2020health.org conference in association with EDS Hewlett Packard
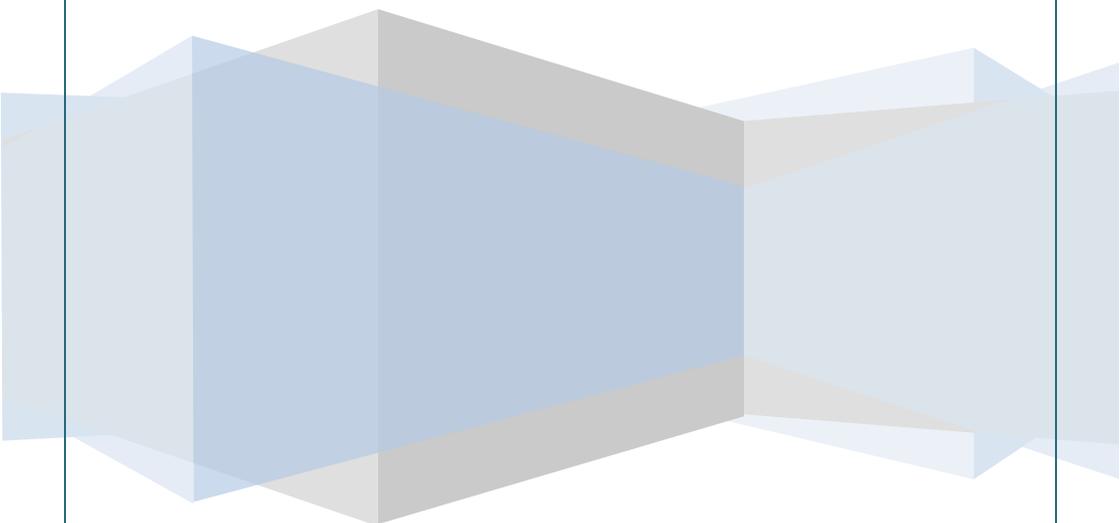
Investing for success in healthcare IT

19 May 2009

Royal Society of Medicine

About this Publication

This publication is a collection of the presentations made at the 2020health conference *Using IT to improve patient outcomes* on May 19th 2009, and the opinion pieces of some of the speakers and our sponsors, EDS Hewitt Packard.

The delay in the implementation of the NHS IT programme has distracted from the benefits to patient care that IT enables and this conference aimed to demonstrate the transformations to healthcare and improvements in efficiency that well developed technology can deliver.

We are extremely grateful to all those who took part in this event. Each speaker highlighted a different way in which IT has or is making possible more efficient electronic patient records or healthcare processes. This document is a compilation of their ideas and experience demonstrating that as a result of progress in IT, more people will be treated in the community or spends less time in hospital.

We are indebted to all our sponsors for their unrestricted funding, on which we depend. As well as enabling our ongoing work of involving frontline professionals in policy ideas and development, sponsorship allows us to communicate with and include officials and policy makers in the work that we do. Participation in the work of 2020health.org is never conditional on being a sponsor.

Julia Manning, Chief Executive

November 2009

Contents

Executive Summary

Perhaps due to the well-publicised setbacks in the implementation of an Information Technology (IT) programme for the NHS, doubts have begun to creep in about the feasibility and practicality of large-scale IT projects. In response to this, 2020health invited a group of experts on the subject to discuss the implications of a health service Information, Communication and Technology (ICT) programme, in terms of the possible gains and the potential challenges.

With the many opportunities for greater efficiency, integration and improved care, medical professionals as well as the general public feel that the NHS should be modernised to constitute the best available system. The aim of the conference was to consider IT in terms of how it can enable better performance, service and health outcomes via case management, bed planning, discharge planning and patient records. Furthermore, the seminar would consider how the establishment of such a communications system would affect stakeholders within the health service, and how they could benefit from it.

Broadly speaking there were four clear discussion themes of new IT systems which could be termed as integration of technology into:

- Existing methods of treatment
- Existing managerial structures
- Current professional practice
- Overall patient experience

For healthcare IT to be a success, it cannot simply be bolted onto systems that were not designed to accommodate it. Instead, there must be changes to take fully into account the new possibilities that IT creates, and to capitalise on the opportunity for increased efficiency. Systems must be designed to ensure that changes are effective without causing unnecessary disruption to management or clinicians.

In order for such change to take place, there will be a need for concerted leadership from NHS managers. A significant change in the systems and processes of healthcare has the potential to disrupt the work of healthcare practitioners if not properly implemented; there would need to be clear vision and focus on the part of managers to ensure that any transition would happen smoothly. Perhaps more importantly, such a transition would require a commitment to strategic and long-term goals in healthcare; a short-term view of IT in the health service is simply not practical. Along these lines, it is vital that healthcare managers fix reasonable goals and help to ensure realistic expectations from patients and clinicians.

Patients and clinicians themselves stand to derive the greatest benefit from integrated IT systems; communications and technology improvements are simply a means, while better clinical care is the ultimate end. This will demand significant input from medical professionals to ensure that systems are tailored to meet their needs and the demands of their role. Additionally, clinicians will have to adapt to new possibilities offered by technological changes; opportunities such as remote disease management, which might be preferable in treating the patient but have hitherto been less practical.

Therefore, although IT systems must be established in such a way that they are compatible with current practice, clinicians themselves must be prepared to embrace new practices that will be offered with improved IT.

Of course the aim of integrating IT into healthcare is to improve treatment of patients. The experts involved in the conference considered that IT could make a significant contribution to the involvement of patients in their own treatment, and in doing so promote better health outcomes. These outcomes might be as a result of better communication between patient and clinician, for example online patient forums that currently help to teach thousands of clinicians, or of efficiency savings such as home-based care that does not require a doctor to leave the hospital to consult a patient.

Benefits of investing in IT for better healthcare outcomes

This conference report is a collection of ideas and experiences that conference speakers felt demonstrated the potential of investing in IT, including the shift of more people being treated in the community or spending less time in hospital.

The Kaiser Permanente experience with the Electronic Health Record (EHR)

An EHR has the capacity to integrate and organise all patient information, facilitate its instantaneous availability to all participants in the health care system including patients, and inform and support the work of practitioners with the most current evidence.

Kaiser Permanente's (KP) implementation of its Electronic Health Record technology, Health Connect and myHealth Manager, in Hawaii led to a reduction of 26% in hospital visits through a significant increase in telephone consultations and use of secure messaging between patient and clinician. Data from Health Connect now helps KP clinical teams track and manage patients with chronic conditions such as cardiac disease, diabetes and chronic renal disease. This allows each team to efficiently and proactively identify patients in need of additional care and interventions. In support of KP's Healthy Lifestyle Programmes, its Total Health Assessment tool has led to 58% of smokers involved quitting as well as 56% involved losing weight and 58% experiencing a reduction in stress.

These results can be attributed to the fact that the Health Connect project was approached as a strategic investment to transform health care delivery, rather than as an IT project. Its aims were to:

- enable the home to be the locale of choice for treatment;
- integrate treatment and wellness activities for holistic care;
- provide technology to enrich the patient care process;
- enable the patient to be a true partner in the delivery of their health.

The project was set as a top priority with long term commitment at Board level and was driven by operational and clinical leadership and priorities while addressing the culture of the organization. Success required clarity around shared strategic goals and ultimate outcomes, full engagement of all stakeholders throughout the process, and a coherent information technology plan.

Improving patient care with the EHR

A case study

In the growing movement toward health care reform in the United States, the development and use of the electronic health record is moving to centre stage as a vehicle for improving quality and controlling costs. The experience of Kaiser Permanente in deploying KP Health Connect, its Electronic Health Record, has demonstrated the significant impact a well - developed EHR can have on the delivery of health care.

Fundamentally, an EHR has the capacity to integrate and organize all patient information, facilitate its instantaneous availability to all participants in the health care system including patients, and inform and support the work of practitioners with the most current evidence. In doing so, it can

simultaneously improve clinical quality and efficiency, enhance patient safety and satisfaction, and alter the process of delivering health care in the 21st Century. But the achievement of these positive results is not inevitable. Success will be elusive at best, unless there is clarity around shared strategic goals and ultimate outcomes, full engagement of all stakeholders throughout the process, and a coherent information technology (IT) plan.

Kaiser Permanente is the largest non-profit health plan in the United States, providing health insurance and health care to 8.7 million people primarily in a fully integrated health care delivery system for a fixed monthly fee. In 2004, it began implementation of an integrated electronic health record in its 420 medical offices and 36 owned hospitals and medical centres. The development and deployment of KP Health Connect was undertaken and managed as a strategic investment to transform health care delivery rather than as an IT project. It was driven by operational and clinical leadership and priorities while addressing the culture of the organization.

To guide this work, four principles were developed to ensure that KP Health Connect would achieve the organizational strategic goals. The past several years of implementation have validated these principles and positively affected the way health care is delivered. Yet, even though Kaiser Permanente anticipated many changes from the outset, it significantly underestimated both the breadth and depth of the impact.

The principles that guided the Kaiser Permanente process describe the KP vision for healthcare delivery in the future:

- The home, and other settings, will grow significantly as a locale of choice for care delivery and a patient's care delivery team will expand beyond the physician to include other community and family resources.

- Medical services to combat disease will be integrated with wellness activities to enhance the overall quality of life as well as prevent and stem the onset of disease. IT will enable the leveraging of specialized clinical resources and increase patient and family involvement in care.

- Technology will allow the caregiver to provide better informed and more efficient care to each patient. The computer will not replace human interaction, but enrich it by full availability of integrated longitudinal patient information coupled with the best knowledge and recommendations science can offer.

- The patient will become a true partner in their health. Customer centric care will be at the patient's convenience and customized to their specific health status and personal preferences, leading to a deeper understanding by the patient of the care they are receiving and a stronger relationship with their clinicians.

The results so far have been significant. Approximately three million Kaiser Permanente patients are actively using secure internet connections to email their physician; review past medical visits, lab results and refill prescriptions online; make medical appointments and access a vast library of medical knowledge.

Data from KP Health Connect helps clinical teams track and manage patients with chronic conditions such as cardiac disease, diabetes and chronic renal disease. This allows each team to efficiently and proactively identify patients in need of additional care and interventions. These tools support mail, phone and email outreach; pre-visit preparation; and consultation and referral to other specialists.

In almost all other spheres of business and industry, electronic information systems coupled with the internet have driven fundamental shifts in how business is conducted. Health care should be no different. The challenge is to avoid adding cost and complexity without reaping the value available by transforming how care is delivered.

Dr Louise Liang was Senior Vice President of the Kaiser Foundation Health Plan. Dr Liang speaks, writes, and consults on a broad set of healthcare issues including electronic information systems, quality, safety, service, and practice redesign. First as a paediatrician at Massachusetts General Hospital, then as a clinical instructor at Harvard Medical school and subsequently as a Division Director of the New England region Public Health Service, Director of the Childhood Immunization Directive, Chair of the board at the Institute for Healthcare Improvement and then to her current position.

eHealth – The road ahead

According to Jean-Claude Healy of the World Health Organisation, eHealth is *"the instrument for productivity gains in the context of existing healthcare systems but also provides the backbone for the future citizen centred healthcare environment".*

More specifically, eHealth represents a key enabler towards individualised healthcare, a better-informed citizen community, trans-border healthcare and knowledge-based healthcare. Telehealth is most appropriate for personalised and home-based services, education, genomics and addressing clinical hot spots. The use of mobile devices will also become pervasive in the delivery of healthcare. Ultimately this will help to meet future challenges from an ageing population and to avoid preventable deaths.

There can be no disputing that services will move out of hospitals into the community and eHealth will be one of the drivers of this.

Professor Ricky Richardson is a consultant paediatrician and senior lecturer at the Great Ormond Street Hospital for Children (GOSH) and the Institute of Child Health (ICH). He has also worked in West Africa, Central America, Brunei and Oman. He is founder of the UK eHealth Association, one of the founding directors of the European eHealth Forum and twice elected Vice-President of the International Society for Telemedicine and eHealth.

Designing care around patient need and technology capability – The value of communication medicine

Remote patient care provides benefits for patients, clinics, taxpayers and government - both the quality and economics of care improve. Consider, then, that more than 90% of UK patients with implanted devices could be managed remotely by using wireless and internet-based technology; information provided about disease state from implanted devices in advance of clinical deterioration would allow primary care initiation of treatment changes to pre-empt hospital admission and maintain patient well-being. As a result, the current level of 800,000 outpatient consultations for device checks every year in the UK could be substantially reduced.

In order for this to be effective, however, we would need to design care systems that exploit the technology rather than graft the technology onto existing care pathways. Furthermore, clinicians must become proactive rather than reactive in learning how to manage disease remotely.

Professor John Morgan Honorary Senior Lecturer at Southampton Medical School and Professor at the University of Teesside. He holds several published patents relating to invention of novel interventional technologies and currently is working in collaboration with the University of Southampton and the Faculty of Health, Medicine and Life Care Sciences in helping to establish a new institute that will investigate the use of novel implanted technologies in managing chronic disease.

Operational efficiency in a modern digital hospital - the Norwegian experience

St Olav's Hospital in Trondheim reported that length of stay had fallen, with 10% staff efficiency savings, due to investment in technology to replace manual activities such as robot transportation devices, automated tube handling devices, pneumatic tube systems and automated drug dispensing devices. This can be achieved with sensible solutions such as unified communication through "all over IP and IP everywhere", ensuring secure information and communications available as and when necessary. In addition, a single converged IP network for data, voice and video instead of 6-7 different networks for TV, data, Telephony, radio, university, etc. improves services and decreases costs. The benefits at St Olav's were realised through changes in working practice, taking a holistic view across people, processes and systems; modern infrastructure demands extensive integration between telephony, networks, patient signals, alarm systems and location systems. Having a common platform (IP) makes it easier to benefit from such projects.

Tore Indreråk ICT Engineer, who for 12 years has project led for the large and complicated new St. Olav's Hospital in Trondheim. 5 years were spent implementing 25 preparatory hospital projects like PACS, electronic patient journal, e-mail, internet, regional secure healthcare network etc. The last 7 years have been full of planning and implementing the hospital ICT project itself, an all over IP network and infrastructure totalling £65 million with a 99.9% availability.

The benefits of IT on the move

IT plays a vital role in delivering the vision of world class ambulance services to patients. Through the provision of modern mobile infrastructure for ambulance services, IT has become a key enabler to productivity improvements and better patient outcomes.

In order to achieve this, systems and processes have had to be re-engineered to accommodate the implementation of new technology. This demanded an aggressive focus on what the patient needs from the service, on what tools staff require to meet this need, and strong clinical leadership to bring the two together.

Paul Sutton Chief Executive of South East Coast Ambulance Service (SECAmb). Paul has adopted an innovative approach to improving ambulance services in England with a desire to emulate and exceed international best practice. This has involved re-engineering systems and processes as well as technology, demanding strong focus on what the patient needs from the service and the tools staff require to meet this need.

Everyday life in a paperless hospital

Clinicians involved in the paperless hospital reported that their Electronic Patient Record (EPR) resulted in more time with their patients, through reduced difficulty in understanding colleagues' handwriting. Furthermore, it offers the convenience of knowing where to look for information, particularly with web-based technology allowing one to open several windows of information. Finally, it affords the opportunity to organise clinical practice through the design of information-friendly clinical forms and spreadsheets. This helps optimise information collection and retrieval, pivotal to clinical decision making processes.

All aspects of implementing a Paperless Hospital are clinically related and so need clinical leadership, supported by operational management. A standard EPR package will need customising to accommodate local practices, so careful prioritisation and definition of requirements is essential. It is key that the clinical IT system is adequately validated by professionals to ensure that product functionalities cover the essential requirements for clinical work, and careful management of expectations during the project is essential to ensure that clinicians are aware of the end goal, the current status, and what lies in and out of scope.

Dr Lola Ruiz Iglesias Director of Health Care Strategy for HP. Her previous roles have included Chair of the Department of Health Policy and Management at the National School of Public Health, Director of the Centre for Development and Innovation in Health Organizations and Director of the Health Sector at KPMG. Internationally Dr Ruiz has worked in Angola, Moldovia, Bolivia, Bulgaria and in Ghana and was involved in the Spanish Ministry of Defence as Director of the Master Framework Plan of Military Health Services.

The 'paperless' hospital

A Testimonial - Dr Juan Baudes

My name is Juan Buades, a nephrologist based at the Hospital Inca on the Balearic island of Palma in Spain. Before being incorporated in the aforementioned hospital I worked in three other hospitals. Two of these were traditional in terms of automation: they were marginally computerized and clinical and administrative processes were mainly handled on paper. The other hospital that I worked with was Son Llatzer, a completely digitized new hospital that had the distinction of being a "paperless hospital". HP provided the electronic clinical and information system. By the time I was employed by Hospital Inca, I was already familiar with the system, despite the fact that certain changes were inherent as solutions were no longer client-server based but instead was supported by online Web technology.

At Son Llatzer, I was happy using a completely computerized system. I now had no trouble understanding the "handwriting" of my colleagues, I always knew where to look for information and most importantly, this fluency of information granted me more time with my patients and colleagues.

In spite of the above, I must say that I was initially taken aback when I arrived at the new hospital as the system they had was not similar to the one I was used to; it was necessary to re-educate myself with the new system. Another surprise was that certain functions were not validated correctly and would require a great effort on the part of the staff. An important consideration was how the new digital solutions eased work-based problems: web-based technology allows one to open several windows of information, making it easy to have complete access to comprehensive patient information without the need to exit and re-enter the system.

Our nephrology department is small, three doctors in total to cover out-patient consultancy, hospitalization, emergencies and haemodyalisis. Our daily routine has clearly been transformed by the unbridled possibilities of technology. I must add that we are an ordered group, quite systematic in our work and we believe that contributes greatly in our understanding, compatibility and regard for the information system.

On a typical day, I enter the hospital at 8am and the first thing I do is to log on to the hospital based Intranet. Through the Intranet I can update my online agenda with hospital news and various events. I can also check on emails while online. I also receive information related to the hospital (ie. I access news,

departmental control panels, document inter-change etc.) In many cases, these are managed using Microsoft Sharepoint.

At 8.15 am we attend a clinical session where, upon logging in, one can list all outpatient consultancies for that particular day. We also automatically enter Health Electronic Records, where one can retrieve all the information for every patient and every user within the regional system. From this we have direct access to our Hospital Electronic Records.

First, we review each hospitalized patient´s case individually on the computer. After analyzing every case, we formulate a pattern of work for the day. Later, we study every inter-consultancy, accessing all the inter-consultancy information needed on each patient as requested by us. All this information is accessed in real-time: case-history, test requests, test results, nurse observations etc.

Patients on dialysis are next on the agenda. From the same room, on the same computer, through the same system we can now access and analyze all relevant information on patients undergoing dialysis. When we finish with the session, each one of us is incorporated into the corresponding area for that particular day: emergencies, out-patient or in-patient.

As you can see, apart from the physical examination of the patient, every analysis, planning and evaluation of each patient´s case history is electronically tagged and updated in real time. In reality, as a part of technological innovation, I can conduct the same level of real time clinical

activity, with my patients and colleagues, from any computer, from any place, albeit at home or while away from Palma.

Truly an important factor of the benefit we obtain from the utilization of HCE is that we now dedicate more time in organizing our practice through the design of information friendly clinical forms and spreadsheets. This helps in the optimization of information collection and retrieval which is pivotal in clinical decision making processes. It is also true that in my hospital not all doctors exhibit the same attitude and dedication to exploit the possibilities of the system at hand to achieve a greater optimization of the work place. But, as demonstrated in the last survey conducted by IBSalut, none of us would return back to using paper records at work anymore.

Personally, I am convinced that new technology will imply a new method to cultivate and organize clinical practice. Much of the day to day activity that we do requires a digital medium.

Dr Jaun Baudes emphasises the view from other medical and technological user perspectives, highlighting the key elements of a health information system are that it is -

- Professionally validated
- Dynamic enough to evolve with the system in time.
- Training
- Internal communication
- Custom designed
- Integral vision of organisation
- Professional understanding and future development
- Open dialogue

How to engage patients with EPRs

A recent 2009 Microsoft survey across several countries revealed that 4 out of 5 people said they were involved in health issues; 1 in 3 said they were health informed; and 1 out of 5 people are health info-ential (informed, engaged and involved). The UK has the lowest ratio of health info-entials of all the countries surveyed. Increasing health awareness and engagement can only come about through campaigns involving the use of multiple digital touch points, engaging audiences in their communities and in their languages.

John Coulthard has 20 years experience of strategic management. He has been the Director of Healthcare at Microsoft Ltd UK supporting the NHS in the achievement of its long term vision for an integrated and modern health service. John was appointed as Retail Services Manager working in Microsoft Consultancy Services and became Director of Small Business for Microsoft. Before joining Microsoft, John worked in the NHS and the MoD leading major information technology projects.

Working with patients online: How to use IT in the real world

One practical IT concept for the health service is the use of Personal Health Records (PHRs). PHRs can ease the patient's burden by making it easier to schedule appointments, order medication refills, send secure messages and access the EPR. The ideal PHR, according to NHS Connecting for Health (2004), has: 'access controlled by the patient; lifelong records; information from all; universal access; [is] private and secure; transparent; [facilitates] easy exchange'. Where appropriate, it could be possible to allow patient's relatives access to the PHR.

There are many benefits to be gained, as evidenced by the online forums by and for patients that teach thousands of clinicians already. However, there are issues of practice that must be taken into consideration when using PHRs. For example, medical notes can be full of errors. Clinicians should anticipate that everything they write may be read one day.

Dr. Mohammad Al-Ubaydli, Honorary Senior Research Associate at UCL's Centre for Health Informatics & Multiprofessional Education, and founder and CEO of Patients Know Best, a Cambridge-based personal health records company. He trained as a physician and programmer at Cambridge and has worked as a scientist at the NIH. He wrote six books about the use of IT in health care, including *Streamlining Hospital-Patient Communication: Developing High Impact Patient Portals* based on his research with CIOs from 2,700 hospitals in the USA. His latest book, *Personal Health Records: A guide for clinicians,* will be out this year.

Reflections on the 2020health.org conference

"*Information and communication technologies (ICTs) have the potential to transform radically the delivery of healthcare and to address future health challenges. Whether they actually do so will depend on the design and implementation processes sufficiently accounting for the users' needs, and the provision of adequate support and training after their introduction*" – Royal Society, 2006

In the three years since the publication of the Royal Society's report[1], few would dispute that progress in England in implementing the Care Records Service has been disappointing. However, the 2020Health event presentations highlighted several successes in implementing ICT in healthcare, both internationally and in the UK. Evidence was shown of improvements in patient care and safety, and in operational efficiency, that remain the goal of the National Programme for IT (NPfIT) in the NHS.

In particular, the presentations highlighted key principles in the effective implementation and use of ICT in healthcare.

---

[1] "Digital Healthcare – the impact of information and communication technologies on health and healthcare" The Royal Society, December 2006

As a starting-point, each initiative was regarded as a change not an IT project. A clear vision – consistent with best international practice – is needed, with clarity of view on where IT forms a critical part of realising the vision. For example, South East Coast's Ambulance Service's vision identified IT as a key enabler to productivity improvements and better patient outcomes through the provision of modern mobile infrastructure.

Likewise, in the US, Kaiser Permanente's Health Connect project firmly supports the organisation's strategic transformation initiative. The project was set as a top priority with long term commitment at Board level.

Related to this is the handling of stakeholder engagement. In Spain, we heard how all aspects of implementing HP's 'paperless hospital' are clinically related and so need clinical leadership, supported by operational management. For example, at the Inca hospital in Majorca, the lead clinician commented that - "*new technology will imply a new method to cultivate and organize clinical practice. Much of the day to day activity that we realize requires a digital medium.*" He cautioned, *"Do not introduce a system that is not adequately validated by professionals…we have to be sure that product functionalities cover the essential requirements for clinical work".*

He also highlighted the management of expectations so that clinicians "*are aware in every moment, while attending patients, the final outcome of the solution, the situation at hand, what we can expect and what we can't".*

The Kaiser experience reinforces the need to deliver against an agreed, published timetable. Over a similar period to the seven year life of NPfIT, they have successfully introduced a modern, enterprise-wide clinical information system comparable in scale to a single NHS Local Service Provider scope.

We also heard how benefits have been realised based on changes in working practice, taking a holistic view across people, processes and systems. In Norway, the building of the new St Olav's Hospital in Norway was designed to offer mobility, flexibility, security and availability and took full advantage of state-of-the-art technology infrastructure. Clinical services are designed to come to the patient rather than the other way around. The use of wall-wall IP technology to control all data, voice, nurse call, telemetry and radio communications across the hospital has avoided the traditional silos of technology. They have also invested in technology to replace manual activities such as robot transportation devices, automated tube handling devices, pneumatic tube systems and automated drug dispensing devices. St Olav's reported that length of stay has fallen, with 10% staff efficiency savings.

Equally, Kaiser reported how the implementation of Health Connect and myHealth Manager in Hawaii led to a reduction of 26% in hospital visits through a significant increase in telephone consultations and use of secure messaging between patient and clinician. Here, patient interaction with clinicians and their care record has been a success. However, patient privacy and security raise difficult issues and in Norway, these have been such that patient access to their records has not been possible.

Profound changes in working practice such as these also raise the inevitable question about whether reimbursement systems can be flexed sufficiently to take advantage of these technology possibilities. However, with tighter funding for healthcare and yet ever-increasing demand, who would argue with the premise of "designing care systems that exploit the technology rather than grafting the technology onto existing care pathways"?

John Cruickshank, Healthcare Industry Executive. John Cruickshank is an independent expert in NHS IT, having been intimately involved in its development over the last 24 years. His passion for healthcare IT began in the mid 1980s when he project managed the first successful NHS implementation of a hospital-wide electronic patient record. Most recently he headed the European healthcare applications business for EDS, an HP Company. Prior to this, he had executive roles with Accenture and Pareto Consulting, a respected independent consultancy in NHS IT. He has personally worked with over 100 different NHS Trusts and all levels of NHS management, including policy development at the Department of Health.

About 2020health

2020health is a health and technology think tank.

Vision: More people enjoying good health

Work streams

- Public health
- Technology
- Sustainability

Mission

- We want to improve health through effective commissioning, competition and technology
- We seek a level playing field between the public and private sector as they work to improve health outcomes
- We search for ways in which the workforce can take more responsibility in local healthcare
- We examine the consequences of healthcare decisions on society, lifestyle and culture

We are 'professional' led, ensuring that all we do has the constant input of people working for and in the public services. Our unique emphasis is on giving people who work every day delivering healthcare, the 'grass-roots', the opportunity to use their experience and expertise to direct our work.