

Tablet PC: Making an Impact in Hospitals and Doctors' Offices

Health care is often the first application that springs to mind when people think about Tablet PCs—medical professionals in white coats, carrying sleek tablets instead of clipboards jammed with patient charts. The image is compelling and highly logical. But the Tablet PC is vastly more beneficial and far more useful to today's hospitals and doctors' offices than as a mere electronic clipboard.

EXECUTIVE SUMMARY

The business of health care today is a delicate balancing act, as payers seek greater efficiencies and lower costs and providers seek newer technologies to maximize efficiency—especially in record keeping and claims processing—while physicians try to deliver the best possible outcomes. Redundancy and error must be minimized, and systems that can capture keystrokes, handwriting, audio, sketches and diagrams, and even video are or will soon be essential.

Technology is poised to dramatically improve the user experience at the provider/patient interface. Using wireless network-enabled Tablet PCs, medical professionals have far greater access to patient information and medical databases, and can also easily share the information with patients or consult with other professionals. As health-care delivery systems evolve, it is critically important that the equipment evolve with them. That's why open-ended computing platforms based on standards such as Microsoft Windows XP are essential in hospitals, clinics and doctors' offices.

The health-care industry is on the brink of a new era, filled with exciting changes. The technology available at the provider/patient interface, as seen in leading Tablet PCs such as the Toshiba Portégé M400 running Microsoft Windows XP Tablet PC Edition, will bring about these changes faster and make them more powerful.



Top Health-Care Benefits of Tablet PC

Feature	Benefits
Single data entry without transcription	<ul style="list-style-type: none"> Serves patients faster Reduces errors and inefficiencies Saves money, as bills automatically reflect the medical procedures performed
Real-time database access via wireless connections	<ul style="list-style-type: none"> Immediate access to patient history, drug doses, changes to medications and policy guidelines Reduces wait time for patient records
Clear display	<ul style="list-style-type: none"> Promotes meaningful medical dialogue with patients and staff Helps patients better understand their condition and treatment
Digital ink capability	<ul style="list-style-type: none"> Facilitates easy annotation of documents All Microsoft Office 2003 applications support digital ink
Captures text, pictures and sound	<ul style="list-style-type: none"> Helps providers create, edit, organize and search through handwritten notes Handwriting and speech recognition capabilities automate translation to digital text
Lightweight and portable	<ul style="list-style-type: none"> Easy to carry from office to hospital and back Captures information in remote locations for later upload
Private	<ul style="list-style-type: none"> Reads and writes secure data to tokenized storage modules
Enhanced version of Microsoft Windows	<ul style="list-style-type: none"> As easy to use as desktop or notebook computers

MARKET CLIMATE

Hospitals and clinics are in a unique position. The public demands the best service, the latest treatments and the best technology—but balks at the attendant costs. Regulators, the news media, and the public have a low tolerance for errors of any sort, and even simple clerical errors can become negative news stories if they are part of a larger pattern. Meanwhile, the industry is governed by numerous laws and regulatory restrictions demanding accurate record keeping, while insurance companies limit the reimbursement for medical procedures and hospital stays.

All medical facilities are, by nature, patient-intensive. But the industry is also highly staff-intensive, both in sheer numbers and the amount of training and experience required of medical professionals. The business staff in health care is equally important, although less visible than the medical staff. Medical record keeping is a demanding field unto itself, governed by the provider's need for accuracy, rapid access, privacy and efficiency.

Doctors were among the earliest adopters of personal computers, as they sought to streamline their office procedures. They were frustrated, then as now, by the need to continually transcribe information from handwritten patient charts and notes and the meshing of paper and electronic records with X-rays, photographs, EKG strips and other records. The Tablet PC offers them a promising way to overcome these obstacles.

BUSINESS CHALLENGES

Today, the onus is on the business staff, as well as the medical professionals who create the entries, to move into a new realm of accurate, easily retrieved information and to enable new forms of retrieval. This modernization benefits patient care, insurance claims processing and billing, and compliance with a variety of laws and regulations.

HIPAA, the Health Insurance Portability and Accountability Act of 1996, is the strongest influence on medical record keeping in the U.S. today. By standardizing electronic interchange and requiring electronic transactions for Medicare and other entities, HIPAA virtually mandates the digitization of many patient records. While the digitization of records is an ongoing process, made more complex by the preponderance of handwritten, paper-based documents, the benefits are overwhelming. They include the ability to share files instantaneously, encrypt documents against unauthorized access, and enable offsite backup to prevent loss through operator error, environmental disasters or theft.

The advent of telemedicine makes the case for electronic records all the stronger. The ability to present patients from remote areas to specialists

for diagnosis (or for specialists to guide surgery or therapies from afar) both increases the quality and reduces the cost of care.

SOLUTION: TABLET PCs WITH WINDOWS XP TABLET PC EDITION

The Tablet PC, coupled with an operating system and applications that fully harness its capabilities, is the ideal foundation for modern medical record keeping. As opposed to the "slate" style of keyboardless tablet, a convertible tablet such as the Toshiba Portégé M400 has both a conventional keyboard and a display surface that can capture handwriting, drawings and "gestures"—strokes of the pen that cause specific actions. Furthermore, Tablet PCs can convert handwriting into machine-readable text and can even accept voice dictation.

Hardware advantages. The latest Tablet PCs from Toshiba compare favorably with conventional notebook computers for lightness, ergonomics and battery life, and have full wireless capability through Wi-Fi and Bluetooth. They provide an ideal provider/

At a Glance: How Tablet PCs Help Increase Hospital Collaboration

- Run all Microsoft Office 2003 applications, including the Microsoft Outlook 2003 messaging and collaboration client and Microsoft PowerPoint presentation software
- Give staff access to e-mail in their office, in patients' rooms, at home or on the road
- On-screen forms simplify and expedite gathering patient data, increasing time spent with patients and colleagues
- Color displays and connections to large-screen displays promote staff training and more patient/staff interaction

patient interface because there is no clerical overhead in delivering the records to the attending professional. The Tablet PC is also capable of displaying all medical data types, including X-rays and strip recorder charts, in addition to textual records. It can also be used to view data that would normally be displayed on a monitor, such as PET scans and other tomographic records.

Communications advantages. Although the Tablet PC is usually in constant communication with a medical records server, this need not be the case. It has more than adequate storage to hold copies of a large number of patient records, so it can be used remotely, such as in a doctor's office out of communications range with the hospital's server. When it is back in range it can automatically update the patient

records database with the changes.

The Tablet PC can also be used at the time of patient intake to help the business staff create new database records, eliminating transcription errors. Patients can participate, and can easily adapt to input with the stylus for signing forms or other tasks, or use the keyboard if they are comfortable with it.

Software advantages. Each Toshiba Tablet PC runs an enhanced version of Windows XP called Microsoft Windows XP Tablet PC Edition which includes specific extensions for the tablet. All Windows applications run on it without alteration, and most will accept stylus input without modifications. Some industry applications have been enhanced for even greater functionality when running under this hardware.

Because the Tablet PC runs the full suite of Windows applications in addition to specific medical records applications, providers can use familiar tools to do e-mail, create letters and presentations, and even import patient data into a spreadsheet to illustrate, for example, changes in weight or cholesterol level over time. Furthermore, applications such as Microsoft OneNote harness the tablet's capabilities, seamlessly blending keystrokes, handwriting, sketches and diagrams, even recording audio and associating the audio with specific notes. OneNote is preinstalled on all new Toshiba Tablet PCs sold worldwide.

Portability advantages. One advantage to providers is that they can easily record patient interviews directly to the Tablet PC's hard drive. Because all data and data types can be stored in the patient's records, the Tablet PC overcomes the problems typically inherent with multiple devices and media.

Microsoft OneNote: Just What the Doctor Ordered

Microsoft OneNote, found on every Toshiba Tablet PC, records and displays textual and graphical information seamlessly, making it a powerful tool for displaying and manipulating patient records, which may include dozens or even hundreds of graphical record types. Scanned documents, charts and films can be annotated, and the annotations become part of the permanent record.

Portions of patient records can be imported into OneNote for annotation, and the enhanced records can be stored in the patient records database for later retrieval. Other features of note include:

- Captures all information in one place
- Takes advantage of digital ink, including customizable pens
- Easy for staff to draw a diagram or annotate a document while meeting with patients
- Quick search to find all handwritten and typed notes
- Makes gathering research information easier by collecting text, pictures, charts and other content all in one spot
- Can send handwritten notes in an e-mail after a meeting

The Toshiba Tablet PC, in conjunction with Microsoft messaging and collaboration software, is a functional platform for telemedicine, as well. Physicians can consult with specialists and can forward photographs, real-time video images, or scans of film-based records such as X-rays or MRIs.

HEALTH-CARE-SPECIFIC BENEFITS

Providers that choose Toshiba Tablet PCs can take advantage of the growing body of health-care-specific applications and accessories that have been released since the first Toshiba models debuted over four years ago. Many of these translate directly into health-care-specific benefits addressing the most vexing technology challenges facing the industry today.

First and foremost is streamlined, seamless interactivity, from patient intake through periodic examinations to unscheduled office visits. The vast majority of data is entered once, which saves time, greatly enhances accuracy for improved HIPAA compliance and lowers the clerical workload.

Delay in filing insurance paperwork is greatly reduced, too. Once the data is entered and vetted, it can be transmitted immediately. Other key benefits include the following:

Enhanced patient experience. The Tablet PC can greatly enhance the provider/patient experience. Since the computer travels with the health-care professional, each patient's record is available at the stroke of a pen. Historical information, prescription records, and current visit information are all visible or easily retrieved without interaction with the medical records staff. Picture archiving and communications systems (PACS) are still seen primarily as tools for radiologists, but as they become more fully integrated with patient records, they will become far more useful at the point of patient contact. The Tablet PC may not be the appropriate tool for critical radiological diagnosis, but it is the ideal platform for all other uses of PACS data.

The physician can also use a Toshiba Tablet PC to display or to direct information to in-room display panels, for patient education or for explanation of treatment options. Movies, medical scans, anatomical diagrams, presentations and other visual information can be easily displayed. The provider can make on-screen annotations and direct images to a printer, if desired. In this era of informed consent, such communication is critical for avoiding misunderstandings.

Online database access. Medicine has come too far for any one practitioner to have an answer for every question that arises. But with a Tablet PC a provider can have instant access to specialized databases during the consultation, such as drug interactions and contraindications, therapeutic alternatives

or diagnostic checklists. The technology can help the provider ensure the most positive outcome from the prescribed therapy or treatment.

Privacy and security. HIPAA mandates strong controls for privacy and security, and it is imperative that the Tablet PC participate fully in both. The Toshiba Portégé M400 is equipped with a fingerprint reader and the Trusted Platform Module chipset, which verifies user identity and handles encryption. If required, additional security is available via a digital token card or even a motion-sensing alarm. Together with operating system security features and encrypted communication with the server, the Tablet PC platform is part of a robust solution that meets or exceeds all legislated security requirements.

CURRENT AND FUTURE INITIATIVES

The PACS display systems mentioned in this white paper are growing daily, and as they move beyond their radiological roots into general medicine, will become far more widely used. The imaging capabilities of the Toshiba Tablet PC are ideal for accessing PACS databases, in conjunction with high-resolution diagnostic displays.

Disease management databases are gaining prominence under the Medicare Modernization Act, specifically in the Chronic Care Improvement Program. Electronic databases are essential here for analyzing the delivery of care to patients with chronic conditions. Now that electronic communication with Medicare is mandated, providers must ensure that their current and future systems fully embrace the model. The Tablet PC, from patient check-in through treatment, is the ideal platform to ensure frictionless electronic communication with Medicare and the other agencies and payers that will doubtless follow suit.

As electronic health records continue to be defined, portable, tokenized storage modules will be introduced. They will likely be based on existing architectures, such as USB keys or SD memory. It is important that providers' terminal devices support these interfaces, as Toshiba Tablet PCs already do. Likewise, medical diagnostic equipment is increasingly able to connect to a PC for easy data capture. This trend will continue in the future, until virtually everything in the office—down to the stethoscope and sphygmo-

Selecting the Right Hardware

Toshiba Portégé Tablet PCs contain several features that are particularly well-suited for hospitals and medical clinics.

- Bright, high-resolution 1400 x 1050 color displays
- Rugged hinge allows convertible display to quickly transform from notebook to Tablet PC
- Docking feature for quick office “ins and outs”
- Wi-Fi and Bluetooth connections
- Long battery life
- Microsoft OneNote application included

manometer—will be part of the network.

While no one can predict the changes in the way health care is delivered, we can be confident that virtually all of the changes will involve higher degrees of information technology. Sophisticated user devices that can handle any kind of input and any kind of display will be a requirement, along with industry-standard operating systems, applications and programming interfaces.

THE TRANSITION TO TOMORROW

The state of the art is constantly changing in medicine and information technology, but the two have never before been so synergistic. The forces of medical care, regulatory pressure and economic realities are converging to redefine the provider/patient interface. Providers are at the point where they must make the transition from charts and clipboards to a fully integrated, electronic future.

Fortunately, the technology, as embodied in Toshiba Tablet PCs and Microsoft Windows XP Tablet PC Edition, already exists. Together they not only make this transition painless, but highly rewarding in terms of improved care, lower costs, fewer errors, faster payment, and open-ended for future enhancements. ■

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