

HEALTHCARE IT MANAGEMENT

ISSN: 1782-8406

THE OFFICIAL JOURNAL OF THE EUROPEAN ASSOCIATION OF HEALTHCARE IT MANAGERS

Clinical Information Systems

The 21st Century Hospital

Six Sigma
and Change Management

The Electronic Health Record

Remote Data Replication

Switzerland: Country Focus

Volume 3 / Issue 1
2008



Why must I re-type an MR
sequence every time?

How long was the report
turnaround time last week?

Why do we have to call
to schedule a CT exam?

Whatever you ask, whatever your task:
syngo Suite provides the answers.

Think new. Start now and portalize your workflow. The *syngo*® portals drive quality and efficiency by directly bringing up relevant information and tools. Providing role-based access to what you really need. In the context of what you do. For example, computer-aided diagnostic tools for radiologists. Applications for fast interaction between referrers and radiologists. Or data for fact-based executive decision-making. *syngo* Suite. Living workflow intelligence.
www.siemens.com/syngo-suite; +49 69 797 6420

Answers for life.

SIEMENS

Letter from the Executive Director, HITM



Dear Reader,

In a modern business context, one of the most distinctive features of information technology is the fact that it can add efficiency and value across an entire swathe of processes and specific operational disciplines. Clinical workflow design is, in some senses, the keystone for the healthcare IT arch, and clinical information systems (CIS) are the subject of this issue's cover story. We provide personal accounts by two experts in the CIS field, one from Europe and another from the US.

We are now more than halfway through the first decade of the 21st century. The decade opened in a turbulent fashion, with 9-11 and the Dotcom Bust which brought some of the excesses of Silicon Valley down to earth. Today, one can safely say that the IT industry is less glitzy and more mature.

Before the Dotcom Bust, a concept like the 21st century hospital may have been little more than high-flying hype. That is certainly not the case with Asklepios Klinik at Barmbek, the German hospital featured in this issue, which imaginatively combines design, processes, and technology to foster an optimal environment for standardised, interoperable healthcare technology, and move from an institutional system to a patient-oriented informational approach.

Indeed, although healthcare has recently been at the forefront of technological change, the bulk of developments have been in the areas of patient therapy and care. Innovations in the area of IT systems have been less

apparent, although these offer the greatest promise in enhancing delivery of healthcare, and capping growth in healthcare costs. Most major IT firms, on their part, have for now adopted a mix of approaches to what will no doubt be a major business opportunity – and an equally impressive challenge, given the host of new regulatory standards in the pipeline. This issue of HITM provides an overview of developments in healthcare IT at some of the world's leading firms.

Several other features are addressed in this issue. These include an overview of satellite technologies as a means to address e-Health infrastructure shortcomings in isolated communities, as well as a primer to the Electronic Health Record (EHR). Moves towards the EHR are expected to acquire considerable momentum through the year, and we will be providing routine insights on this subject and commentaries by experts.

The issue also has two features on an ever-present challenge in healthcare IT, namely quality. In particular, we provide an expert's overview on the meaning of Six Sigma in the context of healthcare and healthcare IT, and its promise of patients reaping great benefits. Following on directly is an analysis of change management, with a focus on the implementation of Six Sigma practices in the hospital environment.

Yours sincerely,

Christian Marolt

Healthcare IT Management is the official voice of the European Association of Healthcare IT Managers

Managing Editor

Tosh Sheshabalaya - editor@hitm.eu

Editorial Director

Catalina Ciolan

Editors

Sherry Scharff
Caroline Hommez
Dervla Sains

Editorial Assistant

Wioletta Bunia

Correspondent

T. Jones

Guest Authors

J.Aarts, C.Caldwell, M.Claps,
G.Dhillon, W.LaFollette, A.Schmid

Publishing House

EMC Consulting BVBA
28, Rue de la Loi
B-1040 Brussels, Belgium
Tel: +32 2 286 8501
Fax: +32 2 286 8508
Email: office@hitm.eu
Website: www.hitm.eu

Publisher

Christian Marolt - c.m@hitm.eu

Media Contacts

Marc Rousseau - m.r@hitm.eu
Stefania Onorati - s.onorati.cd@hitm.eu
Alessia Nicolo - a.n@hitm.eu

Subscription Rates

One year	Europe 80€	Overseas 120€
Two years	Europe 140€	Overseas 180€

Art Director

Nicolas Bernier - n.b@emcconsulting.eu
Carola Mücke - ca.mue@emcconsulting.eu

Production and Printing

Nyomda
Print run: 12,000 – ISSN = 1782-8406



VERIFIED CIRCULATION
according to the standards of
International Business Press Audits

Healthcare IT Management
is independently audited by
Accountskantoor Closset on behalf
of the European Association
of Healthcare IT Managers

© Healthcare IT Management is published five times a year. Publisher to be notified of cancellations six weeks before the end of the subscription. The reproduction of (parts of) articles without consent of the publisher is prohibited. The publisher does not accept liability for unsolicited materials. The publisher retains the right to republish all contributions and submitted material via the Internet and other media.

Legal Disclaimer

The Publisher and Editors make every effort to see that no inaccurate or misleading data, opinion, or statement appears in this publication. All data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Therefore the Publisher, Editor and their respective employees accept no liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

References

References cited in this journal are available upon request to: editor@hitm.eu.



Page 12-15

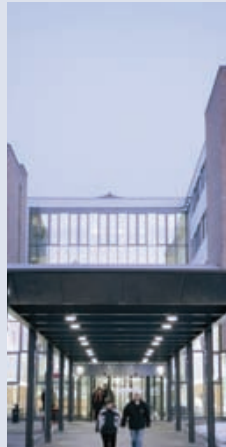
CLINICAL INFORMATION SYSTEMS

Clinical Information Systems are at the hub of a wide variety of healthcare IT applications. They are becoming critical to hospital IT infrastructure, especially to reconcile the requirements of privacy and security in an increasingly open, networked environment.



Page 19-22

21ST CENTURY HOSPITAL



The road to a still-futuristic Digital Hospital is both promising and bumpy. Digital technologies can be employed across a full range of hospital applications. The Asklepios Klinik in Barmbek (Hamburg, Germany) is a good example of a 21st century Digital Hospital.

Page 25-29

PAGE BIG IT & HEALTHCARE

Healthcare IT spending is expected to outstrip most other business sectors by a significant measure over the next decade. At the same time, new regulatory standards in the pipeline will bear on the design of new IT offerings.

An overview of developments in the healthcare area at some of the world's leading IT firms is presented.



Editorial 01

Letter from the Executive Director, HITM

HITM News 04-08

EU Section 09-11

New Approach to Standardisation in the Internal Market
Status of the European Health Insurance Card

Cover Story 12-15

The Clinical Information System

Product Comparison Chart 16-18

Hospital Material Management Information Systems

Features 19-33

The 21st Century Digital Hospital

The Broadband Challenge for Isolated Communities

Healthcare and Big IT

The Electronic Health Record

Remote Data Replication

Management 34-40

Six Sigma

Managing Change in Healthcare

Videoconferencing

Country Focus 41-46

Healthcare in Switzerland

IT and Swiss Healthcare

Healthcare IT Policy in Switzerland

Events 48

Page 34-38

SIX SIGMA AND CHANGE MANAGEMENT

Two articles by well-known experts show the growing importance of Six Sigma quality initiatives on healthcare and the need to translate concepts into the everyday vocabulary of healthcare workers. This is essential to establish a foundation for successful change.



Page 39-40

VIDEOCONFERENCING

The convergence of voice and images has long been a Holy Grail of the IT and telecoms industry. So far, a swathe of initiatives have led to a hotchpotch of mixed results. This now appears to be changing, fast.



Page 41-46

COUNTRY FOCUS: SWITZERLAND

e-Health is rapidly emerging at centre-stage in Switzerland's healthcare IT agenda. One key element is the recognition that though the country is advanced in this area, more needs to be done. The Swiss strategy focuses both on issues of quality and efficiency as well as solid financial benefits.

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

HITM's Membership Opportunities

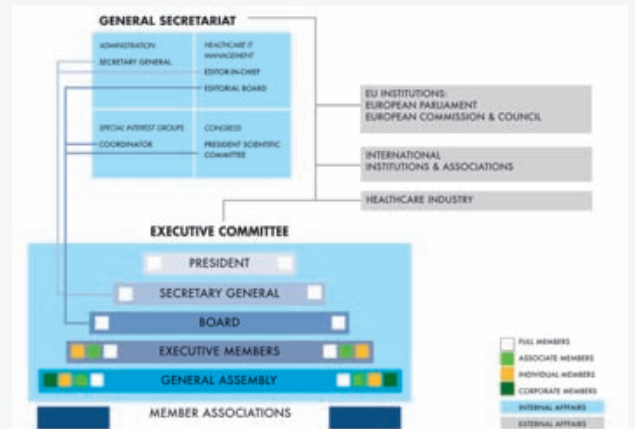
- Participate in advocacy groups that impact healthcare IT legislation
- Share knowledge with peers
- Learn about, and contribute to industry best practices and standards
- Attend the HITM Annual General Assembly and network with colleagues

HITM Membership Categories

- Full Members - are national healthcare IT associations, or if there are none, regional but nationally important healthcare IT associations or groups. Full members must be constituted according to the laws and practices of their country of origin.
- Associate Members - are healthcare organisations, academic institutions, or associations indirectly involved in healthcare IT management and constituted according to the laws and practices of their country of origin.
- Individual Members - are individuals directly involved in healthcare IT management but who are not members of any relevant regional or national healthcare IT association.
- Corporate Members - are representatives from corporations engaged in supplying products and services to the healthcare IT sector.

For more on HITM and information about membership, please contact Catalina Ciolan, Project Director, at c.c@hitm.eu

Organisational structure





AUSTRIA

Ak-MI



BELGIUM

Belgian Medical Informatics Association (MIM)



BOSNIA & HERZEGOVINA

Society for Medical Informatics of Bosnia & Herzegovina



BULGARIA

National Center for Health Informatics



CROATIA

Croatian Society for Medical Informatics



CZECH REPUBLIC

EuroMISE Center

Czech Society for Medical Informatics and Scientific Information



GEORGIA

Georgian Telemedicine Union



GREECE

Greek Health Informatics Association



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

NICTIZ



NORWAY

Norwegian Centre for Telemedicine, University Hospital North Norway



PORTUGAL

EHTO-European Health Telematics Observatory



ROMANIA

Romanian Society of Medical Informatics



SLOVENIA

Institute of Biomedical Informatics, Faculty of Medicine

Slovenian Medical Informatics Association



TURKEY

Turkish Medical Informatics Association



UKRAINE

The Ukrainian Association for Computer Medicine

Association for Ukrainian Telemedicine and eHealth Development (AfUTeHD)

THE NETHERLANDS

Focus on the patient

As of 2008, a total of 54 billion Euros will be available for healthcare in the Netherlands. Minister of Health Ab Klink argues that "the keyword for the coming years is attention for the patient" and together with State Secretary - Jet Bussemaker aims to focus on six themes: quality and innovation, prevention, safety, working in healthcare, and participation. It has been announced as well that together with home care and nursing will be able to take on between 5,000 and 6,000 additional staff.

Additional measures will be taken on the following issues:

- Replacement of no-claim bonus in health insurance
- Smoking ban in cafés and restaurants from July 1, 2008
- Influenza vaccinations for over 60s
- Extension of standard health insurance package (inclusion of contraceptive pill, extra home maternity care, dental treatment for 18- to 21-year olds, short-term mental health care)

As for long-term care under the Dutch Exceptional Medical Expenses Act, it remains accessible and under control and the charges for support services are expected to fall by next year.

For further information, please visit:

<http://www.minvws.nl/en/nieuwsberichten/staf/2007/putting-the-patient-centre-stage.asp>

CZECH REPUBLIC

Czech Healthcare System Far Friendlier to Patients

This year's Euro Health Consumer Index (EHCI) survey found the Czech health care system to have become much more patient-friendly than last year. The Czech Republic placed 15th out of 29 countries (the 27 EU member states, plus Switzerland and Norway), compared to 2006, when it ranked 22nd out of 26 countries. The Czech Republic received 612 points, finishing closely behind Estonia, Cyprus and Spain and ahead of Ireland, Britain and Italy.

Austria with 806 points out of 1,000 placed first, while Latvia (435 points) was at the bottom of the list of assessed countries.

The survey, which seeks to assess patient satisfaction with health care, also focuses on issues such as access to information, waiting time for treatment, as well as results.

For further information, please visit: <http://www.ceskenoviny.cz>

UKRAINE

International Conference "Telemedicine: myths and reality"

The Association for Ukrainian Telemedicine and e-Health Development (a Member of The European Association of Healthcare IT Managers) presented the 1st International Conference "Telemedicine: myths and reality" on November 8 and 9 in Lviv, Ukraine.

One of the key goals of the Association for Ukrainian Telemedicine and e-Health Development (AfUTeHD) is knowledge dissemination, a variety of educational and vocational courses, and the organising of conferences and forums. The aim of such events is to exchange experience and skills, and the availability of information for users. But above all, AfUTeHD showed that telemedicine and e-Health in general are simple, reliable, effective and easily accessible technologies which will allow a significant improvement in the quality of medical help and specialised education at all levels, to optimise and facilitate the work of medical practitioners.

For further information and registration, please visit:

http://www.telemed.net.ua/eng/index_eng.htm

LATVIA

New e-Health Programme to be Implemented

A new Latvian e-Health programme, devised by the Ministry of Health, plans to devote over 40 million Euros to the development of e-Health applications over the next three years.

The objective of the programme is to ensure that all citizens and healthcare providers are able to obtain clear, high-quality and reliable information, in a quick and efficient way. The programme includes the development of complete electronic health records and information on the treatment methods and healthcare services available both in Latvia and abroad. According to the plan, each citizen and healthcare professional (including other service providers) will be able to access a range of e-Health services, including an e-Prescription service, an electronic register of pharmacies, the possibility to make appointments electronically as well as electronic data exchange with health insurance companies.

It is expected that that this will significantly reduce the time required for administrative procedures (eg. the time needed to fill in medical documentation would be reduced by 10%, while the time a doctor takes to obtain information on previous treatments would be reduced by 30%).

For further information, please visit: <http://www.epractice.eu>

➤ Better Aging, Better Care – Exploring Solutions for an Aging Europe

More than 100 participants from regions across Europe gathered at the joint workshop “ Better Aging, Better Care ” organised by Intel and AGE in Brussels in October 2007. The event was held during the European Week of Regions and Cities.

The debate focused on one of the most pressing issues of our time: how will we care for our aging population? Therefore, social inclusion, financial issues and opportunities related to the ageing population as well as the growth in chronic medical conditions were examined in considerable depth.

During the workshop, participants’ interventions showed that technology can play a crucial role in achieving the goal of ‘ an active population ’ – but only on condition that the process is

both participative (involving elderly citizens as early as possible in the design process) and inclusive (ensuring that they continue to care for themselves and play an active role in society, while facilitating access to services and ensuring devices are user-friendly).

Benny Ginman (Intel Europe) argued in his opening speech that in an aging world, technology can help people to stay out of hospital, but that requires a shift of the healthcare paradigm from acute treatment to prevention. Therefore, politicians will need to invest heavily in broadband infrastructure, which connects people to the hospital, rather than have to bring people to the hospital.

The Director General of AGE (European Older People’s Platform), Anne-Sophie

Parent, argued that she saw a huge role for all stakeholders at all levels (EU, national and regional regulators; service providers; and user organisations) in order “ to relieve the heavy burden put on carers and to break the isolation of those who are totally excluded “.The focus moved to how individuals also have a role to play; it was important that people stay active and work longer. Mrs. Parent concluded by reminding the participants at the workshop that it is of tremendous importance to invest more in health prevention, given that, in the long term, this will prove to be both cost effective as well as a source for job creation.

For more information, please visit

<http://www.age-platform.org>

➤ e-Health Standards and Interoperability

Under the auspices of Member of the European Parliament Milan Cabrnock, MD, a Seminar on e-Health Standards and Interoperability was held on October 15 at the European Parliament, Brussels.

In his opening speech, Dr Cabrnock stated that only efficient and interoperable e-Health tools and services could fulfill needs and demands of European citizens. Furthermore, he expressed a sincere appreciation for the contributions offered by the BioHealth project in promoting standards, which are favourable to the development of innovative tools and services in the field of e-Health.

While the first session of the seminar focused on basic information about history, current status and the future of BioHealth project activities, its second was dedicated to the presentation of reports offered by projects and activities relevant for the development and use of e-Health standards and interoperability.

Marc Lange (EHTEL), for example, approached the European Health Insurance Card (EHIC) and presented the broader, legal, economic and political contexts of e-Health interoperability. Tomáš Mládek, from the the Czech web-based health record system IZIP, focused on interoperability

aspects of the Internet patient record as well as the TEN4 Health Project. Another participant, Noel Nader from Sesam Vitale, presented the project NETC@RDS, a move to pave a way towards an electronic European Health Insurance Card.

The seminar on e-Health Standards and Interoperability represented a good opportunity for participants to share experiences and views on how to concentrate efforts to enhance e-Health usability by users, politicians, administrators, experts, developers and healthcare providers.



Telepresence World 2008, London, 18/19 March 2008

“You have to see it to believe it” is often heard when describing telepresence. But telepresence is not “Star-Trek” technology of tomorrow- it is available and in use today. Telepresence meetings make remote participants life-size, with fluid motion, accurate flesh-tones, eye-to-eye contact, and flawless audio. The experience feels remarkably natural for almost any size meeting, from two people to large classrooms. Telepresence solutions are easy to use and surprisingly handy for collaborating on spreadsheets, slide decks, documents, or even physical objects. Medical Telepresence, which makes use of advanced communication technologies such as high speed networks, high defini-

tion video and audio, and large, high resolution displays to produce realistic, interactive experiences, has great potential as a medical tool for remote diagnosis, training and surgery. Many hospitals and medical facilities already use telepresence for remote training, efficiency of service, and continuity of care.

Telepresence World 2008 London, which will take place 18-19 March, 2008, at the city’s internationally acclaimed ExCel London Exhibition and Conference Centre, will showcase this amazing technology and is the only place where attendees can experience first-hand telepresence demonstrations from leading vendors all under one roof.

Attendees at Telepresence World 2008 London will be able to:

- Understand how telepresence can facilitate continuity of care for your patients, even when you are out of town
- Discover how medical residents and fellows can receive training and mentoring from experts in their fields
- Learn how telepresence can speed communications in military or disaster-related environments
- Comprehend how telepresence is making it possible for patients and physicians to consult with the best possible specialists, whether day or night
- Identify how telepresence can help the collaborative process, whether it is used for research, clinical, or diagnostic purposes
- Hear how customers have used telepresence to grow and enhance their business and find out how this technology can help yours!

For further information on Telepresence World 2008 London, including the latest conference agenda and complete registration details, please visit:

<http://www.telepresenceworld.com>

The World Health Care Congress Europe 2008, 4th Edition, Berlin, 10/12 March 2008

Organised under the high patronage of the European Commission, the German Federal Ministry of Health and presented for the 4th consecutive year, the World Health Care Congress Europe is the only major international forum where over 600 health leaders share best practices and successful initiatives for improved delivery and outcomes in Europe.

Participating thought leaders include health ministers, leading government officials, hospital directors, IT innovators, decision makers from public and private insurance funds, pharmaceutical and

medical device companies, and health care industry suppliers.

Four concurrent summits will cover the following topics:

- **Chronic Disease Management:** reengineering care, empowering patients, measuring and improving ROI, promoting health and preventing chronic diseases;
- **Implementing Health IT:** implementing EHR – challenges and applications, improving workflows and integrating care, telehealth and remote monitoring;
- **Improving Financial Performance:**

cost-effective care, pay for performance, balancing public and private contributions, controlling costs;

- **Improving Quality and Patient Safety** designing implementation strategies, leveraging IT, closing the gap between evidence and practice.

For further information on World Health Care Congress Europe 2008, including the latest conference agenda and complete registration details, please visit

<http://www.worldcongress.com/events/HR08015/index.cfm?confCode=HR08015>



“New Approach” Standardisation in the Internal Market

When talking about the Single Market, it should be mentioned that the New Approach and European standardisation have contributed significantly to its development. The facilitation of free movement of goods (healthcare included) between Member States comes as a consequence of the success achieving by the European standardisation system in removing technical barriers to trade.

With the removal of tariffs, the European Commission had to accept that non-tariff barriers to trade presented even more challenging obstacles for the Common Market. It was at this moment that the connection between economic and social policies became visible. Therefore, the elimination of non-tariff barriers to trade is not possible without having to intervene within the spectrum of social policies.

The evolution of the New Approach standardisation goes back to the 1969 Programme when trial to overcome different technical standards and regulations through vertical harmonisation proved to be a total failure; therefore, in 1985, the decisive New Approach to technical standards and regulations, was

based on four horizontal principles:

- legislation was restricted to laying down mandatory requirements instead of detailed technical specification;
- the mandatory requirements were to be concretised by technical standards elaborated by European standardisation institutions;
- these technical standards were of a non-binding nature;
- compliance with the voluntary standards guaranteed free access to the internal market.

Requirements for cooperation between the Commission and CEN/CENELEC were laid down in the 1984 Memorandum of Agreement while in 1989, the Council Resolution on the Global Approach to certification and testing made the following assessments :

- A consistent approach is developed in Community legislation by devising modules for the various phases of conformity assessment procedures, and by laying down criteria for the use of these procedures, for the designation of bodies operating these procedures, and for the use of the CE marking;

DIGITAL DICTATION – FAST, SECURE AND USER FRIENDLY

MedSpeech is a unique software solution for Digital Dictation and Speech Recognition. MedSpeech advantages are many: simplicity, speed and excellent security in combination with support for large volumes of dictations and many simultaneous users.

With more than 20 000 active users, MedSpeech has quickly become the most common system for digital dictation within the Swedish healthcare system.

The software is used in over 100 hospitals and primary care centres in both Sweden and the United Kingdom.



- The use of European standards relating to quality assurance (EN ISO 9000 series), and to the requirements to be fulfilled by conformity assessment bodies operating quality assurance (EN 45000 series) is generalised;
- Setting up of accreditation systems and the use of inter-comparison techniques are promoted in Member States and at Community level;
- Mutual recognition agreements concerning testing and certification in the non-regulatory sphere are promoted;
- The differences of existing quality infrastructures (such as calibration and metrology systems, testing laboratories, certification and inspection bodies, and accreditation bodies) between Member States and between industrial sectors are minimised by programmes;
- International trade between the Community and third countries is promoted by means of mutual recognition agreements, cooperation and technical assistance programmes.

Furthermore, the Commission and the Council started from the idea that a European product safety policy, based on strict product liability and voluntary technical standards elaborated under the New Approach, would suffice to balance out free trade and product safety. The adoption of the Product Safety Directive in 1992 can be understood as a partial failure of the original concept. It would then have been necessary to analyse the Product Safety Directive's impact on and inter-relationship with the New Approach. The Global Concept on Conformity Assessment must be understood as the counterpart to the New Approach. It guarantees access to the internal market and any conformity assessment involves a value judgment on product safety.

Countries involved :

Austria	Liechtenstein
Belgium	Lithuania
Bulgaria	Luxembourg
Cyprus	Malta
Czech Republic	Norway
Denmark	Netherlands
Estonia	Poland
Finland	Portugal
France	Romania
Germany	Slovakia
Greece	Slovenia
Hungary	Spain
Iceland	Sweden
Ireland	Switzerland
Italy	United Kingdom
Latvia	

Status of the European Health Insurance Card

The European Health Insurance Card came into being as a political project initiated by the European Commission with the support of the Barcelona European Council 2002. The main idea behind such a project was to replace all the paper forms needed at the time to obtain health care during a temporary stay in a Member State other than the one in which the insurance was held (i.e. forms E110, E111, E128, E119).

Legislation and entitlements

The European Health Insurance Card (EHIC) was gradually introduced from 1 June 2004 until 31 December 2005. Since 1 January 2006, the plastic card has been issued and is recognised in all the countries listed in Table 1. The use of the EHIC simplifies and reduces the bureaucratic procedure to the minimum: all the holder has to do is to show the card to the doctor for being treated as a citizen of the state he or she temporarily resides in, provided his is an emergency case. Settlement for medical services will be effected by the insuring institutions in the patient's home country and the country where medical aid was given. Settlement can only take effect if the patient has been treated in a health care centre or by a doctor contracted by the local health insuring institution. The holders of EHIC are entitled to all necessary medical aid which allows them to continue their stay in the foreign country under conditions of medical safety, in other words they do not have to interrupt their stay before the due date for medical reasons. Emergency medical aid will be administered up to the point where the doctor decides that there is no immediate danger for the life and the health of the patient.

Planned hospitalised treatment on the other hand is provided for the account of the health insurer if the insurer has granted preliminary consent to it. Every case of hospitalised treatment abroad is considered separately taking into account all the conditions and requirements of the national and European health insurance legislation.

From EHIC to eEHIC

This European Health Insurance Card (EHIC) is currently only an eye-readable information document. It was also foreseen to create an electronic card, which can be electronically read in the premises of, for example, general practitioners, pharmacists, hospitals and dentists, when equipped with the appropriate card reader. The card reader will verify the validity of the eEHIC online. As a consequence, the European Commission, Directorate General Employment has asked CEN to develop a CEN Workshop Agreement (CWA) that will lead to the creation of this electronic card.

Relevant EC/EEC Regulations and Decisions

Regulation (EEC) No 1408/71 of the Council of 14 June 1971 on the application of social security schemes to employed persons and their families moving within the Community.

Regulation (EEC) No 574/72 of the Council of 21 March 1972 fixing the procedure for implementing Regulation (EEC) No 1408/71 of 14 June 1971 on the application of social security schemes to employed persons and their families moving within the Community.

Regulation (EC) No 631/2004 of the European Parliament and of the Council of 31 March 2004 amending Council Regulation (EEC) No 1408/71 on the application of social security schemes to employed persons, to self-employed persons and to members of their families moving within the Community, and Council Regulation (EEC)

No 574/72 laying down the procedure for implementing Regulation (EEC) No 1408/71, in respect of the alignment of rights and the simplification of procedures.

Regulation (EC) No 883/2004 of the European Parliament and of the Council of 29 April 2004 on the coordination of social security systems (Text with relevance for the EEA and for Switzerland).

Decision No 189 of 18 June 2003 aimed at introducing a European health insurance card to replace the forms necessary for the application of Council Regulations (EEC) No 1408/71 and (EEC) No 574/72 as regards access to health care during a temporary stay in a Member State other than the competent State or the State of residence. (Text with relevance for the EEA and for the EU / Switzerland Agreement)

Decision No 190 of 18 June 2003 concerning the technical specifications of the European health insurance card. (Text with relevance for the EEA and for the EU/Switzerland Agreement).

Decision No 194 of 17 December 2003 concerning the uniform application of Article 22(1)(a)(i) of Council Regulation (EEC) No 1408/71 in the Member State of stay.

Decision No 195 of 23 March 2004 on the uniform application of Article 22(1)(a)(i) of Regulation (EEC) No 1408/71 as regards health care in conjunction with pregnancy and childbirth. (Text with relevance to the EEA and to the EU/Switzerland Agreement).

Decision No 196 of 23 March 2004 pursuant to Article 22(1a). (Text with relevance to the EEA and to the EU/Switzerland Agreement).

AN IMAGE SAYS MORE THAN A THOUSAND WORDS

Professional Image Management for Healthcare where the demands to quickly manage, analyse and store clinical images are high. Easy to use, fast and secure with seamless integration into your patient record system. Excellent functionality within the field of pathology, dermatology, endoscopy, ophthalmology and plastic surgery.

Picsara is the most versatile and competent image management software in the market. Using Picsara, it is easy to capture images from all kinds of image sources.

The images can then be manipulated and a number of different measurements performed. Large quantities of images and video clips can easily be organised, stored and shared with other users through a central database.



THE CLINICAL INFORMATION SYSTEM

At the Heart of Healthcare IT

Clinical Information Systems (CIS) are becoming critical to hospital IT infrastructure, in terms of their impact on the security of healthcare delivery in an increasingly open, networked environment. The key technical challenges are to reconcile conflicting requirements, such as providing privacy of patient-specific information while giving patients control over their personal health information. However, a buy-in by its eventual users is also a major challenge, which must be accommodated upfront. Given below are personal accounts by two IT experts in the CIS field, one from European another from the US.

AUTHOR

Jos Aarts is with the Institute of Health Policy and Management, Erasmus Medical College, Rotterdam, the Netherlands.
j.aarts@erasmusmc.nl

A RISKY BUSINESS

Landing on the Moon is Easier than Putting It to Work in the Hospital

The introduction of information systems in health care organizations is a risky business.

The grandfather of medical informatics in the United States, Dr Morris Collen, once wrote that putting a man on the moon is easier than implementing an information system in a hospital.

It is needless to point out that the track record of such initiatives has been dismal. Sometimes a botched-up project is widely published, such as the failed implementation of a computerised physician order entry system in Cedars-Sinai Medical Center in Los Angeles. Most, however, remain anonymous.

BARRIERS TO OPENNESS

Issues of shame, blame, reputation and litigation often prevent organisations to be open about their IT experiences. The situation is, moreover, unlikely to change in the near future. I have studied the introduction of computerized physician order entry systems (CPOE) in Dutch and American hospitals. CPOE is about physicians entering medical requests and retrieving after some time the results. 70% of medical requests (or orders) are about medication. The rest concerns radiology and laboratory tests.

In a 2004 survey of CPOE implementation in the United States [J Am Med Inform Assoc 2004;11 (2): 95-9], Joan Ash

and her team showed that less than 10% of the hospitals have adopted the technology, and there is no indication that the figure has improved since then.

Often poor physician involvement is cited as a failure factor. While non-involvement of physicians will certainly result in implementation failure, it is however only a part of the whole story. Currently, there is no major clinical IT implementation project that does not involve physicians.

SAME SYSTEMS, DIFFERENT OUTCOMES

I have done an in-depth investigation on the implementation of a CPOE system at two Dutch hospitals [‘Same systems, different outcomes - comparing the implementation of computerized physician order entry in two Dutch hospitals’, *Methods Inf Med* 2006;45 (1) : 53-61].

One ended in failure. The other became, after some time, a success. In both projects, physicians were involved, from the very beginning of identifying needs to the actual acquisition and configuring the system for use in practice.

When – during my study – it became clear that the implementation in one hospital was going to fail, I decided to look precisely at what doctors do. There were obvious problems. The implementers thought that a Windows interface would facilitate use. The opposite was true. It slowed down work and secretaries handling appointments for patients were not par-

ticularly happy. The older, command-key based system had been accommodated seamlessly in their daily work. But when the doctors realised that they had to use the system as well, then they started to rebel. One of them said that the system required doctors to send electronic notes. "Doctors don't send notes. They have other people doing that for them." This remark prompted me to conclude that doctors are not necessarily looking at the properties of a system, but are concerned how their way of practicing medicine might change as a result of a putting a new system in place.

GUIDELINES AND WAYPOINTS: A REALITY CHECK FOR SUCCESS

In this case the doctors considered it not to be in their best interest to adopt the system. I conclude therefore that discussions about implementing a new clinical system should address primarily the practice of medicine, and do so along the following lines:

- Are we, doctors, doing the right thing?
- How do we know that we take our patients seriously?
- How about the quality of our way of prescribing medication?
- How about collaboration with our colleagues and nurses?

Design and implementation, in consequence, should not necessarily heed to the wishes and whims of doctors. Hard questions about the practice and organisation of medicine need to be asked and resolved.

It is upon acceptance of possible changes in the way doctors practice medicine that the implementation of clinical information system can increasingly become more successful than it has so far.

THE DRIVERS SEAT

For that reason alone the doctors need to be in the driver's seat. They must be leading the way for the introduction of clinical systems, knowing that society requires them to deliver the best quality care they can and holds them accountable.

CPOE is a very interventionist technology because it relates directly to decisions that doctors make about patient care, and holds promise to improve the quality of care. In my study I found that implementation trajectories take many years to complete. Managers, doctors, government are often impatient and want to see quick results.

IMPERATIVES OF PATIENCE

I believe that these long periods are intrinsically part of getting clinical systems to work successfully. It is a learning period for all involved, for doctors to adopt new practices and responsibilities, for IT staff to accept that the systems will not look like how they were originally conceived and hospital administrators to find out how clinical data can be used to govern their institutions effectively.

The best way to implement clinical systems is not by adherence to detailed organisational and technological blueprints, but to harbor a vision of high quality patient care, and institute an implementation path that is characterised by improvisation to cope with new and unexpected challenges and problems of health care delivery.

This process was aptly described as 'bricolage', by Claudio Ciborra in the 2002 Oxford University Press publication 'The Labyrinths Of Information: Challenging The Wisdom Of Systems'. The underlying philosophy is to allow users to tinker with a system in order to find how it fits best in their new emerging practices.

THE CLINICAL INFORMATION SYSTEM

The clinical information system (CIS) sits at the crossroads of a wide variety of healthcare IT applications. At the baseline, CIS systems consist of a centralised database on patients and their current healthcare status, treatment history and conditions. Modern, state-of-the-art CIS systems provide access and updates to such information in close to real-time, and do so increasingly across distributed locations – including those outside the physical boundaries of a specific hospital. Eventually, CIS systems will also hold genetic, socio-environmental and other forms of information about a patient.

IT IS INTEROPERABLE ...

Tribulations Of Working With A Clinical Information System

AUTHOR

**Gurpreet
Dhillon**

is Professor of Information Systems at Virginia Commonwealth University, US.

One Friday evening, my son insisted on riding his bicycle. I tried convincing him that that road was slippery, that he had to have his supper and that I was tired, but to no avail. Barely had he begun having fun when his cycle went out of control and he fell, breaking his left arm.

Even though I am not an orthopedic specialist, I could see he had fractured both radius and ulna and that it was a green stick fracture.

An orthopedic surgeon friend advised me take my son straight to his clinic. My son, I must say, was rather brave all along. He cried a bit as his arm was being x-rayed and cried a little more while I filled in all the medical history forms, giving my consent to do "anything to my son", taking responsibility if "anything would happen" and filling some more forms required by the HIPPA (Health Insurance Portability and Accountability Act). In my mind I was thinking, "how ridiculous, the point is that they go ahead and fix my son's arm."

My surgeon friend used his influence to get a slot at his preferred hospital for 11 pm. We arrived there one hour before. And it took the hospital staff close to one hour to check us in.

FIRST ENCOUNTER: THE DEVIL IN THE DETAILS

This was my first brush with a hospital information system in the US.

First, the clerk could not figure out the codes that had to be inputted.

Then, she could not process my insurance online. She then had to call for an approval, take copies of my driving license and insurance card and then I waited, and waited. By now the ibuprofen was working on my son. His pain index was at 7, on a 10-point scale. Eventually the arm was put in a cast; another x-ray taken and we were discharged at 3 in the morning.

A BUMPY HISTORY TO SEAMLESS INTEROPERABILITY

Clinical information systems have been around for a while, making their debut in the US in the 1950s with initial application in the dental arena. However, progress has been patchy. The quality of such systems has been inadequate and reliability poor.

In 2004, the US Department of Health and Human Services formed the Office of the National Coordinator for Health Information Technology for developing interoperable electronic health records.

Seamless interoperability can only be ensured if the clinical information systems are well designed and the hospitals have the competence to harness the technology.

GOOD DESIGN AND DEFINING COMPETENCE

Research into the design and delivery of clinical systems suggests that the quality of clinical information systems not only significantly varies from one implementation to the other, but in some cases the design itself is rather poor. To a large extent, this emanates from poor requirements specification. In many cases, developers pay lip service to identifying and specifying system requirements. While industry specified methods and procedures for requirements analysis exist, there is always an issue with respect to managing multiple stakeholders, their intent and perhaps organisational power relationships.

In the US, particular care also needs to be taken of what the physicians want, what the nurses require, what the administrators have need of and what the insurance companies require. Many a time the needs and wants of multiple stakeholders do not stack up; they are often at odds with each other. A clever systems analysis needs to balance out the conflicting requirements while the business analysts need to get all stakeholders on board, a task that is absolutely essential but not easy by any means.

All this suggests that hospitals must develop competence in managing IT and communication technologies. An inability to do so results in complete failure of systems. No wonder that the rate of failure of technology systems in hospitals is higher than that in regular businesses. Competence is an ability that helps translating know-how to know-that and vice versa.

The problem in clinical information systems is the cookie cutter approach adopted in most settings, which may or may not help in achieving the benefits. In most US hospitals, there is little emphasis on good change management while investing in the design and development of a new system. Rather, a techno-centric orientation forbids administrators and developers alike from understanding the context in which the system is being developed.

SO WHAT ?

Findings from various case studies have shown that balancing out the requirements and ensuring delivery of proposed benefits reduces resistance to adoption of new systems. The complexity inherent in the US healthcare system calls for even more careful consideration of stakeholder input.

Research has shown that failure of clinical information systems is largely because of:

Incompleteness of Driver Analysis: When analysts and developers approach the problem domain with certain predetermined

conceptions, it often results in an incomplete analysis of critical drivers for change. In one hospital in the US, the 'hows' and 'whats' got mingled to a point such that the proposed benefits of the clinical information system for the whole hospital became obscured by benefits to a lower level task set. As a result, the intent behind the design and development simply got lost.

Ignored Drivers: In one British clinical information systems implementation, it was discovered that the hospital's key motive was to move towards community-based care. However, the system developers largely ignored this main driver. The result was a system which did not quite manage to support community-based healthcare.

Method Drivers: On many occasions, system developers place too much faith in structured methods. They believe that their methodologies are robust and capable. Hence, they tend to focus on the process, rather than the intent or on what actually may be the problem. Consequently, endeavors get started as technology projects, with limited appreciation for the business.

Value Set Drivers: The total driver set within any organisation is a complex mixture of political, organisational and operational factors in which all parties have value sets that operate strongly. For example the government's belief that the internal market strategy is very suitable for the UK National Health Service forces administrators to run hospitals with a rather different mind-set, which may not necessarily be in the best interest of the patients.

I am certain that if hospitals focus a little more on defining requirements, shun the cookie-cutter approach to defining and designing systems and put a little more emphasis on competence building, the results will be spectacular.

On my part, I am certain that my son's arm would have been fixed hours earlier and would have avoided the trouble of filling out multiple forms and giving an equally extensive multitude of consents – while he was in pain. Would it not have been nicer if a majority of such activities were automated ?

For instance, initiating one activity in a physician's office should have automatically led to checking-in my son into the preferred hospital. I could then have been prompted to confirm the choices, via email or cell phone. This would clearly help eliminate a lot of flab from the current business process.

If banks and investment brokers can use such a process, why cannot hospitals and insurance companies ? Only after we achieve such a level of networked co-dependence, I will call it complete interoperability.

CIS: A LONGSTANDING DEBATE

The debate about the role and reliability of clinical information systems (CIS) goes back several years.

AUTHOR

**Tosh
Sheshabalaya**
HITM

As far back as 1994, a *British Medical Journal* editorial entitled 'Are clinical information systems safe ?' portrayed a series of high-profile failures (which entailed physical harm to patients), and raised some disturbing questions. These included the lack of safety critical certification as well as issues of liability on the part of device manufacturers.

The *Journal* also observed that "Computer consultants should recognise that lack of input from clinicians in the development of information systems in the past may have increased the dangers of failure." It concluded that the ensuring of "reasonable safety for clinical information systems is, then, essentially a problem for clinicians."

Such a debate continues today. However, both its contours and content have become far more complicated. In its editorial, the *Journal* noted that the speed and complexity of information systems "makes it impossible for humans to verify that the results are correct" or allow clinicians to be firmly 'in the loop' of control. That was almost a generation ago.

Today's CIS systems are much faster and complex. The challenges are therefore also greater. And yet, much more is also expected from them.

An Institute of Medicine report, 'Crossing the Quality Chasm: A New Health System for the 21st Century', recently identified the design of more sophisticated clinical information systems as essential for the highest-quality, lowest-cost patient care.

When the *British Medical Journal* published its editorial, formalised IT design techniques were still in their infancy. Indeed, the editorial emphasised that design was less important (and possibly more cumbersome and impractical) than prototyping and field testing, which would then be formally incorporated into an acceptable certification process.

In the late 1990s, the design of CIS systems acquired an artisanal nature – especially due to the growth in platform and functionality convergence, and a rise in object-oriented/componentised architecture. One of the visions of this era was to generate a multitude of clinical information applications from a common foundation, with new systems built out of generic software adapted for different specialties, with a certain in-built element of connectivity. These were, of course, the years when the Internet was just taking off.

Today, CIS design – like that of other healthcare IT systems – is being driven by a new generation of design tools and formal models. These include Platform-Based Design (PBD), with system specifications mapped to Service-Oriented Architecture (SOA) platforms by means of Internet-era languages such as XACML. Alongside, the design of new CIS systems also typically take close account of human-computer interfaces (HCI), healthcare decision support and clinical guidelines, system integration and change management policies, the implications of e-health and distributed IT technologies.

Hospital Material Management Information Systems



ECRI Institute Europe
Weltech Centre Ridgeway
Welwyn Garden City
Herts AL7 2AA
United Kingdom

Tel: +44 (0)1707 871511
Fax: +44 (0)1707 393138
info@ecri.org.uk
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

MODEL	MATERIALS MANAGEMENT INFORMATION SYSTEMS
WHERE MARKETED	
FDA CLEARANCE	
CE MARK (MDD)	
HOSPITAL SIZE	
Number of beds	Facility-dependent
SYSTEM CONFIGURATION	
CPU	Facility-dependent
Operating systems	Facility-dependent
Database management	Facility-dependent
User interaction	Facility-dependent
Portable data entry	Facility-dependent
Printers	Facility-dependent
LAN PROTOCOLS USED	
STANDARDS SUPPORTED	HL7, others
MULTIPLE SITES SUPPORTED	Facility-dependent
SYSTEM FEATURES	
EDI	Yes
Requisitioning	Yes
Purchase orders	Yes
Inventory control	Yes
Online inventory and reordering	Facility-dependent
JIT inventory	Facility-dependent
Reordering methods	Facility-dependent
Control of nonstock supply	Facility-dependent
Automatic purchase/receive	Facility-dependent
Invoice matching	Facility-dependent
Exchange cart/par stock supply	Facility-dependent
Case cart system	Facility-dependent
Capital assets	Yes
Automated financial system interface	Facility-dependent
Report writing	Yes
Customized	Facility-dependent
Supplier bid analysis	Facility-dependent
Cost accounting	Facility-dependent
Patient charges	Facility-dependent
POWER REQUIREMENTS	
PLANNING & PURCHASE	
Warranty	
Hardware	Yes
Software	Yes
System upgrades	
Frequency	At least annually
Training & support	Yes
Costs	High priority
Remote diagnostics	
Phone support	Yes
Delivery time, ARO	
Number installed	High priority
Year first sold	
Fiscal year	
OTHER SPECIFICATIONS	Access to online marketplace; accessible through Web; contract management features; managing returns and backorders; additional supply chain management and administrative features.
LAST UPDATED	
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.

EAGLE	EHS	GEAC ENTERPRISE SOLUTIONS	MEDITECH
PROTEUS	EHS MMIS	SMARTSTREAM	MATERIALS MANAGEMENT APPLICATION
Worldwide	Canada, Europe, Mexico, USA	Worldwide	Canada, UK
Not specified	Not specified	Not specified	Not specified
Yes	Not specified	Not specified	Yes
Any	50 >1,000	Any	15-2,000
Not specified	Not specified	Client/server, Web based	Client/server PC based
Not specified	Pentium 4, 96 MB RAM, Windows NT, 486 Pentium, 96 MB minimum memory	Not specified	EMC AViiON, Microsoft (PC), Compaq, Dell, IBM
Windows 2000/XP/, Novell, UNIX SQL Server, Oracle, Sybase	Microsoft SQL	UNIX, Windows NT/XP Sybase, MS SQL server	Magic; Windows 95/98/NT/2000/XP Magic, Microsoft SQL server, c/s: Windows NT, Intel, SQL
Keyboard, mouse	Keyboard, mouse, RF touchscreen, PDA, bar-code scanner	Keyboard, mouse	Keyboard, mouse
Bar-code scanner, PDA	Handheld computer, notebook, bar-code scanner, RF handheld or notebook Laser, user specified	All	Handheld computer
Any	Ethernet, TCP/IP, Token Ring, ATM, RF	Any standard Windows printer	Remote
Ethernet, Novell, TCP/IP	Ethernet, TCP/IP, Token Ring, ATM, RF	Windows 2003, AIX/5L 5.3 and 5.2, Windows 2000 SP4, HP/UX 11.i, Solaris 9	TCP/IP, Ethernet, Novell NetWare
Not specified	ANSI X.12, HL7	ANSI X-12, Edifact 91.1, ACH	HL7, TCP/IP, Ethernet
Yes	Yes	Unlimited	Varies on organizational network
Optional	Yes	Yes	Transmits POs to suppliers
Yes	Yes	Yes	Purchase requisition for inventory and noninventory items
Yes	Yes	Yes	Auto PO generation from approved requirements
Yes	Yes	Yes	Multiple inventory required methods
Yes	Yes	Yes	Transfer tracking from bulk storage
No	Yes	Yes	AUG, FIFO, and LIFO methods
Automatic or manual	Yes	Yes	Automatic calculation of EOQs, minimum reorder points, more
Yes	Yes	Yes	Automatic update of quantity on hand
Yes	Yes	Yes	Bar-code capabilities, others
No	Yes	Yes	Yes
No	Yes	Partner	Yes
No	Yes	No	Yes
Yes	Yes	Yes	Yes
Optional	Yes	Yes	Yes
Crystal Reports	Yes	Yes	Management and statistical report writing
Optional	Per user request	Yes	Status, physical inventory, optimization report
No	Yes	Yes	Yes
Optional	Yes	Yes	Yes
No	Yes	Partner	Yes
Not specified	Not specified	NA	Not specified
NA	NA	NA	NA
1 year with support	Included in software support program	1 year	Not specified
2/year	Quarterly	Annually	Not specified
Yes	Yes	Included in maintenance costs, training cost varies depending on scope	Yes
Varies	Variable	Not specified	Contact manufacturer
Not specified	Yes	Yes	Yes
7 a.m. to 6 p.m. CST; Monday to Friday; toll-free	8:30 a.m. to 6:30 p.m. EST; 24 hr available	24 hr toll-free	24/7 available
Immediate	90 days	Not specified	Not specified
300	218	~500	913
1997	1980	1991	1980
January to December	January to December	May to April	January to December
Optional modules: BAS interface, mobile interface, service request, bar code.	Tissue, bone and implant device tracking are part of the system.	Embedded workflow; online support; field-sensitive help; multiple APIs; drill down; Web based; full integration with funds control and projects.	Complete healthcare information system, including other general financials such as general ledger, accounts payable, payroll/ personnel, staffing/scheduling, and fixed assets.
Sep-06	Sep-06	Jun-05	Mar-03

ECRI-RECOMMENDED SPECIFICATIONS

PHOENIX DATA SYSTEMS

TECH-TIME

MODEL	MATERIALS MANAGEMENT INFORMATION SYSTEMS	AIMS.NET : AIMS-LAN	STAT! HEALTH INFORMATION SYSTEMS
WHERE MARKETED		Worldwide	USA, Puerto Rico, Spanish-speaking countries
FDA CLEARANCE		Not specified	Not specified
CE MARK (MDD)		Not specified	Not specified
HOSPITAL SIZE			
Number of beds	Facility-dependent	50 to unlimited	Up to 100
SYSTEM CONFIGURATION		PC	Mainframe, PC, terminal
CPU	Facility-dependent	Server Dual Intel Xeon 2.8 GHz	Alpha server
Operating systems	Facility-dependent	Windows XP Professional, Windows 2000 Professional	Open VMS
Database management	Facility-dependent	Microsoft SQL Server Database Engine, Microsoft SQL Server 2000/2003	Flat file
User interaction	Facility-dependent	Keyboard, mouse	Keyboard, mouse
Portable data entry	Facility-dependent	Compatible with all PDAs supporting Palm 3.5 OS (or higher) API, Windows CE, laptop	Handheld PC, bar-code scanner
Printers	Facility-dependent	Laser, ink jet	Dot matrix or laser jet
LAN PROTOCOLS USED		TCP/IP, IPX/SPX	Ethernet, LAT, TCP/IP
STANDARDS SUPPORTED	HL7, others	Unlimited	ANSI, HL7
MULTIPLE SITES SUPPORTED	Facility-dependent	Yes	Yes
SYSTEM FEATURES			
EDI	Yes	Not specified	Yes
Requisitioning	Yes	Yes	Yes
Purchase orders	Yes	Yes	Yes
Inventory control	Yes	Yes	Yes
Online inventory and reordering	Facility-dependent	Yes	Yes
JIT inventory	Facility-dependent	Yes	Yes
Reordering methods	Facility-dependent	Yes	Yes
Control of nonstock supply	Facility-dependent	Yes	Yes
Automatic purchase/receive	Facility-dependent	Yes	Yes
Invoice matching	Facility-dependent	Yes	No
Exchange cart/par stock supply	Facility-dependent	Yes	Yes
Case cart system	Facility-dependent	Not specified	Yes
Capital assets	Yes	Yes	Yes
Automated financial system interface	Facility-dependent	Not specified	Yes
Report writing	Yes	Yes	Yes
Customized	Facility-dependent	Yes	Yes
Supplier bid analysis	Facility-dependent	Not specified	Yes
Cost accounting	Facility-dependent	Not specified	Yes
Patient charges	Facility-dependent	Not specified	Yes
POWER REQUIREMENTS		Not specified	110 VAC
PLANNING & PURCHASE			
Warranty			
Hardware	Yes	NA	1-3 years
Software	Yes	90 days	Ongoing
System upgrades			
Frequency	At least annually	Annual	Quarterly
Training & support	Yes	Yes	Yes
		≥	
Costs	High priority	≥ \$895	\$60/hr/no charge
Remote diagnostics		Yes	Yes
Phone support	Yes	Included in maintenance contract	7 am to 6 pm MST; 24 hr emergency call
Delivery time, ARO		Immediate	8 weeks
Number installed	High priority	> 600	20
Year first sold		1983	1996
Fiscal year		January to December	October to September
OTHER SPECIFICATIONS	Access to online marketplace; accessible through Web; contract management features; managing returns and backorders; additional supply chain management and administrative features.	Optional components available.	Fully interfaced into patient accounting system with bar-code charge entry and inventory control.
LAST UPDATED		Sep-06	Sep-06
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.		

THE 21ST CENTURY DIGITAL HOSPITAL

The Western Europe healthcare sector is dealing with different "inconvenient truths". The problem of skyrocketing costs is possibly one of the best known. However, other challenges too, loom large. The quality of services and delivery paradigms must be changed to tackle ageing of the society, chronic diseases or new pandemics.

AUTHOR

Massimiliano Claps
is Research Director, EMEA,
for the Government and Health
Insights practice at IDC.

Hospitals at the Hub of Healthcare Transformation

Within this wave of transformation, hospitals will be crucial as they are the most important providers of health services in Europe; in fact, according to the OECD and WHO, hospital spending absorbs around 34% of total healthcare expenditure in France and Germany and 44% in Italy.

A question of sustainability arises, and each European country that wants to address healthcare transformation should embark on a modernisation program starting from the hospital system. The modernisation must start with hospitals undertaking a deep functional change, overcoming their supply-side traditional organisation and transform into more efficient patient oriented organisations.

Some countries (e.g. France) have launched hospital reforms that encompass the improvement and measurement of processes, the introduction of funding systems based on case medicine and the application of evidence-based medicine tools in the delivery of care.

Growth in Information Dependency

These changes make hospitals more and more information dependent, thus increasing reliance on information and communication technologies. As a result, nowadays when we talk about the 21st century hospital, we talk about the "digital hospital".

ICT will enable information sharing between all the stakeholders involved in hospital processes and become the means to empower people and enable new processes where the patient is central.

Different stages in maturity

Digital technologies can be employed in different hospital areas and in different phases of patient treatment, from the registration of patients, to emergency and disease management, to discharge and billing.





If we analyse the evolution of solutions proposed for hospital information systems, we encounter different maturity stages.

The basic health information system includes applications that are focused on hospital administrative processes, such as patient registration, admission, discharge and transfer, patient billing, human resources information systems, purchasing and financial reporting.

The second phase enhances the potentiality of the first stage, introducing electronic claims submission functionalities, electronic payment processing, inventory applications, basic order communications, email, Internet and hospital intranet. The clinical aspects are addressed only in a more advanced hospital information system entailing a laboratory information system (LIS), RIS/and radiology results reporting, PACS and operating room scheduling and management system.

Entering the True Digital Era

The hospital enters the real digital hospital stage when information is shared within a single IT architecture, which is fully integrated with all hospital activities. At this point, the hospital wireless network enables it to fully leverage Computerized Physician Order Entry (CPOE), electronic nursing documentation,

department management system, an inpatient Electronic Medical Record (EMR) accessible through a physician and a patient portal, etc.

Once the perfect integration of technologies is achieved within its facilities, a hospital is ready to become a Digital Virtual Enterprise, and act as the hub of extended regional health networks enabling also home healthcare management through remote patient monitoring and telemedicine.

Europe's Landscape Still Fragmented

Compared with the above described maturity model, the European hospital sector landscape appears really varied and fragmented. There are countries like the UK where, through a massive and not simply manageable program, such as "Connecting for Health", hospitals are moving towards the digital hospital stage.

At the other end are some regions as in the south of Italy where hospitals do not have broadband connection and they hardly position themselves in the advanced hospital information system stage.

Asklepios: A 21st Century German Jewel

The Asklepios Klinik in Barmbek (Hamburg, Germany) can be considered an example of a hospital well advanced in its quest for the 21st century Digital Hospital.

Asklepios is a private hospitals union, which currently runs 92 clinics, acute care hospitals and rehabilitation centres in Germany and in the U.S. With the acquisition of the Landesbetrieb Krankenhäuser Hamburg (Hospitals Hamburg Land enterprises), Asklepios became the biggest union of hospitals in Germany.

The new Barmbek Clinic is the reference hospital for the "Future Hospital" program, the Asklepios project for modern healthcare. The new building has been provided with modern IT equipment to deliver increased efficiency through the transition from an institutional system to a patient-oriented informational approach.

The Future Hospital is a combination of design, processes, and technology to foster the optimal environment for employees and patients. This approach requires transparency, interoperability and standardisation of the entire treatment process.

The Strategic Role of IT and Communications at Asklepios

ICT has a strategic role in this transition from traditional departmentally oriented hospital organisation to a holistic patient-centric organisation. The network- and information-oriented approach provides a secure communication environment, which allow information sharing across the continuum of care and realise benefits from tools such as Electronic Medical Records (EMR), mobile point of care, picture archiving and communications systems (PACS), and clinical and management information systems (CIS/MIS).

Asklepios: The 21st Century Hospital

In response to growing global pressures on healthcare and hospital systems, Germany's Asklepios Clinics joined forces with Intel and Microsoft to establish the Asklepios Future Hospital (AFH) Program. At the present moment, the AFH consortium includes 20 medical equipment, devices and IT companies – from both the hardware and software sides. Asklepios is currently the biggest union of hospitals in Germany.

The AFH Program pursues an integrative approach to improving the quality and cost-effectiveness of healthcare treatment by setting new standards, developing and testing innovative new solutions and doing this in a cooperative - but open, dynamic and proactive manner (in order to stay current with leading-edge technologies). IT serves as the key driver for AFH. Projects are focused on establishing seamlessly secured, interoperable communication between all healthcare service users, and on finding both real-world and cost-effective solutions which directly impact upon the quality of patient treatment.

The Asklepios Clinic Barmbek in Hamburg, Germany, serves as the reference centre for AFH. It is Europe's most modern clinic, and pilots / demonstration projects are not only nurtured within its premises but transferred systematically to the over-100 national and international Asklepios clinics.

Timeline

October 1999:

Launch of Barmbek New Hospital project

May 2001:

Final decision in architects' competition, award of commission

October 2002:

Preliminary ground clearance, demolition of existing buildings on site

November 2002:

Planning permission awarded

December 2002:

Foundation stone laid

May 2004:

Topping-out ceremony

September 2005:

Barmbek Hospital presented to its tenant

November 2005:

Open Day for the general public

December 2005:

Relocation and start-up

February 2006:

Opening ceremony of Asklepios Hospital and launch of Asklepios Future Hospital Program

Institutes and Medical Treatment Units

The hospital houses all state-of-the-art treatment and diagnosis facilities necessary to ensure smooth medical procedures to high standards. The medical technology includes:

- 1.5 Tesla MR (magnetic resonance tomography device)
- 16-line and 40-line CT scanners
- Digital X-ray, images on all PCs
- Left cardiac catheter measurement unit
- Integrated cardiovascular monitor system (150 monitors) with data memory which can be accessed from any monitor station if required
- Video endoscopy and bronchoscopy
- Laser systems
- Dialysis facility
- Medical image processing systems accessible from any PC
- Mobile tablet PC data directly accessible (mobile ward rounds)
- Operating theater with laminar airflow system over every operating table
- Pocket Lock system in patient transport

Hospital Figures

- 676 beds arranged exclusively as 68 one-bed rooms with own shower/WC and 440 two-bed rooms with own shower/WC plus beds in special units for intensive care and intermediate medicine and neonatology
- Capacity for approx. 35,000 stationary and 40,000 ambulant patients
- Approx. 1500 staff

The central emergency department, operating theaters and Intensive Care Units are directly adjacent. There is a helicopter landing pad on the roof, with a direct elevator link to the emergency department on the ground floor.

The short distances and coordinated architectural layout of the department assure smooth workflow for emergency cases, rapid response, triage and treatment times.

Building Figures

200m x 100m, 34,000 sq. m usable area and 21,000 sq. m circulation space in 5 floors plus one basement, with a total of 3,300 rooms

The results of such an approach are already quite evident: productivity has risen – the amount of time a patient spends in the hospital has dropped by 0.7 days, which means higher turnaround and revenues – while quality of service has remained high along with the satisfaction of employees.

Barmbek sets an example of excellence, because of project management, ability to drive efficiencies through standardisation and long-term strategic outlook. What stands out in the Asklepios-Barmbek clinic modernisation program is a combination of leadership, collaboration among all employees and collaboration with the consulting units of IT vendors, which enabled the introduction of innovative approaches in direct and indirect cost analysis.

Consolidating the infrastructure on a single architecture increased efficiency, not only in terms of cost savings, but also in terms of releasing resources for more value-added activities and innovative IT solutions. Asklepios traditionally spent 80% of its IT budget for maintenance of systems and now targets reducing this to 60%, which will double the amount spent on innovation with the same budget.

Asklepios' decision to complement the hospital renovation with ICT modernisation demonstrated long-term vision and drove results that are impacting on the hospital's service outcome (e.g. quality of care, patient turnover, and an entirely new experience for patients and employees), well beyond IT efficiency. The Barmbek clinic can set a good practice not only for the rest of the Asklepios group, but also for other large hospitals throughout Europe that are thirsty for modernisation.



Outlook for the Future

Expectations from the benefits of application of ICT in hospitals are rising rapidly; however, technology is only a part of the solution and not a stand-alone answer. Cultural change, a key element in all transformations, will be even more important in hospitals than in other segments.

In fact, healthcare is a paradoxical world: it is one of the most innovative sectors, but at the same time one of the most reluctant in introducing innovation to its processes.

For example, while the high value that evidence-based medicine can add to the medical practice is widely accepted, its implementation has been slow due to the difficulty in obtaining data about the effectiveness of treatments, the challenges in disseminating results, and the inherent variation in patient responses and outcomes. In turn, the lack of data is mainly due to the fact that clinicians do not have the right incentives to collect it and are not fully conscious that the technology they are using is part of the process and not just a complication to their work.

The road to the 21st century Digital Hospital is promising, but is also a bumpy one.



16-18 April 2008
Luxexpo, Luxembourg

THE INTERNATIONAL EDUCATIONAL AND NETWORKING FORUM FOR **eHEALTH,** **TELEMEDICINE AND HEALTH ICT**

Med-e-Tel offers opportunities to meet and network with qualified buyers, specialists, users, health-care providers, industry representatives, researchers, and policy makers from 50 countries around the world.

The event provides hands-on experience and an opportunity to discover and evaluate new products, systems and technologies and to hear about the latest ehealth/telemedicine news and trends.

Med-e-Tel features an extensive educational and conference program with more than 150 presentations and workshops on a wide variety of telemedicine and ehealth topics.

Med-e-Tel 2007 was accredited by the European Accreditation Council for Continuing Medical Education to provide 18 CME credits for medical professionals. Accreditation for the 2008 event is also underway.

Topics will include a.o.:

- personal monitoring systems
- use of ICTs in independent living for the ageing and disabled
- chronic disease management
- mobile ehealth solutions
- telemedicine for diabetes care
- telecardiology
- telepaediatrics and child health experiences
- telenursing
- telepsychiatry and mental health
- interoperability and standardization
- maximizing the potential of ehealth in low resource settings
- early warning for infectious diseases
- satellite communication
- elearning
- and more

Additional events being planned in conjunction with Med-e-Tel 2008, include meetings and workshops by some of the following organizations:

- International Society for Telemedicine & eHealth
- International Association of Homes and Services for the Ageing / Center for Aging Services Technologies
- European Commission & European eHealth Projects
- World Health Organization
- European Telecommunications Standards Institute
- World Academy of Biomedical Technologies
- United Nations Office for Outer Space Affairs
- Centre de Recherche Public – Santé

For registration, exhibition and sponsorship applications, conference program, hotel and travel information, newsletter subscription and more, go to: www.medetel.lu

Supported by



LE GOUVERNEMENT
DU GRAND-DUCHÉ DE LUXEMBOURG
Ministère de la Santé

Venue



www.medetel.lu



THE BROADBAND CHALLENGE FOR ISOLATED COMMUNITIES

HEALTHCARE IT
MANAGEMENT
ANALYSIS

Effective e-Health in isolated communities is clearly dependent on access to broadband infrastructure. Currently, terrestrial technologies like ADSL or cable modem are available for a significant number of Europeans, at competitive prices. But there are challenges.

According to a European Space Agency study in December 2005, broadband coverage ranges from 90-98% of the territory of most northern and western EU Member States. This is however not the case in its central and eastern regions, and also in the south. Even in 2010, broadband coverage is not expected to exceed 50-60% in Romania and 70-90% in Poland, the Czech Republic and Greece.

Some experts believe that a considerable chunk of this gap could be bridged through hybrid solutions of terrestrial systems and satellite-based technologies, especially if demand is aggregated and consolidated on an EU-wide basis.

Satellites, in particular, have the ability to cover vast regions with low-density usage requirements, and avoid the need for major investments in terrestrial infrastructure. What is as interesting is that they can complement terrestrial solutions to even out gaps in access to broadband services – especially for isolated communities on islands and mountainous areas.

Few Successes So Far

Using satellites to provide access to the Internet in remote places is not a new idea, but there are few examples of successful deployments. This is partly due to the problem of cost, as a two-way satellite link can be significantly more expensive than fixed-lines. The issue of latency also poses problems for applications such as voice over IP.

In addition, existing rules for satellite communications do not cover licensing and the selection of operators is largely national. This has led to divergence in approaches to operator selection, impeding the growth of pan-European mobile satellite systems.

The EU Commission has nevertheless sought to take several steps to address what may become a serious digital divide.

European Initiatives Focused on Pilots

One of the first EU projects in this respect was called RURAL WINS, which discussed, reviewed and analysed ways to bridge the digital divide in isolated regions. It drew up an implementation roadmap, and called for significant public sector involvement as far as isolated communities were concerned. It recommended a phased introduction of broadband to rural regions starting with fixed-line services in integrated areas, and extending to satellite-based systems in more remote regions. Its final workshop, which include 30 participants from across Europe, was held in July 2003.

In early 2004, twelve European organisations teamed up in an attempt to link local wireless networks to two-way broadband satellite connections and provide services for rural communities – ranging from Ireland to Poland. The European Space Agency TWISTER project (Terrestrial Wireless Infrastructure integrated with Satellite Telecommunications for E-Rural) set up over 100 ‘validation sites’ across Europe to support innovative applications in a multitude of domains: e-Health, as well as agriculture, education, community services, and e-business.

In January 2005, the ESA launched INSPIRE (Internet via Satellite for Promoting Inclusion of Rural Economies) – to bring broadband to remote locations. Its first phase connected 6,000 users in the UK, and aimed to demonstrate the viability of satellite broadband access, especially on issues like service flexibility and scalability.

HYLAS and BARRD

Real-life experiences with INSPIRE will pave the way for HYLAS (the Highly Adaptable Satellite) to be built by EADS Astrium and scheduled for launch in late 2008. HYLAS’s key purpose is to provide broadband Internet access and to distribute/broadcast HDTV across Europe. It will handle traffic for up to 300,000 users at the same time, by means of high gain Ka-Band spot beams that enable 6 simultaneously active spots (equivalent to more than 40 conventional 33 MHz transponders).

Other ESA initiatives include BARRD (Broadband Access for Rural Regeneration with DVB-RCS). The consortium is led by EADS Atrium. Interestingly, BARRD seeks to support the growing trend for Knowledge Economy workers migrating from the cities to the countryside, and supports the regeneration of rural economies which such a trend encourages.

In August 2007, the EU Commission finally adopted a proposal to select systems for mobile satellite services (in the reserved 2 GHz band) at a pan-European level. If adopted by the European Parliament and the EU Council (of Telecom Ministers), this new rule would allow broadband data, TV and emergency communications to develop smoothly throughout Europe onwards from 2009.

HEALTHCARE AND BIG IT

HEALTHCARE IT
MANAGEMENT
ANALYSIS

Healthcare has, in recent years, been at the front of a feverish pace of technological change. However, the bulk of such developments have been in the areas of patient therapy and care. Innovations in the area of IT systems have been less apparent.

And yet, it is IT which – at the moment, lurking just below the horizon – offers the greatest promise in its potential to enhance the effective delivery of healthcare. It is also held out as a way to cap spiralling growth in healthcare costs – resulting from the demographic realities of an ageing population, staff shortages, stricter laws, rules and regulations and increasing patient expectations.

IT is, at the end, about information. It is central to the ability to quickly develop, access, change and share meaningful data and information, about patients and their health. The participants in such a process are extensive: physicians, hospitals and healthcare providers, health insurance companies, public authorities, drugs companies and pharmacies – and last, but not least, patients and the general public.

Complexity and flux

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

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

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

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

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

CISCO

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

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

The Cisco Medical-Grade Network seeks to connect all stakeholders to a single information and communications infrastructure.

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

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

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

and the seamless dissemination of clinical and business information throughout the healthcare system.

On its part, the Cisco Clinical Connection Suite helps clinicians streamline communications - with integrated voice, video, and data permitting distributed, on-demand, high-quality tele- and videoconferencing. This, Cisco states, improves workflow and productivity, enhances the patient experience, and speeds incident response. In the European e-Health setting, one feature of interest is its inbuilt capability to incorporate offsite interpreters.

HP

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

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

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

HP's current healthcare portfolio consists of:

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

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

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

IBM

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

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

Specific areas of interest for the CHM include:

- Healthcare quality and patient safety: IBM's focus is on highly-integrated approaches which span the payer-provider continuum and/or multiple healthcare-delivery sites.
- Optimising of clinical, administrative and financial processes: As healthcare costs continue to rise relentlessly, and clinical practices evolve from episodic treatment to translational and personalised medicine, IBM seeks to determine which business models and process improvement approaches lead to above-average productivity increases.
- Connectivity and healthcare standards: Like other Big IT firms, IBM is closely involved in the debate and discussion on emerging e-Health standards. The CHM seeks to directly leverage IT advances to meet new regulatory standards. Some of its areas of specific interest include the effectiveness of administrative and clinical data integration in providing returns on investment, as well as improving healthcare quality and patient safety.
- Innovation and transformation: As healthcare services continually evolve, sometimes in surprising ways, and healthcare payers roll out innovative products, the CHM seeks to assess best-of-breed business models, including business process transformation and BPO approaches.

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

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

Zorg & ict

**FREE ENTRANCE:
REGISTER ONLINE**

Go to www.zorg-en-ict.nl

See you at ZORG & ICT 2008

ZORG & ICT: ICT platform for products en services in the healthcare sector

➔ 19 & 20 March 2008 - Jaarbeurs Utrecht

Gold sponsor:



Silver sponsors:



Mediapartners:



Content partners:



New:

MICROSOFT

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

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

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

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

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

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

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

The Blueprint is available free for download from the Microsoft Developer Network Healthcare Industry Center (<http://msdn.microsoft.com/healthcare>).

ORACLE

Oracle's traditional focus in the healthcare area has been on its generic E-Business Suite, which acquired considerable

success in numerous Europe's hospitals as a means to re-structure financial and management systems or improve inventory control. Some of the early implementations include Onze Lieve Vrouwe hospital in Amsterdam, the 23 hospital group in Finland's Hospital District of Helsinki and Uusimaa (HUS) and a variety of NHS Trusts (Heartlands Hospitals, Heatherwood & Wexham Park, Sandwell and Birmingham).

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

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

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

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

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

SAP

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

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

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

- Healthcare e-business applications: To manage patient services, treatment, scheduling, billing,

accounting, clinical orders, and medical/clinical documentation.

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

In autumn 2006, SAP announced that it was joining forces with Accenture to co-develop a collaborative health network (CHN) solution, which would enable healthcare organisations to improve patient care by streamlining the way they access, integrate and share information. The CHN solution will be based on SAP NetWeaver and help organisations to maintain reliable, accurate electronic health records (EHRs) that are accessible quickly by multiple parties. It will also use a service-oriented architecture (SOA) to help reduce IT costs and enable automated collaborative processes among industry participants.

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

SUN MICROSYSTEMS

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

Although the access management and application/Web services facets of the Framework conform closely to the wider JAVA world, the company has launched a series of health sector-specific solutions:

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

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

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

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

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

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

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



THE ELECTRONIC HEALTH RECORD

An Overview

Electronic Health Records (EHRs) are digitised versions of patient health data, both historical and current. They include personal demographic information, data on vaccinations, prescribed medications, treatment histories and progress – alongside laboratory and radiology information, diagnostic photographs (e.g from minimally-invasive devices such as endoscopes), allergies or specific problems encountered in treatment, as well as a record of visits and appointments, and in certain cases, payments. Some EHR initiatives also allow for inclusion of a will.

EHRs are a spin-off from the more-familiar Electronic Medical Record (EMR), which are created at local sites by healthcare facilities. Typically, EHRs would combine data from several EMRs. One European Union definition for an EHR is a “comprehensive medical record or similar documentation of the past and present physical and mental state of health of an individual in electronic form and providing for ready availability of these data for medical treatment and other closely related purposes.”

Benefits

For hospitals and healthcare professionals, EHRs offer some obvious, immediate advantages, in terms of enhance workflow management and efficiency as well as real-time access and sharing of medical data, across clinics and hospitals – and across borders.

EHRs avoid duplicated or triplicated tests as patients move across different specialty practices within one hospital. Secondly, when coupled with electronic prescription order entry, EHRs prevent the possibility of erroneous medication, dosing errors or harmful combinations, known as adverse drug events (ADEs). In the US, studies have shown over 770,000 people are injured or die every year in hospitals as a result of ADEs. In addition, patients experiencing ADEs were hospitalized on average for 8-12 days longer than other patients at an extra cost of \$16,000 to \$24,000.

EHRs can also anonymously accumulate and analyse healthcare data across entire countries to make healthcare delivery more efficient.

Challenges

The debate on costs and benefits of EHRs is still open. Many potential users indeed cite cost as the principal perceived barrier to wider adoption of EHRs.

One of the most important challenges for the EHR involves standards and interoperability. In Europe, this is closely linked to growing mobility (not a few patients fall ill, or have heightened health concerns during overseas vacations). Such a situation necessitates the ability of EHRs to be understood by clinicians in different languages and settings. However, language is not the only issue. Different countries also have

significant variations in the way medical conditions are treated.

The 2004 e-Health Plan of the EU set 2010 as a target for the development of interoperable healthcare systems across Europe.

AUTHOR

**Tosh
Sheshabalaya**
HITM

Other challenges include that of incorporating legacy (paper or EMR) records and allowing for transitions to be seamless. A related technical barrier is simultaneous, multi-site updating of data and information, which is a challenge facing all distributed IT systems.

Data Security

One of the major challenges facing EHRs, however, is that of data security. EHRs contain some of the most sensitive personal data on any given individual. It therefore requires the greatest level of inbuilt protection against abuse. And yet, realising the full potential of an EHR depends on a wide range of medical personnel accessing the data as, when and where it is needed. Such concerns have been amplified by cases of data theft in the US and Britain.

In November 2007, a poll by Britain’s Guardian newspaper found that almost 60% of British general practitioners were unwilling to upload patient data to a national database, because of fears that data could be stolen “by hackers and blackmailers.” The Medical Research Council in the UK states that such an opinion is shared by the general public.

Indeed, barely days later, on November 20, media reports blasted Britain’s Revenue and Customs department for the loss of computer disks containing confidential details of 15 million child benefit recipients, including names, addresses, dates of birth and bank accounts. Making matters worse was the fact that this was not the first time the organisation had lost sensitive information.

EU Draws Attention to EHR risks

The EU Commission, too, has called for caution. On February 15, 2007, its Directorate General for Justice, Freedom and Security issued a Working Document on EHRs, which warned that such systems had the potential “not only to process more personal data (e.g. in new contexts, or through aggregation) but also to make a patient’s data more readily available to a wider circle of recipients than before.” The Working Document added: “In compiling existing medical information about an individual from different sources with the result of allowing for easier and more widespread access to this sensitive information, EHR systems introduce a new risk scenario, changing the whole scale of possible misuse of medical information about individuals.”

The document, however, also offers concrete guidance for healthcare operators and practitioners to attain conformity with EU rules.



REMOTE DATA REPLICATION

Making a Virtue of Necessity

In the previous issue of Healthcare IT Management, we noticed the growing compulsions faced by hospital IT managers to ensure successful backups of their data – especially in the face of the expected acceleration in data creation as a result of modernisation and e-Health programmes. One strategic approach to the issue of disaster management and business continuity involves low-cost remote data replication. This is in some senses fast becoming a twin, the other face, of disaster management.



The remote data replication landscape, like much else in the IT world, has been marked by significant, mainly incremental technological change – largely to make choices easier and more user-friendly as well as cost-effective. Making all this possible is a fall in costs of storage and network bandwidth, as well as optimisation techniques such as intelligent compression, also known by the more unwieldy term – data ‘deduplication’.

Today, remote replication rarely refers to the synchronous replication of all data – with every input to the database mirrored, as it happens, to the remote site.

Instead, remote data replication is part of a wider approach to data and IT systems management. It is used, for example,

in such as consolidating data as well as building datawarehouses. For vendors of remote replication solutions, these direct value-add, user-facing facets are accompanied by taking upfront account of issues like efficiency in the use of network bandwidth, system downtime and flexibility. Yet another trend is the coupling of replication with continuous data protection (CDP) technologies – since replication is, as its name suggests – little more than providing a mirror of the data somewhere else, and this does not eliminate viruses and Trojans or other threats.

One of the key differences between remote data replication and other forms of disaster management is that the latter are essentially host- or storage-based. This entails dependency



powered by
SpeechMagic™

HIMSS 2008: Acting on reliable information

European CIOs attending the annual meeting of the Health Information Management Systems Society (Orlando, FL, USA, Feb 24-28) can see first-hand how Philips is advancing speech recognition to support patient safety. Based on its award-winning technology platform SpeechMagic™, the company will present innovative approaches that help physicians capture vital information in the electronic health record (EHR) and act upon it.

The lack of adequate information at the point of care is a common cause of medical errors. A survey launched by the EU found that almost four in five EU citizens classified medical errors as an important problem in their country. In Italy medical errors result in up to 90 deaths a day. In Germany, 38,000 patients per year are believed to die because of bad teamwork and communications or poor IT support. And 850,000 medical errors are reported from the UK each year.

“These numbers are a clear call to action for governments, healthcare organizations and technology providers,” said Rob Thornton, commercial director for Philips Speech Recognition Systems, emphasizing that fast and accurate information capturing in EHR systems with the help of speech recognition can contribute to avoid those errors.

Visitors from Europe can exchange experiences with their American and Canadian colleagues, who will be speaking at the Philips booth 6443. Among them is Stephen Rosenthal, MD. He was the first in North America to implement a wireless speech recognition and patient administration solution in an emergency room setting.

A full overview of Philips Speech Recognition Systems activities at HIMSS 2008 is available at www.philips.com/speechrecognition.

on operating systems and architecture, and often therefore on specific vendors – and then not necessarily just one. Remote replication, by contrast, is based on the network.

Storage-Array Systems

There are essentially two approaches: storage array- and fabric-based.

In the past, array-based solutions were inflexible – in other words, the onsite storage (at the hospital) and offsite replication systems had to be compatible. This usually meant they had to be from the same vendor.

However, the situation has been changing, largely due to consolidation in the storage industry; there has been considerable M&A, as well as pressure from users reluctant to change their onsite systems. Many specialist storage vendors now ensure that their remote site works with onsite storage arrays from leading IT systems companies such as IBM, Sun, Oracle or Hitachi.

SAN and NAS

Like disaster management solutions, remote replication is integral to new high-speed storage area networks (SAN). These link remote storage devices (such as disk arrays, tapes and optical storage systems) in such a way that the devices appear locally attached – to both the IT system and user.

The key standard for SANs is Fibre Channel, which has been standardised by the American National Standards Institute. It was originally developed for supercomputer networks. Interestingly, Fibre Channel signals can operate on both fibre-optic and twisted pair copper cables. New developments are focused on acceleration of write time and compression, and an increase in the size of the data packets which are transmitted.

Other standards of direct relevance to SAN vendors are the Common Information Model (CIM) interface based on the Storage Management Interface Specification (SMI-S) Internet Storage Name Service (iSNS) protocol (to automate the management of iSCSI devices).

SAN is, in some senses, the opposite of network-attached storage (NAS), which uses file-based protocols to access a portion of a file rather than a disk block – and there is no attempt to demonstrate any local availability.

Fabric-Based Remote Replication

The latest development is network fabric based replication. This is principally by means of enabling software embedded as switches within the SAN (storage area network), which do not have any significant impact on network performance.

Fabric replication also serves to eliminate a ‘spaghetti’ of backup solutions inherited from previous cycles of technology, which like much else in the legacy world is a day-to-day challenge for IT managers.

At present, several specialised vendors are researching means to provide elements of ‘intelligence functionality’ to their switches. These so-called second-generation solutions can scale from 16 to 256 or even 512 ports (in a dual chassis configuration) and provide for larger levels of storage with greater speed and control.

Large players such as Cisco are adding Quality of Service (QoS) offerings to their SAN switches to dynamically differentiate and prioritise storage traffic based on the specific requirements of the data. For example, QoS capabilities provide priority to latency-sensitive applications such as on-line transaction processing (OLTP) in favour of throughput-intensive applications such as data warehousing.

Asynchronous and Synchronous Replication

As with much else in technology (and real life), there are trade offs in the manner by which remote data is replicated.

Synchronous replication entails real-time, end-to-end elements. The data has to be transferred from source to destination, and this has to be acknowledged – before, so to speak, the next data shipment is packaged and delivered. The two principal limitations here are network disruptions and distance, and the use of synchronous replication is usually confined to a remote storage site in the basement of a hospital, or a data centre next door.

In the case of asynchronous replication, data is transferred to a local server, which acknowledges receipt. The next step – transfer to the remote storage facility – is done when time and bandwidth permit. Asynchronous replication is also more robust as far as network disruption is concerned since a local copy of the data is maintained on the local server until the network is restored.

Some of the newer solutions also return to only a fixed percentile of the interrupted transfer, to eliminate the need for a full-scale restart of the replication process.

Real World Choices

Many users (including hospitals) have resorted to a mix of synchronous and asynchronous remote replication. They have also assigned priorities for replication to conserve

bandwidth, with mission critical information taking centre-stage while other forms of data are queued for remote replication, if required synchronously, during the night shift.

Such real-life choices are further facilitated by using solutions which only replicate changed blocks of information – once again, with the option of night-time, synchronous replication of the entire databases.

Vendors are now seeking to allow such priorities and schedules to be set (and reset) via a central console, which also manages all host bus adapters (rather than having to do so separately from individual servers).

New-generation solutions also offer a host of other user-friendly features such as GUI interface and single screen setups, as well as a simple choice for implementing ad-hoc overrides – an all-too-common reality in the life of healthcare IT managers.

Management Checklist for Remote Replication

- Demand-side investigation: It is key to not lose focus on the reason for replication – whether this is principally for disaster management and business continuity or for data warehousing (an issue likely to grow in importance in the years ahead as e-Health programs begin to gather momentum).
- Prioritise replication/backup objectives: While some vendors offer such an enabling feature, it is still advisable to start out by limiting remote replication to mission-critical and sensitive data, while retaining local backups for day-to-day operations, or queuing the latter for remote replication during the night shift, when bandwidth availability is higher.
- Legal issues: Alongside the above establishment of priorities, contractually verify the location of the remote data site, and assess its conformity with (evolving) EU rules and regulations. This will be required if, for example, patient information is hosted in a location outside the European Union (according to European Union Directive 95/46/EC).
- Design volume consistency groups: This will ensure that closely-related data volumes are replicated simultaneously. This not only maintains data flow integrity but serves to underwrite disaster recovery, by providing access to all required information. As one IT manager told Healthcare IT Management, “99.9% of data in a sensitive operating room setting is 99.9% too little.”
- Buy an open solution: It is important that the remote replication solution is server- and operating-system independent – and does not simply function in more than one environment, via middleware. It is evidently also key to ensure top-of-the-line helpdesk features on a 24 x 7 basis.



Expertise in Electronic Health Records

For ten years now, Orion Health technology and experience has been contributing to EHR, telehealth and disease management programmes worldwide. We add new capabilities to health infrastructure by linking legacy systems, providing secure data access and creating a unified view of patient information – across facilities, regions and nations.

Our technology framework is being implemented as part of local, regional and national projects in four continents, for clients including the US Centers for Disease Control (CDC), the University Hospitals of Leicester NHS Trust and the Ministry Of Health And Consumer Protection of the Balearic Islands.

Find case studies and more information on how Orion Health can assist your eHealth strategy at www.orionhealth.com

FOLLOW ME – I’M RIGHT BEHIND YOU ON THIS SIX SIGMA THING...

Healthcare And Six Sigma

AUTHOR

William LaFollette

currently serves on the Board
of Directors of the American
Society for Quality (ASQ).

Six Sigma can reduce defects in services to unprecedented levels because of its strong emphasis on statistical analysis and measurement in design, manufacturing, and the entire area of patient-oriented activities. It is obvious applying Six Sigma has impacts on how well a business performs, and, in the healthcare area, it has been proved that patients reap benefits from focusing on operational efficiency.

Defining Six Sigma

What exactly is Six Sigma? Put simply, it is a data-driven method for achieving near-perfect quality. What makes Six Sigma different from other quality efforts? It is that the focus is to follow a structured process for defining, measuring, and controlling an opportunity for improvement.

More specifically, it is a disciplined effort that closely examines a company’s repetitive processes for product designs, production, suppliers, services, and organisations. Six Sigma is a statistical method of translating a patient’s needs into separate tasks and defining the optimum requirement for each depending on how all of the tasks interact. Based on what is revealed, the steps that follow can have a powerful effect on the quality of organisational health, the performance of patient services, and the professional development of employees.

Six Sigma and Healthcare

What does Six Sigma mean to healthcare professionals? Sadly, in many organisations – not much. There is a misunderstanding of how to apply Six Sigma methodologies. Common responses when a healthcare practitioner hears Six Sigma – “Oh great, another fad. I don’t have time for this, I have to see patients. I cannot change. My patients are sicker. We do not have repetitive processes. Every person is dif-

ferent.” Sound familiar yet? Six Sigma methodologies are not taking the focus off of the patient and only looking at cost cutting. The methodologies are also not taking away clinical quality and looking for short cuts or ‘cookie cutter’ medicine.

Why Do We Need It in Healthcare?

There are a number of key elements in achieving Six Sigma:

- First, we must genuinely focus on the patient and identify their key to quality requirements.
- We must ensure that our processes are designed and managed to meet these key to quality requirements, and that we have appropriate measurement in place to understand how well we are meeting the patient requirements and how well the patient feels we are meeting the requirements.
- We need to involve our people, make sure they are effectively equipped so that they are able – and feel able – to challenge their processes and improve the way they work.
- And we need to undertake that improvement using a systematic problem solving and process improvement approach.

We know why we need it, but how do we do this Six Sigma thing?

Practical Tips on Implementation

The most critical step in implementing a successful Six Sigma initiative is to have senior management support. This has to be driven from the top. If the ones determining the future and direction of the organisation are not supporting an initiative, it will not be successful. I say this bluntly and without opinion; it is fact. All too often organisations want to bring Six Sigma into their operations without leadership support and fail miserably. This not only is extremely costly financially, but it is also costly in employee acceptance when another ‘program’ is thrust at them.

When management has determined Six Sigma is the right approach for the organisation it will take some time and research to ensure the right people are aligned to the right processes. This often requires assistance from someone who has significant experience applying Six Sigma methodology.

This is not a common occurrence in healthcare. There are many healthcare professionals who have made the transition to operational quality with great success. However, in many cases healthcare systems just do not have the resources or ability to stay within the organisation and must look to outside help, at least when building the foundation for Six Sigma.

There is a healthcare system in the Midwest (United States) that created a department focused on operational excellence staffed completely with engineers from outside healthcare. The approach was not focusing on clinical but operational improvements. Finding these experts often requires a non-traditional method for recruitment. The American Society for Quality (ASQ) has a job posting board that is a valuable tool for finding quality professionals who can serve in healthcare.

Help is on the way...

We know what it is and how to get started, but now we have to ask ourselves what it looks like in application. Defining the opportunity is the first step in launching a Six Sigma project.

This quote by Albert Einstein says a lot, *"The significant problems we face cannot be solved by the same level of thinking which caused them."*

Six Sigma Opportunities

- ❖ Flaws in complex interactions among several individuals. Complex interaction can involve multiple hand-offs between provider and staff and between departments. For example, orthopaedics is sending a patient to x-ray, the patient says he is here for an x-ray on a shoulder and ends up getting an x-ray of a foot. Extreme case, but you get the point. If we lacked a documented process step and did not have some type of process control, the results could be catastrophic. Any time there is a change in process or direction a process control point must be established to ensure consistency of care and direction.
- ❖ Problems at the interface of people with sophisticated technologies, products, and organisational systems. When there are occasions for individuals to interface with new and ever-changing technologies, the opportunity for errors is vast. This is where our subject matter experts, whether Six Sigma or IT

professionals, face their greatest challenge. Getting healthcare professionals to utilise new technology is an almost impossible task.

The first hurdle we must face is defining the technology, and then we need to explain how that technology will benefit the organisation.

Getting healthcare practitioners out of the "that's the way we have always done it" mind set is never easy, but with the right focus and methods the new technologies with proper control can have a significant impact.

The case study that follows is one example of how technology improvements and following a Six Sigma path of define, measure, analyse, improve, and control provided one organisation with major improvements to the overall operational health of the organisation.

Opportunity Identified

The healthcare system identified an opportunity to be more proactive in serving their patients by reducing the amount of paper charts used within the system. The basic flow of getting a provider the information needed to consult with a patient involved a courier pulling paper charts and delivering them to a provider's department.

This can require the transfer of thousands of records across many floors within a 150,000-square-foot facility. It also causes a one-day delay in the process. After delivery, medical staff was required to sort through information and 'prep' for the next day's patients. More delay. When the patient arrives for his or her appointment, the provider reviews the paperwork (delay) and begins treatment. They then have to send handwritten notes to be transcribed. Yet another delay in the process of treating patients. Transcribed notes are then added to the patient's record. Delay.

Opportunity Defined

The aim is to determine a method to eliminate paper records needed and eliminate need of a courier to deliver records by hand.

Opportunity Measured and Analysed

The costs associated with the delay in process, manual delivery of records, transcription, transcription errors from hand written notes, collection of records, as well as paper and printing costs, were all calculated. The actual financials are withheld to protect the privacy of the system. However, the cost avoidance and savings were sizable.

Improvements

The system determined electronic medical records - loaded, stored, and accessed through tablet PC technology - were the most direct and valuable solution.

Working with a clinical quality team, business quality team, informatics, and information technology, the type of information along with how it should be presented, how it will be captured from a provider, and how it would be reported was defined.

Once the solution was implemented not only were all objectives for the project met, but some unexpected improvements came out.

Specifically, the satisfaction of patients showed a marked improvement. This result was attributed to patient satisfaction surveys stating patients were happier to see doctors more focused and spending less time having to seek information from previous visits.

The overall operational impact to the system was considered a major success and has been used as a best practice for implementing electronic medical record technology.

Control

Process controls are in place to review the technology solution and are monitored and reviewed on a continuous basis.

The healthcare industry can benefit greatly from Six Sigma, a disciplined approach to evaluate repetitive process, and the technology solutions that often accompany such improvements.



MANAGING CHANGE IN HEALTHCARE

The Senior Leader's Nondelegable Role

AUTHOR

Chip Caldwell

is president of Chip Caldwell & Associates, and is the Northern Florida Regent of the American College of Healthcare Executives.

As a consultant and coach to senior leader teams, Black Belts, and physician leaders who are learning to use improvement approaches like lean and Six Sigma in healthcare, Chip Caldwell also takes on the role of translator. "Any quality system involves a lot of jargon," he says, "so the first thing we do is read a three-page glossary of terms."

Caldwell, faculty member and instructor for the American Society for Quality (ASQ) and coauthor of Lean-Six Sigma for Healthcare, finds that translating a lean and Six Sigma vocabulary into a language healthcare workers understand helps establish a foundation for successful change. Once workers see that lean and Six Sigma concepts already exist in their own world, simply under different names, implementation becomes easier.

For instance, introducing lean effectively is often a matter of discussing throughput - a concept hospital workers know well, as accreditation standards require documentation of measures for addressing throughput and patient flow. With Six Sigma, speaking in conventional healthcare terms of "errors" or "bottlenecks" achieves better results than "defects per million opportunities."

Although overcoming communication boundaries is crucial when introducing any change, Caldwell points out that using terminology to establish common ground should not give the impression that a healthcare lean-Six Sigma initiative is like any other initiative in any other industry. Implementation leaders must understand what makes healthcare different.

How Is Healthcare Different?

According to Caldwell, the most important difference between healthcare and non-healthcare implementations is the role the senior leader plays. The active engagement of leadership usually enhances any Six Sigma implementation, but healthcare senior leaders must accept day-to-day ownership for two reasons in particular:

➤ The role of physicians must be integrated for a healthcare application to be successful, and senior leaders are the integrators of physician processes.

➤ When deployed below the senior leader level, Six Sigma projects have a tendency to become tactical, proceeding project by project without working toward strategic objectives.

Ultimately, Caldwell maintains, to ensure that an implementation avoids a tactical focus and achieves true organisational change, leaders must treat deploying lean-Six Sigma as a "nondelegable" role.

The Three-Year Magic Moment Approach to Projects

Tactical approaches to selecting and scoping projects focus on solving specific problems. Teams identify a problem and then launch a project to uncover causes and implement solutions.

Caldwell, however, teaches an approach that places individual projects in a larger context of systemic change. Long-term targets, which he calls "three-year Magic Moments," as opposed to problems, serve as the reasons for conducting projects.

He outlines three questions to consider in order to begin using the three-year Magic Moment approach:

- Three years from now, what results would you like to see? Identify a measurable goal, establishing a target metric 25% improvement in emergency department length-of-stay, for example.
- Which senior leader owns this Magic Moment goal? Find a senior leader who will manage the project work that will realise the goal.
- How many projects will it take to reach the goal? Consider not only the core process or department associated directly with the goal, but other related processes as well.

➤ Are hiring and staffing solutions needed? Will new or existing technologies need to be incorporated or implemented?

Example:

Approximately 20% of a hospital's discharged patients go home by 2:00 pm. Understanding that the time of day discharged patients leave has enormous impact on overall throughput, the hospital wishes to focus an improvement effort on "time of day."

The Tactical approach:

- The hospital launches a project to identify and implement a process improvement.
- The hospital reviews project results to determine whether improvement occurred or another project is needed.

The Magic Moment approach:

- The hospital identifies a long-term target. The "Magic Moment" will be reached when 80% of patients leave at 2:00 pm.
- The hospital assigns a senior leader to own the target.
- The senior leader determines a number of projects throughout the organisation that will help reach the goal over the next one to three years.

The first project launched as part of the tactical approach may identify an improvement that brings results. The risk, however, is that the solution will not be systemic. "A tactical approach attacks sub-processes, not the system," says Caldwell. "This approach to finding solutions is like throwing wet noodles at a wall to see which ones stick."

Within the framework of

HOPITAL
EXPO

INTER
MEDICA

- 750 exhibitors - 24,000 visitors
- The largest French-speaking hospital medical exhibition

AN EVENT



Hit Paris 2008

HealthInformationTechnologies

Technologies de l'Information et Santé

Calling all health information system players: come to this major get-together for the sector in France!

A conference:

- 4 days of training worked out with a multidiscipline scientific committee
- All the essential facts for understanding and managing the healthcare modernisation process

An exhibition:

- 7,400 sq. m. of stands
- A comprehensive presentation of specific products and services

Health professionals, manufacturers, service providers and distributors - make Hit Paris 2008 a key moment in your activity!

120 specialist exhibitors

1,500 qualified conference participants

24,000 visitors in synergy
with HOPITAL EXPO-INTERMEDICA

May 27-30th 2008

Paris Expo

PORTE DE VERSAILLES - PARIS - FRANCE

www.Health-IT.fr



Organisation générale : PG PROMOTION
21, rue Camille Desmoulins - 92789 Issy Les Moulineaux Cedex 9 • France
Tél : +33 (0)1 73 28 15 28 - Fax : +33 (0)1 73 28 15 81
E-mail : info.pgpromotion@fr.cmpmedica.com



Integrating Projects and Processes

An advantage of the Magic Moment approach is that it emphasizes the interrelationships of different functions within an organisation. A Magic Moment itself focuses on a strategic area, but all of the organisation can be involved in projects selected to help achieve the Magic Moment. As Caldwell says, "Projects integrate everything an organisation does for a particular core process to get to the Magic Moment."

Where can hospitals find the best opportunities for Magic Moments that are certain to integrate processes?

- The emergency department (ED), particularly addressing length of stay/ throughput, and the interfaces between the ED and the rest of the enterprise.
- The surgery, addressing capacity optimisation, best measured by "cut to close" hours divided by staffed hours.
- Nursing floors/patient floors, improving patient care throughput, measured by the percentage of patients discharged by a specified time.
- Clinical practice, measured by length of stay and percentage adherence to established evidence-based medicine.
- Staff productivity as it relates to quality, measured by the percentage of "In Quality" staffing levels.

For most hospitals, these strategic areas represent what Caldwell calls "the five lever points." They contain the "vital few" opportunities for improvement but also have hundreds of interfaces throughout hospitals. Every employee at every level can have a role in lean-Six Sigma improvements when change begins with these levers.

Deploy from the Top Down for Real Results

The integration of projects, processes, and employees under the Magic Moment approach makes senior leader involvement indispensable. Senior leaders not only must own individual Magic Moments and identify projects to achieve them, but they also must actively and continually steer the overall implemen-

tation, ensuring that the right Magic Moments are pursued at the right time.

At the beginning of a deployment, a hospital's senior leaders must:

- Come together formally as a senior leader team.
- Determine Magic Moment goals for the organisation and synergize collective Magic Moments.
- Plan the training and deployment Black Belts.

Active engagement of senior leaders from the launch of a deployment ensures a strategic focus on the most influential process lever points and on one other factor that, Caldwell states, healthcare staff often neglect—dollar results.

"Senior leaders understand that if the hospital's core process levers are improved, the exhaust will be cost recovery," says Caldwell. Below the senior leader level, healthcare leaders tend to shy away from cost reduction. Physicians and nurses have been trained to think that cost is not part of quality, that improving quality requires adding resources.

The place of savings in improvement initiatives, then, is yet another way in which healthcare differs from other industries. Manufacturers openly discuss cost as a quality characteristic, but healthcare defines quality by the amount of resources applied. Concepts like savings, waste, and even errors and defects, says Caldwell, don't enter into the typical healthcare discussion of quality.

Changing the Terms of Healthcare Quality

Only senior leaders are in the position to change the definition of quality in their organisations. Leaders who do accept active responsibility for lean-Six Sigma will find the results worthwhile, in terms of both improved patient care and dollar savings.

Caldwell describes results he has witnessed at three hospitals:

- Miami Baptist Hospital achieved a 20% improvement in patient care throughput using lean and Six Sigma approaches.
- Morton Plant Hospital in Clearwater, Florida, achieved a three-year Magic Moment of 26% improvement in ED length of stay, capturing over \$5 million in cost of quality.
- West Jefferson Medical Center in New Orleans recovered over \$5 million in less than six months by focusing on "In Quality" staffing and reduction of hospital-wide process waste.

Hospitals that are ready to consider quality in terms of efficiencies and dollar savings, as well as improvements in care, will find that the keys to achieving lean-Six Sigma results like these are systemic, organisation-wide improvements, accomplished through senior leadership involvement.

© American Society for Quality, 2007.

Lean-Six Sigma for Healthcare:

A Senior Leader Guide to Improving Cost and Throughput, by Chip Caldwell, Jim Brexler, and Tom Gillem, is available from ASQ Quality Press.

Chip Caldwell conducts the senior leader lean-Six Sigma course for the American College of Healthcare Executives and the American Society for Quality. He was the healthcare representative on the U.S. Quality Council in 1999-2000 and was formerly Health Industry Executive of Juran Institute.

Caldwell previously served as president of the HCA Atlanta health system, an eight-hospital network with fifteen owned family practice centers and more than 250 contracted physicians. He also served as president / CEO of HCA West Paces Medical Center in Atlanta from 1986 through 1993.



VIDEOCONFERENCING

New Technologies Hold Promise to Revolutionise e-Health

AUTHOR

Tosh Sheshabalaya

HITM

The convergence of voice and images has long been a Holy Grail of the IT and telecoms industry. So far, a swathe of initiatives have led to a hotchpotch of mixed results. True-blue, real-time videoconferencing, to many critics, remained as elusive a goal as the paperless office. There was a chasm between the 'virtual', plastic-like feel of available videoconferencing technologies, and the face-to-face encounters of the real world.

Beauty, for Shakespeare, may have been in the eyes of the beholder, but for business, the best indicator of someone's real thoughts lie in the eyes, the raised eyebrows, the forehead furrows and sweat of the 'beheld'. Indeed, some studies suggest that as much as 60% of interpersonal communications in business is non-verbal.

Drivers Of Change

For a variety of reasons, videoconferencing technologies may now be turning a corner. The motors driving such a process on this current lap are varied.

They range from the longstanding imperatives of efficiency (less waste of time and costs in travel) through environment politics (reduced travel = lower CO2 load and risks of global warming) to the personal (work-life balance). Meanwhile, the relentless march of technology, of course, underscores the difference in new videoconferencing offerings, as compared to their predecessors.

The impact of today's state-of-the-art in videoconferencing technologies will be sweeping – from business negotiations and boardroom meetings, to job interviews, sales pitches, briefings for shareholders and analysts, and more, much more.



They will also couple directly into – and reinforce - parallel processes of technological evolution in areas such as electronic payments, online catalogues and consumer choice, and eventually, with direct democracy. Indeed, from the US to Australia, experiments are under way to enable citizens vote via the Internet on day-to-day issues of concern.

Healthcare: Poor Quality Videoconferencing Limits e-Health

Needless to say, the implications in the area of healthcare will be equally profound. Poor-quality videoconferencing has long been the bane of the key telemedicine component of e-Health. After all, one of the central planks in the latter consist of a reduction in costs (including opportunity costs) of travel by patients and physicians to one another, along with an assault on the overhead in coordinating interdisciplinary meetings between medical specialists – even within the premises of the same hospital.

From Incremental Refinements to Paradigm Shifts

Fundamentally, there are two processes which are revolutionising videoconferencing. The first is incremental, and involves refine-

ments to existing desktop videoconferencing capabilities. One instance of this is EyeCatcher 3.5, a new desktop videophone from Anglo-Dutch GreenEyes which is held up as a highly cost-effective system to achieve real-time 'eye-to-eye' communication. The company has targeted the disjunction (referred to above as the 'virtual, plastic feel') of available videoconferencing systems, by which a viewer is not always looking at the camera, but at the image of his or her interlocutor – at the other end. A direct parallel here, in the opinion of this author, would be the echo plus time-intervals in long distance telephone communications in the 1980s. The solution offered by GreenEyes is simple but ingenious. It reflects the image of the called party on to a mirror screen, behind which the lens of the camera is positioned at eye-height. The second revolution is more profound and structural, and promises to bring about a paradigm shift in the entire landscape of videoconferencing applications. New generation systems like Cisco's Telepresence are built on state-of-the-art H.264 video codecs (also known as MPEG-4 Part 10), which offer high quality and low bit rates, near imperceptibly low-latency architecture and bandwidth

The World's Largest Videoconferencing Facilities

👉 Dow Chemical:

Based on IP videoconferencing and the company's DowNET global IP network, the system includes 600 iRooms.

👉 National Informatics Centre India:

350 locations.

👉 Caterpillar:

300+ video conferencing locations.

Source: Human Productivity Lab, 2006.

utilisation, AAC-LD (advanced audio coding with low delay), and multi-channel spatial audio with echo cancellation and directional filters, as well as filters to eliminate feedback from mobile devices. Alongside, highly optimised, proprietary voice and audio conditioning provides a sophisticated user experience.

Telepresence: Conferencing Sans Frontiers

Cisco System's Telepresence was launched in autumn 2006 and provides ultra high-definition video (1080p, or 1,920 x 1,080 progressive scanning pixels) plus spatial audio. The configuration links physically separated facilities to resemble a single conference room – even if they are located in different continents. Cisco Telepresence offerings range from the single unit 1000 (priced at about \$80,000) to the flagship three-screen 3000 system (price tag of \$300,000). Telepresence requires 5-10 Mb/sec per screen for 1080p, but can step down to 1Mb/sec for 720p per screen, a resolution on par with lower-quality videoconferencing.

The Telepresence suite is bundled with IP telephony and industry-standard groupware for scheduling, management, reporting, billing, and metrics applications. Cisco also provides real-time support services. According to industry sources, about 150 Telepresence installations were live at the end of 2007, with a significant chunk of this accounted for by Regus, the offices-for-hire major. Cisco, on its part,

plans to put its money where its mouth is by deploying Telepresence for its global operations and save at least 20 percent in travel costs; (in October 2007, Cisco's Chief Executive announced a tripling in its Indian staff to 10,000 by 2010).

According to an IDG News report in mid-2007, Cisco seeks to take TelePresence from the boardroom to consumer living rooms within two or three years for about \$1,000.

Hullo, Halo

Cisco's closest rival is HP. HP's Halo system was launched in

2004, before Cisco's Telepresence and received widespread attention for improving the quality and real-world feel of videoconferencing.

Halo was, in fact, developed by an HP partner, the film and animation company DreamWorks – partly because existing videoconferencing techniques were incapable of handling the details required by 3D animation. HP later took control to adapt and develop Halo for the corporate market. One key difference vis-à-vis Cisco is that HP Halo runs over a proprietary overlay network.

Others In The Running, Too

Other videoconferencing players, too, are in the running. These include older hands in the videoconferencing game, such as the British-American firm Teliris, whose offerings shot dramatically into the spotlight after the September 11, 2001, terror attacks, when scores of global corporations used videoconferencing to avoid air travel. Its offerings, previously known as GlobalTable have been rebaptised as Virtualive, and delivers 60 frames per second – twice that of its competitors. Teliris services are offered through its own proprietary network, InfiNet, or via a customer WAN. Teleris' Virtualive has also been a pathbreaker in being the first to permit point-to-multipoint meetings.

Like Teliris, another old hand in

videoconferencing, Polycom, is also in the fray. The company has augmented its high-end desktop offerings with a Telepresence-like solution known as RealPresence Experience (RPX) – with 720p resolution and 30 frames per second broadcast capability. RPX was developed by a company called Destiny Conferencing, which Polycom acquired in January 2007, for about \$50 million.

While large players such as Cisco and HP hope to eventually use the Metcalfe Law (an exponential increase in the value of an expanding network) to attain a mass market presence, Polycom's strategy is to push its strength as offering the most complete portfolio in videoconferencing infrastructure - from desktops through small bridges up to RPX.

Peek Into the Future

The current crop of emerging videoconferencing technologies are expected to eventually pace the way to 3-D holographic displays – an imaging technique which deploys laser beams to replicate images on glass plates.

On exposure to light, what is created is a 3-D image in air. One can only imagine the possibilities this will open up – in health-care and beyond.



Where's Mommy, CiscoMan?

During tests in 2006, Cisco's engineers experienced an uncanny experience when a child saw its mother on the Telepresence video display, and crawled beneath the conference table to look for her on the other side. She, of course, was not there..

HEALTHCARE SWITZERLAND



The healthcare system in Switzerland is a complex combination of public care, subsidised private and wholly privatised healthcare. The share of public spending, however, is one of Europe's lowest – reflecting the fact that Swiss law earmarks the State's role as a healthcare guarantor only when the private sector "fails to produce satisfactory results". Not surprisingly, on a per capita basis, Switzerland operates the world's third most expensive healthcare system – behind the US and Germany.

Switzerland's healthcare system also reflects the country's confederal State. Consequently, its 26 local governments have strong powers (see box). They are responsible for hospital regulations (including accreditation) and finance, as well as preventive health.

There is, however, a uniquely Swiss element within the healthcare system. Switzerland provides power not only to the local Cantons, but also to individuals - as borne out by its seemingly constant succession of referenda. As a result, Swiss citizens play a direct role in the healthcare system, for example by voting to expand hospitals.

The public healthcare system in Switzerland is largely based on the mainstream northern European model, principally in terms of 'fund pooling' – by virtue of which individual payments are collected by one or several insurance /sickness funds, and grouped together (pooled). Healthcare expenditures are then paid out of it. Subsidised private care in Switzerland generally includes at-home paramedical services during pregnancy, after accidents and for the elderly (including nursing homes). Fully private care, on the other hand, involves treatment by doctors in private practice, at private clinics, and is far closer to the US model.

Healthcare in Switzerland is regulated by the Federal Health Insurance Act. Health insurance is compulsory for all persons resident in the country and covers a range of treatments. These are listed and described in considerable detail within the Federal Act so as to provide similar

standards of healthcare throughout the country.

On their part, insurance companies cannot prescribe conditions or vary premiums on their compulsory policies – on the grounds of age, gender or health status. However, this does not apply to complementary insurance, where premiums are risk-based.

Insured persons retain full freedom of choice among recognised treatment providers. Costs of treatment and hospitalisation are covered by their insurance firm up to the level of the official tariff. The balance is borne personally through an annual 'franchise' ranging from CHF 300 to CHF 2,500, and by a direct charge of 10% of the extra costs. Insurance premiums depend on the insurance company, the chosen level of 'franchise', the insured person's place of residence and the degree of complementary benefits sought – for example, access to private wards in hospitals, dental care etc. In spite of Switzerland's wealth and the fact that the State specifies no limits on healthcare spending, there are challenges on the horizon.

COUNTRY FOCUS: SWITZERLAND

		DATE
Population (million)	7.44	2005
Live births/female	1.44	2006
Deaths/1,000 pop.	8.5	2006
Life expectancy (years)	81.2	2004
GDP (billion CHF)	455.6	2005
Total healthcare expenditure (% GDP)	11.6	2004
Total healthcare expenditure per capita (PPP USD)	4,077	2004
% of healthcare system financed by public funds	56	2004
Number of hospitals (per 100,000 inhabitants)	5.3	2003
Number of CT scanners (per million inhabitants)	17.9	2004
Number of MRIs (per million inhabitants)	14.3	2004
Number of acute care beds (per 1,000 inhabitants)	4	2003
Length of stay (average in days)	9.3	2004
Number of physicians (per 1,000 inhabitants)	3.6	2003
Number of nurses (per 1,000 inhabitants)	10.7	2003
Percentage of households with Internet access	66.2	2005
Percentage of individuals using the Internet for interacting with public authorities	NA	

Source: OECD, WHO, (Federal Statistical Office Switzerland).

Since 1995, the monthly premium for compulsory health insurance has increased by over 75%, outstripping inflation and a rise in the cost of living index by a factor of 10. One third of the Swiss population is already eligible for public subsidies for compulsory insurance, and this proportion is growing.

In the face of this, there is a small – but growing – presence of cost-containment and efficiency elements, principally in the shape of HMO-style managed care solutions, which began in Zurich and Basel in the early 1990s. Switzerland was in fact among Europe's pioneers in the introduction of managed care as an alternative to the more orthodox fee-for-service plans. However, the share of the former remains small, below 10%, largely as it lacks US-style incentives to restrict consumption of healthcare services. Nonetheless, managed care is estimated to have resulted in cost savings of 10–25% as compared with the traditional fee-for-service systems.

Switzerland's principal social health insurers now all have HMO divisions. There also are a handful of physician-owned HMOs. Premiums for HMOs are 10-20% lower than those for standard policies.

A derivative of the above is the so-called GP Physician Network, which exist in many smaller cities. Here general practitioners act as gatekeepers for insurers with the aim of preventing unnecessary hospitalisations. The participant physicians share in profits and losses, with an annual cap on the latter of CHF 10,000 per physician. Premiums for GP Physician Network insurance policy holders are roughly 10-15% lower than standard policies.

While these managed care initiatives have served to cap a growth in hospitalisation, they are, as mentioned previously, devoid of the powers of their HMO counterparts in the US. There is no provision, for example, to set up preferred provider contracts on the basis of negotiated prices with hospitals.

This is a direct result of the more consensual 'European' elements in Swiss politics and culture. The authority for healthcare service provision contracts rests with the Cantons – and their intensely political parliaments – rather than with managers of public hospitals. Swiss law specifies that cantons must cover 50% of hospital costs, and compile lists of approved hospitals with which insurers have to contract.

More radical reforms to healthcare financing services were envisaged in summer 2005 by the federal Committee for Social Security and Health of the Council of States. It has however been shelved for the moment, after intense opposition by the Cantons – and the threat of a referendum. The key element of these reforms was to move to unitary financing of healthcare services, with a single final purchaser in the shape of the insurance firms. Public contributions would be paid directly to the health insurers and anchored within the matrix of basic health services. On their part, rather than providing a subsidy for services offered by public hospitals or for at-home care, the Cantons would be required to pay a contribution determined in terms of a fixed percentage of all services covered by basic health insurance.

At the present moment, the federal government is scheduled to present a new legislative bill to Parliament by the end of 2008.

DIRECT DEMOCRACY AND HEALTH POLICY

Well-known for its referendums, Switzerland is a living example of 'direct' rather than 'representative' democracy. The country's healthcare system is also unique in giving a great deal of power to local governments.

At the highest level, the Swiss Confederation is led by the Federal Council, which consists of seven ministers of equal rank. They are individually elected by Parliament for a period of four years. One is elected every year to be President of the Confederation. The job of the Presidency, however, does not provide any additional powers. The Parliament consists of two chambers.

The 200-member National Council represents the population as a whole. It is elected for a term of four years, with seats distributed according to the votes received by different parties.

The Council of States has 46 members and represents the cantons. Every Canton, notwithstanding its population, is entitled to elect two members. There are 23 Cantons, of which three are split further into two autonomous sub-Cantons each. The Cantons have their own constitution, parliament and laws, and are sovereign in all matters not specifically designated the responsibility of the Confederation by the Swiss Constitution.

In the healthcare area, the Federal Council has delegated powers of implementation to the Cantons.

Given below are the principal areas of Cantonal authority in healthcare.

Regulation of healthcare

- Licensing of health professionals
- Authorisation to open a medical practice
- Authorisation to open a pharmacy
- Market authorisation for medicines (via the Intercantonal Union for the Control of Medicines)

Provision of health care

- Inpatient care: Most Cantons operate their own hospitals, and some subsidise private hospitals. Many have begun to use global budgets since the mid-1990s, although implementation systems vary between Cantons
- Nursing and home care
- Fees: Each Canton endorses fees negotiated between service providers and health insurance funds
- Basic and specialty medical training, paramedical training and oversight

Emergency, rescue and disaster-aid services Disease prevention and health education



IT AND SWISS HEALTHCARE



e-Health is rapidly emerging at centre-stage in Switzerland's healthcare IT agenda. Last June, the Federal Council approved a National e-Health Strategy for the years 2007 to 2015. The strategy is based on a proposal from the Federal Office of Public Health, and follows extensive consultations with a range of concerned parties.

One key element of the Swiss e-Health strategy is the recognition that the country is advanced in its e-Health development, but could have progressed further – especially in terms of the state-of-play across the European Union. Rather than pilot projects and isolated/standalone initiatives, the National e-Health strategy focuses attention squarely on issues of quality and efficiency alongside the attainment of solid financial benefits.

The e-Health strategy paper provides information on targets and costs, priorities for action, procedures as well as a timeline.

THE FOCUS IS ON THREE AREAS:

➤ Electronic Patient Record

This is due to be introduced in a phased manner through to 2015. It is seen as key to giving service providers distributed, real-time access (independent of place and time) to information on their patients, and to thereby boost the efficiency, quality and security of healthcare delivery. As elsewhere, the record is set to be designed in a manner which ensures both privacy and patient rights as well as the security and protection of data. One initiative, the Geneva-based e-toile project, is centred on rolling out electronic patient records in 2008 (see below).

➤ Online Information and Services

Online information on health and the healthcare system is seen as a means to strengthening the Swiss population's individual awareness and drive overall efficiency from the side of personal demand and expectations. The federal and local governments have agreed to use new IT and communications tools to disseminate high-quality online information and online services.

➤ Implementation and Rolling Refinement of the Strategy

Given the diffusion of powers on healthcare in Switzerland, the federal and Cantonal authorities have set up a joint national coordination body and concluded an outline agreement which could ensure clarification of legal issues by the end of 2008 and the initiation of all legislative and regulatory processes.

In early September, a framework agreement on e-Health was concluded between the Swiss Federal Department of Home Affairs and the Conference of Cantonal Ministers of Public Health.

The framework agreement has identified and agreed on several tangible goals:

- Guarantee of interoperability throughout Switzerland of e-Health projects and solutions
- Networking of key healthcare players
- Development of higher-quality, safer and more cost-effective procedures
- Studying information exchanges between patients and healthcare specialists
- The provision of health services irrespective of location and time
- The enhancement of individual competencies in health matters – a key aspect of the Online Information and Services theme mentioned previously

To achieve its goals, the framework agreement has set up a coordinating organisation to draw up e-Health implementation plans. Its mandate includes not only further development of the e-Health strategy, but also the definition of uniform standards and a nationwide e-Health architecture for Switzerland. Under its remit too are proposals to

amend the law at both federal and cantonal levels and coordinate the interoperability of cantonal pilot projects and promoting acceptance of e-Health by the general public.

The coordinating organisation is composed of the following bodies:

Steering committee, with three Federal Council representatives (one in the Chair) and four delegates from the Cantons. It will be responsible for decision-making and top-level management.

Project management committee to oversee day-to-day operations and coordinate working parties. It will be constituted by representatives of the Federal Council and the Cantons, as well as healthcare service providers and insurers.

Working parties will be set up by the steering committee to work on specific topics.

An advisory support group composed of experts.

THE SWISS INSURANCE CARD: A GATEWAY TO E-HEALTH

An electronic health insurance card has begun to lay the foundations for Switzerland's e-Health strategy. In February 2007, the federal government adopted a decree on the card for compulsory insurance. Its key purpose is to reduce administrative costs through an increase in the use of electronic – rather than paper – data. Key data includes the cardholder's name and of the insurer.

By early 2009, all insured persons will have to present their insurance card to obtain services from doctors, hospitals, pharmacists and their health insurance. One interesting feature of the Swiss insurance card – in terms of its role as a gate-

KEY PLAYERS

Other than the authorities, key actors in the health-care IT field in Switzerland include the Centre for Technology Assessment at the Swiss Science and Technology Council (www.ta-swiss.ch) and the Swiss Academy of Medical Sciences (www.samw.ch), the Swiss Academy of Engineering Sciences (www.satw.ch).

These bodies have statutory status and provide advice to the Federal Council. They also coordinate their efforts in broader socio-economic evaluations of issues such as rationing healthcare. In the area of telemedicine and e-Health technologies, current questions for debate involve the following:

- **Economic**
Funded by insurance or personal charges
Savings from efficiency or cost escalation from increased volumes
- **Ethical**
Sound information or questionable advice
Personal care or anonymous treatment
New perspectives for medical professionals or diluted professional profile
- **Legal**
Place of jurisdiction
- **Technological**
Standardised procedures or increased technology risks
- **Utilitarian**
Greater scope for action for all, or opportunities for the few

way to e-Health – is that it already functions as a light version of the electronic patient record.

Holders can agree for vital data (such as current illnesses, allergies and highlights of their medical history) to be stored on the card, and increase its utility, especially in emergencies. The personal data will not only be protected by the PIN (personal identification) code of the holder, but can also be deleted if requested by the holder.

E-HEALTH AND THE INFORMATION SOCIETY

e-Health is one of the two main pillars of Switzerland's wider-ranging plans for ushering in an Information Society; the other is e-Government.

The Federal Council has defined the key principles and priorities of the Information Society and these have begun to already be implemented across the country. As with e-Health, the guiding lights for Switzerland's e-Government plans relate to enhancing quality, efficiency, transparency and cost-effectiveness in administration. An outline concept paper for the standardised handling of electronic data and documents has already been published and was adopted by the Federal Council in January 2007.

TELEMEDICINE: DOWNPLAYING TECHNOLOGY

Switzerland has a world-class healthcare system and one of the highest personal computer and Internet penetrations. By the end of 2005, 98% of the Swiss popu-

lation had broadband access (ADSL and cable modem), although only 25% used it.

Nevertheless, telemedicine projects are, so far, principally local or regional. With some notable exceptions, they are also based mainly on individual initiatives.

The Swiss have also taken a somewhat original approach to the future role of telemedicine. They have sought to define it functionally - in terms of what it achieves, and by role – in terms of who can practise it and under which conditions.

Indeed, many experts in Switzerland question whether telemedicine will encourage the development of a two-tier medical system (face-to-face/personal treatment for the privileged, and distant /anonymous treatment for the less well off). The social aspects of telemedicine, in terms of the quality of patient satisfaction, are also under scrutiny.

Last but not least are concerns about cost-effectiveness – whether telemedicine will simply generate additional healthcare costs due to frivolous use and unrealistic expectations.

Some of the best-known telemedicine projects in Switzerland include the following:

Medi24: This is a 24x7 call centre, with advice on health issues, backed by an IT programme developed specifically for the purpose, and medical collaboration from the hospitals of Biel-Bienne, the

Wintimed physician network and the Praxis Bubenberg HMO. Much of Medi 24's effort involves practical advice on next steps, including contacts with specialists for face-to-face consultation. One of the interesting findings from Medi 24 is that many patients do not require urgent medical intervention, and are satisfied in having this explained to them.

The resulting impact – in terms of reduced pressure on hospitals and private physicians, and on waiting times – has led some health insurance firms to provide rebates to policyholders who undertake to firstly contact Medi 24, before going to a doctor or hospital.

e-toile: Geneva-based e-toile is an advanced project centred on the electronic patient record. It is designed to be open to receiving and transmitting data from telemedicine treatments. e-toile aims to eventually connect all healthcare facilities in Switzerland via a secure medical information network.

The issue of privacy rights has also been taken on upfront. Patients can use a smart card to specify access rights to their data, as well as layer such rights. The project has cost an estimated CHF 50 million for development, and is due to begin going live in 2008.

Since five years, Geneva's Cantonal authorities have been collaborating with a similar initiative in Ticino Canton known as 'rete sanitaria'.

HEALTHCARE IT POLICY IN SWITZERLAND

HEALTHCARE IT
MANAGEMENT
INTERVIEW

Known for its intensely confederal system of politics and decision-making, Switzerland has nevertheless recently begun to coordinate its e-Health initiatives on a national level. Alongside, it is also opening up to new European and international e-Health standards.

To obtain an overview of policymaker's perspectives on healthcare and IT in Switzerland, HITM's Catalina Ciolan interviewed Adrian Schmid from the Federal Office of Public Health in Switzerland.

HITM: At end June, the Federal Council approved a National e-Health Strategy for the years 2007 to 2015. Some reports suggest that one element here is an awareness that Switzerland is advanced in its e-Health development, but could have progressed further – especially in terms of the state-of-play across the European Union? Do you agree?

AS: Switzerland certainly has a unique structure. It's not – like many people think – a small country divided in 26 cantons. By history we have 26 very small but autonomous cantons that have decided to work together. So many basic tasks of a state are in the responsibility of the cantons – that includes important parts of the health system. That form of organisation is favourable for solutions that are close to the needs of all the players in the health system, but it is a burden in finding solutions on a regional or national level and slows down the process. For that reason, the Federal Council and the cantons want to strengthen the national coordination in e-Health.

HITM: In the above context, do you believe IT will have to play an even more central role than it is doing now?

AS: Not IT for itself. We are convinced that the technical part is the easier challenge in e-Health. What we need more urgently is a awareness of the potential

and the will to change the way hospitals, doctors, pharmacists work. That is not a 100-meter-run but rather a marathon race. The most important thing is: With the "Swiss e-Health Strategy" the Federal Council has given the starting signal. Now everybody knows in which direction the race goes.

HITM: Would you agree that Geneva's e-Toile and the Ticino electronic medical record projects are Switzerland's most advanced in terms of e-Health? Are there any plans to use these in a hub-and-spoke model to disseminate across the rest of the country?

AS: The initiatives in the cantons of Geneva and Ticino are different. E-Toile is a concept that has not been implemented so far. And the Rete Sanitaria in the Ticino is a rather small project in the region of Lugano. The aim in testing a health card was to break down the cultural barriers and encourage the introduction of more complex electronic health services with greater added value. Both concepts were designed for the local needs and have elements that make it difficult to transfer them to the national level. But much more important than that is the will to gain experience on a local and regional level and to bring them into the discussion for a national system.



Adrian Schmid

HITM: Would such efforts be buttressed by the fact that the Swiss insurance card already functions as a Lite EHR? Cardholders, we are told, can already have some vital data stored on their cards, specify who has access rights, and also withdraw the data when they choose. These, to us, seem to be key aspects of EHR projects across Europe.

AS: The Swiss insurance card is legally established and the plan is to introduce it in 2009. Indeed, the card can be used as a local carrier of the medical information about the patient – such as chronic diseases, medication or allergies. We also have established rules about who may write or read the infor-

mation. There still is some reservation about this functionality, because the data will be on the card only. A big potential of the insurance card could be that the cantons can use the card for pilot projects in their region with more advanced applications - if they have established the legal basis for these projects.

? HITM: What are your views on integration of your healthcare IT environment – e-Health included, with that of the EU? Do you already have some cross-border efforts with neighbouring EU member states like Austria, Germany, France and Italy?

AS: Probably the most important thing is the will to use international standards where they are on hand. But of course Switzerland has an interest to coordinate its initiatives on a national and regional level. For that reason we do have bilateral contacts and Cantons like St. Gallen, Basel, Ticino and Geneva are in touch with the neighbouring regions across their borders.

? HITM: We know that, given your confederal structure, the Swiss healthcare system is rather complex. Few countries have the autonomy of your Cantons. In the future, due to the scale

requirements of e-Health, do you believe that the Cantons will be willing to surrender some of their autonomy?

AS: That is an open question. The difficulty of IT solutions is that they have to be defined in a very detailed way. That will be a big challenge for the Swiss health system. We now start in 2008 to put the theory of the strategy into practice – on a legal and technical level. We will have to see where that process brings us.

? HITM: Hospital IT departments are at the centre of many changes – e-Health and e-business are new developments alongside their traditional roles in administration and operations. Are these forces having an impact on hospital IT departments in Switzerland?

AS: Hospitals are much more aware of the need to coordinate than many other players in the health system. So for us IT managers in the hospitals will be important partners in the process of building a national system.

? HITM: What are the key challenges and priorities for healthcare IT (beyond e-Health)? Does Switzerland have any issues or specific perspectives on new standards (national versus EU versus global)?

AS: We are just beginning to coordi-

nate e-Health on a national level, to define the roles of all the partners and to find common priorities. As I already said, we want to use international standards where they are available and practical.

? HITM: What about issues such as legacy systems, skills availability, budgets (your per capita health spend is one of the world's highest) ?

AS: We think that e-Health can play an important part in the reform of the Swiss health system. But it is not the engine of this change. There are other health issues that get much more public and political attention. So from today's point of view e-Health has to intersperse into system – by successful local and regional projects and the common will at the federal and cantonal level to go in that direction.

? HITM: In the face of all these changes in the Big Picture, do you think Swiss and European IT managers need a common voice?

AS: IT managers in hospitals are at the core of the implementation of e-Health. To me it seems important that they are aware of that fact. For that they do not need a common voice – but a common understanding is very helpful.

HON: A Swiss e-Health Jewel

As far back as 2004, EU non-Member Switzerland won the European Commission's eEurope Award in the high-profile category of e-Health information tools and services for citizens.

The Swiss Health on the Net (HON) Foundation was selected for its accreditation service plus code of conduct. This aimed at striking a fine balance between providing users with medical information, while also protecting them from being misled.

HON's origins go back to September 1995, when some of the world's

foremost experts on telemedicine met in Geneva for a conference entitled The Use of the Internet and World-Wide Web for Telematics in Healthcare.

Supported by the local cantonal authorities in Geneva, Health on the Net is now available in five languages. It collaborates with a wide variety of organisations, principally from Switzerland, but also France, the US and South Africa.

HON's French connection is especially strong, as it was a key player in WRAPIN (Worldwide online Re-

liable Advice to Patients and Individuals) - an EU-backed project which brought it together with three other entities from Switzerland and four from France.

Apart from news and updates, HON features a sophisticated search engine for medical/health queries. This integrates standard MeSH (medical subject heading) terms, with scientific articles, healthcare news, Web sites and multimedia - into one service to accelerate and refine searches.

More at www.hon.ch

HEALTHCARE IT MANAGEMENT

Subscription form

Ways to subscribe:

- Send an email with your name and address to: office@hitm.eu
- Complete this form and post it to:
Healthcare IT Management - 28, Rue de la Loi - B-1040 Brussels - Belgium
- Complete this form and fax it to: +32 2 286 85 08

Subscription form:

Name: _____
Institution: _____
Address: _____
Postal Code & Town: _____
Country: _____
Telephone: _____
Email: _____

- Two-year subscription One-year subscription

Subscription rates:

One year:	Europe:	80€
	Overseas:	120€
Two years:	Europe:	140€
	Overseas:	180€





Healthcare IT Events

February

HIMSS08

Annual Conference & Exhibition
24 - 28 February 2008
Orlando, US
www.himssconference.org

March

TELEHEALTH

International Conference and Exhibition
for ICT Solutions in the Health Sector
07 - 08 March 2008
Hannover, Germany
www.telehealth.de

WORLD HEALTH CARE CONGRESS EUROPE 2008

10 - 12 March 2008
Berlin, Germany
www.worldcongress.com

ZORG & ICT 2008

19 - 20 March 2008
Utrecht, The Netherlands
www.zorg-en-ict.nl

IV INTERNATIONAL CONFERENCE

TELEMEDICINE - EXPERIENCE@PROSPECTS

25 - 27 March 2008
Donetsk, Ukraine
www.telemed.org.ua/Seminar/eng/2008e/index_e.html

April

MED-E-TEL 2008

16 - 18 April 2008
Luxexpo, Luxembourg
www.medetel.lu

May

EHEALTH 2008 CONFERENCE

06 - 08 May 2008
Slovenia
http://ec.europa.eu/information_society

HIT PARIS 2008

27 - 30 May 2008
Paris, France
www.health-it.fr/

HOPITAL EXPO-INTERMEDICA 2008

27 - 30 May 2008
Paris, France
www.hopitalexpo-intermedica.com/

EHEALTH2008

Medical Informatics meets eHealth
29 - 30 May 2008
Vienna, Austria
www.ehealth2008.at/

June

TTEC 2008

Tromsø Telemedicine
and eHealth Conference
09 - 11 June 2008
Tromsø, Norway
www.telemed.no/

CARS 2008

Computer Assisted Radiology and
Surgery 22nd International Congress
and Exhibition
25 - 28 June 2008
Barcelona, Spain
www.cars-int.org

November

WORLD OF HEALTH IT '08

04 - 06 November 2008
Copenhagen, Denmark
www.worldofhealthit.org/

MEDICA

19 - 22 November 2008
Düsseldorf, Germany
www.medica.de/

RSNA 2008

30 - 05 December 2008
McCormick Place, Chicago, Illinois
rsna2008.rsna.org



HEALTHCARE IT MANAGEMENT

ISSUE 2, 2008

COVER

Hospital Information Management Systems: Experiences and Challenges in Design and Deployment

Laboratory Information Management Systems

FEATURES

EHR and e-Health: Analysis and Update

The Growing Role of Telecoms Companies in Hospital IT

Information Technology in Intensive Care Units:
Challenges in State-of-the-art

FP-7 and Healthcare IT: One Year Review

Mobile Medical Devices

MANAGEMENT

Corporate Governance in Hospitals

PRODUCT COMPARISON CHART

Bedside Information Systems

COUNTRY FOCUS

France

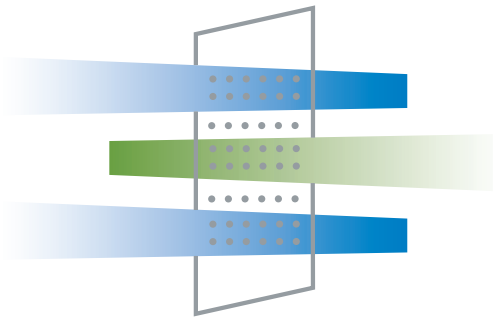
EU SECTION

EU Developments: Overview of Slovenian Presidency



European Congress of Radiology
March 7-11, 2008, Vienna / Austria

**See you
in Vienna!**
March 7-11, 2008



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!