Harnessing Digital Innovations to Improve the Cost, Quality, and Delivery of Patient Care

DIGITAL TRANSFORMATION IN HEALTHCARE

Harnessing Digital Innovations to Improve the Cost, Quality, and Delivery of Patient Care
DIGITAL TRANSFORMATION INTRODUCES OPPORTUNITIES AND CHALLENGES

The digital age opens staggering new opportunities for better, faster patient care and streamlined healthcare operations. Telemedicine, virtual care, mobile access to patient data, artificial intelligence, analytics, automation, and the Internet of Things (IoT) can all improve patient services, often at a lower total cost. The question is how to explore the endless possibilities of disruptive innovations without negatively impacting current operations—and without introducing new security and compliance risks.

Healthcare organizations globally are challenged to deliver the best patient care at the lowest cost. The shift to value-based care is putting new emphasis on keeping populations healthy and moving the point of care beyond the four walls of the hospital to where care can be more convenient and accessible to patients. In turn, healthcare IT is transforming into a strategic differentiator for every healthcare organization, creating opportunities for healthcare organizations to become service providers to clinics and primary care practices throughout their regions and empowering them to improve care delivery reliability, agility, and scalability across networks in highly competitive marketplaces.

Over the next five years, 80 percent of consumer healthcare service interactions will use analytics and Internet of Things technologies to improve the quality, value, and timeliness of patient services.

IDC FUTURESCAPE
WORLDWIDE HEALTHCARE IT 2017 PREDICTIONS
NOVEMBER 2016

VMware empowers healthcare organizations to deliver next-generation, patient-centric care. Through a software-defined healthcare IT platform, VMware enables healthcare organizations to modernize and protect the critical IT infrastructure that is at the heart of value-based patient care while mobilizing providers with always-on access to patient information—from the right device for the right task at the right time. From the data center to the point of care, VMware is helping to transform the cost, quality, and delivery of patient care.

Accelerate Digital Transformation in Healthcare

Drive Innovation and Agility to Reduce Infrastructure Complexity and Cost
Create Exceptional Mobile Experiences that Deliver the Best Patient Care at Any Location
Protect Brand, Patient Trust, and Patient Information

Modernize Data Centers
Integrate Public Clouds
Empower Digital Workspaces
Transform Security
TOP PRIORITIES FOR HEALTHCARE TRANSFORMATION

New digital innovations are helping healthcare organizations achieve a wide range of capabilities and business outcomes:

- **Improved access to patient care** — Retail clinics, telehealth, home monitoring, and other mobile and “virtual healthcare” options show promise for improving the wellness of a community.
- **Reduced cost and complexity** — Healthcare organizations are looking to reduce ongoing IT costs and increase agility, particularly in the face of budget and funding uncertainties.
- **Anytime/anywhere access to patient information** — Remote and multi-channel access to patient information across Windows, mobile, and Web applications is supporting new healthcare business models.
- **Stronger information security** — While digital technology ushers in new and more sophisticated cyber threats, it also has created a groundswell of new cybersecurity invention to strengthen defenses so protected health information (PHI) and other sensitive details stay secure.
- **Better insights to drive decision making** — Healthcare services and hospital operations are beginning to make more and better use of big data analytics and IoT technologies to improve the quality of patient services and business decisions, driving superior results.

VMware accelerates digital transformation by enabling unprecedented freedom and flexibility in how healthcare organizations build and evolve their IT environments. More than 85 percent of healthcare organizations today use VMware technology to run, manage, and secure their healthcare infrastructure and applications. VMware has been named a Category Leader by KLAS, as well as earned awards from Healthcare Informatics, Peer 60, and others.

“With this new facility, we had a rare opportunity to start essentially from square one with our IT program. We wanted a leading-edge, highly virtualized infrastructure to deliver best-of-breed medical applications, including Epic.”

TANYA TOWNSEND
SENIOR VICE PRESIDENT AND CHIEF INFORMATION OFFICER, LCMC HEALTH
MODERNIZE HEALTHCARE DATA CENTERS

IT infrastructure is directly tied to a healthcare organization’s ability to work faster, increase efficiency, innovate, and harness the opportunities of the digital age. For these reasons, infrastructure modernization has become business imperative.

**Modernize Care Infrastructure**
VMware delivers streamlined, hyper-converged infrastructure (HCI) that combines compute virtualization with storage virtualization and management, laying the foundation for cost-effectively supporting staff and patients while accommodating growth and innovation. With VMware HCI, healthcare organizations can shift to a more agile IT architecture, bridge IT silos that stall progress, enable seamless and rapid deployment, and easily control scaling up and down.

Healthcare organizations can take HCI to the next level to include networking with VMware Cloud Foundation™, the unified Software-Defined Data Center (SDDC) platform that brings together VMware vSphere®, VMware vSAN™ and VMware NSX® into a natively integrated stack to deliver enterprise-ready cloud infrastructure for private and public cloud. NSX drastically simplifies network management and enables higher levels of security by leveraging micro-segmentation.

**Automate and Monitor IT**
By broadening IT automation with VMware vRealize® Suite, healthcare organizations can respond faster to requests for IT resources, improve the ongoing management of provisioned resources, and increase IT staff efficiency, reducing both operational and capital expenses.

Specifically, VMware Care Systems Analytics for Epic and VMware Care Systems Analytics for MEDITECH enable IT teams to identify system performance issues that may impact patient care, monitor more than 280 clinical workflows, and integrate electronic health record (EHR) system performance to identify root causes and bottlenecks before they negatively affect end users.

“Now we can give our research community the same sort of service they would expect from an organization like Amazon. They click and we deploy.”

**MANU MISHRA**
SENIOR ENGINEER,
VIRTUALIZATION AND STORAGE INFRASTRUCTURE,
KECK MEDICAL CENTER OF USC
INTEGRATE PUBLIC CLOUD

The cloud is increasingly becoming a critical element of healthcare infrastructure modernization strategies. Public, private, and hybrid clouds provide an array of IT infrastructure services that healthcare organizations can use to their advantage.

Deliver a Foundation for Cloud
The seamless integration of public cloud helps single hospitals and network providers meet rapidly changing requirements and growing business demands. By moving workloads into the cloud, developers can rapidly spin up and tear down environments, paying only for the resources they use. Self-service delivery with zero downtime ensures teams can more quickly pilot projects and scale as needed—even research projects requiring resources for limited periods of time—without increasing on-premises infrastructure costs.

The VMware Cross-Cloud Architecture™ enables healthcare IT to build a best-in-class private cloud; extend easily to public clouds, including IBM SoftLayer and Amazon Web Services; and run, manage, connect, and secure any app on any cloud—all with freedom and control. The VMware approach helps satisfy strict data protection regulations and prevent vendor lock in.

Enable Always-On Healthcare
Resilience is critical to healthcare IT because interruptions to core infrastructure can impact lives. VMware helps ensure always-on infrastructure with failover capabilities in the cloud. VMware supports both on-premises and cloud-based disaster recovery solutions, integrating underlying replication technology to provide policy-based management, non-disruptive testing, and the automated orchestration of recovery plans.

Manage Multiple Clouds
Healthcare mergers and acquisitions have been on a tear in the past few years, as the savings tied economies of scale become even more important as margins tighten. VMware vRealize reduces costs and improves agility, accelerating cloud service delivery with the most complete solution for managing a heterogeneous, hybrid cloud.

“A second data center would not be readily affordable to a hospital of our size. But we also can’t afford downtime. We wanted cloud-based disaster recovery, and we needed it to be secure in order to meet our compliance requirements.”

CHRISTOPHER FRENZ
DIRECTOR OF IT INFRASTRUCTURE,
INTERFAITH MEDICAL CENTER
EMPOWER THE DIGITAL CLINICAL WORKSPACE

By enabling new models of patient care with mobility, healthcare organizations can improve the quality of life for both patients and providers, and gain competitive market advantages.

The Right Device, for the Right Task, at the Right Time
Healthcare executives reported more business benefits from mobile initiatives in a recent survey that also revealed healthcare is number one in reaping digital workspace rewards compared to other industries. Using a single identity across workstations, tablets, and smartphones enables clinicians to review charts, x-rays, and care plans from anywhere on any device, spending more time with patients. Provisioning mobile devices for inpatients allows care recipients to communicate with their care teams and understand their medications. Home monitoring using mobile devices empowers patients to track symptoms, for example diabetes indicators, or remind them to take medications—giving patients more input and control.

VMware unifies user, desktop, and mobile management to enable a Digital Clinical Workspace™ —powered by VMware Workspace ONE™— that moves with care providers or patients throughout their days. From the out-of-hours call to the bedside consult, the solution delivers always-on, secure, simple access to patient information. With the single platform, IT can manage apps and devices, across ownership models—hospital-owned or bring your own device—with complete user privacy. The Digital Clinical Workspace includes VMware AirWatch® unified endpoint management. It enables scalable, over-the-air provisioning and complete lifecycle management, and delivers real-time visibility for users, apps, and devices across any network.

Simplify Non-Clinical Desktops
The wide variety of healthcare desktops (e.g., “workstations on wheels,” registration kiosks, business systems) is difficult for IT to manage, update, secure, and keep in compliance. VMware Horizon® eases non-clinical desktop administration by separating and isolating apps, operating systems, and user data from underlying hardware so they can be managed and updated independently, saving time and resources. With Horizon, virtual desktops run as virtual machines on servers in the data center—keeping PHI secure.

Safely Embrace IoT
Increasingly, smart devices are being used across healthcare to create next-generation experiences that put patients in control of their care, better track patient devices, and improve research reliability. VMware’s IoT solution manages, monitors, and secures all IoT infrastructure to create a more efficient and responsive healthcare system—improving patient care and compliance, reducing security risks, and increasing provider productivity.

“Workspace ONE provides that single pane of glass to get the best application experience whether I’m on a phone, a tablet or a 42-inch monitor. It will let me use the right device for the right task at the right time.”

BILL HUDSON
ASSOCIATE CIO AND VP OF IT OPERATIONS,
JOHN MUIR HEALTH
TRANSFORM SECURITY AND COMPLIANCE

No organization can afford to fall victim to cyber attacks, particularly healthcare organizations entrusted with PHI. Continuity of patient care is critical as a breach preventing providers from accessing patient records in a timely manner could obstruct critical care.

A Ubiquitous Software Layer to Combat Dynamic Threats
Sensitive patient data is best protected when organizations adopt a multi-layered cybersecurity approach—strengthening the security of the data center, care systems, and endpoints—to mitigate the threats of ransomware, malware, phishing, and other breaches. VMware provides a transformative security platform that enables healthcare organizations to address today’s dynamic threat landscape.

Protection for the Data Center and the EHR
With the micro-segmentation properties of VMware NSX, core networking functions—routing, switching, firewalls, load balancing—are abstracted into software. Security is intrinsic at the individual virtual machine level. The result is inherently better security across the data center. Lateral movement of threats inside the network is prevented, and compliance and patient data privacy are achieved without excessive cost. VMware segments the EHR for improved security with NSX and Care Systems Security for Epic, a pre-built template securing the Epic infrastructure from lateral movement attacks. When the EHR is firewalled, only authorized connectivity and port communication is allowed.

Secure PHI on Endpoints
VMware Horizon centralizes data in the data center, leaving nothing on the endpoint. VMware Workspace ONE and VMware Verify provide secure two-factor authentication and single sign-on (SSO) to applications, so IT can build a zero-trust environment with layered security across the entire infrastructure, extending out to all endpoints. AirWatch ensures mobile devices meet compliance standards and can be remotely wiped.

“In addition to the CapEx and OpEx savings, securing business mobility was critical to align with our federal mandates for electronic medical records; specifically, to support regulatory compliance with HIPAA and strengthen our digital perimeter.”

PATRICK STRECK
SENIOR DIRECTOR, IT SERVICES,
BAYSTATE HEALTH
HEALTHCARE SOLUTIONS FROM A TRUSTED INDUSTRY LEADER

From the data center to the point of care, VMware accelerates digital transformation so healthcare organizations can dedicate fewer resources to maintaining legacy apps and more to continuously improving patient care. At the heart of the transformation is the Software-Defined Data Center, moving IT from silos to a single, integrated, secure platform for innovation that builds the foundation to embrace the cloud.

Digital Transformation Acceleration
VMware healthcare solutions reduce IT cost and complexity while mobilizing providers, enabling patient care to be delivered wherever and whenever it is needed. VMware solutions include the capabilities required to solve healthcare IT’s toughest infrastructure, cloud, patient engagement, digital, security, and compliance challenges—improving the cost, quality, and delivery of patient care.

Learn more
www.vmware.com/solutions/industry/healthcare

---

Learn more
www.vmware.com/solutions/industry/healthcare