Bringing Health Care Out of 'Technical Debt'

B.J. MOORE

Do you remember what the world looked like before Expedia and Uber? Until 1996, booking flights at the lowest price required you to do comparison shopping across disparate sources, from airline websites to travel agencies. Before 2009, you had to call a taxi dispatcher and worry about whether your transportation would show up on time, or at all. And all of this effort demanded so much of our time and energy—often for little reward. It seems forever ago now, but this distant memory is not unlike the fragmentation we see in health care today.

Because technology has changed the world so dramatically, the people we serve expect more from us than ever before. They want the accessibility, transparency and innovation they get from other sectors. In Catholic health care, we can meet and exceed these expectations. Not only do we have the opportunity to deliver care how, when and where people want it, we also can deploy technology to ease the way of caregivers and patients and extend our mission to more people in need.

The challenge is that the technology infrastructure in health care is still 15 to 20 years behind other sectors. To catch up with the times, health care needs to overcome its deep "technical debt" by significantly upgrading the antiquated and fragmented information systems we're using today.
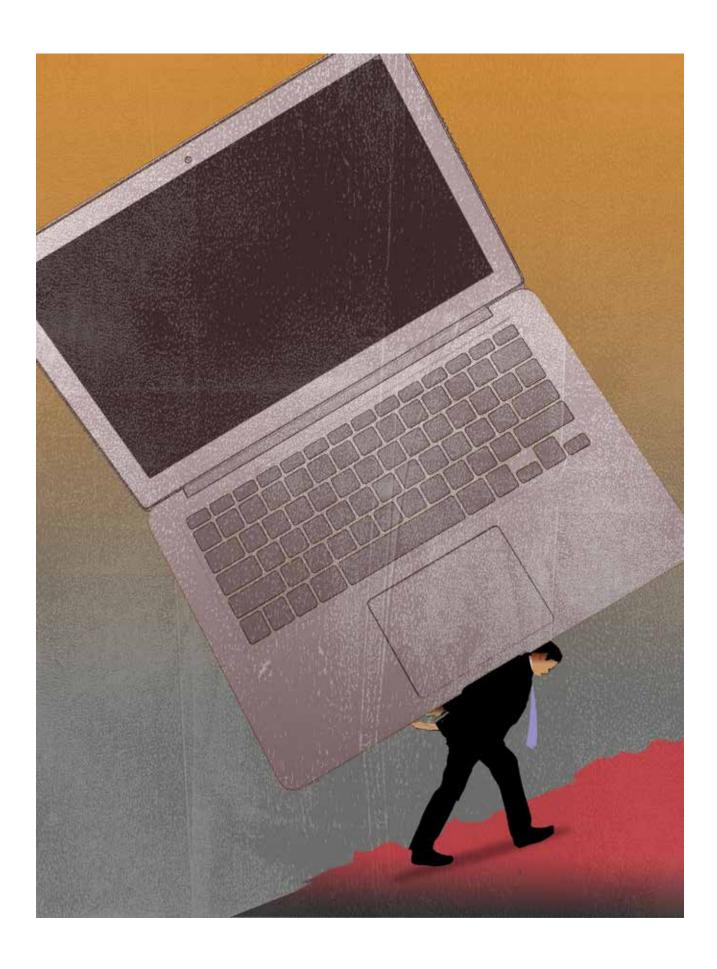
It's a big lift, but it presents an incredible opportunity to vault health care into the future and create greater, more convenient access for everyone. It's an exciting time. At Renton, Wash.-based Providence St. Joseph Health, our digital transformation will help us deliver on our mission of serving patients, and on approaching care in an innovative way.

LEARNING FROM TECH COMPANIES

Change is hard—for people and organizations. In other sectors, disruption can be fast and brutal. But it doesn't have to be. Having worked at Microsoft for 25 years before joining Providence nine months ago, I see an opportunity to take the best practices of a high performing technology organization and combine it with the compassionate mission-driven culture of Catholic health care to do something truly impactful in the world.

Creating the conditions for change starts with having a clear vision. At Providence, our vision is "Health for a Better World." To us that means giving everyone, including the most vulnerable, the opportunity to live the healthiest life possible. Technology plays an important role in bringing that vision to life. To improve access and outcomes in health care, we need to rethink the tools and processes that enable our caregivers and our system to serve our communities.

Another key element is forming the right team and creating a lineup that has talent, as well as passion. People with both of these qualities can figure anything out. And we need to be there for one another no matter what's in front of us, as we win, fail, learn and move forward together. Lastly,

we need to create an environment that fosters experimentation, rewards innovation, manages risk appropriately, all while being fully transparent. When we're all on the same page — and all accountable — we can achieve greater outcomes.

As Ezekiel J. Emanuel wrote in *Prescription for the Future*: "If physicians do not aspire to and work toward achieving the highest-possible quality of care and patient experience, transformation will not happen." I agree. That's why creating the right conditions for caregivers is so important.

YOU HAVE TO WALK BEFORE YOU CAN RUN

Transformation doesn't happen overnight, and in health care we can't deploy truly innovative technology until we have a reliable, stable information system infrastructure in place to support it. That means retiring the multiple, outdated and duplicative applications pervasive in health care and moving to modern, single platforms are more streamlined and efficient. It also requires moving data to the cloud. It's time we get out of the resource-intensive data center business and partner with cloud companies with the expertise and scale to manage data more securely, effectively and affordably. We can reinvest those precious resources back into our mission of direct patient care.

Only then can we get to the truly exciting things like machine learning, natural language processing and artificial intelligence — all things that will help quickly synthesize and make sense of data to support clinical decision making at the bedside or in the exam room. The goal of this transformation is to free up resources that will allow us to invest in innovation and take the calculated risks needed to change health. And we'll do that through strategic partnerships across technology and health care, working with Silicon Valley startups and other health providers to run research trials and analyze data. While our digital transformation all begins with moving to the cloud, it's really about how cloud capabilities will allow us to construct advanced workloads with big data solutions and apply advanced artificial intelligence to increase caregiver efficiency, enhance patient experiences and improve health outcomes.

EASING THE WAY FOR CAREGIVERS

Providence has 119,000 caregivers serving patients in 51 hospitals and nearly 1,000 clinics across our system. In my first three months on the job, I traveled to all the hospitals and ministries and met with the board and sponsors. I spoke with caregivers and patients. I wanted to see firsthand what was working and what wasn't working. In every hospital and clinic I visited, I was surprised by how much time each caregiver spends on administrative work regardless of where each sits within the system. Our digital ecosystem includes an unmanageable total of 4,000 software applications, with all the redundancies and inefficiencies that come along with that. The current nature of the applications ties caregivers to keyboards and traditional personal computers for too long. They need access to information on their phones, they need a strong wireless network, and they need everything to be seamless.

All the extra hours spent working across these applications detracts from caregivers' ability to use the core competencies they brought to their

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roles, whether they are in care delivery or human resources. The extra paperwork is a leading cause of burnout, and we can't improve the patient experience until we alleviate caregiver burnout. That's why we are pursuing multiple initiatives simultaneously to address these issues including moving to a single enterprise resource planning system to replace the multiple redundant systems we have today for basic tasks such as ordering supplies or hiring new team members. As part of a partnership with Microsoft, we also are standardizing and updating our productivity and collaboration software and moving data to the cloud to better support teams and ensure secure communication.

These changes will provide caregivers more operational flexibility and agility enabled by technologies and platforms, improved information access and expanded analytical capabilities via an integrated system environment.

Natural language processing will be used to document clinical encounters, as it allows the clinician to focus on caring for the patient. The

voice-activated system listens and learns from the clinical encounter and integrates this content with information from the patient's electronic health records. This would dramatically reduce the burden of paperwork and could save thousands of hours a year of clinician time.

Machine vision — the technology used to provide automatic, image-based analysis —is also within our sights and could allow for automated diagnoses of common conditions like an infection or skin rashes. It also can be used to catch different types of cancer, like lung, breast and skin, earlier and more accurately.

HOW TECHNOLOGY WILL HELP OUR OPERATIONS

As I mentioned above, we have more than 4,000 applications across our health system. So in theory, any kind of modernization we do, we'd have to do 4,000 times. To avoid this, we must first simplify the ecosystem with application rationalization, a thoughtful streamlining of what software we keep and what we discard. This is a top focus at Providence.

Today, we look more like conglomerates than single health systems. For example, Providence had 14 different enterprise resource planning and human resources systems cobbled together through years of acquisitions. We're working to simplify and standardize our electronic systems related to back-office functions, such as payroll or supply chain.

Along with our enterprise resource planning deployment and Microsoft partnership—both of which affect caregivers and core operations—we also are standardizing around what will be one of the largest instances of the Epic electronic health record systems in the world. Our goal is to:

■ Lower costs associated with legacy systems and outdated technology, and improve operational outcomes by having fewer redundancies

■ Free up resources to re-invest in the community

■ Increase interoperability across the system, improving the way data is gathered and presented at the point of care to improve clinical decision making

■ Use the cloud to relate all the data together, from human resources, to finance, to our supply chain and to patient records.

If you look at the underlying issues that impact health care, many of them could be addressed with technologies, such as watches, phones and other devices that connect to the Internet. That includes operations. For example, a big issue for operations is the lack of visibility across the supply chain due to variability in utilization. Systems could use devices to track and monitor supplies to automatically determine when new supplies should be ordered—well before they're required. This kind of solution is typical of proactive planning that artificial intelligence can enable.

We've realized that the capabilities that we have developed can be deployed to other health systems because they address the same underlying issues that Providence faces. That's why through our Community Connect program we provide our version of Epic to independent providers at a cost that's more affordable than if they were to purchase it on their our own. We have also acquired companies like Blue Tree to offer electronic health record implementation and consulting services to other providers.

We're also rethinking how many of our core systems work. New technologies like blockchain (a banking technology that ensures secure transfer of data), artificial intelligence, and machine learning are driving innovation in revenue cycle management. We recently acquired the revenue-cycle management company, Lumedic, which is based on blockchain technology. Blockchain has the potential to transform claims processing and interoperability between providers and payers, allowing us to redirect unnecessary spending toward either patient savings or care.

EMPOWERING PATIENTS

The relationship between an organization and its customer can be a challenge for anyone in any industry. In health care, where the stakes are higher, it can be even more daunting. Patients want information specific to them, whether making an appointment with a doctor or researching a course of treatment. A customized interaction is not only important, it's expected. In order for us to achieve this, we need to deliver personalized care and be consistent at every point where patients interact with our health care system.

This kind of shift in how we empower patients is how we move toward the consumerization of health care, so that health and wellness services are delivered where patients want and need it. That's why we're intensifying our work to offer personalized treatment and wellness services to people, based on their genetic information and individual health information. And making those services something they can access on their phone or other device.

We live in a world where consumers expect

services to be technology-enabled. But in health care, patients still book appointments like they did a decade ago, calling in and probably waiting on hold. They should be able to be do this online, just like you'd request any other service. We need to provide patients with multiple care options that meet their needs and are genuinely convenient — options like a digital consultation on mobile devices, a pop-up clinic close to home or the traditional patient-doctor interaction. It's not far off in the future. We're making progress in this area, but there's more to come as we all strive to put the power in the hands of the patient.

We're already seeing this shift with the technology we offer our patients. MyChart allows digitally enabled patient interactions, such as online scheduling and telehealth. We're also enrolling users in patient engagement platforms like Circle and Xealth. The first is a pregnancy and parenting app with articles and information as well as health-tracking tools that update providers about a patient's pregnancy or growing child. The second is a digital prescription marketplace that doctors can use to order prescriptions for patients. The Xealth platform also routes the flow of data from services back into the hospital's electronic health record, keeping patient records as accurate and up to date as possible.

Applying artificial intelligence and machine learning to our clinical data is one of the most promising innovations for the future. As part of our work with Microsoft, we want to reduce the time it takes to identify cancer cases using natural language processing and machine reading technology. I'm also excited about bringing in more data sources that live outside the electronic health record, like heart rate monitors, fitness and sleep trackers, and other medical devices.

Although chatbots aren't new, applying them meaningfully in a health care setting is. They will help answer patient questions about everything from wait time to navigating care plans. And it can go a lot deeper than that. Chatbots have the ability to consistently monitor changes in patients' health, as well as use machine learning to help inform doctors of when to proactively reach out to patients if health changes require action.

WHERE WE GO FROM HERE

When we make these changes—when we are digitally enabled at our core—the entire system benefits. They will lower costs, support our caregivers, give patients the access they want and help us achieve better outcomes.

Our long-term aspirations are ambitious and will take time, but we all need to push forward to give both caregivers and patients much better tools in the future. And sooner rather than later. The world has been transformed, and we in health care need to transform with it.

B.J. MOORE is chief information officer for Renton, Wash.-based Providence St. Joseph Health.

QUESTIONS FOR DISCUSSION

B. J. Moore is currently chief information officer for Providence -St. Joseph Health after many years at Microsoft. His concern is moving the burdensome state of technology in health care to more streamlined, efficient and facile platforms and processes in order to better tend to the real mission of Catholic health care.

1. What are your frustrations with the technology practices and protocols at your ministry? How well does it serve patient needs, clinicians' attention to care, communication among care givers, or data necessary to operations? What do you find particularly burdensome? What do you find particularly helpful?

2. Moore describes the partnership between Providence St. Joseph and Microsoft as a way to move data out of multiple applications and into the cloud where information can be stored in uniformly useful and secure ways. Other health systems are in the process of investigating similar moves. How is your ministry pursuing those options? What concerns do you have regarding disclosure, transparency and patient rights? Do you agree that clinicians and other health professionals will be relieved by such moves? Will there be new demands?

3. What kinds of new conversations might mission leaders need to have or be included in for transitions like this? What are the ethical issues that must be discussed around the use of artificial intelligence? What understanding of the ministry can help make the transition a real transformation?

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