

# HEALTHCARE IT MANAGEMENT

ISSN: 1782-8406

THE OFFICIAL JOURNAL OF THE EUROPEAN ASSOCIATION OF HEALTHCARE IT MANAGERS



**The Ethics of Online Healthcare**

**Data Centre Trends  
in the Healthcare Sector**

**Intelligent Infrastructure**

**Country Focus:  
Switzerland**





# REWARDING EXCELLENCE & INNOVATION

## ► GLOBAL HEALTHCARE IT AND MEDICAL TECHNOLOGY COMPETITION

### Competitive presentations include:

- **The European Project RENEWING HEALTH** by Claudio Saccavini; Arsenal.IT, Italy
- **eyeSmart EMR - Intelligent IT Solution for Eyecare** by Anthony Vipin Das; LV Prasad Eye Institute, India
- **Successful Development and Implementation of a Primary Healthcare Information System**  
by Rosemary Foster; Medical Research Council and Western Cape Provincial Government, South Africa
- **Benefits of Free Software in Public Health** by Luis Falcon; GNU SOLIDARIO, Spain
- **The MyHCL Project (Lyons public hospitals, France)** by Cecile Dolla; Hospices Civils de Lyon and Microsoft, France
- **PROJECT FEMI DigitalHealth** by Julio Leivas; FEMI Salud Digital, Uruguay
- **A New System for Continual Defensive Monitoring and Rapid Response**  
by Jeffrey Charles Bauer; Nihon Kohden, USA
- **Schizophrenia prediction: ITAREPS system** by Jan Hrdlicka; Czech Technical University and Charles University, Czech Republic
- **Mobility system to guarantee clinical safety and optimize bedside processes, saving costs**  
by José Manuel Alcaraz Muñoz; Murcia Health Services and Steria, Spain
- **Clinician Developed EMR for Rheumatology** by Shashi Gogia; Amla Mediquip and Indian Spinal Injuries Centre, India
- **Sisopacs, 3D project for Picture Archiving and Communication Systems** by Nejat Unsal;  
SISOFT HEALTHCARE INFORMATION SYSTEMS, Turkey

Full list available online.



**WINNING PROJECT  
GETS PRIZES  
WORTH € 50,000**



**18 – 19  
JANUARY 2012  
THÉÂTRE DU VAUDEVILLE  
BRUSSELS**



**[www.itandnetworking.org](http://www.itandnetworking.org)**

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



## WHAT CAN HEALTHCARE LEARN FROM THE FINANCIAL CRISIS?

Dear Reader,

Today, the financial crisis has once again hit us very hard. Greed still plays havoc with the international stock markets. As banks have grown too big to fail, in 2008 our politicians decided to bail them out with our tax money. Many of us lost savings due to the irresponsible actions of the banking sector without any consequences for the offenders.

The following two years the bankers paid themselves hefty bonuses and today, some banks are once again bankrupt. More public money will flow into their coffers in order to avoid another crisis, to the detriment of other important investments. Once again, our healthcare budgets will have to suffer, despite that investments in the healthcare sector trigger major advancements to the benefit of our society.

### What lessons can be learnt for healthcare (IT)?

Firstly, even when we are told that there is not enough money, at the edge of a disaster it is only a question of government priorities where to spend it. Our banks know this too well. Secondly, even a state on the edge of bankruptcy itself will always find (or better redirect) resources i.e. the taxpayer's money in order to avoid a possible exodus.

This understanding supports my belief that it is up to us in the healthcare industry (and IT) to create enough public pressure in order to receive the public support we deserve for our hard work. We have a particular advantage, as healthcare is such an important issue in our society that no state wants to give up control. Our industry is one of the most important factors in our economies.

So far there is no need to gather in front of parliaments to give healthcare the priority it deserves. But all stakeholders are challenged more than ever before to collaborate closely and to put enough pressure on our governments to make our issues heard. As we must learn from the banks – there is sufficient supply of public money if governments have no other choice!

This should, on the other hand, encourage us even more to prove that properly managed healthcare IT improves cost efficiency, safety and patient outcomes. Several excellent examples will be presented during the *IT @ Networking Awards 2012 (IT@2012)*, held in Brussels from 18 – 19 January.

In this issue of Healthcare IT Management we are covering the impact of Social Media in healthcare. During the Doctors 2.0 Conference it was amazing to learn how such modern and often simple tools can increase efficiency and output.

Furthermore, we have a look into Data Centre Trends in the Healthcare Sector, highlight Intelligent Infrastructure: Lean, Smart and Green and discuss The Ethics of On-line Healthcare. This issue we introduce the FEMI Digital Health Project and explain how Voting in CAD for Mammography can work. Our country focus presents the healthcare system in Switzerland. In this context it is a big pleasure to draw your attention to the HIMSS CIO Summit, held from 20 – 22 November in Geneva.

Our *IT@2012*, organised again in collaboration with the European Association of Hospital Managers, is the world's only event promoting "competing science". I am sure that this is the reality we will have to face sooner rather than later.

*IT@2012* will present some of the finest medical technology and healthcare IT solutions in the market and our panel of expert judges will – together with the audience - have the final say in what they believe is valuable for their institutions.

Each presenter must adhere to our strict presentation criteria (see page 12 for more details). Therefore you can expect an open discussion of successes and pitfalls in implementation and operation. The result will be unprecedented cross-departmental learning. All relevant information can be found at [www.ITandNetworking.org](http://www.ITandNetworking.org) and we will provide in-depth information about the different projects.

Finally, enjoy reading this latest issue of Healthcare IT Management. For comments, suggestions and criticism, please contact me at any time.

Best regards,

your CM (Christian Marolt)  
Secretary General and Editor-in-Chief

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

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**References**

References are available upon request to: editor@hitm.eu.

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**THE ETHICS OF ONLINE HEALTHCARE**

For many people, e-health services and telemedicine provide convenient and flexible ways to manage their healthcare. However, a major enquiry by the UK-based independent Nuffield Council on Bioethics has identified a number of ethical questions and challenges associated with various forms of online healthcare.

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**DATA CENTRE TRENDS IN THE HEALTHCARE SECTOR**

The healthcare facility data centre is no longer a mere supporting element but has become the very core of the operations of the healthcare sector. An effort needs to be made to get the IT shed out of the basement and give it the status and reliability it needs.

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**FEMI DIGITAL HEALTH PROJECT**

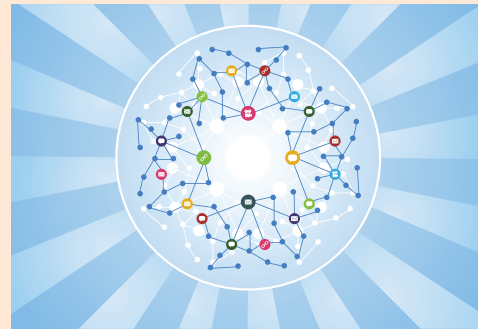
Significant changes in the Uruguayan healthcare system called for new management methods and clinical and epidemiological information of its population. The FEMI digital health project's main vehicle to achieve improvements in the global care and management process is the implementation of Electronic Clinical Records in its institutions.





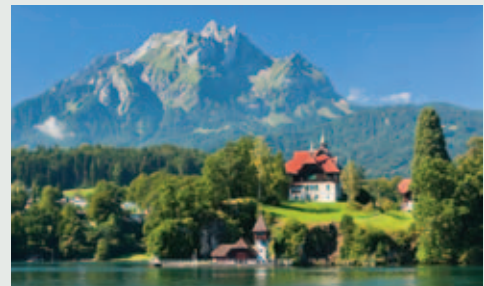
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**SOCIAL MEDIA**

This issue's cover story focuses on social media and healthcare. Already indispensable to today's younger generation, social media is emerging as a key player in the healthcare sector. Doctors are tweeting during conferences and some even during surgeries while many hospitals are taking advantage of this new technology for marketing purposes.



Pages 43 – 47  
**COUNTRY FOCUS: SWITZERLAND**

Switzerland is a federal republic consisting of 26 cantons and the healthcare system is organised at the canton level. Building an e-health framework for Switzerland is thus confronted to similar challenges as building e-health for Europe: Heterogeneity, education and culture with several languages, numerous legal frameworks and political organisations, different cultures and understandings.



# 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, and
- To promote the efficient, cost effective use of IT.

For more on HITM and information about membership, please contact: [office@hitm.eu](mailto:office@hitm.eu)

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### AUSTRIA

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The Austrian Society for Biomedical Engineering (AK-MI)

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Slovenian Medical Informatics Association (SIMIA)

### TURKEY

Turkish Medical Informatics Association

### UKRAINE

The Ukrainian Association for Computer Medicine

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

## UK

### COMMON CLINICAL LANGUAGE FOR NHS

Better patient safety through electronic communication between clinicians has been secured by the adoption of a common clinical language across all healthcare settings and organisations. Nurses, doctors, physiotherapists are now using SNOMED Clinical Terms (CT), the most comprehensive, multilingual clinical healthcare terminology in the world, meaning that information is exchanged accurately and safely across England.

The Information Standards Board for Health and Social Care, has approved this as a fundamental standard and notified all NHS organisations, independent providers and information system suppliers of the need to use SNOMED CT when providing care.

SNOMED CT is available in more than fifty countries including the US, Canada, Australia, Spain, Sweden and the Netherlands. It is already widely used in the UK for the exchange of clinical information, including the Choose and Book service for hospital appointments and for patients' Summary Care Records.

In England, using this common language will enable nurses and doctors working in Primary, Secondary, Community, Mental Health and Social care to all contribute to healthcare shared records.

Health Minister, Simon Burns said: "A common clinical language means nurses and doctors in all care settings can deliver a more effective and safer healthcare system. The adoption of SNOMED CT is an important milestone and will mean clearer and consistent communication between hospitals and GPs. Having a standard language also helps patients better understand their care records."

The UK is a world-leader in the development and use of healthcare terminologies and the use of coded clinical data has significantly increased over the last ten years. All GP records are recorded using terminologies, and there are estimated to be in excess of six billion items of coded data in GP records alone. A comprehensive terminology makes possible clear and consistent communication of clinical information, and improves record keeping, record sharing and speed of entry of information.

Jan Eric-Slot, Chief Executive of the International Health Terminology Standards Development Organisation who owns and manages the SNOMED CT terminology on behalf of 15 member countries, including the UK mentioned: "This is excellent news that one of our leading members has made this important commitment to use SNOMED CT in all healthcare settings. SNOMED CT contributes to the improvement of patient care, enabling systems to accurately record healthcare encounters, deliver decision support and exchange information effectively between healthcare providers. We look forward to supporting them in this important endeavour."

## THE BALKANS

### THE BALKANS TELEMEDICINE PROGRAMME RECEIVES 21ST CENTURY ACHIEVEMENT AWARD BY COMPUTERWORLD

The Balkans Telemedicine Programme, developed by the not-for-profit organisation International Virtual e-Hospital (IVeH) Foundation ([www.iveh.org](http://www.iveh.org)), received the 21st Century Achievement Award in the Health Category by Computerworld in June 2011 in Washington DC. This award was presented to IVeH for developing and implementing telemedicine in the Balkans and other countries.

Dr. Rifat Latifi, president, accepted this award on behalf of IVeH. The IVeH began this development in Kosova and Albania and is now spreading throughout the region. IVeH's Initiate-, Build-, Operate- and Transfer- strategy serves as a model for telemedicine in developing countries. The Health Category recognises organisations for their innovative use of information technology to conduct research; develop new diagnostic or treatment methods and services; improve the safety and quality of patient care; or improve access to, or the affordability of, healthcare.

For more information on the Computerworld Awards, please visit: [www.eiseverywhere.com/ehome/CWHON-ORS2011/21121/](http://www.eiseverywhere.com/ehome/CWHON-ORS2011/21121/).

## DENMARK

### INTERNET MEDICAL HANDBOOK LAUNCHED FOR PATIENTS

The Danish online Patients' Handbook went live on September 6th 2011. It is a free online patient handbook on health and diseases. As the new handbook gives citizens direct access to the same information that doctors use, it is hoped that this will lead to a more open and transparent healthcare. The Patients' Handbook has more than 3,000 articles, written by more than 50 specialists and practicing doctors, and divided into disease articles, symptoms articles and studies. It is illustrated with over 2,000 medical drawings, x-ray images, animations and photographs, and is free of advertising and commercial interests. The handbook has been produced by a collaboration of Danish Regions, the official Danish eHealth portal [sundhed.dk](http://sundhed.dk) and the Danish Medical Association. This is the first time that the public health system has launched an online handbook of this kind.

The Patient's Handbook covers the same information as the Doctor's Handbook which was previously produced as a reference for practicing doctors. The one key difference is that the articles in the Patients' Handbook have been adapted for ordinary citizens. The handbook also includes a dictionary providing definitions of medical terms in everyday Danish.

# GLOBAL HEALTHCARE TECHNOLOGY CONGRESS

## 18 - 19 JANUARY

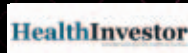
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**Dr Thanga Prabhu**  
Clinical Director

*IT @ Networking Awards 2012*, is a global healthcare IT and medical technology competition, recognising and promoting outstanding healthcare IT and medical technology projects.

### COMPETING SCIENCE

Today, shrinking funds require us to deliver more for less. We experience this reality in all aspects of life, even in science. Hospital departments, healthcare institutions and regions have to create professional business cases to receive sufficient funding to realise their projects.

The *IT @ Networking Awards 2012 (IT @ 2012)*, recognises this new reality: excellent projects are competing against each other in order to win. The Expert Panel, attending peers and competitors can cast their vote supporting their favourite implementations.

### HOW IT WORKS

*IT @ 2012* is a fast-paced, interactive event with two presentation rounds:

**Day 1** – MindByte Presentation - each presenter is given 5 minutes to highlight the key advantages of his project and persuade the audience to vote for them. This is followed by a 5 minute Q&A by with the audience who vote based on the presentation/voting criteria. Only the top 8 rated projects will succeed and move into the next presentation round.

**Day 2** – WorkBench Presentation – each presenter is given 25 minutes to provide an



# ARE IT & MEDICAL COMPETITION



## JANUARY 2012 THÉÂTRE DU VAUDEVILLE BRUSSELS

in-depth insight into their project. The aim is that the audience will support the project. Corporate supported projects are allowed to highlight the industry angle in the Work-Bench session.

In a 15 minute Q&A session all questions can be answered, followed by the final vote to cast the winner.

### THE PRESENTATION / VOTING CRITERIA

*IT @ 2012* will highlight installations from all areas in healthcare to support cross-departmental understanding. All presenters are required to follow a strict structure allowing the audience to compare on common grounds:

- ▶ 1. THE IMPORTANCE OF TECHNOLOGY
  - What technology was used and how was it integrated into the workplace?
- ▶ 2. BENEFITS
  - Has the project helped those it was designed to help?
  - Has the project changed how tasks are performed?
  - What new advantages or opportunities does the project provide?
- ▶ 3. ORIGINALITY
  - What makes the solution special?
  - Are there any original features?
  - Is it the first, the only, the best or the most effective application of its kind?
  - Is it an improvement on existing implementations?

- ▶ 4. DIFFICULTY
  - What important obstacles had to be overcome?
  - Were there any technical or organisational problems?
- ▶ 5. SUCCESS
  - Has the project achieved or exceeded its goals?
  - How do you see the project's success affecting other applications, your facility or other organisations?
  - How quickly would the users accept the implications of this innovation?
- ▶ 6. IMPACT
  - What is your overall impression of the project?

### THE VOTING SYSTEM

*IT @ 2012* uses a highly sophisticated voting system with two separated groups of voters: the expert panel and the audience/presenters, each with 50 % impact.

Based on the Bayesian Model the expert panel is setting a trend. To avoid bias, every vote from the audience out of a credible margin will be automatically disqualified.

### WHY IT @ 2012 SO DIFFERENT?

The main difference lies in the element of competition. Presenters from across the world must present their idea to the highest standard, master all questions and persuade the audience and judges that their solution de-

serves to win. By allowing presenters to cross-examine their competitors, the Q&A sessions take on a new dimension.

*IT @ 2012* requires the open disclosure of difficulties during planning and implementation of the solutions and how these issues were solved. This allows the audience to learn from others' mistakes and bring new methods and solutions back to their own institutions.

### WHY ATTEND?

IT and medical technology is of key importance to healthcare. Intelligent IT solutions increase cost-effectiveness, productivity and safety.

*IT @ 2012* will expand your knowledge on different medical technology and IT solutions from all areas in healthcare and supports a cross-departmental understanding like no other event.

### HOW TO REGISTER

To register, please visit:  
<https://www.conftool.net/itawards2012/>

### LOCATION

*IT @ 2012* will take in Brussels, the capital of Europe.

Hotel reservations can be obtained through [www.booking.com](http://www.booking.com).

For more information please visit our website [www.itandnetworking.org](http://www.itandnetworking.org) or contact us on +32/2/2868501 or send an email to [office@hitm.eu](mailto:office@hitm.eu)

**We look forward to seeing you in January!**

## NEWS FROM HITM MEMBERS

### DENMARK

Hansen, Chairman of Danish Regions, said: "The Internet is already widely in use by Danes when conveying information about illness and health. The Regions have a goal to increase Danish knowledge in this field and give citizens the best available knowledge. A good healthcare system is an open and transparent healthcare system in which patients have access to all knowledge that can help them. Therefore, Danish Regions invested in the Patient's Handbook, in which you can find accurate, specialist and up-to-date information, which is approved by doctors who are updating the content regularly."

The Patient's Handbook is one of the Regions' 24 milestones for healthcare information technology (IT). These goals are to be achieved by 2013 through the Regions Healthcare IT Organisation, which is a forum for regional cooperation on healthcare IT.

Mr Hansen said: "With the publication of the Patients' Handbook yet another benchmark has been reached, and we are proud of this. It demonstrates the cooperation that creates healthcare IT which is effective and of high quality. One of the objectives is to make information easily accessible thereby giving citizens a good opportunity to be active patients, so that healthcare resources can be used most effectively."

For more information, please visit: [www.epractice.eu](http://www.epractice.eu)

### SWITZERLAND

#### EVALUATION OF E-HEALTH PILOT PROJECTS UNDERWAY

Managers of the various e-health pilot schemes carried out in Switzerland can now submit their pilots to the eHealth Suisse Secretariat for evaluation. Each project will be assessed on their compliance with the recommendations for the implementation of pilot schemes in line with Swiss e-health strategy.

Recommendations for the implementation of the Swiss e-health strategy have been continuously issued by the eHealth Suisse Steering Committee since March 2009. On 2 September 2011, the same committee published both the concept and the guidance document for the evaluation of pilot schemes, meaning the evaluations can start.

There are two key aims of these assessments: So that compliant pilot schemes can later be integrated into a national e-health infrastructure and to bring transparency to the e-health landscape and enable other projects to benefit from lessons learnt.

Based on their degree of maturity, the evaluated projects can receive one of the following certifications: 'regional', 'interregional' or 'national'. As the components coordinated at national level have not been fixed yet, the highest certification that can be awarded is 'interregional - strategy-compliant'. The evaluation of the pilot schemes

will be financed by eHealth Suisse, provided that the involved canton certifies in writing that it will provide lasting support to the strategic orientation of Swiss e-health. Private projects can also be evaluated, using the same criteria and rules, but at their own expense.

The eHealth Suisse Coordination Body has a mission to ensure that the various e-health projects are compliant with the Swiss e-health strategy, and that there are synergies between the various projects. The eHealth Suisse Steering Committee is the managing entity of the eHealth Suisse Coordination Body and is composed of representatives of the confederation and the cantons as well as of the relevant stakeholders in e-health. It comprises eight members; four representatives of the confederation and four representatives of the cantons. Based on the proposals of the Secretariat or relevant working groups, it makes decisions on the implementation of the strategy, and it is responsible for the achievement of the strategy's goals. For more information on eHealth Suisse please read this issue's country focus (pg. 46).

### SPAIN

#### MADRID HOSPITAL SENDS PATIENTS APPOINTMENT REMINDERS VIA SMS

The Tajo Hospital in Madrid started implementing an SMS reminder system for medical appointments at the start of October 2011.

This new means of communication has been made possible thanks to a new mobile device application developed by the hospital's Admissions Service and IT Department. The new software sends an SMS notifying patients of the date, time and location of a consultation 48 hours before the scheduled appointment.

This will help patients remember their planned appointments with specialists as well as the arrangement of new appointments; patients that are unable to attend a doctor's appointment on a given date and time can then call the appropriate service and cancel, thus allowing the hospital to fill cancelled time slots and provide enhanced service as a result.

The hospital dealt with 137,866 consultations in 2010 as compared to 124,819 in 2009, representing an increase of 10.5 %. The total number of patients that missed scheduled medical consultations was 10,245 and 10,383 in 2009 and 2010, respectively.

The hospital is committed to the take-up of new technologies and the first SMS notifications for October appointments were sent for pediatric services. This process will be rolled out gradually across other departments.

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## INDUSTRY NEWS

### ISOFT LINE-UP ANNOUNCED FOR ISOFT- SPONSORED EPMA EXCELLENCE FORUMS

Steve Freeborn, a renowned pharmacist and contributor to the landmark report on medication errors, "A Spoonful of Sugar - Medicines management in NHS hospitals"; will be among the speakers at iSOFT-sponsored e-prescribing conferences at Wembley on 20 October and Old Trafford on 10 November.

Freeborn's keynote address, "There and back again - a pharmacist's tale", will describe how pharmacy management in the NHS has witnessed many changes over the years, yet advanced relatively little.

In a recent article, Freeborn said traditionally the NHS lacked the drive to make e-prescribing a reality but the current cost cutting is a game-changer, as it risks patient safety.

"The line-up of distinguished speakers from academia and the NHS promises a lively debate and useful exchange of ideas," said Adrian Stevens, managing director of iSOFT's UK and Ireland business, who is hosting the events.

Both ePMA Excellence Forums are free and open to anyone wanting to learn more about the realities of implementing an e-prescribing and medicines administration (ePMA) system.

Other speakers and sessions include:

- Dr Rachel Howard, University of Reading; "People and computers: error producing or defensive?"
- Prof Tim Dornan, University of Maastricht; "Education and the impact on prescribing behaviours."

There are also sessions offering some practical advice on implementing ePMA systems in the NHS:

- Helen Bennett, Stockport NHS Foundation Trust; "Establishing baseline and performance measures."
- Alex Jennings, University Hospital Aintree; "ePMA risks and benefits."
- Steve Wardell and Bala Sridhar, The Christie Hospital NHS Foundation Trust; "Implementing a complex ePMA solution."

For more information, please visit:

[www.isofthealth.com](http://www.isofthealth.com)

### SECTRA GERMAN HOSPITAL INCREASES EFFICIENCY USING SECTRA'S RADIOLOGY IT SOLUTION

St. Marien-Hospital Borken, Germany, which is a member of a hospital network, is digitising its radiology operation and has signed a five-year agreement with the IT and medical-technology company Sectra.

The order includes Sectra PACS for processing and archiving of digital radiology images, which will be integrated into the hospitals' RIS and existing IT infrastructure. St. Marien-Hospital performs 75,000 radiology examinations per year and is part of a network of three hospitals, one of which already uses Sectra PACS.

"We looked for a well-proven, future-proof digital solution," says Sebastian Seyer at St. Marien-Hospital Borken. "Using Sectra's solution, we gain hospital-wide image and information distribution, thereby increasing the effectiveness of our radiology operation significantly."

The use of an integrated RIS/PACS solution at the hospital in Borken will increase the availability of images and patient information within the hospital thereby improving patient care and enhancing workflow.

For more information, please visit: [www.sectra.com](http://www.sectra.com)

### SIEMENS SOFTWARE LAUNCHED FOR VIRTUAL PLANNING OF SURGICAL PROCEDURES

Together with Synthes, the global market leader for bone implants, Siemens Healthcare has developed the software PreOPlan that will allow surgeons to virtually plan routine bone fracture surgeries (trauma surgery) as well as corrections of leg deformities (osteotomy). Using PreOPlan, the surgeon simulates the planned procedure on an x-ray image of the patient. With the aid of an integrated implant database, he can determine which bone implants are, for example, most suited for the correction of a fracture. Subsequently, the software generates a report that helps the operating staff prepare the surgery with the selected implants. Moreover, the surgeon can

use this report to prove his preparations for the procedure and to comprehensively explain the operation to the patient.

Normally, surgeons plan routine surgeries for bone fractures of the extremities "in their heads" while looking at an x-ray image of the fracture, or they hand-draw the planned procedure on the image. This brings several disadvantages: The surgeon can only estimate which implant is best suited to fix the point of fracture. Furthermore, he is not able to accurately document how he has prepared himself for the procedure. Many hospitals, however, demand such verification. In order to allow surgeons to plan their procedures safer and verifiable, Siemens Healthcare and Synthes jointly developed a software that allows simple and quick preparation of routine surgeries on a computer workstation.

The software PreOPlan allows the surgeon to precisely analyse a bone fracture using a digital x-ray image of the patient: The surgeon can segment the fracture on the screen, measure it and then reassemble the fracture point in the anatomically correct position. All suitable implants for the respective anatomical region are suggested automatically by a database with bone implants from Synthes. The surgeon can call up information about the implants (length, inclination, size, or material) directly on the x-ray image. Once the surgeon has decided for an implant, PreOPlan automatically presents a selection of implants that are required additionally, such as screws for fixing. The surgeon then can make his selection. Overall, the planning of a routine surgery with PreOPlan only takes a few minutes.

Subsequently, the planning documents are summarised in a final report. This contains the planning images that the surgeon can use for orientation during surgery, as well as a material list for the operating staff who have to prepare the procedure. The planning images make it easier for the attending physician to explain the intended surgery to his patient. Moreover, the planning documents facilitate obtaining second opinion from a colleague.

For more information, please visit:

[www.siemens.com/healthcare](http://www.siemens.com/healthcare)

## **PHILIPS** PHILIPS OPENS HOSPITAL RESEARCH AREA TO DEVELOP INNOVATIVE HEALING ENVIRONMENTS

Royal Philips Electronics is stepping up its healthcare research into healing environments by opening a dedicated research facility at its Eindhoven-based Research Laboratories. Based on Philips' in-depth understanding of the hospital patient experience and implemented through the intelligent use of technology, the healing environments concepts aim to accelerate and improve treatment outcomes, while simultaneously reducing the stress and anxiety associated with hospitalisation and hospital-based treatment.

One of the concepts that is being studied uses soothing lighting and calming video images and sounds, and is aimed at reducing the stress levels of patients who are in the preparation room awaiting a PET-CT scan. PET-CT is an imaging technology that is predominantly used to facilitate the diagnosis and staging of cancer and the PET-CT preparation room has been identified as one of the most stressful environments for cancer patients.

"There is an increasing body of evidence to suggest that patient-friendly comforting environments not only reduce anxiety levels but also promote the healing process itself," said Henk van Houten, general manager Philips Research. "The opening of the Hospital Area is a clear expression of our commitment to this important new area of healthcare research, which leverages Philips unique expertise in healthcare, lighting and consumer lifestyle. It is further evidence of Philips' aim to deliver meaningful innovations that improve people's lives."

As people's access to information continues to increase, a new generation of patients is emerging who are knowledgeable about their medical conditions and therapy options, and therefore demand greater choice in where and how they are treated. As a result, hospitals are becoming increasingly people-focused to satisfy those demands. Offering an environment and an experience that helps patients cope with a difficult period in their lives is

one way in which hospitals can achieve that objective.

Philips is a pioneer in the ambient healing environments domain with Ambient Experience, a solution incorporated in medical imaging rooms and emergency departments. Architecture, design and technology (e.g. lighting, sound and projection) have been integrated to create a healthcare space that is designed to reduce the anxiety and increase the comfort of children that are being scanned, while improving the hospital workflow.

Moving further in this new field, Philips will research new healing environment solutions in the Hospital Area, in scenarios as close as possible to those that are encountered in real hospitals. Other projects that are well advanced and that have already moved into the Hospital Area include the prevention of delirium in intensive care units and the adaptive personalisation of patient rooms.

For more information, please visit:  
[www.healthcare.philips.com](http://www.healthcare.philips.com)

## **TUNSTALL** NHS PLYMOUTH INTRODUCES TUNSTALLS TELEHEALTH SOLUTIONS TO SUPPORT PATIENTS WITH LONG TERM CONDITIONS

Telehealth technology can enable patients to live more independently and improve quality of life whilst delivering savings to the NHS.

NHS Plymouth has partnered with Tunstall to implement a telehealth programme that will support the management of long-term conditions (LTCs) for patients in Plymouth.

The telehealth initiative will give patients greater control over their condition, allowing them to monitor it from home with the reassurance that professional support is available if required. This will significantly reduce the hospital admission rate for patients living with LTCs, giving them greater freedom and the opportunity to live more independent lives.

NHS Plymouth's decision to undertake a telehealth programme came about following the need to drive efficiency within its services by tackling the rising costs of treating long-term conditions whilst at the same time improving patients' quality of

life. The programme will initially be available to 100 patients living chronic obstructive pulmonary disease (COPD), and/or chronic heart failure (CHF).

Jane Griffin, Lead Commissioning Manager of Long Term Conditions for NHS Plymouth, said: "We were aware of the possible benefits of telehealth from a number of schemes carried out by other PCTs, and so the decision was made to implement a small-scale programme to see if it could be as beneficial for us and our patients' needs. This is an opportunity for NHS Plymouth to use technological advances for the benefit of our patients. Our aim is to support patients to self care and give them greater independence and we are confident that the telehealth programme will enable this to happen."

For more information, please visit:  
[www.tunstall.co.uk](http://www.tunstall.co.uk)

## **JAC** NORTHERN IRELAND HOSPITALS TO DEPLOY JAC'S ENTERPRISE SOLUTION

Northern Ireland Health and Social Care (HSC) has procured a pan-Northern Ireland Pharmacy Software Solution for the Business Services Organisation (BSO) Information and Technology Service (ITS). The contract has been awarded to JAC Computer Services Limited (JAC), under a Technology Partnership Agreement that BSO has with HP.

The requirement for the pan-Northern Ireland Pharmacy Software Solution will be met by the implementation of the new Enterprise Release Version 5, developed by JAC. This supports multiple sites on a single system, with a common master drug catalogue, supplier file and patient file.

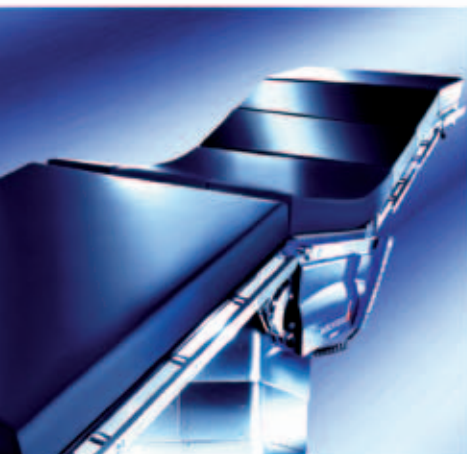
All HSC sites in Northern Ireland will share the same master files and access can be configured to support local requirements. This will provide a single dispensing record for each patient across Northern Ireland and means that a patient's dispensing history can be viewed as they move between sites, supporting continuity of care.

For more information, please visit:  
[www.jac-pharmacy.co.uk](http://www.jac-pharmacy.co.uk)



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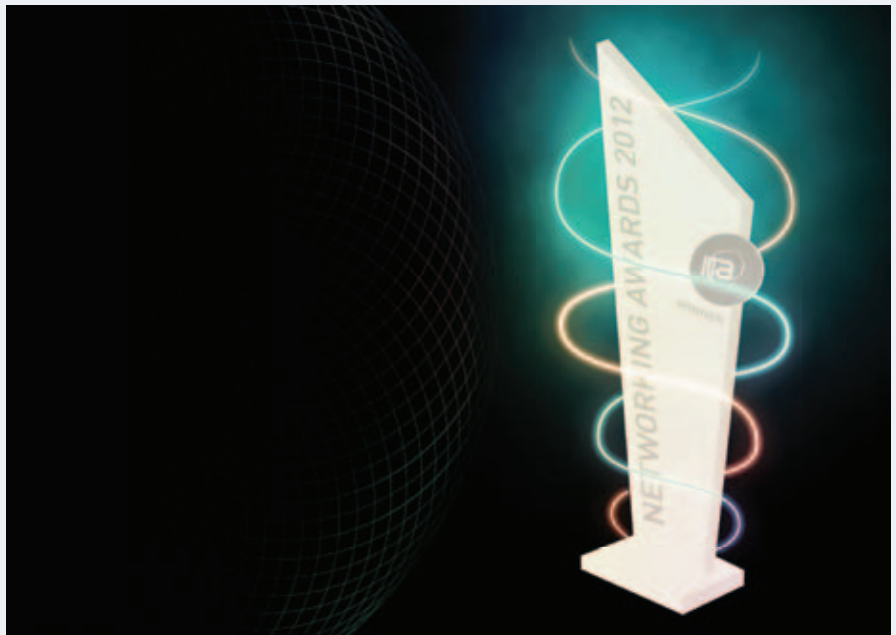
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## UPCOMING EVENTS



### IT @ NETWORKING AWARDS 2012

18-19 JANUARY 2012  
BRUSSELS, BELGIUM

The *IT @ Networking Awards 2012 (IT@2012)* is an open competition for fully implemented, operable healthcare IT solutions. *IT@2012* will identify some of the finest and most innovative departmental, institutional, local, regional and national healthcare solutions. Intelligent medical technology and IT increase cost-effectiveness, productivity and safety. *IT@2012* is designed to help healthcare facilities identify proven medical technology investments.

*IT@2012* is a real competition in which presenters are challenged by expert judges and participants. The element of competition is unique as each presentation is followed by thorough questioning from the voters. CEOs, CIOs, CMIOs, hospital and IT managers will use the electronic voting system to support their preferred projects.

Each presentation must follow the strict presentation criteria to ensure cross-departmental understanding.

#### 1. THE IMPORTANCE OF TECHNOLOGY

- What technology was used and how was it integrated into the workplace?

#### 2. BENEFITS

- Has the project helped those it was designed to help?

- Has the project changed how tasks are performed?
- What new advantages or opportunities does the project provide?

#### 3. ORIGINALITY

- What makes the solution special?
- Are there any original features?
- Is it the first, the only, the best or the most effective application of its kind?
- Is it an improvement on existing implementations?

#### 4. DIFFICULTY

- What important obstacles had to be overcome?
- Were there any technical or organisational problems?

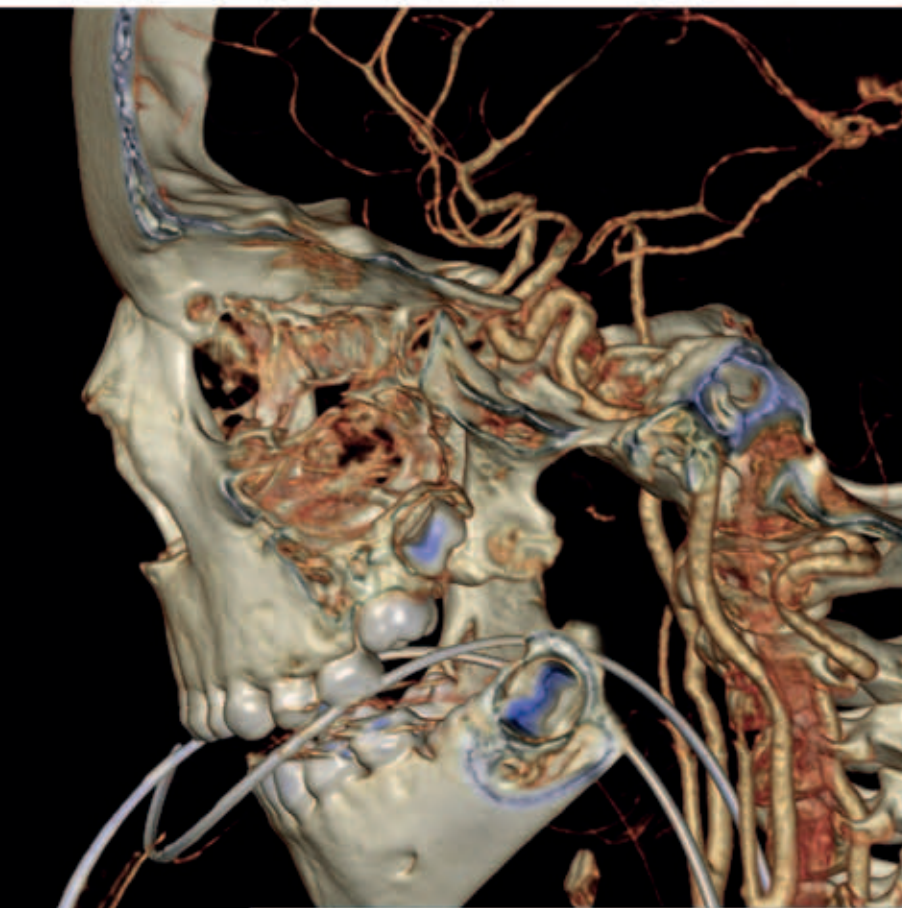
#### 5. SUCCESS

- Has the project achieved or exceeded its goals?
- How do you see the project's success affecting other applications, your facility or other organisations?
- How quickly would the users accept the implications of this innovation?

#### 6. IMPACT

- What is your overall impression of the project?

For more information on the *IT@Networking Awards 2012* please visit:  
[www.itandnetworking.org](http://www.itandnetworking.org)



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## **TELEMEDICINE SHOP TALK TECHNICAL DEMONSTRATIONS FROM AUSTRIA, DENMARK AND SWEDEN**

There is no doubt that telemedicine will play a huge part in healthcare in the future but telemedicine is a complex topic requiring further discussion. For this reason the Telemedicine Shop Talk was organised in October in Brussels.

Telemedicine holds powerful promises for European health systems in need of adjusting to demographic changes and the rise of chronic diseases. However, implementing telemedicine is hard: It requires changing medical care processes, rules and reimbursement systems, and the mind sets of patients, doctors and carers. There are also technical barriers: Complex end-to-end solutions, sensors and devices need to work with other components and legacy systems.

In the Renewing Health project ([www.renewinghealth.eu](http://www.renewinghealth.eu)), healthcare providers in nine regions are implementing

telemedicine solutions in their existing environments. Three of the pilot sites, Carinthia (Austria), Southern Denmark and Norbotten County (Sweden), demonstrated their solutions, reported on their experiences, and shared their lessons. It was an excellent opportunity to learn about the practical realities, potentials, and limitations of telemedicine solutions.

On behalf of the Renewing Health Industry Advisory Board, Continua Health Alliance invited interested parties from industry, public policy, and the stakeholder community to this morning meeting with representatives from Renewing Health pilots for the demonstrations, discussions and networking.

For more information, please visit: [www.renewinghealth.eu](http://www.renewinghealth.eu)

## **E-HEALTH AND EQUITY IN THE GLOBAL HEALTH COMMUNITIES ePRACTICE WORKSHOP**

An initiative of the eHealth Unit, DG INFSO, European Commission, the workshop on 'eHealth and Equity in the Global Health Communities' will take place in Brussels, on December 15, at European Commission premises.

The potential of e-Health to help strengthen health systems and to improve the safety, quality and efficiency of care was recognised by the World Health Assembly in its resolution on e-health in 2005. In addition, e-health should improve health equity as a consequence of the ease of access to information and health services.

The workshop will seek answers to questions such as:

- What types of disparities does this ease of access minimise or exacerbate?
- How are health systems and their governance influenced by e-health solutions, policies and practices?
- What evidence is there to strengthen activities and programmes that support local, regional, national and global health communities?

Organisers are particularly seeking experiences and lessons learnt in low-resource settings including contributors from developing countries.

The workshop will act as a means of dissemination of the key findings to high-level decision-makers; as a promoter of stronger commitment on e-health interoperability and its wider application at global level and as a preparatory forum for selecting issues to present at the forthcoming World Health Assembly.

Prospective topics include:

- Equal access to health related information:
  - The role of the digital divide;
- Interoperability as a means of achieving equity in healthcare;
- E-Health at local, regional, national and global levels as a way to enhance equity in healthcare and services;
- The role of telemedicine and remote care in reducing the healthcare divide on a global scale;
- Using e-health to widen access to information:
  - Does this promote equity in low resource areas?;
- Managing Electronic Health Records for equity in care;
- E-Health systems for care at home: Bypassing age and distance discrimination;
- Legal issues; and
- Cross-border e-health services:
  - Can they enhance equity in care?



## ***INNOVATION TO DIFFUSION TOWARDS SUCCESSFUL DEPLOYMENT OF E-HEALTH APPLICATIONS***

Dr. Karl Stroetmann of empirica GmbH presented initial considerations on the issues and challenges of moving "From Innovation to Diffusion - Towards successful deployment of eHealth applications" at the recent 2nd European Evaluation Methods Concentration Meeting in Brussels, Sept. 08, 2011.

Dr. Stroetmann described how it is not innovations such as the first appearance of a new product or service in the market, but rather that it is scaling up, as in diffusion across various markets, which is the decisive factor in assuring the competitiveness of our economies. He emphasised that such considerations need to be employed for innovation and diffusion in health systems and services as well, where new evaluation and assessment methods are desperately required.

The focus needs to shift towards the information needs of various stakeholders and the benefits and costs involved for decision-makers when introducing new, complex health services facilitated by advanced ICT systems. Dr Stroetmann believes that Health Technology Assessment (HTA) methods have so far fallen short of meeting these complex needs. He argued

that, unless the requirement for more integrated healthcare service processes is better understood and new HTA methods provide the information needed by the decision makers to prove their e-health business models, attempts to advance innovations will fail to provide the urgently needed benefits for our health systems.

Innovation, and diffusion in particular, are also key matters for the attention of the EU-supported Thematic Network eHealth Innovation - Scaling up eHealth facilitated personalised health services. This network, of which empirica is a key partner, develops ideas for and supports the European Innovation Partnership on Active and Healthy Ageing ([http://ec.europa.eu/information\\_society/activities/einclusion/deployment/ahaip/consultation/index\\_en.htm](http://ec.europa.eu/information_society/activities/einclusion/deployment/ahaip/consultation/index_en.htm)). It explores how to achieve in the medium-term more patient/person-centred health services, supported and facilitated by enabling innovative eHealth solutions and services.

For more information, please visit: [www.ehealth-innovation.eu](http://www.ehealth-innovation.eu)

## ***ECANCERHUB A NEW APPROACH TO CANCER COMMUNICATION***

Eurocancercoms has announced the launch of ecancerHub: A new, open-access, integrated approach to providing the whole cancer community - patients, doctors, researchers and policymakers - with high quality and trustworthy information. Integrating the best of social media technology into one unique platform, ecancerHub enables patients, healthcare professionals and researchers to interact, connect and share. They have the opportunity to discuss, debate, generate new ideas, gather opinions and build knowledge not only within their own groups, but also cross-community.

ecancerHub is the product of the Eurocancercoms project, led by the European Institute of Oncology in Milan, which has been looking at issues and bottlenecks surrounding the communication and dissemination of cancer information across Europe, with the aim of establishing a single, efficient network for cancer communication in Europe.

"We are excited and gratified with the response of the partners in the project, who recognised the need for a communication solution for all those involved in cancer across Europe", says Professor Gordon McVie, Managing Editor of *ecancermedicalsecience* and one of the leaders of the project. "We are particularly pleased with the proposed solution,

which we have now launched. ecancerHub fulfils our vision of a 'one-stop-shop' and we strongly urge you to use and help develop it further."

Research conducted as part of the project highlighted the need for a trusted online common platform for healthcare professionals, patients, researchers and policymakers to be able to communicate, network, share and produce knowledge. ecancerHub provides a unique solution to fill this gap.

The cancer community now has a unique way of using social media to the benefit and betterment of oncology at their fingertips.

Professor Richard Sullivan of the European Cancer Research Managers Forum and a leader of the project says "We have this excellent platform and now we want the cancer community to get involved, upload content and make this a buzzing hub of ideas and information."

With the help of the community, ecancerHub beta will develop into a fully functioning and thriving platform.

Visit ecancerHub to join the discussion, search for useful tools and databases, upload and view videos, create and read blog posts and more, [www.ecancerhub.eu](http://www.ecancerhub.eu)

# HEALTHCARE AND SOCIAL MEDIA

## Full Steam Ahead

**AUTHOR**

Interview with **Denise Silber**, founder of the Doctors 2.0 & You Conference

*This issue's cover story focuses on social media and healthcare. Already indispensable to today's younger generation, social media is emerging as a key player in the healthcare sector. Doctors are tweeting during conferences and some even during surgeries while many hospitals are taking advantage of this new technology for marketing purposes. Indeed, social media has become such an integral part of the healthcare sector that there are conferences dedicated to it. One such conference was the Doctors 2.0 & You Conference. Our dossier on the topic includes an introduction to the conference by founder Denise Silber and three short articles from three of the presenters: Lucien Engelen, Tim Ringrose and Yossi Bahagon.*

### What was the idea behind the creation of the Doctors 2.0 & You Conference?

As Web 2.0 and Social Media have gained traction in healthcare in recent years, we've been hearing mostly about the use of the Internet by patients and little about the physician perspective. In creating the Doctors 2.0 TM & You conference, we wanted to explore how doctors and patients are using social media, applications and Web 2.0 tools, to work with peers, governments, industry and payers.

Attendees came from all areas of healthcare and from more than 20 countries on the five continents, although primarily from Europe. We had great feedback and will be returning to Paris in 2012 on May 30-31.

### Can you highlight the trends you discussed?

1. The concept of online physician communities is now well established. More doctors than ever are participating and will continue to participate in online communities. It's a painless way for them to extend their own medical experience and feel more re-assured about certain complex cases or rare conditions.

While physicians may have some concerns about legal responsibility or even the confidentiality of cases in a community context and various regulatory bodies may want to keep their eye on the communities, none of this is hampering the introduction of new kinds of physician communities. Entrepreneurs, often physicians themselves, are developing international communities, new services, new ways to crowd-source, mobile communities. All undoubtedly thanks to social media itself, which is facilitating contact. However, doctors continue to join for the same primary reason: The attraction of peer-to-peer crowd-sourcing.

2. A more emerging trend is the use of social media tools for patients and physicians by hospitals. The number participating in Europe is smaller than in the US but not insignificant and is growing.
3. Another key trend is mobile health (m-health). The adoption of iPads and other mobile devices by physicians, by hospitals, by medical schools and patients. E-Learning, online reference materials, mobile access to patient



data, wireless communicable objects, professional and consumer apps are all growing by leaps and bounds. One of our physician speakers browses through 300 blogs in a few minutes, thanks to RSS feeds he accesses on a table.

4. The main social media platforms such as Facebook (FB) and Twitter have now become healthcare social media. Physician professional associations and regulatory bodies are telling doctors not to "friend" their patients; others consider that FB and Twitter can be acceptable and even attractive vehicles for physician-patient communication, despite the security, confidentiality, responsibility issues they raise. As for Twitter, there are practically round the clock tweet-ups, depending on the hashtag subject and location or language of interest and physicians are tweeting during congresses.
5. We also saw how a single payer-based health system can package a suite of tools and services to impact the entire healthcare process from diagnosis to treatment to online support. This is the case of Clalit in Israel. Unfortunately, while it is a hope for many to do similar things, that hope does not yet make a trend.
6. As for start-ups, the trend is also towards diversification of the delivery platform. Mobile apps are taking a growing share of those businesses. And of course, we saw that new business models in healthcare social media and web 2.0 are still in their early stages but the trend is toward a growing number of start-ups in healthcare.

# E-HEALTH, M-HEALTH AND HEALTHIER SOCIAL MEDIA REFORM

## The Big Scale, Nationwide, View

### AUTHOR

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twitter: @ybahagon

**Clalit Health Services (CHS) is the largest health maintenance organisation in Israel and the second largest worldwide. Through its 14 hospitals and more than 1,300 primary and specialised clinics, CHS provides comprehensive medical care to the majority of Israel's population (above four million members).**

In the upcoming decade, digital platforms will be the backbone of a strategic revolution in the way medical services are provided, affecting both healthcare providers and patients. Digital-based, patient-centered healthcare services allow patients to actively participate in managing their own care, in times of health as well as illness, using personally tailored interactive tools. Such empowerment is expected to increase patients' willingness to adopt actions and lifestyles that promote health as well as improve follow-up and compliance with treatment in cases of chronic illness.

CHS e-health activity focuses on deepening patient involvement in managing health through personalised digital interactive tools. Currently, CHS e-health wing provides e-health services for 1.56 million unique patients monthly with 2.4 million interactions every month (May 2011).

From the IT perspective, virtualisation technologies enabled CHS to scale-up and to rapidly respond to evolving business needs. All services, servers, storage, communications and security components are being monitored to ensure constant operation.

Serving over 4 million members, CHS e-Health platform has put special focus on accessibility issues. CHS e-Health platform complies with AA accessibility guidelines, including supporting of special shortcuts, tags, fonts, themes, graphics and graphs.

CHS e-Health core components include:

- 1. The personal health record layer** (what the patient can see) presents patients with their own medical history as well as the medical history of their pre-adult children, including diagnoses, allergies, vaccinations, laboratory results with interpretations in layman's terms, medications with clear, straightforward explanations regarding dosing instructions, important side effects, contraindications such as lactation etc., and other important medical information. All personal e-Health services require identification and authorisation.
- 2. The personal knowledge layer** (what the patient should know) presents patients with personally tailored recommendations for preventative medicine and health promotion. For example, diabetic patients are push notified regarding their yearly eye exam. The various health recommendations include: Occult blood testing, mammography, lipid profile, etc. Each recommendation contains textual, visual and interactive content components in order to promote engagement and motivate the patient to actually change his health behaviour.

- 3. The personal health services layer** (what the patient can do) enables patients to schedule clinic visits, order chronic prescriptions, e-consult their physician via secured e-mail, set SMS medication reminders, e-consult a pharmacist regarding personal medications. Consultants' answers are sent securely to the patients' personal mobile device.

On December 2009 CHS launched secured, web based, synchronous medical consultation via video conference. Currently 11,780 e-visits are performed monthly (May 2011). The medical encounter includes e-prescription and referral capabilities that are biometrically signed by the physician. In December 2010 CHS launched a unique mobile health platform, which is one of the most comprehensive personal m-health applications worldwide. An essential advantage of mobile devices is their potential to bridge the digital divide. Currently, the CHS m-health platform is used by more than 45,000 unique users, with 75,000 laboratory results views/month, 1,100 m-consultations/month and 9,000 physician visit scheduling/month.

- 4. The social layer** (what the patient can share). Social media networks triggered an essential change at the humanity "genome" level, to be further defined in the upcoming years. Social media has huge potential in promoting health as it combines fun, simple yet extraordinary user experience, and bio-social feedback. There are two major challenges in leveraging healthcare through social networks:
  - a.** Our personal health information is the cornerstone for personalising healthier lifestyle, disease management and preventative medicine. We naturally see our personal health data as a super-private territory. So, how do we bring the power of our private health information, currently locked within our Personal Health Record, into social media networks without offending basic privacy issues?
  - b.** Disease management and preventive medicine are currently neither considered "cool" nor "fun" or "potentially highly viral" activities; yet, health is a major issue of everybody's life. It seems like we are missing a crucial element with a huge potential in health behavioural change – the Fun Theory. Social media platforms comprehend user experience tools that potentially could break current misconception, and engage people in the daily task of taking better care of themselves.

CHS e-Health & IT teams characterised several breakthrough applications in this unexplored territory within social media networks, fusing personal health and social media platforms without offending privacy.

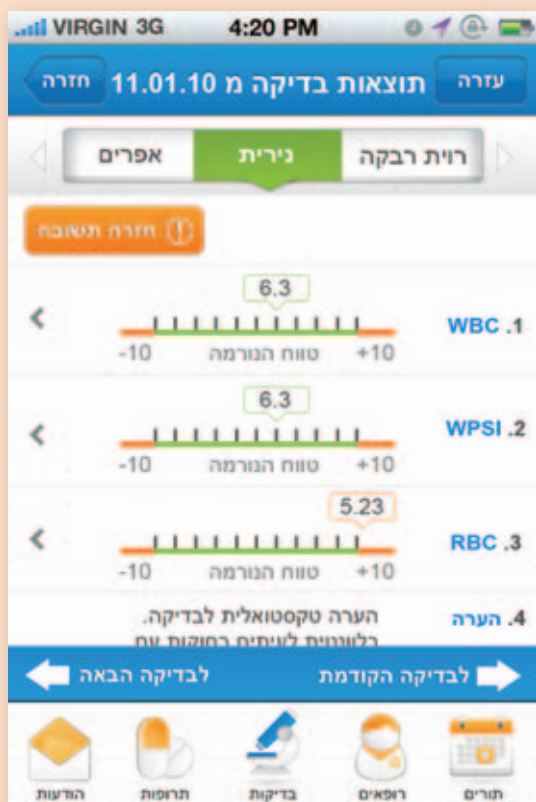


Figure 1: Personal laboratory results



Figure 2: M-Consultation

One of the most crucial issues regarding adoption of e-health and m-health platforms is change management. Being a "hot" innovative "gadget" is far from sufficient for changing health behaviours at the individual and population levels. CHS health behaviour change management methodology includes 4 core elements:

1. Engaging two completely different populations: Patients and medical teams. E-Health applications must present true added value for both medical teams and patients, engaging them through understanding and assimilating "what's really in it for me". Medical teams are further subdivided into physicians, nurses, pharmacists and administrative personnel, each with their own driving incentive. Resistance to change is an obstacle in many fields but it is particularly true in the conservative health industry. To successfully manage a large-scale persuasive process, we treat intra-organisational human resources as "change agents". Harnessing the persuasive power of ~40,000 employees requires engaging them as the primary target group. Successful recruitment has the potential of converting each patient-medical team interaction into an exposure opportunity to the new era of participatory medicine via e-health and m-health channels.
2. Implementation waves: Every group of digital health products that are released at the same time are seen as one project. Each implementation wave leverages the focus of the organisation and target populations to a defined time

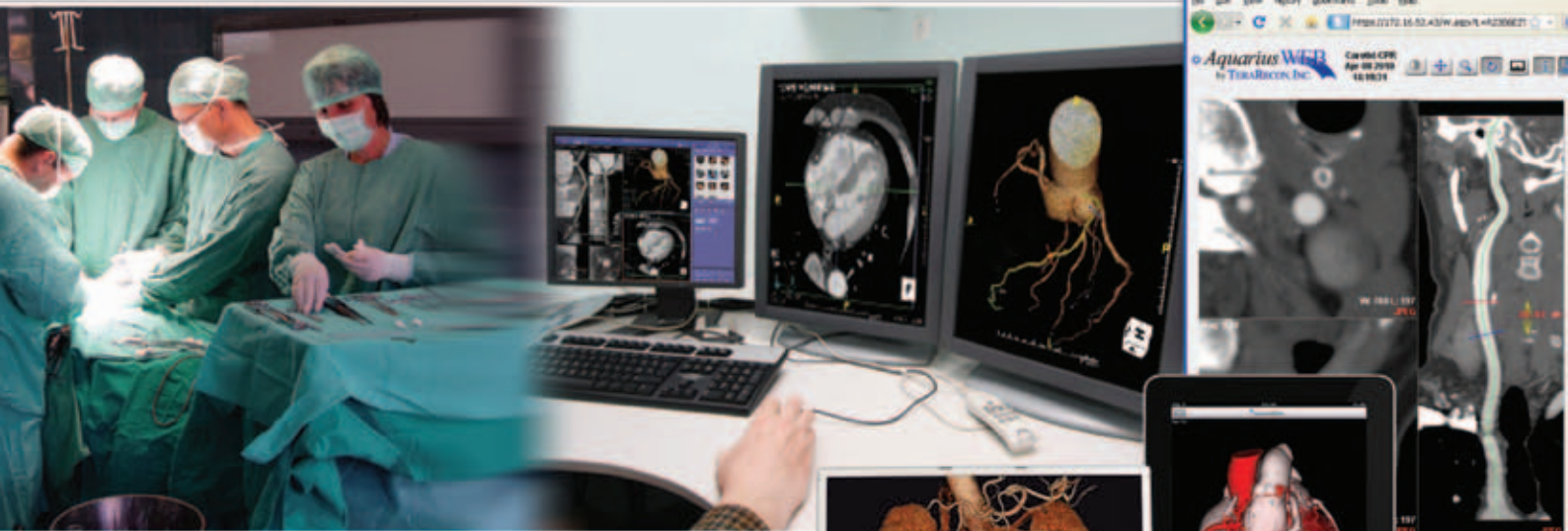
span. There are three major and three minor implementation waves a year.

2. Change-Support Arrow: A structured infrastructure for every implementation wave. The sub-stages in this strategy include:
  - Cross-organisational mapping and identification of early adopters and stakeholders relevant to the implementation wave;
  - Mapping positive or negative perceptions and designing specific marketing approaches for the distinct target groups;
3. Intra and extra-organisational marketing;
  - Conducting intensive training and presentation sessions for groups of implementers;
  - Running conflict-prevention activities such as advanced tackling of potential union resistance;
  - Training change-agents with resistance-management behavioural techniques, focused intervention for specific incidents and for key opinion leaders; and
  - Extensive presence in the clinics during the launch period, etc.
  - The entire process is monitored and managed continuously by a review team.
4. Closing Phase: Each wave is analysed and a "lessons-learned" session concludes the changes required in the modus operandi of the e-health project team.



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# A (R)EVOLUTION IS COMING UP IN HEALTHCARE

## From an eGo into an eCo System

AUTHOR

Lucien Engelen

Director Radboud REshape  
& Innovation Center

[www.radboudreshapecenter.com](http://www.radboudreshapecenter.com)

***From both a personal and organisational perspective, healthcare is designed as an eGo-system. People must go to the doctor or to the healthcare institution, in which almost everything in the workflow is built around the professionals. The organisation's perspective is leading, not the patient's or his/her family. For instance, have a look at the way scheduling is done, with the time it takes to make an appointment and then the actual date you will have your scheduled appointment. Then compare this to how we book our flights; we can choose our seats, aisle or window and even food arrangements are possible. It is not rocket science anymore. For the most part, in healthcare it isn't even possible to get an overview of all the appointments of one patient in one hospital as it is often settled department by department. Healthcare is therefore an eGo system.***

We must start to see healthcare like an eCo system, where all parties know (about) each other and what they have done/are doing. A place where the patient, family and informal carers might help give a boost to not only efficiency but also satisfaction, and perhaps even avoiding errors. Patients can improve their own health by being a member of the (healthcare)team. I am confident that this will happen in healthcare, possibly invoked by a small spark of something "big" happening, like an epidemic or an economic crisis.

### Patients are Changing Seats

In my blog Patients Are Changing Seats: the Future of Health, you can read my musings on the topic. I really think we are overestimating the speed at which we will be facing these developments on broader scale, but likewise I am confident that the implications are of it are equally underestimated. Whether or not healthcare can obtain a customer-orientation is to be seen but things are definitely changing, most notably the reallocation of roles. This move will be reinforced by budget issues, labour problems like the shortage of skilled personnel and a substantial increase in healthcare demand due to demographic factors and increased healthcare consumerism. For more information on this idea take a look at the interview with me in Medical Contacts (one of the Dutch leading medical magazines) and the responses to it. I really see a substantial role for the patient as a "buyer" of care in this system.

Does this mean that we should be putting "Patients central"? Appearing in a lot of hospital mission statements, this is one of the most hollow phrases that I have met in healthcare, since only a very few actually act on it on an organisational level. Step into a random healthcare institution and look at their typical care process. Patient-central? Of course not; it never had to be like that, so it never will be like that. This comes from the "old world" where you could protect your knowledge and expertise. But not anymore in a world where 84 percent of the people visit Dr. Google before actually stepping into the consultation room.

Healthcare tends to be just an eGo system where all the processes have been moulded around the healthcare pro-

fessional. That's why we at Radboud have stopped "putting patients central" and are in the midst of a migration to "Embrace the patient into the healthcare-team" which will take us at least five to ten years.

**"Without any doubt healthcare as we know it will change substantially. This paradigm shift will have to find its way into our education systems as well and has to be researched and operationalised over the upcoming years."**

**Notice:** THE (healthcare)team, not OUR (treatment) team, we have to stop thinking in terms of silos.

### Experience in the Netherlands

Despite the great ambition at the start, the new healthcare system in the Netherlands didn't really succeed in bringing a "market" into healthcare. All healthcare institutions usually offer more or less of the same and whenever a health insurance company wants to buy a only certain part at one or two of them, the world looks "on fire." Not to mention the absence of "purchase" of care by the patient himself. The healthcare system (without home care that is) misses the classical triangle of business. This because the health insurance contracts the institution which in turn has an agreement with the caregiver, but where is the patient in this process? Once again, healthcare is an eGo system!



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## MyHealthStory

We have recently launched [www.myhealthstory.me](http://www.myhealthstory.me) a new way of listening to the patient, the family but also to healthcare professionals. All involved are asked to submit a short (1.5 minute) video on their own YouTube account with advice and suggestions on what could be improved in healthcare. By tagging it, it will appear after review on the website. The site will contain videos in 11 different languages. I launched this with Roni Zeiger (Chief Health Strategist of Google; Dr. Google himself!) on the team.

Neither in the planning phase, nor in the implementation phase are patients involved or even consulted. Up until now that worked, but in the "new world" this will quickly be disrupted once a (new) insurance company starts with a campaign, spreading through social media at a high pace. It will disrupt systems as we know them now. For more on this topic I suggest reading Clayton Christensen's Innovative Prescription.

Moreover, I expect that after the democratisation of the media like TV programmes and newspapers to billboards that scream for your interaction, and after the democratisation of some totalitarian regimes due to the role of i.e. social media, it will soon turn to the democratisation of healthcare as well. Increasing transparency (like ZorgkaartNederland), the introduction of Personal Health Records (as my CareNet, Microsoft HealthVault) and the role of the Internet and social media reinforce the elements that slowly but surely are ensuring that the current roles are starting to change.

This in an era where healthcare (including consulting firms) are talking and talking on how to improve healthcare while literally doing nothing.

As described in the article in the Pathway issue of American Scientific in which I was quoted several times, soon it will be the year of "The Rise of the Empowered Patient". People as (potential) customer care-consumers will need to take action too. There is that patient trust or distrust, from the article "The Rise of the Empowered Patient," back into play.

Without any doubt healthcare as we know it will change substantially. This paradigm shift will have to find its way into our education systems as well and has to be researched and operationalised over the upcoming years.

Unlike what some may think I do not think it is rocket-science that is needed, nor is it complex. Actually I think REshaping healthcare is simple, though not easy. More focus on the

ones we are committed to, more engagement for the family and informal care with often only little things like compassion, authentic communication would help a lot.

### Useful Links

- Interview with Medical Contacts (Medisch Contact) March 2011 [www.medischcontact.artsennet.nl/](http://www.medischcontact.artsennet.nl/)
- "The Innovator's Prescription" Prof. Clayton Christensen [www.claytonchristensen.com/](http://www.claytonchristensen.com/)
- "The Rise of the Empowered Patient" by Nicholas Brody. Pathway issue of American Scientific. [www.sa-pathways.com/new-health-consumer/the-rise-of-the-empowered-patient](http://www.sa-pathways.com/new-health-consumer/the-rise-of-the-empowered-patient)
- [www.myhealthstory.me](http://www.myhealthstory.me)
- [www.radboudreshapecenter.com](http://www.radboudreshapecenter.com)
- [www.slideshare.net/lucienengelen/lucien-engelen-keynote-doctors-20](http://www.slideshare.net/lucienengelen/lucien-engelen-keynote-doctors-20)

### TEDx Maastricht: The Future of Health / 2nd April 2012

TED is a nonprofit organisation devoted to "Ideas Worth Spreading." The TEDx programme gives communities, organisations and individuals the opportunity to stimulate dialogue through TED-like experiences at the local level. TEDx Maastricht focuses on healthcare.

TEDxMaastricht: The Future of Healthcare is about fueling a movement in healthcare in Europe. The event inspires you to participate in a new healthcare system where patients are well informed healthcare customers participating in their own healthcare, sharing medical information, taking responsibility for their own health, co-deciding and joining their own healthcare team. As Lucien has already discussed, social media plays a large role in this process.

For more information, please visit: [www.tedxmaastricht.nl](http://www.tedxmaastricht.nl)



# WHAT DO DOCTORS WANT FROM ONLINE COMMUNITIES?

## *Doctors.net.uk reveals what its members really value*

AUTHOR

**Dr Tim Ringrose**  
Medical Director, Doctors.net.uk

***Doctors.net.uk pioneered the use of social media in a professional peer-to-peer environment by creating the largest and most active professional network of doctors in the UK in 1998. The network, which now boasts more than 184,000 members, was ahead of its time in recognising the potential of the internet for peer to peer communication and collaboration among doctors.***

Since then Doctors.net.uk, which provides extensive clinical content including online education, conference highlights, and discussion fora, has become the most trusted source of information for the majority of its users.

Furthermore, the online forum, which sees GPs and hospital doctors supporting each other and collaborating each week to solve clinical problems, is credited with improving patient care and transforming doctors' working practices. In 2010, more than half a million posts were made by UK doctors. Questions get answered in minutes with opinions provided from the 82 specialties within medicine.

### The Secret of Success

So what is the secret of Doctors.net.uk's success at a time when the British Medical Association is advising doctors to be very careful how they engage with open social networks such as Facebook? Our experience in the UK shows doctors really value the fact that Doctors.net.uk, which was set up for doctors by doctors, is an authenticated and closed professional network. Doctors who are looking for advice need to know that they are speaking to

other doctors in a secure environment that cannot be accessed by the general public.

**"Access to information whilst on the move is important and I expect smartphones and tablets to become the dominant tools for accessing information online within the next two years."**

Furthermore, collaborating with doctors online is mutually beneficial. Our online forum, which is used by thousands of members per week, sees specialists and GPs alike benefiting from their collective experience and expertise by answering each other's questions and discussing topical medical issues.



### Make I.T. Known: Marketing Strategies and Case Studies in the Healthcare Environment

By Charles E. Christian, FCHIME, FHIMSS; Judith A. Kirby, CPC; and Steven R. Bennett, MA (HIMMS 2010)



This book is a guide to marketing your IT department within and to your hospital, health system or organisation. Communicating and promoting the purpose of your IT department, its importance to the healthcare organisation, and how the IT team's efforts make everyone's job easier and more productive are crucial to your department's... and your personal success.

The book will help senior healthcare IT management understand what marketing is and the role it plays; define the role of marketing within a healthcare IT department/

division; and view how other healthcare IT organisations approach marketing. The book contains 40 case studies that provide keen insights from senior IT leaders' experiences with marketing their own IT divisions.

Specific topics covered are:

- Developing a healthcare IT marketing plan;
- Creating a customer-focused culture;
- Public relations;
- Social networking; and
- Crisis communications.



## Doctors.net.uk

Doctors.net.uk is available to UK-registered doctors in primary and secondary care. It is a secure service offering a professional e-mail facility, clinical and non-clinical forums, the very latest medical news and free accredited education allowing doctors to maintain Continuing Professional Development (CPD). It is a trusted source of medical education, research and communication and is used by around 40,000 doctors every day.

Positive feedback on this aspect of the service includes a comment from a GP partner who said: "I feel plainly indebted to Doctors.net.uk for creating a platform for facilitating professional networking and enabling me to stand on the "shoulders of giants."

Helping their peers in this way also enables doctors to further their careers by gaining kudos and respect within the medical community at large. This can be particularly useful for junior doctors looking to build their portfolio. Years ago they had to publish many research papers and case studies, and make a great effort to get their face known. Now they can build their profile online from their computer, iPad or smartphone.

This online professional network can also prove useful for job hunting, enabling doctors to get inside information on other places of work, plus interview tips and help with their CV. They can also view the latest jobs in the network's recruitment section.

Moderators perform a vital function on Doctors.net.uk by ensuring that inappropriate information is removed from the forum and I believe it is important that moderators are peers – not outsiders. This means they are totally in tune with the community's values and their decisions are better accepted.

Of course, Doctors.net.uk also publishes a great deal of clinical content. Doctors need to be certain that this news and information is accurate and we fulfill this requirement with an experienced editorial team and a code of absolute transparency for all information published. More than 300 doctors act as clinical information contributors and advisers to ensure that a wide range of information is available.

Doctors.net.uk capitalises on the latest technology to bring news and information to doctors on the go. Around 80 percent of doctors now have smart phones and we now offer iPhone apps for medical news and conference highlights. Access to information whilst on the move is impor-

tant and I expect smartphones and tablets to become the dominant tools for accessing information online within the next two years.

Doctors.net.uk provides free services to doctors and generates revenue from targeted engagement campaigns for clients, including the pharmaceutical industry, medical technology companies, government and healthcare providers. Doctors.net.uk also provides a range of innovative research services (via the research division medeConnect Healthcare Insight) to provide clients with insight into doctors' awareness, attitudes and behaviour.

## Networks in Health

Clients have asked us if we could replicate our UK activities in other countries to enable them to engage more effectively with doctors internationally. In response, we recently launched Networks in Health ([www.networksinhealth.com](http://www.networksinhealth.com)) – a unique international alliance of online physician communities.

Networks in Health helps organisations deliver communications to doctors across many countries with an approach that ensures their messages are in line with the local language, culture and regulations.

To conclude, the success of Doctors.net.uk shows that secure, authenticated, professional online networks provide an invaluable source of support for doctors and have become an essential part of their working lives.

*For more information on Doctors.net.uk, please call Tim Ringrose on +44 (0)1235 828400 or email [Tim.Ringrose@mess.doctors.org.uk](mailto:Tim.Ringrose@mess.doctors.org.uk). You can also follow Doctors.net.uk on twitter: [doctors\\_net\\_uk](https://twitter.com/doctors_net_uk)*



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syngo.via Web Options present the mobile solution for image and report viewing from Siemens Healthcare. With syngo.via Web Options, physicians and referrers within and outside the hospital can securely access images and reports for viewing in a standard Web browser or on an Apple mobile device<sup>2</sup>. Patient involvement becomes effortless and access to images and reports is faster and easier with syngo.via than ever before. In short, this allows better collaboration within and beyond the hospital. All tailored to your needs with the flexibility and the freedom to have images and reports at your fingertips.

## Tailored solutions depending on your needs

Siemens offers two syngo.via Web Options solutions: syngo.via WebViewer<sup>3</sup> and syngo.via WebReport<sup>4</sup>. The solution that is best suited for your site depends on the specific requirements toward the collaboration within the hospital and with referrers.

For fast reading and viewing of images within the hospital network, syngo.via WebViewer is the ideal solution. This is especially true in larger hospital settings where examination rooms, reading rooms, treatment rooms, and patients are all located in different parts of the hospital campus.

When secure viewing of reports and images by cross-departmental physicians and referring physicians is important, syngo.via WebReport is the perfect fit. Case clarification within multiple location hospitals and with referring physicians outside the hospital become easier than ever. Through mandated access, physicians are granted access to their patients' records only – while keeping all sensitive patient data secure.

## Share reports and clinical images with referring physicians

External access to clinical images and diagnostic reports is included in syngo.via WebReport. The benefit of letting a referrer receive access to reports and images of examinations is tremendous. Access to relevant patient data helps minimize the risk of errors in the future course of treatment. Clinical images can be viewed as 2D or 3D images, such as VRT and MPR. External access is facilitated over a secure Internet connection and is available with a Web browser on a normal personal computer or by using the syngo.via WebReport application on Apple mobile devices.

## Illustrate and discuss results directly with patients

With both syngo.via WebViewer and syngo.via WebReport, patient involvement is easier, too. Instead of bringing stationary patients back into an office or reading room to explain the diagnosis or the future treatment plan, this can be done where the patient is located. With syngo.via WebReport and an Apple mobile device, for example, general practitioners can show 3D images and explain the diagnosis even at home visits. This is the beginning of true patient centric care.

## Colleagues in other departments access images with a snap

Since syngo.via WebViewer can be accessed from a standard Web browser or on an Apple mobile device, sharing information with fellow physicians is fast and easy. Even colleagues without access to a reading station can view images. With syngo.via WebViewer and a diagnostic grade monitor, examinations such as Computed Tomography or Magnetic Resonance can be read on a normal personal computer and viewed as 2D, MIP/MPR or 3D images.

[www.siemens.com/syngo.via-weboptions](http://www.siemens.com/syngo.via-weboptions)

<sup>1</sup> Prerequisites include: Internet connection to clinical network, meeting of minimum hardware requirements, and adherence to local data security regulations.

<sup>2</sup> Apple®, the iPhone™, the iPad™, iPod Touch™ are trademarks of Apple Inc., registered in the U.S. and other countries.

<sup>3</sup> The application is not for diagnostic viewing/reading on mobile devices. In the U.S., only CT images are approved with syngo.via WebViewer. The information about this product is preliminary, as it is under development and does not have the necessary clearances in all countries. Its future availability cannot be ensured. It is not available for sale in e.g. China or Brazil. Diagnostic reading of images with a Web browser requires a medical grade monitor.

<sup>4</sup> The product does not have the necessary clearances in all countries. It is not available for sale in China or Brazil. The application is not for Diagnostic Use.

For iPhone and iPad country-specific laws may apply. Please refer to these laws before using for diagnostic reading/viewing.

# THE ETHICS OF ONLINE HEALTHCARE

## Case Studies in Personal Health Records and Telemedicine

### AUTHORS

**Professor Richard Wootton**  
Director of Research, Norwegian Centre for Telemedicine and Integrated Care  
**Sarah Bougourd**  
Nuffield Council on Bioethics

***For many people, e-health services and telemedicine provide convenient and flexible ways to manage their healthcare. However, a major enquiry by the UK-based independent Nuffield Council on Bioethics has identified a number of ethical questions and challenges associated with various forms of online healthcare. The Council's report, Medical profiling and online medicine: the ethics of personalised healthcare in a consumer age, published in October 2010, makes a number of policy and practice recommendations for providers and users of e-health services. This article highlights the recommendations across two of the report's case studies: Online personal health records, and telemedicine.***

Two key social pressures, 'responsibilisation' and 'consumerisation', were central to the recommendations made in the Council's report. 'Responsibilisation' indicates the trend for people to take more responsibility for their own health, to lead a healthy lifestyle and to actively manage their healthcare. 'Consumerisation' of healthcare and the new technologies available are helping to drive the market for many online medical services.

The Council found five ethical values to be important when considering developments in these areas. These were:

- Private information should be safeguarded;
- Individuals should be able to pursue their own interests in their own way;
- The state should act to reduce harm;
- Public resources should be used fairly and efficiently; and
- Social solidarity (sharing risks and working together to protect the vulnerable) should inform public policy.

These ethical values often conflict with one another but all are important and no one value 'trumps' another. When applying these values to each of the case studies, the Working Party attempted to 'soften' the conflicts by recommending a way of intervening that would allow each value to be respected as much as possible, and making recommendations that were evidence-based, proportionate and feasible.

### Online Personal Health Records

Several commercial companies, mainly in the US, provide services that allow people to organise their personal health information, integrate health records from different providers, and share them with other people, including healthcare professionals. Whilst these services allow more convenient and patient-centred control of health records, they also encourage people to upload, access and share highly personal information via the internet, and the Council is concerned about the possible breaches of privacy.

The Council's report states that people should be able to keep information about themselves and their health private

and free from unauthorised access or use if they wish to. However, there is potential for misuse of stored information. For example, an online health record system could be used to market products to people and there is the possibility of doctor-patient confidentiality being breached through family members or other contacts demanding or guessing somebody else's password.

More broadly, personal health information entered and accessed online may be commercially valuable. The ease with which electronic files may be transmitted and accessed is a double-edged sword: While this feature increases convenience, it also means that files can be 'lost' or misused as a result of carelessness, fraud or institutional change. And if a provider of online health record facilities were to go bankrupt or change hands, it might be difficult for users to guarantee that their data would continue to be held securely and would not be lost.

If we consider the ethical principles set out in this report, there is a conflict between the value of individuals being able to pursue their own interests in their own way and the value of safeguarding private information. What can be done to ensure that people can use online health services effectively and safely without compromising their privacy?

### Recommendations

Currently, it is not straightforward for users to find out how their data will be used, stored, passed on or sold to third parties. The Council recommends that the UK Department of Health should develop an accreditation system for online health record providers. The accreditation system should specify exactly how the details provided by users will be stored, passed on or sold to third parties and the arrangements to ensure the security and confidentiality of data and information if the operator went into administration or changed hands.

The report also states that responsible bodies in the EU, and the Information Commissioner's Office in the UK, establish data protection legislation that applies to online health records held by people who upload and edit their information in the EU.



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As an additional safeguard, the Council would like to encourage good practice for the process by which individuals join online personal health records systems. If people are routinely provided with information such as whether or not they will receive information or advertising from pharmaceutical companies on the basis of information they enter, this would help them to assess whether their private information on the system is being safeguarded.

### Future impact

The use of the Internet for health-related purposes is likely to grow as more people gain access to the Internet across the world and as people who are young and middle-aged now (social groups more familiar with using the internet) become elderly (the group that consumes most healthcare). Healthcare providers may find their patients increasingly demand access to their medical records and other services online, and commercial competition may drive further development of this kind.

## "Telemedicine has the potential to offer care to people in their own home and increase equitable access to healthcare services."

Although use of online health records systems outside those offered by public healthcare systems seems limited at present, the European Commission recently offered support for pilot projects to develop systems for individuals to have their personal health information safely stored within an accessible online healthcare system. The Council concludes that it would be prudent to make arrangements that provide for the possible increased use of such records.

### Telemedicine

Although some types of care will always need to be delivered in person, telemedicine has the potential to offer care to people in their own home and increase equitable access to healthcare services. The ethical issues associated with 'responsibilisation' are of key importance for telemedicine, since some telemedicine services lead to patients (or their carers) taking, or being obliged to take, greater responsibility for their healthcare. This raises questions about how far telemedicine should replace traditional forms of healthcare and about liability for adverse events.

One concern that the Council raises about the introduction of telemedicine systems that link patients to remote healthcare professionals or remote systems, is that it may serve to replace time spent in the physical presence of health professionals, an aspect of healthcare valued by many people. A balance must therefore be struck between the value of using public resources fairly and efficiently and the value of state activity to reduce harm in this case.

Additionally, it is noted that the current legislation for telemedicine does not encourage providers of healthcare services to consider all the factors that are thought to be desirable when deciding whether to introduce telemedicine services, including: Cost-effectiveness; equity; safety; quality; the value of physical time with health professionals, impact upon doctor-patient relationships and the value of global social solidarity.

### Recommendations

Public healthcare systems should offer telemedicine services in circumstances where they can assist in a feasible and cost-effective manner to reducing inequities in access to healthcare. As when introducing any new health service, consideration should be given to ensuring that inequities of access to care are wherever possible not exacerbated for some groups while they are reduced for others, and any impacts on doctor-patient relationships should be evaluated.

To ensure that public resources are used fairly and efficiently, the report recommends to providers of public healthcare systems that telemedicine services should be subjected to the same criteria of cost-effectiveness, equity, safety and quality to which other health technologies are subjected. This recommendation may require careful monitoring of changes in the quality and standards of care for patients, for example if people were at risk of being discharged inappropriately early from hospital due to the provision of a telemedicine service for aftercare and follow-up.

The report concludes that telemedicine could have a particularly positive impact in developing countries, for example, by enabling doctors to seek expert opinions from specialists in industrialised countries. It may also have a role in reducing the 'brain drain' effect of doctors moving from developing countries to work in industrialised countries. The Council therefore recommends that The World Health Organization and other international agencies should encourage telemedicine networks in developing countries where they can be shown to be beneficial, cost effective and sustainable.

### Future impact

Telemedicine could be of particular significance when considering the impact of an ageing population on health and social care. Older people use healthcare more than other demographic groups, and therefore healthcare providers will need to assess ways in which telemedicine can be used to improve cost-effectiveness. Some forms of telecare could be particularly suited to the provision of health services to older people, insofar as telemedicine can help promote independence and detect early changes in health status. It has also been argued that telemedicine is important as a way of better supporting vulnerable adults and those with long-term health conditions such as dementia. Hence it is likely that, at least in the UK and other industrialised countries, we will see increased use of telemedicine in many different forms in the future.

To read Medical profiling and online medicine, the ethics of "personalised healthcare" in a consumer age in full, please visit: [www.nuffieldbioethics.org/personalised](http://www.nuffieldbioethics.org/personalised)

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# DATA CENTRE TRENDS IN THE HEALTHCARE SECTOR

## Balancing Growth, Budget and Compliance

### AUTHORS

**Robert Forsyth**  
**Bruno Raeymaekers**  
 ARCADIS Community of Practice (COP) for Data Centers  
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***Growing IT-applications are taking a central position in the functioning of any healthcare facility. Existing sites are commonly relying on older IT and technical facilities, not able to support the new and demanding requirements of tomorrow's organisations. Cooperation with other similar healthcare companies allows for optimised investment and operational budgets, whilst this differentiated on-site/off-site approach ensures required speed and reliability for the critical services.***

### Identifying Trends

The healthcare sector has, over the past few years, seen an unprecedented evolution towards electronic applications. As broad a range of services as one can think of are currently in use, or being rolled-out on a large scale.

To list only a few significant applications:

- Electronic Patient Records (EPR);
- PACS Server & Storage;
- Nurse Call Stations;
- Patient and ICS Monitoring;
- Pharmacy Information & Recipe;
- Patient Bedside Entertainment;
- Remote Applications;
- Geolocation Services

and even veterinary practices are run through local and larger networks.

Reference healthcare projects in the USA have shown a 300% growth in power, and a 200% growth in IT space over the last 3 years. The impact the immense growth of these services has on the required facilities to manage and maintain such operations is staggering. This article aims at identifying some key challenges and attempts to suggest a few (out of many different) solutions that could offer means to address these challenges. To conclude this introduction, some examples of specific applications which have made international press coverage throughout Europe recently:

- Finland expects to have its National Medical Archives grown to a capacity of 550 PB by 2025;
- UZ of Leuven, Belgium, is introducing patient bedside terminals to offer monitoring, as well as entertainment stations;
- SMS alerting patients to take in critical medications;
- Remote Telepresence services cutting out the doctor to patient distance; and
- The training of aspiring surgical students with the Wii.

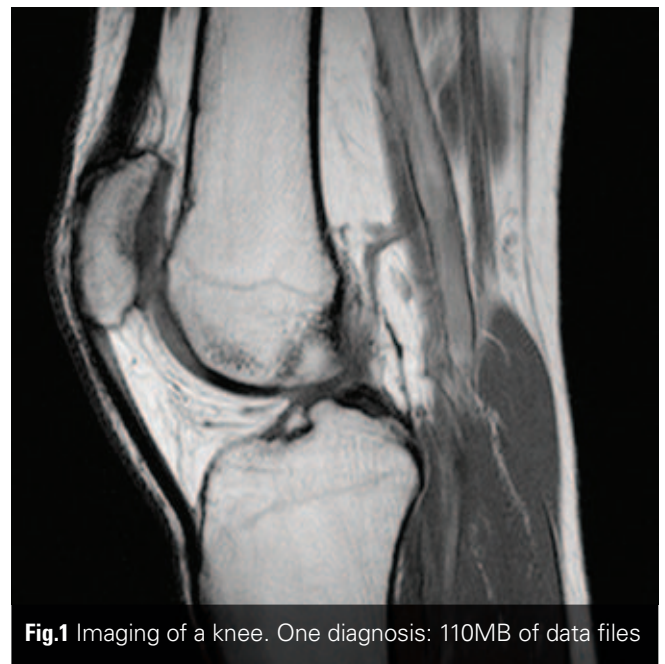
### Challenge: IT and Applications

Applications that have grown out of different perspectives are increasingly expected to communicate with each other; or even to offer a single platform for all healthcare services. From

the EPR archive to the imaging databases to hospital administrative services, these applications are becoming more and more integrated. A considerable effort in software and systems is needed to transfer existing single services into fully integrated application platforms.

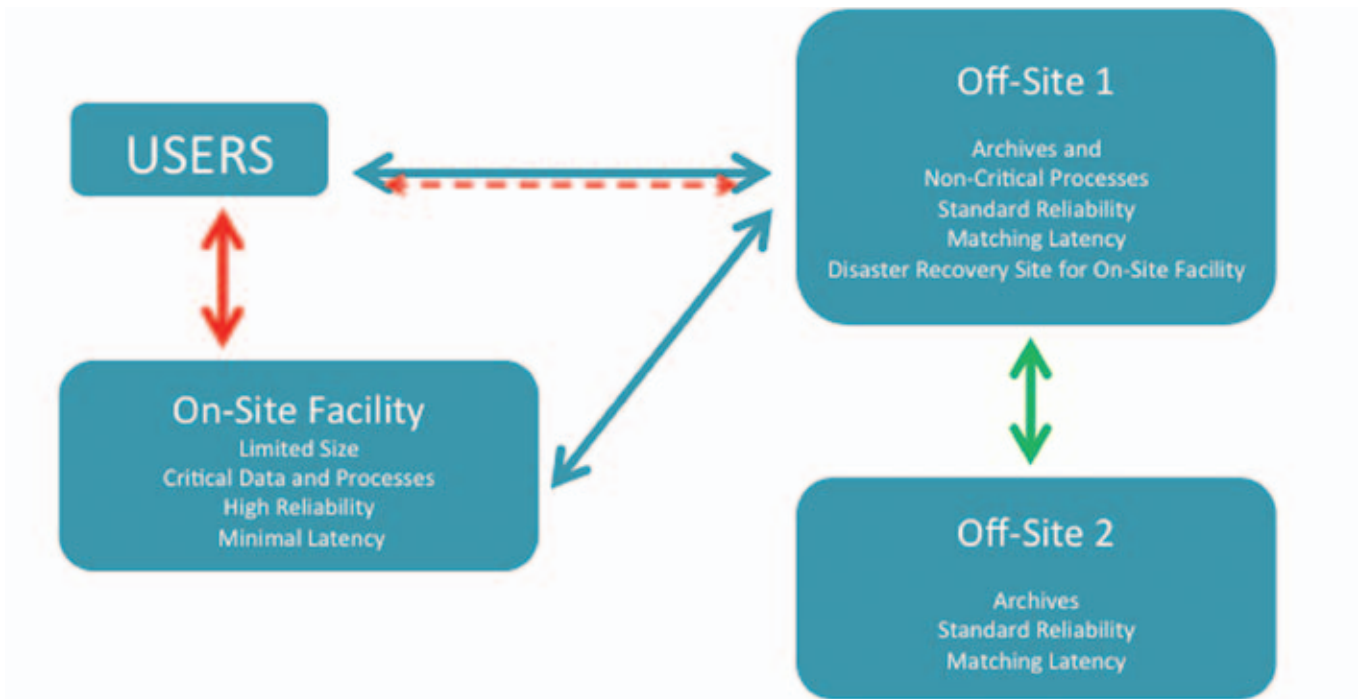
Data can be critical, sizeable, "living" or dormant in archives. To correctly identify the required application's handling, one must assess the nature of the data and allocate the required resources.

- Critical data ("life or death"), like intensive care monitoring, imaging databases and medication management services need to be readily available. Speed and reliability are paramount.
- EPR archives and storage can be bulky, but needn't be kept in such critical environments as the critical data.
- Patient entertainment systems could be considered "obsolete" in the case of system failure, but when integrated into patient monitoring systems, are immediately upgraded to semi-critical applications.



**Fig.1** Imaging of a knee. One diagnosis: 110MB of data files





**Fig. 2.** Different sites with specific objectives each have their own resiliency, size and communication requirements

As far as IT related services are concerned, these critical requirements can be translated into Bandwidth (processing the data as fast as possible), Redundancy (allowing for timely and secure backups), and Disaster Recovery solutions. In any case, the strategy for each of these is to be nested deep in the overall site's Business Continuity Plan.

### Would you invest all your capital into a single stock?

When applying this to significant medical infrastructures (hospitals, doctor/specialist co-ops, etc), the way forward is on one hand to maintain a relatively small, but very critical facility on-site or on-campus, and a second, larger and maybe even shared off-site "data warehouse". The on-site facility, with minimal latency delays to the end-users, manages critical data (intensive care, operating rooms, "active" patient records) being built for speed and reliability.

The off-site facility is mainly focused on archiving dormant patient records and medical information. Sharing the burden on campus, regional, national or even international level allows for optimal allocation of resources, reducing shared costs and outsourcing specialised services. This is where National Medical Archive type projects come into view. This off-site facility is also setup as a Disaster Recovery site, able to take of critical processes should the primary on-site facility fail. Required latencies/bandwidth for such scenarios is to be evaluated.

Taking it one step further, an even more diversified approach is advisable. Duplicating archives over different sites (nationally, or why not, internationally diverse), mitigates many technical, natural and regional risks, and although perhaps counter-intuitive, can significantly reduce investment costs and operational expenses.

Looking toward private "Cloud"-type solutions could very well be the final step, but, as further discussed, will raise significant data security and compliance concerns.

### Challenge: Facilities

The cumulative effect of the identified trends is placing an ever-greater demand on healthcare facilities to provide more data centre space, capacity and fit for purpose infrastructure. Space is at a premium, and where core-business is of a medical nature, supporting services are often driven underground.

In existing sites, one can spend days in the basement, hopping from one department's "IT shed" to the next. None are designed for function, none are efficient in either space or energy consumption and more often than not, significant vulnerabilities to accidental mishandling can be quickly identified. Expanding and upgrading these legacy housings is challenging, costly, if not downright impossible, posing significant threat for the site to manage current and future evolutions.

## “Would you invest all your capital into a single stock?”

The proposed solution as highlighted in the "IT and Applications" section, is relevant here as well. Integrating all critical applications at a site-wide level into a single designed-for-purpose location reduces operational costs, combines investment efforts and better manages current and future needs.

The key challenge for this to work lies with the company's CFO. All too often, budgets are spread out over different de-



**Fig. 3** Cramped, inefficient, out of date IT shed.

partments and it is difficult to identify available budgets for IT-related systems, let alone to get these departments get to see eye-to-eye when it comes down to the “Money Talk”. The care and management for the IT infrastructure needs to be centralised and must not be segregated between a number of departments.

## "Accurately predicting growth for a 5-20 year period will remain, for the foreseeable future, a fools' errand."

Returning to the on-site facility, one would expect a high-power density, very efficiently operated (electrically and mechanically) installation, built for speed and reliability. As mentioned, the off-site facility/facilities can be outsourced to specialised companies, providing infrastructure with relevant service level agreements.

### Challenge: What Does the Future Bring?

Barring scientific breakthroughs in the research field of space and time, it is impossible to predict what the current evolution of “e-services” will look like in five, ten, let alone 20 years. Accurately predicting growth for a 5-20 year period will remain, for the foreseeable future, a fool's errand.

Building massively oversized installations, both in space, power, cooling and communications is costly, inefficient, and downright bad for business. Though looking back a couple years can prove helpful to understand what could happen, pinpointing what will happen is not possible. Therefore, it is imperative to design facilities to requirements and allow for

quick and safe expansions in future. Modular data centres and scalable installations are buzzwords of the IT facilities sector, but are certainly worth looking into. The advantages are clear:

- Reduced investment costs;
- Improved efficiency; and
- Optimal use of space and resources.

There are however dangers for scalable sites too. Again, the IT strategy needs to be controlled centrally, and any changes, upgrades or expansions of installations need to be well considered, and must not adversely impact future flexibility. A critical site needs to be thoroughly commissioned before release. How will you commission future expansion on, an at that point, live data centre? It's certainly not impossible, but it can be quickly made impossible.

### Challenge: Legal and Security

When integrating critical and confidential patient records, security and privacy must not be overlooked. Many national governments have implemented privacy and data protection acts. European regulations are also coming into view, such as:

- The Data Retention Directive;
- The Personal Data Processing Directive; and
- European Medicines Agency guidelines.

But apart from these market-specific guidelines, other issues need to be scrutinised as well. Local criminal law and law enforcement specifications can force your medical database facility to open its doors during investigation procedures.

Joining all data into a single medical archive raises further concerns. One advantage would seem that all Emergency Rooms possess full and relevant patient records, but do we allow all doctors to access all patient records? Weighing quick accessibility in emergencies against patient record security and privacy will be a difficult hurdle to take. How is privacy aligned to the installment of Medical Data-banks? This is certainly an issue to liven up legal debate in coming years.

### Conclusions

The explosive growth in e-health applications puts significant strain on IT departments, supporting facilities and allocated budgets. A diverse approach to managing medical data and other related services has proven a valid model.

The healthcare facility data centre is no longer a mere supporting element but has become the very core of the operations of the healthcare sector. An effort needs to be made to get the IT shed out of the basement and give it the status and reliability it needs. However, integrating many sources and types of medical data requires significant thought to protect patient privacy.

An integrated solution calls for an integrated approach, where the central management office play a crucial role: Requirements need to be detected at a centralised level, budgets need to be allocated at centralised level, and the very IT infrastructure and facility needs to managed and operated at centralised level.

# INTELLIGENT INFRASTRUCTURE

## Lean, Smart and Green

AUTHOR

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***In the current economic climate many hospitals and medical centres are grappling with cost-cutting measures in their ICT architecture. The reality for today's healthcare CIOs is that they need to both drive IT efficiencies in the short term and ensure that their investments today will support the demands of doctors and nurses well into the future.***

This is no easy task in complex environments, where information and images must be transmitted quickly and efficiently to support the correct treatments and diagnoses. The Máxima Medical Centre (MMC), one of the Netherlands' leading training hospitals, is a good example of this complexity. The organisation has a staff of 3,400 who treat nearly 470,000 patients each year. Of these, 23,600 patients are accommodated in 836 beds across two locations.

Fast access to information held in the centre's data stores is vital both to the efficient running of the hospital and the quality of patient care. 10 Gigabit cabling infrastructure was recently installed to handle medical images, such as x-rays and CT scans, which surgeons need to have immediate access to as they prepare for operations.

### Energy Efficiency

As the IT infrastructure of hospitals like MMC grows more complex, more efficient energy consumption makes sense, not only because of mounting governmental pressure on carbon emissions, but also because of the financial benefits. As energy costs continue to rise, CIOs cannot ignore the need to maximise their power efficiency.

Given that a large portion of the IT backbone of hospitals is dedicated to supporting patient administration, power continues to be used by devices such as computers, phones and wireless access points, even when they are not in use.

To this end, energy management software can be combined with Intelligent Infrastructure to enable hospital IT operations personnel to understand, optimise and control power across the entire network infrastructure, potentially affecting any powered device.

### What is Intelligence?

An Intelligent Infrastructure Solution (IIS) provides the missing link between real-time network management tools and the traditionally passive structured cabling infrastructures that connect network devices together.

By providing insight into the physical layer, IIS helps IT professionals and network managers ensure the efficiency of their network by providing accurate reports for capacity management; generating real-time alerts to detect, locate and resolve any unauthorised changes within the network; providing automatic discovery and tracking of physical location of devices connected to the network in real-time, and proactively applying changes utilising electronic work orders in support of change management.

### Power Efficiency

IIS provides the capability for real-time mapping of switch ports to the physical location of wall outlets and network devices. This is achieved through a combination of data cabling information that is gathered from the intelligent infrastructure hardware and networked device data that is collected from managed network switches.

IIS has complete visibility of every physical location that is connected to each switch port. Whenever cabling information changes, IIS detects that change in real-time and automatically updates the cabling information maintained by the management software.

The availability of real-time mapping information between switch ports and the physical location of wall outlets provides IT managers with a very effective way to apply energy management policies to networked devices.

**“IIS helps IT professionals and network managers ensure the efficiency of their network by providing accurate reports for capacity management”**

The combination of IIS and energy management can be used to optimise energy consumption by defining when power should be supplied to devices in certain locations, or when they are not in use and can be powered down. For example, a profile could dictate that all the devices in certain areas of a hospital are powered down after 7pm when all the staff have gone home, and then powered-up again at 7am the following morning. These systems can function across a broad level, such as an entire building, right down to specific floors, single rooms, and even to individual wall outlets.

Because such policies are location-based, these systems can selectively exclude certain locations or create specific policies for certain rooms, offices or desks. IIS allows IT managers to select locations onscreen directly from the building layout, and chose the locations where the selected policy is to be applied. One-time policies can also be created to manage devices in rooms that are only used intermittently, like conference rooms or training facilities.

Additionally, IIS has the ability to track changes in network connectivity, allowing for dynamic implementation of energy policies that can be triggered automatically whenever a new connection is established between a switch port and a wall outlet.

### Reaping the Rewards

Knowledge, as they say, is power and the detrimental effects of not completely understanding how your IT environment is functioning are obvious. IIS allows hospital staff to make informed decisions about device usage by making the consequences of such decisions – such as increased demand for power, heat and space – more visible.

The total cost of IT is actually hard to define unless you have this kind of visibility and control through intelligent infrastructure. Intelligent monitoring systems can provide critical data that is key to reducing both OpEx and power consumption.

In this context, CIOs should re-examine how infrastructure is being used and deployed in their organisations. They need to ask whether existing IT tools are sufficient to make workers more efficient, whether current investments are being optimised or whether there are alternative technologies that can produce worthwhile savings in both energy and OpEx.

*The power of intelligent infrastructure should not be underestimated in meeting this end.*

# FEMI DIGITAL HEALTH PROJECT (FSD)

## Healthcare IT in Uruguay

#### AUTHORS

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Medical Federation of the Provinces Uruguay

***ICT in Uruguay will establish new models of relationships among healthcare professionals but also with users and will generalise healthcare and scientific knowledge. Failing to achieving these transformations will provoke a new form of exclusion for societies that do not admit the possibilities of these developments. The FEMI Digital Health Project (FSD) promotes the generation of necessary tools that contribute to improve the global management of the institutions of the organisation, as well as the quality and security of the healthcare with the consequent benefit to its users. This sets a first step towards the integration of the health information at national level, since FEMI attends a third of the users of the integrated health system.***

### Uruguay

Located in temperate South America, parallels 30 and 35 south latitude and meridians 53 and 58 west longitude (Figure 1). The country's surface is 176,065 km<sup>2</sup>, and has a population of 3,241,003 inhabitants. The distribution of the population through the country is uniform in its demographic, ethnic, cultural and social characteristics. Its capital, Montevideo, located in the south of the country, concentrates more than half of the population.

Life expectancy is 76 years, infant mortality rate (2008) is 10.6 ([http://www.msp.gub.uy/uc\\_3550\\_1.html](http://www.msp.gub.uy/uc_3550_1.html)). Its sanitary profile is similar to that of developed countries; nevertheless, from the point of view of the access of the population to the health system, some asymmetries remain.

### Medical Federation of the Provinces

Founded in May 1966, the Medical Federation of the Provinces gathers physicians settled in the countryside through medical union provincial associations. Its goals include:

1. The improvement of healthcare and ethics of professionals
2. The responsibility to solve the health problems of the populations it attends

Among its purposes is to encourage every initiative that promotes the technical and scientific advancement of the provinces' physicians; prioritising medical care and excluding statutorily the profit motive. Its management is comprised by an Executive Committee (EC) of five members, depending of a Care Plenary (assembly) and a Union Plenary. Legally, it is a second tier that gathers 2,800 physicians. It provides integral medical care to 800,000 users through a network of health services integrated by 23 organisations distributed throughout the country and covering the whole territory (Figure 2).

FEMI (<http://www.femi.com.uy>) owns:

- A care reference centre in Montevideo, Sanatorio Americano S.A. (<http://www.americano.com.uy>) where diagnosis and highly complex therapeutic procedures are performed;
- A purchasing centre of medicines and supplies for the whole system, ([www.cocemi.com.uy](http://www.cocemi.com.uy)); and
- A health insurance for all the physicians belonging to the Federation, (<http://www.semi.com.uy/>).

FEMI is comprised of:

- 34 hospital plants;
- 20 intensive care units (children and adults);
- 13 tomographs;

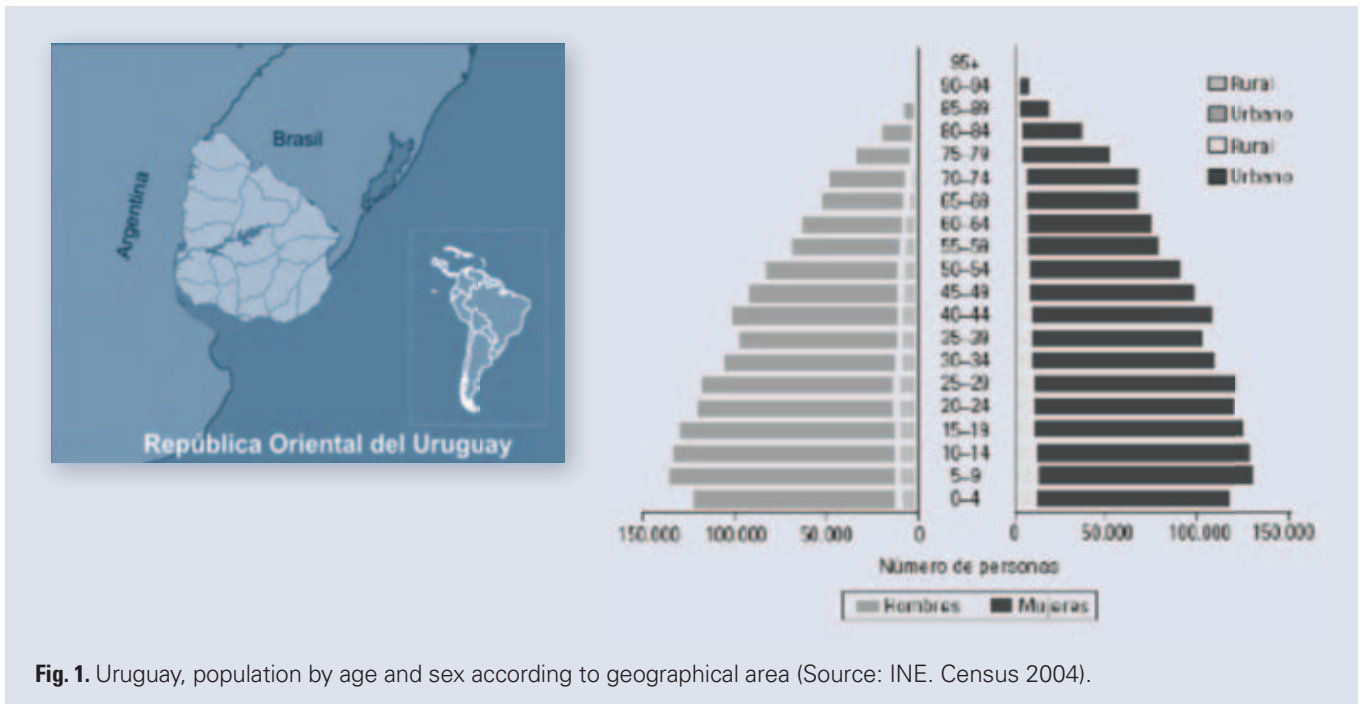


Fig. 1. Uruguay, population by age and sex according to geographical area (Source: INE. Census 2004).

- 2 magnetic resonators; and
- 87 policlinics that form a second and third level of complexity and reach the rural areas.

## Uruguayan Health System

The Uruguayan health system is comprised of:

### I) Integral public providers:

The most important is ASSE; in charge of the integral health-care of 1,200,000 Uruguayans who cannot afford insurance, (36% of the country's population). Throughout the country public providers 63 hospitals and 360 care units that provide care of first level (healthcare and policlinics).

### II) Integral private providers cover 60% of the population and are financed by social security, collective agreements and contributions of individual members.

This is a strongly regulated sector with prices attached to administrative control by the state.

We highlight:

- a) Medical prepaid organisations, with comprehensive benefits among which are FEMI with 23 subsidiaries. The majority counts with inpatient services of their own and its beneficiaries amounts to 1,400,000 people. The institutions have between 3,000 and 240,000 users each one.
- b) Highly Specialised Medicine Institutes (IMAE) of public and / or private nature financed by National Resource Fund (FNR [www.fnr.gub.uy](http://www.fnr.gub.uy) ). It is a reinsurance for the whole population that include complex care of cardiovascular, renal and osteo-articular pathologies and high-cost medicine.

Since March 2005 the government has called for changes in the model of care management and financing of the sector and so created a National Integrated Health System (SNIS). Its main goal is to contribute to the equity of access to the health services and the application of a strategy of Primary Health Care, prioritising citizens' needs and rights through disease prevention, education and health promotion, emphasising the active development of care conducts and social participation. It is financed through a Nation Health Fund (FONASA) that allocates resources to the health sector from capitation according to age and sex, prepaid and with achievement of goals settled by the National Health Board (JUNASA). From these strategic lines FEMI undertakes the implementation of the FSD Project. This is a major challenge for the organisation, which without doubt will result in health benefits for the country.

FEMI participated in projects for the development of their internal management systems. In medical care and computerisation projects of the clinical layer, few but very timely developments have been achieved.

An inter-institutional communication network was implemented, installing voice communications over Internet protocols, a data centre and a database for Mail applications, as well as inter-institutional mailing.

The existence of a communications network with security levels and guaranteed responses has allowed the FSD Project to propose functions for inter-institutional interoperability.

The Uruguayan health system underwent significant changes regarding its conception and financing, so FEMI also had to adapt to those changes to face these new demands of management. In this context and with the need for clinical and epidemiological information of its population, the FSD Project arises. The project's main vehicle to achieve improvements in the global care and management process



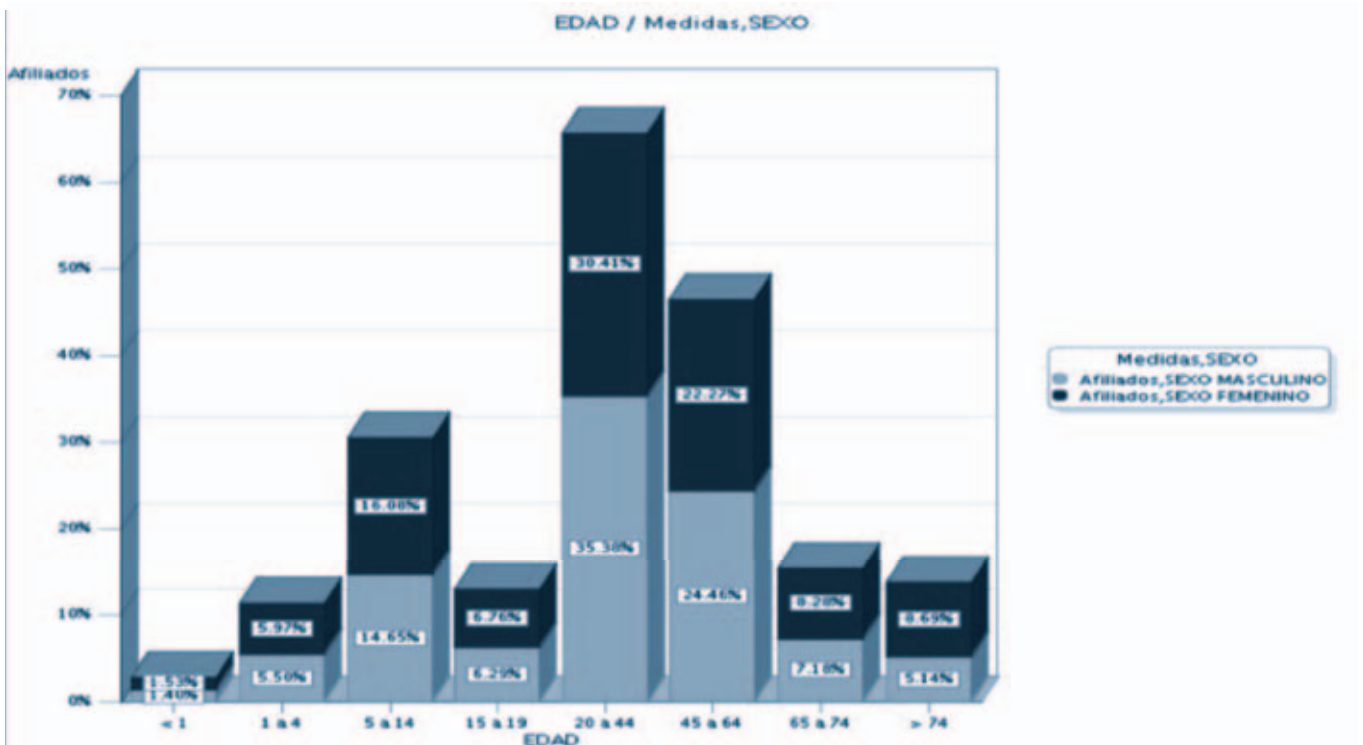


Fig. 3. Distribution by age and sex of the users of FEMI's system. (Source: SIG of FSD Project).

## Cultural Change

Cultural change is a complex process that raises a dilemma, people cannot change if the system does not change, and this cannot change if people do not change. Given the high complexity of the proposed change in FEMI it was necessary to involve the political, economic, union and technical levels of the organisation to work on:

- 1) Organisational communication management;
- 2) Key actors; and
- 3) Training.

To implement such a project knowledge must be acquired in:

- Biomedical informatics;
- Electronic health records;
- Decision making support system and health quality;
- Medical informatics standards (privacy, confidentiality and safety);
- Health multimedia and telemedicine;
- Organisational aspects and change management in biomedical informatics;
- HL7 standards and vocabulary;
- Unequivocal people identification; and
- Federal authorisations.

The FSD project has had, from the legal point of view, assured viability regarding the existing regulatory framework.

In the development of computer law and its junction with telematics law, it is possible to distinguish three moments

in the consideration of new realities on the part of objective Law, namely:

- a) A patrimonial stage;
- b) A relational stage; and
- c) A personal stage.

In this context, tension is verified between the relational perspective and the personal perspective facing the new problems and situations that arise from the globalisation of knowledge. Every subject cannot be seen as a simple sender or receptor of data located somewhere in the network that holds our world.

The project is contemporary to the health reform and also contemporary to the development of the legal framework that supports it. For more information please visit: [http://www.femisaluddigital.net.uy/files/informecepal/Aspectos\\_Legales,\\_Dr.\\_Carlos\\_Delpiazzo.pdf](http://www.femisaluddigital.net.uy/files/informecepal/Aspectos_Legales,_Dr._Carlos_Delpiazzo.pdf)

The speed of change in ICT and its applications in everyday life forced the in-depth study of the discipline and its projection for the following years. For this, FSD:

- Revised IMIAs recommendations;
- Participated in the main congresses of the speciality;
- Revised local, regional and international projects in process;
- Revised recommendations of international standardisation organisms of medical informatics: HL7, Open EHR, SNOMED CT, IHE; and
- Contemplated the recommendations of the hired consultant for the HCE specifications.

The reached definition of the product suffered modifications such as the necessity of using terminological services to ensure the quality and re-usability of the data registered in HCE (diagnosis and procedures). This provoked the inclusion of new tasks in the original chronogram like the implementation of terminological services, the implementation of internal and external interoperability, and implementing a master person Index. The benefits of the HCE for the health team and patients are:

1. Universal accessibility;
2. Information safety; and
3. Information quality included which impacts on customer service and patient's safety.

## Costs

Two types of costs can be identified in the project. The tangible costs are defined as:

- Goods
- Consultancies

The intangible costs are identified as:

- Inappropriate conducts to change
- Politico-economic concessions in the implementations
- Contingency costs

Direct costs are those that can be associated to the final products:

- Diagnosis Consultancy, Informatics Plan Development and System Specifications;
- Development, adequacy and implementation of the application of HCE;
- Internal and external interoperability of the systems;
- Terminological Services;
- PMO;
- Software acquisition for the Epidemiologic and Countable Information System; and
- Implantation of processes and work methods for telemedicine.

Indirect costs are:

- Human Resources;
- Monitoring, evaluation and diffusion of the experience; and
- Miscellaneous expenses.

## Cost Assignment Methodology

To be accountable to the funders, it was necessary to present costs by final product:

- HCE
- Telemedicine
- Epidemiologic and Countable Information System (SIEC)

To assign the indirect costs to the expected products the methodology of costs by absorption employed, using as base the distribution of applied hours. This way, it was a total cost per product, which then served for the analysis of return of investment.

The investor has to have an estimation of cost-benefit of investing in one or other option, or the reason to allocate a share of their income to invest in ICT, rather than equipment, quality programmes and so on.

The developed product is much more than software, it is a comprehensive solution that includes interoperability, connectivity, processes improvement, and improvement in the quality of healthcare decisions and patient welfare.

## Lessons Learnt

We encountered unforeseeable problems at the beginning of the project. They regard issues related to the planning or design stage of the project, to legal realities related to technological change and the change management strategy.

Change management efforts were focused on training doctors, nurses, medical register staff and informatics staff of the member institutions. This demanded proper activity synchronisation with the software installation, avoiding that the latter was done at a too early stage generating frustrations.

The situation diagnosis for the implementation of ICT, the design of the informatics plan and the detailed specifications of the systems had to be done in a previous stage to the project design to know the needs and foresee the obstacles that the project was to encounter.

- In the formulation of specifications of complex software purchase, it is consolidated the need of counting with a technical team integrated by experts in medicine, epidemiology, informatics, medical informatics, economic and legal.
- The human resources selection to form the Executive Unit of the project offered difficulties in the beginning due to the novelty of the subject, the different disciplines to integrate and few available professionals.
- We note that these type of experiences, with execution stages of long duration, where the installation of the ICT products is usually done progressively through time and in different institutions at the time, is convenient to plan the execution of intermediate products or services so as to manage the expectations of those interested and the institutions.

From the legal perspective, we highlight:

- The definition of the business model to the acquisition of the HCE-FSD, "development of their own or outsourcing".
- The importance of having a legal advisor to deal with the issues of intellectual property of the developments in the frame of the project FOMIN/BID.

From the perspective of technological change:

- The products to be acquired or developed need to have enough flexibility to adapt to the existing systems of the institutions and co-exist with them.
- The choice of a good provider is sustained in qualities not always objectified and it is based on "the confidence inspiration" in a relationship of mutual commitment and support in time.

The real value of this type of experience does not lie only in the implementation of the different products, but in the knowledge generated, which becomes a part of the intellectual capital of the organisation.



# VOTING IN CAD FOR MAMMOGRAPHY

## Achieving Low False-positive Rates for Greater Levels of Certainty

AUTHOR

Yuri Prizemin  
Parascript

**Computer-aided detection (CAD) uses software and computers to bring suspicious areas on a mammogram to the radiologist's attention. According to the American Cancer Society, early research suggests that CAD systems help radiologists diagnose more early-stage cancers than mammograms alone. But some doctors disagree about the accuracy of identifying cancers with CAD software. Some feel that CAD devices are not as effective as simply having a second radiologist review films or digital images (double reading), due to the occurrence of false positive identification of benign breast changes, deemed suspicious. However, single reading is already a primary screening method used in the United States and double reading is declining in Europe since fewer radiologists are entering the mammography field.**

Despite this, many radiologists are dubious regarding CAD because of the occurrence of a high number of false-positive marks on CAD interpretations. The incidence of a large number of false-positive marks by a CAD system (with current rates 5 - 10 times higher than those of radiologists) can significantly hinder its usefulness by distracting the interpreting radiologist. A significant reduction in false-positive rates is required in order for CAD to become comparable, performance-wise, to the opinion of a second radiologist.

### CAD and False Positive Rates

It is possible to reduce the false positive rate and increase sensitivity, by combining the individual results of multiple engines and employing a voting mechanism that considers each. However, developing a voting scheme and algorithms to provide improvement for a particular combination of engines is a challenging task, requiring special aptitude and experience. The number of engines included in voting schema, their types, key expertise, accuracy of each engine are just a few factors that have to be considered in choosing the right voting algorithm. In particular, it is very important to analyse whether or not the engines use similar approaches and whether they produce different or similar types of errors. Engines using similar approaches to recognition and producing similar types of errors are called non-orthogonal. Engines based on varying methodologies and, therefore, making different errors are called orthogonal. Voting scheme and algorithms are very different from non-orthogonal to orthogonal engines.

In any case, voting algorithms are uniquely created to homogenise results of particular engines, focus on individual engines' strengths, avoid their weaknesses, and suppress unimportant results. In some cases voting eliminates the results of an engine or algorithm altogether; in others it combines them with the results of others. Successful medical imaging technologies need to consider the strengths and weaknesses of particular engines, their peculiarities and individual characteristics and other factors. Employing non-optimal voting algorithms may not bring about an improvement of results and may even deliver poor performance.

### FACTS ON BREAST CANCER

The chance of developing invasive breast cancer is about 1 in 7 (13.4 percent). The National Cancer Institute estimates that there were 207,090 new cases detected and 39,840 women died of breast cancer in 2010. While in the past approximately only 75 percent of women diagnosed with breast cancer survived five years after detection, today nearly 90 percent of women diagnosed with breast cancer will survive their disease five years after detected. This increase in survival rates is largely attributed to advanced treatment methods and routine mammography screening, including CAD systems.

### The First Applications of Voting Methodology

The implementation of a powerful combination of engines using a number of fundamentally different algorithms and techniques was initially applied in the postal automation industry. A combination of a human-like holistic analysis, multiple neural networks and sophisticated statistical voting algorithms enabled a significant improvement in recognition rates and a decrease in error rates in mail processing.

These advancements in mail automation were first achieved in 1998, when the Remote Computer Reader (RCR) applied by the United States Postal Service recognised about 35 percent of machine printed and two percent of handwritten letter mail pieces. Thanks to the use of voting methodology modern systems recognise 93 percent of machine printed and about 88 percent of handwritten letter mail – or more than 90 percent cumulatively. Similarly, the application of multiple engines in a voting scheme for the banking and financial services industry raised the read rates in payment automation from 40 percent in 1997 to 80 percent at a one percent error rate today. The universality of these algorithms and methods makes them fully applicable to the medical imaging market.

## Voting in Medical Imaging

Multiple, parallel recognition processes offer technological advances in medical imaging. Each image recognition process may identify areas of interest on the mammogram image independently, without sharing information with other image recognition processes. Image recognition processes might also work together to identify different areas of interest. After image recognition processes individually identify areas of interest or objects on the mammogram image, the different areas can be compared to determine a confidence value related to the accuracy of the identifications. The comparison can be done using a voting process.

Comparing the results of multiple image recognition processes allows for the mitigation of the inherent faults of the image recognition process, thus leading to reduced false-positive and false-negative rates. Additionally, methods utilising multiple image recognition processes, rather than a single one, amicably lend themselves to multiple processor systems or networks. Thereby, they allow image recognition processes to be determined in parallel, increasing computational efficiency and spreading the workload across multiple processors. The result is fast and produces accurate actionable information.

The voting mechanism experience in other markets suggests that utilising multiple image recognition processes is the

**“A significant reduction in false-positive rates is required in order for CAD to become comparable, performance-wise, to the opinion of a second radiologist.”**

most efficient means by which superior performance can be delivered to the market. In fact, this same experience shows that not using such an approach rapidly becomes a competitive disadvantage to the supplier that does not offer it to the market once it becomes available and accepted. The reduction of false-positive readings achieved through voting methodology in medical imaging could ultimately result in decreased medical costs, emotional stress, follow-up examinations and recalls. It is only when CAD systems achieve sensitivity and false-positive rates approaching those of a radiologist that they will be embraced as a second opinion tool with no hesitation.

# GUIDE TO THE APPROPRIATE USE OF TELERADIOLOGY

## Update from the French Society of Radiology (“Société Française du Radiologie” / SFR)

***As a result of developments in imaging technology and information technology, as well as improvements in communication, the pathway for the digital transmission of images was cleared. It is essential to understand how our organisations can integrate this new technology with the interest of the patient in mind, and it is with this as our foundation that, since 2005, the “Guide for the Appropriate Use of Teleradiology” created by the “Société Française du Radiologie” (SFR/French Society of Radiology) has become the reference point for the deployment of teleradiology in our country.***

### The Role of the Radiologist

Digital transmission of images ought, in principle, to allow for improved patient care – however, it can also lead to dysfunctions. The role of the French Society of Radiology (SFR) is to promote best practice, including innovation, and at the same time to avoid the ‘not so good’ practices! Digital image transmission also makes us reflect on the role of the radiologist and think about the following paradox; while teleradiology geographically distances the radiologist from his patient, patients increasingly need to interact with their radiologist. The transmission of images can be used for maintenance of radiology sites without a radiologist, but should also be used to support isolated or small teams, justifying their part in regional healthcare organisations.

In radiology departments, the patient pathway is organised according to steps that include the examination request, validation of the request, reception of the patient, information and consent for performing the exam, and patient safety and monitoring. The radiologist is responsible for this organisation and for supporting the patient. To separate these processes may give them more autonomy but it will dilute the medical responsibility of the radiologist: for example, the request is made by Dr. A, validation by B, technical part completed by C, security provided by D, account completed by E, image archiving by F, management of the accounts by G – each stage of the process would have an individual person in charge, geographically separate and enabled by modern technology. In this extreme situation (which mirrors some industrial organisations), the act of

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[sfr@radiologie.org](mailto:sfr@radiologie.org)



Save The Date  
7-9 May 2012  
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medical radiology would no longer exist, responsibilities would be watered down and the role of the radiologist would be reduced to that of an image reader.

## The SFR Teleradiology Working Group

In this context, the objectives behind the creation of the SFR working group on teleradiology were firstly to share common experiences, their advantages and limits, communicate with institutional and individual stakeholders, and work in conjunction with all players up to a European level on all aspects of teleradiology. None of the group members had a conflict of interest.

The first objective of the group was to audit our radiology colleagues who were involved in teleradiology. The audit is now available on the SFR site (<http://sfrnet.org>) as an instructional document, rich in advice and ideas and available to everyone. The teleradiology charter, the outcome of all these experiences, is a summary of good organisational strategies. The first text box lays out some ground rules and key definitions for teleradiology. The specifications of the medical convention teleradiology ([www.sfrnet.org](http://www.sfrnet.org)) should be able to help each of us in this area.

## Activities in the Field of Teleradiology

Group members also participated in a number of conferences where the voices of radiologists were heard and, we hope, appreciated. The European Society of Radiology (ESR) e-health group was enriched by the work of French radiologists. They were also present during the joint session with the European Commission in charge of the telemedicine directive, at the European Congress of Radiology (ECR) in 2010.

Communications regarding the work of the teleradiology group are held each year at the JFR (Journées Française du Radiologie) congress. During 2010 the sessions were held together with the SFR Management Working Group meeting and the SFR Emergency Room Working Group, a joint session including the members of the French Society for Emergency Radiology.

SFR Teleradiology Working Group Members were involved in the support of the Professional Council of Radiology/G4, during the telemedicine debates of the "Hospital, patients, health, territories" (HPST) law and the reports on telemedicine (Simon-Acker and Lasbordes) referenced our work; contacts with the institutions concerned with the drafting of the telemedicine decree, following the HPST law are numerous and yet the decree has still not appeared. A convention on good practice in teleradiology should bind together the French National Authority for Health (HAS) and SFR.

A territorial or regional organisation of teleradiology appears to act more and more as the guarantee of good practice. It is through regional organisation that good practices in teleradiology may be encouraged and, hopefully, promoted. Certain deviations, particularly some bids made by hospital managers, show that the risks of a certain 'demedicalisation' of the radiological act, are still present and cannot be overcome simply by strong involvement of all the radiologists in the healthcare organisations of their territory or region.

## Charter of Teleradiology

The Professional Board of Radiology supports and contributes to national and regional level development of teleradiology. It is a medical organisation of radiological patient care, as described in the Guide for Proper Use of Teleradiology, developed with the National Council of the College of Physicians.

This chart summarises the essential principles.

1. Teleradiology is organised by radiologists, in cooperation with other relevant professionals and is part of the local organisation of radiology, of a specific site.
2. The act of teleradiology is a medical procedure supervised by rules of medical ethics and includes remote diagnostics and tele-expertise.
3. Teleradiology takes into account human relations between the patient, the clinician, the radiologist and the operator and all the technical requirements and organisational aspects, vital to ensure quality of care.
4. Teleradiology should be promoted in the organisation of care:
  - It should allow the doctor, who is in direct contact with the patient, to have access to high quality radiological services;
  - It should promote the transfer of knowledge and expertise among radiologists who use it (tele-expertise and distance learning);
  - It is not simply a form palliative care, used to justify the authorisation for new imaging equipment or the renewal of equipment, without having a team of local radiologists working on a medical project.
5. The development of teleradiology in France is based on:
  - The territorial and regional development of networks, enabling cooperation between clinicians and radiologists to develop telediagnosis (remote diagnosis).
  - Research for the benefit of the patient, with access to the best available resources in radiology.
6. The French Society of Radiology is committed to developing its national recommendations, in cooperation with the HAS, many academic societies, the National Council of the College of Physicians, the Department of Health in particular, the Directorate General of Healthcare delivery and technically, with the industrial and institutional networks involved in uploading images.
7. The Radiologist
  - Both forms of teleradiology, remote diagnostics and tele-expertise, complete the usual local practice of the radiologist;
  - Teleradiology follows all quality requirements and steps taken in the medical radiological care of a patient.
8. The implementation of the charter depends on its validation by the onsite radiologist(s), the teleradiologist(s), the Regional Board of the College of Physicians and the Regional Committee of Imaging, bound by a written form of agreement or a medical contract.
9. Communication:
 

Direct communication between the teleradiologist and the applicant is required. The agreement specifies the obligations of the teleradiologist in case of emergency and the possible need to travel to another location.
10. The contract documentation includes:
  - A set of documents (medical conventions or contracts) signed by the onsite applicant(s) and teleradiologist(s): each teleradiologist, except in exceptional circumstances, individually signs the medical contract / agreement with the local site and has it approved by the Regional Board of the College of Physicians.
  - A contract or a technical agreement signed between the onsite applicant(s), the teleradiologist(s) and the structure, ensuring the logistics of the necessary teleradiology technology.
  - One or more financial annexes specify both the compensation package of medical benefits as well as and the technological services and logistics.
11. Ethics and Safety
  - Information for the patient and their consent for the teleradiology procedures are required;
  - Securing identification of the patient and all those involved in teleradiology, assuring confidentiality and integrity of the information exchanges comply with the code of medical ethics and French laws.

# THE SWISS HEALTHCARE SYSTEM

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**Switzerland's healthcare system is subject to change. Cost containment, competitiveness, transparency of service quality, need for manpower and trend to outpatient care are the main constraints that hospitals face today. Political decision making like the introduction of diagnosis related groups (DRG) further advances this process, which will intensify networking among hospitals, promote specialisation and lead to the closing of those enterprises who cannot meet the challenges of competitiveness.**

## Facts and Figures

Switzerland contains 7.7 inhabitants on a space of 41,285 square metres. The four official languages are German (64 percent), French (20 percent), Italian (6.5 percent) and Rhaeto-Romanic (one percent). The remaining eight percent speak other languages. 20 percent of the population are foreigners. Switzerland is a confederation, divided into 26 cantons (politically autonomous regions). Its gross domestic product is 424 bn. USD, which is 55,000 USD per capita. Life expectancy is 80 years on average for men and 84 years for women.

Healthcare services are one of the growth and innovation sectors. The hospitals alone have a turnover of 20 bn. Swiss francs. The direct value added by Swiss hospitals sums up to 9 billion Swiss francs, 2.1 percent of the GNP. In addition the Swiss hospitals add indirectly a value of 3.8 bn. Swiss francs (value added, by demand of hospitals at other suppliers).

In 2007 the Swiss hospitals employed 130,000 full time equivalent; these are 35 percent of all employees in the healthcare system. The quota of women is 75 percent; the quota of part time employees is 44 percent. The hospitals employ 19,000 medical doctors, 49,000 nurses, 30,000 other healthcare professionals and 30'000 other professions. The hospitals' total pay for salaries is 12 bn. Swiss francs per year.

The costs of the healthcare system amount to 55 bn. francs, with a tendency to rise each year. The access to healthcare services exists for everybody, and the medical catalogue of the social insurance system is large (except

dental medicine). Switzerland's expenditures on social healthcare are therefore high in comparison with other countries. However, costs for healthcare have not increased more than the GDP during the last five years. That's why the healthcare's cost ratio on the GDP is stable; it amounts to nearly 11 percent.

In principle, Switzerland has a mandatory health insurance system. Each citizen has to be insured by an insurance company, and gets paid basic healthcare services. Citizens can be additionally insured in a non-regulated healthcare insurance market, which covers special healthcare services. Within one company, premiums are the same for everybody, regardless of one's income. Insurance companies are privately owned companies and cover all expenses of the ambulatory services. The costs of the hospital services are divided among the insurance companies and the regional state unities (cantons). This is the social element in the healthcare financing. Nevertheless, a diminishing number of people can afford the insurance premium, and more and more citizens receive government subsidies.

The mandatory insurance system covers about 43 percent of the healthcare system's costs, providing for health, accidents, and disability. Private households account for 30 percent, public spending for 17 percent, and private health insurances for 10 percent.

## Trends and Challenges

This section will examine the trends and challenges in the Swiss healthcare system. Four actors are in focus: hospitals (as medical service providers), state (es-

pecially cantons), health insurance companies, and patients.

The actors' roles are complex and multifaceted. Hospitals are basically healthcare providers, but besides they are often an important factor for regional economy and employment. Cantons are not only state actors, but mostly they also own and pay hospitals, and they adopt and control tariffs. Health insurance companies are private enterprises, but as providers of mandatory health insurance they interpret the role of a state authority. And, last but not least, patients are also citizens, taxpayers and insurance holders.

The main focus lies on hospitals. Their system is changing, and the challenges they face are heavy: Cost containment, stronger competition among themselves, transparency of service quality, more need for manpower and trend to outpatient care.

## The Swiss Hospital System is Changing

The Swiss hospitals undergo a profound change, which is manifold.

- Most cantons have changed the status and organisation of public hospitals. 18 of the 26 cantons have regrouped their hospitals to one juridical and organisational unity, mostly as entity of the public law. Only three of them have chosen a form in private law.
- The hospitals have reduced their capacities over the past years. Beds have been reduced in great numbers, from 76,000 in 1982 to 40,000 in 2008. At the same time, the number of patients has risen from 0.95

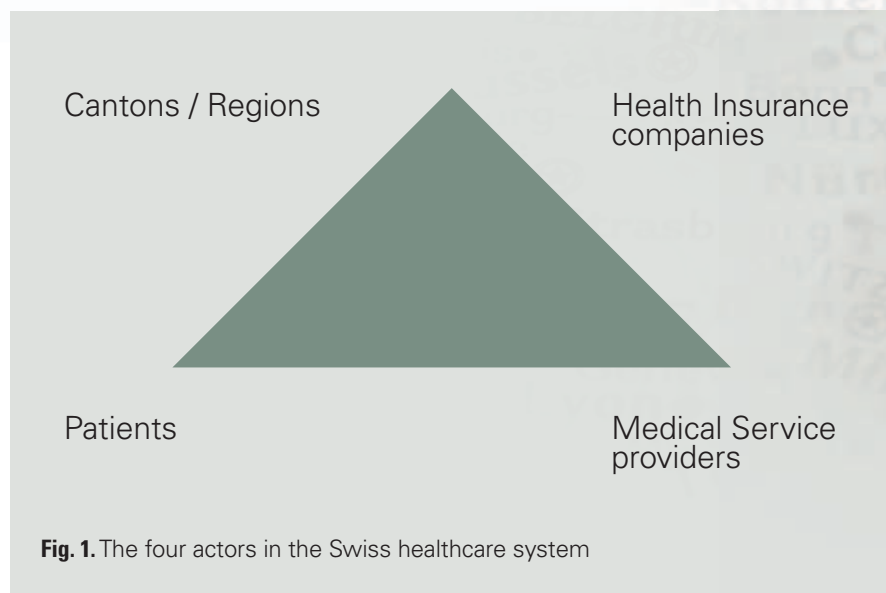


Fig. 1. The four actors in the Swiss healthcare system

to 1.2 million. The average length of stay is 10.7 days in 2008 (7.8 days in acute care hospitals), which is 12 percent less than five years before. Shorter stay is the consequence of more innovation.

- Swiss hospitals are internally changing their organisation. They tend to focus on a core business, a trend that is accelerated by the introduction of the new hospital financing system: Diagnosis Related Groups, or DRG. In particular public hospitals are forming partnerships, e.g. for purchase, and are forced into networks.
- Healthcare providers need more manpower in order to meet the growing demand for healthcare from an aging society. 60,000 retired professionals have to be replaced until 2020 and it is estimated that 25,000 professionals have to be recruited additionally.
- Private hospitals are regrouping and gaining more patients with complementary private insurance in a shrinking market.
- Hospitals are closing (stable number of hospitals until 1970: around 250; from 1970 to 1982: rising to 460; from 1982 to 2008: declining to 320).

The political framework requirements change as well. In 2007 the Swiss parliament decided on a new hospital payment system, whereby cost covering

and financing of hospitals as structures is replaced by paying for performance. Cantons and mandatory health insurance companies share the hospital financing in a ratio of 55:45. The revision comes into force in 2012.

### Challenges to Swiss Hospitals

Hospitals are the most important part of the whole healthcare system. They drive the inventions; they provide the most complex – and most expensive – healthcare services. The healthcare sector covers over one tenth of the gross domestic product, the hospitals alone about one fifth. The healthcare sector is expanding more than the average economy, and it will continue to do so.

The Swiss hospitals offer very different services depending on their size and ownership status (public or private). Their sizes also greatly differ, from five beds to 2,167 beds. There are five university hospitals throughout the country, with total 5,900 beds for 7.7 million inhabitants. The 14 biggest hospitals, nine percent of all hospitals, contain 45 percent of all beds, which reflects their importance in healthcare provision. In contrast, the 87 smallest hospitals of acute care, 54 percent of all hospitals, offer only 13 percent of all beds.

### Cost containment

With its combination of medical, technical, pharmaceutical and biological innovations

on the one hand, the social insurance system on the other hand, the costs of Swiss healthcare are rising each year, and with it the premiums of the insured population. Pressure on hospitals by the media, the public and the politicians is high. Yet it remains to say that the citizens – patients as well as employers – and the economy as a whole are profiting from modern, although expensive medical services.

### Competitiveness

Swiss hospitals have undergone changes to strengthen their efficiency in recent years. Yet they are expected to be even more efficient. One of the incentives is financing by DRG. Swiss DRG is similar, though not equal, to German DRG, and is due to be introduced on 1 January 2012. The DRG may serve as the basis for a more competitive hospital market, which would include a role change of the up-until-now, dominant cantonal authorities.

It has to be accepted that more hospitals will close. The new method of hospital financing will put the medical service providers under more pressure to perform efficiently. Especially small and middle-sized hospitals will probably search solutions in specialising, i.e. in focusing on medical services in which they have a competitive advantage. In fact, many specialised hospitals do already exist, often run by private owners. Parallel to specialisation, Swiss hospitals are forced into networking by the constraints of price pressure, cost containment and quality requirements. Public as well as private hospitals are collaborating more: some merge completely, some combine certain services.

40 percent of the hospitals are run privately. In the past five years, two big private hospital groups have emerged, each consisting of a dozen sites. In addition a network of another dozen private hospitals has been founded. Many other private hospitals hope to continue independently, as a provider of very special services, and/or as a regional actor.

### Transparency of Service Quality

Politicians and public opinion are demanding more transparency in quality. Today, half of the Swiss hospitals publish their yearly quality reports under the new Label H+ qualité. H+, the national hospital association, has already

released two branch reports on quality based on these documents. The national administration, for its part, has published quality data on the basis of mortality. However, mortality on its own can never be an adequate indicator for quality.

### Manpower Need

In the short term the rising need for health professionals can be covered by recruiting abroad. The mean of foreign personnel in Swiss hospitals is at 30 percent, but in some enterprises the foreigner quota amounts to over 50 percent. In the long run Switzerland has to supply its own health professionals, by providing more training positions, better marketing and securing formation financing, as well as by other means.

### Out-Patient Care

A rising number of hospitals and clinics have developed to centres of competence for out-patient diagnostics and therapies. Swiss hospitals deliver up to 40 percent of all out-patient services in a region. Nowadays, patients who used to be hospitalised for several days can return home and go back to the working place much faster thanks to out-patient treatment and after care. The transition between in- and out-patient treatments becomes smooth. The introduction of diagnosis related payment will further advance this development.

### Patient Expectations

Switzerland faces the same trends and challenges as many other "western" countries: The population is ageing, meaning increased demand for healthcare services. The baby boomer generation is entering the healthcare market in large numbers. Society has become more individualistic, with higher mobility, a growing proportion of one-person households and a tendency to seek more professional healthcare for curing more kinds of illnesses.

On the other hand, today's patients are better informed. Books, internet and self-help groups provide lots of information. In Switzerland, like elsewhere, a consumer attitude towards healthcare has emerged. Consequently, hospitals are often judged by the hotel services they provide, rather than by their medical services. Expectations towards the whole service package

are rising. The distinction between wellness and healthcare services is getting blurry: Health insurance companies are offering the use of fitness centres, and life style medicine is advancing.

**"More rules, especially market rules, will be provided on the national level, a process which might weaken the position of the cantonal authorities."**

Waiting lists are not frequent within the Swiss healthcare system. Patients wish to maintain this situation even at a high cost. On the other hand, people have a hard time paying for their mandatory insurance premium. As a consequence, many cancel their complementary private healthcare insurance.

### Cantons

The cantons hold many roles: Owner and financier of public hospitals, tariff adopter and controller, legislator etc. In particular, cantons decide who appears on the hospital list, and whose services are therefore subsidised. However, the cantons' roles are changing. More rules, especially market rules, will be provided on the national level, a process which might weaken the position of the cantonal authorities. At the same time, there is a great financial responsibility for the insured population, and pressure on cost reduction will be upheld.

Still the cantons will keep a lot of power. Lately, they even seemed to widen their scope by starting and enforcing health promotion and prevention campaigns.

### Health Insurance Companies

The role of health insurance companies is complex and ambivalent. As private enterprises they are profit-oriented and act within a competitive environment. However, since they all have to offer and pay the same medical services within the mandatory health insurance, real competition is restrained. Instead a pseudo competition takes place, usually concerning the young and healthy insured because they pay the insurance premium

without demanding expensive services. The number of healthcare insurance companies has reduced dramatically within the past two decades, from a thousand to less than one hundred. In the near

future the concentration will continue. Many insurance companies can only survive due to cross subsidises within a holding. Their substance might soon be consumed. So called "cheap insurance companies" who have insured mostly young and healthy people will have to raise their premiums, too. The "hunt for the good risks" can only be inhibited by introducing a risk compensation, which is effective, i.e. by adding morbidity to the criteria of age, sex, and hospital stay.

The influence of health insurance companies on political decision-making is high, since many parliamentarians represent and defend their interests. They even aim for more power within the healthcare system. For example they seek more control over patient data, an aim that is often in conflict with data protection law.

### Ongoing Issues

Switzerland's legislation process is long. The political parties, as well as the federal power sharing and interest groups, do anything they can to save their particular interests, and therefore tend to block progress. This is true for most political domains but for healthcare reforms in particular.

The most important upcoming reform is the introduction of managed care, i.e. the coordination of therapy processes along the whole chain of treatment. To achieve the reform, all medical service providers have to be included in equal measure, independent doctors as well as hospitals and clinics. Managed Care must focus on chronic, complex and critically ill patients. Next to the refinement of risk compensation, monistic financing has to be installed.

# EHEALTH SUISSE

## Coordinating E-Health in Switzerland

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### The Swiss Healthcare System

Switzerland is a federal republic consisting of 26 cantons, with Bern as the seat of the federal authorities. The 26 cantons of Switzerland are the member states of the federal state of Switzerland. The Swiss Federal Constitution declares the cantons to be sovereign to the extent their sovereignty is not limited by federal law. Most significantly, the cantons are responsible for healthcare, welfare, law enforcement and public education.

Healthcare is regulated by several legal frameworks: The federal level only sets the legal framework for health insurance, access, equity and reimbursement, mostly through the Federal Health Insurance Act of 1994. Health insurance is compulsory for all persons residing in Switzerland. The competence for organising the healthcare system is at the canton level. Thus, there are 26 ministries of health and 26 legal frameworks that set the health laws.

The professional groups are similar to the ones in most European countries, playing important roles and acting as stakeholders, such as the Swiss Federation of physicians, of nurses, of pharmacists, of medical informatics, etc. as well as the academy of medical sciences, the university and high schools, amongst others.

Building an e-health framework for Switzerland is thus confronted to similar challenges as building e-health for Europe: Heterogeneity, education and culture with several languages, numerous legal frameworks and political organisations, different cultures and understandings.

### The role of eHealth Suisse

One of the first important actions has been to define a Swiss coordination organism, in charge of organising the process, providing sustainability and coherence. In order to succeed, the e-health strategy must be nationally planned and coordinated while respecting the needs, requirements and autonomy of each canton. The Confederation and the can-

tons have therefore concluded a framework agreement and created a coordination body, eHealth Suisse, in 2008.

The coordination body represents a political governance in the steering committee and includes representatives of numerous stakeholders, including patients, in the advisory board. It has a project management team which coordinates the work of four groups devoted to:

- Standards and architecture;
- Pilots and implementation;
- Patient portal, and
- Education.

The core task of eHealth Suisse is to push interoperable e-health solutions in all its dimensions, this means at the technical, organisational, political and legal level.

In addition, Switzerland is actually working at proposing a global and federal legal framework for e-health. This work is managed by the Federal Office of Public Health (FOPH).

### The Swiss E-Health Architecture

In order to respect the political organisation of Switzerland and the legal framework that addresses data processing, personal data and privacy, a set of major pre-requisites have driven the work. The following points summarise the major pre-requisites:

- No central patient registry;
- No central document registry;
- Patients self-determination of which information is available to whom;
- Consent management;
- Use of standards wherever they exist; and
- Use of European standards wherever they exist.

Adopting a concept that is similar to the National Contacts Points (NCP) defined in the epSOS European project, one defined Switzerland as being a group of "communities". These communities can have any size and cover heterogeneous groups of care providers, such as groups

of physicians, hospitals, or even states. They have their own internal organisation, but communicate with other communities by the mean of "gateways": eHealth Suisse published the specifications of the gateways, following IHE cross-community exchanges profiles. In addition, a role-based access management system as well as sets of global rules to manage new roles, new care providers, etc. were defined. This year, eHealth Suisse is going to publish further recommendations about person identification and the authorisation system.

### Recent E-Health Initiatives Currently Running in Switzerland

One of the challenges is to have running pilots, that is getting concrete with large scale implementation, professional groups, care providers, patients, getting involved in the strategy and using the tools in their daily practice. Another important challenge is to find the funding for these pilots, taken into account that there is no federal financing possible and that canton's authorities have usually little means for such projects.

Several pilot projects are currently ongoing in several Cantons in Switzerland. The most advanced project is the e-toile project in Geneva. The Geneva Canton is the first Canton in Switzerland that has achieved the adoption of a law for the e-health and a large and successful public-private partnership for the implementation. This pilot started in 2010.

There are numerous other projects, such as:

- The canton Tessin realised the project "Rete Sanitaria". It took place from 2004 to 2007. Part of the project was an e-card for patients. At the moment, the canton prepares a continuation of the project.
- The canton of St. Gallen formulated its own cantonal e-health strategy in 2005. Various projects in the administrative and medical domain were or are being realised.



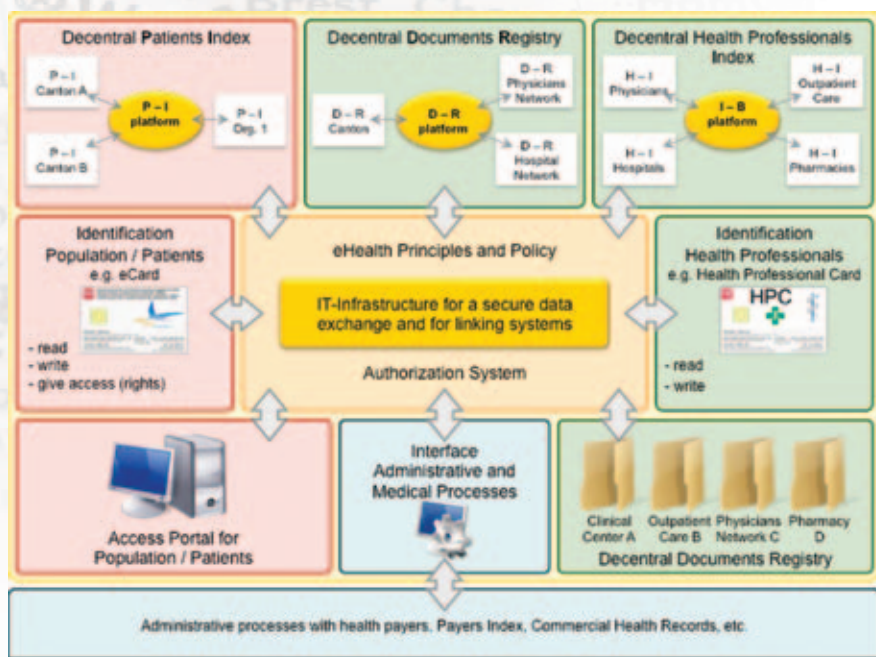


Fig. 1. Basic components of e-health architecture in Switzerland

➤ The canton of Basel has just started a broad pilot in the e-medication domain.

It is one of the main tasks of eHealth Suisse to push evaluations of these pilot projects and to try to disseminate the derived best practice knowledge among the cantons. The main issue of these evaluations is the topic of interoperability.

There are also telemedicine activities in Switzerland: Remote consultations (e.g. cantons of Geneva, Basel, Jura, Tessin), mobile telehealth (cantons of Basel and Wallis), emergency network (Geneva), and remote consultations / eVisits (canton of Basel). As there is currently no national programme coordinating or incorporating the different telemedicine services, eHealth Suisse recommends the Confederation and the cantons to achieve the measures of the European Commission on telemedicine (COM 2008, 689).

### The Benefits of E-Health

The official Swiss e-health strategy was approved by the Government in 2007. The core goal of the Swiss strategy is the establishment of an Electronic Health Record for all citizens by 2015. This ambitious deadline will most probably not be achieved, but it fosters and leverages the culture and the understanding of the challenges in health-

care. It lists greater efficiency, quality, safety and economic performance as the overriding strategic objectives of e-health:

- E-Health creates added value by improving the coordination of players and processes; and
- The processes and procedures in the complex Swiss health system are fragmented because of the federal structures and the fact that some players operate as small businesses and this leaves the processes prone to errors. End-to-end electronic processes can help to reduce errors and save lives.

Like everywhere else in the world, in Switzerland the benefits of e-health are a complex subject in experts' discussions. One difficulty is the fact that the benefits often do not occur where the investments are made. The benefits won by e-health were confirmed by the regulatory impact analysis (RIA) realised by the FOPH in 2010. RIA is a systemic approach to critically assessing the positive and negative effects of proposed and existing regulations and non-regulatory alternatives. The study showed that until the year 2031, the quantitative net benefit for the Swiss society thanks to e-health will go up to 1.6 billion CHF. A more detailed redesign of the RIA study that is currently made shows even significantly higher net benefit.

### The Security Issue

eHealth Suisse permanently emphasises the importance of security issue in the e-health context: To create future, well accepted trusted domains for the exchange of health data, the security aspect is one of the main preconditions. In the near future, eHealth Suisse will elaborate concrete recommendations for the data protection and security subject. At the moment, there are no binding security guidelines from eHealth Suisse or from another federal authority for the exchange of health data. There are no mandatory recommendations edited by the Swiss Federal Data Protection and Information Commissioner (FDPIC).

Of course, there are security constraints that have to be fulfilled by the care providers on the cantonal level at which the healthcare supply is offered. Moreover, the future Swiss e-health communities will have to pass through a certification process that is being defined by the mentioned federal legal project for e-health. One important element of this certification process will be security issues. The future Swiss communities will have to fulfill the constraints defined by the certification process before they are permitted to join the established trusted domains for data exchange between certified communities.

### Conclusions

E-Health addresses numerous challenges: Societal, cultural, educational, financial, legal and technical to quote only some of them. Building a global consensus amongst all stakeholders, creating awareness and sufficient educational level to avoid rising fear and privacy concerns are major factors for success. Technical solutions and commercial pressure must not impede this process. The transition and readiness can seem slow to obtain, but this is the real price of success.

Interoperability has become one of the major targets in this field. However, one must not expect technical solutions to solve misunderstanding and lack of collaboration between people. Thus, addressing this aspect is a major prerequisite in order for e-health strategies to succeed.

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## JANUARY

**IT @ NETWORKING AWARDS 2012**  
18-19  
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*Algarve, Portugal*  
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**ELECTRONIC DOCUMENT  
MANAGEMENT IN HEALTHCARE**  
9  
*London, UK*  
[www.healthcareconferencesuk.co.uk](http://www.healthcareconferencesuk.co.uk)

## MARCH

**ECR**  
1-5  
*Vienna, Austria*  
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**CONGRESS OF THE EUROPEAN  
ASSOCIATION OF HOSPITAL  
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21-23  
*Milan, Italy*  
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## APRIL

**ConHIT**  
24-26  
*Berlin, Germany*  
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## MAY

**E-HEALTH WEEK 2012**  
7-9  
*Copenhagen, Denmark*  
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## SEPTEMBER

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27-28  
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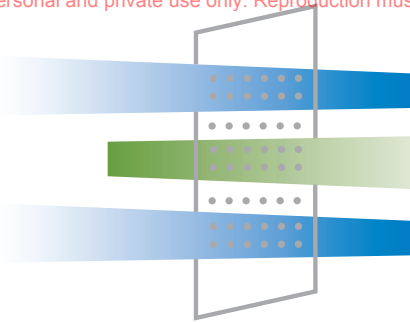


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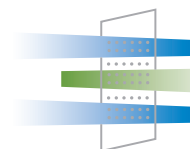
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