



## Perspectives on Digital Imaging to Improve Patient and Provider Outcomes

*Powering clients to a future shaped by growth*

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**Moderator:**

Daniel Ruppar  
Consulting Director  
Frost & Sullivan

**Thought Leaders:**

Dr. Daniel Durand  
Chief Innovation Officer  
LifeBridge Health

Paula Gonyea  
Network Regional Director, Radiology  
The University of Vermont Health Network

Dr. Peter Harri  
Assistant Professor of Radiology  
Emory University

Frank Pecaitis  
Market Leader, North America  
Enterprise Diagnostic Informatics  
Philips

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## INTRODUCTION

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Frost & Sullivan, the Growth Pipeline Company™ for almost 60 years, recently hosted a webinar, *Perspectives on Digital Imaging to Improve Patient and Provider Outcomes*. This timely forum gave industry leaders and healthcare providers an opportunity to share challenges, shifting trends, best practices, and hands-on knowledge of the complexities they face integrating imaging systems and creating a 360 degree longitudinal patient record. The impact of mobile imaging growth in addition to how organizations are managing and reporting analytics were key topics. Most importantly, the thought leaders discussed their mutual goal of improving performance and managing costs while still providing the best possible patient experience, honing in on the usefulness of frameworks like the Healthcare Information and Management Systems Society (HIMSS) Digital Imaging Adoption Model (DIAM) for improving imaging strategies.

**View the webinar on demand here: [www.frost.com/digitalimaging](http://www.frost.com/digitalimaging)**

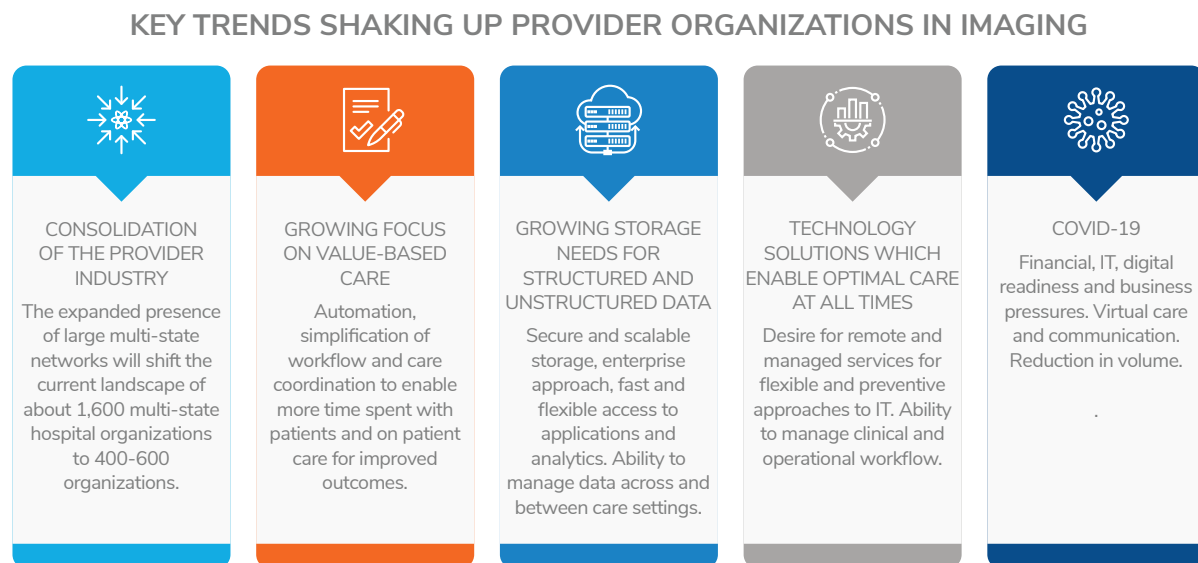
Today, digital imaging is a complex and evolving process across the healthcare continuum. As healthcare professionals and stakeholders manage more and more data from more devices across a growing number of care settings and populations, the stakes have become higher. There is a distinct need to deliver medical imaging securely through the right channel, with the right context, at the right time, to the right person, to improve patient outcomes.



Daniel Rupp, Consulting Director, Healthcare and Life Sciences at Frost & Sullivan, brought over twenty years healthcare industry experience to his role as moderator. Setting the stage for the discussion, he provided an overview of several key macro-trends currently shaping and changing the healthcare landscape, including:

- Consolidation of the provider industry
- A growing focus on value-based care
- Growing storage needs for structured and unstructured data
- Technology solutions that enable optimal care at all times
- The effects of COVID-19

**These trends are encapsulated in Figure 1:**



All of these trends point to the need to revisit IT roadmaps to enable more flexibility and interoperability in care delivery and image-sharing across organizations. The drive for value-based, patient-centric care continues and should continue to fuel improvements in automated systems and solutions that maximize time spent with patients. The challenge of intelligently mining and harnessing an exponentially expanding volume of structured and unstructured data is ongoing, as is the desire for security and scalability when managing data across the enterprise.

The need to optimize clinical analytics and artificial intelligence (AI) to help patients was underscored, as well as the need to obtain a 360 degree view of the patient, one that connects different imaging specialties. Cardiology and radiology imaging are perhaps the most prevalent and well-known, but it's desirable to connect all imaging processes and –ologies along the care continuum.

As the group transitioned to a Q&A discussion, Rupp posed the following questions, with the replies highlighted as follows:

## PANEL Q&A

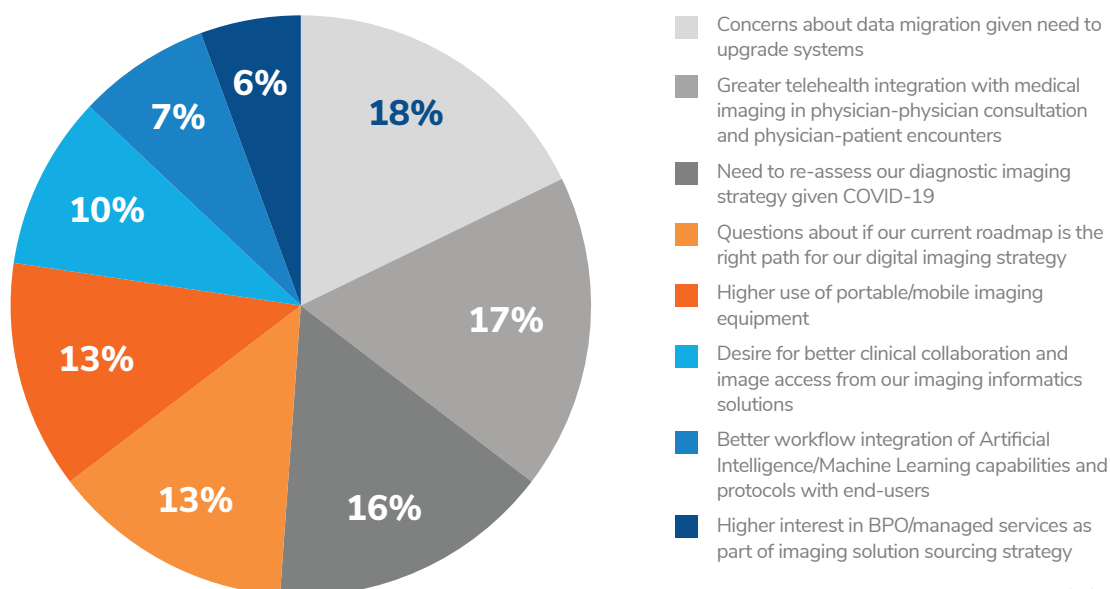
### ► What are top three shifts you've seen in the past 12 months managing digital imaging at your organization?

This question was posed to both the panelists during the webinar and the registrants before the webinar. The top three responses from the registrants included:

- Concerns about data migration given the need to upgrade systems
- Greater telehealth integration with medical imaging given physician to physician consultation and physician patient encounters
- Need to reassess our diagnostic imaging strategy given COVID-19

More details and registrant responses can be found in Figure 2:

What are the top three shifts you've seen over the past 12 months in managing digital imaging at your organization?



Over the last six months, radiologists have increasingly relied on different types of virtual meeting and image-sharing platforms. As noted, although capabilities like AI and ML are still emerging in the market, the reality of the pandemic means that providers must utilize virtual care and work approaches. On the positive side, this has enabled more personalized information sharing and collaboration.

One of the biggest challenges was determining how to efficiently share images. Other obstacles occur in patient virtual encounters, as it can be harder to examine patients virtually. This has led to patients taking pictures (of wounds on skin, for example) and sharing them with their physician.

Paula Gonyea, Network Regional Director of Radiology, at the University of Vermont Health Network, stated that her organization's use of telehealth had skyrocketed, forcing physicians to figure out the best way to diagnose and effectively treat patients. The onset of COVID-19 accelerated this transition and pushed her organization to become more nimble; they have designed new infrastructures to securely and often virtually, treat patients.



► **What are the top digital imaging trends you're seeing which drive alignment with the concepts of the Quadruple Aim (better outcomes, lower costs, improved patient experience, improved provider experience)?**

Frank Pecaitis, Market Leader at Philips noted enabling patient engagement via an easy-to-access “digital front door,” as well as addressing the backlog of patient procedures due to the pandemic. Other virtual care capabilities such as the creation of a remote radiology operations command center were discussed. This kind of center could theoretically help health systems and imaging centers to most optimally manage imaging procedures and catch up with the backlog. The ongoing importance of interoperability and “connecting the dots” between patients, providers and care delivery points in the system, especially in a virtual environment, was underscored.

Further discussion included that emerging trends in the patient point-of-care experience include portable, less costly MRI devices. Such equipment integrates various functions and connects to the cloud and may eventually eclipse larger, more complex machinery. Described as a “Peloton model” for radiology, these smaller devices could help physicians “bring medicine to patients” outside the hospital and even to remote areas.

Another key goal that aligns with the concept of the Quadruple Aim is to more efficiently and effectively harness data for better patient care. As discussed, doctors and other caregivers should be able to access and quickly share images throughout the enterprise. Technology that helps doctors do so and also provides an overview of all patient images can help providers.

Dr. Peter Harri, Assistant Professor of Radiology, Emory University observed that Natural Language Processing (NLP) and AI can help process data faster and get relevant data more quickly, ultimately making the physician’s job easier and the patient experience better. Once perfected, these types of tools and capabilities will save time, improve accuracy and eliminate the need for superfluous tasks such as re-ordering studies.



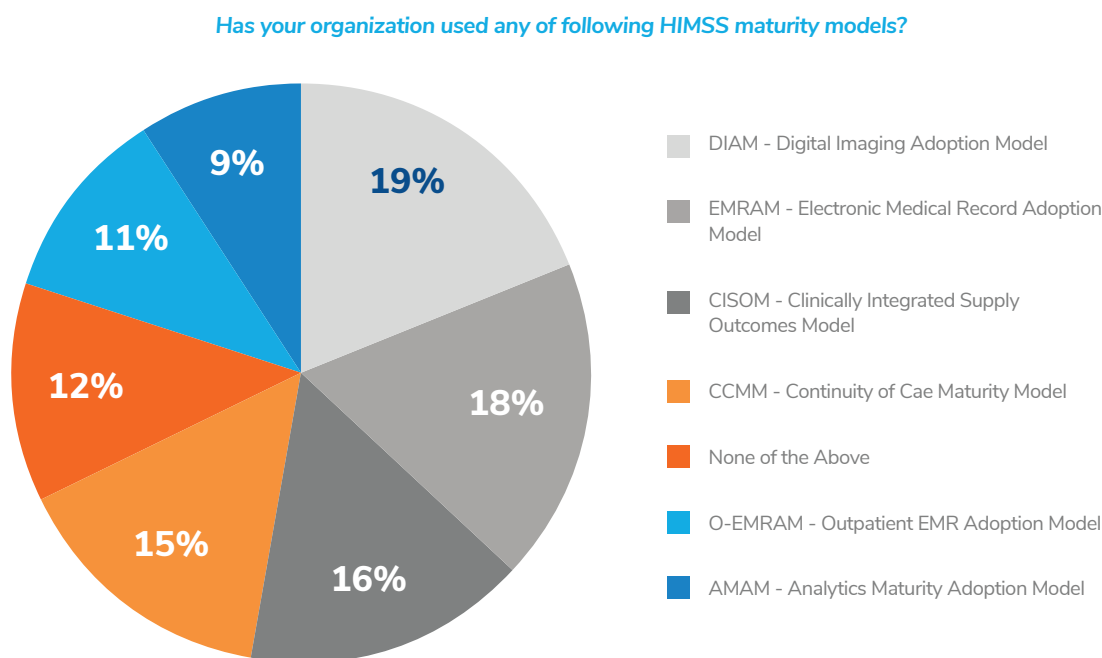
► **Who are the key stakeholders in your organization for defining your digital imaging strategy and implementation?**

Those who led digital imaging strategy varied by organizational size but included Vice Presidents, CIO direct reports, radiology chairs, and clinical informatics chairs. Sometimes there is no formal function for this responsibility.

► **How do you think the HIMSS DIAM maturity model could help organizations in their digital imaging roadmap and journey?**

Approximately 85% of a health systems data storage is imaging data, noted Frank Pecaitis. This is invaluable information and presents an abundant opportunity to create uniformity and standards for securely organizing, managing and sharing data securely. Furthermore make it available for machine learning and artificial intelligence. One example is the Healthcare Information and Management Systems Society (HIMSS) Digital Imaging Adoption Model (DIAM), which offers a roadmap to digital imaging maturity. This model was developed with the support of the Society of Imaging Informatics in Medicine (SIIM), the European Society of Radiology (ESR), and the European Society of Medical Imaging Informatics (EUSOMII).

**Registrants responses to use of HIMSS maturity models can be found in Figure 3:**



As stated, Philips has certified its commercial team on DIAM, so they can serve as advisors to health systems by conducting gap assessments and jointly build a pathway to maturity that aligns with delivering value through their Quadruple Aim performance objectives. There are other models that achieve similar goals. The top three maturity models cited by registrants were DIAM, the Electronic Medical Record Adoption Model (EMRAM) and the Clinically Integrated Supply Outcomes Model (CISOM). As one physician noted, providers and partners need to build governance and strategy into whatever model is utilized. The next question posed to the panel was:

► **How are you managing the complexities of integrating systems, as well as factors such as the growth of images captured via mobile devices?**

Using high-definition photos sent via mobile devices seemed to be a common new practice for this group. The doctors also discussed the practice of having patients take photos and send them via cell phone. This emerged as a good way to track progress of the healing of wounds, for instance. One unexpected benefit to this approach is an increase in patient engagement.

As Frank Pecaitis of Philips observed, “Mobile device technology is a wild frontier” as imaging data is captured on variety of evolving device types. It must done with proper workflow to store it securely, document care and bill in areas like the emergency department through point of care ultrasound and on nursing units for wound care management; of course, all of this with the ultimate goal of improving patient outcomes and clinical staff productivity.

► **How are you managing and reporting analytics to improve performance and outcomes?**

As the Frost & Sullivan poll showed, 57% believe they are at a novice level in managing and reporting analytics, and 28% rate themselves as intermediate. None felt they were advanced.

Dr. Peter Harri shared that his organization had just upgraded their radiology analytics process, putting data at their fingertips. The improved analytics allow them to ensure that patients are receiving the right next step in care, whether that’s making an appointment for a different scan, or being transferred to a different hospital.



Another physician approached the question from a larger perspective. Dr. Daniel Durand, Chief Innovation Officer, LifeBridge Health, stated that there needs to be uniform data warehousing for enterprises and that data siloes need to be broken down. He advocated working with hospital groups to make these improvements for better patient outcomes.

► **What are you doing to best prepare for continued increases in storage requirements and to integrate innovations such as AI/ML into workflow?**

One thought leader shared that they were conducting pilots utilizing AI and ML and noted that the vendor was often helpful in this regard. Another discussed how leveraging rapid AI algorithms could lead to identifying health emergencies like strokes faster or even ahead of time, increasing the possibility of effective treatment and patient survival. These types of predictive technology applications are here and ready for implementation. Payment models for AI platform based solutions were also discussed. Should organizations leverage a reimbursement model? Pay per click?



### ► What most excites you about the future of digital imaging?

As Dr. Peter Harri stated, “With all the portable devices and technologies being placed in people’s hands, we are on the cusp of a true democratization of digital imaging.” He emphasized the significance of getting devices into patient’s hands and of leveraging tools like AI and analytics to improve the way doctors provide care. As he underscored, radiology is on the forefront of this trend and could be a leader in the field.

Dr. Daniel Durand summed up the discussion, stating that imaging comprises a huge amount of healthcare data and noting that healthcare is at a tipping point as device usage and data accumulation explodes. Machine learning (ML) and analytics are instrumental in effectively sifting through volumes of data, and pinpointing the important information. Durand suggested that moving forward, teams of medical professionals should be trained to proactively monitor healthcare data. Finally, he identified three significant aspects of data and healthcare today:

1. The current explosion of data and the need to pinpoint key patient data
2. Leveraging tools like AI and ML to effectively sift through the data
3. A plan to connect this analog approach with a well-thought out team to act on the data

## CONCLUSION

Provider organizations are facing dynamic change where they are looking for solutions and services which enable them to best address their challenges today, and help future-proof their strategies for tomorrow. An enterprise approach to digital imaging directly helps providers achieve their strategic goals as they progressively move in their maturity roadmaps. Established digital maturity frameworks such as the HIMSS DIAM, CISOM and EMRAM are important tools to help providers assess, align and monitor their digital and technology progress over time. For example, the DIAM can directly help provider organizations address COVID-19 demands, such as external information exchange, enterprise image access, remote/virtual care and work models, better clinical decision support and AI/analytics integration for detection and diagnosis.

To achieve the optimal enterprise imaging organizational readiness, providers should take the following steps in their journey:

- Take stock in the various challenges their organization is facing with its current digital and imaging IT strategy.
- Evaluate their current infrastructure and solution approach.
- Benchmark and align their current state to an established digital maturity model such as the HIMSS DIAM.
- Assess what strategy and partners are needed to carry the organization forward in terms of meeting requirements to progress in the stages of adoption of digital imaging.
- Leverage a vendor who can provide a platform for scalability, best manage clinical and operational workflow, manage data securely across and between care settings, and enable the right diagnosis the first time.

## NEXT STEPS

- **Schedule a meeting with our global team** to experience our thought leadership and to integrate your ideas, opportunities and challenges into the discussion.
- Interested in learning more about the topics covered in this white paper? Call us at 877.GoFrost and reference the paper you're interested in. We'll have an analyst get in touch with you.
- Visit our **Digital Transformation** web page.
- Attend one of our **Growth Innovation & Leadership (GIL)** events to unearth hidden growth opportunities.
- Learn more about the **HIMSS Digital Imaging Adoption Model (DIAM)**

### Silicon Valley

3211 Scott Blvd  
Santa Clara, CA 95054  
Tel 650.475.4500  
Fax 650.475.1571

### San Antonio

7550 West Interstate 10  
Suite 400  
San Antonio, TX 78229  
Tel 210.348.1000  
Fax 210.348.1003

### London

Floor 3 - Building 5,  
Chiswick Business Park  
566 Chiswick High Road  
London W4 5YF  
Tel +44 (0)20 8996 8500  
Fax +44 (0)20 8994 1389

✉ [myfrost@frost.com](mailto:myfrost@frost.com)

☎ 877.GoFrost

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Frost & Sullivan

331 E. Evelyn Ave., Suite 100  
Mountain View, CA 94041

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