Executive Summary

The Scottsdale Institute convened eight information technology executives in Chicago for the 2018 SI CIO Summit on June 6-7, 2018. Leaders gathered to share strategies, concerns and insights as we examined the Summit theme of “Innovation in Action,” with specific focus on technical innovations in healthcare, including Artificial Intelligence (AI) and Machine Learning (ML). Attendees represented large academic medical centers, multi-regional health systems, rural hospitals and clinics from across the nation.

Summit Participants

Bill Hudson, VP and ACIO, John Muir Health
Kamal Jethwani, MD, MPH, Senior Director, Innovation, Partners HealthCare
Jason Joseph, SVP, Information Services, Spectrum Health
Mark Lantzy, SVP and CIO, IU Health
Ken Lawonn, SVP and CIO, Sharp HealthCare
Heather Nelson, VP and CIO, University of Chicago Medicine
Ryan Smith, SVP Information Technology and CIO, Banner Health
Tim Thompson, SVP and CIO, BayCare Health System
Eric Yablonka, CIO, Stanford Health Care

Innovation Participants/Speakers

Arun Bhatia, Senior Program Director, MATTER
Steven Collens, CEO, MATTER

Chris White, Allstate
Kamal Jethwani, MD, MPH, Senior Director, Innovation, Partners HealthCare

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Format and Introductions

Participants were guided through a series of discussion topics, and were asked to weigh in on their views regarding technical and entrepreneurial innovation in healthcare. Day One of the Summit was held at the MATTER healthcare technology start-up incubator in Chicago, and featured multiple speakers offering their perspectives as technology innovators deploying new AI and ML technologies in healthcare and other consumer-services businesses. Day Two focused on examining the current state of technology innovation efforts at each of the participants’ organizations, and how each of the attendees might forecast organizational progress with digital transformation over the next few years.

INNOVATION AND HEALTHCARE | START-UPS AND PARTNERSHIPS—BRINGING PEOPLE TOGETHER

Arun Bhatia, Senior Program Director from MATTER, a Chicago-based healthcare technology start-up incubator, opened the Summit by framing some of the challenges faced by entrepreneurs, not only as they work to solve healthcare problems with creative and innovative solutions but perhaps more importantly in bringing entrepreneurs and industry together.

The healthcare space is composed of many sectors, all looking at problems they wish to solve. “For health systems, payers, providers, pharma and med tech—solving healthcare problems means bringing entrepreneurs and industry together,” Arun Bhatia says. Furthermore, it’s sometimes difficult to get started, as goals and objectives need to be aligned between startups and health systems which often takes long and detailed conversations before a new product can be considered.

For some, such as Tim Thompson from BayCare, having access to an incubator such as MATTER has served to help expedite these conversations and needed alignment. “We’ve worked with MATTER before,” he says. “Our innovation director comes up twice a year. It’s a great way to get to know young companies—it gives us a jumpstart compared to what we might be able to innovate by ourselves. MATTER has given us a quicker ramp-up than other ways to get started.”

INNOVATION AND HEALTHCARE | A THOUSAND FLOWERS OF GROWTH AND IDEAS

The group segued into a roundtable review of how technology is viewed, structured and implemented at each participant’s organization: what model(s) they embrace, how innovation is structured, and how they invest (both strategically and financially) in transformation and innovation.

Dr. Kamal Jethwani, Senior Director of Innovation at Partners, has found a collaborative model to be successful. Partners funds a portion of the innovation team, with the remainder sourced from corporate sponsors. “The benefit is that the intellectual property is co-owned, where the corporate sponsors can develop and commercialize it, yet Partners retains the right to use the
products and technology for free—this keeps us on the cutting edge,” he says. Kamal Jethwani advocates that entering early into relationships can help shape software and products, with the result that, not only does Partners get good pricing, but also the software gets developed specifically to meet Partners’ needs.

In contrast, Heather Nelson, VP/CIO at University of Chicago Medicine, feels her organization is just embarking on developing their digital-health strategy. “We’re starting small—working with our strategic office and operational leaders,” she relates. “Operational ownership and planning is important—IT is here to support and enable technology, and we want to help, but IT does not want to drive innovation.” Knowing a plan is in place, and that it has been formed in partnership with operational owners, is viewed as critical for success.

Eric Yablonka, CIO at Stanford Health Care, says his organization and Stanford’s various schools (engineering, medical, business and law) all converge around technology, and the results are dramatic. “Stanford Health, Packard and the School of Medicine all join together to develop strategy,” he notes. “We need to create value—a new patient experience that is value-focused, digitally driven and uniquely Stanford. Faculty are currently working on Machine Learning and Artificial Intelligence use cases—figuring out how to tie this all together—with the right group, having the right resources.” Innovation is happening organically as well as being structured, with Silicon Valley serving as the catalyst. “Many of our best innovators are coming out of Computer Science wanting to change healthcare, rather than being healthcare majors,” says Eric Yablonka.

BayCare started innovation about two years ago, recognizing that if they were going to successfully compete they’d need to do things outside of existing norms. Tim Thompson, BayCare SVP/CIO, notes this is more about deploying technology (and leveraging partnerships) than creating
Go fast and pilot things, see how they work—see which ideas ‘stick,’ and then negotiate how to implement after that pilot. It’s not about ‘I’—it’s more about how to deploy technologies that make a difference for consumers and physicians.”

Reflecting on Sharp HealthCare’s experiences, SVP/CIO Ken Lawonn says, “We’re getting a lot of interest in technologies, and we’ve started an innovations group. We need to determine how we can be more innovative (and it can’t be from IT). We need key users to help spur ideas—and then we can help figure out where they go.”

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Things are bit different at Indiana University Health. Mark Lantzy, IU Health’s SVP/CIO says that innovation is not centralized, and that it comes from all directions. “Innovation bubbles up from those doing the research—we need to identify it, then figure out the right incubator and funding approach,” he says.

Spectrum Health addresses innovation in three distinct ways, relates Jason Joseph, SVP IS. “We have an ‘Innovations Group’ focused on commercialization, a ‘Ventures Group’ which is designed to strategically invest in companies that show promise, and ‘Digital Health’ which is a collaborative effort led by our executive team and organized by IS.” Each strategic group has a different focus and drives different rules. For example, the Innovations Group has driven several commercial products to market. A recent one is “Carol,” which allows families to contact a nurse ‘on demand’ to facilitate access to care. Another direct-to-consumer innovation is Spectrum’s “MedNOW” app, which allows 24/7 access to physicians via a video link. All have come to fruition directly because of Spectrum’s commitment to innovation.

“Interestingly, our physicians like MedNOW because they feel they are more attentive to patients in video visits, as they have to make eye contact with the patient,” relates Jason Joseph, “and
“At Spectrum, IS is ‘in the game’ for innovation, but we’re no longer ‘leading the charge’—there are other groups taking a larger role. Business is now pulling (rather than IS pushing) and that’s had positive results.”

– Jason Joseph, SVP, Information Services, Spectrum Health

“...as a result productivity is actually higher—it’s a positive result we hadn’t expected.”

“...At Spectrum, IS is ‘in the game’ for innovation, but we’re no longer ‘leading the charge’—there are other groups taking a larger role. Business is now pulling (rather than IS pushing) and that’s had positive results,” says Jason Joseph. Mark Lantzy agrees: “We encourage ideas for innovations, partnerships and development of new apps outside the IT organization. We see IT as helping our organization to assess risk (for example security and privacy), being the arbiter of integration and facilitating change governance to support innovation. But it’s important to have initiatives come up from outside of IT.”

In the San Francisco Bay Area, Bill Hudson, VP/ACIO at John Muir, views innovation as an important differentiator in their highly technical and competitive market. “We have a very fast-growing market—and tremendous competition from Sutter, Kaiser and Stanford. Our customers here are very digital, and our digital business has to be very focused on these consumers. How we develop for them is different than how we traditionally develop for IT—and this is uncomfortable for us—it’s not the ‘traditional IT’ we’re accustomed to.”

John Muir also has an investment fund to help spur innovation, yet it’s targeted and focused. Small projects (under $500K) are funded, and investments must be products that can benefit John Muir and its physicians and patients. Indeed, many ideas have come from John Muir physicians, or ideas that leverage existing John Muir analytics. For example, the “Clear Pop”—a lolly pop for children to use to help them clear their ears—was an innovation from one of John Muir’s physicians, and they’re now exploring additional physician ideas such as ventricular repair tools. 

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“Innovation now spans more than IT,” Bill Hudson says. “Med staff and nursing are involved—we have sponsored nursing partnerships such as using LYFT to help deliver patients for care which has helped to optimize access to care. It’s a multidisciplinary approach.”

Another change John Muir has made is to pull all their analytics under one team—which now includes business, clinical and quality analytics along with a single data governance structure, and it sits at the innovation level (and not IT). “We have fewer questions now about our data sources and their validity—now we’re conversing about how data is used—and that’s made a significant difference, our precision is increasing, and it’s been positive for patients overall,” says Bill Hudson.

**MATTER | INNOVATION VIA COLLABORATION**

Shifting gears, Steven Collens, CEO of MATTER, offers some insight into MATTER and where such an incubator might fit into the process. He suggests big organizations have trouble being disruptive, and entrepreneurs are risk tolerant, fast moving and (by definition) disruptors.

It’s a perfect match—but the challenge seems to be how to bring these two different worlds together in order to collaborate. And he feels that’s where the corporate innovation accelerator—the incubator—comes in.

**Steven Collens identifies four key ingredients for successfully implementing innovation:**

1. Imprimatur of the CEO
2. Empowered innovation leader
3. Dedicated budget
4. Dedicated IT resources

In general, the group of attendees agrees, with many saying they’ve seen innovation struggle if any of the four components was not present.

Other challenges with healthcare: “There are fundamental challenges with digital health—there isn’t a good platform for entrepreneurs trying to ‘plug into’ our existing EHR systems. And we need to deliver clear clinical and economic benefits as we evolve from a reactive to a more
predictive model using analytics—but the business model is still fuzzy. We need to be able to demonstrate clinical value,” Steven Collens says.

Google, Apple, Amazon and other technology companies are seen as potential disruptors as they enter the healthcare space. While not their traditional core business, participants feel they could help drive innovation in healthcare. “This is the million-dollar question,” says Steven Collens. “They won’t tell us what they’re doing, and this creates an interesting dynamic. The story here is not written yet...will it make a difference? Absolutely!”

Some technologies are over-hyped (blockchain being the most mentioned). “There will be a healthcare use case in there somewhere, but we haven’t seen a lot of real application yet,” Steven Collens remarks. “Yet some things like predictive analytics are huge. For some healthcare conditions we can collect data in non-intrusive ways, and then look for signals that predict care. For example, how a cell phone is used by a bipolar patient can tell us if that patient represents a high risk for relapse—and the next step is to determine if we can use those predictive analytics to keep him from relapsing. The business models for many of these solutions are mushy—but the clinical potential is huge.”

**ENTREPRENEURIAL EXPLORATIONS | THREE CASE STUDIES**

To help discuss issues and foster collaboration, three start-up entrepreneur organizations were asked to present to the group, offering their perspectives on being technology innovators: AIVA, Gray Matter Analytics and Allstate.

**AIVA**
AIVA leverages Amazon Alexa for Business devices to facilitate patient-nurse communication in healthcare. Using this technology, hospital patients can contact caregivers via an Amazon Echo device, and find out their schedule for the day, or ask their nurse for help, with the nurse able to respond via Echo and immediately answer the patient. AIVA projects use of their technology can improve patient satisfaction and HCAPS scores.

**Gray Matter Analytics**
Gray Matter offers a healthcare data-analytics platform, leveraging cloud storage and Hadoop to assess and correlate multiple sources of patient care and consumer data, including EHR, Experian, Geospatial and disparities of care, scalable for large data sources across multiple data categories.

**Allstate**
Allstate’s “virtual assistant” is a machine-learning, virtual customer-contact-center agent. While not yet truly customer-facing, it is being used internally for Allstate agents. The agent (or “bot”) can be “trained” over three-to-four months as it “learns” the proper responses for various customer inquiries. Allstate hopes to extend the virtual assistant to become customer-facing shortly, and is considering extending it to additional applications within their insurance business.
Roundtable Discussion
After short presentations, representatives from each of the start-up organizations join a roundtable to discuss their perspectives on bringing innovation to the healthcare marketplace.

The roundtable begins with a discussion of ROI, and how the solutions are envisioned to bring tangible value as they are deployed. Tim Regan from Gray Matter Analytics believes ROI can focus on system replacement costs: “We take an older (and more expensive) technology out, and replace it with a more efficient, cloud-based solution. This lets us reduce some level of (financial) risk, and include that as an ROI.”

Sumeet Bhatia from AVIA thinks ROI should be contextual to each setting: “The ROI story and metrics change depending on location. Acute-care settings might see benefits in improved HCAPS satisfaction scores and faster response times. If deployed in a patient's home you might expect a reduction in no-show visits or readmissions. So, ROI depends on where you deploy the solution.”

Chris White from Allstate describes their ROI in terms of reduced time to effectively train new call-center agents and lower staff-turnover rates due to improved job satisfaction.

Data use, privacy and security were also topics, in particular with respect to HIPAA and PHI in healthcare settings. Sumeet Bhatia notes, “We have to be careful with PHI—that we deliver PHI via a secure app. We also purge our data via a strict data-retention policy, and Amazon is not storing any of our data. We also have anonymous devices via Alexa for Business, so that adds a layer of privacy as well.”

THE STRUCTURE OF INNOVATION | WHERE WE ARE TODAY WITH HEALTHCARE IT

Day Two of the Summit began with a roundtable discussion of the current level of innovation adoption across the industry and where participants believe we should best focus our efforts.

“Entrepreneurs appeal to us as they can deliver innovation quicker,” says Tim Thompson. “Our EHR vendor does a good job with our core but seems to be coming to the market late on innovation—they bring products after we want to do innovation.” Ryan Smith of Banner concurs: “Core EHR vendors will continue to struggle. We are waiting for them to innovate. We need bi-directional APIs that allow us to leverage direct-to-consumer apps, but we're stymied because our EHRs are not as open as we’d like.” Adds Jason Joseph: “Digital apps aren’t hard to build—the complex piece is how to connect them to the workflow and EHR, and how to ensure security. Figuring out how to make the idea work is the hard part.”

Ken Lawonn observes: “We would benefit from development ecosystems—we have to encourage the Cerners and Epics to figure out how to open up data. We need to be able to allow apps to move data back into the EHR, and then into clinician workflow so that it’s effective.” He predicts, “This will frustrate the venture model if we don’t change this—it has the potential to
depress investment. We need to work with the industry to solve this.” Pete Smith from Impact Advisors observes, “EHR vendors are interested in preserving their internal data model and their workflow—it’s their ‘secret sauce.’ Integrating back to the core platform is the challenge.”

Ryan Smith believes that integrating back to EHR platforms is even more complex. “This may take some years,” he says. “The logic is deeply tied into the EHR systems—even if they open up the data, there’s no middle ground. We can’t just work with data—in many cases we’ll have to rewrite logic to integrate data back into the EHR workflow.”

Lydon Newman from Impact Advisors asserts, “We’ve spent millions to solve the ‘best of breed’ problem. We wanted a single source of truth, improved workflows and a rationalized portfolio. Now that we’ve achieved this, we’re seeing mobility and apps creating another set of ‘islands.’ Our challenge is how do we not reinvent the problem, yet still innovate at speed?”

Ryan Smith notes the speed of innovation is a key issue: “We need to understand—the train has left the station—we need to get out in front or we’ll get left behind. We need to understand the market—if our core vendors can’t manage the need for a new ‘digital relationship’ with the patient, then Apple or Amazon will. It’s a race to have that relationship with the customer.” Adds Jason Joseph: “It’s not just that we’re digitally behind—we’re organizationally irrelevant to our consumers! Apple and Amazon have the relevance, and can have the dialogue—consumers have to care. Tools will come and go—it’s all about being relevant to the consumer.”

Ken Lawonn adds, “Moving to a single platform allows you to be more responsive. That’s what the Apple Health Record is trying to do. More EMRs make it more complex, especially if we want a single patient experience—until we can bring it together in that single experience we won’t be able to compete with Apple.” Ryan Smith concurs: “We already have four different portals for consumers and apps,” he says. “We have a clinical portal, billing portal, medication-refill portal, urgent-care portal—what we need is one place for all consumers.”

Ryan Smith says, “We defined what ‘digital’ means at Banner. Digital is multi-channel and is defined primarily by the audience—providers, patients or consumers, employees, for example—and is defined as the ability to get select solutions at your fingertips on the device of your choosing at the time you need the information.”
Banner has also taken a unique approach to innovation, creating “Imaginariums” to help foster ideas, development and resources. “Imaginariums can prove concepts quickly,” says Ryan Smith, “and then we can scale them quickly across all of Banner. One Imaginarium is focused on consumers—building loyalty while regionally focused. It’s targeting the goal of providing the best patient experience. Another Imaginarium is the ‘Digital Garage,’ a separately funded digital-business ‘swat team’ to help innovate and develop ideas rapidly.”

Yet, even with all the challenges surrounding innovation, and the pressures for IT to evolve, Summit participants see opportunity. Jason Joseph expounds on this theme: “I don’t see it as threatening. If done well it’s better for the organization. Where I get nervous is when the excitement or propensity for ideas becomes the overwhelming factor rather than the ability to execute or make an impact. There also needs to be a respect for everyone’s role—if you have that trust, then it doesn’t matter who’s leading it. Digital business isn’t just about technology—it’s about the business model and how to apply it—and knowing when to go quickly, and when not to.”

Ken Lawonn adds, “We have to be careful to not let operations innovate on their own, as they will innovate from their own perspective. We need an organizational perspective to ensure platforms work for multiple groups and stakeholders.”

Heather Nelson agrees. “We’re not threatened by it—we’re here to enable technologies. We need to be seen as a partner. The real concern is operational readiness—the ‘what problem are we trying to solve’ question often remains unanswered. Getting business to define the problem is the key challenge we see with innovation,” she says.

Tim Thompson reiterates the importance of partnerships, noting, “We work closely with both planning and marketing. This has been good—marketing has forced us to look at, and think differently about innovation. We needed to have a closer alignment. There’s a creative and practical aspect to this—we have to implement and support applications—and we have to figure out the right balance.”

Eric Yablonka believes healthcare organizations can more successfully innovate if they view themselves as integrators as well as creators. “We need to buy capabilities, ‘skin’ them for our organization’s needs, integrate them and then manage them. We can become digital by

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Tim Thompson says non-healthcare partners with experience in traditional retail may offer tangible advantages. “We’re now partnering with Publix grocery stores to put digital clinics in stores. Patients can connect with physicians via telemedicine in a private room. Everything around that experience is more ‘digital’ than we’ve done traditionally.” He continues, “And in many cases, Publix is better than we are. Take for example discharge medications. Publix can leverage their infrastructure, and they can route patient medications from the nearest Publix store and do home delivery of those medications much faster than we can as a healthcare organization. They have a retail mindset, and that’s a differentiator.”

Bill Hudson also favors partnerships. “It’s not about controlling as much as you can—it’s now about partnering as much as you can. Healthcare needs to focus on what we’re good at, and that’s healthcare—it’s not data centers. And the skills we’ve inherited are not necessarily the skills we need.”

Ryan Smith agrees, saying, “We have to be willing to continually adapt and learn new skill sets to meet where the industry is going, and we’ve also focused on partnerships, with IT respected as a true business partner. We’ve developed a ‘Batman and Robin’ metaphor. Batman is the operational or executive leader who becomes the face and primary name behind each initiative—and it’s not in IT. Rather, IT takes on the Robin role as a partner to Batman. This ensures we get operational engagement, and initiatives are not sold as IT projects. It’s been a really successful model for us.”

**Conclusion | Healthcare has become digital**

As healthcare consumers continue to expect healthcare delivery to become more digital, our leaders are being challenged to find new ways to innovate. Meeting the digital standards and customer expectations set by the retail industry means healthcare systems must adopt similar strategies for development and speed to market as have retail services.

This often manifests itself in new partnerships with technology innovators like startup companies with new ideas and products who are seeking to help digitally transform healthcare, or with established retail partners such as Publix, LYFT or Allstate who may be able to extend retail-based models and technologies to healthcare.

Yet no matter how healthcare systems choose to innovate, what remains clear is that delivering care the way our patients desire, using the tools and methodologies patients are demanding—rather than “medicine as usual”—has become the new norm. The digital transformation of healthcare is here—*healthcare has already become digital*—and how we manage that evolution will determine not only our success as hospitals and health systems, but that of healthcare itself over the next decade and beyond.
About the sponsors

The **Scottsdale Institute (SI)** is a not-for-profit membership organization of prominent healthcare systems whose goal is to support our members as they strive to achieve clinical integration and transformation through information technology (IT). SI facilitates knowledge sharing by providing intimate and informal forums that embrace SI’s “Three Pillars:”

- Collaboration
- Education
- Networking.

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