DELL EMC

WHITE PAPER

THREE STEPS TO HEALTH IT (HIT) TRANSFORMATION

What every HIT organization can do to move forward now

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Digital technologies are transforming healthcare—from patient and physician experience to efficacy of care to decisions that improve outcomes.

Successfully harnessing technology to advance the health mission, however, takes more than digital innovation. It requires a new kind of health IT (HIT) organization that can work strategically with clinical, administrative, research, and financial stakeholders to put data, devices, and applications to work to achieve real results.

This paper describes three steps HIT organizations can take to shift their budgets and efforts from keeping the lights on to delivering new kinds of IT services that enable and improve healthcare.

DIGITAL HEALTHCARE IS INSEPARABLE FROM HIT TRANSFORMATION

Today, every healthcare organization is examining how best to apply rapidly emerging digital technologies to improve care, reduce risks, and cut costs.

From predictive analytics and machine learning to wearable devices and telehealth to secure always-on access to real-time health data—the promise and impact of digital technologies on healthcare are incalculable. They span genomics, patient experience, the precision of diagnosis and treatment, and operational efficiency, opening new opportunities for optimizing the well-being of both individuals and populations.

The development and implementation of a successful digital healthcare strategy, however, cannot be separated from an organization's HIT strategy and capabilities. Even healthcare entities pursuing external IT services and outsourcing strategies will need a robust internal HIT function to actively manage the alignment of IT services with the overarching health mission, care delivery approach, and business models of the organization as well as making sure that important agreements and safeguards are in place.

From systems of record to real-time insight

Essentially, healthcare IT is in the process of moving from static, largely siloed systems of record (e.g., core financial, administrative, and EHR systems) to interconnected, dynamic systems of engagement and insight.

With the proliferation of mobile devices, apps, sensors, and the Internet of Things (IoT), the way health data moves and is used is changing profoundly. As a result, the role of HIT is changing profoundly as well. From the significant challenge of keeping systems up and running, HIT is now charged with providing the digital infrastructure where everything is smart, connected, and secure and the analysis of data streams occurs in real time.

And as healthcare delivery becomes inseparable from the technologies that enable it, HIT plays a pivotal role not just in enabling enterprise strategy but also in shaping it.

STARTING FROM WHERE YOU ARE WITH WHAT YOU HAVE

Most HIT organizations recognize the need to make fundamental changes in the services they deliver and the way they operate. The question is how.

Few HIT organizations have the luxury of starting with a blank slate and a greenfield build-out of 3rd Platform technologies. Transformation necessarily begins with the current state environment, operational practices, and culture.

For most HIT organizations, transitional integration with existing systems within and across the health system is a likely scenario. Adding to the challenge, HIT must continue to support life-critical operations and meet day-to-day demands, even as it transforms itself.

While each HIT organization faces unique challenges, common barriers to transformation are:

- Rapid, unpredictable change and uncertainty affecting every aspect of healthcare
- Legacy applications, systems, processes, and organizational structures
- Limited resources and time horizons for delivering results

Change and uncertainty

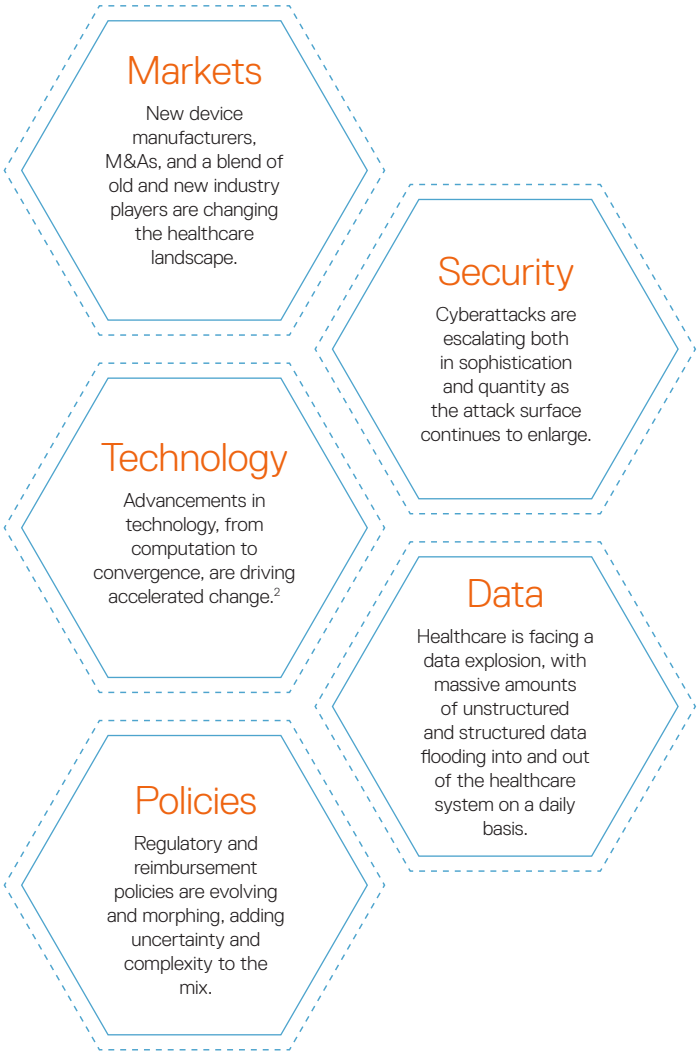
Healthcare is in a state of great flux. Moving targets and a fog of uncertainty both complicate and necessitate HIT transformation. This rapid, unpredictable change spans:

- **Markets:** Clinicians and patients alike are demanding simpler, digital-enabled tools and consumer-friendly interactions. New players are jumping in to fill the demand with medical devices, software, and services. Today, there are more than 265,000 mobile health applications on the market—including apps that help users sort through and choose the right app for them.[1] Hospitals and health systems are continuing to consolidate through mergers and

acquisitions (M&A). New models of care are expanding and new synergies are forming, as signaled by recent news of a possible merger between retail health and insurance provider giants, the likes of which have the potential to change healthcare business models altogether.

- **Regulatory and reimbursement policies:** Uncertainty about government healthcare policies and their impact on insurance coverage, regulations, and reimbursement adds complexity to budgets and investment strategies.
- **Technology:** The rate of technological change is accelerating.[2] In addition to mobile apps, wearables, and other connected Internet of Medical Things (IoMT) devices, leading providers are beginning to apply technologies such as artificial intelligence and machine learning, augmented/virtual reality, and robotics to improve care and cut costs. IDC predicts that by 2019, 60 percent of healthcare apps will apply some form of analytics and intelligence to help discover patterns, offloading as much as 30 percent of a clinicians' time.[3] Core IT technology is also evolving rapidly—from the release of APIs for EHR systems to hyper-converged infrastructure and software-defined data centers to data lakes and health cloud services.
- **Data:** Healthcare is already experiencing data overload, and health data volumes are forecasted to increase substantially over the coming years.[4] Industry analysts estimate that more than 80 percent of health data is unstructured, and digital images and sensor data streams, combined with EHRs and genomic, historical, clinical, financial, and operational data are driving volumes to the zettabyte and even yottabyte scale. Large acquisitions can double data. Storage capacity and performance become a challenge, as does data protection.
- **Security:** In a connected health ecosystem, the consequences of a security breach go beyond the theft of identity data or protected health information (PHI) and personally identifiable information (PII). Medical device hacks and data manipulation or inaccessibility can put patient safety at risk. The sophistication of cyberattacks will keep evolving, and traditional healthcare presents a broad attack surface. IDC predicts a doubling in ransomware attacks on healthcare organizations in 2018.[3] Digital interconnectivity makes traditional perimeter-based security alone inadequate. New kinds of security are needed to make data easily accessible—for example, to authorized caregivers at the point of care while protecting information integrity and privacy. The financial and reputation impacts of security breaches are hard to calculate. In terms of regulatory fines, the US Department of Health and Human Services announced the first HIPAA settlement for lack of timely breach notification in January 2017 for $475,000 USD.[5]

Figure 1. Elements of change: From a new mix of market players to changing policies to increasing security risks, healthcare is in a state of constant flux.



HIT legacy burden

Health organizations born before the digital age find their HIT transformation efforts encumbered by legacy applications and systems, some decades old.

With day-to-day care and operations depending on these existing systems, making any kind of change is no simple matter. At the same time, the need for change is indisputable. Aging, heterogeneous infrastructure is expensive to maintain and vulnerable to performance issues, breaches, and outages.

Management silos and manual processes and tools that are inefficient and error-prone add to the HIT legacy burden. In fact, as much as 75 percent of IT staff time can be spent just keeping the lights on,[6] which leaves precious few resources available to invest in new initiatives. Slow or inadequate response by HIT has led departments to turn to public cloud services, typically with little oversight, adding to the expense and risks of shadow IT.

Legacy leads to lag

Up to

75%

of IT staff time can be spent just on maintenance and upkeep, hindering advancement and innovation.[6]

Limited resources and time horizons

Access to cash flow in healthcare in general is challenging, with the majority of organizations operating at margins of three to four percent.[7] Market, healthcare policy, and reimbursement uncertainties, combined with many competing demands for funding, make it unlikely for most HIT budgets to increase in the near term. And, as noted, most of today's HIT budget is typically consumed by routine maintenance and support. The ability to fund new initiatives or hire or replace staff or to acquire new expertise or skill sets is limited, even as the pressure from executives and departments to deliver new capabilities and results grows.

DO MORE WITH LESS—FASTER THAN EVER BEFORE

To sum up, today's HIT organization is being asked to do more with less and to do it more quickly in an environment of unprecedented change. What's needed is a new approach. Rather than focusing on specific hardware and software technologies, every HIT organization needs to develop its own strategy for optimizing agility, reliability, and efficiency by simplifying data, security, and operations management and by collaborating with stakeholders to anticipate and respond to changing demands and opportunities.

Build the business case

Many struggle with being able to find the needed time, money, and resources to implement these new strategies. Building a business case for incremental investment is critical to enlisting the senior-level sponsorship needed for HIT transformation. HIT should work alongside technology partners to quantify the cost and risk of the status quo with the cost of investment. Obsolete heterogeneous infrastructure, for example, is more expensive to operate—from floor space to power and cooling to licensing and maintenance contracts to staffing support. Old versions of software and legacy applications pose security risks. And they deliver no new enabling or differentiating capabilities to advance the business of healthcare.

An objective assessment of the current state, including benchmarking with peers, can help to identify areas of immediate concern as well as opportunities. Quick wins with benefits that are tangible and visible to the business, and a roadmap with incremental return-on-investment milestones sustain continued investment, momentum, and executive support.

Buy vs. build

HIT can also reduce the time, money, and effort needed for transformation by making smart buy versus build decisions. While the first impulse may be to select the best components or to repurpose existing assets to transform architecture, every HIT organization needs to first take a step back and determine where customization counts.

Preconfigured, engineered, and validated converged infrastructure, for example, can greatly reduce the time, cost, and risk of implementing the foundation for internal resources to begin enabling a differentiating value-add. Cloud platforms that come with engineered service blueprints for faster and easier provisioning of popular office or analytics applications from Microsoft or Hadoop, for example, further cut time, cost, and effort.

At a higher level, hospitals now have the opportunity to balance their business and clinical workloads in a hybrid cloud environment. For example, purchasing software as a service (SaaS) from an EHR cloud service rather than running systems in the data center can free HIT to focus on more enterprise-specific innovations. And cloud-based PACS integration and application integration service frameworks can eliminate the need for internal point-to-point integration projects.

In addition to reducing the time and effort of initial implementation and payback, pre-integrated and externally supported multi-cloud solutions that bring together on-premises and off-premises cloud platforms, such as solutions by Dell EMC, can yield significant operational efficiencies in terms of interoperability, upgrades, and single-vendor support.

Strategic partnering

Similarly, leveraging the expertise of strategic partners can help HIT benefit from the experience and practices of others to avoid common pitfalls and achieve expected results.

THREE STEPS: MODERNIZE, AUTOMATE, TRANSFORM

More specifically, there are three steps that HIT can take to shift resources from business as usual to innovation—and gain the operational agility to become a valued, responsive, and strategic partner in digital healthcare transformation.

These are:

1 **Modernize the infrastructure**
Standardize and consolidate on software-defined technologies to support new workloads, improve performance, and gain agility and cost efficiency

2 **Automate IT services**
Leverage multi-cloud options to enable end-to-end user self-provisioning of standardized IT services

3 **Transform operations**
Operate as a strategic IT services broker and valued partner in enabling and advancing the healthcare mission

1. MODERNIZE THE INFRASTRUCTURE

Modern infrastructure provides the foundation for standardization, consolidation, and automation that enables HIT to shift its focus and spend from routine maintenance and support to healthcare-enabling innovation.

Modern hardware with high memory, processor, and storage densities improves clinical application performance and user experiences with greater stability, in a smaller footprint, with less power consumption, and at a lower cost of operation. It is easier to deploy, use, secure, manage, maintain, and scale.

In addition, built-in monitoring, alerts, and diagnostic, security, and management features simplify, automate, and even eliminate many routine manual tasks that consume limited HIT resources, reduce errors, and enable faster response and resolution of issues. Some systems also collect and analyze data to make recommendations to improve performance and efficiency.

Advanced storage technologies help address data challenges by storing larger volumes of data in less space. Automated tiering of data, performance and utilization monitoring, and seamless scaling to handle data growth greatly reduce administrative tasks. Flash storage, for example, not only maximizes I/O performance but also provides built-in data efficiency capabilities. In fact, all-flash data protection can reduce the time to back up by as much as 50 percent[8] and dramatically lower storage TCO.

Modular scale-out storage with in-line analytics enables right-sizing. It eliminates both the need to overprovision and the expense of underutilization, by scaling quickly and seamlessly with no disruption of services.

Converged infrastructure

Converged infrastructure goes beyond individual technology optimization to package all system components including compute, storage, networking, management software, and virtualization in a single optimized IT system. The benefits of converged infrastructure include speed of deployment, simplified management and maintenance, and the flexibility to scale in both component and system increments.

Hyper-converged infrastructure

Hyper-converged infrastructure (HCI) takes convergence a step further with a software-defined architecture that integrates virtual compute, software-defined storage, and virtual networking in a single modular appliance.

Just as server virtualization decouples compute from physical infrastructure to deliver considerable gains in cost savings, efficiencies, and agility, HCI decouples all infrastructure services from hardware, enabling all system resources (compute, storage and network) to be virtual and modularly pooled, shared, and deployed.

A hyper-converged, scale-out architecture of modular system appliances offers a low cost of entry, while making deployment, management, and scalability fast and easy. New appliances are automatically detected and with just a few clicks, available for use. In fact, with HCI, HIT can set up new infrastructure and deploy a fully virtualized environment in twenty minutes, scale in just five minutes, and reduce TCO by 30 percent.[9]

Software-defined benefits

Besides dramatically reducing the cost and complexity of operations, virtualization and the ability to pool and share resources across workloads result in significant reductions in capital expenditure.[10]

But the advantages of virtualization go beyond TCO. The ability to virtualize networks, for example, enables new approaches to security that simplify protecting data and operations in an interconnected digital age. Software-defined networks can extend across data centers and into multiple clouds. Using software, these virtual networks can be "micro-

segmented" down to the individual virtual-machine (VM) level, with policy-driven firewalling, switching, and load balancing defined in the hypervisor. Virtual network micro-segmentation dramatically shrinks both the attack surface as well as the potential impact of lateral attacks in distributed environments, such as EHR, ERP, and PACS systems. It augments existing perimeter-based security with an "inside-out," intelligent, and granular security capability and can considerably drive down overall security costs.[10]

2. AUTOMATE SERVICE DELIVERY

With a solid, modern infrastructure foundation, HIT can begin to automate IT service delivery using a cloud-consumption model. By standardizing and automating the end-to-end process of IT service definition, user requests, and cloud-enabled provisioning, HIT can respond more quickly and efficiently to the clinical, business, and operational needs of the enterprise, while maintaining oversight and control.

A self-service portal, a catalog of IT services, and an automated cloud provisioning enable users to select from the preapproved infrastructure, platform, database, or applications with the service levels (e.g., performance, backup, remote replication, and disaster recovery) they need without the active involvement of HIT.

By eliminating iterative, time-consuming steps in traditional IT request, approval, and fulfillment processes—and by a standardized menu of choices, tiers, and options, automated IT as a Service (ITaaS) improves the efficiencies and productivity of both users and HIT. For example, enabling application developers to self-provision their own development platforms not only accelerates their projects but also maintains enterprise standards for the IT stack and frees HIT resources to work on strategic business, clinical, and IT innovation.

Becoming a multi-cloud broker

Cloud is quickly becoming the de facto model for new technology platforms in healthcare, with 65 percent of healthcare IT executives reporting that they use some type of cloud service today, with SaaS cloud services being the most popular.[11] Healthcare spending on cloud services is expected to hit $10 billion by 2021.[12]

Most healthcare organizations want to be able to leverage both on-premises and off-premises cloud platforms to support both existing and new cloud-native applications. Applications with sensitive data, high data I/O, and low network requirements are likely to be deployed on a private cloud in the data center or on a dedicated hosted cloud service with a detailed service-level agreement. Public cloud services, such as Azure and Amazon Web Services, are often tapped to support unpredictable growth spikes or for prototyping and proof of concept.

Horizontal applications, such as Microsoft Office 365, can be delivered both on-premises, with Azure stack on data center infrastructure, as well as from the Azure cloud. Mission-critical healthcare applications, such as EHR systems, can also be run onsite and/or consumed as a managed software as a service (SaaS) from a HIPAA/HITECH-compliant cloud like Virtustream. While cloud-native applications can be run on a native hybrid cloud platform like Pivotal.

Indeed, as the number and types of cloud services expand, the ability to efficiently and transparently broker multiple types of cloud services (e.g., private, public, dedicated, SaaS, managed) becomes a critical HIT capability.

This multi-cloud capability can reduce overall operating expense by as much as 24 percent[13] with IDC finding that 39 percent of the savings from hybrid cloud are invested in digital transformation initiatives.[14]

Multi-Cloud Benefits

Organizations are reducing overall OPEX by as much as

24%

with multi-cloud.[13] IDC reports that up to **39% of savings** are going to digital technology investments.[14]

Where are you on your HIT transformation journey?

Gauge your organization's IT transformation maturity with a free **IT Transformation Maturity Self-Assessment**, and see what next steps are recommended to accelerate your progress.

3. TRANSFORM THE OPERATING MODEL

To become a strategic partner in digital healthcare innovation and make the most of modern infrastructure and automated ITaaS investments, HIT needs to transform its operating model.

Traditional silos of technology-focused operations require coordination across and among multiple administrators with different functions, metrics, roles, and responsibilities. The complexity, cost, and time delays inherent in such a model can easily negate the benefits of modern infrastructure and cloud automation. In fact, they are a key factor in the experience of some HIT organizations which have not realized the cost and agility gains they expected from deploying cloud.

From cost center to service center

What's needed is a new service-centered operating model focused on understanding and anticipating business and clinical needs, and delivering IT services that meet those needs.

Aligning IT services with health mission objectives and then effectively designing and deploying services require a cultural shift in HIT. It requires new kinds of metrics, organizational structures, governance models, and cross-functional skill sets. Instead of taking on one-off projects, HIT develops and then leverages repeatable, standardized enabling services to achieve business, clinical, and operational goals.

Service-center roles and responsibilities

Effective and efficient IT service development and delivery require a formal definition of roles and responsibilities to drive and fulfill key IT service-center functions such as:

- **Service development and portfolio management:** Including collaboration with executives, business, and clinical stakeholders to anticipate needs and define new services, to promote the use of and track satisfaction with existing services, and to refine services and the service portfolio over time.
- **End-to-end service delivery operations:** Including service engineering and delivery automation, defining tracking, and reporting on service-delivery operation KPIs.
- **Service-level management:** Including tracking, reporting, and improving service levels, transparent costing, and showback/chargeback based on consumption metering.
- **Continuous improvement:** Continuous refinement of service-center functions based on user feedback and holistic cross-center KPIs.
- **Executive leadership and governance:** Across business and IT to identify/drive initiatives and regularly revisit and align strategies, investments, metrics, and so on.

Jumpstart your strategy with an IT transformation workshop

Bring together senior executives and stakeholders from business and HIT to identify key transformational initiatives and drive consensus. Gain insight through benchmarking data that show how you rank with peers in multiple ways. Review assessments of the gaps in your environment and see the estimated return on investment (ROI) to be gained by closing gaps. Leave with a unified sense of purpose and prioritized list of next steps.

READ THE OVERVIEW

By transforming its operating model to enable the development and delivery of IT services that align with enterprise objectives, HIT can do more than keep the lights on. It can enable new kinds of applications, development, and data insight—such as precision medicine, connected health with IoT edge computing, blockchain, data analytics and data lake, telehealth, DevOps, and cloud-native apps. A good example is Partners HealthCare. It is providing researchers and clinicians with a data lake and analytical tools to conduct sophisticated research, develop new insights, and advance healthcare innovation.

NEXT STEP: TURN DISRUPTION INTO OPPORTUNITY

In a time and in an industry of rapid and radical change, it's easy to be overwhelmed. But disruption can also be a force for positive change. For example, growing pressures on critical applications and workloads can be the impetus for moving off legacy systems. External cloud service providers can drive HIT to explore new, more agile ways of working that deliver new kinds of value to the business and healthcare mission.

For most HIT organizations, there really is only one choice—move forward and seize the opportunity by delivering the services that will enable your enterprise to transform healthcare for the better. That's where Dell EMC can help.

Dell EMC healthcare consultants, solution architects, and delivery teams bring experience in both healthcare and information technology to help HIT organizations accelerate transformation.

We help HIT organizations develop strategies and then implement them with practical roadmaps and hands-on services to deploy technology and make the process and operating-model changes needed to meet HIT-specific objectives.

For example:

- **Industry-leading infrastructure:** Dell EMC converged infrastructure and our growing 30.6% of hyper-converged infrastructure market share[15] offer powerful and proven options for transforming infrastructure.
- **One point of integration, service and support:** We work with experts and solutions from across the Dell Technologies family (Figure 2)—Dell, Pivotal, RSA, SecureWorks, Virtustream, and VMware—as well as a robust partner ecosystem of resellers, integrators, outsourcers, and service providers and a network of certified ISVs with health-specific software, hardware, and services to offer one point of integration, service, and support.
- **Reduced risk:** Over the course of hundreds of IT transformation engagements, we have developed methodologies and tools that reduce the uncertainty, time, and cost of moving applications and data from legacy hardware-based infrastructure to cloud and software-defined platforms. In fact, patented Dell EMC IP and tools that automate asset discovery and the analysis of the interdependencies among applications, storage, and servers typically reduce the time to assess the current environment from four to six months to four to six weeks and eliminate nearly 98 percent of human/manual errors that impact migrations. A recent IDG study put the ROI for enterprises deploying Dell EMC datacenter modernization and migration services at 81 percent.[16]

Investment to innovation

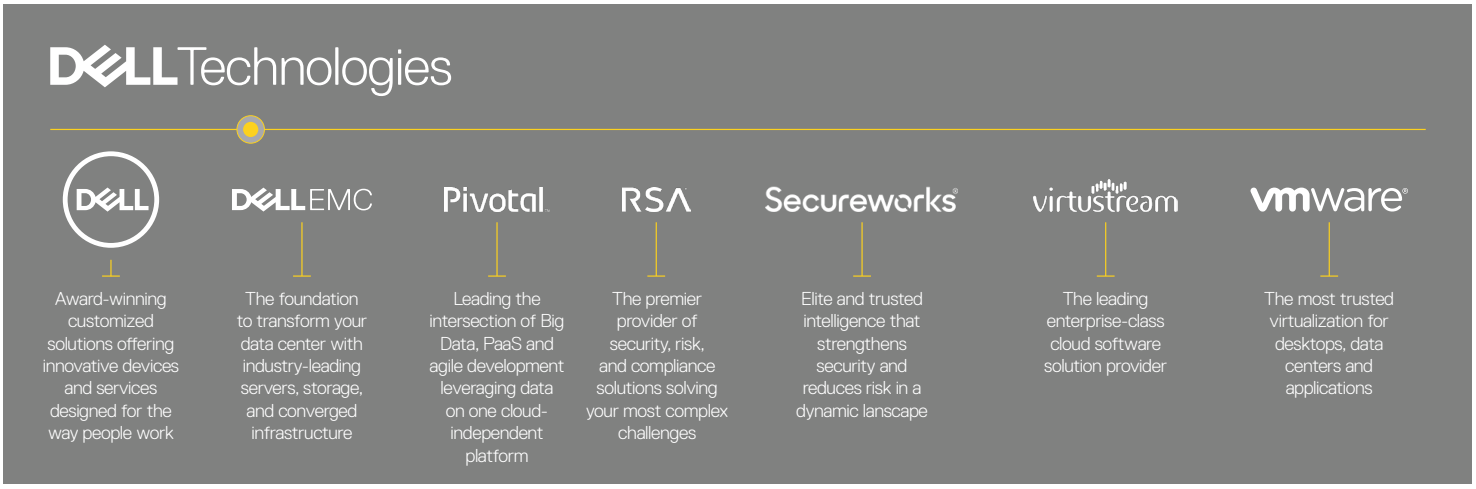
Realize ROI up to

81%

when deploying Dell EMC modernized infrastructure and migration services, freeing up resources to pursue innovation.[16]

Wherever you are on your HIT transformation journey, Dell EMC can offer proven, practical, and pragmatic approaches for moving ahead.

Figure 2. The Dell Technologies: The most comprehensive portfolio of technology solutions—from point of care to the data center to the cloud.



It's an exciting time to be in healthcare and life sciences. We are living in the 'digital era'. Digital transformation is a top priority across all industries—and healthcare is no exception. Dell EMC is making your digital transformation real today—from point of care to the data center to the cloud. From the world's leading integrated delivery networks (IDNs) to rural health clinics, we have transformative technology solutions that make the future of healthcare real today.

Learn more at:

DellEMC.com/healthcare

or contact a Dell EMC Healthcare Representative

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