

SOA Cures Healthcare Integration Headaches

By Greg Mummah

Harriet Summerlin awoke to the sound of a heart monitor. The 67 year-old woman had no memory of the automobile accident that landed her in the hospital. The first face Harriet saw was that of a nurse, quickly followed by a doctor. In reassuring tones, the doctor told Harriet that she would make a full recovery; it would just take time.

Harriet's story features brave paramedics, nurses and doctors, all working to help the patient. These professionals know how to treat a patient. But there's another side to Harriet's story, one that doesn't make good television drama but is still vital to any patient's treatment and recovery. This is the story of the information technology, application systems, and business processes that medical professionals use to treat patients, and how Service-Oriented Architecture (SOA) can improve patient emergency care, medical billing, and follow-up treatment.

The Value of SOA in Healthcare

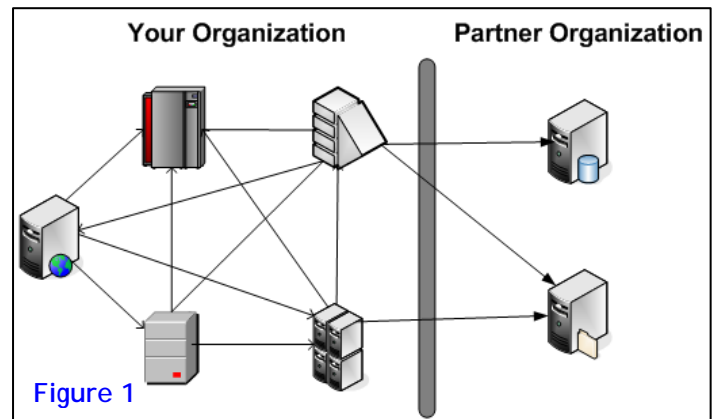
At a high level, SOA is all about standardizing communication. As IT has evolved over the last 30 years, a wide variety of systems and platforms have emerged. Variety gives choices, but also introduces challenges. Specifically, each system design included proprietary communication methods that let it talk to systems of the same design, but not to other disparate systems.

IT first addressed this issue by introducing point-to-point integration— interfaces between systems. This resolved the issue of being able to communicate between systems of different types, but at a price—the cost of maintaining integration points between all the required systems. As organizations increased in size and acquired more systems, maintaining integration became more expensive and complex. The resulting "integration spaghetti" introduces ever-increasing cost and complexity and reduces organizational agility. Each interface between each system is unique, and communication with partners also requires unique interfaces. (See Figure 1)

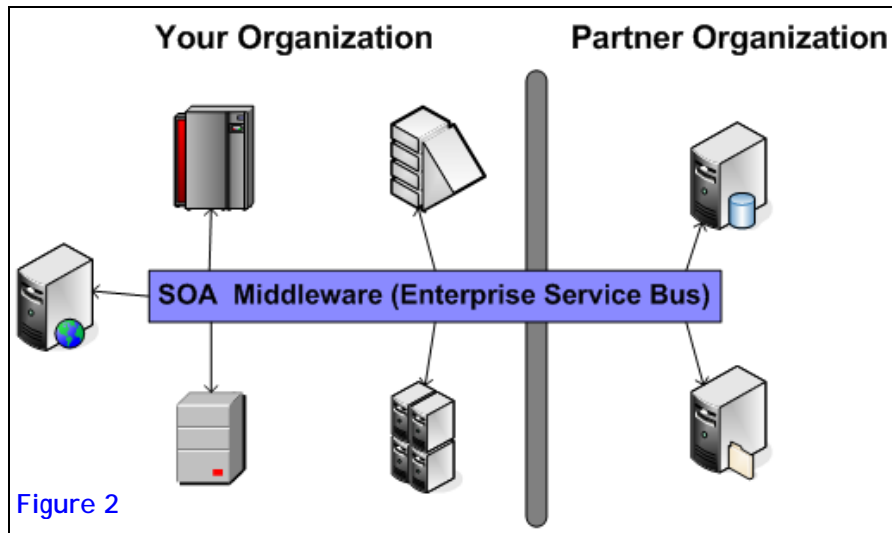
Consider this situation in the healthcare context. By definition, healthcare is an extremely fluid industry. Doctors, hospitals, insurance companies, and patients are subject to a never-ending series of regulatory changes, advances in treatment, procedural changes, and mergers and acquisitions. Each change requires an adaptation of systems, and each adaptation potentially impacts some or all systems.

Point-to-point integration quickly becomes costly and complex to maintain, and results in delays, inaccuracies, mountains of paperwork, and frustration for healthcare providers and consumers alike.

Most doctors have a working knowledge of English because most medical schools and publications use English as their primary language. The value of SOA to the healthcare industry is that it enables systems, like doctors, to speak the same language. If all



systems can communicate using a common SOA framework, integration becomes less complex and IT can adapt systems more rapidly. [See Figure 2]



SOA lets IT take some of the resources and money allocated to integration and use it on other initiatives. It enables standardized communication between healthcare providers, facilities, and insurers. Moreover, SOA facilitates improved quality of care. Let's walk through the events following Harriet's accident and identify ways SOA could improve her emergency care, billing, and long-term treatment.

Accident Scene

Leaving the grocery, Harriet unintentionally pulled out in front of an oncoming car. The impact to the driver's side door of her car broke her left femur bone and cracked her right femur. To stabilize Harriet's condition, the paramedics could benefit from any available information about her medical history and health. In our hypothetical SOA-enabled world, this information gathering can start before paramedics arrive. The emergency services dispatcher requested the car's license plate number from one of the callers. Using that information and the caller's description of the patient, the dispatcher searches department of motor vehicle records and local or state police records to confirm the victim's identity. Many police departments also keep records regarding citizens with special medical conditions—something else the paramedics should know. SOA enables the dispatcher to search all these information sources with a single request, regardless of where this information resides.

The dispatcher can inform the paramedics that the patient is probably Harriet Summerlin and that she has no known medical conditions. [See Figure 3]

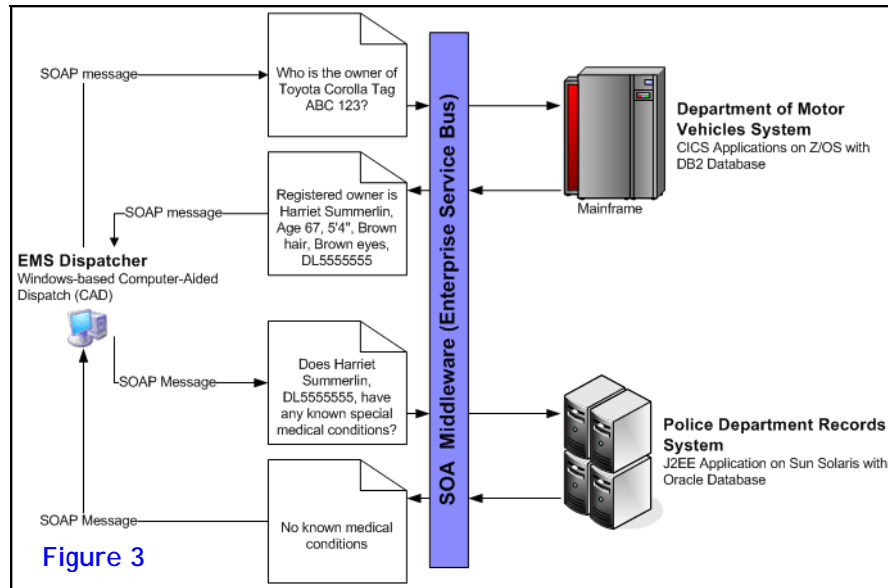


Figure 3

Transport to Hospital

The paramedics perform their initial evaluation and stabilize her so she can receive additional treatment at the hospital. Thanks to the dispatcher, they know who she is. Thanks to their skills, they know she has broken legs, abrasions, and potentially, a concussion. As the paramedics gather this information, they enter it into a tablet PC-based EMS patient information system. Using the capabilities provided by an SOA, the patient information system can automatically convey information to the various hospital systems required to admit and treat the patient:

- Admit Harriet to the hospital (iSeries-based medical records system)
- Requisition medical supplies for treatment (mainframe-based fulfillment system)
- Reserve an operating theater for surgery (Windows-based scheduling system)
- Assign a surgical team to treat injuries (Windows-based scheduling system).

When Harriet arrives at the hospital, nurses are waiting with a cart that contains the medicines and supplies necessary to treat the injuries identified by the paramedics and prep her for surgery. An operating theater is prepped and ready, and a surgical team is standing by. Medical personnel don't have to focus on these procedures because, thanks in part to SOA, systems have done their job properly. Doctors and nurses can spend their time on patient care, not paperwork.

Post-Op Treatment, Recovery, and Billing

Harriet's operation went as planned. Her legs are now set and her abrasions have been treated and bandaged. As the surgical team treated Harriett, they gathered information about their patient that helped determine her post-operative treatment. Immediately following the operation, Harriet will need a surgical recovery room. Once she wakes up and passes her post-op exam, she'll be moved to a recovery room. After several days of recovery under observation, she'll be discharged.

Treatment doesn't stop there, however. With two broken legs, it's likely that she'll need care until she's able to get back on her feet, including medium-term care at home and physical therapy to regain the full use of her legs. And then, of course, there's the matter of arranging payment for all these services.

Various systems manage all these treatments, tasks, and billing instructions. As at the accident scene and during transport and emergency treatment, SOA can greatly reduce the complexity of interaction between these systems to create a better patient experience. For example, SOA can support the complex interactions between the hospital and the insurance company's claims department and provide a mechanism to automatically authorize treatment. [See Figure 4]

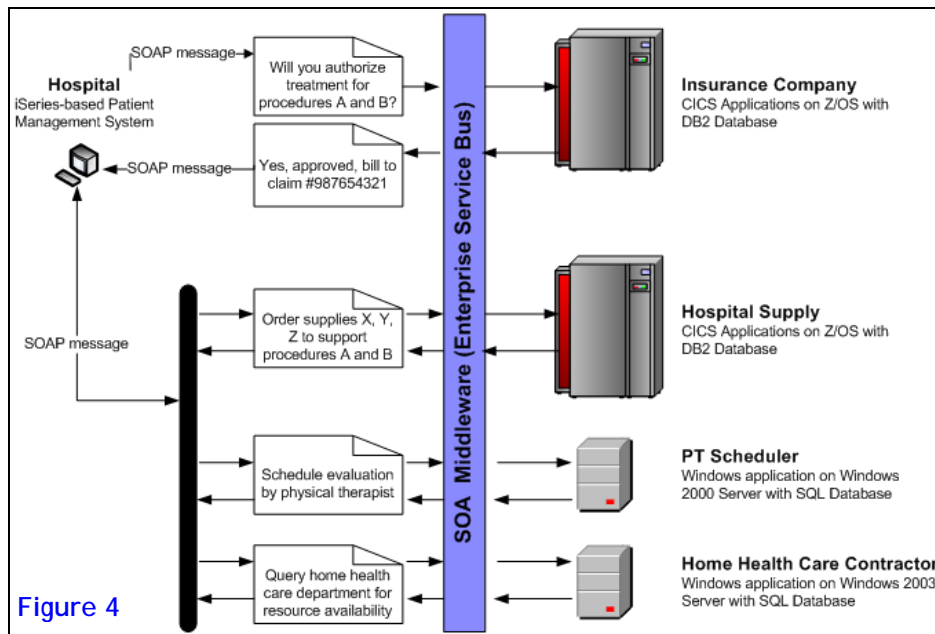


Figure 4

Rules governing treatment might change over time, but since the systems that enforce rules speak the same language, organizations can devote resources to the business rules themselves rather than revising the way their systems communicate after every rule change. In other words, SOA enables organizations to focus on business processes. The faster processes can be adapted to requirements, the more agile an organization can be.

How Do You Get to SOA?

SOA can provide the building blocks that help healthcare-related IT organizations improve patient treatment and billing. It enables IT to focus on process improvement by removing system-to-system communication headaches. It makes organizations more adaptable to change.

You can't go out and "buy an SOA." You evolve to SOA over time. There are great technologies today to transform existing healthcare applications into SOA-compliant Web Services. Once services are published, they're easily included in an organization's business processes and easily decoupled when processes change. Business Process Management (BPM) tools orchestrate published services and human participants into complete business processes. Most organizations are moving toward SOA one project at

a time, using SOA principles and SOA-compliant products so that all new work takes them closer. Nevertheless, any journey begins with the first step. Healthcare organizations that adopt SOA are taking that first step down the road to increased organizational agility and better patient service.

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About the Author

Greg Mummah is a Product Manager for Seagull Software. He has over 10 years of experience with legacy platform integration, BPM enablement, and web enablement and is an authority on SOA and BPM for legacy systems. You can reach Greg via email at gmummah@seagullsoftware.com.

About Seagull Software

Seagull Software specializes in powering legacy-aware application development, helping organizations accelerate the move to service oriented architecture for business agility. Seagull Software's LegaSuite™ is an integrated software platform for connecting IBM mainframe, ICL, iSeries, UNIX/VT and Windows applications to the Web and to other, newer-generations of applications and service-oriented architectures including XML, J2EE, .NET, HTML and Web Services. For more information, visit www.seagullsoftware.com.



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