THE PRICE OF INNOVATION

8 must-reads for hospital CIOs looking to get the most out of IT investment

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9 predictions for digital health in 2020

By Andrea Park

The global digital health market is expected to reach a valuation of more than $234 billion in 2023, up from 2019's estimated $147 billion, driven by the healthcare industry's ongoing transition toward a model of value-based care, per a new Frost & Sullivan report.

The report, "Global Digital Health Outlook, 2020," also describes nine predictions for the growing digital health sector in 2020. The predictions center on products and solutions in several areas, with cybersecurity, big data, digital therapeutics and remote patient monitoring among those offering the most significant growth opportunities.

Here are nine predictions for the digital healthcare market in 2020, according to the Frost & Sullivan analysis:

1. Spending on artificial intelligence will slow by 50 percent as the priority turns to real-world applications of the technology.

2. Cybersecurity services will face ever-increasing demand.

3. Advancements in digital therapeutics will direct the development of information and communications technology.

4. As remote patient monitoring expands beyond chronic disease management, digital health opportunities will also increase.

5. Not only will femtech continue to play a critical role in women's health, but it will also be one of the top five investment areas of digital health.

6. Data analytics will grow to a footprint encompassing at least 65 percent of the world's data health market.

7. Telehealth, currently segmented, will be optimized into an end-to-end solution, accelerating digital health convergence.

8. Employers will make IT-enabled employee health and wellness programs a top priority.

9. The market will become increasingly dependent on big data infrastructure for digital health.

Covenant Healthcare CIO Frank Fear on the Journey Into Comprehensive IT Service & Project Management

Cost effective management of IT projects & support services allows for strategic allocation of funding.

As requests for services and support from end-user groups begin to accelerate dramatically, healthcare CIOs are turning to solutions that offer comprehensive solutions to their IT service management and project management challenges. The healthcare industry is both different from and similar to other industries, along a variety of dimensions. When it comes to information technology development, senior healthcare information technology executives face some unique constraints and challenges, including those around cybersecurity and the sensitivity of patient data, and the tremendous fragmentation of data across the healthcare operating environment.

And what is the lived experience of CIOs and other healthcare IT executives like, right now, and how does that lived experience intersect with the types of services available? Frank Fear is CIO of Covenant HealthCare, a healthcare system centered around a 540-bed community hospital in Saginaw, Michigan. Covenant encompasses 4,500 employees, and serves patients across a one-and-a-half-hour radius extending out from the main hospital campus. The health system supports the IT needs of a large number of physician of¬ ces and facilities in the region, including approximately 340 providers in the area. "As the CIO, I have IT resources, and I need to assess their capacity,"

Fear explains. "What capacity do they have to work on projects, to work on change requests, to work on support requests?

At the 40,000-foot level, having a comprehensive project management solution allows me visibility for insight into those areas, and allows me to plan for project-based work based on the capacity to handle support requests and change requests. We use the ITIL [formerly an acronym for Information Technology Infrastructure Library] framework, a well-recognized framework that helps IT executives to manage work and provide customer service and support. That framework buckets elements into support incidences versus change requests; it can help determine whether a request will require the establishment of a new project or not. And the 40,000-foot view is for me as an executive is that, as I'm planning to manage the requests from my customers, the ITIL framework allows me to manage those requests and capability." Most importantly, Fear says, "Like other businesses, we're becoming a digital business that provides healthcare, just as Tesla is becoming a digital business that provides cars. And our customers realize they need our support. So the demand is escalating and it's only going to increase, as our consumers demand more digitalization of healthcare."

Fundamentally, Fear says, a huge element in the acceleration and intensification of demands on his IT department and on the IT departments in hospital-based organizations nationwide, has to do with the post-EHR implementation operational environment in which he and other HIT leaders are now working. As value-based contracting and demands move forward from all payers—public and private—CIOs like Fear are faced with snowballing demands on their departments' resources—human, process, and technological. Importantly, Fear says, technology adoption becomes completely enmeshed in process changes around performance improvement work. And in healthcare, that speaks to clinical transformation and operational transformation. As Fear puts it, "Just a small number of years ago, a relatively small percentage of patient care organizations in the United States had digital health records, so naturally, the first step was to implement EHRs. And the government came in with HITECH to help us become electronic. We first had to go digital, before anything else. But now, the next step—and I see this inevitably happening in many industries—we basically make our core processes electronic. But then we realize the need to change our core business processes to really achieve the potential efficiency gains that will be needed. With regard to that, we're now over 90-percent fully electronic in our processes. So now, we need to learn how to work different, and we need to leverage information technology to help create those process and performance changes." Importantly, Fear underscores, "The desire for new technology solutions to support change and other processes, is insatiable; it far outweighs the capacity. So I need to be able to clearly articulate what my IT organization's capability is. And, it's very important for me to be able to sit down with those in governance, to evaluate our full capacity, and manage the governance around what is possible."

17 trends in health IT today: innovation, EHRs, revenue cycle and more

By Laura Dyrda

Hospital CIOs, innovators and technology leaders remain focused on supporting patient care with technology and creating a better patient experience.

At the Becker's 5th Annual Health IT + Revenue Cycle Conference in Chicago, Oct. 9 to 12, more than 315 speakers and thousands of attendees convened to discuss the big challenges and trends in healthcare today. Here are 17 key takeaways from the event.

Innovation:

1. Innovation doesn't necessarily require technology. Promote creativity in healthcare by creating competition, bringing in speakers and launching events for both employees and community members, such as hackathons.

2. Patients demand a more streamlined healthcare experience and technology can help health systems get there. Amazon, Walmart, Google and others getting into healthcare will be interesting in the next few years.

3. Data integrity is important but also the single biggest obstacle to achieving return on investment. Hospital executives need analytics to deliver change, not just monitor what's going on.

EHRs:

4. Voice transcription technology is the future, which will allow physicians to interact with the patients one-on-one and the documentation automatically occurs in the background.

5. When rolling out new IT it's important to explain the reasoning behind a new implementation and ask for clinician input. When physicians feel like they are a cog in the wheel of implementation, they will resist.

6. It remains a challenge to access medical records from outside the patient's health system. CIOs are looking for ways to teach patients to safely handle their health data.

Revenue Cycle:

7. Price transparency is increasingly important for patients today. Hospitals need to make it simple for patients to pay through a personalized payment experience.

8. The technology exists to streamline the revenue cycle, but regulations are a big roadblock to implementing those technologies.

9. There is a need for more collaboration between revenue cycle leaders and IT departments to drive innovation. There are so many technologies that can help the revenue cycle that need IT support.

10. Patient collection strategy is top-of-mind for many revenue cycle and financial leaders. Patients expect a seamless billing process. One new trend is risk management for potential negative press due to aggressive collections; in some cases, health systems are updating their collection policies.

Blockchain:

11. Healthcare leaders can look at the financial, retail and gaming industry to gain ideas of how to implement blockchain. Walmart is using it for supply chain and has been successful. By watching what these companies do, hospitals and health systems can come up with ways to incorporate blockchain.

12. Blockchain has the potential to really change physician credentialing. This is a really tedious tasks that could be simplified with blockchain.

13. While blockchain isn't a magic wand, it does have substantial use cases. For example, the technology can reduce the time it takes to complete transactions to a matter of minutes or seconds.

Artificial Intelligence:

14. AI seems scary and unknown and as if it's going to steal physicians' jobs, but in reality it is just a great tool for augmenting human decision-making.

15. When seeking executive buy-in for AI projects, play up the ROI and the "why" of the actual solution.

16. Some of the biggest challenges for healthcare organizations looking to implement AI include determining the provenance of all data used and changing data governance structures to account for new uses; figuring out how to deploy it consistently across the many segmented parts of the healthcare system; and determining/defining what "success" means for AI.

17. Artificial intelligence won't replace physicians; instead, it arms clinicians with another tool to provide better care. In billing, AI can automate processes and create opportunities for employees to move one step up in their technical knowledge and abilities.

Becker's Hospital Review writers Andrea Park, Mackenzie Garrity and Maia Anderson contributed to this article.

How 11 health systems are spending millions in innovation dollars for new initiatives in 2019

By Laura Dyrda

Hospitals and health systems are investing in innovation centers, artificial intelligence, technology startups, telemedicine and hospitals of the future.

Here are 11 hospitals, health systems and healthcare providers that are spending on new companies, initiatives and institutes focused on technology and healthcare innovation over the past six months.

NewYork-Presbyterian in New York City launched the Hauser Institute for Health Innovation after receiving more than $50 million since 2011 from philanthropists Rita Hauser and Gustave Hauser to improve the health system's telemedicine programs.

Cedars-Sinai Medical Center in Los Angeles has become a founding sponsor of Bioscience Los Angeles County, a nonprofit organization supporting life sciences innovation among research hospitals, academic institutions and public institutions.

Charlotte, N.C.-based **Atrium Health, Cleveland Clinic** and the Long Beach, Calif.-based MemorialCare Fund invested $3 million in Xealth, Seattle-based digital health startup, to help the company close a $14 million Series A financing round. UPMC, Froedtert and the Medical College of Wisconsin are also investors in the company.

OSF HealthCare in Peoria, Ill., launched OSF Ventures, a part of OSF Innovation, in 2016 to strategically invest financially in opportunities that will improve patient outcomes, enhance patient experience and reduce the cost of health care. OSF Ventures deployed its first $75 Million fund across 16 portfolio companies and two other investment funds since its inception. OSF HealthCare has collaborated with many of these companies to test and improve the solutions they've created, with some successfully being used throughout the organization.

Hartford (Conn.) HealthCare has promised a $500,000 investment in a health technology accelerator that aims to bring new medtech startups to the city.

The **University of Arkansas for Medical Sciences** in Little Rock established the Institute for Digital Health and Innovation to enhance telemedicine and digital health services. The institute will initially focus on increasing

access to technology for video consultations and seek partnerships with other health systems to broaden the specialties it offers patients.

Providence St. Joseph Health partnered with Microsoft to build a new high-tech hospital that will improve the health system's EMR in addition to evolving the hospital model. Providence St. Joseph Health in Renton, Wash., acquired a Seattle-based healthcare technology company Lumedic, which uses blockchain technology to improve revenue cycle management. The health system also acquired Epic Consulting firm Bluetree as part of its strategy to diversify its revenue and support patient care.

So far in 2019, New York City-based **Mount Sinai Health System** has launched several innovation institutes and initiatives. It partnered with LabCorp to establish the Digital and Artificial Intelligence-Enabled Pathology Center of Excellence within its department of pathology, molecular and cell-based medicine. The health system also partnered with Hasso Plattner Institute in Potsdam, Germany, to establish a digital health institute. Finally, the health system opened the Center for Computational Immunology at its Icahn School of Medicine, which will allow researchers to use genomics, machine learning and immunology to develop precision treatments.

Winston-Salem, N.C.-based **Novant Health** launched the Institute of Innovation & Artificial Intelligence, which aims to use advanced technology to personalize patient care. It will also partner with technology companies and research organizations to reach its goals.

Cleveland Clinic formed the Center for Clinical Artificial Intelligence to further the use of technology in diagnostics, disease prediction and treatment plans. The Cleveland Clinic Enterprise Analytics launched the center, which has already begun building machine learning models to identify patients at high risk of death during admission and several projects focused on personalized cancer care.

Emory University in Atlanta is planning a $1 billion "health innovation district" in Brookhaven, Ga. It filed an application with the city in May and would expect the development, which would include a hospital and hotel as well as commercial space, to take 15 years to complete.

The role of IT In Providence St. Joseph's growth strategy – key thoughts from CIO B.J. Moore

By Laura Dyrda

B.J. Moore is executive vice president and CIO of Providence St. Joseph Health, an innovative health system based in Renton, Wash.

Earlier this year, Providence St. Joseph Health partnered with Microsoft to create a high-tech hospital of the future in Seattle, first targeting the system's EMR and communication functions to help providers share information more easily. The 51-hospital health system is also focused on connectivity and access to information systemwide, aiming to boost quality of care for its hospitals, 829 clinics and 119,000 caregivers.

Here, Mr. Moore discusses the technology his system is using today to become more connected and where he sees big opportunities in the future.

Question: What steps are you taking today to improve interoperability between locations within the health system? What type of resources does it take to integrate a newly acquired hospital or system into the Providence St. Joseph system from an IT perspective?

B.J. Moore: As we move out of our data centers and into the cloud, it will become easier to increase interoperability between our locations across our health system to ensure a common integration point regardless of location. We need to lead with business strategy and processes. What is our integration strategy? Do we move to a common EHR, ERP, domain, identity system, etc. Only then does IT have the

mandate and systems' strategy to achieve goals.

Q: What role does the IT department play in the health system's efforts to improve population health?

BM: IT is central and pivotal to a health system's population health effort. Through a sound big data strategy, patient record, demographic, and other system strategies and the application of advanced technologies like machine learning/artificial intelligence, IT can be the foundation for population health strategy and infrastructure.

Q: How do you think your role will change in the next three years? What are you doing to prepare?

BM: IT's role is changing from just being an infrastructure and application provider, to also being an innovator in areas like big data and machine learning and artificial intelligence. What we are doing to prepare for this evolution is to do the basics right and well, to free up IT resources and to provide the foundation as we build these more advanced tools and applications in the coming years.

Q: What do you see as the most dangerous trend in healthcare or health IT today and why?

BM: Risk aversion to change and slow to embrace new technologies like cloud, big data, and machine learning/artificial intelligence.

How Providence St. Joseph Health's venture fund approaches digital innovation

By Jackie Drees

Aaron Martin brings more than 20 years of experience in technology and strategy to his roles as executive vice president and chief digital officer at Providence St. Joseph Health and managing general partner at Providence Ventures, the health system's venture capital arm.

The corporate innovation fund is part of PSJH's Digital Innovation Group, which drives the Renton, Wash.-based health system's progress and initiatives toward enhancing digital innovation. Operating under DIG, Providence Ventures is tasked with generating strategic and financial returns for PSJH by investing in companies and initiatives aimed toward using technology to solve healthcare issues.

Here, Mr. Martin discusses Providence Venture's strategy for approaching investment opportunities and how he helps support innovation within the group.

Editor's Note: Responses have been lightly edited for clarity and length.

Question: What factors does Providence Ventures consider when searching for new investment opportunities?

Aaron Martin: First and foremost, the team focuses on areas of strategic priority for the system – in other words, finding companies that address or solve the big problems that the organization is facing and wants to solve. In addition, they ensure that the fund has financial return targets that it aims to achieve with the portfolio of investments. By focusing on these large priorities, we believe we're defining a valuable market space, which will de-risk our investments.

Q: How do you promote innovation within Providence Ventures?

AM: Providence Ventures is a key component of a larger innovation model, which is PSJH's Digital Innovation Group. DIG is a team of about 200 people who are responsible for an innovation model that starts with working with our clinical, operations and subject matter experts in the organization to size and prioritize the largest opportunities and problems we have and how we are able to leverage digital technologies.

When we've identified these 'needle movers,' as we call them; we run them through a very deliberate process in which we determine first if we already have a solution

to the problem we've already licensed. If not, we get Providence Ventures and Avia, which is a network of health systems focused on digital innovation and transformation, involved to help us find the 'best of breed' company that has solved the problem or is on track to doing so. If it makes sense, Providence Ventures will invest in the company. If we don't already have a digital solution or we can't find one, we'll build the solution and spin it out as a company. We've done this twice before with Xealth and Circle/Wildflower, and we're currently working on a third spinout. Ultimately, Providence Ventures plays a role in financing these spin outs.

Q: What technology do you think will significantly impact the healthcare industry in the next five years?

AM: Artificial intelligence and related technologies such as natural language processing and machine learning will begin demonstrating value across several different segments and use cases in the healthcare industry. For instance, voice technology that uses natural language understanding and natural language processing will increasingly play important roles with providers and patients.

With providers we believe the in-clinic potential of voice technology can reduce technology burden on providers, for example through automation of documentation and charting. For patients and consumers of healthcare, whether it be in clinical settings like hospital rooms controlled via voice, or in their homes through smart speakers like Alexa and Google, consumers who are increasingly getting used to voice as a mechanism for doing other things can also use it to get their healthcare needs met, such as booking appointments and getting messages from their providers. As an example, PSJH was one of six healthcare organizations to launch a HIPAA Amazon Alexa skill.

Additionally, AI can power robots that can support patients and consumers in navigating the complex health system structure. Whether it be just looking for the right setting of care that matches a patient's needs, whether they are geographic, clinical or other, or actually doing triage, diagnosis and treatment, AI-powered robots can get patients the information they need quickly and efficiently. At PSJH, we've built very early versions of AI-powered robots that help navigate patients to the right care venue.

3 key areas that Centura Health's IT budget is focused on: CIO Ken Lee

By Jackie Drees

Ken Lee, senior vice president and CIO at Centura Health in Centennial, Colo., discusses the focus behind the health system's IT budget and how it aligns with the organization's future goals.

Responses have been lightly edited for clarity and length.

Question: What does your health IT budget look like this year? Is it trending up or down over previous years?

Ken Lee: Most recently, our Centura Health IT budget has been trending downward as we have focused on driving cost efficiency as well as restructuring the IT team to align with our 2025 strategy. My goal is to maintain a flat-to-slightly-increased annual budget as we reinvest savings from operational efficiency to build digital capabilities that will create an 'easy button' for healthcare. We're on a mission to make healthcare more accessible and effective for our customers and increase the efficiency of our providers and clinicians to do more with their patients.

Q: How are you allocating the budget? What difference is there this year compared to previous years?

KL: Our budgeting process focuses on three areas:

keep the lights on, enhancements and strategic projects. As we continually drive efficiencies in our KLO spend, we allow increased investments in enhancements and strategic projects. The focus is on return on investment and alignment to our Centura Health 2025 corporate strategy and annual business goals. Bottom line, our success in IT depends on our alignment to business goals and metrics.

Q: What projects are you most excited about for 2019?

KL: There are a few initiatives that I'm excited about in 2019.

First, our focus to create an 'easy button' for healthcare starts with our physicians. Our physicians have varying levels of efficiency using Epic, and anything we can do to help them be more productive equates to improved patient care and reduced physician burnout. We have a program to provide every physician a personal coach to improve his or her use of our digital tools like Epic. This bi-directional relationship helps us through the change management related to the implementation of new technologies.

Centura Health is also building our foundation for predictive analytics. We've assembled a team of associates with experience outside of healthcare

around machine learning and artificial intelligence. Recently, this group completed an effort to review and analyze all of our physician contract payment terms. Since the contracts were on paper, they used optical character recognition to digitize the contracts and then used machine learning to pull out the terms of the contract to compare payments against the contract terms. This group completed the bulk of this task in a week. We're leveraging those same capabilities on our initiatives to improve patient satisfaction, safety and quality.

Another example is our initiative to provide an end-to-end digital customer journey. Imagine a web or mobile app experience that provides a technology platform for vendors to help us deliver a comprehensive healthcare experience — much like Amazon provides an exceptional retail experience by providing the foundation for vendors to deliver their products through the Amazon ecosystem. The first step to improve the experience is scheduling a visit to any primary care or specialty doctor. This helps both the patient and the physician. Therefore, we are building the foundation to provide a healthcare experience that delivers the same ease and convenience people are accustomed to receiving with other industries, like booking a hotel room on Travelocity or shopping on Amazon. Healthcare is ready for digital transformation and Centura Health is working with our health partners to meet our patient's needs.

5 key thoughts for the Healthcare CIO

IT service management and project management must be conceptualized at the highest levels of an organization, and must be governed actively and consciously, in close relation to the organization's core business objectives and needs.

In this area, technology is inseparable from technology management and from governance. All are interrelated, and must be managed and developed as such.

In healthcare in particular, the needs will only accelerate dramatically in the coming months and years, as the shift from a volume-based payment system to a value-based one, accelerates and intensifies.

CIOs and other healthcare IT leaders can no longer rely on anecdotally based, subjective evaluations of needs and resources in their organizations. A more evidence-based, quantifiable and quantifying, set of processes, is needed.

An organized, comprehensive, strategic process of service management and project management needs to be delivered in an integrated way, via a flexible, supportive platform, in order to help healthcare CIOs move forward effectively in the emerging operating environment in healthcare, in which cost-effectiveness, efficiency, and improved clinical outcomes, are all becoming essential to survival.