Digital Data at the Point of Care

Wyse Technology Server-Centric Computing Solutions for the Health Care Industry

A white paper by
Wyse Technology Inc.

WYSE

EXECUTIVE SUMMARY

Health care organizations today are under pressure to streamline operations with information technology while maintaining the highest level of data security and privacy. Insurance providers and employers see the adoption of Electronic Medical Records (EMR) systems as an opportunity to improve efficiencies and decrease costs. While government and patient organizations view EMR and Computerized Physician Order Entry (CPOE) systems as a way to reduce errors and improve the quality of care. CIOs in U.S. hospitals and clinics are seeking the best way to manage resources and comply with the Health Insurance Portability and Accountability Act (HIPAA) of 1996. On the front lines are physicians, nurses, and other highly skilled and respected professionals who will adopt information technology if it saves time and improves patient care without compromising confidentiality.

All of these stakeholders share a common interest: the health and well-being of the patient. The Institute of Medicine estimates that medical errors in hospitals kill an estimated 44,000-98,000 people per year—more than motor vehicle accidents or breast cancer. Studies show that CPOE reduces those errors by improving the accuracy of pharmaceutical orders and medical directions generating red flag alerts for allergies or adverse drug interactions. Using CPOE, Kaiser Permanente found that incidents of allergic drug reactions and excessive drug dosages declined by 75 percent, and the average time spent in the intensive care unit dropped from 4.9 days to 2.7 days, reducing costs by 25 percent.

While digitization and computerization offer benefits, they also present security risks with confidential data traveling networks and landing on personal computer desktops. Wyse® Winterm™ thin clients combined with Wyse device management software bring secure, mobile access to EMR and CPOE systems to the point of care. Applications and data reside on secure servers maintained by centralized IT staff. Because thin clients have no hard drive and do not store any data locally, health care providers have mobile access to up-to-date information and patient record privacy is protected through log-in. They can issue orders that are legible, accessible, and part of the permanent record.

For most medical treatment facilities, information technology came first to the back office, supporting operations and financial functions. Browser-based applications, data integration, and small, robust computing devices are bringing the benefits of IT to the point of care. As multimedia compression and visual tools improve, more visual information will be available for diagnosis, training, and collaboration. With server-based, thin-client computing systems, health care CIOs are laying the foundation to make the most of information technology for patient care.

CHALLENGES TO PUTTING INFORMATION TECHNOLOGY IN THE ER

As information applications become browser-based and network reliability and security improve, the vision of a paperless clinic or hospital is becoming a reality. The technology exists today to create an integrated system with 99.9 percent uptime and reliable access to electronic medical records and order entry at the point of care, from the office or home over secure networks. Digital, rather than handwritten orders, provide nurses and pharmacists accurate, legible directions, reducing both errors and time.

Despite the availability of these technologies, health care organizations have been slow to adopt information technology to patient care. Offices still rely on paper-based charts, and pay for storage, transportation, and transcription services. Of the estimated 30 billion health care transactions in the U.S. each year, 90 percent are conducted by phone, fax, or mail. The barriers to adoption include the high cost and complexity of integration and interoperability, security concerns, and behavior change.

IT System Complexity and Cost

Health care organizations have complex, disparate IT systems including Windows®-based PCs for access to office programs and mainframe terminals for legacy applications. Increasingly, employees use personal laptops, home computers, and handheld devices in the computing mix. Hospital and health care IT departments support remote sites, mobile users, and personal devices. To integrate these processes and applications into a secure, functional system requires a reliable network, centralized and secure data systems, and end-user devices that support single sign-on, network connectivity, and browser application access without compromising security.

Medical Record Protection and Patient Privacy

HIPAA compliance is required of every U.S. facility providing medical treatment to establish strict security procedures to protect the confidentiality and privacy of every patient's medical history. Paper-based records may be kept in a locked cabinet, but they can be misplaced, left on a desk, or accessed inappropriately. With electronic records, access is limited and managed: user authentication, data encryption, secure networks, firewalls, and limited server access. Many systems enable a legitimate user to download information to a personal computer hard drive where it is virtually unprotected and unguarded. To comply with current HIPAA requirements and reduce risk, critical information should stay put on secure servers.

The Challenge of Change

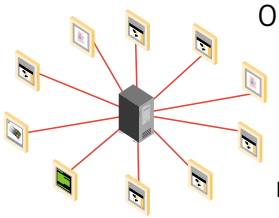
Even as new technologies come to market and hospitals show successful implementations, current practitioners are slow to change. Some studies estimate that only five to 10 percent of physicians in individual practice use EMR and only 25 percent of physi-

cians in hospitals with computerized medication order entry systems used them. In order to make IT an integrated part of a health care practice, physicians must be part of the change process and directly benefit from the change.

According to a leading hospital IT implementation expert, the most common point of failure of an IT system is user acceptance. If too many barriers slow them down—multiple passwords, timeouts, and slow log-ins—health care professionals will stop using the system. Physicians, nurses, and other practitioners must see an obvious benefit such as a single log-in to multiple, secure applications and data, easy and clear transition from one patient's information to another, session mobility from one device to another, and, of course, reliability.

THIN-CLIENT COMPUTING SOLUTIONS

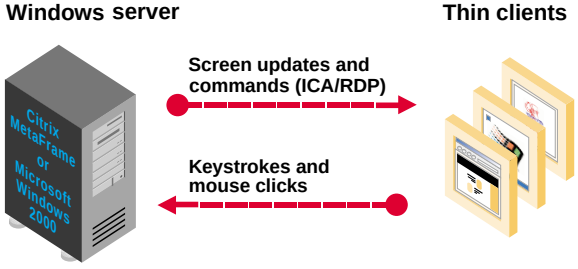
To bring patient information and clinical decision guidelines to the point-of-care with robust, secure computing devices, health care CIOs have turned to thin-client, server-based computing solutions. In this computing model, all data and applications reside on centralized, secure servers. Users connect to the servers through thin clients as part of medical carts, kiosks, integrated monitors, handheld tablets, or other desktop devices.



Only key strokes, mouse clicks, and screen images travel the network, keeping critical information on secure servers, not personal hard drives. Thin clients have become the standard for access in financial institutions, shipping companies, retail stores, hospitals, and many other industries.

Wyse® Winterm™ Thin Clients

Wyse Technology pioneered thin clients and has the largest market share worldwide. Wyse Winterm thin clients range from simple thin clients with the basic protocols needed for terminal server connection to powerful and flexible thin clients with local application processing, additional I/O ports, and optional local peripherals. Platform options include Wyse's Blazer technology, Linux, Windows CE. NET and Windows XP. Winterm thin clients combine the security of a mainframe with the interface and flexibility of a desktop computer, providing access to legacy mainframe applications, secure web-based information, and Microsoft Outlook, Word, and other PC applications. Log-in options include password protection, smart card access, and biometric security sensors.



Thin clients access applications and data on a server.

Hospitals and medical groups have found Winterm thin clients to be a perfect fit at the point of care. They are lightweight, have a small footprint, large screens, long battery life, and low power emissions. Different form factors give health care professionals flexibility in how and where they access data and applications: nurses use medical carts powered by thin clients or integrated monitors at the nurse's station, doctors prefer tablets or desktop access, and pharmacists have medical carts with barcode scanners connected to thin clients.

Wyse™ Rapport® Software

Every Winterm thin client includes Wyse™ Rapport® device management software to change, upgrade, and assess all thin clients on the network domain remotely. The administrator has the option of downloading firmware, embedded applications, and other features to the thin clients at any time, in any order, and to any grouping of terminals. Using server-based policies and utilities, administrators can implement new users, IP addresses, locations, permissions, security levels, and peripherals.

Secure Solutions

Thin clients shift security requirements from the computer to the network, making compliance with security protocols more manageable and protection more robust. Access is controlled through multi-level identification and authentication, and no data or application resides on the access device. If a thin client fails or is stolen, nothing is lost or compromised and a new thin client device is simply swapped into its place. Servers are regularly backed up and redundant systems in multiple sites support continuation of operations.

CONTAIN TOTAL COST OF OWNERSHIP

With server-centric computing health care providers build on their technology investment each year. Thin clients cost less per seat than laptops or desktop computers with the same applications and Windows-based interface. They connect through most standard networks: 10MB Ethernet, 100MB Ethernet, Wi-Fi®, even dial-up and wireless WANs. With applications managed on central servers and thin clients typically not having disk drives, data is almost never lost, stolen, or corrupted by mechanical failure, virus, or malicious attack — allowing thin clients to have the lowest total cost of ownership (TCO) of any computing device used today.

The table on the next page shows three cases for calculating TCO savings with thin clients using high, medium, and low TCO estimates for PCs and three different prices for thin clients. Even the most conservative estimates (Low PC) result in technology savings within the first year of deployment.

Return On Investment Expectations

	HIGH PC	MEDIUM PC	LOW PC	
PC Cost/Year	$14,000*	$10,000*	$9,000*	A
TC Savings	57%	35%	20%	B
TC Savings/Year	$7,980	$3,500	$1,800	C=A x B
Savings/Month	$665	$292	$150	D=C/12
Cost of TC	$399	$525	$1,099	E
Payback (months)	0.6	1.8	7.3	F=E/D
First Year ROI	1900%	567%	64%	

* Gartner Group Estimate

Hospitals and clinics report that they can support more thin-client devices in more locations with fewer IT staff than an environment of desktop computers and laptops. By consolidating management in key locations, they can hire the best, most qualified people to support local and remote users.

THIN CLIENT BENEFITS FOR THE BEDSIDE

Fast, secure log-in combined with session mobility give physicians, nurses, and other health care professionals easy access to the applications and information they need where they need it. By centralizing data and applications on secure servers, the IT department keeps IT current with security protocols and the latest advancements in IT applications for the health care industry.

EMR at the Point of Care

When Dreyer Medical Clinic went digital, they chose Wyse Winterm thin clients for point-of-care access to improve patient care, contain technology costs, and reduce the administrative cost of paper records. Dreyer Medical Clinic operates 12 service locations west of Chicago, Illinois, and previously spent millions of dollars moving and storing paper charts. Doctors had ended each day dictating hours of notes for transcription. If a patient needed urgent care, the record was not available for days.

To access the new EMR system, Dreyer Medical Clinic replaced green-screen terminals with Winterm Windows-based terminals in nurses' stations and also deployed Winterm thin clients in exam rooms for instant access to up-to-date patient medical records. Thin clients are silent and durable with low emissions and low electrical power requirements. They are more robust than handheld computers, and require less maintenance than a

PC. Each device has an identification number connected to the exam room to improve scheduling and managing the flow of patients.

"The small form factor keeps the exam rooms clean," said Stephen Hart, Systems and Network Administrator. "The doctor or nurse can easily access information without losing eye contact with the patient."

Device Options and Ease of Use

WellSpan Health, a not-for-profit health care organization located in Pennsylvania and Maryland, adopted thin-client, server-based computing to reduce costs and expand access to standard applications. WellSpan VP and CIO Buddy Gillespie turned to thin clients when a change in Microsoft licensing several years ago translated into a $4.5 million upgrade to the health care system's IT infrastructure.

His technical staff created a three year transition plan for $1.5 million to increase real-time access to applications, the Internet and email without increasing desktop TCO. With server-based, thin-client technology, WellSpan invested first in the infrastructure and application delivery, extending the life of existing computers, and then transitioned to more efficient, low-cost thin client devices. The organization extended the life of existing hardware, achieved reliability goals, and has a secure viewer for clinical applications.

During the plan development, WellSpan also formed a clinical infomatics committee chaired by a respected physician. His support and involvement made sure that the new solutions addressed the concerns and needs of physicians.

"A physician can never sign on to a computer fast enough," said Gillespie. WellSpan's thin-client, server-based computing system gives physicians single sign-on, real-time access to applications as well as the Internet and email without changing devices. They have begun to pilot enterprise imaging for the organization's picture archiving and communications system (PACS). Real audio and video will make training and clinical learning resources available on the desktop in the clinic or from home.

Affordable, Managed Care

Centralized management of updates and software deployment enables agencies to respond quickly and efficiently to mandates. When one government health care agency was required to update screen settings on all desktop devices, the IT department manually configured one desktop and pushed it out across the network to all Winterm thin client devices. Not only did the managers respond, but they could track and report on the results, certain that every desktop on the network had the new configuration.

Because users log-in to servers for their mission critical data and applications, they are

not tied to a specific location in a thin-client environment. A nurse can open an application and bring up patient records at the nurse's station, then move to an exam room and access the same desktop without taking time to reload applications or find records.

Centralized control also improves protection against viruses, worms, and other attacks. The technical team keeps security patches up-to-date on the servers to prevent disruption for users. Thin clients require patches less frequently than PCs, but if they are required, Rapport software pushes the new updates out to all thin clients.

HIGH TECH IN A HIGH TOUCH INDUSTRY

Almost half of the adults in the U.S. have used the Internet to research a specific health topic, and 73 percent of these adults say their research improved the health information and services they received. Today's adult patients come to the doctor's office with ideas and information about their treatment and health. They expect doctors to have information and resources ready to respond. Electronic medical records, clinical decision guidelines, and order entry applications help busy health care providers respond to changing expectations. With thin clients as the access device, physicians know that their practice is in full compliance with HIPAA, and CIOs can quickly respond to new requirements and protocols.

Hundreds of thousands of Wyse Winterm thin clients have been deployed throughout health care organizations worldwide to support easy access to critical information and applications. In medicine, the right information at the right time helps the men and women who use it save lives.

i Janet Marchibroda, CEO, eHealth Initiative, in testimony before the Subcommittee on Health of the House Committee on Ways and Means, June 17, 2004, from Clinical Information: Achieving the Vision, 2002; Kaiser Permanente.

ii Marchibroda, 2004.

iii Marchibroda, 2004.

iv Susannah Fox and Deborah Fallows, Internet Health Resources, Pew Internet & American Life Project, July 2003. http://www.pewinternet.org/pdfs/PIP_Health_Report_July_2003.pdf

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