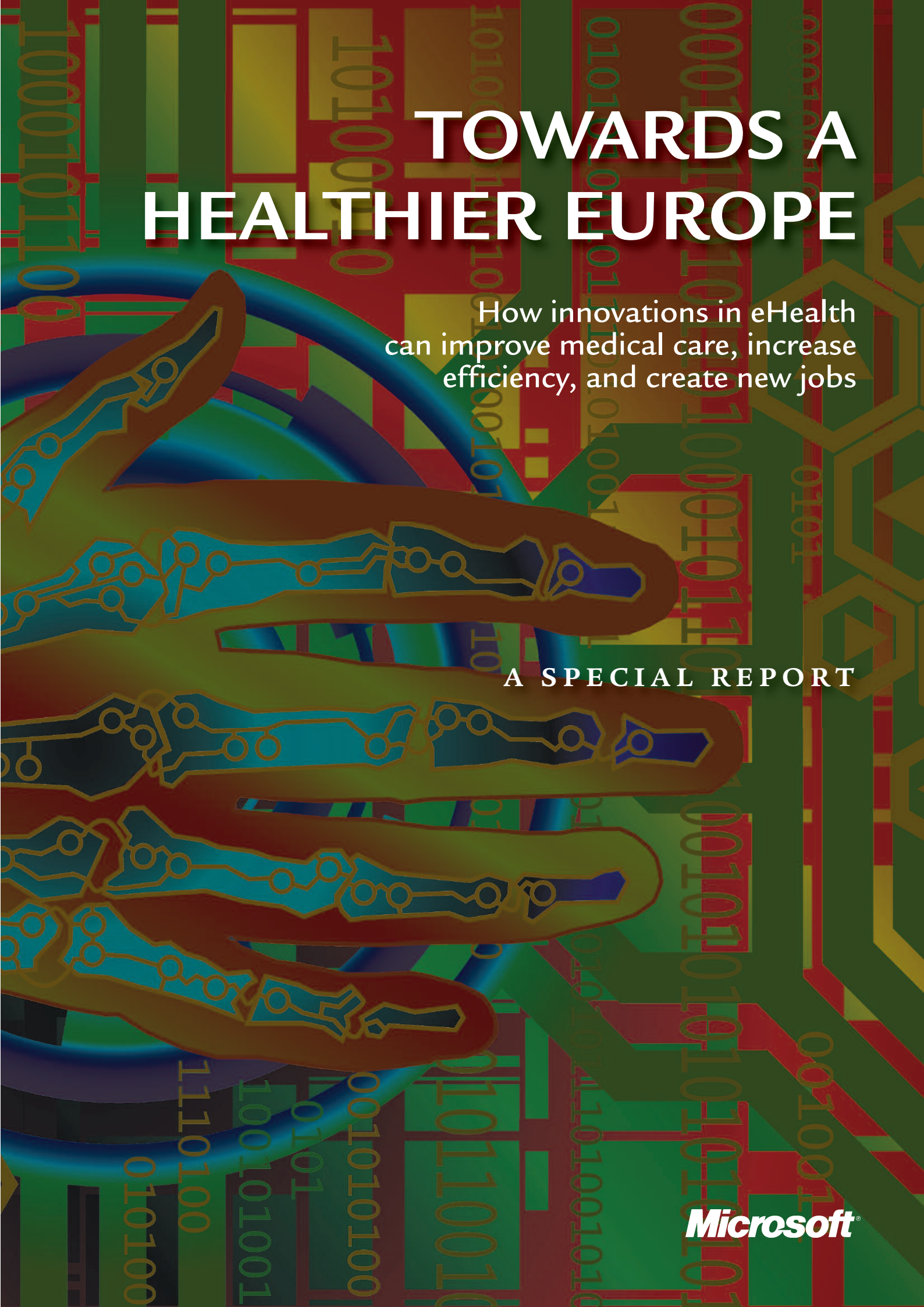

TOWARDS A HEALTHIER EUROPE

How innovations in eHealth can improve medical care, increase efficiency, and create new jobs

A SPECIAL REPORT

Microsoft®

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Healthcare is one of the biggest challenges facing our societies, our economies and our governments over the coming decades. At a personal level almost everyone has a story, an experience and a personal view not only about healthcare but even more so about healthcare innovation. At the organisational level, the private sector has a key opportunity to contribute to transform and innovate healthcare.

The long-term aim is to facilitate prevention and lifelong wellness rather than only treatment and cure. Today's technology enables us to transform how we will think about the problem tomorrow, for example by empowering physicians to anticipate rather than being busy with gathering medical data.

More than 12 years ago, Microsoft started making investments in the health industry. We saw software and the Internet as essential tools to transform healthcare, as they have so many other industries – opening new ways of working, new ways of communicating, and new economics.

We have increased our investments and commitment to health globally. We have focused on openness and interoperability to drive truly scalable solutions that can benefit all.

The vision for healthcare innovation is very broad. Both in Europe and globally the private sector is developing an information infrastructure that connects data, systems, and people. Today's focus on making medical records electronic is an important piece of the broader vision – but it is only one part of that vision. The key is to enable consumers and large health systems to connect and share data to help them build their health data assets.

To move away from today's fragmented delivery system to tomorrow's connected network, we need technology infrastructure that allows data to flow freely throughout the system and be reused. This infrastructure must be **flexible**, to enable many different players across the ecosystem to do what they need to do; it must be **interoperable**, to leverage existing standards and infrastructure investments that work towards more unified ways of organising and sharing data; it must be **scalable**, to adapt to the rate of medical and technology advances; and it must be **secure and private**, to foster consumer trust and responsibility.

Technology enables us to reinvent healthcare. Such a venture deserves to be undertaken through deep partnership and broad collaboration with stakeholders. As a technology company, Microsoft shares the vision of enabling the modernisation of healthcare, focusing on better outcomes, not on technology adoption *per se* but rather on its usability.

FOREWORD

Information and communication technologies (ICT) have the potential to change the face of healthcare.

In the US, President Barack Obama has put computerisation and the electronic patient record at the heart of his push for reform.

In Europe, there is a vision and understanding of the central role of ICT in improving the delivery of health services and its role as the glue that will hold together an array of medical technologies, improving care while curbing costs. This paper explores Microsoft's vision for health-focused information technology, or eHealth, built upon a culture of partnership and collaboration.

CONTENTS

The future of healthcare in Europe

Developed economies are already finding it hard to maintain standards of healthcare on existing budgets. Now payers are facing a huge dose of extra costs, building on advances in biotechnology, pharmaceuticals, imaging, diagnostics and other fields, medical technology is delivering the potential for new treatments and diagnostics. eHealth – the application of information and communications technologies to the healthcare sector – stands out as a way to improve service and raise efficiency. As EU Health Commissioner Androulla Vassiliou noted in December 2008: "Investment in health pays future dividends."

The problems are big, of course. A Europe that should be celebrating the increasing life span of its citizens finds itself preoccupied with the cost of caring for an ageing population. By 2050, a third of the population will be over 60, an increase of 44 per cent over 2006. The number over 80 years of age will increase by 180 per cent. And the prevalence of most chronic conditions increases with age. Cancer and cardiovascular disease in the over-65s account for three-quarters of deaths across Europe. Demographic change is now combining with a recession that seems certain to threaten healthcare budgets, putting vulnerable groups at greater risk.

There are also chronic inequalities. Life expectancy at birth for females ranges from 76 years in several Eastern European countries to 84 in France, Italy and Spain. The disparities within countries can be greater still: according to the World Health Organization's Commission on the Social Determinants of Health, the life expectancy of a child born in the poorest part of Glasgow, Scotland, is 28 years less than that of a child born in the most prosperous part of the city. Such disparities have social causes that can be addressed through the application of eHealth to ensure equity of access to healthcare, improved medical information and giving individuals the means to monitor and manage their own health.

But there's a paradox: information – patient records, medical know-how, test results – is at the heart of healthcare; it is, in fact, one of the most information-intensive sectors of the economy. Yet it is also among the least computerised. That means that, compared with the retailing, finance or manufacturing industries, the healthcare sector in Europe has the greatest potential to boost the efficiency and quality of its service.

What is eHealth?

eHealth is the application of information and communication technologies to the practice of healthcare. It is not just about converting paper records to electronic ones, but also about making these electronic records available, as and when required, to healthcare providers across the chain, from general practioners to hospitals, and pharmacies.

Beyond this, it applies ICT to telemedicine, enabling, for example, patients to have a consultation with hospital-based specialists over a video link from their GP's surgery. It permits X-rays and magnetic resonance images to be transmitted for assessment by specialists. It allows patients to monitor chronic conditions themselves from home.

One of the most important developments arising from eHealth is likely to be giving individuals the information and the tools they need to monitor their own health, and to support disease prevention programmes.

eHealth systems will also pull together all the medical information that clinicians need to keep on top of developments in their fields, backed up by decision-support and search tools to enable them to apply this knowledge.

In the words of Daniela Filipiová, Czech Minister of Health, during the opening of the European ministerial conference of health ministers, eHealth for Individuals, Society and Economy, which took place in February 2009, "Primarily, eHealth brings benefits to patients and healthcare workers. It will be easier for doctors to access information on health conditions of their patients, and, also, they will be able to control their expenditures and gain greater mobility. Patients will have information on their health conditions or drug dosage; with rigorous observation of their personal data protection, naturally." To summarise, eHealth helps increase quality and safety of healthcare services as well as their efficiency.

INTERVIEW

Ilias Iakovidis, Deputy Head of Unit, ICT for Health, European Commission

One of the key missions of the ICT for Health Unit is to promote interoperability of eHealth systems, to enable information to move from one system to another. Here Ilias Iakovidis highlights why this is important.

Patients are at the centre of any eHealth strategy. How will they benefit from interoperability?
The first and most important benefit is safety. Interoperability is the way for every carer to have all the relevant information at his or her fingertips, in the surgery, the hospital, or on the move. That obviously improves safety. The end result is better treatment and better care.

Interoperability also makes it possible to deal efficiently with public health emergencies and to improve evidence and knowledge creation in health research.

The vision of improving efficiency and quality by having correct up-to-date information readily available is common to most sectors, and many have achieved it. Why, after many years of trying, is healthcare still not there?
The hurdles faced by healthcare really are higher than elsewhere. First, you are dealing with personal data about medical conditions, so you only want to share it with authorised people. In other areas, such as finance, confidentiality is important too, but there the information isn't so complex. Numbers and simple concepts on one machine can, with appropriate security, be readily transmitted to another machine.

In healthcare it is far more difficult to preserve the meaning and integrity of medical information when it goes from one system to another. A doctor's report in one electronic health record in one system is not easily understood and automatically translated by another doctor's system.

On top of this, there are far more interests to be reconciled in healthcare. It involves big chunks of every country's GDP, and there is much sensitivity around the availability, interpretation and use of information that interoperability enables on a large scale.

So, are the problems that exist around interoperability purely around the cultural issues of who controls information?
Political, organisational and legal issues are very critical for achieving interoperability as well as cultural and user incentives. But the technology is not all ready. Despite much progress there do remain more straightforward technical issues. A major one is the proliferation of standards for electronic health records. These are competing, and confusing matters with respect to interoperability.

Then, on the other hand, there are not enough guidelines and standards to enable new technologies such as personal monitoring devices to be integrated into healthcare networks. There need to be agreed approaches and possibly new standards for wireless data transmission from devices such as personal blood pressure or glucose level monitors into health records.

Then there is the issue of bringing the profusion of legacy systems, many running bespoke software, into integrated, interoperable networks.

But the biggest and most significant technical barrier is in data input and output (user friendly human computer interaction). The keyboard and the mouse just aren't appropriate for healthcare. Voice input is part of the answer, but digitising voice into free text does not provide structured data that computers can process.

To what extent would handing individuals control of their own electronic health records overcome the barriers to applying ICT to improve quality and control costs, in the same way as it has done in so many other sectors?
Individuals will play a role, and the thrust of much of our effort is to help them. But the idea of giving people complete control has been oversold – many just are not in a position to assume control, or simply wouldn't want to. The health professionals may also not want to trust such data. So it would be wrong to focus on this as the means to the end.

What is the next big milestone in achieving the widespread adoption of eHealth?
I think we need to convince the politicians that this is a battle that must be engaged and won now. The statistics are stacking up in terms of the inexorable rise in healthcare costs coming from citizens' demand for the highest quality care, the increasing burden of chronic disease and the ageing of the population. But there is still a view that the crisis in healthcare is far off.

One way to convince politicians to act now is to prove the benefits of eHealth on a large scale – something like a large clinical trial level of proof. For example, six or seven regions in Europe using personal heart monitors to follow people with cardiovascular conditions and then pooling the data could demonstrate the cost benefits and the improved health outcomes of using ICT to deal with chronic disease. This kind of large scale deployment will be supported by European Commission within the Competitiveness and Innovation Framework this year.

SECTION TWO

The role of technology

eHealth systems can deliver high-quality information, in real time and in a manner that is easily accessible everywhere, while at the same time improving the operational efficiency of all the supporting processes involved in the delivery of healthcare. The reward will not only be better healthcare. It will, as a contributor to Europe's knowledge economy, create new jobs, drive growth in the healthcare sector, boost healthcare innovation and provide greater value for the 11 per cent of GDP that Europe spends on health services.

Many significant new technologies such as point-of-care diagnostics and improved imaging are poised for action. But it will take pervasive eHealth networks for them to come together to change the paradigm of medicine from treating people after the pathology is well established, to a model of **personalisation, prediction and prevention.** The increasing prevalence of chronic conditions calls for more sympathetic disease management, and **integrated care models** that link health and social care, allowing care to be delivered at home. By furnishing new ways of communicating between service providers, patients, clinicians and carers, eHealth systems can be used to build and support more people-centric models.

Here's an alarming statistic: between 8 and 12 per cent of people admitted to hospital in Europe each year suffer harm from the healthcare they receive there. Hospital-acquired infections and inept surgery are two causes. The other two, incorrect or delayed diagnosis and medication-related errors, would surely be reduced by the up-to-date and complete information of eHealth systems. This provides a concrete demonstration of the opportunity that eHealth holds for Europe's economy, society and citizens.

eHealth can also make the system more efficient. Currently, there is huge complexity in moving patients through a healthcare system, from when they first report to a general practitioner, to referral, scans or biopsies, an operation and follow-up.

eHealth systems – electronic patient records, networks for secure transmission of diagnostic tests or the inputs from personal monitoring devices, centralised analysis of MRI scans or X-rays, underpinned by end-to-end data powered healthcare systems – have the power if not to reduce, then to manage, this complexity.

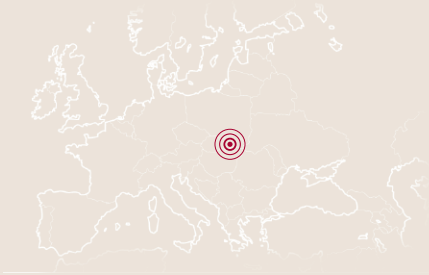
There are huge implications for policy makers and healthcare administrators with their silo budgeting. Point-of-care diagnostics will increase the cost of primary care, but will save on hospital time performing biopsies or running centralised pathology labs, while reducing the economic burden of ill health. With eHealth systems in place **new, targeted interventions can be introduced more rapidly, at a scale that reduces costs and provides relevant, concentrated clinical feedback**.

And the advent of "cloud computing" – the development of software and services on-line – can transform the way the healthcare profession actually works. It can link doctors to hospitals, labs, insurers and to patients in new ways that even the most "wired" healthcare systems are only beginning to explore today.

Indeed, a central role for eHealth will be to **support people in taking responsibility for and managing their own healthcare, from home, within their own country but also across the EU**. The potential is highlighted in the latest Euro Health Consumer Powerhouse ranking of

CASE STUDY

Slovakia: Wireless information system helps doctors communicate



The Kosice Children's Teaching Hospital started a six-month Mobile Point of Care (MPoC) trial in the Oncology Department with a view to streamlining the doctors` working processes and helping deliver increasingly sophisticated levels of care. Each patient was provided with a bedside wireless Internet access point, and the five doctors within the Oncology Department began using the tablet PCs in their daily work. These provided real-time access to patient's case histories and medication files. Doctors could view and enter new information at the bedside –previously information was written down and then entered into the hospital's information system at a later date. The immediate insight into patient histories and medication regimes enabled the doctors to be more responsive to patients' needs, optimised workflows and supported decision-making. The MPoC enables the hospital staff to save at least 25 per cent of the time spent on administration tasks, eliminate duplicate examinations or prescriptions and reduce or eliminate waiting periods.

Irina Oravkinova, Director of the Oncology Department, Kosice Children's Teaching Hospital:
"Communication is a very important part of our work. Fast gaining of information is the key to making the right decisions. We hope that this system improves information transmission and simplifies our communication and communication with our patients' parents."

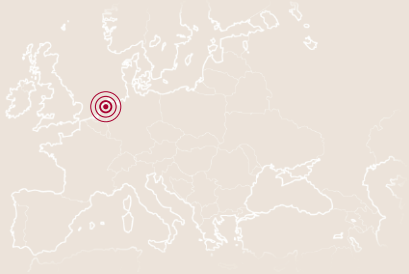
Europe's national systems according to their attitudes to patients/consumers, published in November 2008. This analysis includes measures of eHealth for the first time, and concludes that ICT is a key factor in the consumer-friendliness of healthcare systems, supporting partnership between the individual and the care system and closing the gap between patients and professionals. "**Information will re-shape healthcare in the way we have seen in other major service industries**," says **Johan Hjertqvist**, president of the **Health Consumer Powerhouse**, a leading provider of information and analysis of European healthcare.

Hjertqvist notes that at present it is essentially impossible to get any type of official data on the quality of cardiovascular healthcare in most European countries. Without such information there is little opportunity to increase the quality of that care. "After four years of comparison we now see the leading healthcare systems starting to adopt consumer trends. The leaders aim to support choice by providing information and, via consumer priorities, creating pressure for improvement of services and quality of care."

"From this perspective it becomes evident that eHealth is a spearhead to radically reduce costs, open up the possibility of rapid access to treatment and improved patient safety."

CASE STUDY

The Netherlands: Healthcare organisation to save 10 per cent in operating costs with easy remote access



Amsta Zorginstelling is a growing healthcare organisation located in the Netherlands. Because Amsta must comply with stringent industry reporting regulations, it needs to provide strong security for its proprietary healthcare application, which is used to collect patient data. The company also needs to provide secure remote access because an increasing number of employees work remotely and require easy access to applications. With help from technology integration partner B-able, Amsta implemented Microsoft Intelligent Application Gateway (IAG) 2007, which solved both of these challenges by simplifying remote access and ensuring access control and application security. As a result, IAG 2007 is helping Amsta employees access vital data from anywhere without compromising patient privacy. In addition, the company is saving administrative time and IT management costs.

Shebab Davoudi, Head of IT, Amsta:
"We had an audit that showed that we will save more than 10 per cent of our operating costs by using IAG 2007. That is money we would be spending on time and management without this solution."

What are governments doing about eHealth now?

While healthcare is the responsibility of Member States, the European Union provides a useful, proactive focus for elements of eHealth such as standards and interoperability, and research funds for eHealth projects that can act as exemplars. The Commission's 2004 eHealth Action Plan[1] aims to harness ICT to provide better healthcare for the entire EU population, with the focus firmly on the development of interoperable healthcare systems and services and cross-border healthcare provision. Moreover, the Commission response to the "Aho[2] report" on *Creating an Innovative Europe*[3] in a new initiative – called the Lead Market Initiative – aims at the creation and marketing of innovative products and services in promising industrial and social areas. Chief among the areas of European industry that are ripe for further development is eHealth. One of the four key areas targeted for action in a proposed programme to support eHealth as a lead market is eHealth interoperability, in particular electronic health records (EHRs) interoperability.

With a dozen countries working to set up electronic health records, the Commission is trying to ensure these systems can work together. Its Recommendation on cross-border interoperability of electronic health records, published in July 2008[4] aims to provide the basic principles and guidelines enabling doctors to access the records of patients, wherever the information may be located in Europe.

In support of this, the Commission is sponsoring the €22 million European Patient Smart Open Services (epSOS) project – Microsoft is part of the industrial consortium – to demonstrate the benefits of interoperability. epSOS is co-funded by the Commission and countries that have national electronic health records projects, along with the suppliers installing them.

"Travelling around the European Union is taken for granted, until something goes wrong," said Viviane Reding, the EU Commissioner for Information Society and Media, launching the project.

The epSOS project will work to ensure compatibility of electronic medical information, regardless of language, or sophistication of technology, without having to establish a common system throughout Europe. It is the first time that the Commission has attempted to set out the steps needed to ensure compatibility between different national systems.

In January 2009 the roadmap for the most difficult part of the task, ensuring the semantic interoperability of electronic health records, was published. This covers the job of ensuring that the meaning of information is preserved when it is sent from one computer to another.

Ilias Iakovidis, Deputy Head of Unit for Health ICT at the Commission, forecasts it will take 20 years to achieve full interoperability across Europe. To maintain the momentum he says the benefits of exchanging consistent patient information must be highlighted, confidence must be nurtured that the data will be secure and confidential, organisations must trust those they share information with, and sharing information must not conflict with the commercial or legal interests of any participants.

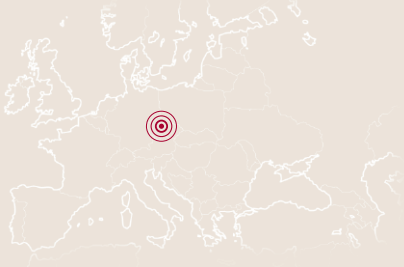
Incorrect or late diagnoses and mistakes with medication are major causes of medical harm to patients. The Commission's Pharmaceutical Package seeks to address this, requiring eHealth systems that give citizens access to high-quality information on prescription-only medicines and to improve patient protection by strengthening the EU system for monitoring the safety of medicines.

Announcing the Pharmaceutical Package, Commission Vice President Günter Verheugen said, "[This] builds on the needs and interests of patients. European citizens should benefit from safe, innovative and accessible medicines. They should be best informed about available medicines and treatments since their health is at stake."

When it comes to modernisation of healthcare and implementation of innovation, Member States vary in their approaches. Several countries are working to implement electronic health record and other eHealth systems.

CASE STUDY

Czech Republic: Seamless integration with current and future systems



Na Homolce Hospital in Prague has deployed Microsoft Dynamics NAV to cover all its activities. The foundation of the solution is efficient financial flow control, transparent management of procurement, stock optimisation, supply chain management, and insurer/patient relationship management. These contribute to improved employee efficiency and reduced operating costs.

Managers find it difficult to predict the way health care will be funded for more than half a year ahead, so they need to carefully monitor all input costs.

The project included an Invoicing to Insurers module, implemented outside the standard product and developed by Webcom to meet the customer's specific requirements. Among the major benefits of the solution is its seamless integration with the current as well as potential future information systems deployed at the hospital.

INTERVIEW

The Association Internationale de la Mutualité (AIM) represents private not for profit health insurers that provide healthcare for 160 million Europeans. Dr Philippe Swennen, Project Manager, says eHealth objectives are important to AIM's members

Are current developments in eHealth supportive of AIM's principle of mutuality?
I think of eHealth as a tool that can improve the quality of the health sector. It could be a big help, for example, in e-telemedicine for the management of chronic diseases and improving healthcare in general. Except in some conditions, I don't think there is any strong evidence ICT can reduce the cost of care, but it can improve its quality.

What is AIM's priority in the deployment of eHealth?
We wouldn't have a single priority. Obviously confidentiality, data protection and privacy are critical, but beyond this we need formal health technology assessments to inform the use of these tools. A lot of investment will be needed in the full scale deployment of eHealth systems, and as insurers we therefore need a business case. Concerning telemedicine, we need to resolve the issue of reimbursement, by updating the nomenclature of medical acts.

How important is the development of electronic health records?
Electronic medical records are at the heart of the eHealth systems that are being developed in a number of European countries. They should generate better information and improve [appropriate] sharing of medical data. France, the UK, Switzerland and Belgium have national projects, but in many cases these projects have stalled because of the sheer complexity of the process and the huge financial investment.

Are developments in eHealth supporting insurers when dealing with cross-border reimbursement?
Of course, cross-border reimbursement is very important for us, even if in practice it represents a very small percentage of what we fund.

It's why we are following carefully the proposals of the EU cross-border healthcare Directive. Similarly, the push to create standards for interoperability is important.

The most ambitious and comprehensive of these is in the UK: the £13 billion Connecting for Health programme, the largest project in the history of civil computing. While the heart of this is a standardised electronic health record, it has other elements such as electronic prescriptions, a system to book appointments, and a national network for transmitting X-rays and other diagnostic images electronically.

The recent eHealth Ministerial Conference in Prague called for increased efforts to facilitate the building of a **European eHealth area** which will enable access to healthcare for all citizens. For this purpose continued efforts are needed, said ministers, particularly in the areas of **telemedicine services deployment, interoperability** as well as Europe-wide cooperation and exchange of best practices. Member States are encouraged to adapt their national eHealth strategies so that the individuals (patients and healthcare professionals), society and economy are all the bene ficiaries of eHealth's positive effects. Microsoft welcomed the minister's call for Member States to participate in discussions about a **Europe-wide governance structure for eHealth** that will give additional impetus to the introduction of new services and the removal of existing obstacles.

SECTION FOUR

The barriers to eHealth

One impediment to innovation is the traditional structure of many healthcare systems. Most care is delivered in the same context – of general practitioners' surgeries, accident and emergency, outpatients and hospital wards – as in the 19th century. New technologies that empower patients would force change. But as the European Commission's recommendations highlight, while there are rocks on the road, it's worth the effort. Developments such as a **Common User Interface**[5], designed in a collaboration between Microsoft and the UK's National Health Service, and innovative products such as **Microsoft's Personal Health Record (HealthVault)**[6], show the potential.

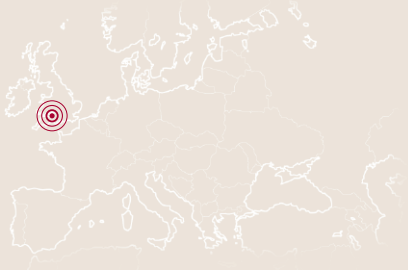
Moreover developments such as **Connected Health Platform** – an open architecture for eHealth – are opening the road to build an infrastructure which is (1) **flexible**, enabling many different players across the ecosystem to do what they need to do; (2) **interoperable**, to leverage existing standards and infrastructure investments that work toward more unified ways of organising and sharing data; (3) **scalable**, to adapt to the rate of medical and technology advances; and (4) **secure and private**, to foster consumer trust.

One of the key objectives of the European Union's eHealth Action Plan is to support and boost investment in the area. But a recent report concludes that merely increasing budgets is not enough. More ICT skills are needed across healthcare, to ensure systems can be used to their full potential. This includes improving the ICT skills and knowledge of medical staff who use the systems, the managers who handle the investment, and the knowledge and understanding of the needs of healthcare among vendors. "An expanded [skills] capability is essential to achieve more success and so help to boost eHealth investment," says the report, Financing eHealth, published by Empirica in January. (http://www.financing-ehealth.eu/)

And there is a further issue: the risk perceptions of citizens on emerging technologies and scientific innovation was identified as an invisible barrier by the Commission in a report, "Future challenges for EU health and consumer policies". This can and should be addressed by illustrating the power of eHealth as evidenced by the case studies in this publication.

CASE STUDY

UK: Foundation Trust set to boost patient care with content management system



More than 7,000 employees at University Hospitals Bristol rely on technology to communicate across eight different sites. But its existing intranet was underused, proving a barrier to effective collaboration and knowledge transfer. Users required intensive training and it demanded dedicated support from the IT team. With a solution based on Microsoft Office SharePoint Server 2007, the trust is rolling out a new intranet where users can create sites and workgroups and edit content independently. Staff have faster access to up-to-date information, while the IT team saves eight hours a week, and has time for value-added tasks elsewhere.

Improved collaboration and new tools, such as a Web part that integrates a real-time view of bed availability, mean the trust can make better-informed decisions that improve the quality of health services for the community it serves.

BUILDING A CULTURE OF ONLINE TRUST

Privacy, compatibility and security

Created in cooperation with leading privacy advocates, respected security experts and dozens of the world's leading healthcare organisations, Microsoft's Personal Health Record (HealthVault) is designed and built to enhance privacy while providing people with the control they expect and require.

"Microsoft is the first major technology company to engage with the Coalition for Patient Privacy in a thoroughgoing way. The privacy protections built into HealthVault reflect the privacy principles of the Coalition. HealthVault prohibits onward transfer of data without explicit informed consent; its contractual obligations with advertisers require protection of any data transferred from the platform; its privacy policy is simple and easy to understand," said Dr Deborah Peel, founder of the Patient Privacy Rights Foundation.

"That means consumers finally have a trusted place to store their personal health information that will not be data-mined, because they alone control it. Microsoft's use of strong privacy principles including the principles of the Coalition, its ongoing relationship with consumer advocates, and its commitment to independent third-party audits set a new standard for privacy protections in health information technology."

INTERVIEW

Martin Denz, President of the European Health Telematics Association (EHTEL), which represents interests from across the range of ehealth

The development of eHealth is poised at a crucial point where all the technology ingredients are in place and the many interested parties, from governments and payers to clinicians and vendors, patients and citizens, appreciate the huge potential of systematically integrating ICT into healthcare, believes Martin Denz. Now a catalyst is needed to move everything forward.

The number one rule when designing and deploying computer systems is to get consent and buy-in from all the users. Why does this so rarely happen in healthcare?
We all have the right ideas I think, but we still have cultural differences and misunderstandings. We need to better understand the issues, and what other people's perspectives are on these issues. This may sound general, but what I am talking about is building an eHealth infrastructure in a sustainable way. The usual understanding of infrastructure is a computer on a desk, or a wire in the ground. But we also need legal, regulatory and standards elements and an organisation framework as essential building blocks for this infrastructure.

Do you think there is progress in reconciling the different interests of the wide array of bodies and individuals that have an interest in eHealth systems?
Well, I'm Swiss, but I would certainly point to the exemplary activities of the European Commission, which is making good progress in overcoming the silos. The major shift is the understanding that healthcare is not only about the practice of medicine, it is about how a healthy population generates a healthy economy. The benefits are two-fold: budgets are spent more productively and Europe can create jobs and build a healthy service industry.

EHTEL has taken a lead in ensuring eHealth systems are patient-focused. Are you confident patients' rights are being properly protected?
We need a framework for patients' rights in relation to eHealth, but because of the complexity and array of issues there is a risk of over-regulation. Regulation should reinforce trust, safety and privacy, not be a barrier to innovation and against the enhancement of health systems. Healthcare is segmented, it is not comparable with one-dimensional markets: we need to be careful that regulation does not reinforce protectionism to patients' disadvantage.

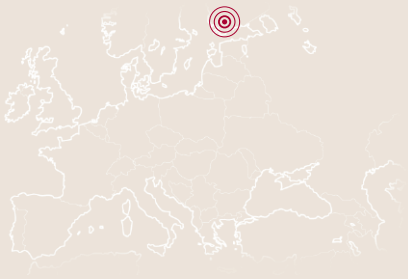
Has the argument for eHealth been won as far as the main users in the medical profession are concerned?
I am now talking from the perspective of a doctor: I do not fear new technologies – since it reinforces my basic aim of achieving the best outcome for my patient. It is a brain extension, and at the same time relieves me from time-consuming hunt for data and improves my knowledge and quality management.

The issue is how to integrate it into my culture: the industry has little idea of what happens when I am in front of a patient. Working in healthcare requests a set of skills as relationship handling, complexity management and dexterity in reef navigation. A big bang approach won't do; such eco-systems need a systemic understanding. Healthcare systems – and by this also eHealth – represent the greatest challenge in change management.

Where are the successful eHealth models?
Healthcare will always be local. Successful examples as Medcom may work for Denmark, but for each other country you need to adapt such an approach to local conditions. But once we have a large-scale, standardised eHealth infrastructure, this impacts as an incentive to use it for better accessibility, quality, safety and efficiency of healthcare systems, while providing individual, tailored services – such a concept of sensible medical mass customisation is portable everywhere.

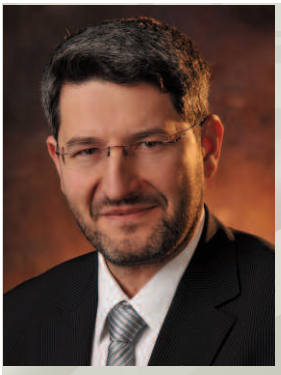
CASE STUDY

Finland: Hospital district connects systems, improves communications



The Hospital District of Helsinki and Uusimaa (HUS) is Finland's largest healthcare organisation. With over 445,000 people using its services annually, it needs an outstanding information system to ensure the wellbeing of patients. In 2007, HUS upgraded its IT environment from a host of disparate software to Microsoft BizTalk Server 2006 R2 Enterprise Edition. HUS hospitals can now collaborate efficiently in an environment that integrates different critical applications.

Mikko Rotonen, Development Director, HUS ICT and Medical Engineering:
"The efficiency of how we deal with patients has improved remarkably and the scalability of the solution means we can continue to grow for the foreseeable future and this at a low cost."



INTERVIEW

Octavian Purcarea, Global Solution Manager in Microsoft's World Wide Health group

Cultural barriers continue to impede the use of eHealth systems and healthcare remains far behind the rest of the economy in its use of ICT. What insights can Microsoft offer to end the cultural impasse?

The key thing is to me the most obvious – we are talking about **knowledge-driven healthcare**. This means everyone involved in healthcare should have the right (evidence-based) knowledge, at the right time, improving outcomes, saving cost and improving quality.

A broad range of IT solutions have to come together to give all those involved the knowledge they need along the continuum of care, from products like the Personal Health Records (such as HealthVault), where individuals can store their own health records, to collaboration and productivity tools for health professionals, to business intelligence and other epidemiology and statistical tools for insurance companies and other payers such as the local and regional governments.

All of this has to be underpinned and connected on a secure, robust platform which would ensure the fundamental functions such as messaging identity and access management, unified communications, system and document management etc.

So how are these components applied?

We are trying to give the world a more comprehensive vision. We are not just supplying the nuts and bolts, but developing specialised solutions, for example, for telemonitoring and disease management. We are working closer with many partners, adding new applications to the end user solutions, with products like **HealthVault** [see box, p8] and **Amalga**. With HealthVault and Amalga, Microsoft is releasing healthcare information, traditionally trapped within data silos, to empower citizens and professionals.

The fact is, the eHealth market remains a complete miasma of competing laws, standards and vested interests. How can you cut through this?

The answer is to find new business models by looking from the opposite end and asking: What is the problem? Classic electronic health records are just static data repositories; they won't improve the outcome. To achieve the full potential of eHealth we need to add the knowledge in a dynamic way along the continuum of care and transform the classic electronic health record in a workflow management system, including the Personal Health Record on this platform. On the hospital side, solutions such as Amalga Hospital Information Systems, Unified Intelligence Systems can bridge and feed the information continuum from care providers to the individual.

Moreover, advanced intelligence systems aggregate information from different sources, and can automatically interrogate it, looking for patterns. Rather than answering predetermined questions it could, for example, highlight a rise in nosocomial [hospital-acquired] infections.

How do you make a business case for eHealth?

There are two main answers. **One is to meet the requirements of all the users – not only the health professionals**. Find out what are the incentives for patients, for insurers, for payers, and use this to provide what they want and build the business case.

The second element is to build trust the between health professionals and the authorities. What healthcare professionals need are systems that are common to them as a profession and follow their normal work process, rather than an adjunct of a huge management or administration system. Such systems could be managed by professional associations.

What one aspect of the technology could do the most to improve the prospects for eHealth?

The main problem at the moment is **usability**. You need standard interfaces like those based on Microsoft's Common User Interface, so that every time a health professional goes to any computer the interface is familiar and consistent. You need common specifications and open standards and architectures underpinning this so that independent developers can use it to build standardised applications. This will avoid medical errors and increase the usability of eHealth systems.

SECTION FIVE

Conclusions and recommendations

For our health and our economy, action is needed now to speed the development and deployment of eHealth systems in Europe. Here are some thoughts for policy action, gathered from experts and stakeholders in the field.

1. Invest in eHealth innovation and spur growth and jobs

Our current economic crisis provides a spur to action. The US government's stimulus plan includes major new eHealth IT spending. President Obama signalled its importance by including it, along with investment in education and research, in his inaugural address.

The global market for eHealth in Europe is the third largest European health industry, after pharmaceuticals and medical devices. It is also a sector of growth and jobs, even and despite the current economic outlook. For example, the demand for clinical information systems and tools for telemedicine and homecare is increasing regularly. But, to tap into its full potential, eHealth needs an environment that is favourable to innovation.

To support the transition to innovative eHealth systems and tools we need:

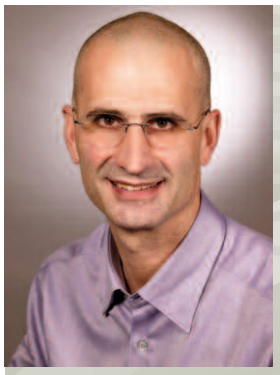
- **Improvement of the skills base** of healthcare practitioners.
- **Promotion of clusters of healthcare innovation**, centred around Europe's great medical universities and teaching hospitals, is recommended. This involves several steps ranging from the reform of tangled intellectual property rules that discourage private investment, to measures that foster the growth of small, innovative healthcare companies with, collectively, the power to create millions of new jobs.
- **The Science|Business Innovation Board**[7] recently urged in the *Wall Street Journal* that Europe act now. The Board is an independent panel of leaders in European industry, academia and policy, to which Microsoft International President and European Commission Ambassador for the Year of Creativity and Innovation Jean-Philippe Courtois belongs.
- **eHealth should be part of that investment programme**.

2. Promote interoperability

Interoperability is a key enabler for the seamless transfer of information and health data along the continuum of care.

The ability of one system to work with or "talk to" another is a precondition for innovation and growth of the eHealth sector. It is also a necessary and desirable element to ensure patients' seamless access to healthcare when travelling across Europe.

- **European, international and global cooperation** is



INTERVIEW

Peter Neupert, Corporate Vice President, Health Solutions Group, Microsoft, and former CEO of the online pharmacy drugstore.com

eHealth covers a broad array of technology for a broad array of users. Where should the focus be?
We really need to focus on the health outcomes we want to achieve, and adopt technology in ways to achieve better outcomes – such as better management of chronic diseases or more effective hospital management. Technology is important but it isn't the silver bullet. The way to encourage innovation in healthcare is by setting goals, not by mandating specific technologies.

What would be one of the greatest advances that eHealth could deliver in your view?
A lot of care happens in the home. As the population continues to age this will be increasingly true. We need to enable physicians and consumers to use technology such as automated monitoring systems and give patients the means to take responsibility for their own health. The Internet presents itself as the foundation for patient/physician connection.

Healthcare is acknowledged to be 10 to 15 years behind other sectors in deploying ICT. What can be done to speed adoption and catch up with the rest of the world?
Everyone points to cultural issues such as professional vested interests, and the need to ensure patient confidentiality as an explanation for this lag. So there needs to be incentives to share data and to make it available at the appropriate time and place. This means putting the focus on making systems interoperate and insisting that vendors separate data from applications.

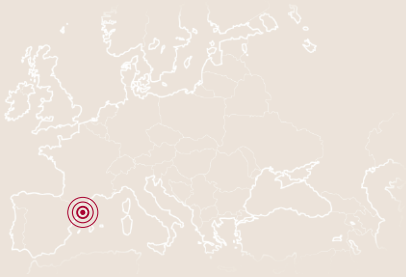
You recently spent time talking to people involved in healthcare in Europe. What was your overriding impression?
Everywhere there is a deep interest in personally controlled health records – more than I anticipated, and despite the fact that some early projects in the category have performed poorly and have low adoption. It is recognised that citizens/consumers need to be actively engaged in their health in order to improve the results and economics of the health system and view personally controlled health records as an important tool to motivate and engage them. They don't see other options that can accomplish this goal.

Privacy is a major issue surrounding the sharing of health data and many have concluded that personally controlled health records are the best solution.

The search is on for ways to connect the health delivery system across institutional boundaries, from GP systems to hospitals and specialists. No one is doing it well yet. But this is seen as critical to delivering better outcomes and containing costs. Seamless data sharing is acknowledged to be the route to new work flows. Unfortunately there remain many barriers to this seamless data sharing.

CASE STUDY

Spain: Hospital boosts patient quality of service, legal compliance with mobile solution



Fundacio Salut Emporda, a small hospital in Spain, needed to better manage its patient consent forms and comply with a government mandate to digitise its records. Using Windows Mobile 6, PDAs, and a custom line-of-business (LOB) application, the hospital has created an efficient electronic forms process. Its customer service has improved, and staff can more easily comply legally. Now they are finding other innovative uses for Windows Mobile.

Francesc Luque, IT Manager, Fundacio Salut Emporda:
"The doctors can spend less time finding paperwork and just focus on giving quality care to the patients."

needed in the development of interoperability of eHealth solutions and systems. It will do us little good to wire hospitals and clinics in one country, only to discover they can't connect with those in another country; that robs us of the opportunity for the savings that arise from a global, competitive market in eHealth solutions.

During the Czech Presidency of the European Union, Deputy Ministers and States Secretaries of the Member States responsible for healthcare met informally for the first time. Their final agreement, and the aim of establishing a high-level coordination structure which should deal with issues such as data compatibility of individual systems and patients' data protection, is a welcome step in the process of eHealth implementation in future.

- **Recent efforts, driven by the Commission, to develop a transatlantic relationship on eHealth should be continued and encouraged** on both sides of the ocean.
- **Discussion and collaboration programmes** developed by organisations such as the European American Business Council, TransAtlantic Business Dialogue and the America Chamber of Commerce to the European Union **are of crucial importance to ensure alignment and coordination in the transatlantic developments around eHealth interoperability**.

3. Enhance the health and wellness of citizens

Health authorities face a daunting set of challenges: they must, with an ageing population, focus on chronic disease management, address cost containment, quality of care and error-free service – all at the same time.

But citizens demand these improvements.

- Progress can come from **collaboration among consumer organisations, associations of healthcare providers and patient associations, at national and European level**. Microsoft has an ongoing commitment to continue the consultation with consumer organisations, associations of healthcare providers and patient associations.
- Governments should **foster the development and testing of new economic models** based on incentives. Pay per performance and organisational changes could offer sustainability to health care systems in partnership with the healthcare professionals.
- **Tackling inequalities and the digital divide** remains of crucial importance to fulfil the promise of eHealth. Governments should promote the creation of partnerships among public, private and non-governmental organisations.
- Industry and healthcare authorities together with the users should continue in their efforts of collaboration and innovation to **drive e-inclusion** and to **promote an inclusive information society**.
- **Special campaign and awareness-raising efforts** like those of the e-inclusion Awards promoted by the Commission's DG INFSO could be continued.

4. Transform health delivery

Implicit in eHealth, as in any new technology, is fundamental change in the way people work. People change behaviour based upon evidence and real cases. Microsoft has set up a specialist division with a mission to improve the way healthcare is delivered.

- **Government and local authorities should fund "proof of concept implementation"** able to convince the health professionals of the necessity to change the way they work.
- **Training of healthcare knowledge managers** is another element required for professionals to be able to deal with ever-increasing amounts of information.
- If Europe is to develop **a new class of health professionals** it is of paramount importance to equip users **with the right skill sets along with management tools that are both innovative and usable**.
- Usability is a fundamental component of how we transform health delivery. **Usability should be tested**.
- **Government-funded evaluation centres and labs in collaboration with universities and SMEs should be promoted** in order to assess the usability and safety of eHealth applications. In turn, this will also **increase the level of trust of health professionals** and patients' groups.

Jan Muehlfeit *is Chairman Microsoft Europe*

We have a vision of how health will be provided in the future. In this vision, technology supports and extends the capabilities of clinicians and healthcare facility administrators. It brings information smoothly into existing ways of working and uses ICT to reduce the complexity of burdensome processes. In this New World of Healthcare Work, clinicians and administrators have pervasive access to the latest knowledge to improve outcomes. Hospitals, clinics, and doctors' offices can operate more efficiently and focus their resources on patient care. The latest innovations in medical science can spread immediately across the professional community and around the world. Providers can extend the reach of their skills to even remote, poorly served areas. Payers can align reimbursement plans to support preventative care and effective treatments without looming over the shoulders of providers and patients. Although medical information and records are standardised, portable, and universally accessible, privacy and confidentiality are protected by the strongest technologies and practices.

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[1] COM(2004)356 final. e-Health – making healthcare better for European citizens: An action plan for a European e-Health Area.

[2] Esko Aho chaired the working group which first drafted and published this report on innovation in Europe. It is his name which has since been used to refer to the report.

[3] See http://ec.europa.eu/invest-in-research/pdf/download_en/aho_report.pdf

[4] See http://ec.europa.eu/information_society/newsroom/cf/itemlongdetail.cfm?item_id=4224

[5] See www.mscui.org

[6] See http://healthvault.com/

[7] http://www.sciencebusiness.net/info/innovationboard.php

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