

SUCCESS STORY

When a Life is at Stake,  
Seconds Matter

 **TIBCO**<sup>®</sup>  
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## When a Life is at Stake, Seconds Matter



Tap an IT executive on the shoulder and you'll hear stories of efficiencies created, costs cut, and fragmented enterprises turned into lean, well-integrated machines. John Conroy, director of application development, Sisters of Mercy Healthcare, has one more story. He recalls using his own systems to save a life.

The drama began at the Mercy Medical Center in Rogers, Arkansas – one of Sisters of Mercy's 26 hospitals. Like all hospitals, it uses biomedical equipment to monitor intensive-care patients. But this health system goes further: to optimize care, it beams vital signs from ICU patients throughout its organization to remote systems and monitors across its network, including its medical hub in St. Louis. One day, St. Louis-based John Conroy is passing a remote monitor when, to his shock, all readings for a specific bed fall to zero: blood pressure, pulse – all flat line. "Within seconds I was on the phone to Arkansas and had someone race into the ICU," recounts Mr. Conroy, a sub-five minute miler who doubtless put that speed to use. The story ends well. "They had discharged the patient a few seconds before, but left the monitoring equipment on."

Still, the system worked.

There was a time at Sisters of Mercy when vital signs from the ICU were transmitted no farther than the local nursing station – a drawback the provider decided to correct. It engaged TIBCO to enable remote monitoring, so that ICU patients could be tracked by clinicians physically located anywhere within Mercy's footprint. Now, TIBCO ActiveMatrix BusinessWorks™ listens for messages from the monitoring equipment, transforms them into XML, and publishes them to the TIBCO Enterprise Message Service™ (EMS) – backbone of the health system's mission-critical systems. Because more trained eyes beat fewer trained eyes, St. Louis clinicians now read vital signs in real time beamed from each of the system's acute-care facilities.

Sisters of Mercy Healthcare – with 26 hospitals, hundreds of clinics, 1,200 physicians and 36,000 staff members – is now an integrated network able to leverage its collective strength on behalf of each patient. "TIBCO is at the heart of it," says

## Sisters of Mercy

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Mr. Conroy. "With patient information taken at admission and from histories, we publish common-information-model messages so that all downstream subscribers can use them to tailor patient care." Among these subscribers: the hospital dietician, ever vigilant for food allergies. "We go to great lengths to care for our patients," says Mr. Conroy. "The last thing we want to do is serve a peanut butter and jelly sandwich to someone who's allergic to peanuts."

It doesn't stop at food allergies. Consider a chronic illness like type 2 diabetes, which affects 17 million Americans – half of whom are unaware that they have it. Among its symptoms: persistent thirst, numbness of extremities, blurred vision and dry mouth. Present any of these indications and here's what will happen in Sisters of Mercy's TIBCO-integrated network:

Clinicians will check your history to enhance diagnosis: demographic information, dietary issues, current medications and key findings from all prior visits. Enriched with contextual data, the event of your admission is entered into an Electronic Health Record (EHR) and fired



Connect



Optimize



Scale



Automate

The Sisters of Mercy Health System was established in 1986 to serve as the parent corporation of a variety of health care facilities and services sponsored by the Sisters of Mercy of the St. Louis Regional Community. Mercy is the ninth largest Catholic healthcare system in the U.S., based on net patient service revenue.

200  
Patients

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across the system with TIBCO EMS. Clinicians will see it instantly, acquiring two advantages unattainable before: first, the information is at their fingertips before the patient arrives; second, its richer context strengthens diagnosis and treatment. Presented with diabetic symptoms in this integrated, real-time environment, doctors can select medications with greater precision – or choose with confidence to rely initially on a regimen of diet and exercise. Looking at your event in historical context, a staff dietician may discover that sugar has never been your friend; all the more reason to adopt a low glycemic diet.

“Health care isn’t just about dispensing medications and performing surgery,” says Mr. Conroy. “The last thing we want to do is have to re-admit a patient at a higher level of care – it’s dangerous for the patient and costly for the hospital, especially in light of current reimbursement models. The best health systems today leverage their collective expertise not just to care for the patient, but to help the patient take care of himself.” TIBCO has helped Sisters of Mercy meet this new imperative. Says Mr. Conroy: “We’d be stuck in the past without the technology to integrate our network, enrich data and circulate it in real time. TIBCO has provided that, along with the knowledge transfer to get it right. Its professionals went above and beyond to support me and my team.” Working on-site at Sisters of Mercy for two years, members of TIBCO Professional Services Group (PSG) helped develop the framework to process

clinical messages onto the enterprise service bus. They also developed the monitoring system for evaluating the “heartbeat” of the bus through a real-time interface.

Sisters of Mercy, America’s ninth-largest Catholic healthcare system, engaged TIBCO when it first adopted EHR – a move that required the integration of all data within its network. This was no small transition. Before EHR, the network relied on a battery of disparate systems for inpatient admission and outpatient registration. These discordant structures – each with its own means of identifying patients, recording visits and so on – were integrated only with ancillary systems in point-to-point interfaces. Data discrepancies were widespread and exacted a high administrative cost: information from each admission had to be hard coded to each system – a process that consumed valuable time. Recalls Mr. Conroy: “We could process transactions, but each new one required a new interface.” As for throughput, the health system processed some 500,000 messages daily. “That sounds like a lot,” says Mr. Conroy, “but in a clinical network spread over four states, we should have been capturing millions.”

Sisters of Mercy replaced its point-to-point architecture with publish-and-subscribe messaging that has TIBCO at its core. In this new environment, once a message is published it is transformed into a common information model and made available to systems downstream immediately.

SUCCESS STORY

"The benefits are quality and velocity," says Mr. Conroy. "We don't send multiple messages. With one message translated into a common information model, we move data at much faster speeds. From the time it exists on our publishing system to the moment it hits our subscribing systems, it takes our data less than a second to ride the network." But data quality and velocity aren't the only advantages; volume benefits as well. With TIBCO automating many of the system's manual interfaces, Sisters of Mercy now captures over five million events every day.

Capturing the data is one thing; using it to resolve medical issues – and even nip them in the bud – is where Sisters of Mercy now excels. Results have been compelling. The health system is using TIBCO technology to accelerate diagnosis and treatment of two progressive, potentially terminal diseases – Chronic Obstructive Pulmonary Disease (COPD) and Congestive Heart Failure (CHF). Mr. Conroy is exuberant and rightfully so.

"By publishing all events to our service bus, and creating enterprise access to these events in real time, we're able to filter across our network for symptoms and diagnoses pointing to COPD or CHF. Once identified, we can enroll these patients in a workflow that gets their data to homecare nurses for treatment immediately upon discharge." With TIBCO's help, Sisters of Mercy is identifying an average of 200 patients monthly in need of immediate, life-saving intervention. The alternative would have been far less sanguine. "Without TIBCO's service bus, trying to find these patients would have required us to write ten different point-to-point (P2P) solutions between the admitting system in each of five regions and our home care follow-up system. Each of these customized P2P solutions would have taken three weeks to develop and another three weeks to test. However, with TIBCO EMS already in place – and with data from all publishers (hospitals, clinics, etc.) pre-certified for consumption by downstream subscribers in the Common Information Format, testing is reduced to what is required only for the filtering criteria. Typically, that's one day."

These new capacities to accelerate and strengthen patient care are not lost on Sisters of Mercy's providers – physicians, nurses, lab technicians and others – who rely on enriched patient data pushed in real time. Today, all doctors see lab results within a second – complete blood counts, blood types, glucose readings and much more – all from disparate labs.

It wasn't always this way. Recalls Mr. Conroy: "Before TIBCO messaging, our ambulatory facilities printed lab orders and handed them to patients. Patients would drive to the lab, present the print-out, and that data would be entered in the system. In some cases the lab would print labels; in other cases not. When it didn't, staff would handwrite labels – a practice prone to error." Now, EHR and lab systems are integrated through TIBCO. Orders move the instant doctors submit them to the labs. Information is robust, speed is real time, and quality is assured.

Next up for Sisters of Mercy: home health monitoring – technology essential to helping patients participate in their own care. Says Mr. Conroy: "Our next step is to hook home-monitoring devices to our network through TIBCO EMS. Patients connected to these devices will be 'seen' by our staff even as they sit in their living rooms. I just hope they remember to shut the equipment when they get up to make a sandwich."



Detail

5 Million

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**TIBCO Software Inc.** (NASDAQ: TIBX) technology digitized Wall Street in the '80s with its event-driven "Information Bus" software, which helped make real-time business a strategic differentiator in the '90s. Today, TIBCO's infrastructure software gives customers the ability to constantly innovate by connecting applications and data in a service-oriented architecture, streamlining activities through business process management, and giving people the information and intelligence tools they need to make faster and smarter decisions, what we call The Power of Now®. TIBCO serves more than 4,000 customers around the world with offices in more than 20 countries and an ecosystem of over 200 partners. Learn more at [www.tibco.com](http://www.tibco.com).

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