

The Connected Business

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A suitable case for treatment

Technology will play a growing role in care delivery but obstacles need to be tackled, writes Sarah Murray

At Stanford University in the US, electrical engineer Ada Poon has developed a means of wirelessly transferring power into the body to run tiny electronic medical devices such as pacemakers and nerve stimulators.

Meanwhile, Google and Novartis, the Swiss drugs group, last week announced a deal to develop "smart" contact lenses that will help diabetics track their blood sugar levels by measuring glucose in eye fluid.

But if technology is accelerating medical advances, IT will also play a critical role in reshaping health systems as the industry struggles to meet rapidly rising demand for care.

With populations around the globe growing older, millions of individuals are living longer but with one or more chronic conditions. As this puts increasing pressure on healthcare systems, the whole emphasis of healthcare needs to shift, experts say.

What was once a reactive system, mending broken bones and curing disease, now needs to prevent people from becoming ill, manage their conditions and do so at lower cost and increased quality.

None of this will be possible without information technology. "IT is the only hope we have of making sure we do a better job of that," says Stephanie Reel, chief information officer for the US-based Johns Hopkins University and Health System.

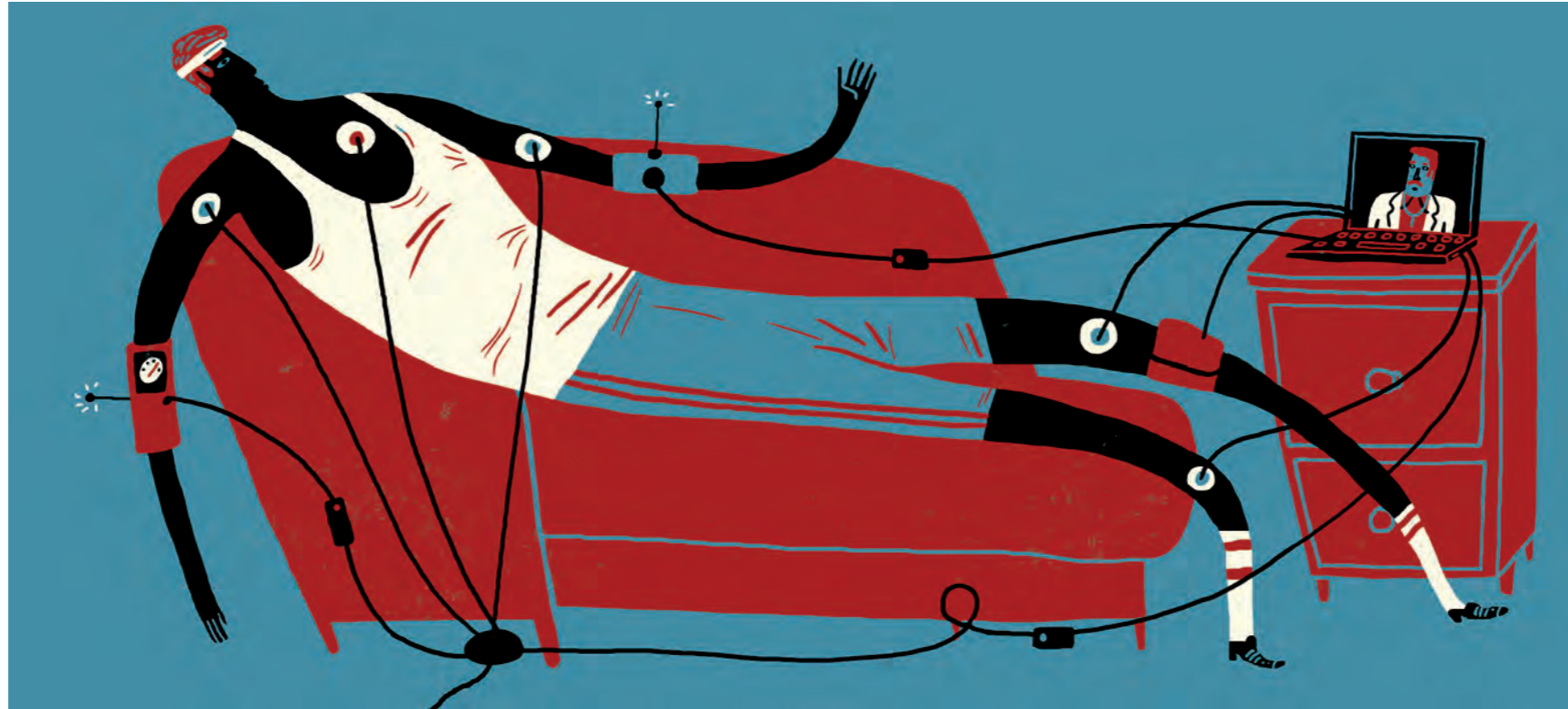


Illustration: Øivind Hovland

First, IT can help shift care from the hospital to the home, cutting costs sharply and giving individuals a better quality of life. Home-based systems can, for example, monitor blood-sugar levels in diabetics and transmit that information wirelessly to the clinic. Sensors in shoes can detect changes in gait and alert caregivers if a patient or relative has fallen.

Apps and wearable health monitors encourage individuals to become more involved in their own care, helping them make dietary improvements or exercise more frequently.

"We're evolving to systems and sensors that will be able to manage,

monitor and motivate people into wellbeing," says Joseph Coughlin, founder and director of the Massachusetts Institute of Technology's AgeLab, which conducts research into technologies, business strategies and policies relating to longevity.

Some see a "consumerisation" of healthcare as IT enables greater choice and price comparisons. "We're used to shopping and booking flights and hotels online," says Anurag Gupta, a research director at Gartner specialising in healthcare. "There's a big push to have some level of this in healthcare."

But while remote monitoring and

apps increase quality and choice in developed countries, in poorer parts of the world they provide something more fundamental – access.

Mobile phones allow community health workers in rural areas to conduct diagnoses remotely by sending texts and images to the nearest healthcare centre. And in the absence of local medical services, the ability to talk to a doctor or nurse in an emergency represents a big step forward.

Another technology tool that is proving critical in advancing healthcare is the electronic medical record. Once used merely to collect information about individual patients, the

EMR is becoming a data source providing the insights necessary to design preventive strategies and more customised interventions.

Correlated with other information, health data can be used to improve population health. Researchers could, for example, compare the incidence of diabetes in a particular area with census and demographic data and information on the number of local parks or shops selling fresh vegetables.

Armed with this knowledge, policy makers, health professionals and others can respond more effectively. In

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Cheap DNA sequencing will transform medical research

Genome technology

A process that once cost \$1bn is likely to fall to tens of dollars within a few years, writes Clive Cookson

DNA sequencing has experienced a spectacular fall in its price to performance ratio, exceeding that in every other important field of technology.

The cost of reading the three billion chemical "letters" in a human genome crashed from \$1bn in the 1990s to \$10m in 2007 and is likely to dip under \$1,000 within the next two years. A small bacterial or viral genome can be decoded for tens of dollars.

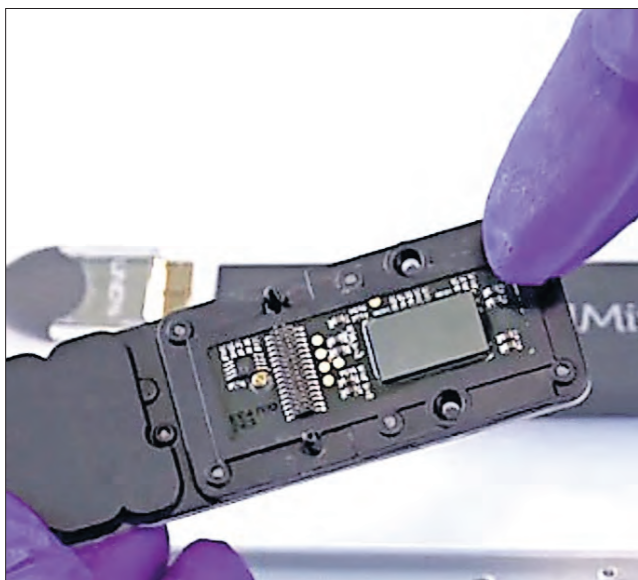
The consequences for medicine and the biosciences of quick and affordable DNA sequencing will be profound. In healthcare, an era of personalised medicine is dawning, in which treatments can be matched to an individual patient's genetic make-up.

In research, genomics is transforming fields from palaeontology – decoding DNA extracted from the fossils of extinct species – to agriculture, where it is giving plant breeders new insights into crop improvement.

This is happening some years later than suggested by a few of the overenthusiastic predictions made as the original Human Genome Project was coming to a close 15 years ago, but that delay was not due to any failure by the technology to make the expected progress; rather, the biology turned out to be much harder to decipher than expected, with the control and functioning of genes showing levels of complexity that scientists are only just beginning to understand.

But there is unevenness in how the revolutionary impact of genomics is affecting research.

An analysis released last month by Marks & Clerk, the London-based intellec-



Oxford Nanopore's Minlon: the smallest DNA sequencer

tual property company, shows that "public research organisations are driving advances in research into genome-related technologies and their use in medicine and industry, with the private sector lagging behind". Most of the innovation is taking place in the US, with the National Institutes of Health (NIH) particularly active.

"The markedly strong performance of US public bodies reflects badly on Europe, with European universities and research bodies surprisingly under-represented among the large filers of patent applications," says Gareth Williams, Marks & Clerk partner.

The biggest single source of innovation is the NIH Advanced DNA Sequencing Technology Program, which has been providing about \$20m a year in grants since 2004. The last round of eight grants was announced in September 2013 – two to companies and six to universities – and the next announcement is expected this autumn.

Perhaps the most eye-catching grant went to a small Californian company, Eve Biomedical, which intends to develop a system "that can sequence an entire human genome for under \$100. The overall system will be based on using light to sequence DNA on a cell phone camera chip."

But the technology being promoted most actively by NIH is "nanopore" sequencing, which involves threading single DNA strands through tiny protein pores in a membrane. Individual bases, the chemical letters of DNA, are read one by one as they pass through the nanopores; each of the four bases in DNA has its own distinctive effect on an electric current passing through the pore.

"Nanopore technology shows great promise but it is still a new area of science," says Jeffrey Schloss,

"Public research organisations are driving advances in research into genome-related technologies"

director of the NIH programme. "We have much to learn about how nanopores can work effectively as a DNA sequencing technology, which is why five of the programme's eight grants are exploring this approach."

Several companies are commercialising nanopore technology. A leader in the field is UK-based Oxford Nanopore, a private

company that has raised £145m from investors since its foundation in 2005. Its Minlon device, the world's smallest DNA sequencer, is not yet on sale but is beginning to give results for academic researchers who have been given early access to the technology.

In principle, nanopore technology has advantages of speed and simplicity over current sequencing methods. These require DNA to be chemically labelled and copied; it has to be broken up into short segments which are sequenced many times.

The world of DNA sequencing machines used to be dominated by Applied Biosystems of the US, which was acquired in 2008 by Invitrogen and subsumed into a merged company renamed Life Technologies. Last year, Life Technologies was bought by Thermo Fisher Scientific for \$13.6bn.

Illumina, still an independent US company after seeing off a \$6.7bn bid by Roche of Switzerland, is leader of the DNA sequencing market, although Roche remains the largest player in Europe. Last month, Roche, which predicts a big role for gene sequencing in its large diagnostics business, bought Genia, a privately owned Californian sequencing company, in a deal worth up to \$350m.

The patent analysis by Marks & Clerk shows Illumina and Life Technologies are far ahead of the corporate pack in the number of patents filed in DNA sequencing technology over the past 10 years, with 80 and 70 respectively.

The leading Asian company in the field is BGI Shenzhen (formerly Beijing Genomics Institute). "We are seeing interest from emerging markets like China, where life sciences companies have for many years lagged behind their electronic counterparts in terms of patent filings around the world," says Mr Williams. "The importance of BGI Shenzhen's appearance in the list of top filers should not be underestimated."

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Google catches cold as debate over 'big data hubris' rages

Epidemiology Scientists are divided over the value of initiatives such as the search engine's flu trends analysis, writes *Andrew Ward*

It was once a symbol of the power of big data. Google Flu Trends was supposed to provide an early warning system for looming epidemics by analysing internet search terms for signs that people were coming down with the bug.

The concept – easy to understand and unambiguously good for society – became a favourite of commentators and policy makers evangelising about big data's benefits.

Six years after its launch, however, Google Flu Trends (GFT) is now more often cited as an example of the limitations and dangers of over-reliance on online data.

During the 2012-13 flu season, GFT predicted 10.6 per cent of the US population had influenza-like illness when subsequent patient data showed the true figure was 6.1 per cent. The algorithm was improved for the 2013-14 season but still GFT overestimated cases by 30 per cent.

Google's shortcomings were laid bare in March, when researchers from Northeastern university in Boston, Harvard and elsewhere published a paper in Science magazine called "The parable of Google Flu: Traps in Big Data Analysis".

GFT, they said, was an example of

"big data hubris" involving "the often implicit assumption that big data are a substitute for, rather than a supplement to, traditional data collection and analysis".

Analysing flu reports provided to the US Centers for Disease Control and Prevention (CDC) by doctors remained more accurate than Google's predictions, the researchers found, even though there is a two-week lag in the data.

"The comparative value of the [GFT] algorithm as a standalone flu monitor is questionable," the paper concluded.

What went wrong? Problems included people searching for information on flu symptoms when they really only have a cold; or because they are worried about getting it; or because they have been prompted by media coverage of flu outbreaks.

Moreover, when people search for information about flu – or anything else – through Google, a list of related search prompts encourages people to make further searches on similar subjects. This risks causing a snowballing in flu-related searches that distorts the data.

During its design phase, Google software engineers analysed more

than 50m search terms for potential correlations with CDC data on reported flu cases in prior years.

Some of the strongest correlations involved searches such as "Oscar nominations" and the "March Madness" US College basketball series which tend to coincide with peak flu season. Unhelpful examples such as these were filtered out and 45 search terms settled on that appeared to be good indicators of flu activity.

The flaws in the algorithm have been seized on by sceptics who believe the benefits of big data have been overblown. However, Google's own software engineers were open about its limitations when they launched GFT in 2008.

"This system is not designed to be a replacement for traditional surveillance networks or supplant the need for laboratory-based diagnosis," they wrote in Nature magazine. "The data are most useful as a means to spur further investigation and collection of direct measures of disease activity."

This was precisely the conclusion reached by this year's Science paper on the limitations of GFT. Beyond the headlines on "big data hubris", the researchers acknowledged that Google data could improve the accuracy of

flu forecasts when combined with CDC data.

Other academics have since stepped in to defend the concept of using big data to improve epidemiology even if Google's first attempt was flawed.

A report from researchers at Harvard University and elsewhere in July concluded that the problems were mainly methodological, raising the prospect that GFT could become more accurate. "A methodological problem has a methodological solution," they wrote.

One possible way to build a more robust model emerged from a Pennsylvania State University study published in July, which claimed to have diagnosed with 99 per cent accuracy people with flu based on their social media activity.

Whereas GFT was based on correlations between search terms and population-wide flu data, the Pennsylvania researchers based their model on 104 individuals who had been professionally diagnosed with the virus in the 2012-13 winter.

The researchers looked at the Twitter accounts of those people to see if they left clues about their illness when they were suffering from flu. Just under half the people referred

This won't hurt a bit: a nurse in Hong Kong prepares to give a flu vaccination

Getty



directly to their condition in their own tweets. Yet, by analysing other patterns of usage, the researchers were able to come up with a model that accurately diagnosed even those who did not mention their flu.

This was done through analysis of text searches, how they interacted with their Twitter "followers", and the intensity with which they were using the site compared with when they did not have flu.

The Pennsylvania researchers believe that basing disease-tracking algorithms on the online behaviour of people known to have had the disease could be the key to more accurate predictions. But they also acknowledge the privacy concerns surrounding such methods.

While their study focused on flu, they noted that the same technique could be used to identify people with more "stigmatised diseases", such as HIV, "where being able to determine if an individual is HIV positive without her knowledge and with only her Twitter handle could result in serious social and economic effects".

They concluded: "It would seem that simply avoiding discussing an illness is not enough to hide one's health in the age of big data."

Problems included people searching for information on flu symptoms when they really only have a cold

Wanted: IT expertise with a human touch

Jobs market

Staff with healthcare and technical skills are highly prized, says *Jane Bird*

From electronic patient records and clinical administration systems to wearable fitness monitors, the healthcare industry is being flooded with data.

Making better use of such information could improve hospital efficiency and outcomes for patients but this can happen only if employees have the right combination of healthcare experience and technical qualifications.

The best staff typically have both, says Jason Bincalar, deputy director of informatics at Barts Health NHS Trust, the largest group of healthcare institutions in the UK. "Hospitals need to focus their hard-pressed resources on medical practitioners, not IT departments," he says.

"People have to hit the ground running. We can't afford to spend two years training them, we need them to be as efficient as possible from day one."

But staff with these qualities can be hard to find, says Frank Myeroff, president of Ohio-based Direct Consulting Associates (DCA). "In the US, there is already a huge shortage of people in the healthcare sector with analytics and informatics skills," he says. To meet the shortfall, US universities are starting to create courses on healthcare IT. These include Columbia University, New York, and Stanford University, California.

"Their aim is to fill the gap and get people trained in university rather than waiting until they are on the job," Mr Myeroff says.

Steve Nathan, chief executive at California-based Amara Health Analytics, agrees that people with healthcare and big data skills are in short supply in the US. "The job title 'data

scientist' has become really hot," he says. In the past, medical software involved mainly capturing the knowledge of experts, Mr Nathan says.

But now, with big data, search programs with powerful algorithms can find patterns and solve problems by themselves, spotting symptoms that could give early signs of specific diseases, for example.

People who can design such systems tend to have a computer science background, often with a PhD in a subject such as artificial intelligence. They also need skills in natural language processing to extract meaning from unstructured data such as clinicians' notes, Mr Nathan adds. And they need techniques for handling large quantities of data at high speed to provide real-time reporting on data being captured by a growing array of electronic monitors.

In the UK, the skills shortage in healthcare is less acute than in the US, says Andrew Gardner, senior divisional director at

'People have to hit the ground running; we can't afford to spend two years training them'

Reed Technology, a UK recruitment consultancy. Although the market is "not awash" with people who have the right mixture of IT skills and healthcare experience, finding them has not been too difficult in recent years, he says. "We have not had to go overseas for talent."

However, that could be about to change. Mr Gardner adds: "The market has been picking up since the end of 2013 and it could become a struggle to find people with technical skills in healthcare in the coming months."

The particular challenge



Vital signs: hospitals rely on complex systems

Arno Masse

in healthcare is that systems cannot be allowed to go down, says Mr Bincalar. The Barts Trust has six hospitals, 50 community clinics and 14,000 staff.

"Given the sheer size of such systems and the fact that nothing is 100 per cent reliable, the only way to ensure fail-safe computing is to add extras and replicate systems, and that increases complexity," he says.

Another important skill for IT staff, given the complexity of most hospital information, is the ability to use the latest data presentation and visualisation tools for troubleshooting hospital equipment. The days when you picked up the phone to ask users if their computers were working are over, he says.

"Staff need to be able to work with toolsets that help visualise and interpret data," says Mr Bincalar, who looks for people who are familiar with software from vendors such as Extreme Networks, which the Barts Trust uses to handle its data infrastructure.

Such tools help IT departments look inside networks and see where users are experiencing problems. "This lets me target my investment," he says.

The software helped reveal the fact that consultant radiologists were being held up when reviewing MRI and CT scans because of bottlenecks between their computers and the system holding the images. "Solving that problem has greatly reduced their level

of frustration and increased their productivity," Mr Bincalar says.

One way to find IT staff with experience of critical environments that need fail-safe computing is to look in sectors such as financial services, defence, utilities and nuclear power, he says.

A further crucial skill for healthcare IT professionals is the ability to communicate. The human element is very important because hospitals tend to be large organisations with relatively few IT staff, says Mr Bincalar.

"We need people who can listen intelligently when they come into contact with clinicians and understand their requirements, so they can help people select the best product, check its functionality, and make sure it is fit for purpose," he says.

Since the recession, many IT workers have been willing to transfer into healthcare. There is also quite a lot of staff movement between the software companies that develop applications and hospitals where they are deployed. "Software developers find it useful to have people with experience of hospital environments, and vice versa," says DCA's Mr Myeroff.

Salaries in the software industry tend to be higher than those in healthcare, as do salaries in other sectors. IT staff choosing to work in healthcare, particularly in the public sector, tend to be motivated by other factors, not just money, Mr Myeroff says.

Public access to files points the way to securing trust

Case study UK

Concern over privacy is a hurdle that can be overcome, writes *Michael Dempsey*

Roger Stedman is a passionate man. With 22 years of work in the UK's National Health Service (NHS) behind him, the medical director of Sandwell and West Birmingham Hospitals NHS Trust thinks the place of information in healthcare is grossly misunderstood.

"Improving the use of data is a massive issue," he says. "People haven't got to grips with the fact that medicine is an information industry and that 90 per cent of healthcare involves the transfer of information between professionals."

Dr Stedman works in a field where data exploitation has an unhappy history and has recently been the cause of much friction between patients' groups and the authorities.

In February, a plan to create a vast database of patient records that could be accessed by medical researchers ground to a halt under pressure from privacy campaigners.

Although the information in the NHS patient database would be anonymised, concerns remained about the ability of third parties to extract identities from registration numbers and postcodes.

With wider fears about

confidentiality triggered by the Snowden saga contaminating trust in the public sector's grasp of privacy, the database plan was put on hold for six months.

This postponed project remains "fundamentally important", according to Simon Stevens, chief executive of NHS England. But public doubts about the security of health data, however ill-informed, are not going away. Dr Stedman recognises that privacy worries are genuine, but thinks the way forward is "to get to where the online banking industry has got in terms of trust in the data and the system".

Research indicates that he may be pushing at an open door. Half the British patients polled in a 10-nation survey by Accenture on attitudes to online medical records thought the benefits of online access outweighed the confidentiality risks.

Tellingly, the vast majority of the 1,000 UK respondents wanted more control over their own health data. This is where the real story lies, says Kaveh Safavi, who manages the consultancy's global healthcare business. "It's true there are concerns over privacy but these are not prohibitive. Patients are already active online so why not give them access to their own records for themselves?"

Western societies face ageing populations and growing healthcare bills so using access to health data as a lever to promote patient involvement and responsibility has obvious

economic attractions. This view gets resounding support from Dr Stedman: "My campaign is to give ownership of the data to the patient," he says.

His vision of a cloud-enabled NHS has patients allowing their records to be stored and accessed online by themselves and any medical staff they encounter in their journey through the bewildering layers of UK state health provision.

He talks of "social healthcare", a model whereby each patient can opt to invite selected partners, healthcare practitioners or even patients with the same conditions into their personal online space. Dr



Roger Stedman: improving the use of data is a huge issue for the NHS

Stedman's vision is of a rising cohort of "expert patients" who can share their experience, what he calls "crowd-sourced, evidence-creating medicine".

He admits this is an idealised view of the future. "There is nothing that will force the hospital that I work for to make available all the information it holds about patients through a cloud portal, or share that information with other providers of that patient's choosing."

But websites such as the US PatientsLikeMe, where patients share information and experiences, are

emerging and he insists it is only a matter of time before these develop formal links with healthcare providers.

Both patient consent and the simplicity offered by cloud services could cut through the perplexing maze that is the NHS. Beyond its two hospitals, Dr Stedman's trust acts as a series of mini-health services including community healthcare nurses and therapists. "Patients view the NHS as a single entity, but in reality it is very fragmented," he says.

The divide between the GP's surgery, where most personal files are held, and the hospital where a patient may be treated is tremendous. Dr Stedman believes his proposed information-sharing agreement would bridge this gap and join up different points in the NHS compass.

For all its 1.7m staff and £109bn budget, the NHS is not a national monolith but a collection of small organisations. In such a dispersed system, grand projects are always going to prove troublesome and face critics.

The failed National Programme for IT, which included an attempt to overhaul all general practitioner computer systems and cost £9.8bn in the decade from 2002, looms large in public consciousness of healthcare and technology.

If more modest patient-participation schemes using online access were pitched as both affordable and attainable, they might win over the popular vote.

Contributors >>

Clive Cookson
Science editor

Andrew Ward
Pharmaceutical correspondent

Paul Taylor
Personal and business technology writer

Jane Bird, Michael Dempsey, Sarah Murray, Paul Solman, Jessica Twentyman
Freelance writers

Andrew Baxter
Writer/commissioning editor

Chris Lawson
Picture editor
Steven Bird
Designer

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The Connected Business

Networking finds fresh dimension

Conferences Smartphone apps and even holograms are changing the game, writes *Jane Bird*

You are at a conference and the speaker on stage is walking up and down and gesticulating to emphasise his points as he talks to a female presenter. All quite impressive, considering he is not on stage at all, but is a hologram.

The technology was demonstrated at a recent London conference (see article, right) and the man was in a booth off-stage but organisers say he could just as easily have been in San Francisco.

Technology is revolutionising the conference experience and not just to create razzle dazzle entertainment for delegates. It is also transforming the economics.

Organising 140 conferences a year used to be a labour-intensive task says Marty Hoski, global manager for travel and meetings operations at ETS, a US-based education assessment organisation. His 14-member team had filing cabinets full of folders containing manually-prepared paper documents relating to contracts for exhibitors, speakers, catering staff and other participants.

Now the process is automated, using Cvent, a cloud-based software service that provides apps to help with everything from venue selection and online registration to travel booking, payment, email marketing and web surveys.

Using the apps enables each event to be managed as an individual project and it takes a fraction of the time, Mr Hoski says.

By subscribing to a service, rather than trying to build the software itself, ETS gets access to the latest technology and can sign up for whatever components it wants: "All we need is a browser and internet access."

In addition to helping with administration, apps from companies such as Cvent and Eventbrite allow conference organisers to monitor who attends which sessions in real time and to use this information for follow-up marketing.

Up to 25 per cent of marketing budgets is spent on events, says David Chalmers, marketing director of Cvent. "Software that lets you run campaigns and integrate them with your sales and marketing workflow



Voices off: a hologram at last month's Meet the Future conference

sounds dull and dry, but it is transformational in proving return on investment for an event."

Organisers can also use the apps to analyse chatter on social media. They can assess the level of interest from people not attending the event, for example by seeing how many messages are "liked" on Facebook or retweeted. This helps plan a better event next time, says Renaud Visage, chief technology officer and co-founder of Eventbrite.

"Delegates can be offered the chance to book seats at networking sessions, panel discussions or lunch tables where they can meet delegates

who want to discuss the same topics," Mr Visage says.

This has turned out to be one of the most popular aspects of the Eventbrite app. Another useful app, sli.do, allows delegates to submit questions during a presentation and to vote for their favourites so that those have more chance of being asked.

For Jackie Chi, manager of strategic initiatives at The Culinary Institute of America, based in Hyde Park, New York, being able to include maps and guides, and change them at the last minute, has been a big advantage of the app approach.

"There are often late changes, such

as a presenter dropping out or a new sponsor coming in," Ms Chi says. "You couldn't reprint the guide but you can update the app in a few minutes."

Moreover, daily maps can be provided for areas where the location of exhibitor booths is changed each morning depending on the theme for the day. This is useful for event staff as well as delegates, Ms Chi says.

Apps are much more convenient to use than printed guides, she adds. "They are not just available online, but from a smartphone in the palm of your hand. That's much easier than rummaging in your handbag or briefcase to find details of the next speaker."

Not all conference apps have proved popular. Apps that let people exchange electronic business cards by "bumping" smartphones were introduced a few years ago but did not take off. They were too cumbersome and worked only for people with the same system.

Much progress has been made since then, says Daniel Curtis, a director of emc3, a London-based event organiser. "Nobody was interested in 2010 when we tried to introduce an app that let conference organisers register delegates as they arrived on iPads and print badges," he says. "But we had to build the software ourselves and it had glitches. Now you can buy or subscribe online to packages, although they can still be expensive for small organisations."

Futuristic technologies such as 3D holograms are beyond the financial resources of most conference organisers at present, says Eventbrite's Mr Visage. "And lots of technologies require high levels of bandwidth, which might not be available or require installation of special equipment."

Nor does technology solve all conference problems. There is no way at present to prevent leakages and restrict participants from sharing information from the event. "You just have to depend on people's honesty," says Mr Visage. In the end, anything that makes conferences more exciting, engaging and fun is likely to get adopted, he believes. But in reality, many people still prefer to exchange traditional business cards.

Technology Conference delegates feel the buzz as microchip name badges help them tap into the future

Delegates arriving at the Meet the Future conference in London were handed name badges containing a microchip programmed with their details. Instead of swapping business cards when they met someone new, they could tap their badges together.

The badges lit up and vibrated as they exchanged contact information, using the near field communication (NFC) technology found in travel passes and contactless payment with mobile phones.

"The flashing and vibrating acts as an icebreaker and makes networking and meeting new people more fun," says Maria Schuett, conference producer for Central Hall Westminster, where last month's event took place. The data were made available to delegates after the conference.

Showing how technology could make conferences more enjoyable for delegates – and more profitable for organisers – was the purpose of the conference and to this end a special application to run it was devised. Creating an event app was much quicker and easier than having to design a conference website, Ms Schuett says. Delegates could use it for registration, checking the agenda, displaying the floor plan and seeing who else was there. The conference also featured other technologies, such as radio frequency identification (RFID), Bluetooth and iBeacon, holographic projection, audience polling, a demonstration of Google Glass and various 3D applications.

Bluetooth and iBeacon were used to send personalised welcomes to delegates' smartphones and other devices. Tapping the badge against kiosk screens in the exhibition area allowed people to pose for a picture of themselves against a London skyline and have the image sent to all their social media contacts. In addition to taking the stress out of using Twitter and Facebook, this helped gain much more publicity for the event, Ms Schuett says.

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Heads up: Google Glass headsets could aid speakers

Bloomberg

Getting people to tap their badges as they entered the main conference hall enabled the organisers to know precisely when the seats downstairs were full, so that they could direct everyone else to the balcony. "We are considering offering those people an extra package for next year or guaranteeing them a seat downstairs," Ms Schuett says.

During the conference, there was also a demonstration of how a speaker wearing a Google Glass headset could see the audience ahead, while viewing a side display showing audience questions and live results of polls. The live polling required delegates to access a mobile app – sli.do – via a web link. At the beginning of the day, this needed the inducement of the chance to win a weekend in London at a five-star hotel, but by the afternoon people had become so enthusiastic that they were logging on unprompted.

The event app also enabled people to see who in their social network was close by, locating them within concentric circles of 5m and 10m. "[It was] a visual and fun way to network," Ms Schuett says.

Visitors saw various 3D technologies in action. These included using a stereoscopic presentation to launch small products such as medical components, which can be filmed, projected, rotated and dissected on screen. On the merchandising side, people could be scanned in 3D then a colour plastic model of them "printed" out, 20cm tall, complete with facial expression.

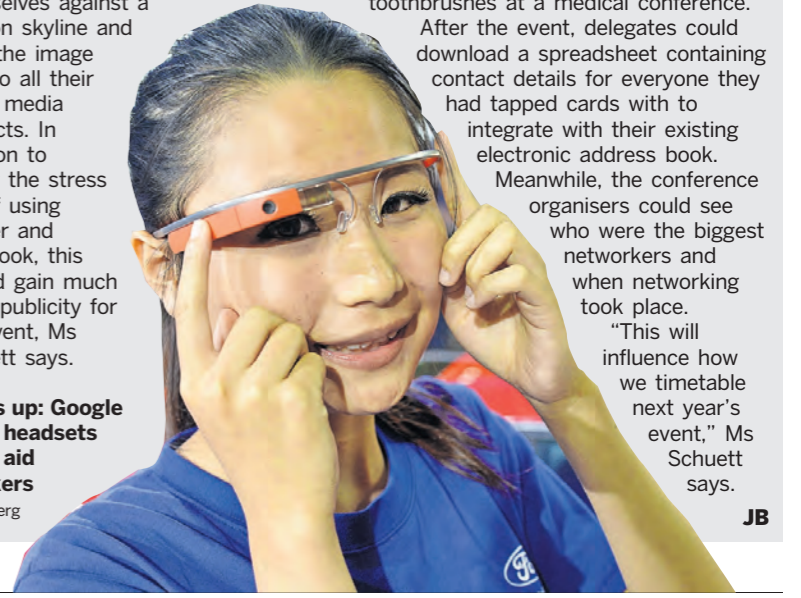
"People loved the 3D replica of themselves," Ms Schuett says. This is one type of bespoke souvenir that you could not produce commercially, she notes. "Another might be personalised toothbrushes at a medical conference."

After the event, delegates could download a spreadsheet containing contact details for everyone they had tapped cards with to integrate with their existing electronic address book.

Meanwhile, the conference organisers could see who were the biggest networkers and when networking took place.

"This will influence how we timetable next year's event," Ms Schuett says.

JB



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Consumer network cameras give businesses a clearer picture



Paul Taylor

Video surveillance plays a vital role in securing many businesses, ranging from the corner shop to the large scale manufacturing facility. Historically these systems, which include CCTV (close circuit television) equipment that was often combined with video recorders, were complex, costly and usually delivered grainy images that were all but useless.

In recent years many companies and small businesses have replaced these systems with IP-based network cameras that either record to a NAS (network attached storage) drive, or are monitored by local or remote security teams.

These systems, made by a range of groups including Panasonic, Axis and Foscam, deliver much better video quality than old CCTV equipment and are more flexible, but they are still relatively costly to purchase and difficult to set up. Typically they require a corporate IT department or external specialists to do this.

I have two weatherproof Panasonic network cameras set up at my home and connected to my Control 4 home automation system. One monitors our driveway, the other, a "pan-tilt-and-zoom" model, is installed on our porch to monitor the front door – but neither device was easy to set up.

Recently, however, I have tested a selection of consumer network cameras – equipment that because of its ease of set up, flexibility and low cost is increasingly finding its way into businesses as part of the so-called consumerisation of

enterprise IT. This move has been led in large part by disruptive upstarts such as Dropcam, which was recently acquired by Google's Nest Labs unit.

Most of this new generation of network-based webcams does not require a hard-wired Ethernet connection, instead they hook up to a home or office WiFi network, are configured easily using a web app or browser and deliver alerts to users via their smartphones or laptops.

Samsung's SmartCam HD Pro is a prime example of how easy the latest consumer webcams are to set up. Like most of its rivals it can capture high definition video and uses the cloud, web and mobile apps to provide a wide range of features including remote viewing.

In design, it lacks the Apple-inspired sophistication of the Dropcam Pro (see below) which costs a little more. But for image quality and functionality, they are very similar.

I connected the SmartCam to my home WiFi network before signing up with Samsung's free cloud-based service, which is accessible from either a browser or using the free iOS and Android smartphone apps.

Among its distinguishing features, the SmartCam HD

Pro has an ultra wide-angle lens capable of capturing an image spanning 128 degrees. If you position it correctly, that means you can monitor a large area with just one camera.

I found that the SmartCam worked well even in difficult lighting conditions, producing clear, sharp images in both bright sunlight and dim internal lighting. In addition to remote monitoring, you can also

Most of this new generation of webcams do not require a hard-wired Ethernet connection

capture and store video clips on an SD (secure digital) card.

Another product I have tried, the D-Link Outdoor HD Cloud Camera (DCS-2330L) is one of the newest consumer webcams from D-Link, which has an extensive range of devices aimed at both the consumer and business markets.

The DCS-2330L is actually one of the smallest weatherproof home security webcams

and, based on my tests, one of the best performing in the dark. D-link claims the new webcam can be operated outdoors in temperatures as low as -13F or as high as 113F and can capture video of objects up to 15ft away in almost complete darkness – an impressive feat and a useful feature if you want to keep an eye on a house or business at night.

The DCS-2330L captures 720p HD video rather than the full HD (1080p), so video is not quite as crisp or sharp as some competing devices, but I found it perfectly adequate for general viewing.

However my favourite webcam for use in the home or a small business is the Dropcam Pro, which shares many of the features of the Samsung SmartCam HD Pro including its wide angle lens, high-quality video and remote monitoring service. This includes an optional, low cost cloud-based recording service.

It also supports two-way audio (so you can scold the office cat remotely if required) and its free iOS app offers a pinch-to-zoom feature that enables users to zoom in to an image to see detail.

But most importantly, the Dropcam Pro incorporates a high quality, six-element, all-glass lens and a larger image sensor to provide higher quality video in a wide range of lighting conditions.

Earlier this month Dropcam also introduced a feature called Custom Activity Zones, designed to give users more control over what motion alerts they receive. The new feature should be particularly useful when the device is monitoring a high traffic area such as a doorway and enables users to filter activity alerts so that they receive only the alerts they care about.

I have yet to test the new feature but, based on my experience to date with Dropcam, I am optimistic.

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