



Delivering patient information at the bedside

B.-A.-Z. County and Teaching Hospital uses 2 in 1 devices based on the Intel® Core™ i5 processor to improve care for vascular patients



“The 2 in 1 devices enable us to use a single health information system, for both reading and writing information, everywhere. Data capture at the bedside has eliminated re-typing and minimized errors too.”

“Our internal tests have shown that we’ve been able to cut the time spent on reporting, and minimize the amount of paper we’re storing, cutting costs by at least 30%.”

*Prof. Lajos Mátyás,
Regional Chief Medical Officer
in the Vascular Surgery Department,
B.-A.-Z. County and Teaching Hospital*

Borsod-Abaúj-Zemplén (B.-A.-Z.) County and Teaching Hospital in Hungary was using hand-written notes at the bedside to update its health information system. As a result, it was difficult to get a consolidated and timely view of a patient’s medical record and treatments, making it hard to offer the best possible care. The ward ran a pilot project using Intel® Core™ i5 processor-based 2 in 1 devices that enable doctors to access and update the timely patient information from anywhere in the ward.

Challenges

- **Data accuracy.** Ensure patient data is accurate, timely and complete to ensure the best possible care can be provided.
- **Data capture.** Enable doctors to enter information directly into the health information system (HIS) at the bedside, to ensure data accuracy and timeliness.
- **Patient records.** Enable doctors to read patient records from the HIS on their ward rounds, so they have complete and accurate information during consultations.

Solutions

- **Mobile devices.** Lightweight HP Elitebook* 2760P mobile 2 in 1 devices, based on the Intel Core i5 processor, enable doctors to read and enter data while on their ward rounds using the MobiWorkS-mHosp* software from Asseco/Globenet.
- **Wi-Fi integration.** Over Wi-Fi, the devices connect to the MedWorkS* Health Information System from Globenet, part of Asseco Central Europe, which runs on servers powered by the Intel® Xeon® processor E7 family.

Impact

- **Improved care.** Consistent and timely patient data is available on demand during consultations, which minimizes any delay in treatment and improves patient care.
- **Paper eliminated.** Paper doctors’ notes have been replaced with digital storage, freeing up storage space and budget for clinical use.
- **Patient care.** Having access to a complete patient record on the ward round, and being able to update it during a consultation, enables doctors to improve the level of patient care.

Providing consistent care

Accurate, timely and consistent information is vital for providing good quality healthcare services, but paper-based processes can make it difficult to achieve that.

This was a challenge for B.-A.-Z. County and Teaching Hospital in northeastern Hungary.

Its Vascular Surgery Department has 40 beds and was using a combination of a HIS, a paper-based fever document, and other notes. The fever document contains all the information captured at the patient’s bedside, such as the vital parameters, temperature, medicines, examinations, and any laboratory tests prescribed during the medical visit. The document contains text, numbers, and graphical charts information.

Having the information split across different systems made it difficult to get a consolidated view of a patient’s health or the care they were receiving. The data on previous care was kept in the HIS, and the paper fever documents were completed with the latest information at the patient’s bedside by a doctor or nurse and later typed into the HIS by an administrator. There

was a significant risk of inconsistencies between the duplicated data, and of mistakes being made as data was moved between paper and the HIS, especially since many patients would have similar conditions and prescriptions.

The ward was also consuming a huge amount of paper. Government regulations require hospitals to retain patient records for between five and 30 years. The hospital cares for 60,000 cases each year across 27 inpatient and 178 outpatient departments, which results in a vast amount of paperwork. Hospital real estate must be allocated to administration rather than clinical use.

“It is a real problem for hospitals to provide enough space for storing and maintaining these huge amounts of data,” said Prof. Lajos Mátyás, Regional Chief Medical Officer in the Vascular Surgery Department, B.-A.-Z. County and Teaching Hospital.

Going mobile

For a pilot project, the Vascular Surgery Department replaced its paper fever documents and paper-based processes with five HP Elitebook 2760P mobile 2 in 1 devices based on Microsoft



Using Intel® Core™ i5 processor-based 2 in 1s on the ward provides consistent and timely patient information

Windows® 8 and Intel Core i5 processors. A 2 in 1 device based on Intel technology offers the best of both worlds, delivering a full performance laptop and tablet in a single device.

The devices run MobiWorkS-mHosp from Asseco/Globenet, a company that makes comprehensive information systems for healthcare providers, the public sector, the banking and finance sectors and insurance institutions. The software connects to MedWorkS Hospital Information System, which stores patient data in a server in the hospital's IT department. The server is based on the Intel Xeon processor E7 family.

The device connects to the HIS using Wi-Fi, so clinicians can read patient information at the bedside and add new information directly into the system. This eliminates the need for paper and lowers the risk of errors being introduced as the paper notes are typed in to the computer. The tablets are connected to the internal Wi-Fi system of the hospital, ensuring the security of the confidential data of the patients. To protect confidential data, the application contains a strict authorization system.

The clinician can update any information about the patient using the touchscreen, including their location in the hospital (if the patient is moved), and vital parameters (e.g., body temperature, weight, height, and stool and urine reports). For more complex data entry, the device can be converted so the keyboard can be used. The doctor or nurse can prescribe medicines or request tests while with the patient, with the requests going directly into the HIS. The system can also store photos showing the status of the patient or voice-based notes for the administrators, enabling clinicians to spend less time capturing data and more time interacting with and treating patients.

Clinicians can use the device to find patients in the hospital by ward and bed. In a typical ward visit, a doctor or nurse confirms the identity of the patient using a barcode or QR code, which is printed on the patient's identity bracelet. They can then read information about the patient from the HIS on the device, including which examinations and laboratory tests were carried out, and the results from them. This new process

is much faster: before using the mobile application the clinicians had to search for the patient record by the health ID number and find the right document at least twice. As a result, clinicians can now spend more time caring for patients and be more responsive to patient needs.

The system is able to store photos showing the status of the patient or voice-based notes for the administrators, enabling shorter routine consultation times, so clinicians can dedicate more time to providing care where it is needed most.

"We chose a 2 in 1 device with an Intel Core i5 processor, because it was important to have a light device that clinicians could hold with one hand and conveniently use at the bedside," said Prof. Lajos Mátyás. "We needed the combination of a touchscreen for immediacy and a keyboard for more detailed data entry. Since most phones today have touchscreens, the technology was familiar to the doctors and nurses, who recognized how the devices could help them to improve patient care."

He added: "The best thing about the use of the 2 in 1 devices is that the support is centralized using Microsoft System Center* 2012, so all the upgrading and bug-fixing can be carried out from one place, the IT department of the hospital."

Improving patient care

The devices and MobiWorkS-mHosp have enabled the hospital to improve the care it offers its patients.

"Previously, there was a huge risk that we would make mistakes because the same information was being recorded in two or three different systems," said Prof. Lajos Mátyás. "The devices enable us to use a single health information system, for both reading and writing information, everywhere. Data capture at the bedside has also eliminated re-typing and minimized errors."

Having all the data in one digital system also makes it easier to store patient records long-term, and to generate reports that help clinicians understand the care provided and plan future resources at the hospital. "With the application, all the documents are stored in servers, making it really easy to gain data for statistical reporting or any queries arising, even after a long time," said Prof. Lajos Mátyás. "Our internal tests have also shown that we've been able to cut the time spent on reporting, and minimize the amount of paper we're storing, cutting costs by at least 30%."

The data is also valuable for research. Previously, there was a lot of data that was only recorded in the fewer documents and not in the HIS. Having the complete information in the central data-

Lessons Learned

B.-A.-Z. County and Teaching Hospital found it could cut the amount of paper it used, and ensure it had more consistent and timely information, by using Intel Core i5 processor-based 2 in 1 devices on ward rounds. The devices access the single health information system, so doctors and nurses can see the complete patient history. Using the 2 in 1s, they can update the system directly at the bedside and request new tests, with all the data immediately going into the centralized database.

base enables advanced reporting that links treatments with changes in vital parameters. These reports are useful for medical research, to help doctors understand the effects of medicines, and for financial management by monitoring the medicine consumption and efficiency.

He concluded: "The Intel Core i5 processor-based devices deliver good value for our money. They are enabling us to transform our healthcare practice, by bringing vital patient information to doctors at the bedside, and enabling them to update the health information system directly and immediately."

The next steps for this will be to roll out the devices for the whole hospital, with the application modified to account for pediatric and emergency requirements. Training will be delivered to over 100 users, and the application will be extended to incorporate speech recognition and picture display for MRI, CT or X-ray images.

MobiWorkS-mHosp was ported to the Intel-based Core i5 processor-based 2 in 1 devices at the request of the hospital by Globenet, part of Asseco Central Europe. Krisztina Mlinárscsik, project manager for Globenet, said: "Intel gave us a lot of support with porting our application to the devices. We met with the Intel specialists for mobile applications often and it was very helpful to be able to draw on their experience. The best things Intel did for us were to provide expert consultancy and give us access to devices we could use for testing."

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