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## Volume 3 / Issue 2 / 2008 - Features

### Mobile IT Solutions in Healthcare

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#### Gathering Speed, Slowly But Surely

The promise of mobile solutions for healthcare has some parallels to the US Bill of Rights; its truths are self-evident. They are also the result of three convergent trends. The first is the explosion of hospital data. The second is the increasing requirement for specialist advice and care. Last but not least is the demand that healthcare intervention be delivered as close to a hospitalised patient as feasible. Taken together, it is clear that there is now a growing mobility of specialist physicians within a modern hospital, alongside a need to remotely access data at all times, from anywhere.

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IT clearly plays the key role in the metamorphosis from the departmental approach of traditional hospitals to a patient-centric one. As explained in a feature on the Asklepios 21st Century Digital Hospital in the previous issue of Healthcare IT Management, this transformation has seen a measurable and impressive increase in productivity, with average patient times declining by 0.7 days.

#### Adoption Still Sluggish

The take-up of mobile solutions has, however, been slow. There are two reasons for this. Firstly, users have resisted, or at least not embraced such solutions passionately. There is a direct correlation, certainly in Europe, between the years of experience of a physician and his or her resistance to change. This is of specific relevance given that mobile healthcare solutions are one of the most tangibly disruptive aspects on clinician workflow.

Secondly, healthcare IT vendors have not integrated mobility upfront into their new offerings, but rather as a layer atop a network or an add-on to their other offerings. One reason is that the emerging healthcare environment has been, and continues to be, in a state of flux - both in technical and regulatory terms. New standards on data privacy and security – or the need to avoid electromagnetic interference - are neither fully fixed and embedded in stone, nor necessarily consonant with other aspects of the pervasive, digital e-Health world of tomorrow, such as interoperability, distributed access – or even operating systems. In the context of mobile technology evolution,

for example, new broadband solutions seemingly emerge by the week.

In the face of all this, the parallels between Big IT firms and senior surgeons are, to say the least, impressive. Neither is happy with transitional realities.

HITM sources believe the best mobile solution would not only deliver remote access to patient data, patient scheduling, appointment reminders etc., but do this interchangeably through both voice and the Web in a synchronised manner.

Indeed, it is difficult to argue that voice commands provide one of the most easily tangible experiences – especially for users outside the IT domain, and may be the best way to engender 'pull' from the healthcare professional community for adoption.

#### Some Evidence of Productivity Gains

So far, the experience of hospitals with mobile solutions has been scattered and ad-hoc, in both Europe and the US. There is still insufficient data on their effectiveness or the enhancements they bring to workflow productivity and patient quality-of-care to make an authoritative assessment. At best, mobile deployments are reported to result in 'significant' or 'impressive' gains.

However, an Intel-sponsored mobile solution piloted in Britain's George Eliot Hospital (see adjoining box) found an impressive set of time savings. These included:

- Ó Locating pathology results during a clinic visit by consultant or nurse: 25 percent
- Ó Community monitoring of chronic patients by nurses: about 10 percent
- Ó Recording and filing surgery notes by administrative staff and consultant: 20 minutes per procedure
- Ó Retrieving surgery notes at follow-up visit: about 50 percent per patient visit
- Ó Charting of inpatients by medical staff in wards: 6 percent
- Ó Scanning of pre-op patients by nurses:  
approximately 10 percent

Indirect evidence, too, remains compelling. Several studies have shown the sheer scale of patient deaths due to medication errors – an area which would be attacked head-on by mobile solutions that bring the medication administration process to the patient's bedside.

As a result, very few would argue that mobile healthcare IT is approaching an inflexion point in adoption. Led by new bottomup initiatives such as the Asklepios Clinic, or sweeping modernisations underway elsewhere, mobile solutions are already standard requirements in calls for hospital modernisation proposals. They will no doubt continue to gain traction in the years to come.

#### **New Demands on IT Staff**

For hospital IT professionals, mobile solutions will lead to several demands.

Routine new tasks would consist of ensuring alignment and synchronisation of mobile physician inputs (e.g via PDAs, tablet PCs or mobile ECG/imaging systems) with those made through other mobile systems or workstations – both by the physicians and/or their assistants.

More demanding roles would be to allow collaborative data sharing in hybrid settings made up of both multiple mobile and fixed systems.

On the infrastructure side, therefore, one pressing challenge will be to keep connectivity up to speed, given the need for sharing and managing multi-site inputs on digital medical images (whose size, in spite of ever-increasing sophistication in compression algorithms, continues to rise relentlessly).

In a related sense, there will also be requirements for scalability, seamlessness and redundancy in connectivity - especially as fixed, wireline and wireless platforms converge, and do so within hospitals, with ambulatory platforms as well as external healthcare facilities.

#### **Technology Challenges Lie Ahead for Vendors**

Such seamlessness sounds easier than it is in the real hospital world, not least because of issues such as network access control – a crucial consideration for privacy and patient data security.

Many hospitals have traditionally deployed two wireless networks: a private one for in-house staff, accompanied by an accreditation/sign-in process for visiting physicians, alongside an open network for the public based on different technologies.

More recently, some have sought to set up quarantine zones which all users – in-house and the public – are first required to connect with to determine the level of access rights.

Some sources also point to the inevitable need to deploy or build middleware for existing legacy equipment, especially the swathe of bedside equipment (such as cardiac monitors) which are commonplace in hospitals, and unlikely to be discarded in the near future.

Overall, the state of play in European hospitals with regard to mobile solutions is heterogeneous. Some institutions have build their own customised solutions. Others have chosen vendors from the US or Europe.

#### **Mobile Solutions at Hospitals in Europe - A Bird's Eye View**

## **Belgium**

As part of a larger federal project in Belgium to manage patient files, nine hospitals in the province of Liege have chosen mobility solutions from France's Groupe Bull subsidiary Evidian. They will implement the Enterprise SSO, Policy Manager and Identity Manager modules of Evidian's IAM Suite. The solution targets 4,500 hospital staff who need to move from one hospital to another, to access their applications and patient history in each hospital. The IAM suite allows implementation of role management, workflow, user provisioning and single sign-on access control.

## **Denmark**

Frederiksberg Hospital is one Copenhagen's largest hospitals. It has adopted a turnkey, scalable solution from Symbol, a US vendor, with the key purpose of maximising patient care by reducing the potential for hospital error during the process of administering medication. The Hospital has equipped nurses and doctors with Enterprise Digital Assistants (EDA) and mobile computers, along with wireless switches and access ports, as well as the vendor's Mobility Services Platform (MSP) to securely capture, move, and manage patient information, including vital data and chart information. On their part, patients are provided bar code identification on their wristband.

## **Germany**

The University Hospital of Leipzig has deployed a mobile solution which enables electronic patient files for neuro-surgery inpatients. The solution was designed and implemented by an in-house IT team. Its components include a terminal server and WLAN infrastructure, alongside a Tablet PC for mobile tasks. On the IT side, an interesting facet is that rather than actual patient data, the application transmits screen output in secure RSA-RC5 bit streams to the mobile terminal device. This offers users their traditional work environment. It also prevents data loss in case a wireless transmission is interrupted.

## **Spain**

The Hospital Universitario Son Dureta in Palma de Mallorca is piloting the use of the new RFID-integrated Intel Motion C5 mobile clinical assistant (MCA) platform. The MCA reads patient wristbands, allowing healthcare professionals to access patient information including clinical results such as blood tests, scans etc. The MCA is supported by Orion Health's clinical software which enables patient data to be available at any point of decision (bed, stretcher, or wheelchair). Son Dureta uses Oracle Healthcare Transaction Base (HTB) as a centralised, standards-based repository for clinical data.

## **United Kingdom**

In a pilot conducted with Intel Solution Services, the George Eliot Hospital deployed 20 wireless tablet or notebook PCs to a cross section of care providers, who in turn used the devices with a mobile application portal to access electronic patient records as well as standalone radiology/pathology results. A dashboard application was provided to monitor patient status. The supporting infrastructure consisted of wireless networks and LAN (with TKIP/RC4 encryption), and two servers (one for the SQL database and the other as an IIS Web server). The UK pilot found mobile access to clinical information systems produced significant time and resource savings.

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