HEALTHCARE IT
MANAGEMENT

THE OFFICIAL JOURNAL OF THE EUROPEAN ASSOCIATION OF HEALTHCARE IT MANAGERS

STRATEGIC VS TACTICAL DATA

VALUE BASED SERVICE
INNOVATION IN HEALTHCARE

MANAGEMENT AND LEADERSHIP

HEALTHCARE INTEROPERABILITY

THE NORDICS

e-Prescribing

9 771782 840078

Dear Reader,

Like Project European Union, e-health is a multi-speed, multi-layered and multi-directional creature – and differences sometimes seem to strongly outweigh commonalities. But like several optical illusions; it is important to step back a little to gain real perspective, and do this from time to time. Visions require reality checks. Reality too can sometimes do with a vision boost.

At the moment the huge US e-Health project under ARRA, the American Recovery and Reinvestment Act of 2009, is clearly the Show in Town but at the less sexy, nuts-and-bolts level, Europe is well ahead in the e-health game. Even the Americans acknowledge it.

The key challenge for Europe is how to make sure that continues to lead where possible, defines priorities clearly and makes sure that too many fragmented initiatives do not end up simply cancelling one another. For when it comes to the scale of imagination, effort and money required for a Grand Plan, no one can match the US, or its freewheeling entrepreneurial business culture. Neither Ayn Rand nor the Great Gatsby would mean as much anywhere as they do in the US.

A good example of Europe's lead at the e-health nuts-and-bolts level is in e-prescription. This is an area with a strong business case. An expert from the Netherlands shows us why.

One reason why e-prescribing systems have achieved less than their potential involves security limitations and the interoperability barriers between different clinical information systems. The interoperability challenge (both technically and in terms of the EU policy response to it) has been highlighted by Healthcare IT Management on several occasions in the past. In this issue, a British expert provides a personal overview of healthcare interoperability, throwing light on two charged questions: Are international standards really necessary? And how do standards development affect healthcare providers and IT vendors?

Another topic close to the heart of CIOs and healthcare IT managers is that of the explosion in data, healthcare data. With hospital information systems becoming increasingly complex (and likely to continue doing so), the need for efficient information processing is a strategic priority. As explained by a German researcher, a good way for systematic information management is to separate 'strategic' from 'tactical' data.

In our previous issue, we carried a feature by academies at Sweden's Royal Institute of Technology on adapting value models to facilitate the design of new forms of collaboration in healthcare, as well as innovative healthcare services. Continuing from there, this issue provides another feature by experts at the Institute on value based service innovation.

On a closing note, I am proud to announce the launch of the European Association of Healthcare IT Managers' first IT@ 2009 Awards – to give recognition to European healthcare IT pioneers. The timing for the Award could indeed not be better. As one of our readers complains (page 4), imaginative healthcare IT solutions seem to usually come from outside Europe, and not just the US. Is this, he asks, "because we lack such genius on the Old Continent …. Or is it because our geniuses are not encouraged sufficiently? Or is it because no one hears about them? The IT@ 2009 Awards, details of which can be found on Page 6, is designed as a direct response to such complaints. We look forward to the enthusiastic participation of our readers and their organisations. Together with our team, I wish our readers a very warm and happy Summer.

Yours truly,

Christian Marolt

HEALTHCARE IT MANAGEMENT

Page 16-18
E-PRESCRIBING

As Europe moves from national healthcare IT pro-grammes towards full-fledged e-health services, many experts see e-prescribing as a key foundational step. There is a strong business case, accompanied by equal-ly strong perceptions, that improving the prescribing and medication management process with IT will di-rectly reduce errors, increase service quality and the delivery of effective care across the spectrum. An ex-pert from the Netherlands explains.

Page 41-46
COUNTRY FOCUS: NORDICS

The Nordic healthcare system has a long heritage. It is especially well-established with regard to pri-mary and preventive healthcare. These couple into sophisticated occupational health standards which are considered to be models by the outside world. In spite of a generally high-level of commonality, there are some important differences in the Nordic region with regard to healthcare.

READER'S COMMENTS

Patient Classification Systems also face hurdles in Europe

Sir,

Congratulations on the thought provoking analysis by Paul Johannesson and Erik Perjons on value modeling (Issue 2, 2009). I was especially impressed by the sweep of issues they covered and the fact that the models satisfactorily explain how healthcare has evolved almost autonomously. One of the subjects that struck a chord with me was that behind the seeming chaos (open-ended network) of the western healthcare system, there is a logic, and this can be used to bring about meaningful reforms.

I am looking forth to read their next article on designing (new) e-health services by using value models (balancing needs and expectations of patients on the one side, and resource constraints of providers on the other). I believe such insights would have a great deal of relevance in the US too.

Sam Garg
Boston, US

US e-Health programs

Sir,

Your feature on the Patient Admissions Prediction Tool hammered in two home truths.

The first is that there is a huge problem on the ground facing hospitals – to manage overcrowding in ERs – but that "contrary to the conventional wisdom … the number of admissions per day can be predicted with remarkable accuracy."

The second is that such answers come (seem to mainly come) from outside Europe, and not just the US.

Is this because we lack such genius on the Old Continent - genius being the ability to find simple solutions for seemingly complex problems ?

Or is it because our geniuses are not encouraged sufficiently ? Or is it because no one hears about them ?

Jan Tebeest
Eindhoven, Netherlands

Europe should be concerned about India

Sir,

Your feature on the scale of the forthcoming challenge from India in the area of healthcare IT and technology is worrying (Issue 2, 2009). It endorses a BusinessWeek feature "Innovation from India: The next big wave" (February 18, 2009), the bulk of whose examples were in the healthcare sector.

If one does the numbers, GE's simulated hospital alone will outclass anything comparable here.

Add to this the SoA commitments by IBM (in public), and the iSoft/Lorenzo move to Indian development centers, and all the rest of the pack (Philips, Siemens etc.) and you have a recipe for curry-flavouring Global Healthcare IT Inc. And the breadth of this is sweeping. In 2007, for example, Philips transferred its business processes to India's Infosys (in a 250 million dollar contract).

Nevertheless, your otherwise-detailed analysis missed noting two other worrying facts: that GE's 25 million dollar spend on its virtual hospital is in addition to 50 million dollars which it has already spent, and that the facility has room for no less than 2,000 researchers, including several hundred to be seconded from the West.

I honestly wonder whether our policy leaders are aware of such developments.

Jonas Claudel
Brussels, Belgium

Patient Admissions Prediction Tool

Sir,

You say Mr. Obama's e-health plans could do to "healthcare IT what the Apollo program did for space exploration, or the Manhattan Project for nuclear technology". I remember hearing something as sweeping about Britain's NHS modernisation program a few years ago.

Rupert Winfield-Jones
Oxford, UK

*We invite comments from readers at **editor@hitm.eu.** Please keep your letters to below 150 words. Healthcare IT Management reserves the right to edit letters for space or editorial reasons.*

THE EUROPEAN ASSOCIATION
OF HEALTHCARE IT MANAGERS (HITM)

The European Association of Healthcare IT Managers

The European Association of Healthcare IT Managers (HITM) is a non-profit pan-European umbrella association of all relevant national healthcare IT associations in Europe.

Believing in the fundamental importance of unifying healthcare IT professionals at European and global levels, HITM is committed to increasing the professional authority and responsibility of healthcare IT managers and representing their interests to international institutions and associations.

HITM is strategically based in Brussels, for easy access to the European institutions and associations.

HITM's Mission

- ⤵ To establish common healthcare IT standards, best practices, cross-border collaboration, unifying policies and strategies at EU and international levels
- ⤵ To increase the visibility, role and importance of IT management in healthcare facilities
- ⤵ To educate key policy-makers, industry players and the general public about the benefits of healthcare IT
- ⤵ To promote cross-collaboration in different healthcare sectors
- ⤵ To promote the efficient, cost effective use of IT

For more on HITM and information about membership, please contact: **Yana Konstantinova, Project Manager, y.k@hitm.eu**

HITM MEMBERS

AUSTRIA
Working Group Medical Informatics and eHealth of the Austrian Computer Society (OCG) and the Austrian Society for Biomedical Engineering (AK-MI)

BELGIUM
Belgian Medical Informatics Association (MIM)

BOSNIA & HERZEGOVINA
Society for Medical Informatics of Bosnia & Herzegovina (BHSMI)

BULGARIA
National Center for Health Informatics (NCHI)

CROATIA
Croatian Society for Medical Informatics (CSMI)

CZECH REPUBLIC
EuroMISE Center

Czech Society for Medical Informatics and Scientific Information (CSMISI)

FRANCE-SWITZERLAND
Fondation Franco-Suisse pour la Recherche et la Technologie (FFSRT)

GEORGIA
Georgian Telemedicine Union (GTU)

GREECE
Greek Health Informatics Association (GHIA)

ITALY
Associazione Italiana Sistemi Informativi in Sanità (A.I.S.I.S.)

LITHUANIA
Telemedicine Center of Kaunas University of Medicine

MOLDOVA
Center for Public Health

NETHERLANDS
National IT Institute fr Healthcare (NICTIZ)

NORWAY
Norwegian Centre for Telemedicine (NST)

POLAND
Polish Telemedicine Society (PTS)

PORTUGAL
EHTO-European Health Telematics Observatory (EHTO)

ROMANIA
Romanian Society of Medical Informatics (RSMI)

SERBIA
JISA - Union of ICT Societies of Serbia (JISA)

SLOVENIA
Institute for Biostatics and Medical Informatics (IBMI)

Slovenian Medical Informatics Association (SIMIA)

TURKEY
Turkish Medical Informatics Association

UKRAINE
The Ukrainian Association for Computer Medicine

Association for Ukrainian Telemedicine and e-Health Development (AfUTeHD)

HITM Welcomes its New Members:

BULGARIA
e-Health Bulgaria Foundation

PORTUGAL
Administração Central do Sistema de Saúd (ACSS)

HUNGARY
John v. Neumann Computer Society (NJSZT)

THE NETHERLANDS
European Society for Engineering and Medicine (ESEM)

The IT @ Networking Awards 2009 will select outstanding European healthcare IT solutions in hospitals and healthcare facilities and bring them to the pan-European stage.

WHERE AND WHEN

Brussels, the centre of European decision-making, will be the location for the IT @ Networking Awards 2009 *(IT @ 2009)*. It will be held from 29 - 30 October 2009 during the European Summit in October at Square-Brussels, ensuring international attention.

WHO

The event will be organised by the *European Association of Healthcare IT Managers* (HITM) and the *European Association of Hospital Managers* (EAHM), the worlds' largest interest represenation of its kind.

The attendee roster will include hospital CEOs, CIOs, CMIOs, hospital and healthcare IT managers, physicians with an interest in IT, members from European and national institutions whose mandates cover healthcare IT and members from the pan-European Press.

WHY

Behind its fragmented façade, European healthcare IT includes a number of world-class jewels: cutting edge IT solutions that meet real-world challenges, efficiently and cost-effectively, and not rarely, in an elegant fashion. Unfortunately, many such jewels remain unknown to the outside world – not just to the general public, but ironically, to the healthcare IT community as well.

So too do their designers and architects, unsung heroes who have often invested their creative talents, and dedicated months and years of hard work – to create and build something good, something better, all the way through to the very best. But many such efforts extend beyond job definitions, stretch far above the call of duty.

These pioneers need recognition! Their stories will inspire others. The lessons they have learned can help both avoid mistakes and transform healthcare IT challenges into opportunities, into "Made-in-Europe" success stories. This is the goal of *IT @ 2009*.

HOW

HITM and EAHM believe that peers will make the wisest decisions in respect to their own needs. As far as healthcare IT is concerned, the Associations consider it to be self-evident that senior healthcare professionals will know what is the best solution for them and their challenges they face.

To use familiar terminology for IT professionals, *IT @ 2009* is built on the principles of best-of-breed and peer-to-peer networking.

An on-the-spot, one-person = one-vote electronic system will be used to enable attending CEOs, CMIOs, CIOs, hospital and healthcare IT managers as well as department heads to make their choices. Only they are eligible to vote.

ORGANISERS:

European Association of HEALTHCARE IT MANAGERS

MEDIA PARTNERS:

HEALTHCARE IT MANAGEMENT

Hospital

G AWARDS 2009

ROLLOUT: FROM MINDBYTE TO WORKBENCH

FIRST DAY: MINDBYTE

All successful submissions for the *IT @ 2009* will be allocated 10 minutes for a Mindbyte (a short presentation) on what differentiates their solution and makes it special.

VOTING

Voting will immediately follow a synopsis of all presentations, and the finalists will be announced by the Chair of the Organising Committee.

SECOND DAY: WORKBENCH

Finalists of the *IT @ 2009* will be given 45 minutes to provide an in-depth presentation, followed by a 1/4 hour Q&A session with the audience.

FINAL VOTING

Final voting will commence immediately after the last presentation followed by the awards ceremony.

THE IT @ Networking Awards 2009 CEREMONY

Out of the finalists, the 3 top rated IT solutions will be awarded a prize.
The winning project will:
- receive the IT @ Networking Awards 2009 Trophy;
- have a detailed presentation of their solution in Europe's
  leading healthcare management media, and
- be awarded a cash prize of Euro 5,000.

WHO SHOULD PARTICIPATE

Developers of imaginative, innovative healthcare IT solutions. Solutions can be built on both COTS as well as bespoke designs. However, all entries have to demonstrate a considerable degree of customisation and show ingenuity. All entries must be already implemented in at least one site.

SUBMISSION DEADLINE

Submissions must be received by **25 September 2009** and must be entered through **www.conftool.com/itawards2009/**

For further information on IT @ of for your project submission please visit our website **www.hitm.eu**, contact our General Secretariat via email **awards@hitm.eu** or call **+32 / 2 / 286 8501**.

TIETO AND INTERSYSTEMS

TIETO AND INTERSYSTEMS CREATE SWEDISH NATIONAL ELECTRONIC HEALTH RECORD

InterSystems has announced the initial stage of the Swedish National Patient Summary project. The first Electronic Health Record for Sweden has been launched, which is a vital part of the implementation programme of the National IT Strategy for the healthcare and welfare sector in Sweden.

The project aims to improve patient security and quality of care nationwide. It will extend up to 500 users in the first phase of the solution across Örebro – including healthcare practitioners and two private nursing homes. Furthermore, it will implement the EN13606 patient record international industry standard, and will include the ability to transform records from local formats to the central standard making it easy for existing systems to connect to the National Patient Summary.

For more information, please visit: **www.intersystems.com**

IBM

IBM OUTLINES NEW MODEL FOR HEALTHCARE

IBM has announced a major healthcare study of Patient Centred Medical Home (PCMH) that underscores the critical need for a new model of care. It is committed to primary-care based, coordinated, proactive, preventive, acute, chronic and long-term and end-of-life care, which are identified as a possible foundation for the reform of today's healthcare system.

Some of the benefits of the Medical Home consist of providing comprehensive and timely care and payment reform, underlining the central role primary care. The aim is to preserve the patient's personal, long-term relationship with a primary care physician and to support the patient with a team approach to care.

The Medical Homes are intended to empower the fully functioning, secure interoperable electronic health records with decision support capabilities connected to their own practice management system and other information sources, such as health information exchanges or other providers' systems.

For more information please visit:
www.ibm.com/healthcare/medicalhome

iPod

IPOD TOUCH TO ACCESS PATIENT DATA AND DIAGNOSTIC IMAGES

At Jung-Stilling Hospital in Germany, doctors are using an iPod Touch to access patient data and diagnostic images at the hospital bedside. Through the wirelessly-connected iPods, which are loaded with PACS software, the staff can take information including patient information, test results, x-rays, MRIs and CT scans directly to the patients.

Currently, all senior clinicians at the hospital are using the iPods. The aim is to implement them across the hospital throughout the year. Its primary use is accessing patient data in tabular format with the function of viewing tables, information and images in detail. Another plus is the speed at which the information can be accessed and demonstrated in real-time. The iPod Touch sealed streamline design allows it to be easily wiped clean in order to limit the threat of infections in hospital, such as MRSA and swine flu.

For more information, please visit: **www.ehealtheurope.net/**

Orion Health, Oracle

TENDER FOR DEVELOPMENT OF THE BALEARIC ISLANDS ELECTRONIC HEALTH RECORD

IB-Salut, the health service of the Balearic Islands, awarded Fujitsu Services in conjunction with their technology partners Oracle and Orion Health their tender for development of the "The History of Health" ("La Historia de Salud").

The goal of this tender is to transform the area's existing model of dispersed health information, into an integrated Electronic Health Record (EHR). Furthermore, it aims an integration and communication between different healthcare levels, facilitating access to patient information irrespective of where it has been generated. The project will work on guaranteeing the quality and the security of the information providing to the end user correct and up-to-dated clinical information. The clinical professionals will have access to a complete and update clinical information and this way a customised care at any time and place will be improved.

For more information please visit: **www.orionhealth.com**

Philips

SANT PAU HOSPITAL AND PHILIPS PIONEER HEALTHCARE TECHNOLOGY PARTNERSHIP MODEL

The Hospital de la Santa Creu i Sant Pau in Barcelona and Royal Philips Electronics have signed a 10-year agreement. Philips will be responsible for the provision, maintaining and replacement of medical equipment. It will provide the hospital with consistent access to leading imaging technology solutions, designed around its needs.

According to the contract, Philips will ensure that the hospital is equipped with solutions that put clinicians' and patients' needs at the centre of care. Medical equipment will be replaced in line with agreed cycles, based on clinical guidance from Hospital Sant Pau and taking into account any technological advances that occur during the contract period. The agreement includes management of equipment from imaging specialties including MR, CT, nuclear medicine, x-ray and ultrasound.

As a result of the agreement, the hospital Sant Pau will become an international reference for Philips.

For more information please visit: **www.philips.com**

MIC 2009 CONGRESS IN THE NETHERLANDS

The MIC 2009 congress will take place in Veldhoven, The Netherlands, on November 26 - 27, 2009. The program will consist of workshops and presentations. The main focus will be on Care and ICT. Besides the call for workshops, the congress will offer the possibility to present or demonstrate a product.

The event is organised by VMBI in collaboration with the National IT Institute for healthcare in the Netherlands (NICTIZ), Association for Care Administration and Information (NVMA), the Belgian Medical Informatics Association (MIM) and the Nursing and Care Informatics Association (VVZI). The aim of the event is to bring together caregivers, IT experts, administrators, hospital and healthcare IT managers, policy makers and other healthcare practitioners.

For more information please visit : **www.mic2009.nl**

JISA'S DISKOBOLOS 2009

Diskobolos is an annual event organized by JISA, the Union of ICT Societies of Serbia. It aims to award the most qualitative breakthroughs in the application of information and communication technologies in the fields of healthcare, finance, administration, education, etc. This year the Diskobolos will take place on December 22, 2009 in Belgrade, Serbia.

For more information please visit: **www.jisa.rs**

EHEALTH 2009: ELECTRONIC HEALTHCARE FOR THE 21ST CENTURY

The second international CST conference on electronic healthcare will be held September 23 - 25, 2009 in Istanbul, Turkey. The event offers the opportunity of bringing together experts from the industry field, global healthcare institutions and academics in order to share experience with world healthcare service providers and policy makers.

The main focus during the congress will be on investigating a realistic potential of the Internet in providing evidence-based healthcare information and education to patients and global users.

The program of the conference will consist of:
1) Privacy, trust and security;
2) Epidemiology and early warning systems and outbreak detection;
3) Healthcare ontologies and knowledge management systems;
4) E-learning, educational games and the impact of information delivery to patients and professionals and
5) Web 2.0 in healthcare, well-being and online communities of practice.

For more information please visit: **http://www.electronic-health.org**

ISCB 2009: 30TH ANNUAL CONFERENCE OF THE INTERNATIONAL SOCIETY FOR CLINICAL BIOSTATISTICS

EuroMISE Centre, The European Centre for Medical Informatics, Statistics and Epidemiology together with the Institute of Computer Science of the Academy of Sciences of the Czech Republic and the Statistics and Epidemiology and Guarant International Ltd. are organising the 30th Annual Conference of the International Society for Clinical Biostatistics. It will be held on August 23 - 27, 2009 in Prague.

The aim will be to provide a scientific forum for international exchange of theory, methods and applications of biostatistics in medical research and practice among clinicians, statisticians and members of other disciplines, such as epidemiologists, clinical chemists and clinical pharmacologists, working or interested in the field of clinical biostatistics. Additional highlight of the conference will be the mini-symposium on Biomedical Informatics, paralleled with mini-symposium on statistics in vaccines research.

For more information please visit: **www.euromise.org**

CENTERIS'2009 - CONFERENCE ON ENTERPRISE INFORMATION SYSTEMS

The European Health Telematics Observatory (EHTO) is taking part in the CENTERIS'2009 conference in Ofir, Portugal on October 7 - 9, 2009. This event will be co-organised by the Polytechnic Institute of Cávado and Ave and the University of Trás-os-Montes e Alto Douro.

The public will consist of academics, scientists, IT professionals, managers and solution providers. The event will provide opportunity to share experiences, bring new ideas, debate issues and introduce the latest developments in the healthcare field.

CENTERIS'2009 will be presented from three perspectives: social, organisational and technological. The program will include scientific sessions, tutorial and technical sessions, exhibitions by solution's providers and product presentations.

For more information please visit: **www.ehto.org**

15 -16 SEPTEMBER 2009

BALTIC CONFERENCE ON E-HEALTH

The European Association of Healthcare IT Managers invites you to take part in the third Baltic Conference on e-health on September 15 - 16, 2009. As customary, the congress will be held in Hamburg. The programme will consist of a pre-opening session on the 15th with a guided tour through the advanced hospital of the University Medical Centre Hamburg- Eppendorf (UKE), various presentations and panel discussions. The official opening sessions will be held in the Chamber of Commerce on the following day. The conference will be under the patronage of Ulla Schmidt, the Federal Minister of Health in Germany.

During the conference the attendees will be introduced to best practices and strategy-oriented presentations, workshops and exhibitions from international health-care IT solution providers of the Baltic and Scandinavian countries.

The event will focus on "Cross-Border Healthcare". That is the reason why the slogan of this year's event is "To learn from each other – to work with one another". The topics of the panel discussions will address the impact of globalisation on healthcare systems and services, the requirements regarding interconnectivity, interoperability and the standardisation and need for cross-border cooperation.

Furthermore, a cross sector forum of healthcare IT providers from Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Norway, Poland, Russia and Sweden will be presented at the show. During the congress, the other main subject will be the optimisation of clinical and business processes, and of hospital information and communication systems in order to increase the quality and economics of patient care.

Telemedicine
Special attention will be given to the link between e-health and medical engineering and the crucial financial situation of hospitals and clinics and the contribution of the deployment of high-quality e-health solutions to these problems.

The public will consist of representatives from hospitals, governments, health insurance organisations and service providers.

For more information please visit:
www.baltic-conference-on-ehealth.com

29 -30 OCTOBER 2009

IT@NETWORKING AWARDS 2009

The IT@ Networking Awards 2009 (IT@2009) aims to select outstanding European healthcare IT solution in hospitals and healthcare facilities and bring them to the pan-European stage. The event will take place in Brussels from 29 - 30 October 2009.

The attendees will consist of CEOs, CIOs, hospital and healthcare IT Managers, physicians with an interest in IT, members of the European Parliament, civil servants from the EU and individual European countries whose mandates cover healthcare IT, as well as members of the specialist healthcare and IT press.

The aim of IT@ 2009 is to give recognition to pioneers from the European healthcare IT field, who provide efficient, cost-effective solutions. The lessons learned can help both to avoid mistakes and transform healthcare IT challenges into opportunities and success stories.

What makes this event different from the others is that IT@2009 is built on the principles of best-of-breed and peer-to-peer networking. The European Association of Healthcare IT Managers believes that peers will make the wisest decisions in respect to their own needs. An on-the-spot, one-person one-vote electronic system will be used to enable attending CEOs, CIOs and healthcare IT managers to decide which project is the most innovative and best solution for them.

The program will consist on the first day of 'Mindbytes', or short presentations of all successful submissions for IT@ 2009. Each presenter will have five minutes to convince the public why their solution is special and is differentiated from the others. The voting will follow immediately after the synopsis of presentations and the finalists will be announced by the Chair of the Organising Committee.

The second day will have the finalists take part in a workbench, where they will present their project in detail. The final voting will take place immediately after the presentations, followed by the awards ceremony and a reception in the European Parliament.

The winning project will receive the IT@Networking Awards 2009 Trophy, have a detailed presentation of their solution in Europe's leading healthcare management media and be awarded a cash prize of 5,000 Euros.

For more information on submission deadlines and requirements, please visit:
www.hitm.eu/awards

13 – 14 MAY 2009, BRUSSELS, BELGIUM

WORLD OF HEALTH CARE CONGRESS EUROPE 2009

The 2009 World of Health Care Congress Europe (WHCCE) took place on May 13 - 14, 2009 in Brussels. More than 400 participants from Europe, the US, Middle East and Asia were present at the event.

Among the participants were key health ministers from leading countries in Europe, government officials, hospital directors, IT innovators, decision makers from public and private insurance funds, pharmaceutical and medical device companies and heath care industry suppliers. The event featured general plenary sessions, concurrent leadership forums, executive summits and market insight series.

The key topics covered at WHCCE 2009 focused on:
↘ Emerging Business Models for Patient-Centred Care
↘ Technology Deployment
↘ Chronic Care Management
↘ Improvement of Health Outcomes and Costs

The Congress was held in Bedford Hotel & Congress Centre where besides the sessions, the participants could visit the stands of the associate sponsors and supporting associations. A health poster exposition was presented as well. As an official partner of the World Health Care Congress Europe, The European Association of Healthcare IT Managers was present at the event.

Among the speakers were prominent European Ministers of Health, senior health policy executives, hospital and healthcare associates, insurers and payers, patient groups, associations and academics and thought leaders.

The event represented a good opportunity for participants to share experiences and view on best practices and successful initiatives on a European and global level.

The 6th World Health Care Congress Europe will be held in Brussels again on May19 - 20, 2010.

For more information, please visit:
www.worldcongress.com/europe

26 – 27 MAY 2009 BUCHAREST, ROMANIA

E-HEALTH 2009 CONGRESS

The 4th edition of the e-health 2009 Congress was held in Bucharest, Romania on May 26 - 27, 2009. The event brought together national and international healthcare ICT key players and other healthcare professionals. Tarus Media and the Romanian edition of the British Medical Journal were responsible for media coverage of the event.

The main topic of the program addressed the Electronic European Health Insurance Card (eEHIC). Furthermore, an extended overview on the European and Romanian e-health markets was presented, together with a review on Integrated EHR systems. Last but not least, during the congress, the newest e-health trends and solutions have been introduced.

Among the distinguished guests at the event were Mr. Ion Bazac, Minister of Health of Romania, Rodica Nassar, Chairman Health Committee, Mr. Sorin Oprescu, Mayor of Bucharest, Prof. Irinel Popescu, the president of CNAS (Casei Nationale de Asigurari de Sanatate/National House of Health Insurance) Chamber of Deputies.

From Brussels, Prof. Florin Lupescu, the new Director of ICT Addressing Societal Challenges from the General Directorate Information and Society Media of the European Commission shared his views and expertise on best practices in healthcare systems and projects.

The European Association of Healthcare IT Managers was represented by Mr. Christian Marolt, the Secretary General of the Association. He was invited as a Chairman of the panel discussion on "Trends and challenges on the European market for e-Health, European directives and success stories, Romanian perspective".

Other distinguished international speakers were Dr. Jacob Hofdijk, the President of the European Federation for Medical Informatics, and Mrs. Andrea Kdolsky, the former Minister of Health in Austria.

More than 200 participants from over 10 countries were present at the event. The public consisted of representatives from hospitals, health insurance organisations, government officials and other physicians involved in the European and International e-health arena, as well as media representatives.

For more information (only in Romanian), please visit :
www.ehealth.tarusmedia.ro

PIPS: *PERSONALISED INFORMATION PLATFORM FOR LIFE & HEALTH SERVICES*

PIPS is the virtual assistant who is attentive, discreet, loyal and always available. It exploits the most advanced information technologies for you in order to encourage healthier individual choices.

Informed individuals

The main goal of this virtual assistant is to encourage healthier decisions by providing information among the patients in their daily lives. PIPS can improve one's well-being and quality of life and this way prevent and keep under control the diseases and guarantee continuous support to treatments after being discharged from hospital or to chronically ill patients.

Furthermore, PIPS is helping the patient through translating medical advices and prescriptions into practical suggestions and this way prevent possible risks to one's health. The services are personalised on an individual's profile and are based on preventive medicine, developing innovative technological solutions such as continuity of care and education and impact on lifestyle.

The PIPS technological platform consists of a wide range of innovative services, such as Decision Support tools, Knowledge Management tools, Trust models/tools (sensitive data privacy and protection, trust case), Risk Management strategies, Protocols for integration of smart health monitoring, product traceability devices and location-based-services.

Moreover, it provides the patients with ad-hoc simple solutions for their needs with the aim to improve compliance. It generates an automatic ubiquitous support those with and anywhere and it is useful for healthy people and for chronic diseases as well.

PIPS provides a holistic view on the personal health and well-being empowering the involvement of health professionals, family and individuals in a comprehensive care delivery process making the integration with the context a reality. Through education and entertainment, PIPS aims to reach the citizen and motivate them towards an improvement of their lifestyle. It raises their awareness in order to help to take decisions in the day-by-day life.

Further exploitation of results

So far three PIPS pilot projects have been released in Italy and Spain with the involvement of external experts and end users in the validation and evaluation proves. At the moment the strolling and motivation trial for diabetes patients at the San Raffaele Hospital in Milan is being exploited.

PIPS strategy of innovative personalised services is feeding a rich pipeline of new e-services which aim at prevention and improvement of an individual's lifestyle. It is part of the challenging San Raffaele Scientific Institute (HSR) initiative "Quo Vadis". This initiative is an innovative healthcare site dedicated to deliver predictive and preventive medical services for well-being offered to the citizens. All you need is a computer, a mobile phone and an internet connection.

For more information please visit:
www.ec.europa.eu/information_society/activities/health/

Lead Market Initiative: *e-Health*

The European Commission has launched the Lead Market Initiative (LMI) for Europe, following the European Union's 2006 Broad Based Innovation Strategy. Its aim is to encourage the emergence of lead markets of high economic and societal value. The initiative has six markets, one of which is e-health due to its market potential in terms of growing demand and market growth opportunities, changing demographics and disease patterns, and healthcare capabilities.

The LMI for e-health consist of a roadmap of policy recommendations for the period 2008 - 2010, which has been developed by the European Commission in collaboration with representatives from several DGs.

The action plan is focusing on the challenges of:

↘ Market fragmentation and lack of interoperability

↘ Lack of legal certainty

↘ Insufficient availability of financial support and

↘ Procurement issues.

Twenty measurable actions are being prepared in order to tackle the four above-mentioned obstacles on the e-health development.

For more information on the initiative please visit:
www.ec.europa.eu/information_society

LHDL : *THE LIVING HUMAN DIGITAL LIBRARY*

Sharing biomedical data in an easy, controlled, safe and financially viable way is no longer impossible thanks to the LHDL project. PhysiomeSpace service provides you with the possibility to import, store and organize your biomedical data in a digital format.

The Living Human Project (LHP)

The goal of this initiative is to develop an *in silico* model of the human neuromusculoskeletal system which can predict how mechanical forces are exchanged internally and externally, from the whole body down to the protein level, consistently with the scope of the European Virtual Physiological Human Initiative. In order to obtain this objective, it is important for large research communities to share highly heterogeneous collections of data and models through a fully integrated repository, and be directly accessible by any researcher in the world. This will result in a significantly and positive effect on the European research, clinical and industrial practices.

The projects, realised until now by LHDL, are the following:

↘ PhysiomeSpace
  This is the first professional data management and sharing service of biomedical data

↘ PSLoader
  It allows you to import virtually any biomedical dataset, organise your collection of data in space and time and upload it to the data management service

↘ LhpBuilder
  An application for processing and modeling neuromusculoskeletal system data

↘ LhpSimul
  A powerful architecture of execution web services for the distributed execution of data-intensive algorithms

↘ LhpSWS
  A semantic web service with full semantic brokering capable of combining storage and execution services in complex data processing flows

↘ LHDL ontologies
  A collection of specialized ontologies to annotate the data and service resources available through PhysiomeSpace

↘ LHP Data Collection
  A compilation of experimental and modeling data on the descriptive and functional anatomy and the multiscale biomechanics of the musculoskeletal system.

PhysiomeSpace architecture

The client application:PSLoader
With the desktop application PSLoader, after authentication you can import biomedical data stored in different digital formats (DICOM3, STL, JPG, TIFF, ANSYS,etc.) and organise them in space using a hierarchical tree. The system allows you to have long list of interactive views and visualise whatever combination of data you can have.

The Service: PhysiomeSpace
The PSLoader allows you to upload on your private space the entire collection of PhysiomeSpace servers with only one click from a single web interface. You can add, remove, annotate data resources and assign to each resource a different set of access permissions. You have the possibility to talk directly to anyone who would like to download the data, before granting access.

By PhysiomeSpace data resources can be browsed and searched in various ways relying on the fact that each data resource is annotated by a set of metadata defined according to the LHDL Master Ontology. Depending on the type of data you can choose additional sub-ontologies to add to the data special concepts that are specific to a certain data generation modality.

PSLoader automatically annotates a good part of the master ontology but the user is still requested to do some manual curation.

PhysiomeSpace has a quality index which shows how extensive the annotation of each data resource is. The dataset you place in your private space will be available for download next time you connect to it. The database can be exported in whatever format, and used with other specialized applications.

Usage terms and conditions, data re-use and privacy policy
PhysiomeSpace is expected to be launched as a commercial service at the end of 2009. Until then its services will be free of charge. The data will be uploaded under complete responsibility of the users and there will be no guarantee provided for the continuity of the service, the storage, the integrity and the preservation of the data stored. The confidentiality of the data will be protected only through the access limitation of the service, and in principle system administrations are in the condition to access all uploaded data.

For more information please visit :
www.ec.europa.eu/information_society/activities/health/

E-PRESCRIBING
IN THE NETHERLANDS

AUTHOR

Michael Tan
is a Project Manager
at NICTIZ, Netherlands

As Europe moves from national healthcare IT programmes towards full-fledged e-Health services, many experts see e-Prescribing as a key foundational step. There is a strong business case, accompanied by equally strong perceptions, that improving the prescribing and medication management process with IT will directly reduce errors, increase service quality and the delivery of effective care across the spectrum. Given below is an analysis of e-Prescribing in the Netherlands.

National Programme for Pharmacy

Nictiz - the National IT Institute for Healthcare in the Netherlands - was founded in 2002 by the Dutch government to improve healthcare processes through the use of IT. The organisation laid down their plans for a decentralised national infrastructure based around a National Switchpoint, but of course an infrastructure by itself has no purpose, unless it has content. Therefore, the first focus of Nictiz was the pharmacy domain, because its use was widespread through all levels of healthcare. Implementing this domain would imply that a major chunk of the healthcare sector would need to connect to the national infrastructure.

The Dutch national implementation started with the medication history of patients. The history is based on dispensing information retrieved from community pharmacies. The rollout of this project is currently active and is carried out by IT vendors and professional associations under supervision of the Ministry of Health.

Nictiz itself is already occupied with additional functionality in the pharmacy domain, which is grouped under the rubric of EMD plus.

e-Prescribing

E-prescribing is the next functionality which Nictiz is planning to implement.

There is probably little need to explain the benefits of e-prescribing in detail. Most readers would have come across various articles explaining the advantages of electronic prescribing with arguments such as:

⬎ Preventing transcription errors of unreadable handwritten prescriptions.

⬎ Improving medication safety by cross-checking on double medication, contra-indications, dosage and medication interactions at the moment of prescribing. Preventive checking is more effective than medication safety checking at the moment of dispensing.

⬎ Logistic improvements and lowering in the costs of handling. With first time prescriptions the gain is not so significant, because in general the prescriber would note down a generic drug name and the pharmacist would still need to do some manual handling to select an appropriate brand name. However, with repetitive prescriptions the handling would yield tremendous logistic advantages.

Currently, most GPs in the Netherlands are already registering their prescriptions electronically, although some still print it out and give a printed version to the patients and/or fax it to the pharmacy.

Once such prescribers become used to the computer, it will be regarded as a small step forward to send the prescription through a network. Seventy to eighty percent of the volume of all prescriptions are repeat prescriptions and these are often generated by the GPs.

Moving the laggards

So the key question in the Netherlands is about those yet to begin prescribing electronically and what would be the benefits in getting the last of the Mohicans behind a keyboard. Surveys show that specialists, giving consultation to patients in a ambulatory setting or day care, are still reluctant to use electronic devices to enter patient data.

Unlike a GP who generally has the workstation on a desk in the consultation room, it is the mobility of the specialists, running from one consultation room to another, which prevents them

from sitting down behind a workstation. Currently, it is easier for a specialist to jot down a written prescription, than taking his or her place behind a workstation to register an electronic prescription.

For patients in an institutional setting, the circumstances are different. A team of nurses, assistants and institutional pharmacists form the backup for the doctor to help the prescriber with the registration of medication information.

Medication safety is still the key driver in order to get this last group to make electronic prescriptions.

In the Netherlands, it is customary for patients to be treated by a GP in the first stage and only consult a specialist after referral by the GP.

There are chances that patients are in a more serious or complex condition than would be the case if the GP would treat the patient himself. Dosage of the medication could then be more critical and therefore cross-checking with the help of computerized software would be more essential.

What are the functions we want to introduce in the Netherlands through the national program? The e-prescription will be equipped with an electronic signature from the prescriber, thus making the paper version obsolete.

Secondly, the reason for prescribing will be included in the prescription when it is necessary, providing the pharmacist with essential information for the correct dosage. This is mostly the case with multiple purpose drugs.

The electronic signature

The requirement for a signature on a prescription is based on common European legislation. The Dutch version of this law has been renewed to accept an electronic signature as a valid token from a recognized prescriber.

Signing data might seem straightforward, but there are certain pitfalls in the choice of the signed data. In the basic method, the process of signing data and the generation of the message or document are handled at the same software level.

However, this is often not the case in hospitals. The workstation on which the prescriber is signing off a prescription is generally a different software layer than where the document or message is generated. Messages or documents are generated by communication engines. This means that certain coded elements which have to follow certain messaging conventions are not (yet) available at the moment of signing. These conventions are either XML or HL7v3 conventions. An example is the dosage instruction which is transferred as a complex GTS (General Time Specification) datatype.

WYSIWYS: What you see is what you sign

Given the above reasons, Nictiz has regarded the intent of the prescriber as the focus on which the signed data is to be signed. In other words "what you see, is what you sign". This choice means that the prescriber has to understand what he or she is signing.

In many cases, coded elements (for example a product code) could be meaningless for a prescriber. It is often the case that a user selects through a data-item by picking out a displayed text without seeing the code that is generated in the software. Therefore, the displayed text is regarded as leading, as compared to the coded data in the signed fields. The coded form is merely attached to make computerised checking possible at the receiver's side.

However, if any discrepancy between text and code is found, then the signed text will be regarded as the rightful signed data.

Closing the gaps

There are still certain matters to address with regards to the use of electronic signatures with prescriptions. The electronic signature is mainly a method to identify the rightful origination of the prescriber. It is basically focused on securing the transfer of signed data and much less the uniqueness or the persistence of the document. The verification of the validity of signed data is valid as long as the certification of the signature still can be recalculated. The chipcard of the prescriber is valid for a period of three years. This could mean that a prescription, that is signed at the end of the validity period, would appear as non-valid if checked shortly after the end of the validity of the card. The chances, however, of the need to review a prescription by the inspection are almost nil and the question is how far do we need to take measures to address such rare situations in advance.

A copy of an electronic file is indistinguishable from the original and an electronic signed prescription would be just as valid as the original signed document. This is where the Dutch national infrastructure, called AORTA, comes into place to prove the uniqueness of issued prescriptions.

The core of the national infrastructure is the National Switchpoint. The switchpoint not only logs and identifies correct transactions, but also takes care of proper routing of all transactions. All electronic prescriptions which are transferred through the National Switchpoint will be registered in the index and therefore secure uniqueness of the signed prescriptions.

Guidelines on medication profile

Once e-prescriptions are introduced, then of course it will be possible to place queries and retrieve information from the various sources. Quite recently the guidelines for transfer of medication care were brought out by the various professional associations.

Cardiovascular Information Systems

Identifies the most important specifications to consider when comparing models

ECRI Institute
The Discipline of Science. The Integrity of Independence.

ECRI Institute Europe	Tel: +44 (0)1707 871511
Weltech Centre Ridgeway	Fax: +44 (0)1707 393138
Welwyn Garden City	
Herts AL7 2AA	info@ecri.org.uk
United Kingdom	www.ecri.org.uk

ECRI Institute, a non-profit organisation, dedicates itself to bringing the discipline of applied scientific research in healthcare to uncover the best approaches to improving patient care. As pioneers in this science for nearly 40 years, ECRI Institute marries experience and independence with the objectivity of evidence-based research.

ECRI's focus is medical device technology, healthcare risk and quality management, and health technology assessment. It provides information services and technical assistance to more than 5,000 hospitals, healthcare organisations, ministries of health, government and planning agencies, voluntary sector organisations and accrediting agencies worldwide. Its databases (over 30), publications, information services and technical assistance services set the standard for the healthcare community.

More than 5,000 healthcare organisations worldwide rely on ECRI Institute's expertise in patient safety improvement, risk and quality management, healthcare processes, devices, procedures and drug technology. ECRI Institute is one of only a handful of organisations designated as both a Collaborating Centre of the World Health Organisation and an evidence-based practice centre by the US Agency for healthcare research and quality.

For more information, visit **www.ecri.org**

Supplier Footnotes

<1> These recommendations are the opinions of ECRI Institute's technology experts. ECRI Institute assumes no liability for decisions made based on this data.

<2> Adult Cath; Adult Vascular Angiography (future), Adult Echo: Stress, TTE and TEE; Pediatric TEE; Vascular Ultrasound ; Nuclear Cardiology; Cardiac CT Reporting; ECG Management: Adult resting 12-lead ECG; Stress (store and view); Holter (store and view of report-future)

<3> Special features include iintegration with EMRs, RAD PACS and enterprise imaging archive and distribution systems; optional ECG management system, Whiteboard scheduling; Off Line Measurement Toolkit, DICOM Secondary Capture Import from 3rd Party Systems
mai-08

<4> LCD: LG L200ME Single Color Flat Panel 20.1" Viewable Size, Black Bezel, 1600x1200 Model: USE-200ME - 19" supported
PC, bar-code scanner, laptop

	ECRI RECOMMENDED SPECIFICATIONS <1>
MODEL	**Basic CIIMSs**
WHERE MARKETED	
FDA CLEARANCE	
CE MARK (MDD)	
INFORMATION/IMAGES	Either or both
ENTERPRISEWIDE SOLUTION OR SPECIFIC TO SPECIALTY CARE AREA	
If specific to care area, which one(s)	
HARDWARE & SOFTWARE OR SOFTWARE ONLY	Either or both
CLINICAL FEATURES, DATA/WAVEFORM/IMAGE	
Resting ECG	User preference
Echocardiology	User preference
Cardiac cath	User preference
Stress testing	User preference
Electrophysiology	User preference
Holter	User preference
Other labs/devices	User preference
CENTRAL WORKSTATION	
Monitors/station	1
Screen, diag, cm	48
# cases/display	2
Input device	
Web browser	
Output options	
REMOTE WORKSTATION	
Screen, diag, cm	43
Input device	
Web browser	Yes
Output options	
SYSTEM CONFIGURATION	
Hardware platform	No preference
Operating system	No preference
Servers	No preference
Program languages	No preference
Memory, MB	512
Integrity	Secure, redundant, auto tape backup
NETWORK	
Communication protocols	TCP/IP
Architecture	Client/server
Cable type	No preference
INTERFACES	HIS, RIS
IMAGE INPUT	
Modalities	CT, MR, NM, XA, echo
Digital acquisition	Direct or direct capture
Film digitizer(s)	No preference
COMPRESSION TYPE	Lossless or lossy
Ratio	3:01
ACCESS TIME, SEC	
Online	5-mai
Archives	20/120
REPORTS GENERATED	User preference, user customizable preferred
DICOM 3.0 CONFORMANT	Yes
STANDARDS SUPPORTED	HL7
OTHER SPECIFICATIONS	
LAST UPDATED	fév-06

AGFA HealthCare	McKesson	SCHILLER	VEPRO
IMPAX Cardiovascular	**Horizon Cardiology**	**SEMA-200**	**MEDIMAGE**
Worldwide	Worldwide	Worldwide	Worldwide
Yes	Yes	NA (software only)	Yes
Yes	Yes	NA (software only)	Yes
Both	Both	yes/yes	Both
Cardiovascular only or integrated with an enterprisewide imaging and access solution , ECG Management System for departmental use or integrated as part of CVIS	Enterprise Imaging	Specific	Not specified
Cardiovascular and Interventional Radiology, ECG Department	Cardiology	Cardiology	Not specified
Both	Both	Software only	Both
Yes/yes/yes	WIP/WIP/yes	Yes/yes/yes	Yes/yes/yes
Yes/yes/yes/ Integration with 3rd party advanced analysis tools for 3D Echo/ Sophisticated Off-Line Measurement Tools	Yes/yes/yes	No/no/no	Yes/yes/yes
Yes/yes/yes	Yes/yes/yes	No/no/no	Yes/yes/yes
Yes/yes/yes - Nuclear Stress and Echocardiography Stress, Exercise Tolerance Test (PDF)	Yes/no/no	Yes/yes/yes	Yes/yes/yes
Yes/yes/yes (Store and view)	Yes/yes/yes	Yes/yes/yes	Yes/yes/yes
Yes/yes/NA - Store and View (future)	No/no/no	Yes (ECG, ABP)	Yes/yes/yes
MR, invasive (future) angiography	NM, MRI, CT	Spirometry, stress spirometry	User scalable
Up to 2	Unlimited	NA	Up to 12
46	LCD: LG L200ME Single Color Flat Panel 20.1" Viewable Size, Black Bezel, 1600x1200 Model: USE-200ME - 19'' supported	NA	43.1, 48.3, 55.9
Up to 48 (NM), varies	~140, scalable	NA	Unlimited
Laptop, PC, bar-code scanner (WIP)	PC, bar-code scanner, laptop	NA	All
Internet Explorer	Microsoft Explorer 6.0 and above	NA	Internet Explorer, Netscape
Print, fax, digital image, e-mail	Print, fax, digital image, e-mail, e-fax	NA	Print, e-mail, graphic file
46	<4>	User selected	43.1, 48.3, 55.9
Laptop, PC, bar-code scanner- HeartStation (WIP)		Windows 2000/XP/Vista compatible	All
Internet Explorer	Microsoft Explorer 6.0 and above	Internet Explorer	Internet Explorer, Netscape
Print, fax, digital image, e-mail	Print, fax, digital image, e-mail, e-fax	Windows 2000/XP/Vista compatible	Print, e-mail, graphic file
Dell or HP	DELL or HP servers/PCs	User selected	High-end PC
Windows	Windows 2003 Server	Windows 2000/XP/2003 Server	Windows
Dell or HP	Enterprise, departmental	Advantage Database Server	Dell, MC_ (VEPRO validated)
C++, Active-X, XML	VB, C++, C#, ASP, .NET	Not specified	C++, Java, HTML, .NET
1 GB, varies	≥1 GB	≥1024	≥2 GB
Secure, redundant	Full redundancy, clustering, RAID, NAS, SAN, DVD	Hard disk, CD, DVD	Not specified
Ethernet, TCP/IP	ATM, Ethernet, fiber channel, HL7, ISDN, TCP/IP, LAN, WAN, DICOM, phone line, IHE, CCOW	TCP/IP, HTTP, serial	Ethernet, TCP/IP, wireless LAN
Client/server, 3-tier for Web delivery and reporting	Open, PC-based client/server	Client/server, local	Centralized with backup, distributed
100BaseT copper 5 A (or better)	Twisted pair, fiberoptic, CAT5	RS232, Ethernet, wireless	Wireless, twisted pair, coaxial
HL7 ADT/ORM Inbound,Outbound ORU, Outbound Server Fax. EMR integration, Hemo import, DICOM SR import for US, OCR import for US, XML export to support Registry submission and 3rd party reporting systems	HIS, ADT, RIS, billing, DICOM worklist	HL7, GDT, SEMA2, XML, PDF, DICOM, LDAP	HL7, DICOM (to every IS), GDT/BDT, proprietary
US for vascular and echocardiography, XA, nuclear cardiology, CT, MR, IVUS, EP XA images	XA, MR, CT, NM, US, RF, CR, DR, IVUS, SC	NA	All DICOM and analog
Direct capture, A-D converters, DICOM	Analog video, digital DICOM, direct capture, frame grabber; proprietary after customizations	NA	DICOM, frame grabber, scanner
None	None	NA	Lumisys, Vidar, others
Lossless DICOM, lossy for US if desired	Lossless : Lossy	NA	Lossless, lossy, JPEG2000
2:01	DICOM : Configurable	NA	3:1 lossless, up to 100:1 JPEG2000 (review)
<2/<2	<1/<2	Not specified/NA	<1/<3
<2/<2 spinning disk, ~30/~30 robotically controlled DVD jukeboxes	<2 (NAS, SAN, EMC), 30 (DVD)	Not specified/NA	<1/<3
<2>	Cath echo, cath, NM, vascular	Not specified	Optional
Yes	Yes	YES	Yes
HL7, DICOM, IHE	HL7, HIPAA, DICOM, CCOW	HL7, GDT, SCP, XML, DICOM, LDAP	HL7, DICOM
<3>	Extended warranties available.	None specified.	None specified.
mai-08	mai-08	juin-09	mai-07

These guidelines describe the medication profile consisting of prescribed, dispensed and administered medication as well as contra-indications as the basic set of information when patients are transferred from one care-provider to another.

Therefore data elements, such as prescriptions, need to be implemented electronically, at first in a standard way before a consistent report can be understood by receivers. Standard product codes such as the Dutch G-standard from Z-index and a common terminology on contra-indications form part of understanding each other. Dosage instructions are also transmitted in coded form so that computer intelligence can perform medication safety checking.

Interventions

Once electronic prescriptions are available, the need for intervening on the prescription will be necessary. Of course, the phone is always there for emergency cases, but more often getting in touch with the responsible prescriber can be a time consuming effort. Users have underlined the need of an electronic intervention to optimise the support of the electronic prescription process and to report a reliable medication profile of the patient. For reliable reporting, a meaningful registration of the time interval in which the prescription is active is important.

Underlying this need is the philosophy that the prescription is in essence not only logistic order to supply medication, but an agreement between the prescriber and the patient to follow a certain therapy. In fact stakeholders have suggested that a prescription, which consists of both a dispensation information section as well as one on administration instructions, could contain only dosage instructions with a zero supply, if the prescriber and the patient conclude that the patient had enough stock in his possession and only required to change the dosage.

To be able to signal changes, an intervention message is available to pass on the modification in the therapy. The use cases are:

❧ The original prescriber nullifying or adjusting the therapy of his or her own prescription to notify or alert the dispenser of the change.

❧ Another prescriber notifying the original prescriber that a patient is now in his or her care and that the therapy had to be changed.

❧ A dispenser requesting the original prescriber to provide a new prescription, because of issues discovered with the original prescription.

An example of the second use case is where a patient is institutionalised and discharged from hospital. These moments of transfer are often precarious moments, where until now the lack of information has led to hazardous situations on medication safety. If the instructions to the patient or attending family or personnel are not clear, it could end up with double medication or improper dosages.

Future plans

Nictiz still has ambitious plans for the future. Currently all electronic prescriptions are being pushed from a prescriber to a dispenser. The advantage of this method is that prescription can be checked and prepared long before the patient or representatives arrive at the dispensary. Specialists in hospitals are not inclined to ask a patient to which dispensary the prescription should be sent.

Above that lies a strong political requirement, that freedom of choice for the patient for the pharmacy should be taken into account. Patients would choose a pharmacy first, identify himself or herself and request the pharmacist to retrieve the prescription from the source. This would reverse the flow of the prescription, indicating a pull mechanism rather than a push mechanism.

Pharmacists argue that changing pharmacies frequently is not in the benefit of supporting the patient on medication safety and that a patient should have a fixed pharmacist. It is likely that both scenarios need to be supported. Young and healthy people who occasionally pickup some medication need less guidance than elderly feeble patients using multiple medication.

The forthcoming architecture for electronic prescriptions would be that patients could indicate their wish for a preferred pharmacy through a patient portal. In future, a prescriber would only register the prescription in his or her own system. The national system would know if a patient has a preferred pharmacy and redirect the prescription directly to this dispensing point. If no preferred pharmacy is registered, then the prescription will be held at the source until the patient appears at a pharmacy to ask the pharmacist to retrieve the prescription. This does however mean that the medication has to be prepared and that the patient has to wait.

Nictiz

Nictiz, a member of the European Association of Healthcare IT Managers, is the national coordination point and knowledge centre for IT and innovation in the healthcare sector in the Netherlands.

The national switch point forms the core of electronic communications in the sector, which is managed by Nictiz. Any authorized healthcare practitioner can be connected to the switch point so that he or she can obtain the latest and most relevant information about a patient at any time, from anywhere in the Netherlands and in a simple, secure and reliable way.

In consultation with, and at the request of the healthcare sector, Nictiz is continuously developing and refining national standards for electronic communications in healthcare. Furthermore, Nictiz supports the sector in developing functional IT solutions that can be used nationwide, and contributes to policy making on IT issues as they relate to healthcare on a national and international level.

LEADING A TEAM IN TIMES OF CHANGE
Personalities and Outcomes

AUTHOR

Dr. Elizabeth Robertson
is a Consultant Radiologist with NHS Grampian, Scotland, UK

Each of us has different risk profiles for adoption of change. Some of us are native risk takers, happy to adopt change without clarity of detail or definite outcomes or specific plans. Others are risk averse, require all of the above and do not want to gamble.

In an ideal world, leadership vision would readily convert to a management agenda and engagement of the team would not be an issue. Exploring this a little, intransigence is the least likely reason for lack of cohesion in a team.

Different experience, beliefs and values influence individual perception and action. We all wish to positively influence our future and our work environment. Yet we all hold the cherished card of the patient dear in terms of their safety and best possible outcomes. An open mind to different approaches is helpful. The leader must be a good listener to hear and understand the disquiet of others and convert that by allaying concerns and channelling energy.

Individual Perception Influences Outcomes

Individual perception of situations is varied and unpredictable. One should never assume that all team members are seeing a situation as one sees it. This is due to value systems, beliefs and experience but also personality.

Some have a very person-focused approach to life and will natively consider impacts on people (i.e. the patient or staff groups).

Others have a task focus and, at all costs, may want their outcome to win the day, regardless of collateral impact.

By acknowledging these natural differences, we can step around the potential conflict that could arise. Prioritisation has another extremely individual influence on outcomes. Individuals lead busy lives and assuming that your agenda is their agenda can lead to misunderstanding.

The Role of Stakeholders

In undertaking a change in healthcare services or practices, it is essential to pinpoint the individual stakeholders. Patients are an obvious group, but the staff who provide the service and their referrers are legitimate additions.

Less obvious stakeholders are those who ultimately pay for the service and alternative service providers or linked services. Those who are involved in any required training or retraining of staff to provide the new service should also be given a voice. Once the stakeholders are identified, it is useful to consider what their concerns about the new service might be. Often these will fall into positive and negative aspects, benefits and drawbacks or unintended and unhelpful consequences.

Leading a team involves a certain effort to predict and document the potential pros and cons of any new service. This allows the team leader to arrive at a vision of the future that acknowledges the impact and individual concerns that might arise to encourage joint working through of these issues to mutual benefit. It is always better to have joint working through of issues and development of plans than for a group or individual to feel that it is 'being done to them'.

Ensuring Team Compliance

When announcing a new change in service or practice, there is a certain approach that aims to ensure team compliance, as follows:

- Assemble all identified stakeholders, as outlined above
- Present them with the issue to be addressed or the service to be developed
- Seek ideas giving an outline of the overall intended vision
- Be in listening mode - active listening is a skill that can be employed here.

In active listening one reflects back the information that a stakeholder has given to confirm understanding but also to encourage clarification in a very supportive, positive way. This may be in the words of the reflector and a useful dialogue may ensue achieving understanding and exploring approach and process. A shared vision may be developed and even details of the 'hows' in terms of the planning process. It is worth remembering that nobody understands a service as well as the stakeholders and the users of the service are critical to that understanding. They may even have astute observations in terms of service improvement.

Practical Considerations

At a practical level it is helpful for team-building to put the service development on a poster or board on the wall at one end of the room and for everybody to sit facing the poster. In that way all staff have an opportunity to be seen as part of the solution and it recognises that everybody's contribution is valid. Practical suggestions can be noted on Post-Its and stuck on the wall by a neutral facilitator of the discussion. Following this session, the clinical leader and facilitator will have a wealth of information upon which to develop a sound plan. This approach sends out the message of the future being a jointly developed one.

It is also important that all parties are kept up to speed with the evolving and developing service change. Adverse impacts on individuals are less likely to arouse obstructive behaviour if there is awareness and preparation for them. Acceptance of adverse impacts is always easier if the consequence is acknowledged and worked through involving those affected rather than being ignored. Individual response may be quite emotional if the status quo is under threat and this negates any initial 'fight or flight' response.

Valuing the diversity of different approaches and perceptions is the strength of a good leader and the basis of a strong and mutually supportive team. Leaders and team members should not feel threatened by different perception but rather actively seek them. The difficulty is sometimes that different perception may feel like a challenge to the 'authority' of the leader.

In summary, team leaders need to be good listeners. They need to hear the problems and concerns of all parties. They should be slow to take offence but value the strength of diverse contributions. It is too easy to appoint in your own image or select candidates with similar or consonant points of view to your own. The result is "group-think" of a like-minded group. This may feel very comfortable but is exclusion of diversity and a lost opportunity.

MANAGER OR LEADER:
More than detail in the difference

AUTHOR
Tosh Sheshabalaya,
HIT

Bennis is credited with pioneering the study of leadership as a formal academic discipline'in the US and Britain.

For Bennis, leaders had the following qualities: a guiding vision, passion, integrity, trust, curiosity and daring.

Manager or leader

Bennis has drawn twelve distinctions between managers and leaders:

1. Managers administer.
   - *Leaders innovate.*
2. Managers ask how and when.
   - *Leaders ask what and why.*
3. Managers focus on systems.
   - *Leaders focus on people.*
4. Managers do things right.
   - *Leaders do the right things.*
5. Managers maintain.
   - *Leaders develop.*
6. Managers rely on control.
   - *Leaders inspire trust.*
7. Managers have short-term perspective.
   - *Leaders have long-term perspective.*
8. Managers accept the status-quo.
   - *Leaders challenge the status-quo.*
9. Managers have an eye on the bottom line.
   - *Leaders have an eye on the horizon.*
10. Managers imitate.
   - *Leaders originate.*
11. Managers emulate the classic good soldier.
   - *Leaders are their own person.*
12. Managers copy.
   - *Leaders show originality.*

Manager and leader: The Healthcare IT case

The above dialectics clearly have considerable relevance for healthcare IT managers and CIOs, who have the task of both managing and leading (non-technical) decision-makers. The arguments are, however, hardly straightforward.

A good way to highlight the delicacy of the dual management/leadership challenge is to substitute CEOs for leaders in some of the above quotes.

For example, it would be a tough call to say the healthcare IT manager or CIO 'administers' and 'maintains', while the hospital CEO 'innovates' and 'develops', or for that matter that IT managers and CIOs have 'an eye on the bottom line' while CEOs have 'an eye on the (technical) horizon.

Searching for healthcare leaders

In the US, The National Center for Healthcare Leadership (NCHL) is a Chicago-based non-profit organization to stimulate the development of leadership in the healthcare area, especially in terms of the challenges of the 21st century. NCHL is seeking to transform the industry's leadership by competency-based learning, benchmarking against best-in-class organizations both inside and outside healthcare, and establishing standards of best practices, and collaborating with leaders inside and outside healthcare to continuously seek innovation and improvements in healthcare to benefit all of our communities.

Areas of relevance in the healthcare IT area, include Leadership Excellence Networks and the Health System Demonstration Project. Other areas which NCHL is supporting include a Nurse-Team Leadership Project, and a University Graduate Health Management Demonstration Project, an especially proactive measure to begin identifying and tapping into tomorrow's healthcare leaders.

Transformational Leaders for Healthcare

Healthcare IT is also part and parcel of some organisations associated with the NCHL: the Healthcare Research & Development Institute and, to an extent, the Institute for Healthcare Improvement. The most influential organisation, however, is GE Healthcare.

NCHL and the GE Institute for Transformational Leadership provide a portfolio of comprehensive learning programmes focused on leaders at critical stages of their careers as they advance within healthcare organizations. The programme curriculum is grounded in leadership development best practices, an area for which GE is renowned across the world. It is however crafted in the context of the healthcare industry, with due attention to both healthcare technology and IT management – as well as, of course, leadership.

A note of dissent: Artist, craftsman, technocrat

The concept of manager versus leader (and its seeming resonance in the US) has, however, been powerfully challenged from further up north. Patricia Pitcher, a Canadian business school dean and Chief Economist at the Toronto Stock Exchange, uses a factor analysis technique to define three types of leaders, each with a differentiated profile. The title of her book 'Artists, craftsmen and technocrats: The dreams, realities and illusions of leadership' (Stoddart, 1995) indicates how she visualises managers:

- ↘ Artists: imaginative, visionary, intuitive, daring, entrepreneurial and emotional
- ↘ Craftsmen: steady, well-balanced, reasonable, predictable, and trustworthy
- ↘ Technocrats: detail-oriented, fastidious, uncompromising, and intellectual.

Pitcher speculates that none of the above offers a universally preferred style of leadership. Instead, she suggests that artist leaders build and create, craftsman leaders solidify position, while technocrats are best at delivering on unpleasant jobs. Pitcher's study found no balanced leader who exhibited all three sets of traits.

MEETING THE CHALLENGES OF HEALTHCARE INTEROPERABILITY

AUTHORS

Philip J. Scott
is the Head of ICT Development Programmes, Portsmouth Hospitals NHS Trust and a Board member, HL7 UK.

President Obama's $19.2 billion HITECH Act has refocused attention on healthcare interoperability. The legislation (Title XIII of the American Recovery & Reinvestment Act, available via http://www.white-house.gov) aims to have electronic health records for the whole US population by 2014. It budgets $20 million specifically for "advancing health care information enterprise integration through activities such as technical standards analysis and establishment of conformance testing infrastructure".

The American Recovery & Reinvestment Act's emphasis on adoption of "certified" Electronic Health Records (EHRs) requires the existence of standards against which the record systems can be tested and validated. A substantially enlarged effort in healthcare interoperability standards is anticipated. What will this mean for healthcare IT in Europe?

The aim of this article is to give a brief overview of healthcare interoperability. Are international standards really necessary? How does standards development affect healthcare providers and IT vendors? I write predominantly from a UK perspective and offer a personal viewpoint, not an official voice of either the NHS or HL7 UK.

What is healthcare interoperability?

In a general sense, "interoperability" simply means to be able to work together. In the case of healthcare, we need to be able to safely and securely create and convey a meaningful record of clinical knowledge, plans and actions. This could be as simple as reporting whether a biochemistry test result is normal or abnormal, or as complex as a detailed record of a hospital admission.

The US National Alliance for Health Information Technology (NAHIT) produced a widely-supported definition of healthcare interoperability (based on IEEE's wording): "the ability of different information technology systems and software applications to communicate, to exchange data accurately, effectively, and consistently, and to use the information that has been exchanged" (see **www.nahit.org**).

Healthcare interoperability can apply at different levels, typically described as either syntactic (grammatical) or semantic (logical). Syntactic interoperability means that both the provider and consumer systems can process defined messages or records and determine whether they are correctly structured. But at this level, the systems cannot validate the logical content of the information. It may be quite correct in structure but contain meaningless data. Therefore, for healthcare IT the final goal is computable semantic interoperability – enabling software systems to interpret and validate the clinical content of an EHR or message. This complex, higher level of interoperability requires a common information model and a robust method to link interpretable concepts to items in record structures and transactions so that meaning (in context) can be safely reproduced.

Why should we work to international standards for healthcare interoperability?

Standards development is sometimes portrayed as distant from the real world, a remote academic exercise practised only by learned experts as a self-perpetuating industry rather than a useful solution to pressing operational problems. And there is some truth in this view! But what is the alternative?

If we do not work to standards then we face information anarchy. We simply cannot achieve anything beyond very limited and small scale localized interoperability without at least national or preferably international standards. Citizens are mobile and major system vendors need to operate globally.

In my view there are three key arguments for standards:
- They prevent repeated reinvention of solutions for virtually identical business needs. They provide compatible ways to share information without constraining the innovative functional advantages that can give one system a competitive edge over another.

- They can act as a form of "corporate memory", embodying the knowledge, experience and ethics of dedicated specialist teams.

- They enable integration solutions to become packaged commodities rather than bespoke developments. Multiple vendors can then offer services such as conformance testing, implementation management, training and support.

When developed with sufficient versatility, standards can allow constraints or specialisations that encompass specific business requirements for localisation and diversity, either by clinical specialty, healthcare domain (private/public, primary/secondary care) or national/regional realm.

In summary, we cannot envisage joined-up global, or even pan-European, healthcare without international standards for EHR interoperability.

Where are we with healthcare interoperability standards?

Internationally, there is continuing intensive work on a range of core standards. HL7 version 3 has a robust Reference Informa-

tion Model (RIM). The RIM is mostly used to specify structure for records or messages, but has recently been used in software design (RIMBAA – RIM-based application architecture). HL7 also publishes the versatile and widely-adopted Clinical Document Architecture (CDA).

The European standard EN13606 for EHR communications defines an information model that is conformant with the HL7 RIM and can be mapped to CDA. EN13606 adds the important concept of clinical archetypes (devised by the openEHR Foundation), meaningful "chunks" of structured healthcare information such as observations, plans, findings or treatments. These are essentially the same as templates in HL7.

SNOMED CT provides a foundation for clinical terminology content expressed in a rich and flexible ontology comprising over 300,000 distinct concepts and over a million relationships between them. At the archetype or template level, data items ("fields" in the information model) can be "bound" to specific constrained ranges or value lists of clinical terms. For example, a "blood pressure" archetype might be constrained to a particular set of SNOMED CT terms related to whether the patient was standing or sitting, the diastolic and systolic values, the type of instrument used or other specified clinical parameters. The idea is that archetypes and templates can be re-used across multiple clinical domains and provide a level of modelling that is meaningful to care providers who are not IT experts.

The global organization Integrating the Healthcare Enterprise (IHE) originated in the radiology field but has extended into a range of clinical domains. IHE develops and maintains profiles of specific use cases, defining particular uses of HL7 messaging and DICOM image workflow. IHE operates on a vendor self-certification basis, where suppliers publish their own compliance statement indicating the IHE profiles that they support. IHE compliance is demonstrated by participation in the annual Connectathons, valuable opportunities for suppliers to work together (interoperate!) to show end-to-end information flow for particular operational scenarios.

There is also work in progress on summary patient records at various levels. For example in Scotland there is the Emergency Care Summary (ECS), in England the Summary Care Record (SCR) and in Europe the EPSOS project is in its early stages.

However, current operational EHRs in the UK are mostly islands of information – GP clinical systems, departmental hospital systems and a small minority of hospital-wide information systems. There has been excellent progress in electronically transferring patient records between GP systems, but this is so far limited to a subset of vendor systems. Most current healthcare interoperability in Britain still uses a mixture of loosely defined international standards (for example, various flavours and interpretations of HL7 v2), some international profiles (for example, IHE radiology workflow profiles) and, predominantly, locally devised or proprietary solutions. Furthermore, due to the gulf between GP and hospital EHR maturity there is yet no interoperability at the semantic level between primary and secondary care, as there

is no significant content with which to interoperate. The only nationally defined and supported information standard for electronic communication from hospitals to GPs in England is the EDIFACT-based method for sending laboratory results.

How do interoperability standards affect on the vendor market?

In England, the rigorous approach adopted for conformance certification to national specifications has raised the entry level of investment for vendors wishing to supply products compliant with national systems.

However, much healthcare activity is outside the current scope of national systems. So many smaller vendors are still active for departmental systems or corporate systems with only local integration. Such solutions can use less rigorous standards, such as flavours of HL7 v2 or proprietary integration methods, but this adds to the costs per implementation. There are many opportunities for systems integrators at the local hospital level due to the predominance of applications that are not standards-based.

What is the likely European impact of the Obama HI-TECH investment?

If the American programme follows the anticipated path of building upon usage of HL7 v3 CDA, SNOMED CT and IHE, then this will support and enhance the work already done by the national programmes in Canada and England, among others.

In particular, global vendors who have already participated in standards development will be well placed to take part in the American projects.

The Obama investment should also increase the drive for cooperation between standards development initiatives, as already seen in accords such as the collaboration agreement between HL7 and IHTSDO, the not-for-profit organization that owns and promotes SNOMED CT.

One key factor will be whether the American programme centrally manages its own conformance testing or opens this to the market. If specifications used for certification are close to the international standards (with minimal realm-specific modifications) and the process can be delegated to authorised testing centres, it is possible that the financial entry level for vendors need not be prohibitive for niche or start-up companies.

Either way, it seems likely that the HITECH Act will further polarize the market between major global vendors and niche suppliers of specialized systems or integration as a commodity.

Conclusions

There is no question that standards are essential for effective healthcare interoperability. The incentives and mandates from national programmes give the impetus that is needed for widespread adoption of standards. In turn, the widespread adoption matures the standards. And, ultimately, patients will benefit from the improvements in care made possible by safe and reliable production and transmission of their healthcare information.

TANGOING TOWARDS E-HEALTH
THE AUSTRALIAN CASE

AUTHOR
Tosh Sheshabalaya,
HIT

The year 2009 has witnessed a flurry of initiatives in Australia to get its healthcare infrastructure e-Health ready. As in Europe or the US, however, the process has seen some steps forward, others backward, and quite a few to the side.
The issue of most concern in Australia at the moment is that the government seems ready to leave e-Health, not least the Electronic Health Record, to the 'market'.

National e-Health Strategy endorsed in December

A National e-health strategy, formulated in a report by consultants Deloitte Touche Tohmatsu and endorsed by the Australian Health Ministers' Conference in December 2008, noted that up to 18 per cent of medical errors resulted from lack of access to patient information. These in turn entailed a cost to the country of about AUD 3 billion a year "in avoidable expenditure – money that could be better spent on health demands driven by an ageing and sicker population."

Health, noted the report, is "a knowledge industry with information being central to all aspects of care planning, management and delivery." In spite of this, the primary information tools used to manage health care in Australia "still revolve around pen, paper and human memory."

The Deloitte report recommended that Australia establish a strategy of alignment across government jurisdictions in four different areas:

↘ Implementing the national health information highway, with appropriate infrastructure and rules to allow the secure sharing of information

↘ Stimulating investment in high-priority IT systems and associated tools

↘ Encouraging the health sector to use the tools

↘ Establishing an e-health governance regime

The report also went straight to the heart of the technical arguments for e-Health:

"In a complex, multi-point service delivery environment with hundreds of millions of encounters each year, reliance on largely manual processes and information flows creates the potential for errors and inefficiencies."

Fragmentation and under-funding

The Australian approach to e-health, like some countries in Europe, is to proceed via a phased and incremental build-out of existing clinical systems and communications platforms, but keep national goalposts and a full EHR as its target.

So far, in spite of several reports on the efficiency and safety gains of a national e-health system, different parties have pursued their own agendas, resulting in a fragmented infrastructure.

Although the inter-State Council of Australian governments approved AUD 218 million in investments for the National E-Health Transition Authority (NEHTA) in 2008, the lack of a national plan has entailed significant federal underfunding.

NEHTA is the enabling agency responsible for establishing a uniform IT infrastructure across the country and has committed to deliver a unique healthcare number for every Australian resident by 2010.

Large-scale e-Health applications promised in January …

In January 2009, NEHTA announced that large-scale applications of a pan-Australian e-health system would start during the year, and do so as quickly as possible.

The first areas identified for action by NEHTA included hospital discharge summaries and electronic medication management.

… but Government retracts soon after

In spite of the burst of NEHTA initiatives in January, however, a month later Federal Health Minister Nicola Roxon announced that NEHTA would continue with its foundation work on interoperability and information security, rather than proceed with rolling out operational applications. Worse, full details of the Deloitte-advised National e-health strategy remained under wraps – except for the summary information released in December.

This was a sharp about-turn from the enthusiasm shown personally by Minister Roxon at the Australian Health Ministers' Conference, which endorsed the e-health strategy and stated that it was "a practical framework" for further steps.

Advocacy groups step up pressure

In the face of such official inertia and secrecy, patient groups and healthcare professionals have sought to force the government to change course.

Consumers Health Forum, an especially powerful advocacy group, notes that patients sought "access to their health information when and where they need it", and so "we're continuing to push for a full e-health record".

On its part, Australia's local healthcare IT body, the Medical Software Industry Association, has also raised its profile in anticipation of increased involvement in consultations over national e-health projects.

Physicians too are calling for more to be done. In January, the Australian General Practice Network (AGPN) called for its e-health training programme to be extended after it comes to an end in June this year.

In February, heavier artillery support for e-health arose after the Australian Medical Association formally identified e-health infrastructure as one of three 'critical' priorities (alongside investment in GP training and for equipment at rural hospitals) for the Australian government's AUD 10 billion Health and Hospitals fund. In an official submission, the Association noted the need for "further investment in e-health infrastructure, particularly in hospitals, medical practices, aged care, pharmacy and other allied health practices" and said this was indispensable "to fully enable the sharing of patient information electronically in Australia."

The Health and Hospitals Fund is for investment in health and hospital facilities and equipment, medical technology and major medical research facilities. Moneys in the Fund can also be used for information management and technology systems installation.

Leaking 'secrets' in the e-Health strategy

In spite of such pressures for accelerating real moves towards a national e-health system, the retrogressive momentum has strengthened in the months since. Both federal and state ministers have continued to keep a lid on costings and timetables.

In May, an activist physician and IT expert, Dr. David More, leaked several findings of the National e-health strategy report on the Internet. He noted that the full report had been available to all official health bodies for over six months, and that he found it "quite wrong in my view that the public does not get a chance" to debate its merits.

One point of interest: Deloitte called for the abolition of NEHTA, accompanied by the establishment of a fresh e-health entity with a more influential governing board and stronger regulatory powers. According to some observers, rearguard resistance by NEHTA may be part of the explanation on the

secrecy surrounding the report, and the stalemate in the months since about recommended policy measures and actions. As discussed later, the latest Australian budget seems to have only strengthened NEHTA's hand.

Modest investments required

According to figures from the report released by Dr. More, the estimate for a national e-health infrastructure is just AUD 1.5 billion over five years, or AUD 2.6 billion for a 10-year roll-out. This, stated the report, "represents a relatively modest investment", in the context of Australia's annual health spend of AUD 90 billion, two-thirds of it from the State.

In addition, Deloitte estimated "tangible benefits" from implementing the e-health strategy at AUD 5.7 billion in net present value terms over a timeframe of ten years.

The report identifies four key areas for investment on the five-year timeframe:

- Foundational activities: AUD 370 million (24.7% of overall outlays)

- E-health solutions: AUD 630 million (42%)

- Change and adoption: AUD 470 million (31.3%)

- Governance: AUD 30 million (2%).

Marginal success in pilots/standalone projects

The relative insignificance of the above numbers are all the more perplexing when account is taken of the over-AUD 5 billion spent over the past decade on e-health projects and pilots by Australia's government (at the federal and state levels). Overall, such an effort has resulted in only "marginal" success, according to the Deloitte report.

Worse, though some standalone projects have delivered encouraging results, almost none can be easily connected to other health systems or scaled up, the report observed.

The risks ahead: Scalability, heterogeneity

"There is a point at which the number of these disparate systems will be so great, and integration so difficult," that gains from a future integrated system may become "prohibitively risky and expensive." In turn, this will undermine Australia's ability "to promote equity in health outcomes, drive meaningful safety and efficiency gains, and ensure safeguards for personal health information."

Such an explicit warning on the risk of technological heterogeneity (alongside an inability to scale up and interconnect) may have powerful resonance in Europe. Europe too faces a plethora of competing bottom-up e-health initiatives, moving forth at different speeds, and doing so ironically because of top-down EU-level legislation on an e-health framework.

An e-Health bombshell

As Healthcare IT Management went to press, Australia, in a little-noticed move, dropped an e-health bombshell after the government seemingly endorsed moves by the likes of Google and Microsoft to foray into the field of health records.

At the end of April, the National Health and Hospitals Reform Commission unexpectedly rushed out a paper which found that "commercial IT developers" were best placed to deliver personal e-health records to patients, and do so in an "open, competitive market." This was a death blow to concerns about the specific security requirements of a national health information system and more broadly, of personal healthcare data.

For seasoned observers of technology policy, signs of a build-up to this state-of-affairs were present ever since the Australian government clamped down on releasing the findings of the Deloitte National e-health strategy report.

Security and privacy

Federal Health Minister Roxon has since mandated civil servants to draw up new rules and regulations, and "develop a legislative and regulatory framework" so that physicians and public health providers can share sensitive patient data, and to overcome security/privacy concerns that have so far restricted secondary use of personal medical information.

The Department of Health says it will also "support secure messaging services to assist the widespread take-up of electronic referrals, prescribing and discharge summaries, and develop policy parameters for a long-term approach to individual e-health records."

Not astonishingly, the areas of prescribing and hospital discharge summaries were precisely those identified for large-scale application rollouts by NEHTA as a means to establish a homogeneous IT infrastructure across the country.

Pragmatism and bureaucracy

Australia's stance on e-health and EHRs may well turn out to be the most pragmatic in the long run. Rather than the government, it will be the Australian patient who pays commercial providers of EHRs to build and maintain their health records.

However, the ease and haste with which long-running fears about patient data 'security' were jettisoned suggests that, across the world, the e-health debate is at least partly dictated by technology for its own sake, and that neither politicians nor civil servants have the expertise to set a realistic agenda.

In the typical diction of any bureaucracy, the Australian government notes: "Appropriate levels of protection of an individual's health information will help provide consumers with confidence that their information is managed in a secure environment."

The next steps

The Australian government's federal budget announced in mid-May laid to rest any further speculation about its commitment to the core recommendations in the Deloitte National e-health strategy report.

Instead of the AUD 1.5 billion five-year budgetary outlays recommended by the report, the Government earmarked AUD 57 million to "support the health sector to safely exchange health information between authorised healthcare providers, with the long-term goal of every Australian having access to their own individual e-health record." Funding for these items is set to drop in stages to AUD 27 million in 2012-13, underscoring the fact that it saw patient-funded EHRs by "commercial IT developers" in an open market as the way forward. The only e-health application to be funded is an AUD 1.2 million clinical information network for Tasmania, for which a paltry AUD 300,000 has been allocated in this year.

On the other hand, an AUD 10 million outlay for e-health 'efficiency programs' has been withdrawn (also scrapped is a total of another AUD 25 under the heading over the next two years).

Last but not least is the dumping of the Deloitte recommendation on NEHTA. The budget unequivocally states that NEHTA will be in the driver's seat as far as the goal of "improving clinical decision-making" is concerned.

Healthcare IT pips

Alongside the absence of any meaningful e-health funding commitments (bar the AUD 1.2 million Tasmanian clinical information network), the latest Australian budget commits AUD 300 million to practice incentive programs (or PIPs) for general practitioners (GPs).

Included here is a controversial secure messaging PIP which will enable an estimated 4,000 to 5,000 GPs to secure AUD 50,000 per year in grants by using "approved software".

Such approvals do not yet exist.

To qualify for the grant, GPs will be paid as long as their software provider has agreed to participate in NEHTA-led workgroups which set standards for next-generation platforms.

These workgroups too have yet to be formally set up. Indeed, the body responsible for national health IT standards is the IT-014 committee of Standards Australia (which establishes standards for all industries).

Meanwhile, vendors of secure messaging do not need to demonstrate any security features, not even the HL-7 compliance for electronic messaging which NEHTA adopted in 2007.

Since the year 2000, Australian GPs have received significant subsidies to use PCs and connect to the Internet. However, given the lack of a national e-health infrastructure, patient information remains largely locked in individual PCs.

The University Hospital Hamburg-Eppendorf Introduces New Quality Standards for the Distribution of Radiology and Clinical Images

UKE implements Web-based Centricity RIS/PACS solution by GE Healthcare

HAMBURG, APRIL 22, 2009 – Short distances in hospital information exchange help to reduce time for examinations and get fast diagnoses. Therefore integrated radiology information and picture archiving communication systems (RIS/PACS) are key in modern healthcare. The University Hospital in Hamburg-Eppendorf (UKE) has implemented a Web-based IT solution by GE Healthcare for radiology information management and picture archiving of all imaging modalities in the newly created hospital building.

The goal is to optimize the radiology and clinical workflow and guarantee real time access to patient information, including images. The Web-based PACS is playing a key role in this process: it is building the foundation to access images from any PC throughout the hospital. At UKE, Centricity is part of the Electronic Patient Record (EPR). Therefore an extensive authorization concept has been worked out with Hamburg's data security authority. It includes 800 different constellations of authorization in order to limit access possibilities following function, modality and the profession of users accessing the database.

"In order to guarantee a high quality patient care at UKE we are working with state-of-the-art standards. Therefore a powerful RIS/PACS solution is indispensable," says Prof. Dr. med. Gerhard Adam, Director of the clinic for diagnostic and interventional radiology. Dr. Peter Gocke, leader of Information Technologies, adds: "The performance of Centricity Web-PACS was a positive surprise for us. Finally we are able to provide a seamless image distribution throughout our clinics. This productive IT solution is one of the reasons why we are currently one of the most modern hospitals in Europe."

Only half a year after placing the order, the RIS/PACS system was integrated into UKE's existing hospital information system (HIS) and the EPR. Since February 2009, the system is fully operational.

"We expect to achieve an improved and streamlined workflow with the new RIS/PACS-solution," explains Prof. Adam. "In addition, we are able to integrate modalities such as ultrasound and endoscopy." So far diagnostic radiology, nuclear medicine and neuroradiology are fully integrated. Further modalities will follow. Besides, the project plan foresees the cooperation with a private medical prevention center specialized in full-body MRI scans. Centricity will also be applied at the rheumatism clinics in Bad Bramstedt, also partnering with UKE.

"Centricity IT-solutions by GE Healthcare are among the leading digital technologies for image management, distribution and archiving worldwide," says Juergen Reyinger, Vice President and General Manager at GE Healthcare IT in Europe. "Centricity is user-friendly, easy and fast to install and 'Citrix Ready'." In addition, it offers an ultra-fast streaming technology and modern tools like 'Pixel-on-demand', MIP/MPR (Maximum Intensity Projection Module/Multiple Planar Reconstruction) and PET/CT (Positron Emission Tomography / Computed Tomography). Temporary access via 'Grant Access' and advanced 3D technology to easily evaluate huge sets of data are key for referring physicians. "The project at UKE proves once more our know-how and great competence to implement complex projects reliable and on time. This is what significantly differentiates us from our competitors," Reyinger concludes.

About GE Healthcare

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technology, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our "healthymagination" vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality and efficiency around the world. Headquartered in the United Kingdom, GE Healthcare is a $17 billion unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employs more than 46,000 people committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at **www.gehealthcare.com.**

Contact

GE Healthcare, Europe, Middle East & Africa
Allison Cohen
T: +972 (0)4.8579.290
Cell: +972.(0)54.7299.742
allison.cohen@ge.com

GE Healthcare IT, Europe, Middle East & Africa
Nicole Lipphardt
Cell: +49 (0) 172 7460 038
nicole.lipphardt@ge.com

GE Healthcare

VALUE BASED SERVICE INNOVATION IN HEALTH CARE

AUTHOR

Paul Johannesson
is Professor of Information Systems at the Royal Institute of Technology, Stockholm

Martin Henkel
is a lecturer at Institute, in the area of information systems

The complexity of today's health care systems is increasing with large numbers of specialised actors cooperating in novel organisational forms and networks. At the same time, stakeholders in health care need to innovate in order to manage changes in social attitudes, economic conditions and the potential of medical technologies. In order to meet the challenges of complexity and innovation, healthcare organisations need to design new forms of collaboration as well as novel service offerings.

Value Models: A Novel Form of Enterprise Modelling

Designing innovative healthcare services, including e-services, is an intricate task that needs to address the needs and wants of citizens as well as the goals and constraints of healthcare providers. An effective instrument for this task is a novel form of enterprise modelling, called value models, that focuses on the exchange and transformation of resources in value networks.

Complexity and Innovation

A core component in the European welfare society is an equal and efficient healthcare system. Large resources are spent on healthcare, but a number of problems still remain, including unequal access to healthcare, large variations in outcomes of treatments, deficiencies in service quality, and inefficient resource use. A main reason behind these problems is the complexity of the healthcare sector, where a large number of stakeholders participate and interact in order to ensure the delivery of high-quality healthcare. Organisational forms, vocabularies, IT systems, regulations, and relationships vary and evolve over time, thereby contributing to the complexity. Furthermore, European healthcare faces a period of potentially profound changes: in social attitudes, economic conditions and the potential of medical technologies. This makes the ability to innovate and evolve essential for stakeholders in healthcare.

In order to manage complexity and support innovation, healthcare organisations need to acquire effective instruments for managing their knowledge about themselves and their environments. One popular instrument for this purpose is enterprise modelling that offers graphical representations of the structure, processes, information, resources, people, and constraints of an organisation. A novel type of enterprise model has recently been proposed, so called value models (or business models). A value model gives a high level view of the actions taking place in and between organisations by identifying actors, resources and the exchanges of resources between the actors, thereby making it possible to visualize networks of cooperating actors. Value models provide compact and graphical descriptions of complex networks, which makes them ideal for supporting com-

munication between different stakeholders. Furthermore, value models can be used for the purpose of innovating new and improved healthcare services by supporting stakeholders in reasoning about the values and benefits of the services. In this article, we will outline how value models can be used for service innovation in healthcare.

The Basics of Value Models

The central entities in value models are actors, resources, and exchanges and transformations of resources. The purpose of a value model is to show how these entities can be configured in order to form value networks, i.e. networks of actors that collaborate to produce value.

Actors. An actor is someone who is able to participate in resource exchanges and transformations. An actor is typically a legal entity, such as a person or a company.

Resources. A resource is an object that is viewed as being valuable by some actor. A resource is typically scarce; otherwise an actor would not consider it valuable. Some concrete examples of resources are books, cars, movies, haircuts, and medical treatments. However, resources can also be of a more psychological and social nature, such as status, beauty, pleasure, health state, honour, and feeling of safety. The first examples of resources are often classified as economic resources, meaning that they can be controlled by an actor and can be transferred from one actor to another. The latter examples of resources are internal to an actor and cannot be sold or bought.

Transformations. An action that uses some input resources to produce new or modify existing resources is called a transformation. For example, water and flour can be used as input resources in a baking conversion to produce bread. Another example is an eye treatment that is used to improve the health state of a patient.

Exchanges. An exchange of a resource occurs when one actor transfers the ownership of a resource to another actor.

The Eye Hospital Case

The figure below shows an example of a value model. The model is an excerpt of a larger value model created in the REMS (Referral Management and Support) project, a collaboration project between the County Council of Stockholm, St. Eriks Eye Hospital, and The Royal Institute of Technology. The purpose of the project was to improve the collaboration between the primary care providers and the eye specialist clinics within the Stockholm area. The value model was used as a starting point for analysing the resource exchanges between the patient, the primary healthcare units and the eye specialist clinics. Subsequently, this analysis was the input to defining new e-services supporting the resource exchanges.

In the value model in Fig. 1, actors are shown as stick person icons and exchanges as labelled arrows. A label on an arrow tells which (economic) resource is exchanged and, within parentheses, the benefits of using the resource, i.e. what benefits the receiving agent can get by using the resource in a transformation.

Let us take a closer look at the exchanges from the primary healthcare provider to the patient. When a patient experiences an eye health problem, she will visit a primary healthcare provider. The primary resource this provider offers is an investigation service. The benefit of this investigation is that the patient gets an increased feeling of safety. Furthermore, the investigation provides a basis for an information exchange, where the provider informs the patient about her health status. This information has the benefit that the patient will get an increased knowledge of her health condition. If the pa-

tient needs further treatment, either the primary care provider will carry out the treatment (not shown in Figure 1) or the provider refers the patient to an eye care specialist at a hospital clinic that is able to provide advanced treatments. To do this, the provider offers a referral to an eye specialist treatment, which is a voucher for an eye treatment.

There are two benefits as a result of the exchange of the referral. The first benefit is direct: the patient will get an increased feeling of safety, since the patient knows that the referral can be used for advanced treatment, thereby reducing anxiety. The other benefit is more indirect: if the patient uses the referral, the treatment at the hospital clinic may improve the health state of the patient, i.e. another benefit of the referral is a potentially better health state. Furthermore, when the primary care provider starts investigating the patient, it gets a responsibility for the patient's health, i.e. the provider is responsible to carry out required actions in order to maintain or improve the patient's health state. The benefit is that the patient gets an increased feeling of safety, since she/he knows that a professional healthcare provider has a responsibility for her health.

The other exchanges in the value model can be described in a similar way, but this is left out for reason of space. The example illustrates some of the advantages of value models. They enable healthcare stakeholders to easily get an overview of their complex networks. They can be used to describe the rationale of a network and analyse its sustainability and the benefits it provides to its participants. Value models can also be used as a starting point for identifying business processes and services needed for realising the interactions of a healthcare network, and this is the topic for the remainder of this article.
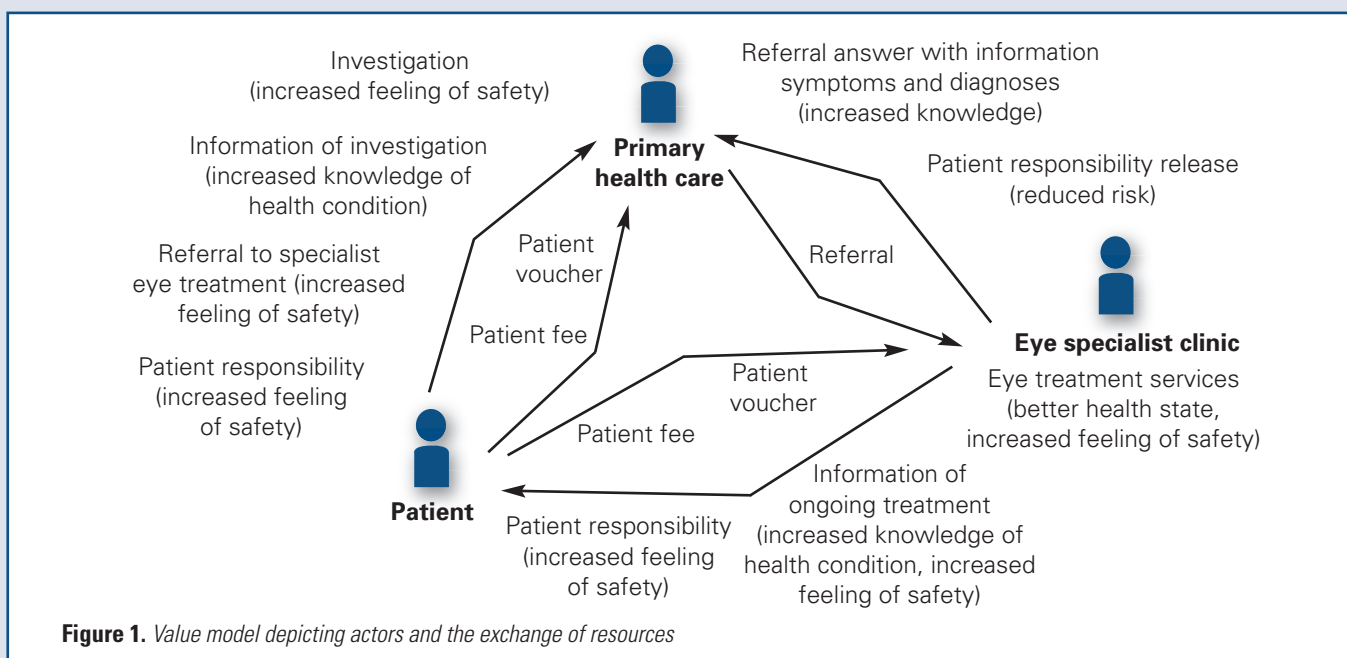

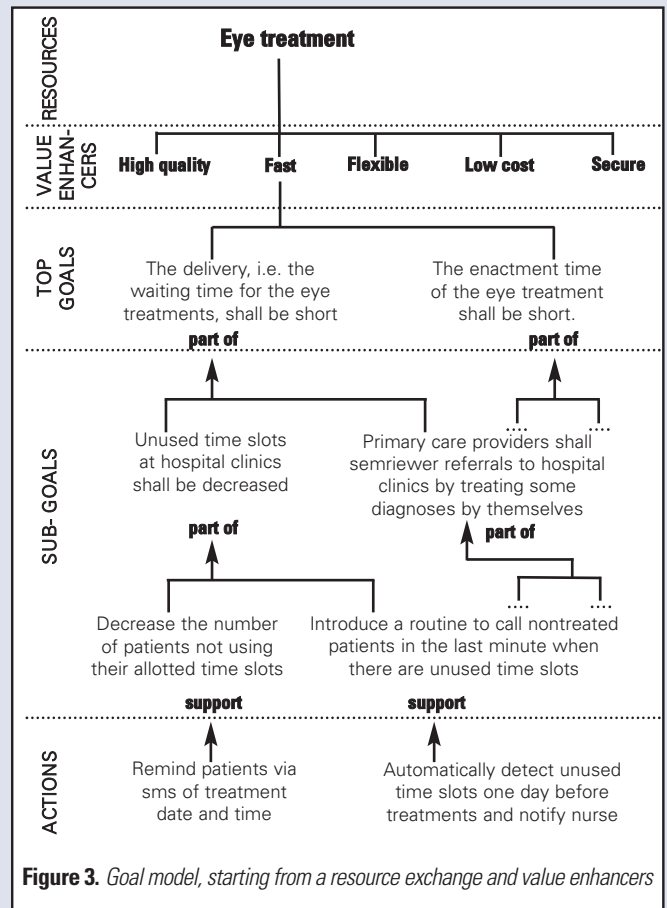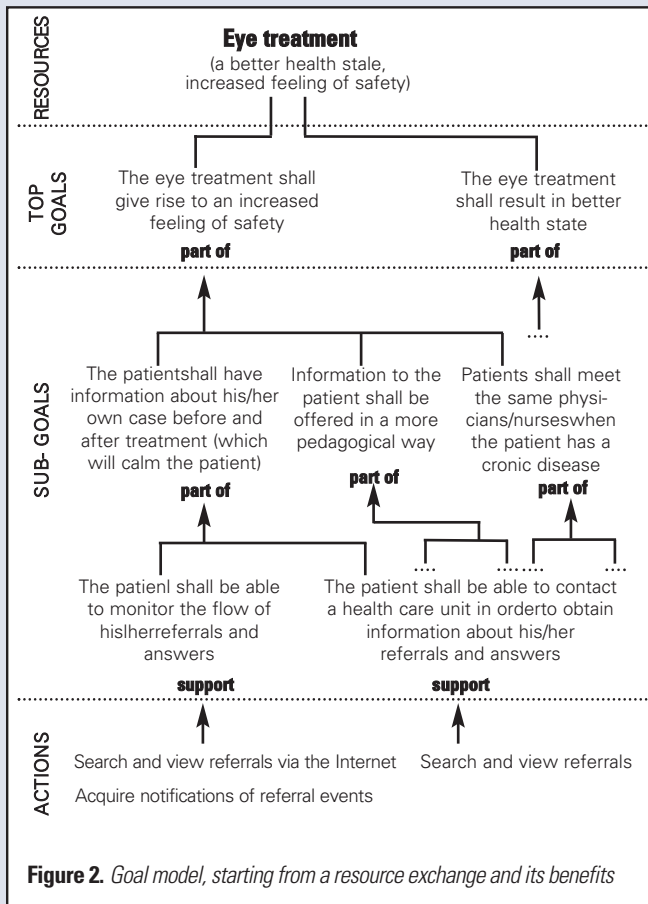**Figure 1.** *Value model depicting actors and the exchange of resources*

From Values to Goals and Actions

As a first step in identifying and designing processes and services, it is helpful to derive goals from the resource exchanges in a value model. A goal is generally a description of a desirable state, something that is worth pursuing. In other words, a goal expresses something a business seeks to accomplish, a desired future state of affairs or condition. Examples of goals are being the market leader in an industry or having a profit of more than 1 million euros. Goals can be decomposed, i.e. one goal can be a part of another goal. Generally, the decomposition forms a hierarchy where high level goals are broken down into sub-goals. In order to achieve a goal, an organisation can make use of actions. The main difference between actions and goals is that an action states what an organisation will do to achieve a goal, while a goal tells what the organisation views as desirable. When breaking down a goal into a goal hierarchy, the goals will be more concrete further down the hierarchy and actions are commonly defined for these lower level goals.

One way of identifying goals from a value model is to address each resource exchange and focus on the benefits it is intended to provide. For example, starting from the re-

source exchange of Eye treatment, we can identify two top level goals "The eye treatment shall give rise to an increased feeling of safety" and "The eye treatment shall result in better health state", see Fig. 2. Each of these goals can be decomposed into a number of sub-goals. Such sub-goals may concern the exchange of information between actors, responsibility relationships between actors, transaction costs, internal efficiency, risk management, etc. In Fig. 2, we have decomposed the top levels goals mainly by focusing on information exchanges, taking into account what information patients should get and what channels should be used to distribute it. Goals at the lowest level are related to actions that can support them.

Another way of identifying goals from a value model is to focus on desirable properties of resources that are exchanged as well as desirable ways in which the resources are delivered to the recipients. In particular, desirable properties in this context are high quality, fast, flexible, low cost, and secure. These properties are called value enhancers as they describe what makes resources even more valuable. The value enhancers can be used to assist a designer in finding goals that address the usefulness of a resource as well as the adequacy of its delivery. For each resource being ex-

Figure 2. *Goal model, starting from a resource exchange and its benefits*

Figure 3. *Goal model, starting from a resource exchange and value enhancers*

changed and for each value enhancer, we identify a number of top level goals.

In Fig. 3, we have started from the resource Eye treatment and identified two top level goals based on the value enhancer "fast". The first one states that the waiting time for the eye treatment shall be short, while the second one states that the time for carrying out the treatment shall be short. Just as before, we can decompose these goals into lower level goals based on aspects like information exchanges, internal efficiency, risk reduction, and resource planning. In the example, we have primarily considered sub-goals about resource planning, i.e. how time slots shall be booked and used in efficient ways. Finally, we identify actions to support low level goals. These actions can vary in nature but they often take the form of new e-services. For example, the sub-goal of decreasing the number of patients not using their time slots can be supported by an e-service that reminds the patient via SMS.

In the REMS project the value model and goal models were created in several modelling seminars, each seminar included representatives for the involved actors. Together with a seminar leader proficient in goal modelling, the representatives identified sub-goals and supporting actions. In this way, the decomposition of top level goals into actions led to the identification of a number of e-services. A subset of these services was later implemented in a web-based system.

Concluding Remarks

The approach suggested in this article can be used in two ways. First, it can be used to systematically suggest and identify new innovative actions that improve the overall performance of a network of actors in the healthcare sector. A part of these identified actions will be the creation of new e-services. The approach will thereby assist designers in generating new ideas, where the use of value and goal models helps to ensure that all potential improvements are explored. Secondly, the approach enables traceability of actions to the high level goals they support. This enables designers to validate existing actions, in particular the effect they have on actors participating in a value network.

The proposed approach illustrates how value modelling can be used to systematically design, reconfigure and improve networks of healthcare providers, citizens, and other stakeholders. These tasks will become even more important in the future, as citizens are no longer only passive consumers but active co-producers of value in a healthcare network.

INTEGRATING STRATEGIC AND TACTICAL INFORMATION MANAGEMENT IN HOSPITALS:
Interactive Strategic Information Management Plans

AUTHOR

Ulrike Mueller
is with the Institute for
Medical Informatics, Statistics
and Epidemiology at the
University of Leipzig, Germany

As hospital information systems become more and more complex, the need for effective and efficient information processing increases. A precondition for systematic information management is a Strategic Information Management plan (SIM plan).

Introduction

SIM plans are a result of enterprise architecture planning. As this, they describe the goals of information management aligned to the hospital's business goals. From the goals, the optimal future architecture of the hospital information system is derived, and a migration strategy is described that contains the projects that have to be realised to build the future architecture.

Since 1996 the project group "Management of health information systems" of the Institute for Medical Informatics, Statistics and Epidemiology (IMISE) is responsible for developing the SIM plan of the Leipzig University Medical Center. Past plans have usually been valid for a three-year period. Only paper copies were published. Although the strategic planning in general paid off well, the publishing process turned out to have some disadvantages:

↘ In a validity period of three years the plan's contents like planned projects or sometimes even strategic goals, are subject to change. In a paper document this cannot be taken into account without a revised version, which in turn is costly and time-consuming. There-

fore the document is left as it is and thus goes out of date fast, which reduces the acceptance among the users (CIO, IT project managers) even faster.

↘ In the majority of cases no systematic monitoring of whether the goals described in the SIM plan are achieved takes place during the validity period of the plan. This is, of course, also due to the fact that a paper document does not allow for updating key figures needed for continuous monitoring (like an automatically generated electronic document would) but it involves the risk of missing goals or at least parts of them.

Publishing the SIM plan as an interactive document and in parallel offering a possibility to monitor the plan's goals would avoid these disadvantages and harbors the chance of making the SIM plan the Central Information Management application.

Information management

Information management can be differentiated into strategic, tactical, and operational information management. Objects of information management are information, application systems and information technology. These objects have to be planned, directed and monitored.

Strategic information management deals with the information system as a whole. Its goal is to enhance the hospital information system in a way that it supports the hospital's business goals. Tactical information management deals with single components of the hospital information system that have to be introduced, enhanced or replaced for strategic purposes. The realization takes place in terms of projects that are defined in the SIM plan and initiated by strategic information management. Operational information management is responsible for the provision of resources that are necessary for the smooth operation of the hospital information system. It provides not only hardware like PCs, printers or network components, but also personnel for maintenance and user support.

The relation between strategic, tactical and operational information management can be described that way: the success of strategic information management depends on tactical and operational information management. Strategic information management defines orders that have to be executed according to their types either by tactical or operational information management. After the completion of the order the tactical or the operational information management reports

the results to the strategic information management, more precisely, the strategic monitoring, where this information is used for updating the strategic planning or initiating new projects (see Figure 1).

Strategic information management planning
The first and most creative step of strategic planning is the development of the information management goals. These goals have to be formulated in consensus with the hospital's top management, i.e. they should base upon the hospital's business goals. As a next step, the current state of the hospital information system has to be described and assessed regarding how far it fits to the strategies. Conveniently, a description of the hospital information system's current state already exists, because such a documentation is useful for other information management tasks too. An expressive modeling technique for such a purpose is the Three-layer Graph-based Meta Model 3LGM (www.3lgm2.de), which describes the enterprise functions of a hospital, the application components used to support the enterprise functions as well as the hardware components necessary for the operation of the application components on three linked layers. As a result of the assessment the future architecture should be derived. To close the gap between the current and the future architecture, a project portfolio including assigned resources like personnel, investments and future operation costs as well as deadlines have to be defined.

The result of this planning process is the SIM plan. The validity period of a SIM plan is limited. It has to be rewritten or updated after 3 to 5 years.

Strategic monitoring
Monitoring of hospital information systems means to examine continuously if the goals defined within the planning process are achieved, and if the hospital information system supports the business functions efficiently. The information management should be able to assess the state of the information system by means of key performance indicators regarding costs, quality, and productivity. Monitoring takes place on each information management level (strategic, tactical and operational). It is part of a con-
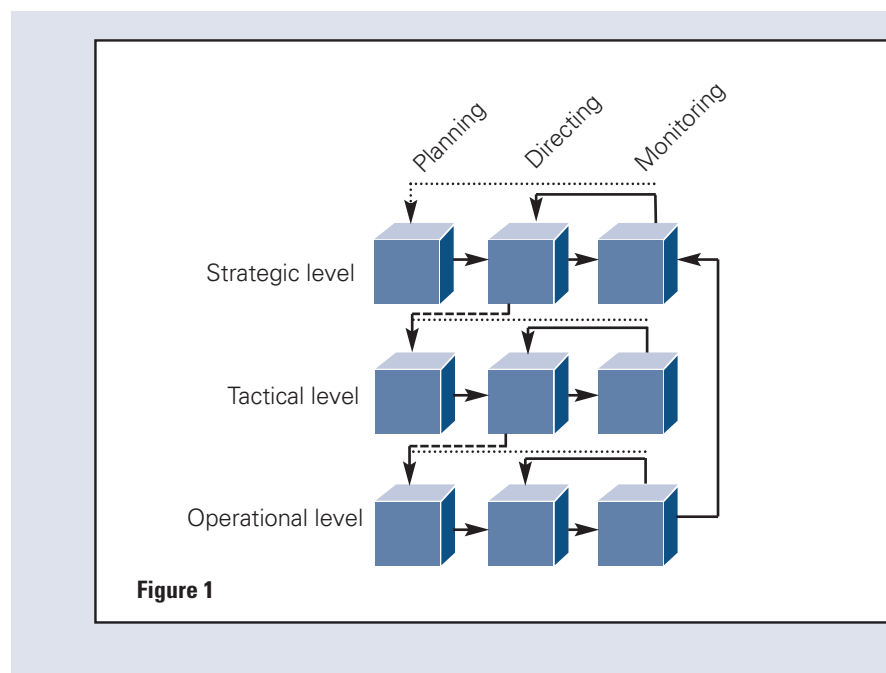

Figure 1

trol cycle, that corresponds to PDCA (Plan, Do, Check, Act) also known as the Deming Cycle. The fourth step (Act) is represented by the feedback mechanism of the control cycle. But information gathered by tactical and operational monitoring is reported not only within the respective level but also to the strategic monitoring. This means strategic monitoring plays a superordinate role. It has to collect all information and use it, for example, to revise the SIM plan or to initiate additional IT projects.

The fulfillment of a goal in general depends on two premises. In most cases a goal is interrelated to projects. This means that first of all these associated projects. have to be completed successfully, for which tactical information management is responsible. Not until then can it be measured if the project would yield the desired success, e.g. by measuring if the implemented application system is actually used or the reorganisation of a process improved the quality of care.

As mentioned in the introduction in the majority of cases no systematic monitoring takes place. This is not only due to deficient technical assistance. Frequent reasons are lacking awareness of the problem, missing knowledge about appropriate methods, limited financial and or-

ganisational resources as well as fear of negative results or transparency on the part of the information managers. Publishing the SIM plan electronically, including monitoring aspects and integrating the whole tool in the daily work of information management staff, can solve some of these problems, because it raises the awareness for systematic monitoring and limits the additional effort. Nevertheless, it is indispensable to sensitise information managers to that effect and to provide them with convenient methods.

An Interactive strategic SIM plan

To make the SIM plan central for an information management application the strategic planning and monitoring have to be integrated. That means, not only strategic goals and associated projects should be displayed, but at least also project management data that can be derived from the tactical information management. In summary, the SIM plan should become a management dashboard that provides different views for the different users. Beyond that, not only the management but also the hospital's employees should have access to these information, because they are affected by a great number of projects, namely those regarding the infrastructure of the hospital information system.
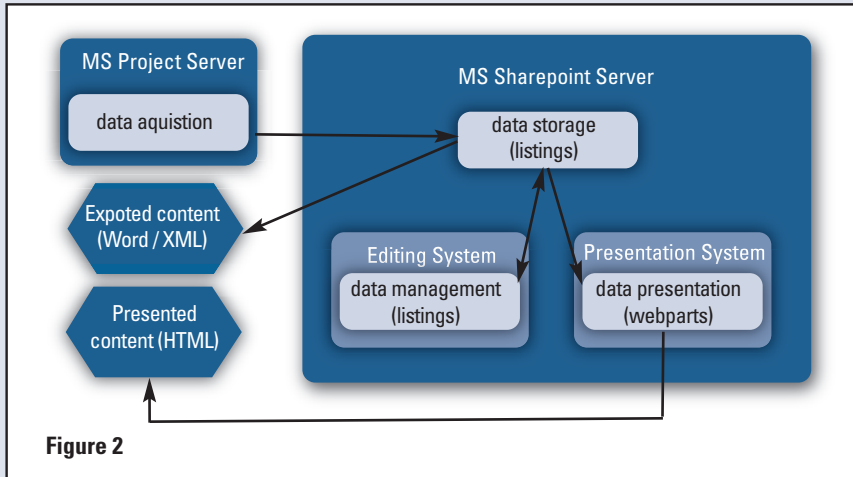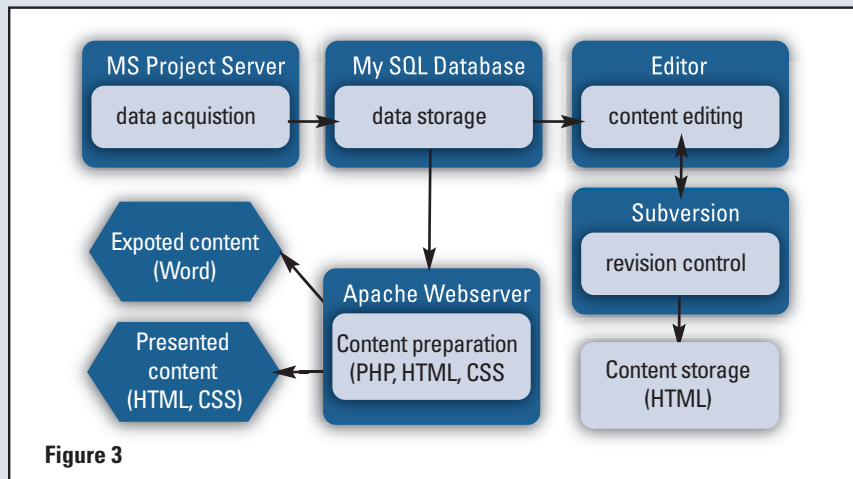
Figure 2

Figure 3

cations, memorize a lot of login data and become acquainted with new processes steadily. Therefore the introduction of a new tool is always difficult, even if the future users are skilled computer personnel. Hence, the challenge is to satisfy the information need (SIM plan, monitoring data) from within the well-established working environment.

Many organizations use Microsoft's server-based applications like MS Sharepoint Portal Server and MS Project Server. Within this environment it is quite easy to implement a SIM plan as described above. Both the static and the dynamic contents can be managed using data lists that are realized by Sharepoint Custom Lists. To connect goals and projects, ID mapping lists can be created. To retrieve the project data from MS Project Server, the XML based interfaces PDS (Project Data Service) and SOAP (Simple Object Access Protocol) can be used. To present the content of the SIM plan and the monitoring data to the hospital staff, Sharepoint Web Part sites can be used. Similar to HTML pages, Web Parts allow the configuration of a website with free definable zones (see Figure 2).

For organizations that do not already use these Microsoft server-based applications, the investment costs and the effort to implement interfaces to existing tools would be so high that an in-house development would be more economical. That can be easily done using the web scripting language PHP and a MySQL database, that stores the dynamic parts like goals, projects and monitoring data (see Figure 3).

Create awareness

Creating awareness for the necessity of the integration of strategic planning and monitoring among the responsible persons has to be the first step. Like mentioned above, the need for systematic monitoring is not respected it should be. Furthermore, existing monitoring methods have to be adapted to meet the demands of information management in hospitals. By now, there exist different initiatives for benchmarking hospital information systems, both in science and practice.

Most of the data, needed to be included in the SIM plan, already exists. To avoid double documentation this data should be integrated from the application where it is documented originally. This predominantly concerns the project management application. The integration of project management data possibly also has positive effects on the project documentation's quality. Usually, only the information management staff has access to the documented information. An interactive strategic SIM plan allows every employee to see the goals' statuses and the project data. This should be an incentive to document a project's progress promptly, because otherwise it looks like the project is in delay and therewith the goal is in danger.

As mentioned above, strategic monitoring should also include the monitoring of the operation and usage of the information system and its components. For this purpose, during the strategic planning process, key performance indicators have to be defined for each strategic goal. These would measure th fulfillment of the respective goals. Such metrics can not be chosen from a school book. Anyway, scientific and practical approaches like CobiT or the Balances Scorecard offer methodical assistance for the formulation of metrics.

How can such an interactive strategic SIM plan technically be implemented?

In today's working and everyday life we have to deal with a lot of software appli-

The European Centre
for Health Technology

On the occasion of the first anniversary of the European Centre for Health Technology, HITM's Yana Konstantinova interviewed Kåre Finbak, the Managing Director of this Health Centre of Excellence. Mr. Finbak is also the Director for Business Development at HP Norway.
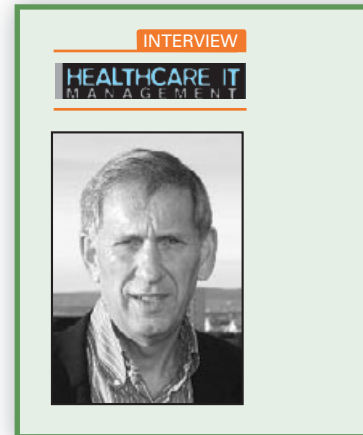
Mr. Finbak, we have understood that recently there were some changes in the management of the European Centre for Health Technology and you have been appointed as Managing Director of this Centre. Did you feel prepared for this position?

Yes, I have been appointed to the position of Managing Director in March 2009. I did feel prepared as my career over the last twenty-five years at HP Norway was mostly in management positions. My work consisted of planning business development and preparing strategic projects.

The European Centre of Health Technology is a global centre for HP, situated in Norway. We have customers from all over the world. The Centre coordinates numerous global visits and activities. For example, in August, we are expecting visitors from Canada, Australia, US and Italy.

Do you see the Centre more as a demonstration site for the latest healthcare IT technologies or as a place for investigating and resolving challenges? Or both?

The vision and mission of the Centre is twofold. On one side, it is a place for demonstrating the latest IT healthcare solutions and technologies, as implemented at St. Olavs Hospital and Ahus Hospital in Norway. On the other side, it is a competence centre for testing new ideas and solutions prior to their selling and implementation.

What are the backgrounds of the key people at the Centre: technical experts, academics, marketing people seconded from your corporate backers, hospital professionals?

The background of the people involved in activities and visits to the Centre differ. We have technical experts in different solution areas, sales and marketing people and also project specialists that have been part of the St. Olav's hospital and Ahus implementation projects. There are people involved from all our partners. Cisco, Imatis, Telenor, Microsoft and HP are the major players.

So far, what would you say your greatest successes have been?

We have had visitors from different regions. Australian, European, American and of course several Norwegians. The visitors have been from hospitals, construction companies, politician from local and central government and press. The huge interest in the Centre has exceeded our expectations.

Concretely, you saw yourselves as 'a window' to the future of healthcare. Are you on track?

We can probably never say that we are "on track" since the technology and solution areas to increase effectiveness and efficiency in hospitals are huge. The challenges with reduced number of available recourses at the same time as the population is growing older will make the focus on IT solutions even stronger. What we have accomplished though is to concretely show and explain what the two hospitals in Norway, which are probably at the leading edge in implementing IT solutions, have accomplished.

What is the outlook for the next year for your Centre, and in the longer term, say over the next 5 years?

The first step is to move the Centre to one of the two mentioned hospital, so as to really get integrated within the hospital. Both hospitals can provide the visitors the possibility to combine a visit to the Centre and the hospital in a better way. Secondly, we plan to have joint R&D activities with the hospital and the University in the area, as both hospitals are University hospitals.

Are you still satisfied in your choice of Norway as the place to base yourself? Does the fact that this is a non-EU country help or hurt your efforts, say in the field of standards, best practices etc. Or is it neutral?

I would say neutral. The two hospitals are at the forefront in implementing healthcare IT solutions. Norway is, as you say,

not part of the EU but is an EEA member bound to the same legal aspects as EU members. As I have said before, the visitors of the Centre are global and necessarily not only from within the EU. The decision on placing the Centre in Norway was not driven by these factors, but more which country was most fit to be the host of the Centre.

On a corporate IT systems level, you have HP and Cisco in your core team. We expect that the EDS-HP merger must have impacted on your Centre in terms of bringing in a pure play IT services company into your orbit. Is this true? Can you explain?

At the moment the integration of EDS has not impacted the Centre as no changes have been done. We are in the process of investigating how the EDS solutions in the health care business are fitting the Centre's strategy.

On the other hand, are you not growing too big? HP, EDS and Cisco. We would expect healthcare IT people at IBM and Microsoft must be concerned.

I do not think this is an issue. Competitiveness is good for the market and it is stretching the vendors. We are in some markets cooperating and in other markets competing. There are also beside the mentioned vendors other strong competitors in this segment.

There are other similar initiatives, and in faraway places. GE Healthcare has announced a month ago that it is opening a virtual hospital in India, its biggest worldwide, to test new technologies. Right next door, Intel has its largest design centre, as do SAP and Philips, and not least IBM that is doing a lot of its SoA work there too. Even HP and EDS have major R&D operations, possibly much larger than their European ones, as does Oracle – now bolstered by Sun. What do you believe will be the impact of all this?

The Centre we have established is run as a Global Centre on behalf of HP and it is also linked with our WW Health initiatives, including R&D in this area. There are, as you say, similar initiatives from different vendor and vendor collations both in the IT industry and also in the technical medical equipment where GE is one of the major players. We have, and will have, cooperation with vendors in the other areas of hospital solutions.

Which IT healthcare solutions are being tested in the Centre at the moment?

At the moment the Centre works with Imatis in developing solutions. Microsoft has more general solutions in healthcare. There is positioning system equipment from Sonitor, which is based on ultrasound. Tandberg offers media conferencing, a system to be able to share pa-

tients' pictures from one hospital to another. The EG's Endoscope system is linked to the IMATIS system in order to show that you can implement technological medical equipment in the solution.

At the Centre, we work with the Swedish company Bodycomp and we have a remote heart monitoring system called Kiwok, which allows the patient to be monitored by the hospital in his/her home and have the results sent by cell phone. We have also implemented the MAS (Medical Archiving System) from HP, which will help the hospitals to archive and store huge quantities of data in a secure way, and retrieve the same data whenever needed.

As the Managing Director of the European Centre for Health Technology, do you feel Europe is making its voice adequately heard? And that policy makers are listening?
In fact, there is a lot of duplication going round in Big Ticket projects.
We believe, all too often, Europe gets hurt both ways. Individual EU members do not count for much, at least as far as the big programmes like e-health are concerned. Meanwhile others – small breakthroughs mainly – do not get noticed. What would you see as the way forward?

I fully support your thoughts. We see the duplications across countries but even within a country. It is a challenge to leverage success at one hospital, even within the same country. Politicians work too close with one vendor or a coalition of vendors due to the competition law within the country or EU. This is, as far as I see it, a hindrance for standardisation and an increase in efficiency and also a cost for the community.

The European Centre of Health Technology

The Centre was established at 2008 in Oslo, Norway. It is designed to be both a showroom and a competence centre in order to demonstrate latest healthcare technology solutions. The main partners of the Centre are HP, Imatis, Cisco, Telenor and Microsoft. The vision of the Centre is to deliver "state-of-the-art technology" in order to secure meaningful information anytime, anywhere within a hospital environment and thereby improve patient care and technology efficiency. Its mission is to work close with hospitals and technology vendors and share best practices in a cost efficient way, at both the European and global levels.

For more information please visit : **www.hp.com/HCoE/**

ELECTRONIC PATIENT RECORDS
ACROSS THE CARE CONTINUUM

AUTHOR

David Kwo
is Managing Director,
Ubiquity Healthcare, UK

Britain's National Health Service (NHS) is moving towards vertical integration of healthcare services as exemplified by the 'Integrated Care Pilot Programme' launched in October 2008. Vertical integration is where the full range of health providers (hospital and community services, GPs, mental health providers, home health services, social services, etc.) in a geographically contiguous region join together to deliver services in a patient-centric manner. This type of integration requires collaborative clinical service delivery integration, with or without corresponding organisation integration.

Integrated care and the EPR

It is clear that integrated care organisations require integrated information systems, in particular integrated Electronic Patient Record (EPR) systems.

The Electronic Patient Record (EPR) systems market is becoming active again in the UK after several years of being dormant. The reason is that the National Programme for IT (NPfIT) is severely delayed in delivering EPR solutions and hospitals are looking outside of NPfIT for alternatives. To help hospitals re-enter the EPR market, it is useful to understand the shape of the EPR market today and where it is going in the future.

The EPR Market in the UK

The customer market for hospital EPRs in the UK is classified into 3 tiers according to the hospital's underlying business model.

Tier I hospitals adopt a "Hospital Departments" business model and view EPRs as a technology to maintain hospital operations and activity reporting by replacing aged (and/or introducing new) PAS (Patient Administration System) and departmental systems such as A&E (Accident and Emergency), maternity, operating theatres, cancer, pharmacy, etc.

Tier II hospitals adopt a "Hospital Integration" business model and view EPRs as a technology as well as an organisational change agent for improving (or transforming) the way the hospital does business, integrating processes across departments, improving the quality of care in multidisciplinary ways and improving the safety and experience of patients across the patient's journey through the hospital.

Tier III hospitals follow a "Vertical Integration" business model and view EPRs as a technology, an organisational change agent, and a tool that supports the vertical integration of care with other healthcare organisations across the local care community or health economy. The EPR is a collaborative tool for supporting and indeed stimulating, integrated care across care settings and care organisations, in the manner of an Integrated Care Organisation (the new pilot programme established by the Department of Health in late 2008). Kaiser Permanente and Intermountain Health in the US exemplify the Tier III hospital business model.

The EPR supplier market: three corresponding product segments and supplier business models:

Type I EPR suppliers follow the "Best of Breed" business model and develop EPR products to meet the demands of Tier I hospitals. They offer collections of departmental systems and an interface engine to exchange patient, orders and results data using HL7 messaging. They tend to offer more decision support functionality within, and less across, departments.

Type II EPR suppliers follow the "Integrated EPR" business model and develop EPR products to meet the demands of Tier II hospitals. They offer an integrated suite of EPR modules that satisfy the needs of hospital departments AND provide an additional level of cross-department or enterprise-wide (i.e. integrated) benefits such as: (a) hospital-wide decision support; (b) hospital-wide scheduling; and (c) hospital-wide integrated care pathways.

Type III suppliers follow the "Vertical Integration EPR" business model and develop EPR products to meet the demands of Tier III hospitals and other healthcare organisations. There are no 'pureplay' Type III EPR suppliers in the UK but some of the more established Type II suppliers are likely to claim that they already have Type III EPR products available, particularly from their overseas product catalogue, but have not sold them in the UK due to lack of sufficient Tier III demand.

EPR Impact on Quality of Care

There are four critical success factors that enable EPRs to improve the quality of care. EPRs need to:

- be intelligent (i.e. offer advanced real-time and pro-active clinical decision support);
- offer deep integration (i.e. functions need to be integrated seamlessly by design and at all levels of EPR function);
- be detailed (i.e. the full set of up to date and relevant clinical details need to be available, not just a subset where important clinical data will regularly be missing);
- be cross-setting (i.e. operate wherever the patient is, not just within the bounds of certain organisations or clinical offices).
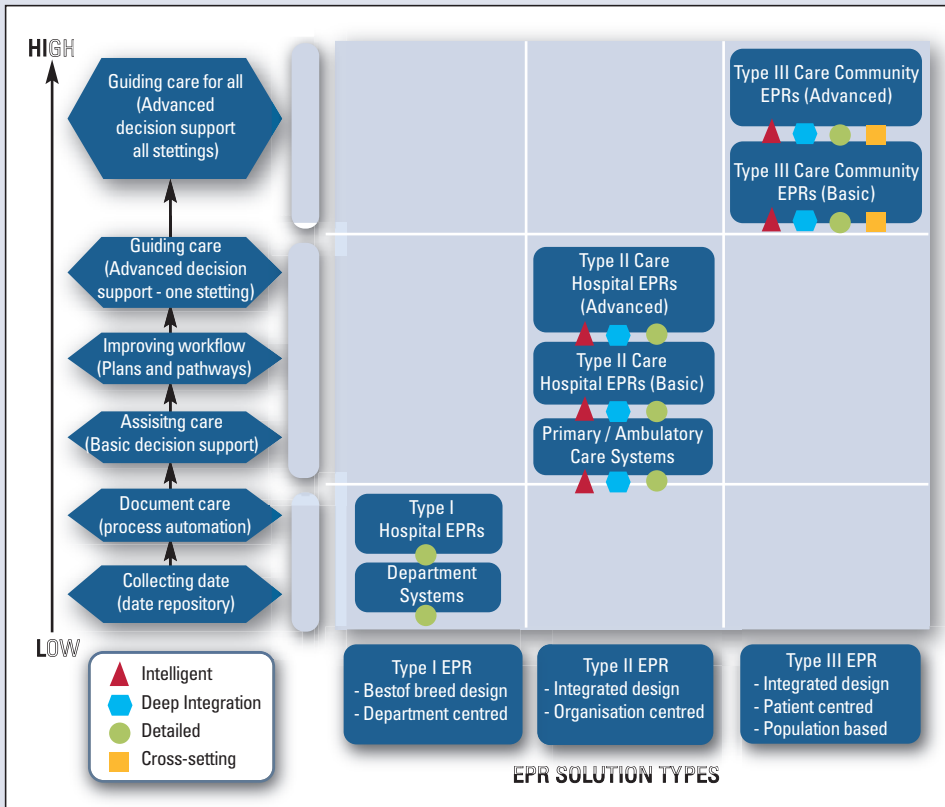
Figure 1: *EPR demand, supply, critical features and quality impact*

The key conclusions from the above considerations are:

- Healthcare needs to be more patient-centric. Hospitals should think Tier III and plan for local vertical integration in clinically and organisationally practical ways. The Darzi Review's clinical pathways are an expression of this objective. Virtual care teams at the clinical pathway level should work across care settings in multi-disciplinary ways. To facilitate such collaborative working, hospitals and other providers should form EPR procurement consortia and share in the design, costs and benefits of Type III EPR systems.

- The higher the EPR Type the higher the quality of care but also the higher the quality of information that will be generated as a by-product of that improvement. Reliable information is best obtained from systems that are relied upon.

- EPRs should be procured against a local EPR vision and strategy. Years of frustration and disillusionment have led to disinterest in IT strategy at local levels. This trend must be reversed so that the progression from Type II to Type III systems can be designed, developed and deployed.

- Type III EPRs should be sought directly from EPR suppliers, not the LSP. The LSP model of EPR deployment has failed because LSPs lack EPR experience and interfere with the EPR customer/EPR supplier relationship.

- In the future, higher tiers of EPR demand will emerge including EPRs that work across geographies (e.g. Tier IV: National EPR needs) and Tier V: Global EPR needs). Corresponding EPR types will emerge to meet this demand. In any case, the EPR is more than just a 'record'; it offers intelligent and proactive functionality that will guide and predict care across patient populations, clinicians, organisations and countries.

- Bringing data together does not in itself integrate care, either at the organisation, regional or national levels. Deliberate and collaborative efforts to integrate care across local settings, designed around the patient, driven by local care givers, is required first.

- EPR vendors will not develop new systems until they see real demand from the market. A more cohesive and visionary approach to EPR procurement is therefore needed across care communities (primary, secondary and acute).

These critical success factors highlight the need to ensure 'materiality of impact' when designing and deploying EPR systems. EPR benefits (such as reducing adverse drug events and medical errors, improving patient safety, enhancing the patient experience, improving outcomes) need to be measured in terms of [level of benefit from EPR] x [numbers of patients likely to benefit from EPR]. Applying Type III systems across a care community is more likely to achieve a HIGH [level of benefit], based on research evidence, and for HIGH [numbers of patients likely to benefit]. Summary records, or passive clinical data repositories have low impact because they lack detail and intelligence.

Most hospitals in the UK drift along as Tier I hospitals and consider Type I EPRs to be sufficient for their needs. Many hospitals have slowly progressed to Tier II mind-sets and can see the benefits of the well integrated Type II EPRs as promised by the LSPs for the past 6 years. However, the greater benefits underlying integrated care and Tier III hospital business models are beginning to be recognised by a few hospitals (and associated organisations). These benefits should be stimulated and realised.

There is a growing trend to discharge patients from hospitals back to their homes so that they are rehabilitated in a familiar environment. Such trends require Type III systems that operate across healthcare providers and enable clinicians (e.g. nurses, GP's, therapists) to deliver treatment seamlessly across acute, community and primary care settings. Chronic diseases also require Type III EPRs with clinical pathway and case management functions. Over the years there has been a proliferation of disease specific solutions but which do not work across the care continuum (they are Type II and not III).

gy at local levels. This trend must be reversed so that the progression from Type II to Type III systems can be designed, developed and deployed.

EPRs will have the next highest impact on quality of care when Tier III demand is matched by Type III products because that is where integrated products support integrated care. And more integrated care is what patients desire and deserve.

HEALTHCARE IN
THE NORDIC COUNTRIES

HEALTHCARE IT MANAGEMENT

ANALYSIS

The Nordic healthcare system has a long heritage. It is especially well-established with regard to primary and preventive healthcare. These couple into sophisticated occupational health standards which are considered to be models by the outside world. All Nordic countries also have highly-developed hospital services.

Nordic systems are taxation based, locally administrated, with every citizen having equal access to services. All countries, however, require co-payments by patients for hospital care and medicines.

In general, the markets have a low level of influence on the functioning of health care systems. At the political level, equity and equality are important priorities. At the same time, productivity and efficiency are coming to the political agenda.

In spite of a generally high-level of commonality, there are some important differences in the Nordic region with regard to healthcare. Some of these are, moreover, growing as each country seeks to adapt to budgetary pressures and an aging population. Explicit moves to cut down waiting times and improve hospital productivity have been made in Denmark and Finland. Variable user fees for hospitalisation are also charged in Finland and Sweden.

A brief description and overview of such issues in the four principal Nordic countries is provided below.

Denmark

Like the country itself, Denmark's healthcare sector has three political and administrative levels: the State, the regions and the local municipalities. The health care service is organised in such a way that responsibility for services provided by the health service lies with the lowest possible administrative level. Services can thus be provided as close to the users as possible.

The Ministry of Health and Prevention was established on 23 November 2007 when the Ministry of the Interior and Health was separated into two.

The Health and Prevention Ministry is in charge of administrative functions related to the organisation and financing of the healthcare system, psychiatry and health insurance as well as the approval of pharmaceuticals.

Earlier in 2007, local government reforms in January saw a system of 15 counties (including the metropolitan area) and 271 municipalities replaced by five regions primarily focused on the healthcare sector and 98 municipalities responsible for a broad range of welfare services.

Overall, within such a decentralised system, the State is responsible for legislation and supervision, while counties and municipalities are charged with operating health services (the former for hospital service and health insurance, and municipalities for other areas of healthcare, as well as nursing and child/school health care). The counties own most hospitals. Some private hospitals have contracts with their county, while a handful of mainly small private hospitals operate outside the public hospital system. Specialist hospitals are not organized separately. Neither does Denmark have health centres with hospital beds.

GPs are the primary point of contact for patients except in an emergency, when they directly use hospital services. Specialist physicians work based on an agreement with a health insurance scheme, and most patients are referred to them by general practitioners.

To cut down waiting times, the Danish Government has been making supplementary allocations to health services since the turn of this decade. The sum has averaged DKK 1.2 billion a year, and has been rising steadily (it was DKK 1.4 billion in 2006). This has been combined with

	Denmark	Finland	Norway	Sweden
Population (million: 2008)	5.5	5.25	4.66	9.06
Live births/female (2008)	1.74	1.73	1.78	1.67
Deaths/1,000 (2008)	10.25	10.0	9.33	10.24
Life expectancy in years (2008)	78.3	78.97	79.95	80.86
GDP (billion Euros: 2008)	233.3	186.2	283.0 (2007)	328.3
Total healthcare expenditure (% GDP: 2004)	9.0%	7.5%	9.7%	9.5%
Total healthcare expenditure per capita (PPP dollars: 2004)	2,838	2,275	3,862	2,875
% of healthcare system financed by public funds: 2004	82.30%	76.6%	78% (2005)	84.9%
Number of general hospitals (2003)	57	NA	28	NA
Number of CT scanners (per million inhabitants: 2004)	14.6	14.2	NA	NA
Number of MRIs (per million inhabitants: 2004)	10.2	14	NA	NA
Number of acute care beds (per 1,000 inhabitants: 2006)	3.1	2.4	3.1 (2003)	2.8
Length of stay (average in days: 2006)	3.4	4.2	6 (2004)	6.0
Number of physicians (per 1,000 inhabitants: 2004)	3.6 (2003)	2.4	3.5	3.3 (2003)
Number of nurses (per 1,000 inhabitants: 2004)	7.0 (2003)	7.6	14.9	10.3 (2003)
Percentage of households with Internet access	75% (2005)	54% (2005)	69 % (2006)	77% (2006)
Percentage of individuals using the Internet for interacting with public authorities	Obtaining information 42,5%, Downloading forms 16,4%, Returning filled forms 13,9% (2004)	Obtaining information 44,6%, downloading forms 21,5%, returning filled forms 11,2% (2005)	Obtaining information 52.1 %, Downloading forms 30.1 %, Returning filled forms 28.2 % (2006)	Obtaining information 48,7%, Downloading forms 30,7% (2005), Returning filled forms 21,4% (2005)

Source: European Central Bank, OECD, WHO, EU Commission and national statistical agencies

opening-up possibilities for patients to receive treatment at private hospitals or certain accredited hospitals overseas, should waiting times be more than one or two months, respectively.

The reforms have had a significant impact. Waiting times for 18 major surgical procedures fell from 27 weeks in 2002 to 21 in 2005, and an estimated one of eight non-acute patients are now treated outside Denmark.

As significant is a move since 2004 to expand own management of funding by hospitals, with an eventual target of 50% of overall hospital allocations. Though this has led to some uncertainty about hospital budgets, it has contributed to increased efficiency and reduced waiting times.

The federal state block grant still constitutes the most significant element of financing – about 75%. In order to give the regions equal opportunities to provide healthcare services, the subsidy is determined by a number of criteria such as demographics, and the social structure of each region (the percentage of employed, the elderly etc.).

Following the local government reforms of January 2007, one novelty is that the municipalities contribute to financing healthcare. The purpose is to encourage them to

initiate efficient preventive measures for their citizens with regard to health issues.

Local financing consists of both a basic contribution and an activity-related contribution. Together they constitute about 20% of total financing of healthcare in the regions.

The basic contribution remains determined by the regions. The maximum limit is fixed by statute (DKK 1,500 per inhabitant at the price and wage level of 2003). The local basic contribution is initially fixed at DKK 1,000 per inhabitant.

The activity-related contribution depends on how much the citizens use the regional health services (hospitalisations and out-patient treatments at hospitals, as well as the number of services from general practitioners). In this way the municipalities that succeed in reducing the need for hospitalisation through efficient measures such as preventive treatment and care will be rewarded.

Finland

Finland has a highly decentralised, three-tier system of public health care, coupled to a much smaller private health care system. Physiotherapy, dentistry and occupational health services are the main areas covered by private care. Employers are legally obliged to provide occupational healthcare services for their employees.

Responsibility for healthcare is devolved to the municipalities (local government, according to the Public Health Act of 1972. Groups of municipalities run specialised central and regional hospitals. Municipalities are also responsible for providing health and social services for elderly people, including assisted living.

Primary healthcare is obtained from district health centres employing general practitioners (GPs) and nurses. These provide most day-to-day medical services and act as gatekeepers to more the more specialised services in the secondary and tertiary care sectors.

Secondary/specialist care is also provided by the municipalities through district hospitals.

At the top of the hospital system in Finland is a network of five university teaching hospitals located in the major cities of Helsinki, Turku, Tampere, Kuopio, and Oulu. These provide tertiary care and contain the country's most advanced medical. The university hospitals are also funded by the municipalities, but supported by the national government.

The Finnish National Public Health Institute and the National Institute for Occupational Health are presently investigating the healthcare sector on issues concerning the structure and division of roles and responsibilities between the State, county councils and the municipalities.

In the public health service system, as mentioned, patients need a referral for specialist treatment, except in the case of emergency. At private clinics, however, patients need no referral to visit private specialists. Physicians working in private clinics can refer their patients either to public or private hospitals.

From March 2005, bar injury, patients are required to be examined and treated within a given time. Appointments have to be given within three working days. Treatment assessments have to be made within three weeks of referral to a hospital. In cases where treatment cannot be given at the first visit to the health centre, it is required to be started within three months, and within six months for specialised treatment. If a patient's own health centre or hospital cannot provide treatment within the specified time limit, it has to be offered at another municipality or a private institution, at no extra cost to the patient.

Finland also has Europe's first law on patients' status and rights. This ensures a patient's right to information, to informed consent to treatment, the right to see any relevant medical documents, and the right to autonomy. Backing this a Patient's Injury Law, which gives patients the right to compensation for unforeseeable injury that occurred as a result of treatment or diagnosis. To receive compensation, it is sufficient that unforeseeable injury as defined by law occurred. This system has struck a balance between a litigious blame culture like the US or the development of

defensive medical practices as in many parts of Europe.

As principal providers of healthcare (accounting for two thirds of all spending), the municipalities are funded by national and local taxation. The balance third of spending is met by the national insurance system and private finance (either employer funded or by patients themselves). Barely 10 per cent of the income of the private care sector comes from private insurance.

Though spending on healthcare is below the European average, the quality of healthcare service in Finland is high. According to a survey published by the European Commission in 2000, Finland has the highest number of people satisfied with their hospital care system in the EU: 88 percent of Finnish respondents were satisfied compared with the EU average of 41.3 percent.

Finland's National Research and Development Center for Welfare and Health is establishing a single, accessible, Web-enabled repository for healthcare indicators gathered from healthcare providers across Finland.

Norway

The State is responsible for healthcare policy and capacity issues as well as the quality of healthcare through budgets and laws. The State is also responsible for hospital services through regional health authorities – who organise hospitals as health trusts. Municipalities have responsibility for primary healthcare, including both preventive and curative treatment. Regional health authorities and municipalities are free to operate public health services as they deem fit, although budgetary factors limit choices in the real world.

Private healthcare does not play a major role in Norway, due to the high standards and reach of the State system. Some private insurers offer complementary health insurance to those seeking to avoid hospital waiting lists or receive certain treatments such as cosmetic surgery. Private healthcare is also used for substance abuse, as well as dental treatment and certain forms of rehabilitation.

General practitioners (GPs) are gatekeepers in the Norwegian health system. GPs prescribe drugs and provide referrals to specialists and hospitals. They also treat acute and chronic illnesses, and provide preventive care. Citizens can choose the GP of their choice, but can change them up to a maximum of only two times a year. People seeking State medical care must make sure their GP is contracted into the State scheme; others require payment of full (rather than nominal) fees by the patients. Out of normal hours, GPs operate an on-call system.

Specialist physicians are also referred to as consultants. GPs refer patients to a consultant if they need specialist diagnosis or intervention.

Norway has 80-plus hospitals located in major towns and cities. Patients are admitted to hospital either through the emergency department or via referral by their GP. Once admitted, treatment is the responsibility of a hospital doctor. In the rare cases where the Norwegian hospital system lacks the expertise to provide care, treatment is arranged overseas at no cost.

The Norwegian health system is funded predominantly through taxes taken directly from salaries. There is no specific health contribution fund. The Trygdeetaten (National Insurance Administration) is responsible for administering the State National Insurance Scheme (NIS), which guarantees everybody a basic level of healthcare and welfare (disability, unemployment, pension). All citizens and residents of Norway must contribute to the NIS.

In return, there are relatively few fees for using the State system. Inpatient hospital treatment is free. However, visits to doctors and specialists as well as purchases of prescription medicine incur small co-payments. So do radiology and laboratory tests. There are nevertheless a number of exemptions, not least those afflicted by chronic diseases.

Sweden

The Swedish healthcare system is organised in seven sections: proximity or close-to-home care (this covers clinics for primary care, maternity care, out-patient mental health care etc.), emergency services, elective care, hospitalisation, out-patient care, specialist treatment and dental care.

The healthcare system is administered by 21 Councils, of which 18 are at the county level and three are regional. The population in these 21 areas ranges from 60,000 to 1,900,000. The Councils have considerable freedom in planning for the delivery of care and this is one explanation for significant regional variations.

The role of the central government is to establish principles and guidelines for care and to set the political agenda by means of laws and regulations. This is also achieved by means of agreements with the Swedish Association of County Councils and Local Authorities.

At the national level, several expert bodies play a role in planning the healthcare. Socialstyrelsen (National Board of Health and Welfare) is the central government's key supervisory authority. The others are Hälso- och sjukvårdens ansvarsnämnd (the Medical Responsibility Board), Statens beredning för medicinsk utvärdering (Swedish Council on Technology Assessment in Healthcare) Läkemedelsförmånsnämnden (the Pharmaceutical Benefits Board), Läkemedelsverket (the Medical Products Agency) and the State-owned Apoteket AB chain of pharmacies.

Hospitals are run by both county and regional authorities. The former include specialised hospitals covering the entire county and general hospitals covering a part of the county.

Medical treatment is provided at both hospitals and outpatient clinics. Specialised treatment is provided by the regional hospital service.

There is a small presence of private (but publicly-financed) healthcare in Sweden, along with political controversy. About one-third of medical consultations are with private medical practitioners.

Regulations, waiting times and patient fees vary in the different Councils. The national guarantee of care states that a patient should be able to get an appointment with a primary care physician within 5 days of contacting the clinic. If referred to a specialist by the GP, they should get an appointment within 30 days, and if treatment is deemed necessary by the specialist, it should be given within 90 days. However, urgent cases are always prioritised and emergency cases are treated immediately.

The main criticism is that waiting times are too long in practice, especially for low priority-non emergency surgery such as hip and knee replacement, where the guaranteed time is 90 days.

Nevertheless, Sweden has a far higher rate of efficiency in its healthcare service delivery than most EU members. It has the EU's highest rate of physicians per capita, at 3.3 per 1,000; although this slightly lags non-EU Nordic neighbour Norway, it compares to a rate of 2 in Britain. Such a ratio allows patients to have quick and easy access to healthcare professionals.

Sweden also recognised in the mid-1990s that health services had to change to meet increasing demand, especially as people began to live longer. As hospital treatment tends to be expensive compared to GPs or outpatient/community care, it started to push for more patients to be treated in primary care. Over the last decade, GP visits have steadily grown while specialist interventions have fallen. Sweden has also sought to drive patients more quickly through the hospital system, a methodology now acknowledged to be superior (not least in terms of reducing nonsocomial infections).

Having less people treated in hospitals, for less time, has allowed Sweden to plough more investment into community services, which was one of its goals to begin with.

Overall, the Swedish State finances the bulk of healthcare costs (about 95%), with the patient paying a small nominal fee for examination. Hospitalisation charges for patients are capped at SEK 80 per day. Patients under 40 pay only half the cost for the first 30 days of each sickness period.

IT AND NORDIC HEALTHCARE

Ahead of the pack

Nordic countries rank high in terms of e-health readiness indicators, as well as healthcare and IT/Internet infrastructure. Indeed, the World Economic Forum's Network Readiness Index 2008/2009 remains dominated by the Nordic countries, with Denmark and Sweden continuing in the first and second slots (the same position as in 2007), Finland slightly down to sixth (from fourth in 2007) and Norway up to eighth (from tenth in 2007). The Index is based on a combination of factors: ICT penetration and usage, e-government and e-business environments as well as government vision, education, R&D and a talent for pioneering high-technology applications.

In other words, the Nordic countries have the highest quality infrastructure in place for effective e-health. They also have the political will – from the point of view of the demands of an aging society, the need for individualisation and customisation of healthcare delivery as well as requirements for increasing healthcare efficiency.

High R&D spend

Buttressing the above is the high R&D spend in the Nordic region. Unlike their EU-12 peer group, which spend 1.9% of gross domestic product on R&D, the figures are 2.6% for Denmark, 3.5% for Finland and 3.7%.

Only Norway (a non-EU member) ranks below the EU-12 average, with 1.6%. This can be explained by the relatively high GDP due to its oil and gas revenues.

Indeed, in Euros per person, Norwegian R&D spending is higher than the EU-12.

While all Nordic countries make clear their commitment to deliver on the key e-health enabling Electronic Health Record, there are, however, some differences in approaches and speed.

Denmark

Denmark is one of the few countries to have an explicit policy on healthcare IT, in terms of a 'National IT Strategy of the healthcare system 2003-2007' from the Ministry of the Interior and Health (as the Ministry was previously known). This provides a framework for choices and priorities on healthcare IT, in terms of general technology and public policy.

In April 2009, at the World Health Care Congress in Washington, Arne Kverneland, head of the health informatics department within Denmark's National Board of Health, drew parallels between his country's e-health approach with the Obama administration priorities, citing the shared goal of increasing quality of care and decrease healthcare costs by computerising health records. As approving observers noted, Denmark's health spending as a share of gross domestic product is about half that of the United States but the country is far ahead in the area of e-health, with more than 90 percent of general practitioners using computerised records. Denmark, it was also reported at the Congress, is also taking a lead in developing the content and structure for an international EHR standard.

Finland

On its part, Finland has a traditionally strong interest in the mobility aspects of e-health – an understandable factor given that it is home to mobile telephony giant Nokia. Finland also places considerable priority on bioinformatics, and is among the first EU Member States to have a specific IT policy for addressing the needs of the elderly.

More recently, the Finnish government announced in March 2009 that it was on track to build a national electronic health record repository, one of Europe's most ambitious EHR initiatives to date, which physicians will be legally required to start using from 2011. Included in the project is a national e-prescription service and a patient-viewable record called eView. Technically, in spite of a near-100% roll-out of EHRs, a localised approach which builds on existing systems bottom up has resulted in challenges to interoperability. To address this, a new national eArchive is under development. This will build on top of existing local systems, rather than replace them. The eArchive, which will provide a longitudinal record of patient treatment details, will contain all coded patient data held in local EHRs, together with a log of data exchanges and authorisations for access. Access will initially be limited to physicians directly involved in patients' care.

Norway

Norway has long been identified as a telemedicine pioneer, largely due to its scattered population clusters. The country has operational telemedicine solutions in place at a variety of medical disciplines and facilities. Norway also has assigned official/State-supported R&D institutions with a mandate to investigate healthcare IT and e-health, grouped under the cross-Ministry Norwegian Centre for Informatics in Health and Social Care. The Centre operates the Volven database which contains coding, classifications, terminologies and definitions for a coherent e-health infrastructure.

Another interesting initiative in Norway – especially given its status as a non-EU Member – is IKTHELSE (ICT in Medicine and Health Care). This programme which ran from 2001-2005 sought to map current and future healthcare ICT technologies and needs, and to develop Norwegian competencies, some of which have since become eligible for government financial support through a programme called VERDIKT.

Sweden

In Sweden, June 2009 saw successful deployment of the first stage of the Swedish National Patient Summary Project (NPO). The Örebro County Council and the Municipality of Örebro healthcare region in central Sweden have connected to the NPO in the first stage of a project to create a Swedish national health record.

The NPO solution, which is being extended to more than 500 doctors, nurses and occupational therapists, will make real-time patient information available on a national level to county councils, local authorities and private healthcare providers. It will eventually be scaled up to a national level.

AGENDA **2009**

August
MIE 2009
30 – 2 September 2009
Sarajevo, Bosnia and Herzegovina
www.mie2009.org

September
BALTIC CONFERENCE ON E-HEALTH
15 - 16 September 2009
Hamburg, Germany
www.baltic-conference-on-ehealth.com

DISASTER PREPAREDNESS SUMMIT
17 September 2009
Seattle,WA, USA
www.disastersummit.org

MEDICINE 2.0 2009
17 - 18 September 2009
Toronto, Canada
www.medicine20congress.com/ocs/
index.php/med/med2009

ISFTEH INTERNATIONAL CONFERENCE
21 - 24 September 2009
Moscouw, Russia

**HOSPITAL MANAGEMENT &
INFORMATION INNOVATION 2009**
22 - 23 September 2009
Nanjing, China
www.hmii2009.com

**2ND EHEALTH CONFERENCE
"PATIENTS OR USERS - WHO ARE
WE DEVELOPING SERVICES FOR?"**
23 - 25 September 2009
Istanbul, Turkey
www.electronic-health.org/cfp.shtml

October
ECDL REGIONAL CONFERENCE
02 - 04 October 2009
Palic, Serbia
www.jisa.rs

ABU DHABI MEDICAL CONGRESS 2009
11 - 13 October 2009
Abu Dhabi, UAE
www.abudhabimed.com

HEALTHCARETECH SUMMIT
26 - 27 October 2009
Dubai, UAE
www.healthcaretechme.com

IT@ NETWORKING AWARDS 2009
29 - 30 October 2009
Brussels, Belgium
www.hitm.eu/awards

November
**TELEHEALTH AND ASSISTIVE
TECHNOLOGY 2009**
4 - 6 November 2009
Cambridge, Massachusetts, USA
www.iasted.org/conferences/home-663.html

MEDICA
18 - 21 November 2009
Dusseldorf, Germany
www.medica.de

HISI
19 - 20 November 2009
Dublin, Ireland
www.hisi.ie

RSNA 2009
29 - 04 December 2009
Chicago, US
www.rsna2009.rsna.org

December
DISKOBOLOS 2009
22 December 2009
Belgrade, Serbia
www.jisa.rs

ISSUE 4, 2009

⬐ **COVER**
On-Demand IT Services/ASP

⬐ **FEATURES**
Mobility and healthcare
21st century hospitals
Miniaturisation and healthcare
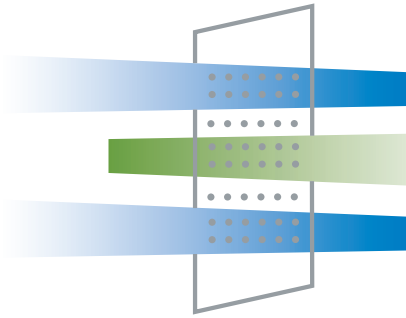Cloud computing – hype or hope

⬐ **PRODUCT COMPARISON CHART**
PACS

⬐ **MANAGEMENT**
Decision Analytics
Staffing Shortages and Scenarios in Healthcare IT

⬐ **COUNTRY FOCUS**
UK

European Association of HEALTHCARE IT MANAGERS

The European Association of Healthcare IT Managers is a non-profit pan-European umbrella organisation for all relevant national healthcare IT associations in Europe.

OUR MISSION:

• *The European Association of Healthcare IT Managers supports and encourages the emergence of common healthcare IT standards at both EU and international levels.*

• *The European Association of Healthcare IT Managers believes that the European Healthcare IT sector needs a common voice - especially in the face of rapid technological change and growing socioeconomic pressures.*

• *The European Association of Healthcare IT Managers invites you to be involved in a community to exchange opinions and experiences with like-minded colleagues. We defend your interests and make your voice heard, effectively.*

If you are a CIO, CMIO or IT Manager in the healthcare area

JOIN US !

Visit our website at www.hitm.eu to apply for membership today!

IT@

NETWORKING
AWARDS 2009

WINNING PROJECT GETS EXTENSIVE PRESS COVERAGE AND €5,000 CASH

SECURE
YOUR PRESENCE
NOW!

More information on the IT @ Networking Awards 2009 on page 6 and 7.