Interoperability and Cloud Hosting:
Synchronizing Business and Clinical Operations
A THOUGHT LEADERSHIP ROUNDTABLE

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Infor recently hosted a thought leadership roundtable with members of the College of Healthcare Information Management Executives (CHIME) to explore cloud hosting and interoperability. Topics included current strategy for migrating to the cloud, synchronizing business and clinical operations, EMRs, ERPs, partnerships, cybersecurity and more. CHIME President and CEO **Russell Branzell** moderated the discussion.

Participating CHIME members:

Cletis Earle
SVP, CIO, Penn State Health and Penn State College of Medicine

Robert Frieden
VP, CIO, Genesis Health System

Jennifer Greenman
CIO, Cancer Treatment Centers of America

Tamara Havenhill-Jacobs
CIO, Bozeman Health

Michael Jeffries
CIO, Boulder Community Health

Sheree McFarland
CIO - West Florida, HCA Healthcare

Scott MacLean
SVP, CIO, MedStar Health

Karen Wilding
VP, Chief Value Officer, Nemours Children's Health

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INTRODUCTION

Infor hosted a thought leadership roundtable featuring members of the College of Healthcare Information Management Executives (CHIME) to explore cloud hosting, interoperability, and the potential of a connected platform to synchronize business and clinical operations. Chief information officers (CIOs) and other digital health leaders discussed their current strategic perspectives on whether to migrate data to the cloud or keep data centers located on-premises. CHIME President and CEO Russell Branzell moderated the roundtable: contributing to the discussion were Infor representatives Matt Bragstad (VP, Head of Vision, Healthcare & Public Sector) and Tim Brown (Chief Business Information Officer).

CHIME members participating:

- Cletis Earle, Senior Vice President and Chief Information Officer, Penn State Health and Penn State College of Medicine
- Robert Frieden, Vice President, Chief Information Officer, Genesis Health System
- Jennifer Greenman, Chief Information Officer, Cancer Treatment Centers of America
- Tamara Havenhill-Jacobs, Chief Information Officer, Bozeman Health
- Michael Jeffries, Chief Information Officer, Boulder Community Health
- Sheree McFarland, Chief Information Officer - West Florida, HCA Healthcare
- Scott MacLean, Senior Vice President, Chief Information Officer, MedStar Health
- Karen Wilding, Vice President, Chief Value Officer, Nemours Children's Health

SUMMARY

The complexity of connecting and combining disparate sources of data has prevented many in the healthcare industry from maximizing the true power of data by turning it into insights and action. Working with legacy data systems that pose interoperability challenges for security mandates, digital health leaders often face a need for in-house integration that consumes considerable staff resources. At the same time, those staff resources are needed to address rising demand for digital capabilities such as remote workforce enablement and supply chain insights.

Healthcare IT leaders are currently making strategic choices from an array of new technologies that offer to improve efficiency and patient outcomes through advanced digital healthcare models. Cloud hosting of data is on the rise as organizations begin to outsource the most technical aspects of keeping data on-premises. Still, decisions on whether to migrate data to the cloud with a third-party vendor are multifactorial, as leaders consider issues such as budget allocation, reliability, flexibility and staffing needs, in addition to interoperability and cybersecurity.

Digital health leaders want to close the digital gap between the electronic medical record (EMR) and enterprise resource planning (ERP). Clinical care and planning are based on the EMR, while business issues such as supply chain, human resources and payroll flow through the ERP. Lack of compatibility between the two systems creates significant administrative challenges. Increasing interoperability would enable rapid improvement in planning, efficiency, cost containment and quality of care.

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>
> **Sheree McFarland**
> CIO-West Florida, HCA Healthcare

MIGRATING TO THE CLOUD: A SNAPSHOT

Leaders reported that their organizations occupy every point along a spectrum from keeping data centers mostly on-premises to adopting 100 percent cloud hosting as rapidly as possible. Many are using hybrid solutions and moving toward the cloud in many areas.

"We are in flight, as leadership migrates everything over to cloud technology," said Sheree McFarland, CIO - West Florida, HCA Healthcare. "The way we look at cloud-based hosting is that the EMR is only one part of our ecosystem. We have relationships with Google, Microsoft, Apple, and Amazon, and we're involved in a lot of partnerships and keeping options open for interoperability."

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> **Cletis Earle**
> SVP, CIO, Penn State Health and Penn State College of Medicine

"We're also on the journey," said Cletis Earle, SVP, CIO, Penn State Health and Penn State College of Medicine. "Our ERP is fully cloud hosted. Our EMR is moving toward the cloud base. We are truly getting out of the business of hosting, but when you're dealing with an academic side, there are thousands of systems, so we're moving along a path toward our goal."

All participants reported some level of hybridity in their data-hosting. "Most of our enterprise services are either cloud-based or software as a service (SaaS)," said Scott MacLean, SVP, CIO, MedStar Health. "ERP is the last enterprise platform we have on-premises: we can't make it work for cloud right now because of some external factors."

Some leaders still see real cost advantages to on-premises data centers, a perspective which may be related to a health system's size and the relative impact of economies of scale. "We say around our organization

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that the cloud is just someone else's computer," said Michael Jeffries, CIO, Boulder Community Health. "We only use cloud offerings when vendors don't have a non-cloud offering, because every time we've done an evaluation, we can do it faster, better, and cheaper with our internal resources. We're lucky enough to have good talent. But we will move to cloud when it makes sense."

"We're hybrid, with our EMR side in the cloud," said Robert Frieden, VP, CIO, Genesis Health System. "The biggest thing still on premises is ERP, but that's because we're legacy on the import side there and our radiology is also local, so there are lots of images involved. We have two data centers, and for some infrastructure, the backup is important."

Other participants reported similar considerations for imaging and data hosting due to the very large file sizes of images. "The imaging is really hard to take out of data centers without performance suffering," said Jennifer Greenman, CIO, Cancer Treatment Centers of America. "But we're about halfway there, so most of our commodity-type applications, both clinical and business, are in the cloud."

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STRATEGY VS. CLINICAL BUSINESS DRIVERS

Leaders vary in their approaches to adopting cloud hosting: some are driven by overarching strategic goals to move to the cloud, while others base decisions on individual clinical business drivers.

"You've got to have the right on-premises connectivity," said MacLean. "Some applications such as biomed need to be onsite to avoid latency issues. For our organization, a decision is based on the product selection and what the product does, but with no commitment that everything going forward has to be cloud-based."

Greenman agreed. "My preference would always be a cloud-hosting model, but for radiation oncology imaging, the cloud options are not cost-effective, and performance can be an issue."

"Cloud would also be my preference, but sometimes a choice will come down to the subscription cost and operational impact," said Havenhill-Jacobs.

Earle agreed on cost considerations, particularly for academic institutions. "We are a university and a major R1 facility, so we have pedabytes of data to store," Earle said. "It is currently cost-prohibitive to put pedabytes in the cloud, and our growth in data is becoming exponential."

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CAPITAL EXPENDITURE VS. OPERATIONAL EXPENDITURE

The shift from the capital expenditure required for hosting on-premises data centers to the operational expenditure required by a subscription service is disrupting the previous model of organizational budget planning. Capital expenditures are fixed and often one-time charges, which makes capital-based budgets fairly predictable. As expenses swing heavily to the operational side with more recurring charges for subscriptions, software-as-a-service and cloud hosting, budgeting can become fraught with debate. Organizations that reduce their operational budgets for the year may create challenges for digital health teams that have committed to a fixed subscription cost or costs that may rise with additional data storage. If a healthcare system's fiscal leaders do not account for the impact of the switch from capital expenditure to operational expenditure, it can be easy to develop a misimpression that IT based on subscriptions is now costing the organization a great deal more than IT did when on-premises hosting expenses were tabulated on the other side of the budget in capital expenditures. For the future, it will be important for both organizations and vendors to address budget planning and cost containment in a healthcare ecosystem that has now evolved away from the fundamental assumptions on which IT budgeting was previously based.

CORE CRITERIA FOR FUTURE PARTNERSHIPS IN CLOUD HOSTING

Participants considered their expectations for future cloud-based partnerships and suggested several fundamentals they would like partners to provide.

"I'll name three core expectations: 1) uptime; 2) access to our data; and 3) interoperability," Earle said.

Wilding suggested that there must be transparency from vendors on key performance indicators (KPIs) of their service offerings and reliability, noting that communication becomes crucial once the data moves offsite. "When data is on-prem, there is confidence with the access and oversight controls," Wilding said. "But when data is sitting off site, there is a greater ability for that party to impact business & clinical operations. Transparency and pro-active communication must be prioritized so there is a strong partnership."

"I would emphasize visibility," said Frieden. "Often a vendor will be able to see our side completely, so they see any problems and tell us that we have to fix any problems on our side before they take any action. But we can only see so far into their side, so we can't tell if there's a problem over there that is actually causing the current situation. If they would give us greater visibility into their side, we would have a better partnership."

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Participants also pointed out that resource management will be a differentiator for vendors. When a major simultaneous upgrade for all customers occurs, for example, vendors will need to have the resources and staff in place to assist all those customers at once. Staffing at that level might prove to be a challenge. However, the potential advantage of a partnership is that the burden of high-intensity events is shared because the healthcare organization itself no longer has to handle massive patches on its own, with the consequent need for cyclical IT staff buildups and reductions.

CYBERSECURITY IN CLOUD PARTNERSHIPS

Keeping data secure in a world where cyber threats are severe is a central concern for healthcare organizations across the country, as shown by the CHIME Digital Health Most Wired National Trends 2021 (p. 9). Migrating data to the cloud raises questions about which organization is responsible for the security of the data: is it the healthcare system, the cloud hosting company, or both?

"Many people don't understand the shared responsibility model of the cloud," said Greenman. "So, when breaches happen, the vendor will claim that the fault lies with the healthcare system's team for not configuring the environment correctly."

Vendors also need to plan for adequate recovery support in the event of a large-scale cybersecurity issue. "For a smaller healthcare system, the question is, where are you in the order of recovery?" asked Havenhill-Jacobs. "After a major cyber event, how do you know you will receive the right level of response and prioritization?"

Participants pointed out that there has been insufficient industry discussion of the necessary testing and validation that needs to accompany the vendor's control of the data environment. "You're putting the power in the hands of these vendors to ensure that they're doing all the due diligence," Earle said.

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> **Scott MacLean**
> SVO, CIO, MedStar Health

EMR/ERP INTEGRATION

Digital health leaders agreed on their expectation that if vendors are going to be partners in data hosting, those vendors must also take steps to marry the functionalities of the EMR and ERP to improve efficiency and care delivery.

"If we could have real-time decision support at the point of care—decision support that allowed clinicians to make decisions about costs as they planned care—that marriage of the EHR and ERP would be critical for us," said MacLean.

"Predictive insight around utilization of the supply chain would also be very helpful at an enterprise level," added Greenman.

"There are scores of major EMRs out there in the marketplace," noted discussion moderator Russell Branzell, CHIME CEO and President. "Should an ERP provider be expected to work with all of them?"

Participants responded that the ERP providers could begin by ensuring interoperability with the largest EMRs, and then work from that foundation.

Others suggested a more global approach to achieving interoperability quickly. "The vendors need to work together to create a framework that would allow for the systems to interact," said MacLean. "Historically, the provider has had to pull data from both EMR and ERP and put data from these two sources into a third data analytics program. Instead, these two systems should interact directly with one another."

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"The EMR and ERP should be fully integrated," said Earle. "And the vendors need to be talking to one another to figure it out with bi-directional integration."

Leaders agreed that as cloud hosting becomes more common and opens more paths to interoperability, vendors should do the heavy lifting required to achieve system integration. Healthcare organizations seeking value, efficiency and better patient outcomes need vendors to automate more of the back-end processes that support those goals.

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> **Karen Wilding**
> VP, CVO, Nemours Children's Health

"If integration doesn't happen, the impacts are profound to operations and care delivery," Wilding said. "For example, supply chain delays can impact surgical care and staff productivity, facility throughput and more. It's a massive domino effect. Lack of integration can even lead to a poor patient experience and a poor staff experience. The stakes are high, now more than ever in a value-based care landscape, and these challenges must be resolved."

"One of the things we need to ask is what the patients expect of us today," Jeffries said. "We're being asked to know what things cost, and the dirty little secret is that we don't always know what things cost. And the reason for that inability to estimate costs is that our systems are so disparate. If instead we could bring together our supply chain costs and our clinical data, we can do activity-based accounting and really understand the costs. Then we could inform the customer of an accurate cost range for the procedure, and I think that's what's expected of us as healthcare providers."

"Integration is not just for cloud hosting," MacLean pointed out. "These vendors are involved in our on-premises systems too, and we need their help with integration there."

CONCLUSION

All roundtable participants agreed that cloud hosting is the logical future direction for data management. Even those who are more skeptical of current cloud-hosting capabilities express a desire to move to the cloud "when all the kinks are worked out," given a hypothetical four-to five-year time frame.

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> CIO, Boulder Community Health

"The move to the cloud is being expedited by COVID-19, and that's going to continue," said Earle. "For example, remote work has increased the difficulty of hiring IT staff with specialized skill sets, as many of them can now work anywhere in the country without relocating. Resource management challenges such as hiring for the right skill sets will be answered by outsourcing some of those tech skills to the vendors."

New regulations requiring price transparency in healthcare mean that the healthcare ecosystem must move quickly to achieve the interoperability that will allow more efficiency, and cloud hosting can help.

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"In the next four years, we should have strategies in place around interoperability and cost containment," Wilding said. "We have to find solutions, and our vendors have to help us lower total cost of care."

"We're looking to our partners to help us create economies of scale, and we're looking for changes in accounting rules to help us with the impact to operational expenditures," said Havenhill-Jacobs.

If cloud hosting can be optimized in many of the ways suggested by leaders (transparency, validation, communication, interoperability), then cloud-hosting partnerships will play a transformational role to move digital healthcare toward a new level of performance. Of all the needs arising in a rapidly changing environment, the most pressing is for interoperability. Healthcare organizations are seeking a new level of vendor partnership that can further interoperability while maintaining data security. Progress will rely on teamwork between collaborating vendors who develop platforms where systems can work together to meet the evolving needs of the whole healthcare ecosystem. Providers and vendors will also need to advocate together for regulations that assist in interoperability.

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> CIO, Bozeman Health

"Interoperability is not just a technical issue," MacLean noted, pointing to the need for industry-wide cooperation. "It's a people and policy issue involving incentives."

The increased fluidity for data enabled by cloud hosting offers the opportunity for frictionless collaboration that was not possible in the pre-cloud data world. Now it remains to the stakeholders in digital health to take advantage of that opportunity with a more collaborative approach to innovation.

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