

HEALTHCARE IT MANAGEMENT

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THE OFFICIAL JOURNAL OF THE EUROPEAN ASSOCIATION OF HEALTHCARE IT MANAGERS

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METRICS FOR PRODUCTIVITY: TEAM BUILDING

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Sensors
> ALLIANCES FOR MEDICAL QUALITY

> COUNTRY FOCUS: IBERIA

> IT @ NETWORKING AWARDS 2010



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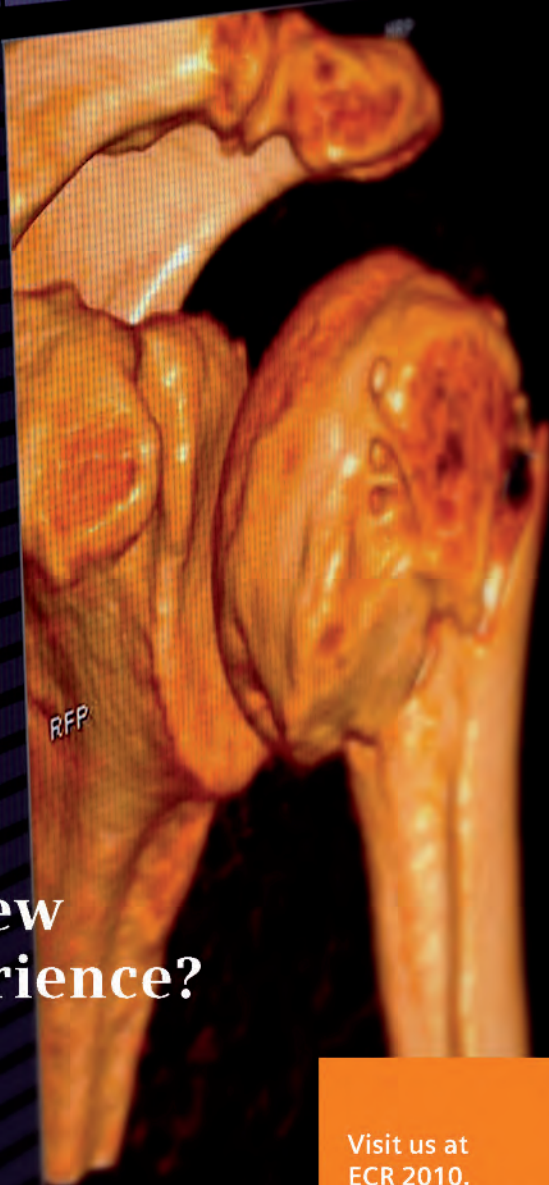
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SIEMENS

Letter from the Secretary General and Editor-in-Chief, HITM



Dear Reader,

On several occasions, we have pointed to the policy challenges facing Europe in terms of modernising its healthcare infrastructure and preparing for the era of real, meaningful e-health. There is, however, another associated problem here: how to process the explosion of data which will accompany this looming e-health revolution, and do so with the highest standards of security – on a round-the-clock, real-time basis, from a range of geographic locations.

One answer may lie in grid computing: large-scale, distributed cluster computing involving hundreds or thousands of separate computers, coupled to network-distributed parallel processing. This is an area where Europe is taking a global lead. Two framework projects, BEinGRID (Business Experiments in Grid) and Enabling Grids for E-science (EGEE), are rolling out ambitious e-health applications. Our Cover Story provides some background to the new world of grid computing (whose conceptual roots are barely a decade old), and its implications for e-health.

While grid computing may form the skeleton and nervous system of the e-health infrastructure, at the other end there lies another major challenge: acquisition of healthcare data from patients, as far as possible, in their homes, on the move, and – like grid computing – on a round-the-clock basis, too. The field of sensors may be unknown to some, but it is the subject of a sweeping scale of technological change. A Polish expert assesses the multitude of challenges which lie ahead: the hard trade-offs between miniaturisation and usability, security and reliability, the promise of new materials, and last but not least, the need to lower costs and pave the way for mass market take-off in a virtuous cycle.

In between, however, lie a host of other e-health opportunities. One of these is mobile Health or mHealth. In a special feature written for Healthcare IT Management, the co-founder of one of Europe's most exciting mHealth service providers, 3G Doctor, makes a strong case for the fact that workable mHealth solutions are already available. These range from matching organ donors with recipients through monitor-

ing pregnant women to minimising patient waiting times. Most crucially, unlike many e-health projects – which face the risk of patient (and physician) resistance – mHealth can be pulled into life by enthusiastic patients and healthcare professionals, alike. All that is really required is a little nudge and push from healthcare IT/hospital managers.

E-Health looks at the future, but there is also considerable baggage from the past that is, also, of concern to healthcare IT managers. While finance for new medical technology is squeezing hospitals budgets across Europe, existing equipment is hardly being managed as efficiently as it could. The way forward: more attention to asset management systems, especially since they can be seamlessly coupled with mushrooming Wi-Fi networks. A healthcare consultant, and lead author of a major study into this subject, provides an analysis.

Demands for higher efficiency do not concern just devices, equipment and other things. People also count – but people management in the healthcare context poses its own specific challenges. An US health information specialist provides us with findings from a real-life exercise on how to enhance productivity, with a bottom-up team building process.

HITM proudly announces its 30th member organisation and we are sure that in 2010 even more will join our great community. We are also pleased to inform you that the registration for the world's most highly funded healthcare IT competition, *IT @ Newtorking Awards 2010*, organised in collaboration with the European Association of Hospital Managers, is already open. We are looking forward to your great submissions!

Yours truly,

Christian Marolt

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References

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HEALTHCARE ASSET MAINTENANCE AND PATIENT SAFETY

The greatest expenditure of hospitals today are on mobile medical devices, starting from patient beds to other technologically advanced diagnostic systems.

The efficiency of a healthcare organization largely depends on its ability to know where things are and on how efficiently these resources are used by the hospital staffs and patients. This is the key promise of an asset management system.

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DEVELOPMENT OF PRODUCTIVITY MEASUREMENTS FOR HEALTHCARE IT

There is a never-ending search by healthcare managers to improve quality and productivity in the workplace. Successful implementation of information systems assumes that improvements with productivity and quality of work will occur, at least over time. In order to measure improvements, managers must establish monitors and develop base line productivity and quality standards. The ultimate goal is to achieve best performances from the work group.



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CHALLENGES IN THE DESIGN OF SENSORS FOR TELEMEDICINE

Sensors for portable telemedicine are a fast-growing market. They are changing the way in which health service providers interact with patients. Hardware devices, alongside software and communication systems, are enabling the rapid change in quality of the monitoring patients outside hospitals. This constant flow of data may be used to check a variety of medical conditions, including compliance with a physician's instructions. However, new technology is posing new challenges.

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TIME TO START DEVELOPING YOUR mHEALTH STRATEGY

For many HIT Managers, the stars are aligning as colleagues and their patients, fuelled by the buzz of iPhones and Appstores, are beginning to show interest in using the mobile technologies that they're all familiar with. But what are the fundamentals and what's the best approach?

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GRID COMPUTING AND E-HEALTH

Grid computing is emerging as a promising solution to some of the most vexing challenges facing e-health. It also offers a powerful tool for other areas of healthcare such as drug discovery, as well as economic and weather forecasting, earthquake analysis, etc.

In all these domains, grid computing easily out-classes traditional IT systems, in terms of its ability to cope cost effectively with their massive demands on computer-processing power, and the intensity of real-time data throughputs. However, there are several challenges, too.



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COUNTRY FOCUS: IBERIA

Healthcare in both Portugal and Spain aims to be free and universal. The key challenges for the former are cost containment: health expenditure in terms of a share of GDP is above the European Union average. In Spain, a powerful tradition of regional autonomy has led to fragmentation and major disparities. This is also reflected in the country's healthcare IT infrastructure, which is nevertheless at the forefront of a national effort to bring more homogeneity and less disparity to the country's healthcare system as a whole.



READER'S COMMENTS



IT@Networking 2009

Sir,

Congratulations to you and your team for a great job in demonstrating that Europe has healthcare IT innovators who can stand shoulder-to-shoulder with their counterparts from anywhere across the world.

In my own humble way, may I nominate your Association for a Healthcare IT Leadership award. I hope to see IT@N continue in the future. May I also request you to provide a review of other entries to your competition. Some may have relevance for other efforts. A portal site of these, for example, may allow other European firms to get to know one another and learn, and possibly build the scale to fight against competitors from the US and elsewhere who have more resources on hand.

Julian Potter
Birmingham, UK



Going Dutch V 2.0

Sir,

We Dutch are a marvel. As you pointed out 'Dutch Health System Remains Europe's Top Ranked' (Issue 5, 2009), our healthcare system is not only the best, but seems to be getting better by the year. Part of this may be explained by the fact that we now have the highest per capita health spend in Europe. No more tight-fisted Hollanders, watching our wallets. What a change? However, what is curious is the warning from Euro Health Consumer Index (EHCI) that their effort "does not measure the best healthcare system, but rather the most consumer-friendly one." Maybe this is because we leave our doctors alone.

Average physician consultations in the Netherlands (OECD data), were just 5.7 in 2007, against 6.3 in France and as much as 7.5 and 7.6 in Germany and Belgium.

Other figures from the OECD show that we simply do not like hospitals. Period. In 2006, hospital discharge rates per 100,000 population in our country was 10,689 – considerably behind 17,374 in Belgium, 22,040 in Germany and an astonishing 28,440 in France. Such indicators may mean as much as those used by EHCI: patient rights and information, waiting times, outcomes, range and reach of services provided, pharmaceuticals and e-health. Maybe the lesson from the Netherlands as far as high-quality healthcare is concerned is to use doctors and hospitals as little as possible.

Jan Scherphuis
Groningen, Netherlands



Made in Europe

Sir,

An interesting Editorial in your previous issue (No. 5, 2009). Few know that not only the Internet, but the race to space and nuclear technology were led by Europeans.

In terms of healthcare technology, too, we are at the forefront. You mention in your Editorial that Urobot, the first prototype robot for minimally invasive surgery (MIS), was developed by Nanyang Technological University in Singapore. This effort, however, largely remained a technology demonstrator. Moreover, a similar level of sophistication was shown in 1988 by PROBOT, a robotic MIS system developed at Imperial College, London, for prostate surgery.

Current state-of-the-art, in the real world, is the Da Vinci robot system, used at almost 1,000 facilities for over 75,000 surgical procedures a year. Very recently, the Da Vinci system was used for a pioneering scarless neck surgery procedure on a 67-year old, in London.

Though developed by an American, the Da Vinci system was clinically tested in the 1990s in Belgium (as the Green Telepresence System) and implemented in a decisive manner for a coronary bypass at the Leipzig Heart Centre in Germany, by Dr. Friedrich-Wilhelm Mohr. This was in May 1998.

But then, your key point is taken. Da Vinci is owned by Intuitive Surgical, based in California, and which launched the Da Vinci system commercially one year after Dr. Mohr's pathbreaking success in Europe.

Genevieve Carton
Clermont-Ferrand, France



The EHR and Clinical Research

Sir,

In his otherwise excellent article on the EHR and clinical research (Issue 5, 2009), the author suggests that "On a small scale", EHRs could alert physicians about a contraindication to a prescribed drug. I disagree, at least as far as the US is concerned. In 2007, a report by the Centers for Disease Control and Prevention found that deaths from accidental drug interactions rose 68 percent in the 1999-2004 period, with unintentional drug use becoming the second-leading cause of accidental death in the United States, after car crashes.

Jerry Carlsson
Boston, US

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

THE EUROPEAN ASSOCIATION OF HEALTHCARE IT MANAGERS (HITM)

The European Association of Healthcare IT Managers

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

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

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

HITM's Mission

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

For more on HITM and information about membership, please contact: **Morna Chitiyo, Project Manager, office@hitm.eu**

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and the Austrian Society for Biomedical Engineering (AK-MI)

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Having the right information at the right time is key to patient care. IntelliSphere healthcare informatics solutions convert data into actionable information that enables clinical decision-making. From acute to general care, IntelliSphere seamlessly integrates clinical data to support diagnostic and treatment decisions and to help improve and save lives. To find out how you can start harnessing the true power of information, visit us at www.philips.com/intellisphere.

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PHILIPS

PHILIPS CONDUCTS SPANISH TELEMEDICINE STUDY

Philips and the Catalonia Health Service have completed a study on the benefits of telemedicine in patients with chronic diseases.

The study, called Catalan Remote Management Evaluation (CARME), evaluated the impact of MOTIVA, a remote patient management solution, used in the care of 97 patients within the Heart Failure unit of the German Tria i Pujol Hospital of Badalona, managed by the Catalonia Health Service.

The results of CARME showed the benefits of telemedicine technology for both clinical staff and the patient. Over the one-year study, critically ill patients saw the quality of life improve and a decrease in hospitalisations was realised.

Telemedicine enables the patient to better self-management of their condition through more information. MOTIVA is now being considered for use in primary care settings, where this patient empowerment can be instilled and then transferred as the degree of care changes.

For more information, visit www.healthcare.philips.com

IBM, INITIATE SYSTEMS

IBM TO ACQUIRE INITIATE SYSTEMS

IBM has signed an agreement to acquire Initiate Systems, a data integrity software company used by healthcare and government companies.

Initiate Systems will be the 30th acquisition by IBM strengthening its efforts within information and analytics. Initiate's software enables healthcare professionals to be more efficient through access to patient and clinical data.

Their clients include payers and providers as well as retailers selling prescription drugs, including the Alberta Ministry of Health and Wellness, BMI Healthcare (UK) Calgary Health Region, and CVS/Caremark Humana., among others.

Proper management and delivery of information is pertinent of the healthcare sector. The acquisition of Initiate Systems will continue to provide their customers with the software they already depend on, but also the global and technological capabilities of IBM.

For more information, visit:

www.ibm.com/industries/healthcare

McKesson, HP

MCKESSON AND HP COLLABORATE ON EHR BUNDLE

McKesson and HP will offer their electronic health record (EHR) products and services to independent physicians to accelerate and simplify EHR adoption.

McKesson will include the EHR/practice management systems software while IBM will provide the office hardware, preconfigured together for easy deployment.

The collaboration hopes to benefit the independent clinicians through increased efficiency, productivity with more focus on patient care. The offering will also include other McKesson organisational software also provided.

With HP's vast product line, the solutions will be adapted to meet the needs of each individual practice. The product offering has been designed in preparation of more private practices adopting EHR systems.

For more information, visit:

www.mckesson.com

ISOFT, ULTRAGENDA

ISOFT ACQUIRES ULTRAGENDA

iSoft, the largest Australian health IT company, has acquired UltraGenda adding more innovation to their existing IT solutions.

The acquisition is part of a strategy to increase sales through bolt-on acquisitions. The Belgium-based IT company UltraGenda will add scheduling software that is already integrated in different healthcare facilities in the UK and Netherlands. The Enterprise-Wide Multi Resource Scheduling software solution enables healthcare organisations to schedule and manage appointments improving efficiencies within multiple operational provider facilities. The software has been proven throughout the European markets, including Belgium, Denmark, France, Germany, Netherlands, Norway, Spain, Switzerland, and the UK.

Benefits include improved patient satisfaction due to increased operational efficiencies in the healthcare facility. The functionality of the UltraGenda software is a demand of many large organisations, and can be deployed without replacing existing solutions.

For more information, visit:

www.isofthealth.com

GE HEALTHCARE

GE HEALTHCARE PROVIDES IT SOLUTION FOR VANCOUVER OLYMPICS

The solutions provided by GE Healthcare IT benefitted both medical facilities and athletes in the 2010 Winter Olympic Games in Vancouver, British Columbia.



The implementation of GE's Centricity® Radiology-IW (PACS-IW and RIS-IC with Precision Reporting) in polyclinics at the Vancouver 2010 Olympic and Paralympic Winter Games allowed for clinical staff to manage and access medical images and information at any location. The Centricity system was being deployed at the Vancouver Polyclinic with links to Whistler Polyclinic and the Mobile Medical Unit, providing all with immediate access to patient information.

Stationed around the clock with doctors, specialists and nurses, the Mobile Medical Unit provided access to diagnostic and patient monitoring equipment within the Olympic and Paralympic Village Whistler. The 4.5 million dollar unit was funded through the sponsorship agreement between GE and Vancouver Organising Committee for the 2010 Winter Games. The Mobile Medical Unit was complete with GE solutions, including Vscan, their latest ultrasound technology.

Area residents have also benefitted from the partnership with GE and VANOC. Residents of Whistler, Squamish and Pemberton received the Whistler CT Scanner as a gift from GE and VANOC, unveiled at a preliminary event.

For more information, visit:
www.gehealthcare.com

TERSO

TERSO EXPANDS IN EUROPEAN MARKET

Terso has expanded operations to the European market with a new German-based facility.

Due to an increasing demand for the company's radio frequency identification technology, Terso Solutions, Inc. has set-up a new production facility in Mannheim, Germany. Terso's RFID-enabled appliances that include refrigerators, freezers and cabinets for the healthcare industry will be manufactured at the new location.

With assembly and technical services based in Germany, Terso will be able to meet the demand of their European customers. Products will be delivered sooner and unnecessary transportation will be eliminated.

Terso has worked with manufacturers, distributors and end users in the healthcare, life sciences and security industry since 2005. Their products help reduce inventory costs while meeting regulatory requirements of the respective industries.

For more information, visit:
www.tersosolutions.com

SIEMENS, MICROSOFT

SIEMENS LICENSES HEALTHVAULT IN GERMANY

Siemens has announced that it will exclusively license Microsoft's HealthVault in the German market.

The agreement between the two companies will allow German citizens to use of the personal application, HealthVault, which stores individual health information in an online account.

Storing information such as immunizations, disease history and prescriptions will enable patients to connect to various systems run by physicians, hospitals, pharmacies for a comprehensive view of their personal health information. Individuals also have the possibility of allowing access of this overall knowledge to their care providers and family members if they choose.

Germany is the third country worldwide and the first in Europe where HealthVault has been deployed. The application was deployed previously in the United States and Canada through a partnership with Telus.

For more information, visit:
www.siemens.com

ORION

ORION HEALTH LEADS EHR SOLUTION IN SPANISH COMMUNITY CARE

Orion Health has helped deploy the first electronic health record (EHR) in community care in Spain.

Gestion Sanitaria de Mallorca (GESMA), a three-facility system focusing on social-medical issues, has selected Orion Health technology for the sharing of patient information and care plans. Orion Health's technology, the Rhapsody Integration Engine and Concerto Portal Software, will allow for GESMA clinicians, nurses, psychiatrists and community care workers to share patient information and to have access to co-developed care plans.

The technology streamlines information transfer while providing all pertinent patient information including history, treatments and procedures. With GESMA community care patients being treated on an on-going basis, the technology from Orion Health will help improve the quality-of-care.

GESMA serves the community through their services in social medical issues such as mental illness, alcohol detoxification and chronic respiratory conditions. Paper-based records had been used in the past by GESMA, making it difficult to share between facilities. For more information, please visit www.orionhealth.com

For more information, visit:
www.orionhealth.com

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ultragenda.com



Bulgaria

BULGARIAN MILITARY DEPLOYS SMART CARDS

The Bulgarian military has begun the deployment of smart cards to provide secure access to the electronic health records of military personnel and their family.

Commissioned by Bulgaria's Military Medical Academy, the personal health record (PHR) project aims to improve health records availability, access and security.

The patient and the healthcare professional simultaneously insert their own card into the double-entry reader and type in their PIN code to enable viewing or modifying of the medical file, which is stored on a highly secure IT infrastructure. The patient can also view their personal data online, using the reader and card to authenticate themselves.

The electronic health record provided is a complete electronic archive of the patient's medical history. Data stored includes all existing medical documentation, such as: laboratory tests and results, X-ray pictures, all visual tests, and electronic prescriptions. Additional information includes the patient's blood group, allergies and genetic predisposition to diseases, health check-ups, surgical interventions and other useful medical information.

Medical data can be accessed immediately meaning healthcare professionals can make more accurate decisions, especially in emergency situations, for which there is a special section in the electronic health record containing the most important relevant information.

ITALY

SMART CARDS FOR PREGNANT WOMEN

All the medical events relating to a woman's pregnancy will be made accessible in one click of a mouse in the Italian region of Veneto thanks to the 'Woman Card' ('Carta Donna' in Italian).

Pregnant women will be handed out a smart card during their first examination; all the medical reports and ultrasounds issued during the pregnancy will be stored on the card. This will enable future mothers, their family doctors or the specialist practitioners to easily view the images and reports from any computer, this in full compliance with privacy requirements. Indeed, the prior insertion of the password provided on the occasion of the card's handing out is required to access the content of the card. The smart card is an important part of the electronic health record.

According to Angelo Lino Del Favero, the Chief Executive Officer of the 'Unità Locale Socio Sanitaria (Ulss) 7 Veneto' - the local health agency which launched the card - "The Woman Card is a modern, simple and easy-to-use device which will not only allow to overcome the limitations of traditional paper-based documentation (...), it will also enable women to carry their own electronic health record on a card whose dimensions are those of a bank card."

The Woman Card has already been distributed to over 20 future mothers who have expressed their appreciation of the initiative. In addition, to save them from having to go around with medical reports and X-rays, the card will give them the possibility to show images and the 'short film' of the baby to parents and friends even prior to birth.

This 'pink' electronic health record initiative received the assistance of the Italian Ministries of Health and Innovation respectively, as well as of the Veneto Region. The government-owned Italian Mail provided support as well.

For more information, visit: www.ulss7.it

FINLAND/GERMANY

SMS APPOINTMENT BOOKING

In Finland and Germany, SMS-based Pre-Call services are said to be improving the efficiency of hospital appointment booking and encourage the patients' involvement in accessing healthcare.

In the North Karelia Central Hospital (PKKS) in Finland, a SMS-based Pre-Call Request service has reduced the cancelled appointments rate by 20 percent, a percentage equivalent to the annual workload of nine nurses who are now able to focus on delivering patient care. More precisely, according to preliminary results, the new process saves about 10-15 percent of the working hours per nurse who are dealing with booking appointments at the otorhinolaryngology clinic. Similarly, at the paediatric outpatient clinic, the SMS Pre-Call system has significantly reduced the number of phone calls by a third and phone calls regarding rescheduling by over 60 percent.

When a hospital is using the SMS Pre-Call Request service, each patient is requested about the suitability of the appointment date before booking the appointment or sending an invitation letter. Via the SMS-service, the hospital makes sure that the offered appointment date is suitable for the patient and thus reduces the need to reschedule appointments.

As far as patients' benefits are concerned, the SMS services enable them to take responsibility for their own access to care and make the appointment booking process more patient-oriented. This service eases the daily routines of healthcare professionals, improves organisational productivity and customer service and speeds up access to care.

SMS services have already been implemented in Sweden for several years. An interactive SMS solution has also been launched in Germany. The German service does not only support appointment confirmation and patient reminder processes, it also finds and reaches a suitable patient to replace a cancelled appointment.



6-7 APRIL 2010

HEALTH 2.0 PARIS 2010

The Health 2.0 Conference is the leading showcase of online and mobile technologies in healthcare. After five successful conferences in the United States they are making their way to Europe.

The agenda will span the key elements of Health 2.0 and showcase how consumers and professionals can:

- Search for more appropriate health content;
- Share personal information in communities; and
- Use Tools to self-manage and enhance the patient-physician relationship.

You will gain unique insight into the following questions:

- How does specialized Search relate to Health 2.0? Is there life beyond Google in Europe?
- Are online patient communities different in Europe and across

European countries?

- Have European doctors gone 2.0?
- Are personal health records being adopted by health care systems in Europe?
- How do European hospitals, payers and governments relate to Health 2.0?
- What opportunities exist for Pharma to play a bigger role in Health 2.0?

Health 2.0 Europe will integrate the best of European health technologies, and compare, contrast and contextualise them with leading examples of Health 2.0 from North America:

- What works in the context of Europe's evolving health care systems;
- Whether there are commonalities across European systems that can lead to economies of scale (or not!) and

- What the "boundary-less" online world means for consumers and physicians working in distinct health care systems.

There will also be a presentation of the latest thinking about Health 2.0 in the European context, special videos, an unconference session and the introduction of new companies at Health 2.0 Europe's Launch.

Keynote speakers at the conference will include senior healthcare policy makers Etienne Caniard from the French National Authority for Health and Pieter Vos from the Dutch Council for Public Health and Health Care, who will discuss Health 2.0 from a government view point and how it fits in with national IT strategies.

For more information, visit: www.health2con.com/paris2010



18-21 MAY 2010

HIT PARIS 2010 "BETTER CARE, BETTER MANAGEMENT, BETTER DECISIONS"

HiT Paris, the European healthcare information technologies congress, was launched in 2007 on the initiative of the FHF (French Hospital Federation) to respond to the need of healthcare players for information and training on the modernisation and development of information systems.

After three successful years HIT Paris will take place again this year boasting an educational programme of reference, guaranteeing highly-qualified visitors.

The Congress is programmed in collaboration with a multidisciplinary scientific

committee and with the support of a steering committee consisting of French and European hospital federations, conferences of CME (medical establishment committee) directors and Presidents, industry federations, Ministry spokespersons, and representatives of private practice representatives.

The event is produced under the high patronage of Commissioner Viviane Reding, in charge of the Information and Media Society at the European Commission.

Who will attend?

- Institutionals: GIP, DHOS, ARH,

Working Groups, Agencies...

- Hospital decision-makers: General Managers, IT Directors, Medical IT Management executives, CME Presidents, Cluster Managers
- End-users (Doctors, pharmacists, nursing staff, and other health professionals)
- Private practice professionals
- Standardisation groups
- Manufacturers and industrials, financial providers and consulting businesses

For more information, visit:

www.health-it.fr

HITM REPORTS



20-23 JANUARY, VALENCIA, SPAIN

HEALTHINF 2010

The third international conference on health informatics, HEALTHINF is part of BIOSTEC - The International Joint Conference on Biomedical Engineering Systems and Technologies.

The purpose of the International Conference on Health Informatics was to bring together researchers and practitioners interested in the application of information and communication technologies (ICT) to healthcare and medicine in general and to the specialised support to persons with special needs in particular.

Databases, networking, graphical interfaces, intelligent decision support systems and specialised programming languages are just a few of the technologies currently used in medical informatics. Mobility and ubiquity in healthcare systems, standardisation of technologies and procedures, certification, privacy are some of the issues that medical informatics professionals and the ICT industry in general need to address in order to further promote ICT in healthcare.

Key note speakers included:

- Peter D. Karp, Director Bioinformatics Research Group, Artificial Intelligence Center, United States;
- Rui M. C. Ferreira, National Coordinator for

Cardiovascular Diseases, Office of the High Commissioner for Health, Portugal;

- Tony Cass, Institute of Biomedical Engineering, Imperial College London, U.K.; and
- Vicente Traver, ITACA, Universidad Politécnica de Valencia, Spain.

There were also numerous workshops providing attendees the opportunity to learn about and discuss the latest trends. Featured workshops included:

- Medical Image Analysis and Description for Diagnosis Systems (MIAD)
- Mobilising Health Information to Support Healthcare-related Knowledge Work (MobiHealthInf)
- Open Source in European Health Care: Crossing the Borders (OSEHC)
- Rapid Prototyping for Improving the Development of Biodevices (RAPID-Bio)
- Bio-inspired Human-Machine Interfaces and Healthcare Applications (B-Interface)

For more information, visit:

www.healthinf.biostec.org/HEALTHINF2010



2-6 MARCH 2010, HANNOVER, GERMANY

TELEHEALTH 2010

LEADING TRADE SHOW FOR EHEALTH WITH CONFERENCE

TeleHealth, part of the CeBIT line-up, once again confirmed its status as the leading international trade show for eHealth solutions. This year's TeleHealth was again dedicated to communicating the value of IT in day-to-day healthcare delivery, demonstrating how this technology can help doctors provide more effective treatment and generally benefit patients - now and in the future.

The German Federal Minister of Health, Dr. Philipp Rösler, was the official patron of TeleHealth officially open on 2 March.

TeleHealth is based on the classic concept of conference, exhibition and networking and provides an ideal platform for a broad range of solutions - from telemedicine to healthcare management.

The keynote themes of 2010 - prevention, infrastructure, telemonitoring and homecare/ AAL - covered a broad spectrum of topics dealt with in both the conference programme and the exhibition.

- Regarding telemedicine, the programme covered telemonitoring, telediagnosics, teleconsultation, teleconferencing, teletherapy, telerehabilitation, telecare, and mobile health.

➤ Healthcare management issues included data/information management, process management, security management, online solutions, knowledge management, interoperability and RFID.

➤ e-health topics included e-health cards, e-patient records and e-doctor passes.

➤ Another main feature of the congress was FutureCare, an information-gathering event for healthcare professionals and policy makers, organised for TeleHealth 2010 by ICT industry association Bitkom. Entitled "e-health comes of age" visitors were invited to take a tour of modern healthcare provision and discover how ICT is built into every stage of the healthcare delivery process (in the doctor's surgery, in hospital, in the home, etc.).

The aim of FutureCare was to foster greater acceptance of the intelligent use of ICT in the healthcare sector. It also addressed the keynote themes of the congress: prevention, infrastructure, telemonitoring and homecare/ALL.

For more information, visit:

www.cebit.de/telehealth_e

SPAIN TAKES OVER PRESIDENCY OF EU COUNCIL

Spain has pledged to drive forward the realisation of the European Research Area (ERA) during its six-month Presidency of the Council of the EU, which started on January 1st. Innovation and equality are at the heart of the Spanish Presidency programme, explained Science and Innovation Minister Cristina Garmendia who added, "Promoting the construction of the ERA is key to the success of this programme. It is only by having a common shared space for knowledge, the ERA, in which scientists and ideas can move freely, that research and innovation will be able to act as engines for economic and social progress over the coming decades. For this reason, they should be at the heart of European Union policies".

Spain has identified three "axes" to drive the ERA forward: integration, involvement and inclusion. The integration axis refers to the importance of integrating research and development (R&D) policies into other policies - and specifically into the EU's strategy for 2020. Through the involvement axis, Spain will seek to ensure that all instruments supporting R&D and innovation in Europe, whether they are regional, national or pan-European in nature, address the major challenges faced by society today. These include climate change, the search for new sources of energy, ageing and disease, and globalisation. Finally, the inclusion axis focuses on the role science and innovation can play in promoting social cohesion and tackling poverty and exclusion.

Writing on CORDIS, the Spanish Presidency explains "Europe has the duty and the opportunity to lead the battle against inequality and to put science and technology to use in this fight." Looked at more broadly, Spain's priorities for the next six months include: consolidating Europe's social agenda, paying special attention to gender equality and the fight against domestic vi-

olence; getting out of the economic crisis; energy security and climate change; creating a safer EU, particularly with regard to the challenge of immigration; and enabling Europe to speak with its own voice on the international scene. Spain will head up the EU Council for the first half of 2010, before handing over the reins to Belgium on July 1st.

Together with Hungary, which will hold the Presidency in the first half of 2011, Spain and Belgium have put together an 18-month work programme. In it, they promise to "take full account of the importance of research and development and innovation in the renewal of the post-2010 Lisbon Strategy". In addition to the creation and governance of the ERA, priorities identified by the trio include the analysis of the mid-term review of the Seventh Framework Programme (FP7) and the implementation of joint programming. In particular, the Presidencies are keen to emphasise the importance of the regional dimension of innovation and research policies. They also highlight the importance of making research careers more attractive and attracting the world's best brains to Europe.

The three nations pledge to closely follow the creation of the first knowledge and innovation communities (KICs) under the European Institute of Innovation and Technology (EIT). Finally, they say they will "closely monitor" progress on the development of the pan-European research infrastructures identified by the European Strategy Forum on Research Infrastructures (ESFRI).

For more information, visit:

www.eu2010.es

www.cordis.europa.eu/spain/presidency2010/home_en.html

COMMISSIONER PROMISES "ACTION AND DELIVERY" FOR RESEARCH, INNOVATION AND SCIENCE

The European Commissioner designate for Research, Innovation and Science, Máire Geoghegan-Quinn, pledged to move research, innovation and science "to the heart of European policy" in a hearing at the European Parliament. Speaking to the European Parliament's committees on Industry, Research and Energy (ITRE) and Culture and Education (CULT), the new Commissioner designate said that the European Union must become an Innovation Union. "Knowledge, research and scientific excellence is a cornerstone of innovation", she stated. "In the new economy, refined knowledge will replace crude oil as the economy's prime motive force".

During a confident performance, Mrs Geoghegan-Quinn said that if approved as Commissioner, her policies would focus on three main areas: completing the creation of the European Research Area (ERA), addressing societies' grand challenges, and

creating an innovation research culture. In her opening speech, she also highlighted the importance of bringing more small and medium-sized enterprises (SMEs) into the EU's research programmes, and leveraging additional EU funds, such as the Structural Funds, for research. After the speech, the floor was thrown open to questions from the Members of the European Parliament (MEPs), and during her grilling, Mrs Geoghegan-Quinn gave an idea of the kind of Commissioner she would be.

Asked whether she would be a Research Commissioner who comes up with the big idea or one who improves the instruments we have available, she replied forcefully: "I'm a politician, not a civil servant. I'm going to use the instruments that are already there to ensure that we deliver research to where it is needed". Describing herself as "a doer", she continued,

"I will be robust in pushing this forward". She concluded by expressing her desire for 'action and delivery'. Responding to a question on how she would obtain a large block of funding for research during the next round of EU budget negotiations, she said, "I'm up for the challenge. I've done it before in government. I will fight to get as much as I can." In reply to a query on

how she would attract more people to science. We should make science sexy. Do we have celebrity scientists? We should have".

For more information, visit:

www.europarl.europa.eu/hearings

www.ec.europa.eu/commission_designate_2009-2014/index_en.htm

SmartPersonalHealth: A EUROPEAN E-HEALTH PROJECT

NEW EUROPEAN EFFORT TO PROMOTE PERSONAL TOOLS FOR HEALTH AND WELLNESS

Smart Personal Health is a new European Initiative to promote awareness about issues and challenges related to personal health systems interoperability, from technical to organisational and legal aspects.

More and more devices and applications are coming onto the market. They are often recommended by doctors and health insurers to help patients monitor their health and wellness. These personal health systems (PHS) are one of the key elements of the growth of European e-health. PHS will only realize their true potential if they are interoperable: a device from one vendor should work seamlessly together with another and other e-health applications.

Stakeholders must understand and support the challenges of personal health systems interoperability. These challenges are technical, organizational and legal.

The European Commission has called for action to support a wider understanding of interoperability amongst key stakeholders and has funded a Support Action to promote interoperability among personal health systems and to other e-health systems. The project SmartPersonalHealth started on 1 January 2010 and will run for one year.

Key activities of SmartPersonalHealth will include three thematically focused regional stakeholder workshops and one central pan-European PHS Interoperability Conference. Further networking and dialogue with healthcare providers, patients, industry, insurers, standard development organisations will be carried out. The Continua Health Alliance web portal will provide relevant information.

The workshops and related networking will result in a report addressed to the European Commission highlighting the current status, concerns, barriers and incentives to accelerate the development and adoption of interoperable PHS systems. Recommendations for interoperability promotion will be proposed to the EC, national governments, stakeholder groups and industry.

The programme is run by Continua Health Alliance, IHE-Europe, ETSI and Empirica, coordinated by The Centre, and funded under European Commission's FP7 Programme. The first event will be on 18 March 2010 in Barcelona.

For more information, visit:

www.sph.continuaalliance.org/index.html

HL7 TRANSMITS GENETIC RESULTS TO EHR

Health Level Seven (HL7), the global interoperability standards body for healthcare IT, has announced that its messaging standard has successfully coded genetic test results from a lab and transmitted them to an electronic health record for the first time.

The HL7 Version 2 Implementation Guide details how to structure a genetic test result into the EHR using HL7 Version 2.5.1 and covers the reporting of genetic test results for sequencing and genotyping based tests.

The implementation guide was used by The Partners Healthcare Centre for Personalised Genetic Medicine (PCPGM) and the Intermountain Healthcare Clinical Genetics Institute to obtain genetic test results and transmit them directly through a computer interface from PCPGM to Intermountain Healthcare to the EHR.

Stan Huff, chief medical informatics officer for Intermountain Healthcare and HL7 board member, said, "The project is among the first in the country that will create a standardised advanced

electronic patient record system containing genetic data".

"This may lead to electronic health records of the future, which would support treatment plans that are tailor made for each individual-right down to their DNA".

Huff worked with PCPGM for 14 months to build the framework for receiving test results and integrating them into an EHR. At the same time the Partners team also developed a lab reporting system that would create and send out the test results message through a centralised interface hub. Any lab or EHR that implements the HL7 standard can now interface with the hub.

Using the guide, Intermountain and Partners Healthcare are now working to make the genetic information available within the EHR, including clinical decision support, linkage to clinical genetic knowledge bases and drug order entry.

For more information, visit:

www.hl7.org

Real benefits of AIDC

TECHNOLOGY AT THE PATIENT BEDSIDE

Accurate identification. While the technology, processes and financing can seem daunting, the road to improvement begins with addressing the first link – accurate identification and tracking at the point of care. This means tracking patients, medication and data. Innovative technology like barcode scanners, mobile computing terminals, and wireless local area networks (WLAN), all work together to deliver positive patient and medication ID at the point of care. Serving as the central workstation, the caregiver uses either a mobile computer or a handheld scanner linked to a mobile cart to read the barcode on the patient wristband.

The barcode positively identifies the patient to receive the drug. Once confirmed, the caregiver is given a visual indication to administer the drug. If an inconsistency is found between the “5 Rights” and the doctor’s order, the caregiver is visually informed of the problem on the mobile computer or the mobile cart’s workstation display.

Data protection. The barcode scanner used with a workstation cart is linked to the cart via a short-range wireless connection (Bluetooth) so that it can be maneuvered around the bedside, unencumbered by a cord. Honeywell’s advanced government-certified encryption ensures both accuracy and security when patient data is transmitted wirelessly.

Patient wristband design. Reading barcodes on a wristband can be a difficult task; traditional barcodes are just not suited for the wristband application. Their shape tends to be a long rectangle that becomes wider as one adds more data characters. These “linear” barcodes cannot be positioned, rotated, or shrunk in a way that addresses all the reading challenges. Two-dimensional (2D) barcodes are better suited for use on wristbands.

- ▶ 2D codes make better use of space, so they can more easily be printed on wristbands;
- ▶ Multiple symbols can be tiled over the wristband so that at least one is visible;

no matter how the wristband curls around the patient’s wrist;

- ▶ 2D codes employ powerful Reed-Solomon error correction, making them a durable choice and the enhanced data security is important for accurate patient identification; and
- ▶ Area imagers make reading easier because they scan codes omnidirectionally, eliminating the need for nurses to align a laser beam with a barcode.

Disinfectant-ready equipment. Honeywell is the first company in the automatic identification and data collection (AIDC) industry to introduce disinfectant-ready housings, designed specifically for use at the point-of-care – where infection control is critical.

The use of “anti-microbial” additives in data collection hardware sounds appealing, however, it does not eliminate the need for such products to be cleaned routinely.

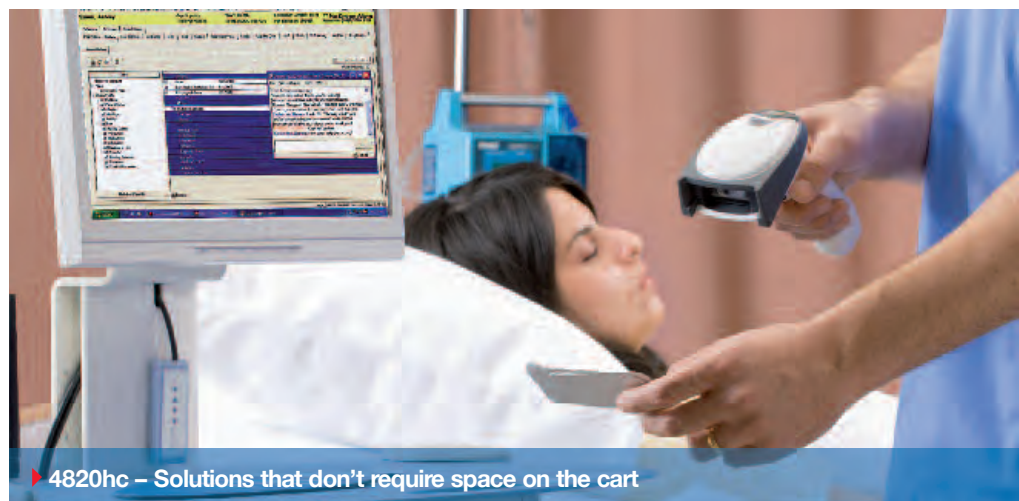
Infection control procedures demand the use of strong cleaners and disinfectants, which cause cracking and damage to traditional plastic housings. Honeywell’s disinfectant-ready housings have been designed to alleviate this problem, ensuring that your 2D scanners and mobile computers can withstand frequent exposure to harsh chemicals. This translates to a lower total cost of ownership.

Return on Investment. Expected returns on investment are difficult to generalise without being misleading. The degree of benefit will vary depending on each hospital’s current state of IT, safety and efficiency. For your return on investment analysis, consider the benefits that other hospitals have gained by implementing AIDC at the bedside:

- ▶ Safety and cost benefit of reducing misidentifications;
- ▶ Reduced medication inventory due to better tracking; and
- ▶ More accurate charge capture and allocation to patients.

Contact us. Honeywell provides innovative solutions in patient safety for hospitals and healthcare providers by leading the healthcare market toward ubiquitous use of barcode technology to track patients as well as the products and services delivered to them. We develop innovative, purpose-built solutions for healthcare workers such as disinfectant-ready plastics and remote device management that deliver quick ROI.

For more information visit www.honeywellaidc.com, contact marcel.dijkkamp@honeywell.com or ask one of Honeywell’s healthcare partners.



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GRID COMPUTING AND E-HEALTH

AUTHOR

Tosh Sheshabalaya,
HIT

Grid computing is emerging as a promising solution to some of the most vexing challenges facing e-Health. It also offers a powerful tool for other areas of healthcare such as drug discovery, as well as economic and weather forecasting, earthquake analysis, etc.

In all these domains, grid computing easily outclasses traditional IT systems, in terms of its ability to cope cost effectively with their massive demands on computer-processing power, and the intensity of real-time data throughputs.

Grid Computing and e-Health

Whether one speaks of business travellers and tourists outside their home countries, the growing number of elderly with chronic diseases who cannot easily visit hospitals, or urgent, complex cases requiring consultations with a range of specialists, e-health means real-time, secure acquisition and access to extremely vast volumes of data from anywhere, at anytime.

From a pacemaker to an electronic health record, grid computing is seen as one of the ways to address these, as well as a wide array of associated challenges.

Both the robustness and the in-built fault tolerance of grids juxtaposes directly with the demand for 'always live' healthcare applications.

“There are several e-health grid computing initiatives underway in Europe, at different stages – from research through pilot projects to implementation”.

Other than access to distributed databases, the rapid data mining capabilities of grids are seen as enabling tools for a variety of epidemiological and biomedical applications. Grid computing is also proving itself in bioinformatics research, and has several proponents who swear about its advantages in terms of new drug design/discovery as well as personal medicine (or i-health).

At the moment, there are several e-health grid computing initiatives underway in Europe, at different stages – from research through pilot projects to implementation.

Grid Computing in Europe

The European Union has been heavily involved with grid computing right from the start. However, two foundational projects, both funded by the EU's RTD Framework Programme, set the stage for the emerging pan-European grid computing infrastructure, including its e-health dimensions.

These projects are known by their acronyms: BEinGRID and Enabling Grids for E-science.

- BEinGRID (Business Experiments in Grid) was launched in June 2006, and concluded at the end of 2009. Its aim was to establish effective routes to foster both adoption of grid computing and stimulate further research into grid computing-based business models.
 - One of the key e-health applications of BEinGRID is the RadiotherapyGrid (discussed below).
- The Enabling Grids for E-science project (EGEE), which includes sites in the US and Asia, is a more application-oriented successor to a previous project called European DataGrid (EDG). It is considered by many to be the world's largest computing grid. EGEE was developed to support the CERN Large Hadron Collider, which requires storage rates of several gigabytes per second.
 - One of the key e-health applications of EGEE is the Health-e-Child project. Another is VPH. Both are discussed below.

e-Health Grid Projects in Europe: A Sample

RadiotherapyGrid

The usual recourse to treatment for the roughly 3 million Europeans diagnosed each year with cancer is external radiotherapy. This uses a Linear Accelerator to attack cancerous tissue with radiation, delivered from several different directions. However, calculating the process for delivering the prescribed doses can be an arduous task: too much radiotherapy is as risky as too little. In addition, treatment also involves

calibrating the direction, size and length of radiation dosages, in order to avoid damaging healthy tissue.

The RadiotherapyGrid, spun out of the BEinGRID foundational project mentioned above, uses grid computing technology to plan the most effective/personalised treatment for each patient. In complex cases, the Grid has already proved its effectiveness in improving the quality of treatment and helping hospitals save money – and thereby treat more patients effectively.

RadiotherapyGrid, which produces results much quicker than hospitals have been used to, has two core objectives: exploiting massive computational for the verification of radiotherapy plans using accurate computing techniques, and searching for optimal treatments. RadiotherapyGrid is also future proofed. It is designed to be easily extended via further algorithms and tools.

The BEinGRID project was meant to develop business models for the use of grid computing.

The process of contracting with RadiotherapyGrid is transparent, and based on an automated Service Level Agreement (SLA) negotiation. RadiotherapyGrid is planned to be primarily marketed as a Software-as-a-Service (SaaS) platform at the nearly 1,000 institutions in Europe which offer radiotherapy.

Health-e-Child

Health-related projects based on the above-mentioned EGEE (Enabling Grids for E-sciencE) include a paediatric application called Health-e-Child. This is integrating innovative predictive disease models, complex data visualization and knowledge discovery applications. The ultimate goal is to support clinical decision making in cardiology, rheumatology and neuro-oncology, and develop personalised healthcare for children using database-guided biomedical support.

The system has undergone security assessment, and released officially at the end of 2008. It is currently providing secure and anonymous hosting of health records. Four leading European paediatric hospitals are participating in Health-e-Child: Great Ormond Street Hospital (London), NECKER Enfants Malades (Paris), Istituto Giannina Gaslini (Genova) and Ospedale Pediatrico Bambino Gesù (Rome).

neurIST

This project involves developing an end-to-end grid IT infrastructure for the management of all processes linked to research, diagnosis and treatment for multi-factorial diseases. Based on a service oriented architecture (SoA), it is targeted at use by medical researchers, clinicians

GRID COMPUTING: THE ESSENTIALS

The System

In technical terms, grid computing consists of large-scale, distributed cluster computing, coupled to network-distributed parallel processing. The network interface is a traditional one such as an Ethernet. This sets grid computing apart from a traditional parallel-processing supercomputer, which uses many processors connected by a local high-speed computer bus.

Again, unlike the customised hardware of a supercomputer, usually built in a small series, the bulk of components in a grid computer are commodity off-the-shelf products. Last but not least, scalability is in-built into the grid because of a lower need for connectivity between nodes as compared to the capacity of the Internet.

The Process

Fundamentally, the grid computing process consists of breaking up and assigning blocks of a specific software program between hundreds or thousands of independent computers, and thus harnessing their additional power – not least when this is idling or functioning at below maximum rating. The architecture of grid computing extends from managing computing processors to data storage and transfer, security, remote monitoring, as well as a toolkit for developing a range of customised services for specific applications.

One key element of the process is specific middleware, to allow sharing heterogeneous resources.

The users of grid computing extend from one large entity at one or more sites to public collaboration across many organisations and countries. Indeed, for cross-border collaborative initiatives like Europe's e-health program, grid computing seems a natural.

One of the most famous grid computing networks is SETI@home, which

used more than three million (mainly personal) computers to search for extra-terrestrial intelligence (ETI).

Its Pioneers

The term 'grid computing' is now just over ten years old.

Conceptually, it was defined in a book 'The Grid: Blueprint for a new computing infrastructure' (Morgan Kaufmann Publishers, 1999) as a means to make computer power available on demand from a variety of sources – rather like an electric power grid. The authors of the book were two of grid computing's three fathers, Ian Foster (Argonne National Laboratory at the University of Chicago), and Carl Kesselmen (Associate Professor of Computer Science at the University of Southern California); and Steve Tuecke (also from Argonne National Laboratory).

These three created what was called the Globus Toolkit. Until the present, the Globus Toolkit remains the de facto standard for designing and building grids. However, one of its core middleware components is facing competition from newer entrants.

Recent Developments

Technology, meanwhile, marches forth. The grid computing market has several sub-segments: middleware, grid-enabled applications, utility computing (provision of grid computing and applications as service), and more recently, software-as-a-service (SaaS).

There are also close parallels between grid computing and cloud computing. Indeed, new systems such as AppLogic from 3tera overlap the two fields. A more compelling case for such a fusion is the fact that some of the pioneers of grid computing are now playing lead roles in cloud computing.



and other healthcare specialists, as well as IT solution vendors and medical suppliers.

neurIST's first phase involves one condition: cerebral aneurysm and subarachnoid haemorrhage. However, its core technologies are designed upfront to be replicable for other diseases and disease groups. The infrastructure consists of datawarehouses, computational analysis services and multi-scale, multi-modal information systems at distributed sites.

Akogrimo Mobile Grid Framework

Akogrimo is specifying and prototyping a mobile grid computing infrastructure for a Heart Monitoring and Emergency Management Scenario (HMES). Akogrimo supports establishing a full range of applications - from patient monitoring via ECGs with data transfer to the grid via mobile telephones, to complex procedures such as remote emergency handling.

The HMES service, which aims at the early recognition of heart attacks or apoplectic strokes and rapid access to treatment, has established two baseline cases:

- A permanent cardiac monitoring service with rapid alert triggering and a disease-specific response in an emergency; and
- A non-permanent monitoring device activated by patients suspecting a cardiac problem.

Other than mobility, HMES's key facets are:

- Cross-disciplinary service involving ambulances/paramedics, hospitals and physicians; as well as network operators and application services providers
- Decision support services to manage high loads of live and historic patient data.

Virtual Physiological Human (VPH)

This project involves a computer simulation model for investigation of the human body as a single complex system - from the cellular level, through individual organs to the whole individual organism. Its eventual goal is to integrate biomedical research across disciplines, and pave the way for personalised medicine (i-health).

VPH necessitates both a massive amount of computing power and demands on data storage and management. Grid computing, including the EGEE foundational project, is being harnessed to meet such needs.

Some key VPH projects, with extremely heavy data and computing processor power demands, include:

ARCH - Patient specific image-based computational modelling for improvement of vascular access in patients on haemodialysis therapy.

ARTreat - Patient-specific artery and atherogenesis model for outcome prediction, decision support treatment, and virtual training.

ContraCancrum - Composite multi-level platform for simulating malignant tumour development and tumour and normal tissue response to treatment modalities and schedules.

EuHeart - Patient-specific cardiovascular modelling and simulation for medical device evaluation and optimisation.

HAMAM - Highly-accurate breast cancer diagnosis through integration of biological knowledge, novel imaging modalities, and modelling.

IMPACT - Image-based multi-scale physiological planning for radio frequency ablation cancer treatment.

NeoMARK - Advancing current models and methods predict neoplastic reoccurrences, and to apply it to the study of oral cancer.

Osteoporotic Virtual Physiological Human - Diagnostic image-based modelling to predict the strength of patients' bones and how this strength will change over time.

PASSPORT - Patient-specific liver modelling combining anatomical, mechanical, appearance and biological preoperative modelled information.

PredictAD - New biomarkers and clinically useful tools for early Alzheimer's disease diagnosis.

RADICAL - Roadmap for enhancing security to protect medical and genetic data.

VPH2 - Patient-specific computational modelling and simulation of the human heart to assist the cardiologist and cardiac surgeon in defining the severity and extent of Left Ventricular Dysfunction (LVD), with or without ischemic mitral regurgitation.

Technical Challenges for Grids in the Healthcare Context

While its operational/functional features are driven by technology (see box), grid computing in an e-health context has to meet several standards on security. These impact upon any healthcare information technology system, but have even more stringent demands in terms of grid computing.

Some of the key challenges are :

Access: Different users of a grid (hospitals, GPs, specialists, authorities and patients) will require flexible controls on access.

Authentication: Every healthcare IT system faces the problem of verifying the source and authenticity of requests for information. Distributed grid computing, by its very nature (anytime, anywhere) makes such a task even more demanding.

And yet, authentication should not be a significant burden on users, especially medical professionals on the move. One potential solution is seen to lie in biometric sign-up systems.

Audit trails: An audit trail is already a regulatory requirement, especially to ensure that (the chain of) those modifying a patient's healthcare data are identifiable and traceable.

Security breach detection: Given the dispersal of both hardware and application resources across a grid computing network, one challenge is IP spoofing. The challenge is to devise a system for both user and server certification, which allows for mutual authentication during any transaction, without producing a drag on the speed of the overall system.

Once again, given the distributed nature of the grid, preventive monitoring of security breaches is a major technical challenge.

Data encryption and integrity: Following mutual authentication by both user and server (see above), the next step in grid

computing is devising an encryption key for local data transfers, alongside VPN technology for remote transfers.

Given the sensitive nature of healthcare information, data integrity issues in a grid involve both encryption as well as digital signatures. This is to ensure that data outputted from a system is reliable, not only in terms of reading but also as far as modifications are concerned. Most grids also seek to retain a back-up version of the data, prior to modification.

The Future: Technology Development and Policy

In addition to the issues described above, it is crucial to take account of the fact that neither the challenges of e-health, nor its enabling technologies, are static.

To make e-health a reality, grid computing initiatives have to be closely tied into progress in terms of interoperability of healthcare IT systems and integration with Electronic Health Records (EHRs).

A related challenge will be to grid-enable medical devices, which face their own interoperability and interconnectivity conundrums with regard to healthcare IT applications, in what is bound to be an artificial hardware-software segregation.

SHARE (Supporting and structuring HealthGrid Activities & Research in Europe)

The EU SHARE project, which concluded in 2008, investigated the technology and policy challenges mentioned above, and drew up a roadmap for accelerating deployment of grid computing in the healthcare area.

As expected, key issues raised by SHARE concerned security, data protection and privacy, and the trades-off between easy access and security, not least in terms of conformity with data protection laws. SHARE's work is being continued by the EU's new e-Infrastructure Reflection Group (e-IRG).

One looming challenge for policy makers will be how to formalise patient consent in terms of being fully informed about who will have access to their records across a health grid, and how this would be used.

The inherent conflict - is making anonymous the vast volumes of data in a grid, while permitting rapid identification of its origin for emergency treatment and personal medicine. Such a task is not going to be technologically straightforward.



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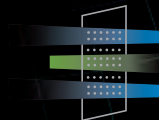
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HEALTHCARE ASSET MAINTENANCE AND PATIENT SAFETY

AUTHOR

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The greatest expenditure of hospitals today is mobile medical devices, starting from patient beds to other technologically advanced diagnostic systems.

The efficiency of a healthcare organisation largely depends on its ability to know where things are and on how efficiently these resources are used by the hospital staffs and patients.

Asset Management Systems: An Overview

Hospital IT systems have been an integral part of healthcare for the past few years and are witnessing advancements in diagnostic and disease management technologies such as CTs, MRI machines etc. When it comes to the usage of the right technology to track and manage their assets, the hospital industry lags behind other industries. This leads to the over-utilization or under-utilisation of their inventory assets.

In spite of the fact that an average hospital spends 15% more on maintaining their equipment, the main focus of European healthcare organisations rests principally on improving the quality of care and patient safety. This pushes the investment on asset management systems (AMS) down their priority chart.

Major Drivers for Asset Management Systems

Cost & Productivity Benefits

Equipment-financing is squeezing all hospitals in Europe. It is not only incongruous but difficult to spend huge amounts of money, time and resources in searching for misplaced, lost or stolen equipment. It has to be noted that to perform planned maintenance and repair which entails high cost, many hospitals in Europe rely on Original Equipment Manager (OEM) and distributor/suppliers of medical equipment. Asset management's automated collection of asset information such as date of manufacture, location, maintenance status, etc. leads to cost and productivity benefits. Moreover, governments are finding it increasingly difficult to keep a track of the assets in public hospitals. It is essential for a government to account for taxpayers' money and also submit an account of value obtained from it. This requires proof for investments on assets.

Added Value of Wireless LAN

One of the major advantages of wireless LAN technology is that once adopted for AMS, it can also be used for other healthcare IT solutions such as disease management, e-prescription, EMR etc. Thus, once an initial outlay is invested on building the basic infrastructure, there is a fall in follow-on investment requirements for the future.

Asset Management Applications

The key asset management applications include asset tracking, asset identification and authentication, data collection,

data transfer and sensing. Asset tracking has the highest priority, followed by identification of assets in relation to patients and authentication. Apart from its application to assets, data collection and transfer are also performed in relation to staff and during clinical trials in patients. Asset sensing, which has the most minimal priority, has major potential for both assets and patients in hospitals.

Offerings at Departmental Level Remains a Priority

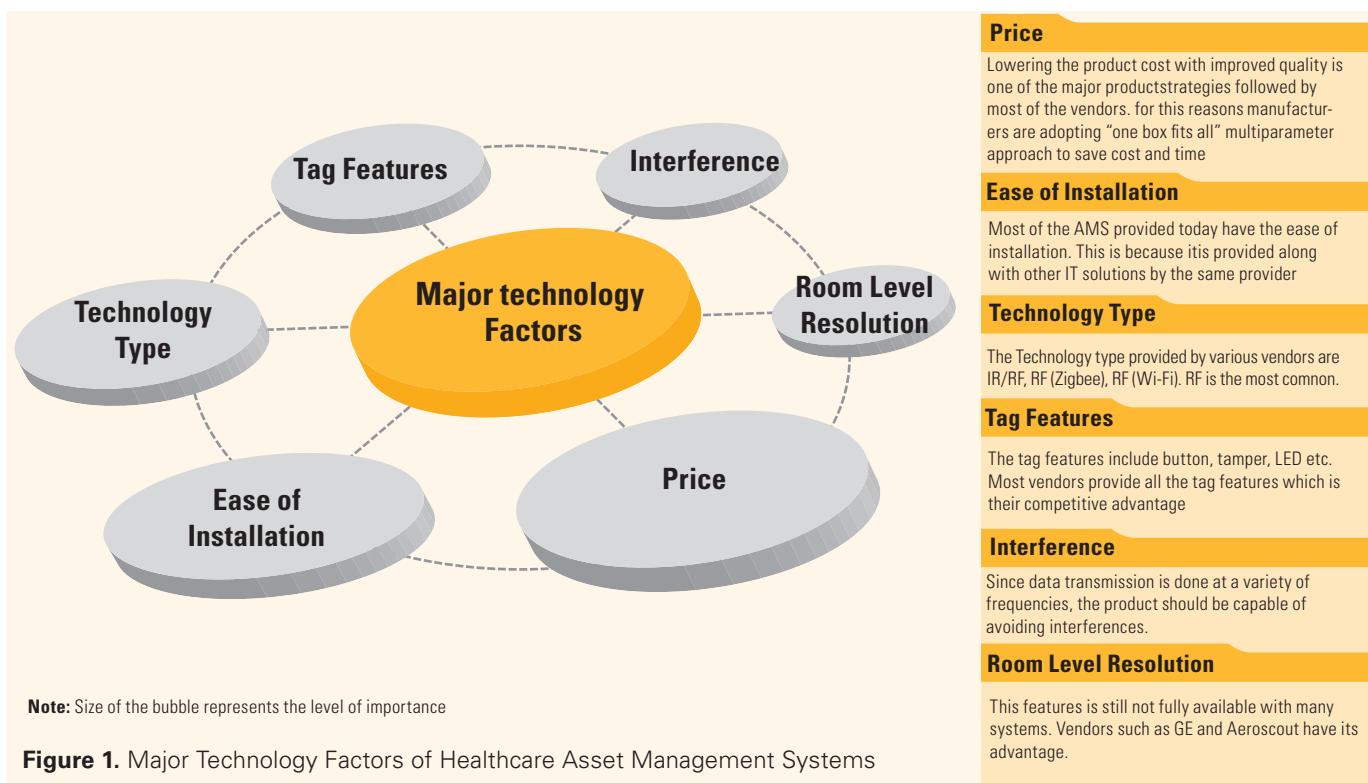
Given the relatively low number of AMS providers, it is evident that the European market is still not mature and the level of competition is low. Often, the services of AMS are provided to hospitals only as a part of a larger IT implementation project. In most of the cases, it is taken up by large Tier-1 companies who have an international presence or by Tier-2 companies who have a strong local presence and are often referred as system integrators.

Previous studies show that almost 95 percent of all healthcare AMS installed till 2009 were performed and initiated only at the departmental level. Many vendors have recognised this demand ceiling and continue to initiate projects at the department level, albeit with a long term goal of providing AMS service to the whole hospital setting.

Challenges: From Cost Factor and Lack of Quantitative Data to Other Technology Related Factors

Not all hospitals in Europe are equipped with the infrastructure for wireless technology. The time and money involved in shifting from wired to wireless technology is very high and deters many hospitals from adopting it. The public funds are insufficient for this. Hence, hospital managers and CIOs are facing an investment dilemma in wireless technology. In such a scenario, it is important for the AMS vendors to emphasise patient safety and security, a subject to which the European healthcare system is already sensitive, and use this as a stepping stone to promote the initial installation at departmental level.

Another challenge that is facing the adoption of AMS is the fact that there is little if any data to quantify the ROI that it can deliver. In addition, the market for AMS is at the initial stage and only slowly progressing towards a growth stage, with less than 2 percent of hospitals in Europe having adopted this technology. As a result, there is little user experience to make a convincing case for AMS.



Given this lack of analytical, evidence-based data, it is difficult for the hospital staff to clearly understand the technology and merits of AMS.

In addition, on the technical side, depending on the source and distance, data transmission by wireless networks use a variety of frequencies. There are widespread concerns about interference problems arising when multiple emitters are used within the same spectrum.

The market for AMS also lacks standards that can promote its integration with other hospital management systems. CE Mark is the only certification that vendors need to possess while selling an AMS. However, this does not describe the quality and relative effectiveness of a solution and hence vendors are finding it difficult to convince customers about the accuracy of the information provided by their products.

Moreover, hospitals are not able to adapt to the landscape of fast evolving technologies, owing to the usually tight financial budgets for healthcare IT in Europe. Shifting from wired to wireless LAN consumes a lot of time and is a complex, sometimes cumbersome, process. Due to the lack of standards and lack of quantitative proof, it becomes difficult for vendors to convince the CIO and head of each department within the hospital. By the time a decision is made, it can be too late – with the adopted technology already outdated.

Electronic and Wireless Economy: Finding a Set of New Opportunities

The potential for wireless healthcare technology demands mobility in today's healthcare environment.

When the market for other technologies in healthcare-IT has already matured, it is the precise time to forge ahead and accommodate wireless technology in hospitals. Wi-Fi (Wireless fidelity) and active RFID (radio frequency identification) are the two major technologies which are dominant within the AMS market. The two technologies are ideally used within a Real Time Location Systems (RTLS). They are also combined with other wireless technologies such as infrared (IR), ultra-wideband (UWB) for different purposes.

In the broadest terms, Internet technology is reorienting the way healthcare organisations function. The open and scalable nature of Web-based technology and services allows easy addition of applications, provided they are compatible with Internet protocols. Integration of mobile devices, such as PDAs and hand held computers to support real-time information capture, is becoming a norm today. The electronic economy is finding itself a new set of opportunities, challenges, and restraints in the healthcare environment in Europe. When it comes to the usage of information systems/information technology (IS/IT) in healthcare management, it is finding itself in a state of turbulence and flux.

Though the current entry cost of RTL tags is high, market growth is translating into a trend of decreasing unit costs, and is expected to make RTL increasingly affordable over the years, along with an improvement in the battery life. This will have a positive influence in the demand for Wi-Fi based RTLS.

Moreover, the loss and misplacement of high value assets such as wheelchairs and ventilators, the growth in technology savvy patients as well as healthcare regulations like the Healthcare Information Portability and Accountability Act



(HIPAA) will converge to justify the value of the tags. It is still critical for healthcare organisations to be very clear of where the RFID and Wi-Fi technologies are to be used, as its application can extend from simple location of wheel chairs or pump to matching up patient records and connecting it to equipment maintenance records.

An Integrated Approach to Provide a Better Customised Service

Choosing the right vendor helps healthcare organisations avoid confusion, as a result of multiple components purchased from different vendors. Given this factor, vendors should remain capable and committed to providing high quality patient care in a more cost effective way to their customers.

This requires solutions to be more customised with an in-built capability to progressively remove the complexity and risk, which they are otherwise associated with.

New customers often specify both general and customised features they expect from a product as well as special value-adding features such as scalability. Since the importance of providing a customized solution as a part of a major project keeps growing with time, there is a clear need for more strategic alliances and partnerships among infrastructure vendors and software vendors who have already made a mark in the industry.

An integrated approach by vendors is likely to help demonstrate an innovative product offering with advanced technology across a variety of geographic regions.

Key Factors to Jumpstart the Asset Management Systems Market

The benefits of mobile technology in healthcare for its users are often underestimated. Healthcare workers, especially in Europe, often resist change that a technology brings. This is yet another problem for most vendors.

Such resistance can be broken by establishing a better rapport with existing clients. Loyalty and trust held by each vendor should be maintained by concentrating on the response time for all inquiries raised by hospital staff. Frequent meetings and brainstorming sessions should be held with the administrative and management staff to address new technology updates, issues and latent concerns related to the technology should be actively solicited. It is also important to provide advance notice on any major, impending upgrades.

Whenever such an upgrade is made, it is very important to organise sessions involving customer participation and obtain feedback from them. Vendors could jumpstart the AMS market by systematically addressing questions on compatibility, added value, the maintaining of data ownership, issues about file distribution and synchronisation, and above all, the ability to improve patient safety through timely updates and recall management.

Marketing Strategies for Healthcare Asset Management Systems (Europe)

Reference Points: Since AMS today are mostly accepted at the departmental level, it becomes essential to convince

the CIOs, administration and various department heads. With the relationship built on the bases of proven trust and quality, references for expanding the sales to other departments can be obtained; this is an important sales and marketing strategy.

Conferences: Since the market for AMS is emerging and relatively new, conferences can prove to be a very useful basis for sharing information and knowledge on the technology. Such an approach may be essential in today's competitive healthcare environment as it helps to send the right message to the customers and drives the growth of value added offerings. In many cases, more than two vendors could partner to hold conferences. In such situations, technology benchmarking is well accepted. Good brand awareness among the customers will help in maintaining market position.

Newsletters: Vendors can use newsletters as a medium to promote their products by highlighting their AMS product features and advertising how it can improve a customer's profit and service. It is also an opportunity to cite previous experiences, which can act as a proof of performance. The customers also get to compare various products by different vendors and learn about upgrades, innovations and new product launches.

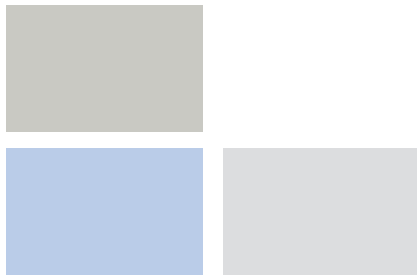
Partnership: Apart from being able to provide more advanced and innovative products, partnership and strategic alliances also helps in gaining market share and geographic expansion by an emerging company or a new market participant. Most of the strategic alliances and mergers are made by the large Tier-1 companies who are dominant in other healthcare-IT solutions. Vendors who enter new markets are working with strong partners that can use their extensive sales and distribution capabilities to penetrate key markets outside their established ones.

Asset Management Systems Market Has a Bright Future

Both existing and new AMS vendors have an open market to distinguish themselves. Though the existing companies operate on various pricing models such as leasing and licensing as a competitive strategy to overcome the biggest challenge – namely cost – not many companies have yet reached the bottom line of profitability. This can be attributed as one of several factors common to emerging industries.

However, the real hurdle is that AMS providers generally show poor commitment to large contracts, which in turn, would accelerate market acceptance and vendor profitability. From past experience, it is evident that the provider market is slowly shifting its view and is moving to implement enterprise-wide tracking and management solutions.

To summarise, the future of asset management systems market looks bright. Companies providing more accurate and reliable solutions are sure to have a high level of demand and will be best positioned to capture more contracts in the future.



Patient Infotainment Terminals

Serving both the patient and the healthcare professional

The Patient Infotainment Terminal (PIT) by Advantech has improved the hospital experience, serving not only the patients through bedside entertainment and communication but also the medical staff through providing the tools to improve quality-of-care.

1 What does the PIT offer the patient?

The all-in-one technology enhances the hospital experience for patients. The interactive terminals include all the entertainment and communication tools right at the bedside. Patients can do anything from watching TV or playing a game to communicating with friends through a phone or instant messaging. Internet access supplies the patient with information on their condition or their caregivers and healthcare facility. With this added knowledge and amenities similar to the comforts and conveniences of home, Advantech PITs provide an overall better hospital stay for the patient.

2 How has the PIT benefitted hospital managers and staff?

Hospital managers and staff see more ease in workflow due to secure access to electronic patient records and databases at the bedside. Both patients and healthcare professionals benefit from the bedside images and information aiding diagnosis. Nurses save time as patients are able to more easily communicate their needs. With more options than just a call-button, improved communication allows nurses to more efficiently use their time, saving the hospital money. These improvements in operational efficiencies in turn

improve the overall quality-of-care in any healthcare facility.

3 Will the PITs advance with changing technology?

Today's PITs are enabled to adapt with the continually changing demands of healthcare. Clean and green: the PITs match the trend toward paperless hospitals while meeting the sanitation requirements through their easy-to-clean design, as well as other meeting other regulations. The PITs fit within any healthcare facility as Advantech works with IT partners, to ensure compatibility often customising orders to meet the requests of hospitals. Advantech's partnership with Intel guarantees that the latest processing technology will be found in their PITs.

4 What is the added value with Advantech PITs?

The collaborations with IT companies add experience to R&D, ensuring the next generation of Advantech PITs meet the future demands of healthcare facilities. Advantech invest in their products from start to finish. They take part in each step of the product lifecycle: R&D, production, as well as providing continued service after product placement. This overall knowledge of the product and the needs of the healthcare industry allow for Advantech



to make continual improvement. As the technology changes, Advantech PITs adapt as well, with each generation being compatible enabling easy transition with further rollouts in facilities. This continual dedication ensures that the next generation will meet the demands of tomorrow while still being compatible with the technology of today.

The PIT-1702 terminal with the 17-inch touchscreen and the 16:9 widescreen version, the PIT-1501W, will both be on display at the Advantech Booth, 624, at the WoHIT2010, taking place 15 -18 March in Barcelona, Spain.

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HEALTH INFORMATION MANAGEMENT

Development of Productivity Measurements

AUTHOR

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HIM Consultant at
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Solutions, Inc.

There is a never-ending search by healthcare managers to improve quality and productivity in the workplace. Successful implementation of information systems assumes that improvements with productivity and quality of work will occur, at least over time. In order to measure improvements, managers must establish monitors and develop base line productivity and quality standards. The ultimate goal is to achieve best performances from the work group.

This process was recently undertaken at a Health Information Management Department at a large urban hospital in New York City. Hospital administration desired to streamline processes in the department to prepare it for an EMR (Electronic Medical Record) system scheduled to be installed within a year.

The management of the department had little to no traditional HIM training. Administration planned on restructuring the department and to hire a HIM director that would provide leadership during this critical transition period and beyond.

Data should be Collected Only if Useful

The employees at this hospital are union members, with reward for seniority rather than performance. Employees rarely, if ever, received feedback regarding productivity and quality of their work. Historically, management collected large amounts of daily data on employee work. However, much of these statistics had lost meaning over time. Any data that is collected should be done so with purpose and intention. If not, then the process should be eliminated.

It was recommended that the department restructure the daily data collection so that the information collected was easy for both employee and manager to manage. The main focus was that the employees needed to quantify how much time was spent performing key functions within the department. Management needed to assure that the most important functions were being performed on time and with good quality. This is why quality and productivity standards needed to be established.

Metrics for Productivity in Optical Imaging

The focus on productivity initially began with the prepping, scanning and quality control (QC) functions of the optical imaging area. The department had an imaging system in place for many years to scan patient paper medical records.

Management developed the monitors for productivity: for prepping, inches of paper prepped per hour; for scanning and QC, images processed per hour were established. All work hours

associated with each function were recorded by the employee as well as the number of inches of paper processed. The actual images scanned or QC'd were provided by reports from the imaging system.

“The core problem with the department is that they are over staffed and work is distributed among all employees. If hospital administration was to force the department to cut positions, then setting priorities would be critical and managing by the numbers even more important. Until that happens there is not too much incentive to change management behaviours.”

It should be noted that the number of hours worked on a job function did not include breaks, lunches, meetings, etc. Worked hours reflected actual time worked. Non-work hours would also be collected as a way to monitor lost work time. Analysing lost work time could be advantageous to study and decrease as well. Management should attempt to maximise the time employees are paid producing work.

Securing Employee Participation

The imaging monitors were presented to the employees to review and make any suggestions. These monitors were

EMPLOYEE ID #	TOTAL HR	TOTAL IN.	AVG/HR
4	15.5	164.7	10.6
24	15.5	131.7	8.5
17	4.3	35.3	8.2
22	11.0	61.5	5.6
20	7.4	41.0	5.5
1	3.8	20.2	5.4
19	3.7	19.0	5.2
3	4.6	20.5	4.5
10	15.5	62.7	4.0
14	8.1	31.5	3.9
18	6.9	21.8	3.2
8	13.4	39.1	2.9
34	3.8	8.2	2.1
11	4.7	9.3	2.0
23	19.4	32.0	1.6

Table 1. Initial Trial Period. Prepping – Productivity for the week Inches Prepped per hour by employee, Sorted by Averages

EMPLOYEE ID #	TOTAL HR	TOTAL IN.	AVG/HR
23	19.4	32.0	1.6
4	15.5	164.7	10.6
24	15.5	131.7	8.5
10	15.5	62.7	4.0
8	13.4	39.1	2.9
22	11.0	61.5	5.6
14	8.1	31.5	3.9
20	7.4	41.0	5.5
18	6.9	21.8	3.2
11	4.7	9.3	2.0
3	4.6	20.5	4.5
17	4.3	35.3	8.2
34	3.8	8.2	2.1
1	3.8	20.2	5.4
19	3.7	19.0	5.2

Table 2. Initial Trial Period. Prepping – Productivity for the week Inches Prepped per hour by employee, Sorted by Total Hours

agreed upon and worksheets were developed for the employees to record statistics on a daily basis. Education was provided to the employees on how to complete the new productivity worksheets.

It took time for employees to adjust to the new method of documenting their work day especially keeping track of the hours

spent on job functions. As management reviewed the worksheets, continuous evaluation of accuracy and completeness were made and employees were counselled as appropriate.

Documenting Productivity

Excel spreadsheets were developed to document daily productivity amounts by employee and for the group.

The first set of data collection showed that there was a wide variety of production results especially for the prepping function (see Table 1). One employee had extremely high productivity of more than 10 inches per hour prepped. The lowest producing employee had less than two inches per hour prepped. The group average was 4.9 inches prepped per hour.

With this first set of data, management was able to make some actionable decisions. This analysis is an example of managing with data.

The number of hours worked per employee per week was taken into consideration. The employee with the lowest production worked the longest number of hours on this job function. Another observation involved the number of people involved with prepping.

In a “what if” scenario, if only the top seven performers prepped more hours during the week, the average prepping per hour would increase from 4.8 to 6.9 inches. If the top four performers prepped the average inches prepped per hour would increase to 8.2 inches.

The theory established based on this initial period was that having only top performers work at certain job functions management maximises the productivity and decreases the hours needed to perform the work overall. FTE reductions could ultimately be realised.

Tradition of Cross-Training

Historically, management in the HIM department had made sure that all employees were cross-trained to perform as many jobs within the department as possible. In addition, management focused attention to the prepping function because this is the first step that needs to be completed when utilising optical imaging. If all the work of the department is up to date, that is without backlogs (which frequently occurred) prepping could be a bottleneck. All the other employees working on imaging would be waiting for prepping to be completed before they could perform their work.

Avoiding Bottlenecks

This resulted in most employees prepping, especially on Monday mornings, so that a bottleneck would not develop. Looking at the data (Table 2), most of the employees working the least hours had lower productivity, which was lower than the average of the group. This managerial decision of having everyone prepping was not financially prudent and produced poor operating efficiency.

It was determined and shared with employees that key groups of high performers could get the same amount of work done



with less hours overall. This would ultimately decrease the number of hours (i.e.: FTE's) needed to perform these functions. Each function of prepping, scanning and QC was divided into primary teams and secondary teams.

EMPLOYEE ID #	TOTAL HR	TOTAL IN.	AVG/HR
4	15.5	164.7	10.6
24	15.5	131.7	8.5
17	4.3	35.3	8.2
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8	13.4	39.1	2.9
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11	4.7	9.3	2.0
23	19.4	32.0	1.6

Table 3. Month 2 – Post Implementation. Prepping – Productivity for the week. Inches Prepped per hour by employee, Sorted by Total Averages

EMPLOYEE ID #	TOTAL HR	TOTAL IN.	AVG/HR
23	19.4	32.0	1.6
4	15.5	164.7	10.6
24	15.5	131.7	8.5
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1	3.8	20.2	5.4
19	3.7	19.0	5.2

Table 4. Month 2 – Post Implementation. Prepping – Productivity for the week. Inches Prepped per hour by employee, Sorted by Hours

Building Primary Teams

The primary teams were composed of mostly the top performers for each function. However, special consideration was taken regarding personal issues and skill levels. There were approximately 4-5 FTE's in each group and they were provided an estimated amount of hours they were to work on that job function. The secondary teams were selected to provide backups for the primary group (in case of vacation or sickness). This methodology was implemented so that employees could manage the work themselves with little management intervention. It also forced the employees to cooperate with each other.

The employees generally were very receptive to the information. The team development process had begun. They seemed to understand the concepts involved. ID numbers were assigned to each employee so that each employee was able to monitor their own performance and how they measured up to the group.

Feedback and Motivation

Feedback to the employees was provided both in groups and individually. Graphs of productivity monitors were found to be the best method to share data. There were some employees that were challenged by the data and wanted to improve their productivity. Others found that their numbers were not close to average and immediately felt unworthy of their work. Poorer performers were given more time and opportunities to improve. Unsuccessful performers were assigned other tasks that were better suited toward their skills.

Group meetings took place to review results and provide time for discussions. Team development was evolving. The team was slowly learning to work as a group. In time, it is estimated that continuous feedback with employees will empower them to improve their individual and group processes and ultimately become a better work group.

Follow-On Monitoring

Over the following months, data continued to be shared with the employees. Adjustments with employee work schedules were eventually made and the averages of the work teams began to solidify.

During the initial period, employee ID #4 had a productivity average for prepping of 10.6 inches per hour. However, this number was found to be exaggerated and the productivity average dropped to 3.4 inches per hour. Perhaps the drop in productivity was because of employee inaccuracy with the number of hours worked or the number of inches prepped.

Dealing with Poor Performers

This employee also was not pleased with being placed in the primary team for prepping. The employee felt that prepping was not challenging and it was one of the employee's least favourite functions to perform. This negativity could also have resulted in decreasing this employee's productivity numbers.

The employee may also have purposely worked at a slower rate because that was just his personality. Another note of interest was that this employee was the most senior ranked union employee in the department. He utilized his seniority to extreme measures constantly challenging management with a variety of issues. The management staff needs to consider reassigning this employee to another task that he wants to do.

Unexpected Surprises: Productivity Drops

Other significant changes occurred when comparing the initial period to the two-month period. (See Tables 3 and 4). Three of the top performers dropped their averages significantly. Other than employee ID #4 (described above), employee numbers 24 and 22 decreased four and 2.9 inches respectively.

Another shock was that two of the lowest performing employees in the initial period improved their productivity significantly in month two. Employee ID # 23 improved from 1.6 inches per hour to four inches. Employee ID # 11 started at two inches and improved to 5.5 inches.

These changes in productivity shifts were unexpected. It is believed that the ID 23 and 11 were completely motivated to improve while the ID 4, 24 and 22 may have inaccurately documented their numbers initially and then adjusted later.

Productivity is affected by many different issues as described above. Additionally, special attention should be given to the number of hours worked per job function by employee and for the group.

Building Win-Win Teams

Best solutions must be found to make the work environment a win-win situation for both individual employee and for the group. Management has not found the right mix of employees to perform prepping. There is much room for improvement by eliminating poorer performers from working certain job functions.

Even though one could say that the initial period was not a true reflection of work performed, one could say that month two shows a better base of data from which to judge performance. Employee motivation needs to be further evaluated and team performance need additional discussions.

Management as Obstacle to Change

The biggest obstacle of change has been within the management group. Logically, and in theory, management understands how the data works. They continue to make slow and sometimes illogical decisions. Long held beliefs of little to no backlogs at the end of the day continue to be emphasized. All employees still work on Monday mornings prepping records which defeats the purpose of only having the best performers work on certain functions.

The core problem with the department is that they are over staffed and work is distributed among all employees. If hospital administration was to force the department to cut posi-

tions, then setting priorities would be critical and managing by the numbers even more important. Until that happens there is not too much incentive to change management behaviour.

Balancing Productivity and Quality

Both productivity and quality of work must be balanced so that they are at the highest levels and neither suffers. Frequently, when productivity improvement is focused on, employees may sacrifice quality of work. Each employee must determine the best balance to optimally find the maximum output with the best quality that can be produced. Just as productivity must be measured, quality must be measured as well.

“The key to a successful productivity programme is to focus on facts and to share all information with the team. Total transparency is needed so that all parties can work together without hidden agendas.”

Quality monitors were implemented on a point system (ranging from 1-5), where management judges the severity of errors found. Minor errors are given low numbers and serious errors are given higher numbers like four or five. An example of a serious error resulting in an assignment of a five would be for indexing documents to the wrong patient. This would obviously result in a missing or lost record, one of the worst quality problems that could occur in a HIM department.

There are two ways that quality is monitored. Quarterly or biannually, audit samples are to be reviewed. Management will perform audits to look for quality of work. Minimum standards per function have been established and errors found through looking at a sample of an employee work would be reported.

In addition to the audit sampling technique, any error found through discovery during normal business would also be counted. Through these processes quality point measurement will be accumulated and compared among employees. Group benchmarking will ensue and quality standards will be established over time just as productivity has.

Key to Building Productivity in Teams

The key to a successful productivity program is to focus on facts and to share all information with the team. Total transparency is needed so that all parties can work together with-



out hidden agendas. Accuracy is critical if managing with data. Employees must be trusted to accurately document the hours worked on each function and management needs to be able to share the data as accurately as possible.

The Role of Information Systems

Information systems need to provide management with tools to perform these types of tasks such as monitoring productivity and quality. The process described above was implemented with manual monitoring utilising data made available from the imaging system. However, the imaging system could provide more complete data if appropriate reporting was set up. For example, the system could keep track of how much time an employee works on scanning or QC. It also keeps track of employee output. All the data could be made available in management reporting, however, the vendor has not chosen to develop these management tools. The hospital could try to extract this data from the imaging system and develop a specialised tool to collect data. This probably would take a great amount of time to develop and even then it would not be complete because prepping is performed manually, outside of the system and therefore would have to still be manually tracked.

The expectations of end users and executive management require that software functionality and deployment of such systems incorporate automation of work. They demand to see evidence of tangible value for these investments. Productivi-

ty and quality measurement of work performed is at the heart of the matter. Improvement of staff performance and operating efficiency is expected of any information system. "You can't manage what you can't measure".

Management Must Provide Leadership

Management must set the stage for identifying key performance indicators. Productivity and quality of work are some basic concepts that can be monitored as key performance indicators for many different departments. Many hospitals are incorporating business intelligence systems which can pull data from several systems together. Truly managing by the numbers becomes increasing important as hospitals evolve into complete electronic environments.

Strong leadership is required to make change occur in any environment especially hospitals. Effective management of using productivity and quality measurement and monitoring has the potential to decrease costs and maximise labour. As described in this HIM department project, it takes time to develop productivity and quality monitoring systems and the issues revealed can be frustrating. The rewards can be great by developing effective teams and improving staff efficiencies. This consulting project was short lived and the end results expected had not been witnessed. However, with strong leadership and direction the HIM department has great baselines from which to work.

HEALTHCARE PRODUCTIVITY AND THE EUROPEAN SCENE

Cost-effectiveness, employee productivity and operational efficiency pose tough challenges, in particular for services such as healthcare delivery. In Europe, there are a variety of schemes to address such an issue.

A good example of an explicit commitment in this respect is the British National Health Service (NHS), which seeks to "demonstrate that it is making the most effective use it can of public money to deliver quality healthcare".

In 2006, the NHS developed and launched high-level indicators that highlight potential areas for improvement in efficiency by acute care hospitals and primary care trusts. Known as Better Care, Better Value Indicators, they are used in planning/establishing budgets and, in measuring potential cash and resource savings in different areas of healthcare delivery.

They are also meant to be a platform for generating ideas on how such savings can be realised enhancing both efficiency and quality enhanced. Nevertheless, the NHS takes care to point out that the indicators are "not targets", and that there is "no specified level" which must be achieved on each indicator.

The indicators are focused on clinical productivity, workforce, prescribing and procurement. They are updated on a regular basis.

An overview is provided aside:

Clinical Productivity

- Reducing length of stay
- Increasing day surgery
- Reducing pre-operative bed days
- Managing variation in surgical thresholds
- Managing variation in emergency admissions
- Managing variation in outpatient appointments
- Managing 14-day emergency readmission
- Managing new-to-follow outpatient appointments
- Managing outpatient referrals and attendances

Workforce

- Staff turnover
- Reducing sickness absence rates
- Reducing agency costs

Prescribing

- Increasing low cost statin prescribing
- Increasing low cost prescribing for lipid modification
- Increasing low cost PPI prescribing
- Increasing low cost prescribing of drugs affecting the renin-angiotensin system

Procurement

- Uptake of national framework agreements

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CHALLENGES IN THE DESIGN OF SENSORS FOR TELEMEDICINE

AUTHOR

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Sensors for portable telemedicine are a fast-growing market. They are changing the way in which health service providers interact with patients. Hardware devices, alongside software and communication systems, are enabling the rapid change in quality of the monitoring patients outside hospitals. This constant flow of data may be used to check a variety of medical conditions, including compliance with a physician's instructions. However, new technology is posing new challenges.

The problems encountered in the design and implementation of sensors for telemedicine systems are, in general, common to all health related devices and software. This article is based on our 'out of the hospital' monitoring system under development at Kuziemski.pl. It covers many, but by no means, all the challenges we have encountered. Most importantly, our lessons can be extrapolated to other systems for telemedicine.

Sensor Accuracy

Sensor accuracy is not a problem in typical medical solutions. However, given the requirements of miniaturisation and the need to contain costs for mass market devices, the choice is tough. The use of advanced software algorithms is one way to ensure the right interpretation of gathered data, as it is common to use different kinds of sensors to monitor one function.

Data Interpretation

Correct interpretation of gathered data is critical, given the differences between individual patients and the lack of an 'ideal' readout from sensors. First, data integrity has to be checked. This is followed by appropriate algorithm checks for anomalies and results are obtained via an expert system. The latter are rarely easy to implement, not least due to human factors and the need to cover, combine and program different fields of expertise.

Software and Hardware Errors

Software and hardware errors are major threats to an entire IT system and telemedicine is no exception. Extensive testing on all phases is required, along with solid design and prototyping. Communication between sensors, processors and memory has to be carefully planned. Algorithms have to be checked and proven, with interference and risks of malfunction eliminated. The system has to run 24/7 without any memory leaks, unexpected loops or other behaviour which makes it unreliable.

Communications

Fast, secure, reliable and safe communications are crucial. Ideal sensor units in a telemedicine system must be compact,

without wiring. Due to the need for ease in wearing, the processing and long range communication unit is usually separate from the sensor unit. Communication between units should, if it is possible, be wireless with minimum power (and so minimum range). Securing uninterrupted, safe communication is difficult due to proximity to a patient's body, power supply limitations and possible interference.

Communication between the processing unit and a health-care provider is usually obtained with Internet using a GSM modem; the key challenge here is encryption and security. Newer choices such as a smart phone are more versatile and easier to implement, but are complex devices and not designed to fulfil medical reliability standards.

Power Source and Power Consumption

Power supply impacts directly on ease of use, especially for a portable telemedicine device. The charging intervals should be long (from 24 hours to a few days) and should be performed without a need to stop the devices. Technology is advancing. Current LiPo cells reach almost 200 W/kg and more futuristic LiS (lithium – sulphur) are rated at 350 W/kg.

Minimising power consumption via sophisticated algorithms to harness hibernation capabilities, energy efficient sensors and

continued on page 34 »

The Key Challenges Faced by Sensors

- Sensor accuracy
- Correct interpretation of gathered data
- Software and hardware errors
- Prevention of communication problems
- Power source and power consumption balance
- Miniaturization and trade-offs with power requirements
- Materials, health regulations
- Intuitive, user-friendly interface
- Security: access rights and information safety problems
- Reliability and ruggedness
- Training for routine operation and emergencies
- Proactive testing
- Bringing down unit costs

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» continued from page 32

radio links can do wonders for run times. The unit should also be watertight, to be worn, for example, in a shower.

Miniaturisation

For 'out of the hospital' monitoring on a 24/7 basis, the weight and size of the sensor unit is essential. Miniaturisation is a very important factor here: the unit has to be compact, as light as possible, and preferably elastic. This makes the design of the electronics of the sensor unit an especially tough challenge.

There is a contradiction between battery capacity and miniaturization, and the trade off has to be weighted carefully.

Materials, Health Regulations

Materials in contact with a patient's skin have to be carefully chosen, according to health regulations. Minimally, this means dermatological safety and inflammability, as well as comfort.

The product has to comply with national and international regulations for medical devices and the risk management process must cover its life span from production to disposal.

Some kind of ruggedised design would be preferable to assure long life of this component and increase safety of the user.

User Interface

A high quality user interface is essential to assure good communication with the patient. It has to be clear, easy to read and understand (especially for older people). The screen resolution should be high and its size should be sufficient to ensure good readability of the messages to the user in all lighting conditions.

Being intuitively-friendly to users not familiar with modern computer interfaces is also important, as a majority of potential users of such systems today would consist of the elderly, who are a relatively computer-illiterate demographic group. The design of the system has to therefore be clear, concise and logical, and tested carefully with the full range of target groups.

Security

To ensure the safety of the information gathered by a portable telemedicine system, access rights and encryption algorithms have to be implemented. During the planning phase, all information users must be named and a stringent data protection policy developed.

The data and communication have to be protected from tampering – which could have serious (even fatal) repercussions. This is an especially important point given that the number of medical data hijackings is growing by the day.

Communication has to be secured from all potential errors. Commands have to be answered with confirmation, double and triple checked. The design of the electronics, software, and above all, algorithms, have to be closely monitored.

Reliability

The reliability of such systems must be extremely high. For in

stance, malfunctioning of an insulin pump due to incorrect sensor data or a misinterpreted command from tele-operation could result in coma or even death. Reliability is closely correlated to the security issues discussed above.

Training

Extensive training of personnel is required to ensure that operating procedures are followed rigorously, while unexpected events are handled professionally. A swift response to alarms is of specific importance. The medical data and events/incidents chain has to be logged correctly, so that they can be swiftly recalled during an emergency. Human factors are always a risk in telemedicine systems, and well-designed operational procedures are essential, both for data privacy and the proper functioning of the system.

The training program should also include awareness of combating common techniques used by hackers and data thieves. Users of the system should be queried routinely – even if they suspect any misbehaving software or hardware or if they encounter any signs of intrusion into the system. As always, a skillful network and system administrator is a must.

Testing

The testing of system components should be performed during all stages of design. External experts must be consulted during the design phase to proactively prevent or detect impending errors. A test program should be developed and test procedures designed and implemented. Even if a system is working well, it must be closely and routinely monitored through the test program.

Costs

One of the main challenges in telemedicine, especially sensor systems, is to achieve low cost per patient year. The design of sensors has to take in to account the final cost needed to manufacture the device, how long it will operate, and the cost of the communication device (especially if it entails an expensive Smart phone).

The eventual goal is to achieve a low-enough price point, so that sensor systems can be included in typical health insurance schemes.

The Future

To sum up, the future of telemedicine is bright. The pace of development in the field of sensor systems is rapid, and is in turn expected to lead to the application of mini-robots. The main challenge at present is to ensure that sensors continue to perform better and more effectively, and do so with safety and reliability.

More than anything, this will drive market uptake and bring down unit costs which will in turn, further boost sales in a virtuous cycle.

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STRENGTHENING ALLIANCES FOR MEDICAL PROGRESS AND QUALITY

German Medtech Presents 10-Point Plan

In Germany healthcare spending in the medical technology sector amounts to more than 23 billion euros. The medical technology industry employs 170,000 people in more than 11,000 companies in the country.

Outstanding Innovative Capability

The medical technology industry is dynamic and highly innovative. German medical technology manufacturers achieve approximately a third of their business volume with products that are less than three years old. The researching companies in the medtech sector invest an average of about nine percent of their sales revenues in research and development.

Another proof of the industry's high innovation capability: according to the European Patent Office in Munich, medical technology heads the list of registered inventions with 11.4 percent of patent applications over 15,700 patents. Thus originate from the medtech field, which is followed by telecommunications (10 percent) and IT (6.7 percent).

10 Points for Providing Patients with Advanced Medical Technology

How will the medtech sector further develop in Germany? The days of the grand coalition (CDU/CSU and SPD) and of healthcare minister Ulla Schmidt (SPD) are numbered. The Christian Union of CDU/CSU under the leadership of Chancellor Angela Merkel and the pro-business Free Democrat Party (Liberals) have won the German general election on 27 September 2009. Consequently, Angela Merkel won a second term and ditched the centre-left Social Democrats with whom she has shared power in an uneasy coalition since 2005. The Liberals have been the preferred partner of the Christian Union.

BVMed has published a "10 point plan" for the care of patients with advanced medical technology" as discussion points for the health policy negotiations of the new government. The plan was sent to the plan to the decision makers of CDU, Liberals and CSU to give impetus for the elaboration of the new government programme.

Information Campaign on Healthcare Compliance

Another important issue for hospitals and the medtech industry is healthcare compliance. The medical technology companies and their trade association BVMed seek to provide orientation with a new information campaign called "MedTech Compass" to promote transparent and good cooperation between industry, medical facilities and physicians. The "Compass" uses its own website (www.medtech-kompass.de), an informative flyer, regular newsletters, e-learning tools and films

to advocate the existing recommendations for cooperation in the healthcare market, with the help of clear principles and real-life examples.

Cooperation Between Industry and Hospitals as Innovation Motor

This topic is particularly important for Medtech companies and hospitals, since the cooperation between medical facilities, physicians and industry is a prerequisite for medical advances. Politically, such cooperation is also desired. Together with partners in the hospitals and the medical profession, the Medtech companies in Germany have endeavored for many years to provide a secure and transparent basis for cooperation in the healthcare market.

In order to offer clear recommendations for an effective and transparent cooperation, industry, health insurance funds, physicians and hospital associations in Germany have developed the "Medical Device Code of Ethics", the "Common Viewpoint" and numerous model contracts. The contents of these recommendations are lived day in and day out in many places. Nevertheless, questions and uncertainties often arise in practice. The Medtech Compass is to provide answers to these questions and thus offer more security in daily routine.

Four Principles as "Pillars" of Healthcare Compliance

The basis of an effective and transparent cooperation between industry, medical facilities and physicians are the following four principles:

- **Separation Principle:** We advocate the strict separation of donations, benefits and sales. Specifically, this means, for instance: It is wrongful to sponsor a medical event after being assured that medical technology products will be purchased.
- **Transparency Principle:** Every donation and reimbursement received must be disclosed. The consequence being: All services for a medical facility or a physician must be communicated to the employer and specified in writing.
- **Equivalence Principle:** Performance and recompense must have a reasonable relationship to each other. If, for instance, a physician produces a study relevant to medical technology, his fee must be appropriate to his effort and expense.



➤ **Documentation Principle:** All services must be documented in writing. The written agreements will stipulate

in detail what kind of funding it is, which purpose it has and which services have actually been performed.

10 POINTS FOR PROVIDING PATIENTS WITH ADVANCED MEDICAL TECHNOLOGY

1. The quality rating of medical devices must be demonstrated by means of a CE-Med quality mark,

The CE quality mark for medical devices differs from that for other products in that it does not only guarantee the safety of the product, but in addition stands for a proven performance capability. A distinctive CE-Med quality mark should therefore be introduced for all medical devices.

2. Access to medical-technical innovations should be designed to be unbureaucratic and flexible

In order to enable patients to gain more flexible and faster access to medical-technical progress, BVMed suggests simplifying and deregulating the remuneration of new examination and treatment methods (Neue Untersuchungs- und Behandlungsmethoden, NUB) within the Statutory Health Insurance (SHI).

3. It must be possible to introduce medical-technical innovations into hospitals without restrictions

When launched onto the market, many medical-technical innovations are first used in hospitals because these have suitable staff and adequate technical infrastructure. This process must be continued in order to make innovative medical technologies available to all patients in Germany who need them, without delay. If similar structures exist in the outpatient sector, the same procedure should be possible for this sector as well.

4. We advocate an innovation pool to accelerate the introduction of medical-technological innovations into the SHI

Medical-technical progress should be made available to patients as soon as possible. At present, it takes up to four years to assure adequate remuneration. In order to accelerate the introduction into the SHI service catalogue, funds should be paid by the SHI into a so-called "innovation pool" to be used for the purpose of medical-technical innovations. The inclusion of additional funds, e.g. from research funding, should be considered as well.

5. We campaign for a tax-advantaged innovation savings scheme (Steuerbegünstigtes InnovationsSparen, SIS)

There is great demand for additional services outside the range of the SHI service catalog. In this context, we suggest granting tax privileges for savings schemes in the healthcare sector, similar to those for the pension savings scheme "Riester-Rente". This would create an important incentive to make provisions in time, especially for younger people. Certain innovative and desirable services that exceed the care provided by the SHI benefits would be supported. Such optional schemes increase the freedom of choice for patients.

6. We consider health services research a useful and necessary joint task for all players in the healthcare system

Health services research is the basis for decisions that are relevant to health and can increase the planning assurance for all those involved in the healthcare system. Actively involving all players in the healthcare system in the process is important if health service research is to be generally accepted.

7. Cooperation between medical institutions and industry is desired and essential for the improvement of patient care

An idea for a device or procedure is often jointly realised by physicians and the engineers in the companies. This cooperation leads to excellent products. Together with its partners in the hospitals and among physicians, BVMed has been working for many years on providing a secure and transparent basis for the necessary cooperation in the healthcare market. This includes extensive information and advisory services. In the area of medical care, profitable cooperation takes place between companies, service providers, SHI-physicians and hospital physicians, hospital operators. This is now being restricted unnecessarily by the amendment of section 128 Social Security Code V (SGB V). Regarding this situation, there is urgent need for action.

8. Emphasis must again be on the quality of medical devices (e.g. regarding aids and appliances). Patients must be able to freely choose their service provider and their products

The MedTech companies recommend a competition for the best quality in medical care, not for the lowest price without consideration of quality and qualification. Therefore, we advocate developing and establishing criteria for proper quality competition in cooperation with the health insurance funds in order to counter the trend towards cheap medical care.

9. Homecare should become regular part of SHI

Six million people in Germany use aids and appliances supplied by homecare companies, and the number is rising daily. We live in a society where people are getting older and older, not least thanks to medical-technical advances. Older patients mostly have several chronic diseases. Changes in hospitals mean that they are transferred to ambulatory care as soon as possible. Homecare companies have been successfully meeting the challenges this poses for years. Trust and professional counselling require that services are provided close to home. Therefore, the patient should be entitled not only to the product (medical device) but also to comprehensive homecare treatment.

10. Telemedicine should become part of regular care

E-Health, telemedicine and telemonitoring by means of medical technologies and the required networking lead to better, safer, optimised, and more cost-effective care and must therefore become part of standard care.

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TIME TO START DEVELOPING YOUR mHEALTH STRATEGY

AUTHOR

David Doherty
cofounder of mHealth
service provider 3G Doctor

For many HIT Managers, the stars are aligning as colleagues and their patients, fuelled by the buzz of iPhones and Appstores, are beginning to show interest in using the mobile technologies that they're all familiar with. But what are the fundamentals and what's the best approach?

Mobile is the Newest Mass Media

The mobile phone has emerged as the newest and least understood of all the mass medias. With attributes that are distinct from the Internet, mobile phones have a natural synergy with the needs of healthcare. For example, mobile phones are always turned on and permanently carried; they display the personal status of the user while being available at the point of creative impulse.

To avoid creating wasteful and disappointing experiences, healthcare institutions (and solution vendors) must adapt to serve these unique attributes. Instead of trying to force concepts from the previous media (the Internet, television, print) we must develop services that leverage the unique power and potential of mobiles to deliver radical new concepts.



Doctor Companion, a popular mHealth application

Workable mHealth Solutions Already Present

Cutting GP no-shows in the UK by 90 percent = Reduced patient waiting times The effectiveness of SMS Appointment Reminders is being widely reported by healthcare providers. In the UK General Practitioners are reporting reductions in appointment no-shows by as much as 90 percent. This is delivering millions of pounds of savings and, in turn, directly helping reduce patient waiting times.

Mobile Books for medical texts: More popular in the US than electronic records Mobile Books show the speed of adoption that mHealth technologies are having with healthcare professionals. Already in the USA (a country in which less percent of all doctors use electronic patient records), a higher share (20 percent) of doctors report they are accessing textbook data via their mobiles.

One good example is MedHand.com which offers Nurse Companion, Doctor Companion, Pharmacist Companion, titles which enable professionals to carry up to date, made-for-mobile versions of all their familiar medical texts on any Smartphone.

Secure Systems for Organ Donors

As a nod to where this is all going, University Hospital Birmingham has built a bespoke transplant management solution in conjunction with BlackBerry Enterprise Solutions. This solution enables access to real time information with end-to-end encryption across a multitude of different platforms to maintain, search for and profile patients/organs for organ donation.

The program has eliminated confidentiality risk, increased ease of use and improved the speed of donor/recipient matching. The team is now working to extend the application to other transplant teams, replacing the hospital paging system with BlackBerry smartphones and integrating the BlackBerry solution into its emergency preparedness plans.

BlackBerry solutions are also being used in a variety of other settings, for example by midwives to securely edit the patient records of pregnant women.

M2M (Machine-to-Machine)

Mobile Data means that a healthcare organisation's mobile strategy is no longer restricted to just mobile phones.

3G Data Dongles are helping ensure that staff who are out and about can access the data they need when they need it, while eliminating the additional costs or security risks of un-

secure WiFi Hotspots.

Wireless Module specialists such as Cinterion.com show the future impact of mobile data in the healthcare industry by connecting medical devices such as ECG, Glucose/Blood Pressure Monitors, Weight Scales, Pedometers, etc. through the GSM network.

As a result, they have eliminated the installation costs/problems of fixed line communications and barriers of mobility. Once connected, medical devices have the potential to be part of robust, aggregate, secure and flexible new way to manage medical data on web-based platforms.

Lone/Community Workers

As care moves to the community and becomes more mobile, the need to seamlessly connect staff is being driven by a range of demands including personal safety, timely response and more effective allocation of resources and personnel.

Blackberry Enterprise Solutions are reporting some dramatic achievements in this space with a community worker solution involving a 'Bluetooth Pen' that enables data written on paper forms to be automatically entered into hospital electronic data systems - removing the need for behaviour change, enabling patients to keep physical records of encounters and eliminating the paper, cost and time inefficiencies previously associated with remote data collection.



Patient Participation/Feedback

While the days of one-way communications are clearly over, the costs and quality of call centre services can quickly mount. Fortunately 1-2-1 communication via SMS is very popular with patients - so healthcare institutions would do well to include them in their strategies.

In addition to appointment reminders, other areas for immediate application include feedback and suggestions to help identify problem areas and learn how to improve the quality of service being offered. A good example here is the mobile patient surveys from Questback.co.uk.

YouTube and Skype have shown consumer appetite for video content and quality healthcare content is proving a great way of communicating what to expect of healthcare facilities. Institutions can go the extra mile and syndicate content from specialists in healthcare video content such as HarleyStreetTV.com.

One quick point of entry to the world of mHealth lies in substituting the Contact Us page 'submit' box with a secure messaging platform. This avoids the security issues which are inevitably bound to arise with email. In turn, the platform can be leveraged further, for example, by using patient interviewing questionnaires to improve the patient care benefits and the quality of data that is collected.

Next Steps

The following four steps describe relatively easy-to-implement initiatives which will help prepare a healthcare institution for the mHealth future:

- **Begin by analysing customer/visitor/patient/patient family needs.** What would you like to find if you were a visitor? Would a map of the location be helpful? Opening times? Car parking options/costs? Contact us details? Make sure to also include suggestion and feedback survey links.
- **Launch a mobile web presence for mobile visitors to your website.** The costs for this pale in comparison to developing/testing and implementing platform specific applications. Instead, it gives access to early adopting customers and, crucially, to their feedback. Rather than paying consultants, such real-world customer feedback is clearly far more useful to hone what you're offering.
- **Add electronic patient registration services and then progress to mobilise these.**
- **With a touch screen, your patients can check in for their appointments automatically.** This, in turn, would translate into saving receptionist time, reduce queues and relieve some of the frustrations of both patients and staff. One source of information on integrated touch screen devices for hospitals and clinics can be found at www.wiggly-amps.com/touchscreen
- **Add secure messaging to your services.** Bid farewell to the costs and security headaches of other systems. Push SMS to your customers, asking them to log in to view sensitive results or other information For example: "Your test results are now available. Log in with your Mobile Number and Password at AnyClinic.com to view".

THE HEALTHCARE SYSTEM IN IBERIA

An Overview



AUTHOR

Tosh Sheshabalaya,
HIT

	PORTUGAL	DATE	SPAIN	DATE
Population (million)	10.61	2007	43.7	2006
Live births/1,000 pop	10.4	2005	10.5	2004
Deaths/1,000 pop.	9.7	2005	9.2	2004
Life expectancy at birth (years)	75.9 (males) and 82.2 (females)	2007	77.8 (males) and 84.3 (females)	2007
GDP (billion EUR)	166.4	2008	1,088.5	2008
Total healthcare expenditure (% GDP)	9.9	2006	8.5	2007
Total healthcare expenditure per capita (USD PPP)	2,150	2006	2,671	2007
% of healthcare system financed by public funds	71.5	2006	71.8	2007
Number of CT scanners (per million inhabitants)	26	2007	14.6	2007
Number of MRIs (per million inhabitants)	8.9	2007	9.3	2007
Number of hospital beds (per 1,000 inhabitants)	3.6	2006	3.3	2006
Length of stay (average in days)	6.8	2007	6.6	2006
Number of practising physicians (per 1,000 inhabitants)	3.5	2007	3.7	2007
Number of practising nurses (per 1,000 inhabitants)	5.1	2007	7.5	2007
Number of Internet users (million)	1.48	2005	6.7	2005
Number of broadband users (million)	1.46	2006	6.6	2006
Percentage of individuals using the Internet for interacting with public authorities	54	2005	35	2005

Source: OECD, Eurostat, Health for All Database, WHO, Health Ministries of Portugal and Spain, Nielsen and International Telecommunications Union (for Internet statistics).

HEALTHCARE IN PORTUGAL

Healthcare in Portugal aims to be free and universal, and is centred on a tax-based National Health Service (NHS). However, private financing plays a significant role. The Portuguese Constitution takes care to define the NHS as “universal, comprehensive and approximately free of charge”. The Health Ministry is currently being restructured as part of a general reform of the civil service system in the country. This is a serious issue. Total health expenditure, at 9.9 percent of GDP, is above the European Union (EU) average and 1.4 points higher than neighbouring Spain.

Distribution of Roles and Responsibilities

The Portuguese health care system is composed of an overlapping network of public and private providers. These are the tax-funded central National Health Service, private voluntary health insurance (VHI) as well as occupation-based insurance plans for certain professions. Each of the entities has its own reporting channel to the Ministry of Health which exerts regulatory oversight. There are some responsibilities which have been delegated by the Ministry to regional and local bodies.

Most Portuguese can choose between the NHS and VHI, or use both.

Primary Healthcare

Primary healthcare in Portugal is delivered by a mix of public primary care centres (PCCs) incorporated into the NHS as well as others run by private health service providers on both a profit and non-profit basis. There are a total of 350 PCCs, in addition to 1,800 smaller entities known as health posts or primary care units. There are significant differences in the size and structure of PCCs, varying from state-of-the-art, purpose-built units to small facilities in rural areas, established by the Church in disused hospitals and monasteries.

Population coverage per PCC averages 28,000, but ranges from less than 5,000 to over 100,000. Together, they employ about 7,500 physicians (mainly GPs) as well as 6,000 nurses.

Outpatient contacts in Portugal, at 3.8 versus an EU average of 6.8, indicates a relatively high and inefficient use of hospital care.

Hospitals and Beds

Sharp Fall in Hospital Numbers

Like other EU countries, Portugal has witnessed a significant decrease in the number of hospitals, from 640 in 1970 to 170 in 2005. Of the latter, 89 were public and 82 private. Almost half the private-sector hospitals are for-profit institutions. Nevertheless, public hospitals have seen steady improvement in their facilities and infrastructure.

In early 2007, the government also published recommendations on the licensing of private health care providers, in order to facilitate their growth.

Trends in Bed Numbers

In 2005, Portugal had approximately 22,000 acute care beds, and another 1,850 psychiatric and long-term care beds. Portugal's bed density is in line with EU averages, although it is higher than its counterparts with similar NHS models like neighbouring Spain and the United Kingdom. More importantly, as part of ongoing reforms, the Portuguese NHS targets an increase of long-term beds to approximately 13,500 by the year 2015.

One important trend is a sharp fall in the number of dedicated psychiatric beds

in public hospitals, and the transfer of some psychiatric care services to general hospitals.

Healthcare Financing and Reimbursement

Both public and private bodies are involved in financing and reimbursement in Portugal. There are a variety of systems, ranging from historical budgets to prospective payments, whose role has increased sharply since 2003 after the transformation of many NHS hospitals into (state-owned) corporate entities.

Patient co-payments constitute a significant portion of financing, estimated at about 25 percent of all spending on healthcare.

Co-payments range from a fixed amount for certain NHS services to a fixed proportion of the cost of a medicine.

Healthcare staffing

There has been a steady increase in the number of practising doctors in Portugal since 1970 (0.95 per 1,000) to 2.8 in 1990 and 3.5 in 2007. This is higher than the EU average.

In response, the government has sought

	2000	2001	2002	2003	2004	2005	2006
Acute care	3.2	3.2	3.1	3.1	3.0	3.0	2.9
Psychiatric care	0.7	0.7	0.6	0.6	0.6	0.6	0.6
Chronic care	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	4.0	4.0	3.8	3.8	3.7	3.7	3.6

HOSPITAL BEDS PER 1,000 INHABITANTS IN THE YEARS 2000-2006

Source: Based on data from Ministry of Health, Portugal

RIS/PACS Increases Workflow and Streamlines Patient Care



Quirón Group in Spain Moves to Paperless Environment, Reduces Administration Time and Number of Repeat Exams

Objective

The Quirón Group of Hospitals needed to set up a digital radiology department in the newly-constructed centre in Madrid to give medical staff immediate access to historical and current patient records, images and reports, follow the development of injuries and make a better diagnosis. To meet the objective a RIS/PACS (Radiology Information System/Picture Archiving and Communication System) solution was implemented to integrate with the other information systems across the Quirón Group.

Profile

The Quirón Group of private hospitals consists of five general hospitals located in Barcelona, Madrid, San Sebastián, Valencia and Saragossa. In 2009, two further centres will be opened in Bilbao and Málaga. A day hospital in Saragossa also forms part of the Quirón Group together with an assisted reproduction centre in Bilbao. Overall the Group employs over 2,000 staff and 1,500 associated doctors.

The Quirón hospital in Madrid was built in 2006 and is the largest private centre in Madrid. Thanks to an investment of €24 million, the centre boasts cutting-edge equipment and progressive techniques for diagnosis and treatment. The Quirón hospital in Madrid specialises in 35 different surgical and medical practices, specifically radiology, handling over 100,000 studies a year.

'We are using Carestream Health solutions in more than 80% of our projects, which is a huge advantage for our radiology team and for the clinics of the hospital'

Dr. Vicente Martínez de Vega, head of the Image Diagnostics Unit, Quirón Hospital Madrid

Challenges

The Quirón Group needed to increase workflow and streamline patient care.

The Carestream Health RIS/PACS system enabled online access to historical and current patient records, images and reports relating to patient exams. Furthermore, the RIS/PACS integration reduced administrative time spent on producing reports and minimised errors.

The Quirón Group also needed to reduce the number of repeat exams. The high-quality digital radiological exams and better storage management capabilities enabled by the Carestream Health solution led to a huge reduction in repeat exams.

Another significant challenge was the hospital's need to make the administrative process, such as booking appointments and medical examination procedures paperless. This was overcome by integration with the Hospital Information System (HIS), from a local provider, which serves all the hospitals within the group and enhanced capabilities for diagnostic reporting, such as voice recognition software.





'Working with Carestream Health RIS/PACS solutions means that the work carried is of an excellent quality. Thanks to Carestream Health we have managed to reduce diagnostic errors and avoid doing unnecessary or repeat exams'

Dr. Vicente Martínez de Vega, head of the Diagnostic Imaging Department, Quirón Hospital Madrid

Benefits to the Quirón Group of Hospitals

The Quirón Hospital in Madrid benefits from:

- **A reduction in the number of diagnostic errors and increased reliability**, therefore avoiding unnecessary exams being carried out or repeated
- **Better collaboration** between clinical staff and the Image Diagnostics Department
- Improved **quality and efficiency** in the exams carried out on patients
- **Reduction of time that each patient spends at the hospital** thanks to the immediate access to images and reports
- The **automation** of workflows in the Image Diagnosis Department, results in improvements in efficacy and efficiency
- Increased diagnostic **reliability** by making available to the Radiologist special tools for displaying images and for advanced postprocessing, as well as information associated with the Patient's Clinical History
- Immediate and secure **access** to the results of the radiological investigation (images and diagnostic report) by the specialist referring clinician and/or simultaneously, access by any other authorised clinician
- **Elimination** of the **chemicals** (developer and fixer) which are used in a non-digitised environment for developing X-ray plates, reducing environmental impact
- **Reduction of the dose** administered to the patient as a result of minimising the need to repeat investigations on account of under- or over-exposure
- **Reduction in administrative processes** for the preparation of diagnostic reports, since the equipment incorporates, for example, voice recognition systems that streamline procedures
- **Integration** of the PACS system with other manufacturers' equipment, enabling the Quirón Group to work with a range of modalities supplied by different equipment providers

Collaboration between Carestream Health and the Quirón Group of Hospitals

The implementation of Carestream Health solutions began in March 2007 at the Quirón hospital in Madrid, culminating with the Saragossa site in November 2008. The project has been similar across the four hospitals in the Quirón Group. The number of annual radiology studies carried out at each centre are: Madrid (100,000), Valencia (over 90,000), Saragossa (70,000) and San Sebastián (20,000). **Total: approximately 280,000.**



The team in charge of the implementation consisted of professionals from the Quirón Group of Hospitals and Carestream Health. Following integration, Carestream Health offered remote services for problem solving and proactive remote monitoring in order to anticipate possible incidents, as well as training.

'By using our solutions, we are helping Quirón Hospital Madrid become one of the best private hospitals in Spain. We are therefore contributing to the achievement of their main business objectives'

Santos Lopez, sales director of Carestream Health for Spain and Portugal

	2000	2001	2002	2003	2004	2005	2006
Health spending as share of GDP in %	8.8	8.8	9.0	9.7	10.0	10.2	9.9
Health expenditures per inhabitant in USD (PPP)	1,509	1,568	1,657	1,823	1,912	2,098	2,150

HEALTH SPENDING IN PORTUGAL: THE NUMBERS - Source: OECD, 2009

to control intakes by medical schools. However, critics have concerns about a potential deficit in the number of physicians over the next 5–10 years. In addition, this is exacerbated by an uneven density in physician distribution across the country and a shortfall in availability in some regions.

In spite of a similar pace of long-term growth in the number of certified nurses (rising from less than 1 per 1,000 in 1970 to 2.24 in 1980), nurse densities in Portugal (at 5.1 per 1,000) remain among Europe’s lowest. Still, recent years have witnessed an acceleration in the intake of nurses (as compared to physicians). This is being accompanied by an expansion in their roles and responsibilities. At present, over 70 percent of Portuguese nurses still work in central and district hospitals, while only 25 percent work in primary care services (the balance are in psychiatric services).

Physician Payment

NHS physicians in Portugal are paid on a salaried basis. Certain hospitals have introduced performance-related pay and other incentive mechanisms including activity-related payments.

Private practices of physicians are paid for on a fee-for-service basis. The bulk of these, however, are covered by explicit agreements with the NHS.

Hospital Stay Down, Patient Throughput Up

According to Ministry of Health figures, the average length of stay in Portuguese hospitals was 6.8 days in 2007, with a steady decrease since 2004.

The average occupancy rate in 2006 was 75 percent. In spite of a similar decrease

over the 2004-2006 period in terms of occupancy, patient throughputs saw a small rise (2 percent), while emergency admissions and surgical procedures grew by over 5% each. Day care sessions saw the most dramatic increase, by almost 12.5 percent.

Outlook for the future

Slowly but surely, the Portuguese healthcare system is moving to attain EU levels of median performance. Much of the strategic vision behind this process is defined in the ongoing National Health Plan for the period 2004–2010.

Although the pace of implementation of the plan has been slower than anticipated, its overarching objectives – to get higher efficiency in healthcare delivery and contain costs – remain anchored in a general political consensus.

HEALTHCARE IN SPAIN

AUTHOR

Tosh Sheshabalaya,
HIT

Spain’s General Health Care Act of 1986 constitutes the foundations of the Spanish healthcare system. It provides universal coverage, free access to healthcare, and is principally funded through taxation. It also has a regional organizational structure. A guaranteed healthcare benefits package is stipulated by the Cohesion and Quality Act of 2003.

The shape of Spain’s current healthcare system has its roots in the country’s transition to democracy in the late 1970s, after a prolonged period of dictatorship. This led to several changes in its political structure, which directly impacted on the healthcare system. One of the key issues has been decentralisation.

Since the 1986 General Health Care Act, the process of reform to the Spanish healthcare system has been phased, with a fo-

cus through the rest of the decade on rationalization of the system and cost-containment, and in the 1990s, on management and governance, coordination and convergence with the EU, as well as the introduction of some market-oriented elements such as competition. Since 2000, there has been considerable emphasis on clinical management and evidence-based policy making, as well as improving coordination between central and regional levels.

As a result, the role of healthcare technology has become increasingly central in Spain.

Distribution of Roles and Responsibilities

The federal Spanish government in Madrid shares power with 17 highly autonomous regions (Comunidades Autónomas), each with its own regional govern-

ment and legislature.

The federal government, through the Ministry of Health and Consumer Affairs, is responsible for strategic coordination and cooperation in the health sector. Its mandate covers basic health legislation, the financing and guaranteed benefits under a National Health Service scheme, pharmaceutical policy, as well as medical education and international cooperation. The Comunidades Autónomas organise their own health services in their regions.

An NHS Interterritorial Council (known by its Spanish language acronym CISNS), promotes homogeneity in the system. It is composed of representatives of both the federal Ministry of Health and Consumer Affairs as well as the Comunidades Autónomas.

Real-world health policy power in Spain lies at the regional level. Each of the Comunidades Autónomas has a so-called Health Map, which breaks up the region into areas and basic health zones. Health areas have between 200,000 and 250,000 residents, and are responsible for both the management of facilities and the delivery of health services within their limits. Basic health zones form the bottom rung of the Spanish healthcare system, and generally consist of a single Primary Care Team.

Primary Healthcare

A key element of Spanish healthcare delivery is the primary healthcare (PHC) sector, which has undergone a major process of capacity building and reform since the mid-1980s. The system consists of about 3,000 PHC centres and multidisciplinary teams, providing both personal and public health services.

The bulk of preventive medicine is integrated within the PHC system and undertaken by GPs and practice nurses within their normal workload.

Specialized care is provided by hospitals, with the GP functioning as a gatekeeper.

Hospitals and Regions

In 2004, there were about 780 hospitals in Spain, with 320 (or a little over 40 per cent) were part of the NHS. However, the NHS hospitals account for two-thirds of all beds, and are generally far larger than private hospitals.

There are major differences in hospital density between one region and another. Catalonia had the largest number of hospitals with 185 in 2004, corresponding to about five times the national average. Nearly 80% of these were private, again significantly above average. On a per capita basis, Madrid, too, stands out with a total of 70 hospitals.

“Real-world health policy power in Spain lies at the regional level.”

Bed distribution trends

In terms of beds per capita, Catalonia leads other regions, while Aragon, Castilla-La Mancha and Andalucía have the lowest. Regional differences in per capita bed availability are however lower. This is principally because higher densities of smaller private hospitals (as in Catalonia) are compensated by larger public hospitals in other regions. Catalonia indeed has the lowest density of public hospital beds (1.9 in 2003), while Aragon had the highest (3.6).

Since 1980, there has been a steady drop in the number of hospital beds in Spain, as

well as a significant change in the ratio of acute care versus other beds, principally due to mental health reforms, that have moved care to an outpatient setting.

The below figures, however, conceal one significant development. After a steady decline through the 1980s and 1990s, acute care bed numbers rose in 2000, from 28.4 per 10,000, to over 30. This was not the case in other categories

Lack of Homogeneity Between PHC and Hospitals

The current two-tier healthcare delivery system (PHC/hospital) is accompanied by a significant level of systemic problems, principally in terms of coordination between hospitals and PHC centres, duplication of clinical records and diagnoses, delays in treatment, and waiting times. A 1:4 ratio of staff between PHCs and hospitals indicates an emphasis on specialized care and a corresponding overload on PHCs.

One specific complaint due to this lack of homogeneity is a high number of emergency hospital admissions.

Healthcare Financing and Reimbursement

The transition to a National Health System in the mid-1980s in Spain also in-

	2000	2001	2002	2003	2004	2005	2006	2007
Health spending as share of GDP in %	7.2	7.2	7.3	8.1	8.2	8.3	8.4	8.5
Health expenditures per inhabitant in USD (PPP)	1,536	1,636	1,745	2,017	2,126	2,267	2,466	2,671

HEALTH SPENDING IN SPAIN: THE NUMBERS

Source: OECD, 2009

	1980	2000	2001	2002	2003	2004	2005	2006
Acute Care	3.98	2.8	2.8	2.7	2.6	2.6	2.5	2.5
Psychiatric care	0.11	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Chronic care	0.23	0.4	0.3	0.3	0.3	0.3	0.3	0.3
TOTAL	5.2	3.7	3.6	3.5	3.4	3.4	3.3	3.3

HOSPITAL BEDS PER 1,000 INHABITANTS IN THE YEARS 1980, 2000-2006

Source: Ministry of Health, Spain, and OECD, 2010

country focus

CATEGORY	SUB CATEGORY	SHARE %
Outpatient care		36.4
Inpatient care		29.3
	Curative and rehabilitative care	27.2
	Long-term and nursing	2.1
Home care		0.4
Medical goods		
	Drugs	22.2
	Devices	3.7
Preventive care		1.4
Health administration		2.3
TOTAL		100

HEALTH SPENDING BY CATEGORY OF SERVICE

Source: OECD, 2005. (Percentages may not add up due to rounding errors.)

volved a major overhaul of healthcare financing, which transformed a former social health insurance (SHI) system into one financed by federal and regional taxes with near-universal coverage; the only exception consists of civil servants who are free to choose between NHS coverage or full private insurance.

A new financing model, adopted in 2001, seeks to guarantee both continuity and financial sustainability. One of its key elements is an effort to contain pharmaceutical costs, which had been rising at 5-6 percent a year and accounted for a fifth of healthcare spending.

Previously, hospital expenditure was reimbursed retrospectively. In the early 1990s, Spain introduced prospective financing of targeted activities to enable comparison and differentiation between hospitals. Hospitals in the NHS are now financed by means of a global budget, set against individual spending headings.

In spite of the new model for funding hospitals, health spending leaped up sharply in 2003, and has since continued to grow inexorably.

Private Spending

In Spain, private spending on healthcare accounts for about a quarter of spending.

There are two components: co-payments to both the public and private sector, as well as voluntary health insurance. The latter have a relatively minor role within the Spanish health system, with the exception of civil servants, who can choose between the NHS or publicly-funded mutual funds, which in turn rely on private

firms. There has been some debate about civil servants seeking high-technology interventions at public hospitals.

Private insurance schemes cover about one-tenth of the Spanish population. Since the mid-1990s, reforms have sought to expand their role, especially in the field of occupational health services. In 1999, the government provided a variety of tax sops for employer-purchased private insurance.

“The process of reform in the Spanish healthcare system has been phased. The emphasis in the late 1980s was on rationalisation and cost-containment, and in the 1990s on management and coordination/convergence with the EU, as well as the launch of some market-oriented elements such as competition”.

Healthcare Staffing

According to 2007 statistics from the OECD, Spain had 3.7 physicians per 1,000

inhabitants (in line with the EU average). This is a significant rise from 2.9 in 2002. Nurse densities are low, at 7.5 per 1,000 in 2007, notwithstanding a sharp rise from 2.95 in 1995.

Physician Payment

GPs receive a salary plus a capitation component, which depends, among other factors, on the over-65 year share in the population covered, and amounts to approximately 15% of the total. Private physicians are paid on fee-for-service basis. Specialists working at hospitals and in ambulatory settings are salaried.

Public sector physicians have the status of civil servants and their salary is regulated by the national government. However, the region can provide certain supplements, and this has led to significant variations the autonomous communities.

Hospital Stay on the Decline

The average length of acute care hospital stay in Spain has decreased steadily in recent years, from 7.1 days in 2000 to 6.6 days in 2006, largely driven by hospital financing reforms (see above).

Outlook for the Future

Despite significant achievements, key challenges which Spain faces in the future include cost-containment, a need to boost staffing and efficiency at the core primary healthcare centre level as well as the political challenge to achieve a reduction in sometimes dramatic regional inequalities.

HEALTHCARE INFORMATION TECHNOLOGY IN IBERIA

AUTHOR

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Portugal

The hub of the healthcare IT system in Portugal is the Administração Central do Sistema de Saúde or ACSS - Central Administration of the Health System. It coordinates, supervises and manages the IT facilities, systems and equipment of the NHS. The ACSS also has responsibility for the definition of policy, regulation and planning of IT systems in the area of health service contracting.

Systems development on a federal level, and coordination with the emerging pan-European IT infrastructure is one of the key priorities of the ACSS, which took over this mandate from another organisation, Instituto de Gestão da Informação Financeira da Saúde or IGIF (Institute for Financial Management and Informatics). The IGIF had previously been tasked with development of the IT systems and infrastructure capable of allowing rational management of economic and financial resources. One of the drivers for this was the need to collect data on an individual patient basis for DRG grouping purposes, as part of reforms to establish a prospective case-mix financing system for hospitals. In 1989, the IGIF began to develop a minimum basic dataset – Folha de Admissão e Alta – which now covers all NHS hospitals. Additional IT applications, for registration and analysis of hospital activities, as well as DRG-based systems to manage hospital admission databases, soon followed.

Other initiatives included the Ministry of Health portal, which includes data on waiting lists and a variety of performance indicators, as well as a system called Alert-er, which has been adopted for emergency admissions by several hospitals.

The current priority as far as healthcare IT in Portugal is concerned is a Patient Identity Card, in accordance with the EU's e-health plans. This has been reinvigorated after previous attempts (in the early 1990s) to launch electronic medical records did not acquire adequate traction – principally due to a lack of standards, fast-evolving technologies and concerns about legal frameworks and protection of privacy.

In Portugal, the key goal of the Patient Identity Card at the moment covers payment and reimbursement by identifying the entity taking financial responsibility for care provided to the card holder, and to identify exemptions from co-payments should they exist.

The card is being issued free of charge to citizens. Despite a slow start, there are now, ironically, a larger number of cards than people, largely due to duplication and a lack of organization. The issuing of new Patient Cards has since been suspended, as the authorities await developments at the EU-level on an Electronic Health Record.

Spain

In spite of a continuing degree of fragmentation, healthcare IT in Spain has seen a dramatic improvement in recent years.

One reason for the lack of national homogeneity in the country's IT infrastructure has been a lack of clarity in law. In 1986, clauses in a General Health Care Act on medical records led to a proliferation of local rules – which were then zealously protected by Spain's fiercely autonomous regions.

These, in turn, led to a heterogeneous mix of clinical information and documentation systems across Spain. Indeed, 16 years after a successor federal law entered into force, only the Basque region had approved a decree to provide a regulatory foundation for the use of medical records.

The successor law referred to above, Legislation (41/2002 Act), set strong foundations for a national healthcare IT strategy. It introduced both basic rules and a minimum level of content which were to subsequently be adhered to and used as a development framework by the regions.

One key element here is a coordination mechanism for medical records and a unique identification code for citizens across the spectrum of care provided by the NHS, and its various points of access and contact. This is expected to provide compatibility for exchange of clinical data across Spain, so that patients can avoid duplicated tests and pro-

cedures at different hospitals.

However, neither the technical standards for the Individual Health Card nor the assignment of codes for specific data have been finalized. Several regions have yet to pass enabling laws in relation to medical records and other clinical documentation.

At the moment, the picture remains mixed. However, healthcare IT experts believe that the 41/2002 Act will at the least prevent further heterogeneity.

So far, successes include Catalonia's OMI-AP (Primary Care Informatics Organization and Management) and Andalusia's TASS/DIRAYA (Health and Social Security Card/Unified Citizen Health Record). These have led to standardisation and simplification of common procedures, from appointments, through tests and prescriptions to the issuing of electronic clinical reports. However, loopholes remain such as permitting bi-directional data flows, not least in emergency care settings.

Also on the positive side, the so-called CMBD information system for hospital admissions is operational.

On the minus side, there is still no common e-prescription facility. It remains impossible to know either the prescribed medication or its value outside a specific region. One of the highest profile failures was the TAIR (Autonomous Device for Prescription Identification) project. Even the CMBD hospital admission system is largely limited to in-patient settings.

The Spanish government, nevertheless, continues in its efforts to harmonise and integrate the country's healthcare IT infrastructure.

In 2003, a Cohesion and Quality Act set budgetary lines for studies of new healthcare IT technologies.

Since 2006, a National Quality Plan for the NHS has sought overall improvement of the country's healthcare IT system, through coordination of existing regional systems. These initiatives, in turn, are being provided with both funding as well as a clear-cut road for the future through the EU's e-health projects and programmes.



AGENDA 2010

March

PERVASIVE COMPUTING TECHNOLOGIES FOR HEALTHCARE 2010

22-25 March 2010
Munich, Germany
www.pervasivehealth.org

April

HEALTH 2.0 EUROPE CONFERENCE

6-7 April 2010
Paris, France
<http://www.health2con.com/paris2010>

IHE CONNECTATHON

12-16 April 2010
Bordeaux, France
www.ihe-europe.net

MED-E-TEL

14-16 April 2010
Luxembourg, Luxembourg
<http://www.medetel.eu>

HEALTH-E-CHILD FINAL CONFERENCE

23-24 April 2010
Sestri Levante, Italy
www.health-e-child.org

May

HEALTH INFORMATICS MEETS EHEALTH - FROM SCIENCE TO APPLICATION AND BACK

6-7 May 2010
Vienna, Austria
www.ehealth2010.at

HIT PARIS 2010

18-21 May 2010
Paris, France
<http://www.health-it.fr>

WORD HEALTH CARE CONGRESS

19-20 May 2010
Brussels, Belgium
www.worldcongress.com

WORLD CONGRESS ON INFORMATION TECHNOLOGY 2010

26-28 May 2010
Amsterdam, The Netherlands
www.wcit2010.com

June

HTAI 2010 - MAXIMISING THE VALUE OF HTA

6-9 June 2010
Dublin, Ireland
www.htai2010.org

EUROPEAN CONNECTED HEALTH WEEK 2010

14 - 18 June 2010
Belfast, Northern Ireland
www.echcampus.com

July

ADIS INTERNATIONAL CONFERENCE E-HEALTH 2010

29 - 31 July 2010
Freiburg, Germany
www.ehealth-conf.org

September

EUROPE HEALTH IT LEADERSHIP SUMMIT

29 September-1 October 2010
Rome, Italy
<http://hitleadershipsummit.eu>



ISSUE 2, 2010

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Health 2.0 and Med 2.0

➤ FEATURES:

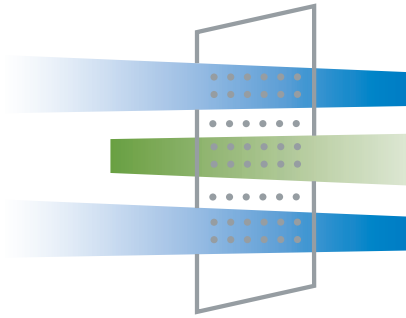
E-Health: Reality Checks
Investing In Hospitals For The Future - HIT Contexts
Patient Participation In Healthcare IT
Health Technology Assessment
E-Health And Africa

➤ MANAGEMENT:

Hospital Managers And Healthcare IT Managers
Healthcare IT And Continuing Medical Education

➤ COUNTRY FOCUS:

Austria / Switzerland



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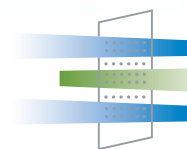
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