

Dragging Hospitals into the Digital Age

by Dennis Irvine
President & CEO
Irvine Team



Digital images integrated into electronic health records. Digital hospital initiatives. The acceptance, utilization, and celebration of digital technology. The shift toward digital-based information sharing has allowed the care giving part of the job to be just that — care giving — by minimizing the cumbersome and time-consuming tasks

associated with logging patient information, making pharmacy phone calls, deciphering handwriting, counting and billing medications, and filing X-rays.

Forward-looking healthcare organizations agree: the Digital Age has arrived. Sure to transform healthcare as we know it, the key word is digital. It's a word that pops up frequently and represents a technology many Americans already embrace: digital clocks, digital cameras, digital photos, compact discs, digital televisions, and many other digital devices. Though more complex than this explanation, digital describes a system based on discontinuous data or events. And in the context of healthcare, information technology offers near-incalculable opportunities to improve patient care while positively addressing the business aspects.

Tools of innovation — wide area outdoor wireless (WiMAX), voice over Internet protocol (VoIP), radio frequency identification (RFID), among other technologies— allow information to be disseminated quickly and easily at the critical point of care. And whether you're a patient or a medical professional, it's clear that modern healthcare delivery is an information business, not just a people business, that operates amid a society increasingly dependent on immediate gratification.

Leading hospitals celebrating the Digital Age are clearly paving the way as industry innovators and giving their peers a glimpse of

the digital potential: greater productivity, lower patient mortality rates, and increased quality of care. On the flipside, naysayers question whether accepting, utilizing, and celebrating technology is the only road to “top hospital” status.

For many hospitals and medical professionals, accepting the apparent shift toward digital technologies is the most difficult aspect because it requires a complete reversal of traditional healthcare practices and processes. The healthcare industry's hesitation — and resistance — to join the Digital Age became clear over the past decade, precisely the same timeframe in which companies of all sizes and in an extensive range of industries rushed to embrace the advantages, opportunities, and productivity afforded them by evolving technologies. For healthcare organizations that did commit, expenditures were often misdirected, equipment was underutilized, systems were inflexible, technologies and quality had not been perfected, and “Bah humbug” echoed in the halls.

To fully appreciate the potential benefits of an integrated digital hospital, it's important to recognize the traditional healthcare information process for what it is: an endless flood of paperwork generated by aids logging vital signs, medical associates manually posting lab and test results, nurses hand-chronicling patient progress, doctors scribbling notes and prescriptions, then nurses scrambling to clarify them. Cumbersome X-rays are physically filed in vault-size filing rooms, and other types of medical information are housed elsewhere throughout the hospital. The “chart,” which archives the patient's history, is neither real-time nor easily retrievable. And while inefficient and too much left to chance, this process has been the norm for decades, despite the booming acceptance of technology across other industries.

A very different scenario has emerged at digital hospitals with modern information management capabilities. With network software acting as the central system, wireless laptop Lifebooks are being used by nurses and aids for patient recordkeeping. Doctors access the network, both internally and remotely, to review patient records, view X-rays, order prescriptions, and check lab tests.

In a nutshell, these Lifebooks pull together all of the digitized pieces of information — vital signs, physicians' notations, lab and test results, prescription histories, X-rays — and package them as repositories for real-time, enterprise-wide electronic data delivery. In some hospitals, these laptops are located at central stations on each floor. Other hospitals utilize portable "laptops-on-a-stick" that roll on a device similar to an IV pole and operate through a wireless connection, while many hospitals use portable computers known as COWs — computers on wheels — that roll on rubber carts.

Digital recordkeeping is only one component that is changing the healthcare landscape. Often seen around digital hospitals are Mr. Rounder robots equipped with a video screen and two-way video capability. In reality, this robot allows a doctor to be in two places at once. For example, a physician can activate the robot remotely using a laptop and navigate it with a joystick to conduct virtual visits and video conferences with patients; he can log on from the operating room to check on a patient in recovery; and in the case of inclement weather that prevents a physician from getting to the hospital in a timely manner, decisions can be made remotely under every-second-counts conditions.

As it relates to pharmaceuticals, digital equipment and processes are gaining acceptance. A digital drug-order entry system, also known as an electronic prescription drug system, enables physicians to write prescriptions directly to a pharmacy. In-house dispensaries are also in play. For example, automated Pxyxis machines dispense medications and supplies at the nursing station or from the hospital pharmacy directly to the nursing cart. Pxyxis machines also record and bill medications, maintain inventory records, and restock medications.

One of the most common starting points for hospitals seeking an entry into digital technology is patient registration systems whereby hospitals send electronic questionnaires and pre-registration forms to patients. This significantly reduces registration time at the hospital, and in many cases allows the

patient to go directly to the point of care, such as the radiology department, CATH lab, or maternity ward. Bar-coded wristbands are also widely used to ensure proper identification of patients, outline medical procedures to be performed, and prevent kidnapping of infants.

Seemingly whimsical, if not space age, the use of robotic "digital docs," COWs, and pharmaceutical vending machines yield results that are serious and proven. Portable computers put real-time, comprehensive records at or near the patient's bedside and, coupled with digital pharmaceutical dispensary, combat human error that costs approximately 7,000 Americans their lives each year, according to the National Academy of Sciences Institute of Medicine, as a result of missed drug-interaction problems. In addition to heightening patients' access to physicians, robotics also allows specialists to consult with patients at other facilities and in other cities.

The Bush Administration has become a major advocate of digital healthcare, which may eventually drag the lion's share of healthcare organizations into the Digital Age. In 2004, President Bush tapped physician/economist David Brailer as the point man for the Administration's push toward e-health records that would require all patient care by hospitals, doctors, pharmacists, and others to be tracked in a single, privacy-protected database. This digital initiative would ultimately allow for information sharing and create a substantial health-status benefit.

Also on the digital bandwagon is Medicare, which launched a pilot program with 277 hospitals to track hospitals' quality of care in five treatment areas with a promise to provide greater compensation for better care. This trial suggests that better care is a result of better information, with an average quality-of-care score increase of 6 percent since the study's inception. With profitability paramount for hospitals, Medicare's financial incentives could prove to be a driving force in the digital shift, particularly in light of the aging of America.

The statistics are sound. The benefits are proven. The technology is available. So why isn't digital technology embraced universally? Indeed there are those who have been quick to advocate a shift toward digital technology in the interest of increased productivity and quality care. And the youngest generation of doctors is graduating from medical school with a high comfort level using evolving technologies. But there are an

equal number who have been reluctant or opposed to a fully digitized system.

Resistance is most common among established doctors in private practice and independent of the hospital. While the hospital nurses are employed directly by the hospital and required to adhere to process mandates, independent physicians are free to grumble at changing the way things have been done for decades. Admittedly, few medical professionals, if any, enjoy the time and effort involved in learning a new way of conducting business. And the capital required to participate in the Digital Age is mind-boggling.

Digital technologies don't come cheap, generally rising into the tens of millions of dollars and often requiring existing systems to be scrapped. Researcher Dorenfest Group estimates that hospital spending on higher-quality care may climb as high as \$30.5 billion in 2005, up from \$25.8 billion 2004. Digital capabilities in operating rooms require more square footage to accommodate equipment and monitors, with the average requirements between 700 and 900 square feet. This is a significant increase from the 400 square-foot operating rooms of previous decades that were considered a generous size.

To win over the medical staff, it will take more than technology for technology's sake as the primary selling tool. The list of benefits to all involved parties is significant, and when collectively viewed, even the most reluctant of healthcare providers cannot ignore the positive impact of a digital facility. Certainly some benefits can be measured in dollars; others can't. Many can be measured in quality of care, lives saved, the ability to woo doctors to digital facilities, and compete for patients. Among the selling points:

- Information flow is boosted to an unprecedented level.
- Patient care is highly coordinated.
- Real-time, at-your-fingertips digital information eliminates the time inefficiencies, administrative hassles, and potential inaccuracies associated with faxes, phone calls, and misinterpreted handwritten records.
- Time efficiencies translate to a significantly lightened administrative workload.
- Productivity increases significantly.
- Bar code scanning of drugs prevents administrative errors.
- Robotic pharmaceutical systems reduce manual pick errors.
- Dangerous if not potentially fatal drug interactions are identified easily.
- Preventative compliance is improved by providing reminders about medications and dosages, and offers ticklers for tests to be performed in the future.
- Digital technology empowers hospitals to effectively address a myriad of issues —staffing, government regulations, patient safety, finances, profitability, and competition.

Clearly, e-health is knocking at the medical industry's door. Only time will tell who will answer that call... and how. In the absence of a crystal ball, a best guess is that some will follow the early pioneers willingly and excitedly; many will enter with guarded anticipation, yet others will be drug into the Digital Age without a choice.

Dennis Irvine is president and CEO of Houston-based Irvine Team, the first-of-its-kind innovator with extensive experience in the commercial design + construction industry. Irvine Team has been involved in the design and construction of several Houston-area digital projects totaling more than \$100 million.