Case Study

Intel® Atom™ Processor

JAO TECH

"What began as a technology dedicated to improving patient well-being through entertainment and communication at the bedside has now developed into a solution that offers a much broader usage model. The most significant benefit is having the necessary information such as electronic health records at the point of care — this is where our smart terminals are making an impact in improving healthcare IT."

– Warren Kressinger-Dunn

Embedded Intel® Architecture

Simplifying the Integration of Point-of-Care Clinical Information and Patient Entertainment

Summary

Today as people's expectations with regards to multimedia access continue to intensify, hospitals and clinical care environments are looking more and more into investigating and addressing the multimedia requirements needed to take patient care in to the future. Patients now want more than just a hospital television with standard channels. They want individual bedside terminals that provide state-of-the-art entertainment and communication facilities. The deployment of terminals in a hospital-based environment can help ensure that a hospital stay becomes less monotonous and time consuming, resulting in increased patient comfort and satisfaction.

However, there are other significant benefits to be gained. Bedside terminals also help achieve greater efficiencies by deploying staff in such a way so as to ensure that new and more efficient procedures can be more easily implemented. While a hospital will ultimately be judged on the quality of medical care it provides, looking ahead, as patients' needs continue to evolve, they will also be evaluated on the quality of multimedia access and other services they offer.

In fact, other healthcare environments such as diabetes/dialysis clinics, retirement homes, hospital waiting rooms, etc., will be judged on their ability to provide similar multimedia services. However, that is only part of the story. A smart terminal system also can positively impact on the role of medical staff members within a hospital environment. The capability to access all patient information at the bedside while talking to a patient, to display an ECG profile, or to discuss the specific treatment pattern based on a MRI image can be considered extremely beneficial by medical staff members.[1]

Today Intel® architecture-based platforms are enabling leading-edge companies such as JAOtech to accelerate the delivery of feature-packed patient bedside terminal solutions. That's all due to Intel's scalable family of processors that can support the various networking protocols, software stacks, and multiple I/O interfaces essential for current and future bedside terminal designs.

Introduction

Smart terminals are becoming an increasing fixture today in many hospital- and clinic-based settings. In many cases a personal TV and individual Internet access from the bedside is becoming a de-facto requirement by patients, and hospitals are now often judged not only on the quality of care they provide but also on the quality of multimedia services offered. Other progressive hospitals are going a step further by integrating bedside terminals directly to the Hospital Information System to ensure quick and easy access to electronic patient records along with allowing patients to access other information to help make their stay more comfortable. Today patient bedside terminals can come equipped with an array of features such as the following:

- Web Camera
- Nurse Call
- Internet Access
- Information Services
- Patient Education Services
- Telephony (IP/Analog)
- Video on Demand
- Digital Radio
- Access to Electronic Patient Records
- Facility Control
- Magnetic Stripe Reader.
- Bar Code Scanner
- Biometric Security
- RFID Technologies
- Touch-screen Interface
- Ultrasound Microphones
- LED Reading Light

The most efficient use of bedside terminals within a hospital setting revolves around facilitating healthcare physician (nurse/doctor) interaction by integrating the terminal with the hospital information system. Nurses can promptly record and retrieve patient's clinical data such as vital signs and quickly determine medications given or required for that particular patient. The charting of patient data is considered to be more accurate because the data is entered in real time, which increases the quality of the nurse's documentation and reducing duplication. Also, recording data at point of care using a terminal alleviates a nurse from having to record the patient care information at a nursing station, which requires extra time and can lead to an error-prone transcription each time a nurse reconciles information on a particular patient.

The end result is that bedside terminals result in a more efficient and productive use of nurses' time, allowing them to allocate more time to patients and other medical tasks. Doctors, in using the terminal to share patient medical images such as ultrasound, CT, or MRI scans, can inform and explain to patients the next course of treatment, resulting in more informative consultations and more responsive patient care. It also results in greater consistency of diagnosis and allows faster generation of results, which can have lifesaving consequences in emergencies. Bedside terminals can also have many other uses ranging from hospital assets tracking, orderings medical tests within the hospital, prescribing by the bedside, and automated meal ordering, so it is easy to see how valuable the benefits of this technology are now becoming.

Annecy Hospital — Smart Terminal Deployment

The regional medical center of Annecy (Centre Hospitalier de la region d 'Annecy – CHRA) treats more than 70,000 patients per year and has recently undertaken one of the largest deployments of bedside terminals in France.

CHRA specifically chose JAOtech's smart terminal with over 600 Obie* terminals being deployed. This terminal had all the special features required to meet CHRA's exacting hospital ward requirements. It ticked all the boxes in terms of the functionality, performance, and durability that were demanded by CHRA for a challenging hospital environment. Significantly, the terminals also have a high-quality design and medical-grade finish, which is purposely designed for the hygienic and noise-free environment of a hospital ward.

The terminal is also going to have a big impact within the hospital by changing the workflow thanks to the integration of the terminal with the hospital information system. Healthcare physicians will now have immediate and secure access to the full set of patient records and data, which will allow them to make a on-the-spot full clinical assessment. Patient records being used in this way ensure a more efficient workflow, which will result in higher patient satisfaction without any major impact on the budget. The terminals are also linked to the hospital's automated pharmacy, which means that treatments prescribed can be delivered when required. The same terminals also provide patients with digital entertainment access such as cable, satellite, IPTV, video on demand, interactive games, and radio.

Obie Smart Medical Terminal

The Obie^2 17" smart terminal is a medical all-in-one computer based on the latest high-performance, low-power Intel® Atom™ processors. It is an ideal solution that fits the needs of both patients and hospital staff.

It provides an easy-to-use front-end touch-screen user interface with a sizeable 17" screen, and it contains all the features required to provide patients with an outstanding multimedia experience. The high-quality SXGA LCD display provides a crystal-clear image, making it an ideal choice for patient entertainment and patient consultation.

Figure 1. Obie* Smart Medical Terminal

The terminal needs to be designed to withstand a harsh patient-care environment as well as being easy to clean and sterilize, which is a prerequisite for equipment based in a hospital environment. The terminal also meets the very precise hygiene and noise requirements of a hospital ward environment. (The low noise places a premium on having a fanless solution.) Low power is also critical as hospitals are focusing more effort on reducing energy costs and limiting the load placed on the hospital's power infrastructure.

Why Intel?

With Intel®-based platforms, OEMs like JAOtech can benefit from an interoperable, open development environment that enables them to deliver exciting new product capabilities quickly and cost effectively. They can also use many of the third-party solutions that have been designed for use with Intel architecture or additionally they can add layers of software as needed to enable exciting new usage models. There is no need to overhaul hardware and software with every new design as Intel architecture is scalable across product generations, ensuring that one design effort can become multiple solutions by simply changing hardware or software.

According to JAOtech CEO Warren Kressinger–Dunn, the question of why Intel was a simple one for his company. He outlined three major reasons why JAOtech selected Intel architecture to form the basis of all their bedside terminal designs.

1. **Long Life.** JAOtech needed a partner who had the appropriate longevity of supply for their smart terminals, and Intel, with its long-life embedded roadmap, easily met that requirement.
2. **Compatibility.** In designing their terminals, it was important for JAOtech to have pin-for-pin compatibility between different devices.
3. **Low Power.** Low power is absolutely critical in a hospital, and Intel has a number of embedded processors that are especially suited for this environment.

The Future for Bedside Terminals

There are many potential use cases for smart terminals within the hospital environment, such as triple-play services (Web, IPTV, and movies on demand) for entertainment, communications through VoIP phone, Webcam, instant messaging, and service improvements through automated meal ordering and patient surveys. These are just some benefits on the patient side as we look to the future. For the hospital, it is execution at the point of care, which is important, accessing electronic medical records and hospital databases, prescribing medication, test ordering, and viewing x-rays, to name but a few. Terminals are also beginning to be extended into other areas within the hospital environment such as waiting rooms and on battery-powered carts.

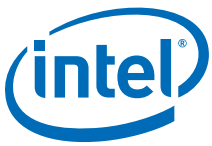
There is no doubt that in the years ahead, significant deployments and new usage models for bedside terminals will emerge. As hospitals start to deploy this technology, medical IT staff will need to find more effective ways to provide support, such as repairing systems when they break and configuring systems for specific-use cases. Perhaps this is something that needs to be factored into the hospital's ROI model when considering a deployment. As on-site service calls are expensive, IT departments could look at installing terminals that have Intel® Active Management Technology (Intel® AMT) built into the hardware platform. This feature can help to get systems online faster and at lower cost. It provides an important advantage over standard software based solutions through the "out-of-band" link that allows the system to communicate with a management console without relying on functioning operating systems.

More Information

http://edc.intel.com/

http://www.jaotech-healthcare.com/

Solution provided by:



[1] http://www.allbusiness.com/health-care-social-assistance/158128-1.html

[2] http://www.jaotech.com/products.html

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