

## Volume 3 / Issue 1 2008 - Features

### Healthcare and Big IT

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Healthcare has, in recent years, been at the front of a feverish pace of technological change. However, the bulk of such developments have been in the areas of patient therapy and care. Innovations in the area of IT systems have been less apparent. And yet, it is IT which – at the moment, lurking just below the horizon – offers the greatest promise in its potential to enhance the effective delivery of healthcare. It is also held out as a way to cap spiralling growth in healthcare costs – resulting from the demographic realities of an ageing population, staff shortages, stricter laws, rules and regulations and increasing patient expectations. IT is, at the end, about information. It is central to the ability to quickly develop, access, change and share meaningful data and information, about patients and their health. The participants in such a process are extensive: physicians, hospitals and healthcare providers, health insurance companies, public authorities, drugs companies and pharmacies – and last, but not least, patients and the general public.

#### Complexity and Flux

At the moment, most major IT firms have adopted a mix of approaches to what will no doubt be a major business opportunity – and an equally impressive challenge. Healthcare IT spending is expected by many experts to outstrip overall IT spending by a significant measure.

At the same time, a host of new regulatory standards are in the pipeline, which will bear on the design of new IT offerings. These will allow them to conform – and do so flexibly – to the emerging requirements of a distributed and interconnected, real-time e-Health environment, centred on the individual Electronic Health Record.

The most crucial rules and laws driving healthcare IT developments include the US Health Insurance Portability and Accountability Act (HIPAA). While Europe's e-Health programs continue on a principally national or even sub-national level, in the US, the Medicare Modernization Act of 2004 has mandated deployment of a nationwide e-prescribing program starting in January 2008.

On a technical level, the field of play is far more complex. Healthcare applications have a long heritage. They are generally complex and many large healthcare systems boast more than 300 different applications. Meanwhile, new standards include Health Level 7 (HL-7), C Electronic Data Interchange, ACR/NEMA Digital Imaging and Communications in Medicine Standard Medical Terminology and Code Sets.

Given below is an overview of developments in the healthcare area at some of the world's leading IT firms. These are Cisco, HP, IBM Global, Microsoft, Oracle, SAP and Sun Microsystems.

#### CISCO

Cisco's in-house healthcare marketing teams have aimed to fuse the hard logic of a secure, high-performance infrastructure, with the softer perspectives of an interoperable and connected healthcare 'ecosystem'.

At present, its flagship healthcare offering is the Cisco Medical-Grade Network. A related solution is the Cisco Clinical Connection Suite.

The Cisco Medical-Grade Network seeks to connect all stakeholders to a single information and communications infrastructure. The foundation for advanced healthcare solutions is laid in the shape of two juxtaposed offerings: collaborative care – which streamline communications between patients and caregivers and location-awareness – to quickly and easily locate and track assets, equipment, and people for improved workflow solutions. The final touch is provided by Location-Aware Healthcare, which enables remote tracking of examination rooms, medical equipment and patients, reducing inventory costs and enhancing operational efficiency.

At the technological level, the Medical-Grade Network is based on Cisco's modular Service-Oriented Network Architecture (SONA), which allows for the addition of new applications, technologies, and/or equipment to the network.

The Medical-Grade Network architecture comprises three functional layers: the Application Layer, an Interactive Services Layer, and a Networked Infrastructure Layer. Each enables system-wide communications, to allow for operational efficiency and the seamless dissemination

of clinical and business information throughout the healthcare system.

On its part, the Cisco Clinical Connection Suite helps clinicians streamline communications - with integrated voice,

, and data permitting distributed, on-demand, high-quality tele- and videoconferencing. This, Cisco states, improves workflow and productivity, enhances the patient experience, and speeds incident response. In the European e-Health setting, one feature of interest is its inbuilt capability to incorporate offsite interpreters.

## HP

Although traditionally HP was known for popular healthcare IT solutions such as the CareVue clinical information system, its current healthcare sector-specific offerings are increasingly product- and hardware-focused.

Much of the company's pitch is on its proven hardware strengths – for example, its Integrity NonStop servers which are justifiably seen by many users as a gold standard for availability, data integrity and scalability. Likewise in the area of e-prescribing where HP healthcare IT media materials portray physicians using third-party applications – atop an HP Tablet PC or an HP iPAQ.

Alongside, HP has chosen to emphasise its generic bestpractices and business process strengths to provide systems and data integration, and thereby give better access to secure patient information.

HP's current healthcare portfolio consists of:

- Ó Health information systems, to simplify storage and retrieval of patient records and other data.
- Ó Medical archiving, to retrieve and protect reference images stored at imaging centers, hospitals and other providers.
- Ó Mobility for health, where it emphasises its position as an industry-leader in providing mobile devices and wireless networking products.
- Ó Electronic health records. Here again (as with electronic prescribing), HP advises customers explicitly to evaluate external, third-party packages, and restricts its involvement to products and devices, for document input, data access, printers and server/ storage systems.

HP has explicitly sought to target the healthcare market bottom- up. Its offerings are segmented by user size:

- Ó Small and medium business: Physician offices, group practices/clinics and hospitals with less than 250 beds.
- Ó Public Sector healthcare, University and State hospitals, and hospitals with more than 250 beds.

## IBM

IBM Global Services has set up a Centre for Healthcare Management (CHM) in Washington DC. Its aim is to promote development of "innovative ideas, research and best practices" and build strategic management solutions in healthcare. The CHM is fundamentally an in-house IBM think-tank. It brings together management and IT strategists, experts from industry and academia, healthcare payers and providers.

IBM has no reservations about the aims of the CHM. Its goal is to understand how business and technology can be fused to "create new, effective healthcare industry solutions."

Specific areas of interest for the CHM include:

- Ó Healthcare quality and patient safety: IBM's focus is on highly-integrated approaches which span the payer-provider continuum and/or multiple healthcare-delivery sites.
- Ó Optimising of clinical, administrative and financial processes: As healthcare costs continue to rise relentlessly, and clinical practices evolve from episodic treatment to translational and personalised medicine, IBM seeks to determine which business models and process improvement approaches lead to above-average productivity increases.
- Ó Connectivity and healthcare standards: Like other Big IT firms, IBM is closely involved in the debate and discussion on emerging e-Health standards. The CHM seeks to directly leverage IT advances to meet new regulatory standards.

Some of its areas of specific interest include the effectiveness of administrative and clinical data integration in providing returns on investment, as well as improving healthcare quality and patient safety.

Ó Innovation and transformation: As healthcare services continually evolve, sometimes in surprising ways, and healthcare payers roll out innovative products, the CHM seeks to assess best-of-breed business models, including business process transformation and BPO approaches.

In recent years, IBM has funded several research initiatives in the US:

- Ó Wireless computing for nurses, in order to determine its impact on patient care and safety.
- Ó Management of IT-enabled organisational transformation at University of Illinois Medical Center.
- Ó Use of application service providers (ASPs) to improve efficiency and effectiveness of healthcare information and service delivery.

In early 2007, Microsoft launched its new Connected Health Framework Architecture and Design Blueprint, the first of a series of offerings from the company for global healthcare provider community.

The Blueprint provides healthcare organisations with an extensible IT architecture to simplify interoperability and integration between different solutions. Alongside, Microsoft also released its Health Connection Engine, a standards-based set of Web services that enable health organisations to rapidly deploy solutions which improve interoperability, clinical collaboration and decision-making tools.

The Blueprint and the Health Connection Engine gives a realworld model to providers seeking to deploy service-oriented architecture (SOA) healthcare solutions. Microsoft believes they will enable integration of patient information stored in a variety of data sources, including disparate legacy systems. They will also permit the design, building and deployment of new applications quickly and economically by healthcare IT firms.

The Blueprint captures best practices from a number of previous customer projects in the US and Europe.

In Portugal, for instance, the 317-bed Hospital de São Sebastião near Porto used Microsoft technologies to build a highly-integrated real-time electronic patient records (EPR) system, which has made it a world leaders in its class. The hospital spent just over \$100,000 on the solution. In contrast, it estimates that similar functionality with a third-party system would have cost in the neighbourhood of \$1.2 million.

In the EPR/EMR area, Microsoft technologies are also used in offerings by leading European vendors, such as i.EPR from iSoft, and in clinical information system solutions such as Optimum from Misys and iSite from Philips.

Microsoft's new Connected Health Framework Architecture and Design Blueprint has been explicitly field-tested at

Germany's Asklepios Group (see accompanying article in this issue of Healthcare IT Management) and at Sutter Health, a California hospital association which used the Blueprint to design and implement an early detection and treatment program for severe sepsis in ICU patients. Sutter says the solution – which is faster, accurate and more proactive than its predecessor - resulted not only in cost savings of \$1 million, but also of lives.

The Blueprint is available free for download from the Microsoft Developer Network Healthcare Industry Center

<http://msdn.microsoft.com/healthcare>.

## ORACLE

Oracle 's traditional focus in the healthcare area has been on its generic E-Business Suite, which acquired considerable success in numerous Europe's hospitals as a means to restructure financial and management systems or improve inventory control. Some of the early implementations include Onze Lieve Vrouwe hospital in Amsterdam, the 23 hospital

group in Finland's Hospital District of Helsinki and Uusimaa (HUS) and a variety of NHS Trusts (Heartlands Hospitals, Heartherwood & Wexham Park, Sandwell and Birmingham).

More recently, Oracle's Healthcare Transaction Base (HTB) became the first information system based on the HL7 v3 RIM (Health Level Seven Version 3 Reference Information Model). HTB provides a suite of tools for building new clinical applications and sharing data/information between existing systems in a consistent and secure manner.

One of the first implementations of HTB in Europe is at Stockholm County Council, which provides healthcare services to almost 2 million citizens – and is using HTB to develop a single, longitudinal electronic healthcare record (EHR) for every patient. Other early deployments include hospitals in Austria, Germany, the Netherlands and Spain – which are also using HTB to build EHRs centred on a comprehensive and scalable data repository, alongside a standardised format for data storage and sharing (which has in-built design elements to eliminate duplication, data-re-entry and delay in diagnosis and treatment).

Oracle says HTB offers intelligent healthcare management and decision making, by virtue of the following enabling factors:

- Ó Continuity of care
- Ó Public healthcare analysis
- Ó Quality of care management
- Ó Patient portals
- Ó Healthcare enterprise interoperability

Oracle is also involved in leveraging its other ERP (enterprise resource planning) offerings from Peoplesoft, J.D Edwards, and above all Siebel. Siebel has a strong following in the pharmaceuticals sector with its OnDemand suite. This is employed by more than 90 pharmaceutical companies, including 25 of the industry's global leaders. Interestingly, Oracle collaborates closely with rival IBM in the Siebel healthcare offering.

## **SAP**

SAP had adapted its classic ERP portfolio under the SAP for Healthcare and mySAP Healthcare rubric.

The company states that the solution is tailored to the "specific standards, processes and challenges of the healthcare industry," including HIPAA and DRGs.

The solution runs on the NetWeaver integration/application platform, and provides the following features and functions:

- Ó Healthcare e-business applications: To manage patient services, treatment, scheduling, billing, accounting, clinical orders, and medical/clinical documentation.
- Ó Healthcare-specific portals: To deliver customised information and applications for healthcare professionals.
- Ó Internet business collaboration: For online communication channels and supply networks between healthcare organisations and doctors, clinics, payers, and suppliers, integrating supply chain processes with clinical processes.
- Ó Datawarehousing: Enables access to healthcarespecific business information, from medical treatment results to laboratory data and billing data, to use for strategic planning and decision-making.
- Ó Customer focus: Coordination of customer touch points, aligning all business processes around patients, external physicians, employees, donors, and other customers.
- Ó Business support and enterprise management: Comprehensive tools and processes to manage financial accounting, human resources, procurement and inventory, and facility and plant maintenance.
- Ó Mobile access: Wireless connection to critical applications and information from mobile devices – anywhere, anytime.
- Ó Integration for an end-to-end solution: This involves the coupling of SAP Business Suite to the leading clinical application IS-H\*MED (developed by Berlinbased GSD and debis Solutions, along with TSystems Austria) for an end-to-end solution. GSD has also developed a diagnosis related group (DRG)-directed management information system, MIS\*DRG.

In autumn 2006, SAP announced that it was joining forces with Accenture to co-develop a collaborative health network

(CHN) solution, which would enable healthcare organisations to improve patient care by streamlining the way they access, integrate and share information. The CHN solution will be based on SAP NetWeaver and help organisations to maintain reliable, accurate electronic health records (EHRs) that are accessible quickly by multiple parties. It will also use a service- oriented architecture (SOA) to help reduce IT costs and enable automated collaborative processes among industry participants.

Meanwhile, Accenture has been developing an Electronic Health Record (EHR) Connection Platform to provide information management and exchange services to the healthcare industry.

## **Sun Microsystem**

Sun has traditionally counted on its OpenRx Framework for healthcare solutions. Like other vendors, Sun has also take great care to help integrate previous legacy systems into a distributed computing model, and the OpenRx Framework

supports key healthcare industry standards.

Although the access management and application/Web services facets of the Framework conform closely to the wider

JAVA world, the company has launched a series of health sector- specific solutions:

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- Ó Community Health Information Infrastructure
- Ó Disease and Bio-Surveillance Grid
- Ó Java Health Card
- Ó Outcomes and Research Data Warehouse
- Ó Medical Imaging Grid
- Ó Personalized Healthcare Infrastructure
- Ó Real-time Healthcare Enterprise
- Ó Smart Medical Supply Networks
- Ó ePrescriber Network

In February, Sun launched its new B2B-enabled Electronic Master Patient Index (EMPI), along with two OEM PACS (Picture Archiving and Communication Systems) offerings, namely PACS and uPACS. These releases are part of the company's push on its Solaris 10 Operating System to deliver infrastructure software that enables easier data sharing across the entire healthcare spectrum, for both payment processes and electronic health records (EHR).

The new EMPI solution, part of the Sun Java Enterprise System, provides enterprise-class infrastructure software for healthcare organisations (including hospitals and insurance firms) who need to share patient data within and across organisations, using both Intranets and the Internet.

iPACS are available in different sizes to accommodate a wide range of hospitals, while uPACS are designed for multitenant facilities with a focus on disaster backup capabilities. They provide an integrated platform for OEMs and systems integrators to build new cost-effective, scalable and high-performance solutions on the basis of a 'pay-per-use' model.

This reduces capital costs and impacts directly on TCO – a crucial consideration for healthcare IT managers in today's cost-sensitive environment. With no less than 80% of new PACS implementations outsourced in the US, Sun's healthcare strategy is to support OEMs in the design and delivery of differentiated products, while ensuring end-to-end solutions for end users.

Both EMPI and the PACS offerings are seen as a sign of Sun's commitment to be ready for the emerging e-Health environment.

Sun has also recently released StorageTek 5800, the world's first application-aware programmable storage system based on Solaris 10 and Java technology.

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