service National Programme for IT. Sun was selected to support the integration and single patient view solution as a national application service provider (NASP) and to provide the integration solution for three of the five regional local service providers (LSPs).

National Programs

National healthcare initiatives are applying many of the concepts introduced at the regional level and augmenting these with new capabilities to deliver a consistent set of services and a unified view of the patient across entire nations. The U.K.'s NHS National Programme for IT (NPFIT) is the most advanced of these initiatives and is delivering an IT information infrastructure for the NHS that will improve patient care by increasing the efficiency and effectiveness of clinical and other NHS staff. This involves the rollout of common, regionally supported systems for key healthcare processes; sharing 50+ million electronic patient records, on-line booking of appointments across a range of 250+ hospitals, electronic transfer of prescriptions, patient demographic services and services to provide feedback on quality of care. Other current national initiatives include a central repository for pharmaceutical information, increasing access to health care of high quality in rural areas, streamlining the claims and payments process through the use of smartcard technology and the regulation of direct patient access to certain health care providers such as hospitals.

The Java Integration Suite is being used by **British Telecommunications PLC (BT)** to help deliver and manage a national patient record database and transactional messaging service which forms a core part of the NHS Care Records Service. As a National Application Service Provider (NASP), BT is using Sun as the Web Services and J2EE based integration platform for business process management within the transactional messaging service initiative. Sun is also being used as the basis for the NHS Care Records Service to record and cross-index patient and care information electronically, for the purpose of eliminating duplication of patient files and improving information-sharing.

The General Medical Services (Payments) Board in Ireland is responsible for processing more than 40 million transactions from 5,000 primary care contractor. Sun is being used to integrate payment data coming from eight regional health authorities, matching it against a central index of claimants called the Central Client Eligibility Index (CCEI). Using the CCEI, the board is able to quickly verify the accuracy and validity of submitted claims on behalf of the Regional Health Boards. In addition to processing payments more quickly than before, the system is able to realize a cost savings of several million euros annually through the elimination of duplicate or erroneous payments.

Regional and Local Healthcare Providers

Capio AB is a market leader in the European health and medical care industry, with operations in its Swedish home market and six other countries. In addition to providing healthcare and diagnostics services for private patients, it carries out work under contract for national health services in different countries. Capio chose Sun to manage the flow of information between PeopleSoft OneWorld and local Patient Administration Systems (PASs) such as SHS in France and Cambio in Sweden and the U.K. Information relating to customers, including insurance companies as well as patients, is extracted from the PAS using Sun SeeBeyond eGate™ Integrator and then fed into the ERP system for billing and accounting purposes. Capio has also taken advantage of the B2B functionality of Sun SeeBeyond eXchange™ Integrator to streamline the procurement process. Direct links have been set up with specific suppliers and information relating to orders is automatically routed to and from the core ERP system.

Oberösterreichische Gesundheits-und-Spitals-AG is the largest hospital operator in Upper Austria, with 13 hospitals and 8,500 staff. The hospital uses Sun to manage the flow of information coming from 400 interfaces across 50 heterogeneous IT systems to deliver accurate and timely data to medical staff while considerably reducing time in areas such as patient administration. Access to data across the group also allows gespag to plan and schedule more effectively, eliminating unnecessary use of resources in areas such as bed occupancy.

Salford Royal NHS Hospital Trust is one of the largest Health Trusts in the U.K., servicing a population of over 300,000. It is using Sun to manage the integration of information from patient administration, pathology, radiology and other systems with a central electronic patient record system to provide the ward and consultants with a list of patients and their results in real time. All such information about a patient is visible to a caregiver on one screen, thereby improving the service that patients receive, both within the hospital and as an outpatient.

CHL – Le Centre Hospitalier de Luxembourg is a principal hospital centre in Luxembourg, with 1,300 employees and 500 beds, treating 20,000 patients annually. CHL is using Sun to link SAP HIS (Hospital Information System) with a range of disparate systems including Radiology, Cardiology, Surgical, Laboratory and Picture and Archiving System (PACS). The ability to provide a seamless flow of information throughout the patient admission to discharge cycle has resulted in reduced operating costs and enhanced quality of service. Today, invoicing consistently includes all treatments – something that was difficult to achieve in the past. In addition, CHL now has real-time visibility of all services and results, with the automated management of errors and exceptions. Sun has also been used to exchange information with other hospitals and third parties in the health sector.

Sun Health Services Framework

Sun offers a comprehensive framework for the collection, management and exchange of health data and enables the creation of new business processes leveraging existing infrastructures. This is achieved through the deployment of Packaged Composite Applications (PCA's) based on a Service-Oriented Architecture (SOA) – all delivered with the support of a superior Professional Services team and powered by the Java Integration Suite.

This framework covers all of the major aspects of healthcare integration, enabling you to implement best practice services in a rapid and robust manner.

For the first time, healthcare professionals now have access to an overview of patient medical data, which can be used for the documentation, planning and administration of all aspects of healthcare services across departments, regions and even nations. With the aid of Sun's advanced information management functionality and composite applications, a patient's progress through the healthcare chain can be logged and monitored to improve the standard of care with all relevant data available on demand for decision-making purposes.

Sun is uniquely able to provide better service as the only vendor to offer an integrated package of application-to-application integration, organization to organization integration, master patient indexing, business process management, human workflow management and an integrated patient access and update portal (Single Patient View). Sun's solutions provide a flexible infrastructure for hospitals, regional and national projects including the creation of Electronic Health Records and Physician Portals that span the care continuum.

As a leading supplier of integration solutions to the healthcare industry, Sun has unparalleled expertise in helping hospitals, regional healthcare providers, payers and employers deliver the next generation of health care systems for business success. Sun's proven composite application technology is now accepted worldwide as a key platform to enable this transition. Sun solutions augment the strengths of distributed core clinical and administrative applications to deliver the flexibility needed to support the aggressive evolution of healthcare infrastructures towards regional and national healthcare objectives.

Learn more about Sun's offerings at
<http://www.sun.com>

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