



# **Integrated, Real-Time Decision Making:** A Prescription for Improving Patient Outcomes and Your Bottom Line

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## INTRODUCTION

Almost universally, hospital executives state their mission this way: “Deliver the best possible care for patients while being fiscally responsible.” To achieve this goal they must resolve what is sometimes seen as the tension between optimal patient care and costs. And when in doubt they usually and understandably err on the side of patient care.

As a result, many hospitals have succumbed to the “build it and they will come” syndrome. In the laudable desire to ensure that no detail is overlooked they proliferate systems and processes. But because these systems and processes have grown tactically rather than strategically they often remain unintegrated, highly specialized and inflexible. The inability of these disparate systems to consolidate and share data can lead to the very problems of patient care they are intended to prevent – and the ballooning of costs they should help to control.

Experience in numerous industries, including healthcare, has shown that integrated business and data systems lead to greater effectiveness and greater efficiency. Such a proven set of capabilities forms the basis of the majority of financial transactions in the United States. According to a leading market research firm, more than half of leading process-centric companies and more than one-third of the top 25 process-centric healthcare companies use such capabilities to provide the end-to-end process visibility required to cost-effectively deliver superior service.

To help you explore the potential of these capabilities for healthcare organizations, this white paper will:

- Examine the reality of unintegrated processes and data in healthcare settings
- Describe a set of proven tools for achieving integration
- Offer real-world examples of healthcare organizations that are applying these tools to affect patient outcomes and control costs
- Identify proven approaches to six specific and highly critical challenges for healthcare organizations
- Suggest what you can do to begin achieving enterprise integration and real-time decision-making

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## TODAY'S REALITY

Hospitals today face a variety of demanding requirements and business imperatives. They need to:

- Acquire more patients and avoid losing patients.
- Adhere to applicable federal, state and payor requirements without adding extra work to already highly utilized staff. This is a moving target for healthcare institutions. For example, since 2005 the Centers for Medicare and Medicaid Services require reporting on 10 metrics. In 2010 the number increased to 72 metrics. And, most recently, healthcare institutions must address the specifications around “Meaningful Use” tests and reporting to qualify for government funding.
- Eliminate adverse events and reduce patient wait times. Today, adverse events are the fourth leading cause of death in the U.S.– mostly around administered drugs. Across the U.S. today, 50 percent of patients don’t get the proper care whether it be preventative, acute or chronic. This might soon be a reportable metric that the industry will be judged on.
- Attract best possible staff and increase patient referrals.

Unfortunately, numerous obstacles hinder many institutions from fully realizing these goals. These obstacles include siloed systems with little or no integration among them, and complex IT infrastructures that are often hard-wired, proprietary, and outdated. These systems are the result not only of sub-optimal technological approaches but also of political and economic forces. They result in unwieldy processes that alienate patients, contribute to adverse events, and lag behind evolving business requirements.

### The Burden of Integration

There are many nodes of information in healthcare institutions: clinical systems, administrative systems, PACS system, monitoring databases, diagnostic repositories, drug information systems, external systems, and more. However, due to the lack of integration the data in these systems is not contextualized in a way that provides information that can be used by caregivers. Often, the burden of integration falls on the individual caregiver at the point of care, or what we call ‘the patient-based moment of truth.’ Without the proper information at the proper time, caregivers must make decisions based on experience, not on information. These decisions are not just mission-critical, but can also be matters of life and death.

### Process Complexity

Consider a typical business process within a healthcare institution, whether it’s patient admittance from the time they come through the ER to the time they are moved into a room, or any of many other processes. Typically, these processes are quite complex, consisting of many steps that can occur sequentially or sometimes concurrently. A single business process can actually span many departments, service lines, and political boundaries within an institution. These additional layers of complexity can make it difficult to ensure smooth hand-offs and efficient processing, and can hinder the ability to pinpoint the bottlenecks. In fact, when a well-known major consulting firm was hired to map the processes for NASA and highlight problems the project took less than one year. The same consulting firm worked for two years on mapping the processes at a major healthcare provider and gave up.

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## THE PATH TO INTEGRATION

You can cut through the complexity and achieve visibility of your processes and business within your institution and across your external partners by moving to a much more flexible IT architecture. Unfortunately, today there are few interconnected systems, and those that are interconnected typically use point-to-point interfaces that require pervasive modifications to accommodate changes to business requirements, making it difficult to comply with evolving mandates. Users must navigate through multiple functional systems to perform a single task. They may have 20 percent of data at their fingertips and then need to get the other 80 percent from other systems. The individual systems don't communicate easily across functional, political, or technical boundaries, which makes it difficult to share information or reuse functionality.

### Service-Oriented Architecture

Often the first step in moving from point-to-point data collection to an integrated enterprise is to integrate existing data, eventually evolving to the integration of business and clinical functions. This is the path to Service-Oriented Architecture or SOA.

SOA provides the flexible information architecture required to decouple business functions from hardwired, monolithic legacy applications. Application components or "services" are well defined using common interfaces; they utilize a contract to define how services will be invoked, and they interact in a loosely coupled manner. In this environment, the terms "client" and "server" are purely situational. At one moment, an application could act as a client by calling an external service, while moments later, it may act as a service-provider when called by another application to perform a task. When properly implemented, SOA ends the building and maintenance of point-to-point integrations. Using SOA, you can generate new services in a flexible and agile way by combining existing logic and exposing it via reusable services.

Once your core business functions have been exposed as services, they can be integrated across organizational boundaries. These loosely coupled services provide you with the ability to respond to changing requirements because of the layer of abstraction that SOA provides between the services and the underlying technology. Meanwhile, SOA governance tools ensure that services and other assets within the SOA continually meet established expectations for security, performance, quality, and reliability.

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## Supporting Process Improvement

Achieving enterprise integration is just the first step. You still need to address the issue of multiple systems and interfaces to perform a single business function. In other words, you need a way to simplify execution of single tasks and enable integration across functional and technical boundaries.

You have no choice but to deal with such business processes. However, you do have a choice of how to improve and manage them. You can implement them through passive technological osmosis that leads to a patchwork of processes that are imperfectly pieced together with point solutions, manual labor, and expensive ERP systems. Or you can employ a reasoned, disciplined, and innovative approach that confers significant competitive advantages.

That's where Healthcare Process Automation comes into play. Using Business Process Management (BPM) software, you can combine system steps with guided human interactions to create well-coordinated business processes. Using BPM technology, business users can make changes without programming and without affecting the underlying infrastructure. This flexibility enables you to respond to new business requirements faster, especially given that you can't know exactly how those requirements will evolve.

Meanwhile, Business Activity Monitoring (BAM) software can provide you with end-to-end visibility of processes and gives you the ability to monitor them in real time. Visibility, in turn, drives change as your organization and users, now with a clear picture of a process, see ways to improve it.

In addition to providing end-to-end visibility, BAM provides real-time notifications of delays or issues within a process. You can establish and measure clinical markers or key performance indicators (KPIs) within and across the enterprise and be alerted as these markers are being approached, not after the fact.

These capabilities provide invaluable decision-support within your institution as well as across your network, delivering actionable, contextualized information when and where it is needed – without disrupting your day-to-day operations or requiring clinicians to change practice habits. With interoperability and visibility thus enabled, you can make the kind of real-time, integrated decisions that help you achieve your financial goals and fulfill your mission.

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## REAL-WORLD SUCCESSES

Many healthcare organizations are already applying these principles and tools to improve their processes. For example, TELUS Health Solutions, Canada's leading electronic healthcare solutions provider, is using Software AG's webMethods technology to create that nation's most comprehensive Electronic Health Records (EHR) system.

Of course, if asked about EHR, many institutions will say that they practice it already. But according to an analysis by one of the industry's major consulting groups, less than 3 percent of the approximately 5000 hospitals in the United States have a documentable, effective, pervasive EHR. In absolute terms, that's only 150 hospitals. Even if the figure is ten times that number, it comes to only 1500 hospitals, which suggests that the overwhelming majority of institutions would do well to think carefully about whether they have a genuine EHR.

### Toward a Comprehensive Electronic Health Record

TELUS Health Solutions is helping lead the change in Canadian healthcare through innovative and proven information communication technology. The company was ranked #1 in Branham's Top 10 List of Healthcare IT Companies in Canada in 2007 and 2008 and was named 2008 Health Company of the Year by the Information Technology Association of Canada. TELUS handles millions of healthcare transactions each year and manages more than 4 million drug cards, covering 8.5 million Canadians.

Canada is investing billions of dollars to build an EHR system that will enable healthcare providers, coast to coast, to electronically and securely access and update any Canadian's health record. By 2016, the plan is for every Canadian to have an e-health record, containing a variety of medical documents, from doctor's notes and diagnostic images to prescriptions and test results.

TELUS is delivering a Health Information Access Layer (HIAL) solution that aligns with the Canada Health Infoway Blueprint and will enable every provider in the province of Newfoundland and Labrador to access Drug Information System (DIS) data. The solution leverages Software AG's webMethods product suite for integration, Service-Oriented Architecture (SOA), governance, portals, Business Process Management (BPM), and Business Activity Monitoring (BAM).

Among the first such provincial DIS systems in Canada, it will:

- Give healthcare providers immediate access to EHRs at the point of care
- Enable updates of EHRs in real-time, 24/7, integrating data from many sources
- Improve collaboration between providers for the best possible patient care
- Facilitate new ways to share information, leading to better business processes to improve patient care
- Help healthcare providers work more efficiently, leading to lower costs and shorter wait times



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At the core of the HIAL is the TELUS Health Integration Platform, the foundation of many TELUS offerings, which is based on the webMethods Enterprise Service Bus (ESB). The Health Integration Platform brings together data from virtually any system, including care-provider registries, domain-specific clinical data repositories, hospital-based clinical information systems, and pharmacy practice systems.

To access the DIS data, healthcare providers can use a portal, such as the Care Provider Portal TELUS developed using webMethods technology. They can then update the EHR data in real time, so that the next provider has the latest, most accurate patient record. Providers can also access the same data through their EMRs connected to the HIAL.

Benefits of the system include:

- Delivering complete patient data at the point of care
- Saving lives by reducing errors and keeping providers informed
- Reducing costs by automating processes and leveraging existing technologies
- Meeting HL7v3 standards for electronic health information exchange
- Providing the ability to easily scale to meet the increased demand for EHRs

### **Working Directly with Doctors and Healthcare Professionals**

The Children's Hospital of Eastern Ontario (CHEO) is an academic pediatric hospital affiliated with the University of Ottawa, with a mandate for care, research and teaching. Over the past thirty years, CHEO has established itself as a world-class academic health sciences center providing leading-edge treatment, diagnostic and laboratory services for children and youth aged 0 to 18 years.

Pediatric hospitals like CHEO face a unique challenge in critical care. As a noted child care expert puts it, "the status of children under critical care changes at a much more rapid rate than it does in adults." Therefore, the many monitoring devices used for children have thresholds set to provide staff with alerts that must be addressed individually. Because each alert requires a dispatch, the frequency of alarms dictates that, with a given nursing staff, only a low fixed number of children can be cared for. However, if the staff could understand each patient's total alarm picture from the multiple monitors, they could better understand which case needed urgent attention and which case was routine.

Using the webMethods suite, CHEO is now able to aggregate all (7-10 or more) alarms for each patient and process them against clinical markers defined by the senior staff. Staff and caregivers can efficiently and effectively monitor more patients, provide better care, and help ensure better patient outcomes. The staff has now evolved from reacting to anticipating as trending markers are met or exceeded.

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## MEETING SPECIFIC CHALLENGES

The foregoing examples only begin to suggest the wide variety of specific challenges that individual organizations face and that enablement of integrated, real-time decision-making can help meet. Six of the most common challenges – and proven approaches to them – include the following:

**Gaining greater visibility into the health of the institution:** Using the webMethods integration platform and webMethods Optimize for Process to get real-time analytics, you can achieve a holistic view of clinical and business operations and thereby quickly identify what's working well and pinpoint process bottlenecks in order to drive process improvements.

**Addressing more intense competition:** In today's competitive environment, you need new ways to differentiate your organization by serving patients as quickly as possible while delivering the best possible care. The solution: a real-time, 360-degree patient view. With the webMethods integration platform, you can aggregate and gain a reconciled view of patient data faster across departments and partners to make better and more consistent decisions. The result: reduced patient wait times, improved customer satisfaction and improved outcomes.

**Achieving clinical excellence and physician and employee satisfaction:** Clinical excellence and caregiver and employee satisfaction are mutually reinforcing. Better outcomes mean more fulfilling work; and more fulfilled employees, equipped with the tools to do their jobs, translate into better outcomes. End-to-end healthcare process automation can greatly help to create that virtuous circle. With the webMethods Business Process Management Suite, you can automate and monitor end-to-end processes, establish performance goals, and measure Key Performance Indicators. You can write and change clinical and business process rules—without IT's help. And you can easily measure, alert and report on key clinical markers, increasing efficiency by automating system steps and guiding human interactions to complete processes.

**Streamlining reporting compliance:** Complying with governmental reporting regulations is cumbersome and time-consuming. But with the flexible reporting and business intelligence provided by webMethods Optimize for Process you create regulatory reports for local, state and federal agencies—faster and with less staff impact. Specifically for “Meaningful Use” SAG greatly facilitates implementing, testing and reporting on all three tiers:

- Data Collection, sharing and reporting
- Implementation of structured information and continuous process improvement
- Decision support and surveillance

**Enabling HIPAA Compliance:** In the US, compliance with the Health Insurance Portability and Accountability Act (HIPAA) is driving business processes. New laws, changing consumer attitudes, and Federal incentives have all forced health organizations to adapt their existing systems to this new reality.

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A HIPAA solution which provides rapid and seamless integration of Providers, Payers, Routers, and Sponsors to support HIPAA 4010, 4010 A1, and 5010 standards is key to successful healthcare integration. Software AG's webMethods HIPAA Link Module is built upon the top-ranked webMethods integration technology, giving it a proven foundation for integrating systems inside and outside the organization. With this solution – any existing IT investment can be part of a HIPAA transaction process. This includes any system such as healthcare specific systems like Epic, Cerner, GE, McKesson, Siemens and legacy systems such as MUMPS. Moreover the HIPAA Link solution also validates HIPAA transactions against frequently updated code sets to help maintain compliance and interoperability.

The solution is built to scale and processes documents segment-by-segment for improved performance. It generates detailed error reports in HTML or XML formats, and automatically sends e-mail alerts for quick resolution. In addition, the solution maintains the integrity of all trading partner transactions by providing automatic archival of transaction messages, ensuring non-repudiation of content. In a nutshell, the Software AG solution allows sharing of information end-to-end, providing the scalability and flexibility that can only be found in enterprise-level integration products.

**Integrating disparate systems:** As we have noted, having critical patient information and business data locked in disparate systems leads to cumbersome, costly, and time-consuming processes; and point-to-point integrations are brittle and costly to maintain. The solution, as we have also seen, is enterprise integration. Software AG offers mature, fully integrated capabilities for building a flexible healthcare information integration architecture – featuring proven software to dramatically reduce integration time and costs. You can greatly improve information sharing, develop new applications and processes faster, and meet all of your information integration needs with a single platform. Most importantly, you can achieve the integration of patient processes and business processes that enable you to deliver the best possible care while remaining fiscally responsible.

**Augmenting limited in-house resources:** Although you want to rapidly achieve enterprise integration, you may find yourself hampered by a lack of in-house resources for designing and deploying a solution. Software AG can help. The experts in our Global Consulting Services practice can work with you to plan, design and implement a tailored information integration solution. By leveraging our extensive experience with the technology, you accelerate time to deployment and achieve sustainable results for the long term.

## WHERE TO BEGIN

Technology is no obstacle. The technology for achieving enterprise integration and real-time decision-making is proven, flexible, and available. The real barriers holding back most institutions are inside: Performance metrics are based on internal politics and functional silos, instead of being designed to guide behavior toward better patient and business outcomes. Decisions are made on the micro level, without considering the macro level. And, perhaps most importantly, IT and the business are misaligned.

Software AG's team of senior advisors has spent many years helping organizations of all kinds overcome those barriers to optimal performance. They have long experience in formulating strategies for businesses in multiple industries, including healthcare, that specifically focus on achieving efficiency and differentiation through the application of technology.

Our approach is not to change systems but rather to overlay them with intelligence, enabling organizations to leverage their existing IT investments while overcoming the limitations of those legacies. Our methodology is applicable to any service line. And our strategy is to work with our customers to find the best area in which to begin improvement so that they can realize value in weeks rather than months or years. We then move to the next area for improvement, building on the momentum of success and harnessing the enthusiasm of all constituencies for ways of working that benefit patients, caregivers, and the bottom line.

We invite you to contact us for a conversation on ways to help increase the health of your institution and make it the best choice for patients and staff.

To learn more, please contact us at [fastresults@softwareag.com](mailto:fastresults@softwareag.com) or call (703) 860-5050.

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Take the next step to get there – faster.

#### ABOUT SOFTWARE AG

Software AG is the global leader in Business Process Excellence. Our 40 years of innovation include the invention of the first high-performance transactional database, Adabas; the first business process analysis platform, ARIS; and the first B2B server and SOA-based integration platform, webMethods.

We offer our customers end-to-end Business Process Management (BPM) solutions delivering low Total-Cost-of-Ownership and high ease of use. Our industry-leading brands, ARIS, webMethods, Adabas, Natural, CentraSite and IDS Scheer Consulting, represent a unique portfolio encompassing: process strategy, design, integration and control; SOA-based integration and data management; process-driven SAP implementation; and strategic process consulting and services.

Software AG – Get There Faster

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