Building a more efficient health service

The critical role of speech recognition technology in the future of healthcare

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Executive Summary

With the tidal wave of change that is set to hit the healthcare sector over the next few years, healthcare professionals need to drive through innovative improvements to their organisations that don't just deliver incremental benefits, but fundamentally transform their bottom line.

The basic question they are seeking to answer is how to increase efficiency, while also maintaining or improving standards of quality and patient safety. This paper looks at how voice recognition technology and its associated use in end-to-end automated workflows can deliver improvements in the production and communication of clinical documentation.

It begins by examining the implications of current changes for the healthcare sector, including:

▸ a greater than ever scrutiny of cost, coupled with increased competition how this is framed in the context of the drive for quality, including the impact that the NHS Quality, Innovation, Productivity and Prevention initiative has had

▸ the continuing need for improved communications, taking its impact on hospital discharge times and readmissions as a case in point demands for ever greater efficiency

Then, based on case study and best practice evidence, it suggests a response from the health sector. While productivity continues to be a focus, healthcare providers seeking efficiencies should look to limit the impact on front-line staff. Technologies that improve the creation and management of documents, including for example radiology reports, will be a key differentiator.

At the same time, the health sector should drive up quality in order to maintain safety, compliance and smooth over processes. The paper itemises the factors that contribute to quality, including accuracy, speed, automation and the ability to provide greater detail – and it explains how voice recognition technology can boost all of these.

At the end of the day, healthcare managers are going to be asking two questions about any technology investment: what's it going to cost and what's my return on investment? While the return-on-investment is not a simple equation, and can differ markedly from one organisation to another depending on its current state, we provide evidence from the US and elsewhere that suggests the returns are enticing.

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Part One: A tidal wave of change

With the changes that are set to hit the UK healthcare sector over the next few years, senior managers could be forgiven for putting their heads in the sand, sitting tight and waiting to see what happens.

The government almost instantly went on the defensive about the Health and Social Care Bill it put before parliament, stating it was an "evolutionary" move that would be tested and bedded in gradually. But a bill proposing the abolition of Primary Care Trusts, Strategic Health Authorities and handing their responsibilities over to commissioning consortia could hardly be described as a gradual change – more like a tidal wave of change. In the event, the watering down of some of the proposals in the recommital and subsequent passing of the bill may have been enough to placate some opponents, and the timetable may have been pegged back, but the original intent of "status quo is not an option" remains.

Setting aside skepticism about the moves, and the suspicion that by effectively handing over commissioning to the private sector or "any willing body" and decentralising the bureaucracy in the way of Prime Minister David Cameron's Big Society, the government may actually just end up shifting administrative costs elsewhere, there's no doubt that a revolution in the architecture of the UK's health sector is under way.

In revolutionary times, hiding away is certainly one response to change – but managers could find that if they don't act, they will be the species that ends up in an evolutionary cul de sac. A far better response is to put your house in order, and ensure that your organisation is able to ride out the storm of scrutiny, and demands for quality and efficiency.

1.1 Scrutiny as never before

The government white paper, Liberating the NHS[1], which prepared the ground via one of the biggest ever consultations, for the current Health Bill, made for ominous reading. What was clear even at this early stage, was that the changes that were coming were set to be monumental. In a section headed "cutting bureaucracy and improving efficiency", for example, the paper states:

> **Over the past decade, layers of national and regional organisations have accumulated, resulting in excessive bureaucracy, inefficiency and duplication. The Government will therefore impose the largest reduction in administrative costs in NHS history**

Some commentators have questioned the figure of £5.3bn in administration costs that Health Secretary Andrew Lansley has quoted in this respect, pointing out that this includes the core infrastructure services, including IT, that stretch across the entire health sector – but few have questioned his government's determination to slash those costs. This is set to result in even greater scrutiny, and as Lansley himself has pointed out, cannot be achieved simply by piecemeal cuts across the sector. While every last cost line will be examined as never before, healthcare providers will have to find new ways of working to dramatically drive down operating costs in line with this requirement.

This is unavoidable blood-letting – if an organisation isn't the leanest and meanest it can be, it will simply be replaced as new competitors spring up. GPs, it seems, imbued with the spirit of entrepreneurialism this initiative is trying to foster, are already stepping up to the mark, and hospitals and other primary healthcare providers have been examining costs for some time. Where decisions may have been deferred or avoided in the past, now may be the time to re-examine projects that may have been mothballed, because they were thought to be too painful for the organisation.

1.2 The continuing drive for quality

The picture of a bloated and bureaucratic healthcare management, overspending public (and in some cases private) money, is an emotive one. That's why the government's picture of freedom, of "liberating the NHS", is always accompanied by a call for quality and best practice. It might be decentralising the controls over healthcare provisioning, but there will be no let up in quality.

The drive for quality is a philosophy that permeates through healthcare the world over. Janet Dillione, VP of the healthcare division at Nuance, explains in an interview with HealthTech Wire: "We should all understand that healthcare IT is personal, because at the end of the chain there is a patient, and that patient could be you, me or a member of our family. The number one priority is, therefore, quality. We have to deliver high-quality speech recognition to enable doctors and nurses to do what they do best – provide healthcare."

Meanwhile, what is being described as an information revolution in the UK will see the Department of Health evaluate the information returns it demands from healthcare providers, but this will not be at the expense of quality of patient care. The drive for quality has perhaps been one of the success stories in UK healthcare over the past decade, and the Quality, Innovation, Productivity and Prevention (QIPP[3]) initiative will continue to highlight best practice areas for improved quality and efficiency (see section 1.4, below), while the annual Quality and Outcomes Framework (QoF) will continue to incentivise GP practices.

Although it's a voluntary programme, the QoF has had a very high take-up, representing nearly 100% of registered patients. Scoring surgeries across four domains – clinical, organisational, patient experience and additional services – the QoF results give a good picture of attainment in primary care quality. The programme can also be seen as an acknowledgement that it's not just front-end clinical quality that matters to patients – but also quality of management. So under the heading "organisational", 36 indicators include measures of quality in records and information, information for patients, education and training, practice management and medicines management.

Sitting across the various quality initiatives, the Commissioning for Quality and Innovation (CQUIN) incentive framework enables commissioners to reward healthcare providers that achieve local quality goals.

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1.3 The need for better communications

All the debate about the changing the architecture of the healthcare sector only serves to highlight the importance of efficiently-produced documentation, high-quality communications and seamless workflows. The ecosystem of different care providers working together as a whole to drive out any inefficiencies can only be facilitated by collaborative communication, using technology and automation to eliminate manually laborious steps in processes.

The concerted push for a faster, more responsive health service, for example, has been facilitated by technology. Although performance management of the 18-week referral to treatment pathway has now ceased there continues to be pressure on treatment times, and it's widely accepted that eliminating backlogs in documentation has contributed to bringing down average wait times for treatment to 8.6 weeks. However, there are still areas for improvement.

Poor performance on targets for discharge information are a case in point. A survey from the NHS Alliance[2] found that despite targets for hospital discharge information being made available to GPs coming down to 24 hours by April 2010, many hospitals were missing the 24-hour target, and only one in three were meeting an earlier 48-hour target.

Nor was timeliness the only concern: In the survey, 57% of GPs had seen patient safety put at risk because of poor quality discharge information and seven out of 10 doctors reported that clinical care had been compromised because discharge information was late, incomplete or both. The most common risk to safety was incomplete or inaccurate information about medicines patients had been prescribed.

Comparing performance when the survey was first carried out four years ago with the latest findings from February 2011, the NHS Trust found:

	2007	2010
No instance of patient safety compromised	**21%**	**6%**
Clinical care compromised by poor discharge information	**58%**	**70%**

Another case in point is readmissions. In announcing penalties for hospitals re-admitting patients for emergency procedures within 30 days of discharge, the Government pointed out a stark rise in readmissions from 359,719 in 1998-99 to 546,354 in 2007-08. It claimed this pointed to hospitals' over eagerness to discharge patients to free up hospital beds for other patients.

These figures disguise the rise in procedures over the period and in fact as a percentage of admissions, readmissions only went up slightly. But the Government wants hospitals to take more responsibility for looking after patients' well-being for up to a month after they are discharged, and has even suggested a new funding structure to help guarantee this.

Using speech recognition is one way healthcare providers can improve the quality of documentation, while simultaneously introducing efficiencies in the circulation of that communication. It helps introduce detailed, well-written reports, while ensuring their fast availability into an electronic health records workflow. By introducing technology at the point of records capture, it eliminates the manual bottleneck before it begins. As we'll go on to show in part two of this paper, it also brings a host of other benefits.

Dillione comments: "In some markets, the process from patient consultation to report creation can be measured in weeks. Move to incorporate speech recognition into the workflow and it is measured in minutes. This is a major advantage to both referring physicians and patients. Speech recognition also helps clinicians document more clearly, consistently and accurately."

1.4 Ever greater efficiency

Of the many forces pressing on the health service, perhaps the most powerful is the continuing demand for efficiencies. The government's comprehensive spending review in October 2010 on the surface appeared to reaffirm a commitment to funding the Health Service for the period 2011-12 to 2014-15. But delve below the figures and it's clear the commitment is actually about what Health Secretary Lansley called "making every penny count." A good example is in radiology, where the government expects to save £7.9m by having consultants examine and take some x-rays.

The headline figures were:

▶ a 1.3% rise in the resource budget
▶ a 17% decrease in capital spending
▶ a reduction in the administration budget of 33%
▶ and reinvestment in certain areas, such as diverting £1bn to social care to help cut emergency readmissions to hospitals

Although the increase in funding is welcome, particularly compared with the drastic cuts envisioned elsewhere in the public sector, the increase is nowhere near enough to keep up with inflation in the NHS nor the rising demand from an ageing population. The NHS has already been planning to make £20bn of cuts over the next four years, and measures like reducing the number of quangos from 14 to 10 by 2014 will be part of this.

However, more dramatic cuts, particularly in administration and back-office functions are going to be needed, and it is still not clear where these will come from.

Certainly, part of the efficiency can come from the sharing of back-office functions. The QIPP's Back Office Efficiency National Workstream, for example, headed by Tony Spotswood, chief executive of Royal Bournemouth and Christchurch Hospitals, has been evaluating efficiency across a number of categories including:

▶ finance
▶ human resources (HR)
▶ information management and technology (IM&T)
▶ procurement
▶ estates management
▶ governance and risk
▶ and payroll functions.

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Its report[1], released through the Foundation Trust Network, concluded that the NHS could release £600m a year for front-line services by improving the back-office functions of health organisations. The report found savings could be made across all sectors of the health service including foundation trusts, other NHS Trusts and primary care trusts by simplifying, standardising and sharing technology and processes.

The report highlighted in particular standardising and centralising functions across GP surgeries and non-clinical hospital functions such as patient record-keeping and reception services. It also provided guidance on how to evaluate the relative efficiency of back-office functions and the steps that should be taken to begin re-engineering and transforming to deliver more value.

Part Two. The health sector's response

2.1 Where will savings come from? Document management

The pressure for ever greater efficiency is leading to some tough decisions for healthcare managers. More than 60% of the NHS budget is spent on staff wages, and with such wide-ranging cuts expected, it is wages which are going to have to be trimmed. While growth in spending in the NHS over the past decade has been at a record level, most of that growth has been swallowed up by salaries.

A recent report by the National Audit Office[4] found that productivity in hospitals has fallen by almost 14% since 2000. The NHS budget over that period rose from £60bn to over £100bn and hospitals' absolute output increased significantly. However, rising staff levels and higher wages have hit productivity hard. NHS staff numbers have risen from 1.1 to 1.4 million for example and consultants pay from an average of £71,900 to £120,900. The NAO (National Audit Office) report found that the NHS could save £1.6bn a year if all hospitals increased their productivity to the level of the best quarter – and this will surely be a minimum requirement if the NHS is to meet its efficiency savings target.

In light of the extra competition set to be introduced into the system, managers will also be alarmed by the finding that private sector productivity has risen by 30%. Clearly, the public sector will need to mimic the efficiency measures introduced in the private sector to maintain its edge.

At the same time, hospitals and primary healthcare providers will look to limit the impact on front-line staff, instead trimming back-office services. A 2009 survey from the University of Warwick's institute of employment research[5] found that from 2007-2017, the occupation likely to grow at the lowest rate was what it described as "secretarial" (medical secretaries, personal assistants and receptions), with a net rise of just 7,000 staff. Those figures will no doubt be revised down in light of the recent Comprehensive Spending Review but it's an indication that the clerical support in the NHS is set to be one of the biggest target areas for efficiency saving, – whether through natural wastage or redundancy. What will be brought in to fill the gap will be critical.

A good area to focus on is the headcount costs related to the creation and management of documents. Document management is a critical function of any healthcare body, and plays a key role in the provision of quality care to patients – but it's also non-value adding; as long as documents are created and circulated quickly and efficiently, the actual method that is used is to a large extent irrelevant.

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It is estimated[6] that UK hospitals produce around 206 million reports annually, of which 22 million are radiology reports, General Practices add another 184 million reports each year. Overall, the NHS spends over half a billion pounds in transcribing medical dictations.

This is an obvious area for cost savings – and introducing speech recognition can save on these costs at the same time as improving quality. Speech recognition brings a number of efficiency improvements in document management including:

▸ practitioners such as radiologists and clinicians in other areas can verify their own transcriptions
▸ producing reports in an electronic format at the point of origin eases ongoing
▸ communication, and supports the overall move to electronic hospital records
▸ turnaround times are drastically reduced more detailed and accurate reports can be produced.

This is not to suggest a comprehensive redundancy programme for clerical and secretarial staff – the function can be trimmed down, while those that remain become less typists and more like editors and remain critical to the smooth running of healthcare organisations. The British Society of Medical Secretaries and Administrators commented on this changing role: "Undoubtedly medical secretaries' duties will change in the light of technological development, but they must be retained as an interface between clinicians, consultants and general practitioners and that is something that we wholeheartedly agree with."

In one case study example at The Royal Bournemouth and Christchurch Hospitals, for example, the number of secretaries supporting the radiology staff has reduced from nine to four through natural wastage, but general manager of radiology Paul Shelton comments: "We had planned a reduction in resourcing over time and we were being reasonably conservative in that. Now several months in it's working so well we are looking to make further reductions. It's also been more cost-effective than predicted, so it's helped me to meet my targets."

Of course there is an upfront cost attached to implementing any new technology, but experience shows the return on investment is high (see ROI case study examples below).

2.2 Maintaining – or improving – quality?

Healthcare managers face a dilemma when it comes to document management. While being asked to make swingeing cuts, they daren't risk compromising the quality of clinical documents and their distribution, as they directly impact patient safety.

In fact, quality is a critical factor in clinical document management, for a number of reasons. First and foremost is the safety element. Quality helps to ensure that the correct diagnosis is made in the first place, then ensures the communication of that diagnosis through every stage of the commissioning chain. Miscommunication is one of the prime factors for hospital readmissions, and as we've seen, hospital discharge information does not appear to be improving.

Secondly, document quality creates an audit trail that can prove essential in a legal defence if anything goes wrong. High-quality documentation shows not only that a proper diagnosis was carried out in the first place but also that it was complete – it supports the clinicians' defence that correct procedure was followed. Without quality documentation (and there are a number of factors in quality, defined below), there is only the clinician's word as a defence against an emotionally charged prosecution.

Thirdly, document quality can itself drive efficiencies in healthcare. One function of six sigma and lean process improvement methodologies is to drive out the idle time between activities, when one activity is waiting for another to be completed for it to continue (for example a doctor waiting for an x-ray report to be made available so they can undertake a diagnosis). While not the only factor in creating those efficiencies, faster report turnaround reduces the lag between processes.

Finally, document quality can assist reimbursement. Accurate and speedy documentation ensures that claims or reimbursement can in turn be made sooner and more accurately.

A number of factors contribute to the quality of document generation and distribution. These include:

▶ **accuracy.** Producing accurate documentation is obviously down to the skill of the recordist, but it can be enhanced by giving them the best tools for the job. Low levels of accuracy may not even come from the recordist themselves but from misreading or miscommunication of the records they keep. Building in a checking step, as speech recognition does when clinicians verify their reports, also helps improve accuracy.

▶ **speed.** Faster documentation both at the time of documenting, in the verification and moving the work to the next step is itself a factor of quality. Again, if clinicians can verify a report while they still have access to the patient or in the case of radiology, the scan, then mistakes such as side errors[7] are immediately spotted. Similarly reducing a time lapse once a report has been made can make sure obvious mistakes are picked up on before they lead to problems for a patient.

Multiple testimonials back up the acceleration of the documentation process that speech recognition brings. For example, at the Great Ormond Street Hospital for Children a 40% increase in productivity has seen the number of reports produced in 24 hours rise from 40% to 60%. At The Royal Bournemouth and Christchurch, a 24-hour reduction in turnaround time was noted. And at HCA International, which has implemented speech technology in six private hospitals and five outpatient centres in London, turnaround time has been reduced to an average of 2.4 minutes

▸ **automation.** Human glue has long been recognised as a key factor in introducing errors into reports. The introduction of automated information capture and automated workflows can therefore go a long way to eliminate the possibility of errors by reducing the number of manual steps. At the same time, it's important not to take automation too far, retaining the human skills needed to make the most of technology. But again, multiple testimonials demonstrate the ability of speech recognition to dramatically boost the productivity of healthcare professionals.

▸ **greater detail.** Finally, it's self evident that introducing greater detail into reports can improve communication and the quality of care a patient receives. For example if an abbreviation is misread or miscommunicated from one consultant to another, this can result in the wrong treatment being applied or worse. Introducing greater detail into documents without automation with so much pressure on productivity can be difficult.

2.3 Need to invest to save, and deliver ROI

Of course, implementing new systems and technology carry an overhead; but organisations need to invest to save. So how can hospitals and doctor's surgeries justify investments at a time when they are being asked to make unprecedented savings?

To gain some insight on this, it can be useful to look to the experience of the US and other markets, which have enthusiastically adopted speech recognition. Dillione comments: "We've seen phenomenal growth in the North American market – from approximately 25,000 physicians using Dragon Medical to more than 150,000 in the space of two years. In Norway, we have close to 80% adoption with physicians hospital-wide using SpeechMagic. Hospital-wide adoption is on the rise in Northern Europe and in the US in both ambulatory settings in clinics and on acute hospital floors."

In the US, a group of hospitals called the Million Dollar Club has come together to share experiences and develop best practices, all of which have achieved million-dollar savings as a consequence of implementing speech recognition-based transcription services. In 2010, 22 healthcare organisations were recognised for this achievement. In total across all the organisations, they have collectively saved in excess of $130m.

Nuance's own research suggests similar savings are potentially available to NHS trusts.

Conclusion

This paper has investigated the challenges facing the healthcare sector as it confronts pressure from government, stakeholders and the public for change. While there are no simple answers, it has suggested that one major area for improvement comes in the production and communication of documents. Based on best practice and case study evidence, it concludes that the sort of advances the sector is seeking can be delivered through speech recognition and its role in improving end-to-end workflows. This is still a relatively untapped opportunity for the healthcare sector, and precisely because of this, the potential uplift could be big, with millions of pounds in savings and the maintenance or improvement of current quality standards.

Footnotes

1: Equity and Excellence, Liberating the NHS, July 2010

2: The Alliance, whose membership includes GP practices and primary care trusts, carried out its survey of discharge information in February 2010 when the national standard contract required hospitals to provide discharge information to GPs within 48 hours. Its survey covered 124 GP practices from 67 PCTs covering all ten strategic health authorities.

3: QIPP National Workstream: Back Office Efficiency and Management Optimisation.

4: Management of NHS Hospital Productivity, NAO

5: Working Future II (2009), University of Warcik institute of employment research

6: Source: Nuance Healthcare

7: A side error refers to a consultant accidentally specifying the wrong side of the body. It can lead to wrong side organs being removed or implants applied

Voice is just the beginning.

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