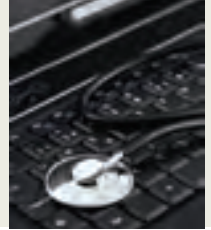


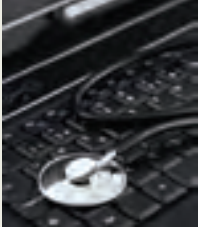
Under pressure: The changing role of the healthcare CIO

A report from the Economist Intelligence Unit



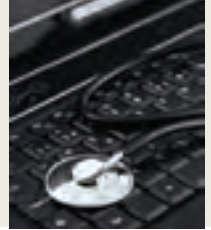
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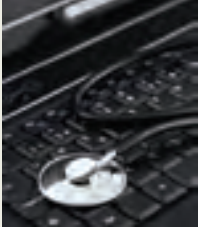
Preface

Under pressure: The changing role of the healthcare CIO is an Economist Intelligence Unit report, sponsored by NEC. The report's quantitative findings come from a survey of 100 senior IT executives in US healthcare organisations (principally hospitals), conducted in August and September 2010. To supplement the survey results, the Economist Intelligence Unit also conducted in-depth interviews with senior technology executives at healthcare organisations across the US.

The Economist Intelligence Unit's editorial team designed and implemented the survey, conducted the interviews and wrote the report. The findings and views expressed in this report do not necessarily reflect the views of the sponsor. Neal McGrath was the author of the report and David Line was the editor. Gaddi Tam was responsible for design.

We would like to thank all interviewees for their time and insights.

October 2010

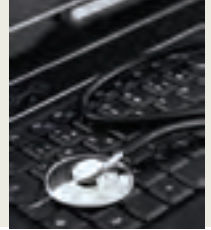


Executive summary

Healthcare is about to witness a revolution in its usage of information technology, as the US federal government pushes for greater digitisation of health records and the increased adoption of technology to replace inefficient paper-based systems that are still used by many providers. The role of Chief Information Officer (CIO) at hospitals across the US will see correspondingly rapid change. As in other industries, IT in healthcare is moving from a primarily functional capacity to one more deeply involved in strategy and business operations. This means greater involvement in—and responsibility for—overall healthcare outcomes and compliance with new regulations, as well as driving operational efficiency. The healthcare CIO is therefore under increasing pressure.

To better understand this pressure—and to present insights into the challenges and opportunities for healthcare CIOs in the coming years—the Economist Intelligence Unit (EIU) surveyed 100 senior IT executives across a range of US healthcare providers. The EIU also conducted additional in-depth interviews with many healthcare technology leaders to gain their views on the most pressing issues facing them during this crucial time for healthcare IT. This report outlines key findings of the survey and presents insights from CIOs working on the front lines of the healthcare IT revolution. Its key findings are as follows:

- **The CIO's role is expected to become increasingly strategic as IT adoption accelerates...** Many healthcare CIOs already occupy “dramatically more strategic” positions within their organisations than a decade ago: “We create solutions that speak to key business issues such as competitiveness and patient safety—many more areas that we previously did not get actively involved in,” says one interviewee. Currently, however, the survey shows only a minority are involved in boardroom discussions on any major strategic initiative. And over half the respondents (53%) say they spend 75% of their time on operations and just 25% on strategy. But a majority (62%) says their role will become increasingly crucial to their organisation as the IT revolution gathers pace.
- **...but others may not see it that way; CIOs will have to educate the board.** The realisation that IT will be increasingly crucial across all aspects of healthcare provision may not be appreciated by all stakeholders: some 70% of respondents in the survey say that IT is still regarded in their institutions principally as a support function rather than a strategic one. “Even though we are no longer tactical, operational order-takers, many people outside the IT organisation still see us the way we used to be years ago, not how we actually are now,” says one interviewee. Successful CIOs therefore must not only become more strategic, they must also be seen to be more strategic—by educating senior management on what they are doing and what the benefits are.
- **CIOs also need to secure the buy-in of clinical staff when planning and rolling out new IT.** Changing the behaviour of those who use the technology—doctors, nurses and other staff—may be a greater challenge than managing board-level expectations. In the survey, 86% of respondents say they actively



participate with clinical leaders in their organisations. This is increasingly important because CIOs need to secure clinical buy-in for new technologies, for instance by using senior physicians to champion technology among clinical teams and by demonstrating improved outcomes. In addition, sufficient time must be devoted to training clinical staff once the investment has been made. In the survey, CIOs see training staff as behind only enabling system and network security and improving cost efficiency as among the principal functions of their department (cited by 51% of respondents).

- **While regulation to drive IT adoption is broadly welcomed, some CIOs remain sceptical about government incentives—and fear new regulations may make their lives more difficult.** The Obama administration’s promise of US\$19bn in incentives to offset the cost of introducing electronic health records (EHRs) and other money-saving technologies (part of the US\$787bn American Recovery and Reinvestment Act) is broadly welcomed by CIOs to “bring healthcare into the 21st Century”. Some 77% of respondents expect to qualify for funding, which will be granted on the condition healthcare organisations meet complicated “meaningful use” criteria. But many are not counting on the money to defray the cost of implementing the new technologies and are sceptical it will be delivered. Moreover, many expect the regulations tied to the incentives (and penalties) to bring considerable complications. Some 76% of survey respondents rate meeting “meaningful use” requirements as a high priority for the IT department, suggesting how time-consuming this will be.

- **Many CIOs expect digitisation of electronic health records will bring more pressure on them to ensure compliance.** An overwhelming majority of respondents to the survey, some 83%, agree or strongly agree that greater use of EHRs will put more pressure on CIOs to ensure compliance, and 71% say that data security to ensure compliance is a top priority when adopting new IT systems. This increased pressure is an inevitable corollary of making files easier to access through digitisation, and of stringent new rules that require information be both shared with more people on demand, but also be protected from unauthorised access.

- **CIOs face big challenges in driving change.** The most obvious obstacle is cost. In the survey, 62% of respondents rate the high cost as the greatest barrier to adopting cutting-edge IT solutions, while 49% note the lack of funds for investment. Ensuring integration of systems, to enable the exchange of information, will also be a major challenge, with many CIOs sceptical of the benefits of health information exchanges. Finally, many also cite the lack of IT staff with the right skill sets as a major challenge, with 24% of respondents ranking it in the top three barriers to the implementation of new IT systems.

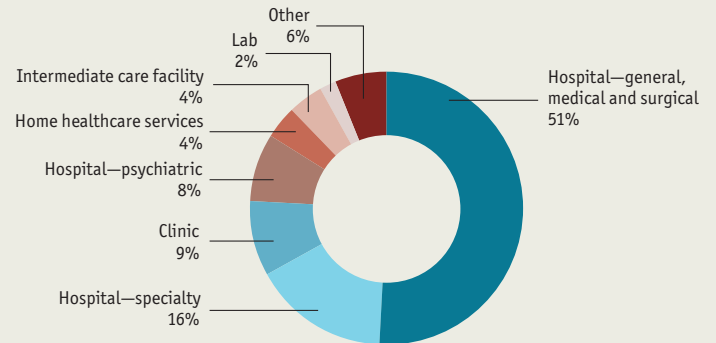


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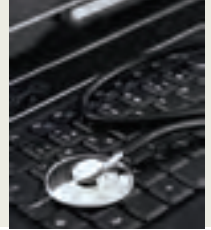
About the survey

The Economist Intelligence Unit surveyed 100 senior IT executives (principally CIOs, but also directors of information technology and other relevant titles) at healthcare providers across the US for this report. Of the respondents, 67% work at general or specialist hospitals, 9% at clinics, 8% at psychiatric hospitals and the remainder at intermediate facilities and other providers. Some 51% of respondents work at organisations with revenues of under US\$500m annually, 34% from organisations with revenues of between US\$500m and US\$1bn, and the remainder over US\$1bn.

Survey respondents by type of organisation



Source: Economist Intelligence Unit



Key points

- Healthcare has been a laggard in adopting IT, even where the benefits are clear (as with electronic health records). As such the CIO's role has not changed as swiftly as in other industries.
- New drivers of change, such as regulatory pressure to digitise health records, suggest the CIO's role is about to undergo rapid evolution.

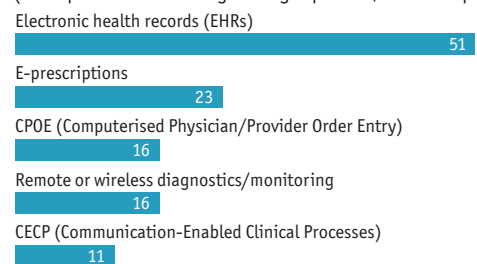
1. Introduction: playing catch-up

The corporate role of Chief Information Officer (CIO) has evolved rapidly in recent years. Driving this change has been the need, on the one hand, for information technology to enable a wider range of products and services; and on the other for technology to support businesses proactively by driving efficiencies. To do this, technology must enable once-separate functions within an organisation to operate with one another and to share data and information. CIOs have therefore been getting more deeply involved with business strategy, and have been spreading their responsibilities horizontally to encompass a wider range of functions that fall outside the traditional purview of information technology (IT).

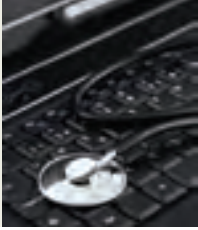
There have been leaders and laggards in the IT revolution. Industries that are heavily customer-focused, such as financial services, led the charge, and the changes to the CIO's responsibilities in this industry are already well entrenched in many companies. But healthcare has been a laggard. While many functions have digitised, implementation has been inconsistent. In many cases, healthcare organisations are not making the full use of the opportunity to use IT to improve efficiency, cut costs and enhance patient outcomes. As such the evolution of the role of the CIO from IT director to strategic information coordinator has been slow.

To take one example, in the EIU survey conducted for this research, just 51% of respondents picked the implementation of electronic health records among their three most successful uses of new IT (Figure 1). Another indicator is the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model. This scores hospitals and health systems on progress towards creating a paperless patient record environment, where stage one includes only early development steps and stage seven represents full adoption. In the HIMSS's most recent survey, from the second

Figure 1: Successful deployment of new IT
(% respondents selecting among top three; select responses)



Source: Economist Intelligence Unit



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quarter of 2010, around half of US hospitals assessed had reached only stage three, while 34% were still below this level and only 16% were above it.¹

¹ "HIMSS Analytics Stage 7 Award—Paperless and Proud of IT!" EMR Adoption Model, US trend, 2nd Quarter 2010

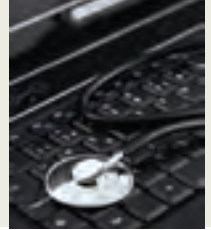
Switching the mountains of paper that now comprise most patients' medical records with more easily accessible digital versions promises massive efficiencies. With ready access to comprehensive patient information, doctors will be able to more effectively treat them, as they will be able to see all pertinent information—history, past conditions, current medications and so on—in one place. Moreover, technology will make it easier to determine treatment options by recommending those which have proven most effective in the past—again, thanks to the ability to collect and analyse data on thousands of other cases. The same technology will also automatically alert physicians to potential medication interactions, and avoid expensive duplicate testing as recent test results will also be readily available. The cost savings through efficiency gains promise to be substantial—as much as US\$40bn on aggregate per year, according to McKinsey, a management consulting firm.²

² "Reforming Hospitals with IT investment", *McKinsey on Business Technology*, Number 20, Summer 2010

So why has the take-up been so slow? One issue is that there is rarely the same commercial imperative driving change in healthcare as in conventional businesses. "There are over 5,000 hospitals in the US, and the majority of them are non-profit," says Alfred Campanella, vice president & CIO at Virtua, a diversified health-services company that operates four hospitals in New Jersey. "Many of those non-profit hospitals have gotten by with limited digital solutions; they just did not think they could afford them," he says. "Plus, the for-profit hospitals also operate on very thin [profit] margins. The high cost of adding technology to an already complex operating environment is a real disincentive."

But change is afoot, and the role of the healthcare CIO is about to undergo rapid evolution as the adoption of IT accelerates. The IT function will be at the forefront of the drive to cut costs and find efficiencies as healthcare reform progresses. Direct regulatory pressure—which in healthcare, unlike in other industries, tends to play a much larger role in driving change—is also increasing for providers to adopt new technologies.

This transformation is expected to have a dramatic impact on the everyday lives of healthcare CIOs. For one thing, they will have to engage stakeholders to help them justify the investments. They will need to manage clinical teams and practitioners to ensure effective implementation. And while the US government has offered up billions of dollars in incentive money to help healthcare providers make the transition, meeting the "meaningful use" criteria necessary to get that money will place another burden onto the shoulders of CIOs. Moreover, ensuring compliance with new regulations that require healthcare companies to make records—and all manner of other information—available to patients, but simultaneously secure it from unauthorised access, will put great pressure on the IT department. In short, the CIO of the average healthcare provider in the US is about to see a considerable shift in his or her responsibilities.



Key points

- The federal government's drive to accelerate the adoption of electronic health records is broadly welcomed by CIOs as a driver of change, even if some are sceptical about getting the money on offer.
- The new regulations could bring considerable complexity to the CIO's role, especially in meeting complicated "meaningful use" requirements to be eligible for government incentives.

2. The HITECH push

“One of the reasons the healthcare industry is behind the curve is because it is not very hierarchical,” says Mr Campanella of Virtua. “In a large bank, the CEO can declare how things will change, and everyone will do it. Healthcare organisations just do not work that way.” But, he says, “The healthcare industry generally responds well to regulatory pressure.”

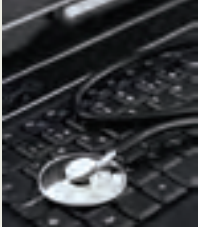
This assertion is now being put to the test. Seeking to accelerate healthcare's move into the digital age, in early 2009 the Obama administration signed into law a sweeping set of new rules that require the healthcare industry to adopt digital technology. The regulations include some US\$19bn worth of incentives to help cover the cost, as well as technical assistance and training from government agencies. And, for those who decline to participate, the new rules impose penalties in the form of cuts in payments for patients covered by the government-run Medicare and Medicaid insurance programs. Physicians and hospitals that do not adopt electronic records by 2015 will face increasingly severe penalties (see box, overleaf).

How will this affect the typical hospital CIO? Many in the technology world view the regulations as a positive step forward, as it creates a large incentive to entice those holdouts clinging to their clipboards and sheets of paper to join the digital revolution.

“People are looking at the HITECH Act as a government mandate, which it is in some respects, but ten years from now people will look back and wonder how we ever managed without the technology that will result from it,” says Mr Campanella.

He is not alone in this opinion. “In the health sciences, most organisations did not used to need sophisticated IT functions to do their work. That has changed,” says Elazar Harel, vice chancellor-IT and CIO at the University of California, San Francisco. “Mandating electronic health records is definitely a good thing; it will bring healthcare into the 21st Century.”

The new regulations mean CIOs must convince their boards of the need to invest in the new technology. Despite the incentives on offer, this is a tall order. According to McKinsey, the new rules will require



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Digitisation through regulation

On February 17th 2009, US President Barack Obama signed into law the US\$787bn American Recovery and Reinvestment Act (ARRA). The healthcare provisions of the ARRA are found primarily in Title XIII, Division A, Health Information Technology, and in Title IV of Division B, Medicare and Medicaid Health Information Technology. These titles together are cited as the Health Information Technology for Economic and Clinical Health Act (the HITECH Act).

HITECH promises some US\$19bn to hospitals, physicians and others in the healthcare industry to help offset the cost of digitising systems in a manner that allows information to be stored and shared electronically in electronic healthcare records (EHRs).

Individual physicians can qualify for up to US\$44,000 in Medicare bonus incentives, and up to US\$63,750 for offices with high volumes of patients covered by Medicaid. In addition, physicians' offices and hospitals that do not adopt electronic records by 2015 will face a cut of 1% in payments for any patient covered by Medicare, which will rise to 3% in 2017.

Medicare is managed by the Federal Department of Health and Human Services (HHS), and the provisions for reimbursement are the most straightforward. Medicaid reimbursement, on the other hand, will be managed by the individual states, which administer all Medicaid benefits, and the guidelines are expected to be more complex (although they must remain consistent with federal Medicare reimbursements).

The key element is what is considered "meaningful use" of such technologies by HHS, which is necessary to qualify for federal funding. In January 2010 the department published proposed requirements—eliciting over 2,000 responses from interested parties. In July 2010, HHS released a final regulation for the first years of the program, with revised rules expected later for subsequent phases. HHS has also issued guidelines that spell out the process for securing certification of EHRs, so that providers can be assured they are capable of delivering meaningful use.

The department has also issued still another regulation that lays out the standards and certification criteria that EHRs must meet in order to be certified. These include areas such as electronic prescribing to replace the widely used current practice of writing prescriptions on small sheets of paper; electronic medical charts that can be readily shared with others treating the same patient; and tools to measure quality of care and clinical outcomes.

What impact will the incentives have? Before the HITECH Act, the Congressional Budget Office (CBO) reckoned that 65% of physicians would have adopted an EHR system by 2019. It now estimates that the HITECH incentives will boost the adoption rate to 90% of physicians in the same timeframe. According to the CBO, this will deliver net savings to the US healthcare system of 0.3% between 2011 and 2019, or more than US\$60bn over eight years.³ Independent estimates predict even greater savings.

³ See *A summary of the HITECH Act*, athenahealth, Inc., March 2009

hospitals to spend up to US\$100,000 per bed for the relevant software, hardware, implementation and training. The same study, however, concluded that the resulting standardisation, automation of medical information, better use of resources and ready access to treatment guidelines will reap annual savings of between US\$25,000 and US\$44,000 per bed—paying off the investment in two to four years.⁴

The government funds on offer are designed to help offset the high cost of adopting the new technology. But how easy will it be to actually get that money? Some are sceptical it will arrive at all—such as Tom Bartiromo, vice president and chief technology officer for the Saint Barnabas Health Care System (SBHCS), which includes six hospitals providing care in a variety of treatment areas located in northern New Jersey. "We're not including that money into our total cost of ownership models," he says, "because we are not counting on being able to actually get it."

Most of the CIOs and other senior technology officers in the EIU survey say they expect to qualify for government funding (Figure 2), but qualifying and actually getting one's hands on the money can be two separate propositions. "Since the HITECH Act's incentives will be funded, in part, from reductions

⁴ McKinsey, *op. cit.*

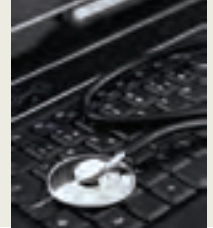
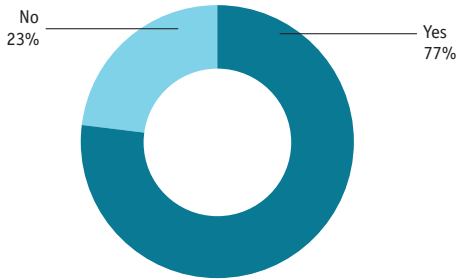


Figure 2: Federal funding
(% respondents expecting to qualify)



Source: Economist Intelligence Unit

in regular Medicare insurance payments, we as an organisation do not carry it on our books as anticipated revenue,” says Virtua’s Mr Campanella. “But no one wants to leave money on the table, so we certainly intend to pursue it.”

Tactical necessities

While the government’s push for digitisation might be seen as positive for a CIO seeking to drive change internally, not all aspects of the regulations may be welcome. HITECH provides

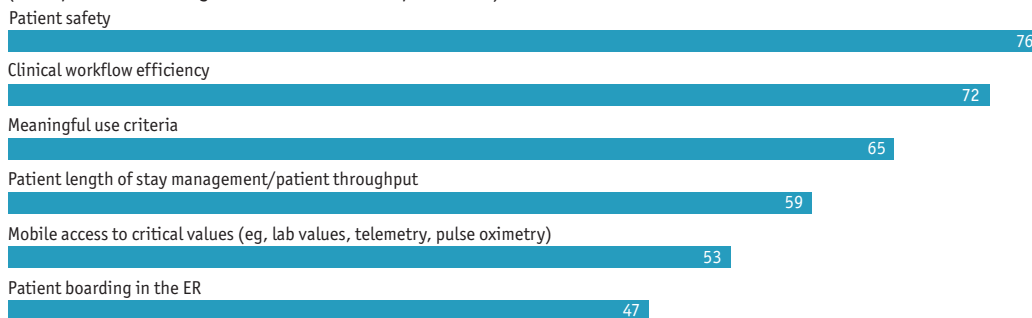
a major push to adopt technologies or to convince reluctant senior management to provide needed investment dollars. But by creating a whole new set of highly specific regulations on exactly how they implement IT solutions (and how to qualify for funding), the regulations may also make CIOs’ lives more difficult.

“I don’t see the HITECH Act causing [CIOs] to be more strategic,” says Stephanie Reel, vice president for information services and CIO at Johns Hopkins Medicine, and also vice provost and CIO for Johns Hopkins University in Baltimore.⁵ “That’s because it calls for specific actions, which draw us into the weeds and cause us to actually become more tactical. For example, HITECH requires us to deliver copies of a patient’s medical records within 72 hours, so we now have to review all our plans and make sure we can do that. We may have built in a mechanism to deliver records, but maybe not within the specific time frame required and perhaps also not in the exact format dictated by the Act. So, we may now have to change what we planned to do anyway in order to meet these new requirements.”

⁵ The Johns Hopkins group includes four hospitals and medical centres of which the largest, Johns Hopkins Hospital, has 1,085 beds.

The survey results show just how high on a CIO’s priority list such requirements figure—and therefore suggest how time-consuming they may be. When asked to rate clinical objectives from 1-5, with one being the highest rank, “meaningful use criteria” to qualify for government funds came behind only “Patient safety” and “Clinical workflow efficiency”, with 76% of respondents ranking “meaningful use” either 1 or 2 (Figure 3).

Figure 3: CIOs’ top clinical priorities
(% respondents ranking issues 1 or 2 on a five-point scale)



Source: Economist Intelligence Unit

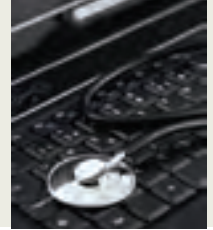


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⁶ Methodist Health System includes four acute hospitals (with 1,150 beds in total), three joint-venture rehab and speciality hospitals, five teaching clinics and 10 family health centres.

Pamela McNutt, senior vice president and CIO with Methodist Health System of Texas, agrees with the assessment that the regulations may bring considerable complexity to the job.⁶ “It’s a very prescriptive set of rules: some of the things we need to do in order to prove we are doing what’s called for under the Act may be at odds with our own strategic vision and goals,” Ms McNutt says. “So to a certain extent it’s a distraction from what we may be doing already, because now we not only need to do those things, but also be able to demonstrate we’ve done them, and that we’ve done them in a very specific way.”

As UCSF’s Dr Harel acknowledges, “It will be difficult at the beginning.”



Key points

- The broader adoption of IT requires CIOs to become more strategic, to get more involved in various functions across the organisation and to lead the way in integrating these functions.
- Many still perceive IT as primarily a support role; CIOs will have to educate senior management on the increasing breadth of their responsibilities. The government's drive to adopt EHRs gives them valuable leverage.
- Securing clinical buy-in for new technologies requires CIOs to involve senior clinicians in their development. Training is also an increasingly vital role for the IT department, to ensure smooth rollout.
- CIOs will come under increasing pressure to ensure compliance with data security and privacy regulations as more health records are digitised.

3. Expanding roles and responsibilities

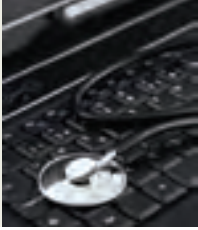
Direct regulatory pressure is only one factor driving change in healthcare IT. Public and private purchasers and payers have demanded greater documentation on the quality of care and patient safety; improved accountability and transparency; better cost-effectiveness; and greater innovation in how care is delivered. These all require more intensive data collection, and the ability to analyse the data to produce meaningful reporting. CIOs have been pulled much more deeply into areas such as performance improvement, patient safety, and quality of care—and many more areas that once were the exclusive domain of clinicians and others outside the field of information technology.

Of course, one key driver of change has been the technology itself. “The technology gives you the tools to be able to do a lot more,” says Bruce Goodman, chief service and information officer with Humana, a health insurer headquartered in Kentucky (see also the case study on page 24). “The technology alone has driven a lot of the changes we’ve seen.”

Providers also see the change in the role of the IT department in delivering care. “In the past, the emphasis was much more on running systems for operational excellence in the business,” says Mr Bartiromo of SBHCS. “Now, the emphasis is shifting. CIOs now need to find ways to help grow and transform the business, to enhance efficiency, growth and competitive advantage. And this is likely to increase as new technology becomes available.”

IT driving integration

The need to integrate what were once stand-alone systems has been a crucial factor in broadening the role of IT and the CIO's responsibilities across the organisation. For example, at one time departments such as medical records were stand-alone operations. They received, maintained and ensured the availability of patient records and directly managed all the functions related to that role. Information technology played only a very minor part, if any. But putting all that paper into digital format requires that IT must become much more deeply involved.



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“Before, everything was pretty siloed,” says Kara Marx, CIO of Methodist Hospital, a 460-bed facility serving the San Gabriel Valley area near Los Angeles. “With increasing automation, all of the functions that were once discrete operations start to bleed into one another. And when you integrate all these functions with technology, people in those departments can’t just change the way they do something on their own, because that would affect the entire system that others rely on to do their jobs.”

Ms Marx points to this as a driving force that has pushed IT departments more deeply into functions with which they previously would have had little involvement. In Methodist’s case, previously each department could procure its own hardware and software solutions, but to ensure interoperability—and to safeguard the security of the network that supports the entire hospital—all of that has now been centralised under one information technology department that Ms Marx runs.

Case study 1: Going mobile at Methodist

When Methodist Hospital, a 460-bed facility serving the San Gabriel Valley near Los Angeles, wanted to create a computerised provider order entry system and digitise patient records, the IT department faced a number of challenges in coming up with a solution that would appeal to the doctors and nurses that had to use the new technology.

Methodist’s CIO, Kara Marx, explains that one key lesson came from pilot projects to see how various users would respond to the approaches they were considering. “We looked at handheld devices, but found that a lot of people did not like them,” Ms Marx says. “Nurses, for example, always have something else in their hands, so we didn’t want to give them something else they have to carry and which may require using both hands.”

Methodist also tried placing PCs in patients’ rooms, but

that proved too distracting for nurses who had to interact simultaneously with patients and family members while inputting data. “It made it difficult to focus on correctly entering the information into the system,” Ms Marx says.

The solution was to place small laptops, connected wirelessly to the hospital’s information network, onto moveable carts, so physicians and nursing staff could use them wherever they liked but would also have somewhere to put down whatever they might be carrying. Without the pilot projects to find out what clinical teams preferred, it is unlikely the new technology and new methods of working would have been enthusiastically adopted.

“Users preferred the carts,” Ms Marx says: “They liked the flat surface because it gives them a place to put down whatever they’re carrying while they enter information, but is also mobile enough that they can push it around as they make their rounds.”

Managing perceptions

Yet for all the progress that has been made in bringing technology from the back room into the boardroom, there remain many challenges. CIOs and their teams may be moving away from focusing on hardware and systems support, but that does not mean everyone in the organisation understands how much more IT is doing for them, and how much more strategic the CIO function has become.

While 62% of healthcare CIOs surveyed agreed or strongly agreed with the statement that their role will become increasingly crucial to their organisation, only a minority are actually involved in boardroom discussions on any major strategic initiative (between 41% and 46%, depending on the discussion, as the chart below shows). Over half of CIOs surveyed (53%) also say that they spend 75% of their time on operations and just 25% on strategy (Figures 4 and 5).

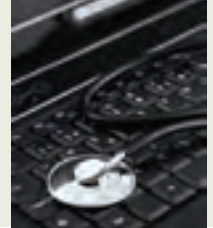
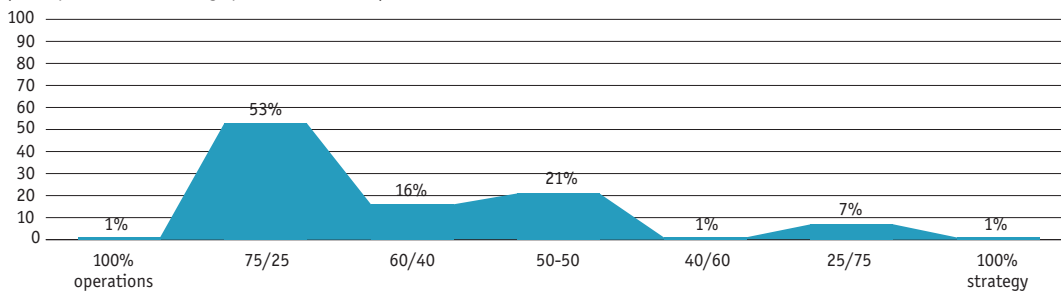


Figure 4: CIOs' level of involvement in strategy
(% respondents selecting "agree" or "strongly agree")



Source: Economist Intelligence Unit

Figure 5: How CIOs use their time
(% respondents selecting specified divisions)



Source: Economist Intelligence Unit

Change in the functional role of the CIO is nonetheless evident at some institutions that have been leaders in adopting IT—pointing to the way in which the CIO's role will evolve across the board as adoption accelerates. "I used to be an order taker," says Ms Reel at Johns Hopkins. "But in the last few years [CIOs] have become dramatically more strategic. We are now innovators, we create solutions that speak to key business issues such as competitiveness, patient safety—many more areas that we previously did not get actively involved in."

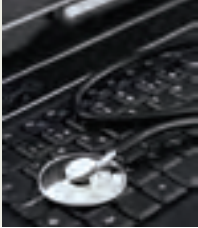
The difficulty may be in persuading other stakeholders that the role has changed. "Even though we are no longer tactical, operational order-takers, many people outside the IT organisation still see us the way we used to be years ago, not how we actually are now," says Ms Reel. This is confirmed by the survey: some 70% of respondents say that IT is still regarded in their institutions principally as a support function rather than a strategic one (Figure 6).

Successful CIOs therefore must not only become more strategic, they must also be seen to be more strategic. "Successful CIOs are going to have to go out there and educate senior management on what they are doing and what the benefits are," says Ms

Figure 6: Perceptions of IT in the organisation
(% respondents)



Source: Economist Intelligence Unit



Under pressure: The changing role of the healthcare CIO

McNutt at Methodist Health System. “You have to be a diplomat, you have to be a persuader, you have to be visionary, and you have to get outside the organisation to understand what is going on in the outside world, and then bring that knowledge back. You also need a deep understanding of the business, on top of managing all the regulatory issues.”

Other CIOs say the government’s push for digitisation offers a great opportunity for them to raise their profile within the organisation. “With all the money being talked about now, if you have not had a seat at the [boardroom] table, now is a really good time to get one,” says the CIO of a medium-sized hospital in New York. “CIOs really need to lead and the money on offer is a powerful tool to leverage.”

Methodist Hospital’s Ms Marx agrees. “It’s not often that information technology can be seen as a revenue-generator; we’re usually viewed as a cost centre. With HITECH, we have the opportunity to go to senior management and say ‘this is how my department can bring money into the organisation’—that’s huge.”

Getting the clinical side on board

Educating senior management and securing approval for the funding needed to launch major new initiatives is one obstacle, but many say that changing the behaviours of those who use the technology represents an even greater challenge.

“The top executives usually ‘get’ how important it is to make these things happen, to make much better use of the technology we have,” says Dr Harel at UCSF. “But there are a lot of cultural issues that need to be addressed, and the cultural part is always the most challenging. The technical part is usually straightforward, it may be difficult but we can plan and then implement. How people behave is much more difficult to predict.”

If securing high-level support is comparatively easy, given the potential financial incentives, how does one go about persuading a much more fickle target audience—the clinicians—to buy into something that will use more of their time and deliver benefits they may not immediately understand? CIOs report that in order to be successful, they are having to get more directly involved in what clinicians do, and making sure clinicians are involved in IT department decisions by seeking their active participation in developing and implementing technology solutions.

In the survey, 86% of respondents say they actively participate with clinical leaders in their organisations, while clinical workflow efficiency is ranked as the second-highest priority when it comes to clinical objectives for information technology (with 84% of respondents marking it 1 or 2 on a 5-point scale to determine priority). Interestingly, only 57% say their organisation has a director of clinical informatics—and of those that do not have this role, very few (7%) plan to create it (Figure 7).

The demands on the CIO to know the clinical side of the business are therefore increasing exponentially. Ms Marx of Methodist Hospital describes how her function has spread into so many areas that it would be impossible for one person to understand them all. “You need a good understanding of the business, but it’s difficult to become a subject matter expert in every area of healthcare, it’s just too complex.”

To remedy this, Methodist has created a slew of positions whose responsibilities include informatics, and each department has at least one person who is specifically charged with being the IT point person.

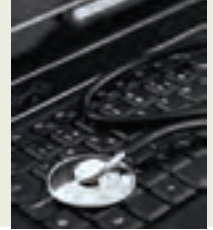
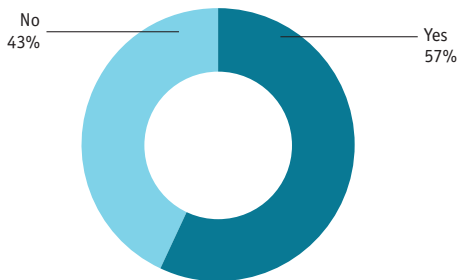
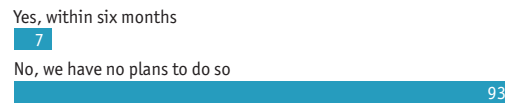


Figure 7: Do you have a director of clinical informatics?
(% respondents reporting title in their organisations)



Source: Economist Intelligence Unit

Figure 7a: Do you plan to appoint one?
(% respondents)



Source: Economist Intelligence Unit

In some cases, that person spends 75% of their time performing tasks relevant only to that function and 25% on IT, but other areas get much more support. Nursing, for example, has four full-time informatics positions because it is such a key function of healthcare delivery.

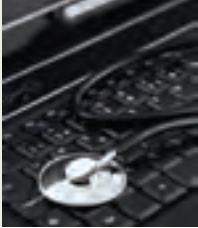
Then there is the matter of managing the clinical team in the tricky process of integrating new clinical IT solutions. For most CIOs, this means not only promoting new technology to those who will use it, but also getting clinicians involved in developing the solutions—most especially the nurses, physicians and others who have direct contact with patients and are collecting the data. Convincing doctors who are used to completing paper forms to start using far more complex digital devices is one of the bigger challenges—especially if using that device requires hours of training that they could otherwise devote to their practices.

“Most doctors are accustomed to coming in to the hospital, looking at sheets of paper with patient history, then either writing down a set of observations and instructions or notifying a nurse or assistant what to do and then moving on to his or her next task,” notes Virtua’s Mr Campanella. “With an EMR [electronic medical record], the doctor has to log into the computer, find the right patient, and then enter much of that information into the computer by clicking menu choices or typing free text. The process is perceived to have many more steps. Of course, once that’s done, a patient’s record is readily accessible and complete, but overcoming the need to do more work upfront is a real challenge.”

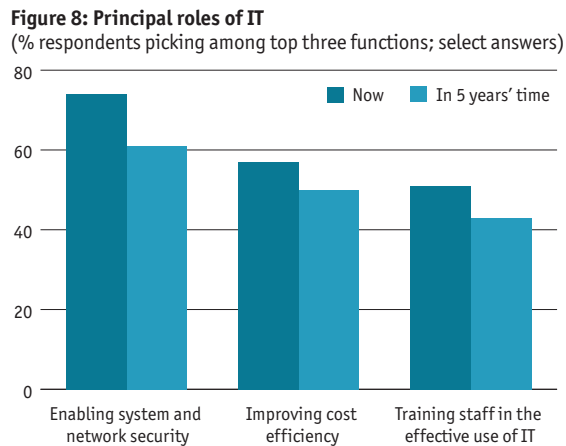
The reluctance of the clinical team to adopt new technologies can be so great that some physicians would rather switch hospitals than adopt new technology. When Virtua rolled out its own mandatory computerised provider order-entry system, hundreds of physicians chose to downgrade their admitting privileges rather than learn the new technology. (Although most of the doctors who brought in the majority of patients were happy to participate—as the case study below outlines.)

The survey results show how vital training is for any healthcare IT organisation: CIOs see training staff as behind only enabling system and network security and improving cost efficiency as among the principal functions of their department (cited by 51% of respondents). The adoption of EMRs might be expected to make it even more so (although somewhat counter-intuitively a smaller proportion of respondents, 43%, expects this to be a major role of the IT department in five years’ time; Figure 8.)

At Virtua, nurses and other clinicians had to devote anywhere from four to 12 hours of training to



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Source: Economist Intelligence Unit

learn how to use each new technology solution. Some of the training was done online via web-based modules, some live in person, while in other cases the company hired people to demonstrate to doctors and nurses how to use the new systems onsite. Virtua also created committees of physicians to help design the solutions to ensure the final result would meet their needs—and also to bolster buy-in before the new approaches were even launched by increasing the sense of ownership of the solution (see box).

Methodist Health System's Ms McNutt has a similar take. "The resistance comes when you try to

adopt a cookie-cutter solution for doctors," says Ms McNutt. "Physicians do not like approaches that are too structured with too many restrictions on how they do things, so you have to get their input early on,

Case study 2: Virtua goes paperless

In late 2005 when Virtua, a diversified health-services company that operates four hospitals in the US state of New Jersey, decided to open a new hospital, the board decreed that it would be a paperless facility. By the time the IT department completed an assessment of what would be needed to make one facility paperless, the board decided that if the organisation was going to invest the money and human resources to do it in one facility, it may as well roll out the same technology in all its locations.

A number of doctors were less than enthusiastic and chose to downgrade their admitting privileges at the group's hospitals rather than learn the new technology—but this did not impact its adoption. "We had a lot of doctors on our registry who only occasionally admitted patients," says Alfred Campanella, vice president & CIO at Virtua. Mr Campanella estimated that just 500 of the more than 1,800 physicians registered with Virtua were responsible for the bulk of the patients the hospital group treated—and those 500 embraced the new technology.

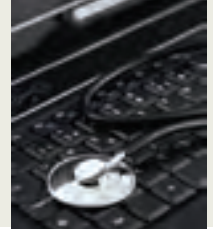
Importantly, the solutions were developed in collaboration with committees involving some prominent physicians. "Getting their buy-in was really important," says Mr Campanella. Thanks to the prior consultation, "By and large [the doctors] approved the approach before we even launched it."

Though the switch was mandatory, the IT department went to great lengths to make it easier for users. That meant web-based training modules for many new systems so people could learn when it was convenient for them. And, since physicians can choose which hospitals to work with and are the primary source of new patients, Virtua sought to make it even easier for them.

"We employed a lot of 'at-the-elbow' training; that is, we would have people on site to help doctors learn how to use the new systems so they did not have to sit through long training sessions," says Mr Campanella. "For the nurses, we tended to focus more on classroom training, as we could simply schedule those sessions into their work rosters."

The entire project cost US\$20m, and included two new data centres, one for active use and the other for disaster recovery. The company also created a new fibre-optic network to carry the data, a picture archiving system and a major scanning initiative to get existing paper-based records into digital format.

The hospital system now has a closed loop for providing medications, including ordering, filling and administering. The systems uses bar codes at every stage, including on patients' wrist bands to register the time the medication is given. If an error is noted, the system will alert the nurse before the medication is given. By early 2011, Virtua physicians will rely wholly on electronic devices to make their rounds and enter information on patients' charts.



and allow them to develop their own templates.”

Pat Skarulis, CIO and vice president for information systems at New York-based Memorial Sloan-Kettering Cancer Center (with 470 beds), agrees that collaborative approaches to implementing new IT solutions is key to success—whichever part of the organisation is involved. “The most successful projects are not created by IT alone,” she says. “We always partner with someone from the functional area to give us the necessary perspective. Another key tool is to create working groups and convene panels of advisors to ensure what we are doing is relevant to how they work.”

Some even believe there is an innate scepticism of anything IT does, and working with clinicians to get them to do the talking is an effective way to overcome that. SBHCS’s Mr Bartiromo seeks out physician leaders to serve as ambassadors. “We meet with senior physicians on a regular basis to discuss strategy, direction and tactics. We work with them on all major new clinical initiatives, then they present the plans to groups of physicians,” says Mr Bartiromo. “That way, it’s doctors promoting it to other doctors, and not some guy from IT. You get much greater credibility – and even if the solution is good, if the clinicians have no voice, they may reject it even if it was something they otherwise may have embraced.”

The compliance imperative

One of the most challenging areas for CIOs of the forthcoming digitisation of medical records are the potentially conflicting objectives of, on the one hand, having to make more information readily available in digital format, while on the other facing stricter privacy rules and harsher penalties for breaches.

As part of the ARRA and the HITECH Act, the US government created new, strengthened privacy rules that are stricter in scope, carry harsher penalties for security breaches and promise stricter enforcement. In fact, the new rules are so much more stringent that many in the industry have come to refer to them as “HIPAA on steroids” after the 1996 Health Insurance Portability and Accountability Act, which contained the patient privacy rules that are the current standard in the US (see box overleaf).

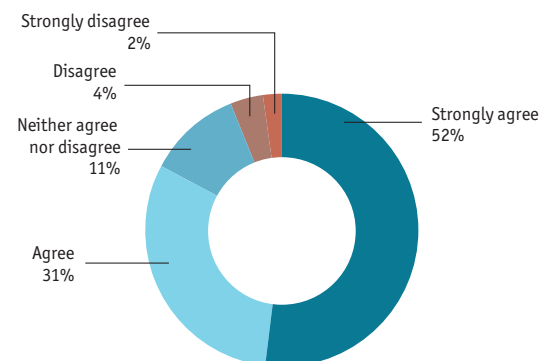
An overwhelming majority of respondents to the survey, some 83%, agree or strongly agree that greater use of EHRs will put more pressure on their role in ensuring compliance (Figure 9). Some 71% also say that data security to ensure compliance is the top priority when adopting new IT systems.

“Security is a challenge,” notes SBHCS’s Mr Bartiromo. “We always need to balance security, convenience and cost with the need to make information available at the right place and the right time to the right people. The new rules do not change that fundamental aspect, but they do make it more complex and will increase pressure.”

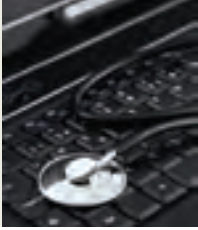
This is an inevitable risk of digitisation. A patient’s records stored on paper inside a manila folder on a shelf are relatively secure: someone would have to break into a physical location to steal them. But put that same information into a database that can be accessed by any authorised employee within the organisation, and also must be made available to outsiders via health information exchanges, and the risks of data leakage are considerably higher.

Figure 9: Under pressure to ensure data security compliance
(% respondents)

“Increasing use of electronic health records (EHRs) means my role in ensuring compliance with data security regulations will become increasingly pressurised.”



Source: Economist Intelligence Unit



Under pressure: The changing role of the healthcare CIO

HITECH: HIPAA on steroids?

While the Health Information Technology for Economic and Clinical Health (HITECH) section of the 2009 American Recovery and Reinvestment Act (ARRA) decrees that vast new quantities of patient information be placed in digital format and made available to a far wider audience of people through electronic exchanges, it also includes provisions for increased privacy protection and stricter enforcement in the event of breaches. The new rules are so strict, in fact, that some are calling it “HIPAA on steroids.”

HIPAA, or the Health Insurance Portability and Accountability Act of 1996, resulted in new healthcare information privacy and security rules, but penalties were mild and enforcement nearly nonexistent. But that could all change under the HITECH Act: enforcement is one of the most prominent features of the Act, as is a much wider scope of who is covered by the new rules.

The new rules apply to any organisation that has access to “protected health information” as defined under the old HIPAA rules. Under the old regulations, only those organisations specified as “covered entities” of the regulations had to comply. Now, any organisation that has access to that information is subject to the same rules—and penalties. This includes a much wider range of businesses, such as banks, claims clearinghouses, billing firms,

health information exchanges and software companies.

HITECH also creates stronger security breach notification rules. Now, covered entities must notify individuals within 60 days if protected health information is breached—in addition to notifying the Department of Health and Human Services (HHS) and local news media if the breach involves more than 500 individuals. Covered entities must also maintain a log of all data security breaches and annually submit it to HHS. The rules also stipulate strict standards for data encryption.

The Office of Civil Rights within the HSS has enforcement authority for the breach notification rule. State attorneys general can bring a civil action in federal court for violations of healthcare security and privacy rules, and victims can receive compensation from fines levied against individuals and organisations. The penalties can be harsh—and can be applied both to specific individuals within a healthcare organisation as well as the organisation itself. The fines can range up to US\$1.5m, in addition to any criminal penalties that might apply.

Individuals also have the right to request a copy of their own electronic healthcare records. Moreover, they can request healthcare organisations to tell them who has accessed their protected health information, and to account for every single disclosure of this information. The organisation may request a fee for this, but it may not be greater than the cost of providing it.

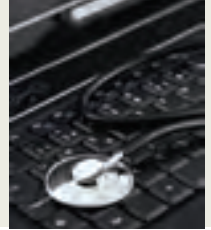
It will be a challenge to create mechanisms that ensure people in a healthcare organisation who need to know a patient’s history have ready access to it for treatment purposes, while also preventing people who do not need to know from seeing it. Restricting access could hamper the ability to deliver optimal patient care, but too much access leaves the organisation open to breaches of security.

“The new HIPAA rules could be quite onerous,” says Methodist Health System’s Ms McNutt. “For example, one of the requirements is not just that patients have a right to see their own medical records, but also a complete list of everyone who has accessed them. And from our perspective, it’s difficult to know who needs to know, so roles-based security is a big challenge. Really, the only effective way to manage it is via audits to see who has accessed information, then to ask each person to explain why they needed to access that information.”

Even in a paper-based operating environment, security is a challenge. A recent survey conducted by HIMSS said that one-quarter of respondents indicated that their organisation had experience a security breach within the previous year, and 34% said that an internal breach was their greatest concern.⁷ Putting everything into a digital database will only exacerbate the challenge—not to mention the risks of making it all mobile.

“One of the really big areas of concern is the likely proliferation of mobile computing devices,

⁷ 21st Annual HIMSS Leadership Survey, HIMSS, March 2010



everything from laptops to handheld tablets and similar devices, even mobile phones that now have so much power they mimic computers,” says UCSF’s Dr Harel. Not only can they be easily lost or stolen, their signals can also be intercepted, giving hackers a way into the network.

One approach that mitigates much of the risk is encryption—but even that may create resistance. “People sometimes don’t like having to go through a couple of extra steps when they want to access information,” says Dr Harel. “And the first time information is encrypted, the process can take a long time if there is a lot of data on the device.”

Methodist Hospital’s Ms Marx also points out that smaller devices with ever-increasing data storage capacity are another potential problem. “We do all the things every technology function does, such as putting in place powerful firewalls, conducting prevention exercises, and hiring outside vendors who try to hack into our system so we can identify vulnerabilities. But what do you do about the many small things that could be a big problem, like someone popping a flash drive into a USB port and downloading all manner of information—especially here in Los Angeles county where there’s always a chance we may have a celebrity in our hospital?”

For this particular challenge, the solution was straightforward: disable all the USB ports. But there are so many more, it means CIOs need to work even more closely with security teams and actively seek out any potential weakness, in the knowledge that the penalties for a breach will be increasingly severe.



Under pressure: The changing role of the healthcare CIO

Key points

- The high cost of implementing new IT is seen as the largest barrier to its adoption—and may prove too high a hurdle for smaller hospitals. CIOs must argue the business as well as the clinical ROI.
- Usability and interoperability are key challenges. Forward-looking CIOs may be hamstrung by the need to replace even relatively new systems to combat obsolescence, such is the speed with which IT complexity is increasing. A lack of standardisation is also hampering the exchange of data.
- Finding staff with the right skills is another key challenge, as extensive training—either in the clinical side or the IT side—is required.

4. Challenges to change

With over US\$19bn in government incentives on offer; huge potential benefits in terms of being able to access far more information about patient history and treatment options; opportunities for researchers to analyse optimal clinical outcomes and share that information with physicians; and the potential to eliminate unnecessary duplicative testing, one would think the healthcare industry would readily embrace technology solutions. The reality is that the barriers are numerous, the incentives may not cover the full cost, and even the penalties may not serve as sufficient incentive for some to go digital. Healthcare CIOs are all too aware of these challenges and how they might prevent as smooth a transition in their roles and responsibilities as they might like.

Finding the funds

The most obvious obstacle is cost. In the survey, 62% of respondents rate the high cost of IT solutions as the greatest barrier to adopting cutting-edge solutions, while 49% note the lack of funds for investment (when asked to rank the top three barriers; Figure 10). That said, pressure to keep down costs and lack of sufficient funding is nothing new: The 2010 HIMSS Leadership Survey also ranked the lack of adequate budget as the top barrier to successful implementation of IT—the tenth consecutive year this issue was selected.⁸

⁸ Ibid.

“Cost will always rank high on any list of barriers,” notes Mr Bartiromo. “You just have to be able to clearly articulate the business as well as clinical value. But for clinical systems, the financial return on investment is not that high; it’s usually a much better picture in other areas of the business. So we when proposing clinical systems, [CIOs should] focus on clinical integration, patient care, safety and connectivity with physicians’ practices. These are core to our business, so offering these types of improvement carries more weight than just a traditional ROI.”

Memorial Sloan-Kettering’s Ms Skarulis uses an inclusive approach to ensure buy-in for solutions

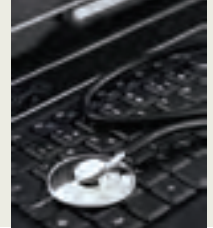
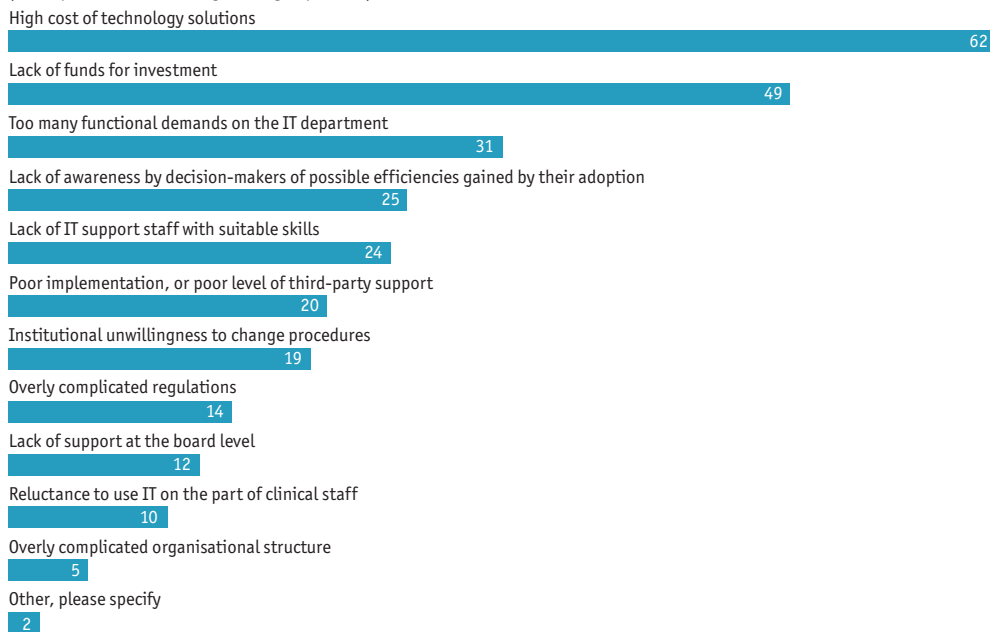


Figure 10: Challenges to implementation
(% respondents selecting among top three)



Source: Economist Intelligence Unit

to overcome resistance to spending the money to create them. “We work with partners in other departments to develop projects, and together we meet with senior management to justify the expense of implementation. That makes for a much stronger business case for the investment.”

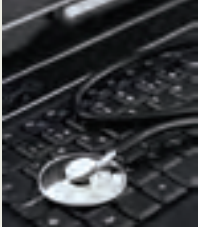
Nonetheless, funding remains a core concern—and there is scepticism about how much the government incentives will help. According to McKinsey’s research, reimbursements will offset only an estimated 15-20% of digitisation expenditures.⁹ “There are hundreds of small hospitals with, say, 100 beds or fewer that simply may not have the resources to complete all the requirements effectively,” says Virtua’s Mr Campanella. “And in the physician community, there is a lot of scepticism that they will actually be able to get the money, because they are not confident they can meet all the requirements, especially some of the ones that are not clearly understood.”

⁹ McKinsey, *op cit.*

Concern over the funding for acute care facilities that achieve “meaningful use” is even greater, as those funds will be dispensed by the states, which can set their own criteria. “State deficits could be an important factor,” notes Mr Bartiromo, pointing to the serious financial problems many US states now face. “The states may get that money, but will they actually dispense it, and if so, how quickly?”

Connecting the dots

Cost is not the only challenge. “The barriers are many,” says Johns Hopkins’ Ms Reel. “The usability challenge is huge. Even though the systems available today are much better than what was available even a few years ago, some of them require 10, 15 or even 20 hours of training, and people do not perceive the benefits as being that great.”



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Ms Reel notes that complexity is another major stumbling block. “Existing systems are simply not sophisticated enough to be able to deliver just the information a physician or other practitioner needs to treat a patient.”

This has created an incongruous situation where some of the more forward-looking CIOs now find themselves in the unusual position of having even greater obstacles to overcome, and more work to do, specifically because they previously were more proactive than their peers.

“The more successful you were in the past, the more difficult your job will be in the future” explains UCSF’s Dr Harel. “If you were successful in implementing cutting-edge solutions five years ago, then you

Case study 3: Sharing information—the payer’s perspective

In 2001 Humana, a health insurer headquartered in Kentucky with revenues of US\$31bn in 2009, was looking into ways of automating its interactions with physicians’ offices. But it faced a quandary.

“We knew it didn’t make sense to try to develop our own system,” says Humana’s chief service and information officer, Bruce Goodman. “After all, there are many insurance companies out there, and we’d never convince a doctor’s office to adopt ours if it meant they would have to then adopt—and learn how to use—numerous others. This was an area where no one company could succeed. Plus, most doctors’ offices are small, so we needed to find a way to drive the technology adoption ourselves.”

So, Humana did what many companies in highly competitive industries usually hate to do: team up with their competitors to create one solution they could all use.

The result was a system called Availity, piloted in the State of Florida with that state’s Blue Cross and Blue Shield organisation. Since that time, Availity has grown rapidly and is now used by over 250,000 physicians in 74,000 practices in 20 states, with many joint-venture partners.

In the paper world, administrators in a doctor’s office fill out forms, sending them to the insurance company and waiting for the insurance company to process them. The insurance company assesses how much of the treatment is covered, generates a statement (called an “Explanation of Benefits”), and sends one copy to the patient and another copy to the physician’s office. Then, the physicians’ office generates its own bill, sends it to the patient and waits for payment.

Individual physicians’ offices lose a lot of money through this approach. “We estimate that only about 40% of what is still owed by patients is actually collected after they leave the office,” says Julie

Klapstein, Availity’s CEO.

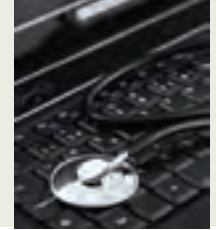
With Availity—or any similar automated system—all of this is done electronically and on the spot. While the patient is still in the physician’s office, administrators enter all the information via an online portal and get that same information in real time. The physician can then collect payment before the patient even leaves the office, and payments from the insurance company are processed electronically—and much more quickly.

Another huge benefit from Humana’s perspective was the ability to drive many transactions online—and off the phone. “This is huge for us,” explains Mr Goodman, “because the cost of paying someone to answer the phone is about ten times what it costs to deploy technology that does the same thing.”

Mr Goodman adds that other features in the system also enhance clinical outcomes. “For example, because we can see whether a patient has filled a prescription written during a previous visit, or followed up on a specialist referral, we can alert the doctor to possible gaps in care, which he or she can then raise with the patient. This is especially important in the case of chronic conditions such as diabetes or high blood pressure where patients do not always closely follow treatment regimens, and these conditions are the single largest source of cost in our healthcare system.”

The system even has features that, for example, remind a physician treating a diabetic to ensure he has regular foot and eye exams to detect potential disease complications that can be serious for the patient, and also add considerably to the total cost of care. The system will also immediately flash a warning if a medication prescribed has a potential adverse interaction with another drug the patient is taking.

“Any opportunity to identify these issues immediately at the point of care, where the physician is interacting with the patient, has a great potential to improve the overall quality of healthcare and also to lower the cost of providing that care,” says Mr Goodman.



now have a lot of legacy systems that probably need to be replaced. That is expensive, plus, if people have got used to using them they will not want to switch, especially if those legacy systems work well. If you have lousy systems, it's easier to get people to switch."

Add to that the rate of obsolescence, common across the technology world, and large sums of money spent today seems like only a short-term investment as the systems will likely be out of date in only a few years. "What users learn today may become obsolete so quickly they don't want to bother training to use the systems," says Johns Hopkins' Ms Reel.

Interoperability is another major hurdle to be overcome. Most legacy healthcare IT systems operate in silos: they were probably used to manage one specific aspect of patient treatment, but were not designed to interact with other systems that contain other bits of relevant patient information. And even if a hospital or physician's practice is able to digitise all its information in one compatible format, what about the outside world?

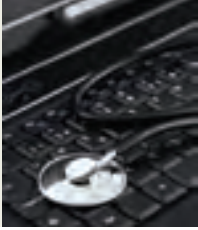
"Let's say another hospital does want to make information available to us about a patient, how do we know the information they are able to share is the information we need?" says Ms Reel, who lacks confidence that healthcare information exchanges (which bring together healthcare stakeholders to exchange information in nationally recognised standards) will provide an effective solution. "There have not been that many success stories in health information exchanges. One of the big problems is that we do not have a unique patient identifier, so it's difficult to say with certainty what information belongs to a specific individual. We've made progress towards standardisation but we still have a long way to go, and a lot of questions that have yet to be answered."

Sourcing the skills

These technical issues aside, many also cite the lack of IT staff with the right skill set as a major challenge, with 24% of respondents to the survey ranking it in the top three (Figure 10). "Demand for qualified healthcare [IT] people is outstripping supply," notes Mr Bartiromo. "On the EHR front alone we're seeing the vendors [of the systems] scoop up talent, and that is really shallowing the pool."

To rectify this, Mr Bartiromo has been working with educational institutions such as the New Jersey Institute of Technology to create a curriculum specifically for healthcare information technology. "We're working with them to train the next generation of IT professionals so they have the skills we need," he says. The programs include internships, mentoring and "shadowing" to give students practical hands-on experience.

Methodist Hospital's Ms Marx takes a more direct approach to help meet immediate needs. "On a day-to-day basis, finding qualified staff is one of my biggest problems. What I tend to do is find someone with the right IT skills working in another organisation, then train them in healthcare so they can transfer those skills, or conversely find someone who is extremely knowledgeable in healthcare and train them in information technology."



Under pressure: The changing role of the healthcare CIO

Key points

- The CIO's role is expanding, bringing new responsibilities. Too many competing demands on the IT function may itself be an obstacle to its effectiveness.
- CIOs now have a once-in-a-career opportunity to drive change within their organisations.

5. Conclusion

Overall, healthcare CIOs' roles have changed in the last decade, and overwhelmingly for the better. Technology directors now have the opportunity to hold more senior positions within their organisations and to deploy cutting-edge technology that can dramatically improve operations, increase efficiency, and lead to improved patient outcomes. Yet with that increased responsibility also comes pressure to deliver in areas over which CIOs may not have direct control, in functions as diverse as record keeping, compliance, payment, research and data analysis. Not to mention managing the hugely important clinical side, staffed by people who are known for operating with a strong sense of independence.

Indeed, the survey respondents list too many competing demands on the IT department as one of the greatest challenges to successful implementation (Figure 10). Successful CIOs must learn how to synchronise all these moving parts—all while managing the constant pressure to do more with less money. Having managed all this, they still face numerous obstacles to driving change within their own organisations.

While the challenges to implementing comprehensive information technology solutions are not new, their scope and urgency is now bigger than before. Cost pressure is a perennial issue, but new regulations may call for greater levels of investment than for projects in years past. The CIO's basic approach to securing funding should be the same, but now he or she has the lure of incentives and the potential of penalties to assist in making the case to invest. Similarly, ensuring systems security and interoperability, and securing user buy-in, are not new challenges, although again the speed with which they must be met and the scope they must cover may be greater than before.

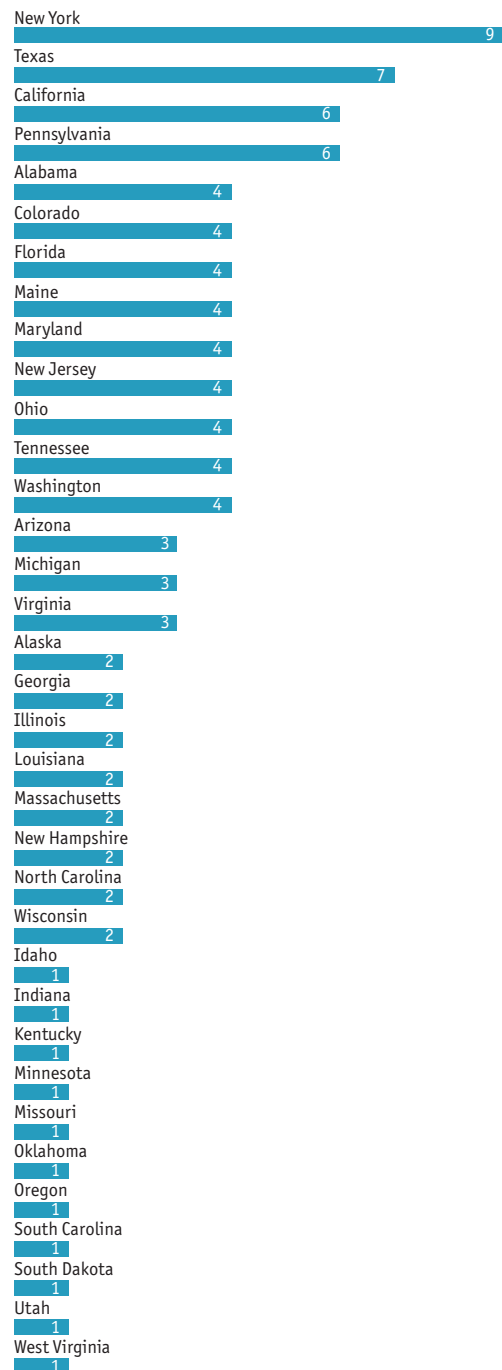
Successful CIOs who learn from their peers and adopt best practices to meet these challenges have a perhaps once-in-a-career opportunity to dramatically raise the profile of their functions, and to become more directly involved in a much wider scope of operations within the organisation. And as the responsibilities of the CIO function evolve, the opportunity for them to drive change is greater now than at any other time in the history of modern healthcare.

Appendix: Survey results

1. Does your organisation provide clinical services/healthcare directly to patients? (% respondents)



2. In which state is your organisation headquartered? (% respondents)

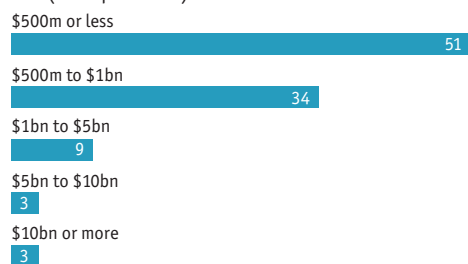


3. What type of healthcare organisation do you work for? (% respondents)

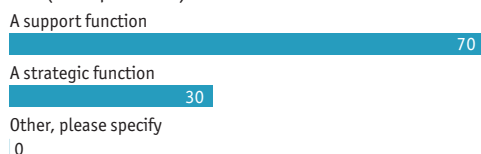


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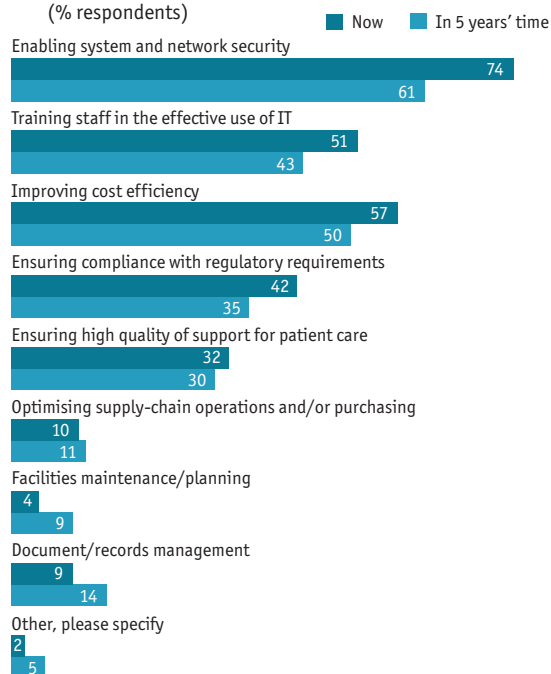
4. What are your organisation's global annual revenues in US dollars?
(% respondents)



5. In your organisation, the IT department is seen principally as:
(% respondents)



6. In your organisation, what are the principal roles of the IT department? Please select the top three now, and the top three as you expect them to be in five years' time.
(% respondents)

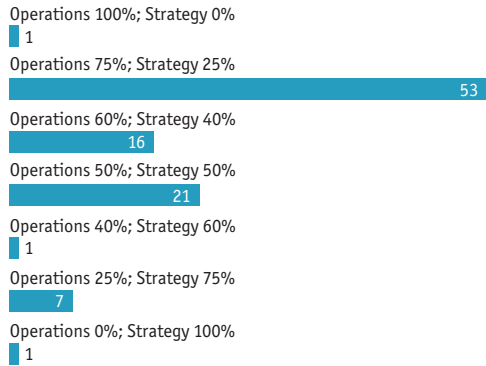


7. Please rate your level of agreement with the following statements. Rate on a scale from 1 to 5, where 1 = strongly agree and 5 = strongly disagree.
(% respondents)



8. Approximately how much of your time do you spend on operations and how much on strategy?

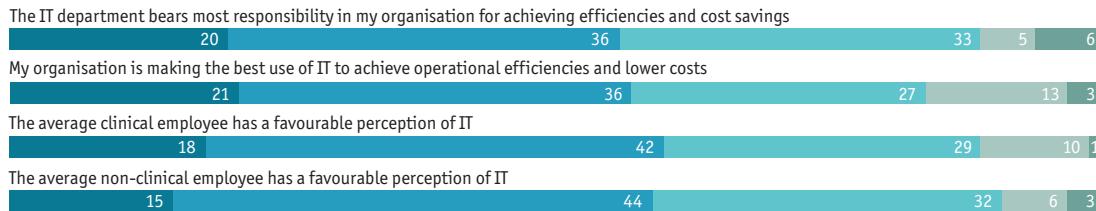
(% respondents)



9. Please rate your level of agreement with the following statements. Rate on a scale from 1 to 5, where 1 = strongly agree and 5 = strongly disagree.

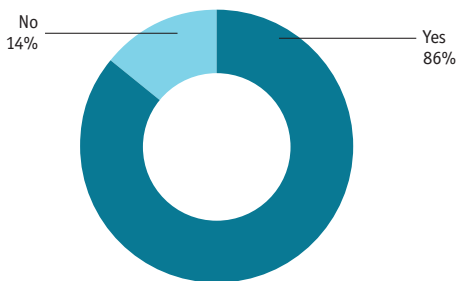
(% respondents)

Strongly agree 1 2 3 4 Strongly disagree 5



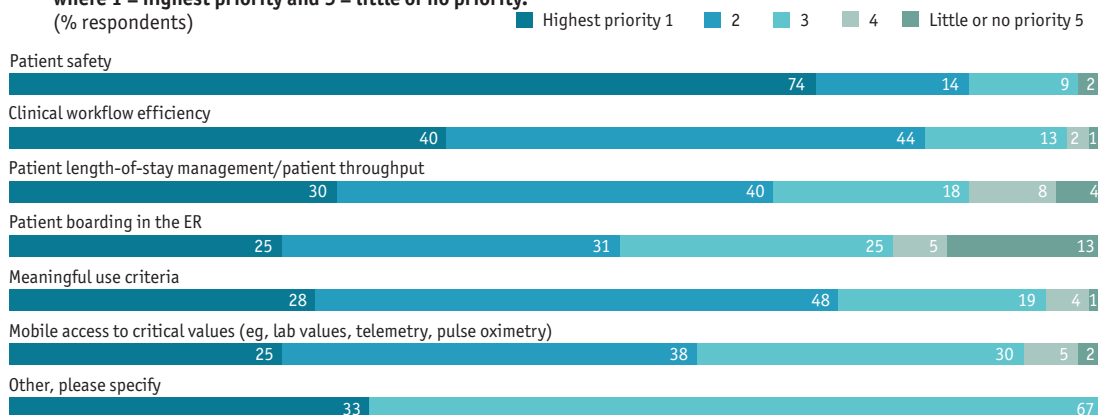
10. Do you actively participate with clinical leaders in your organisation (for example, chief medical officer, chief nursing officer) to support overall organisational clinical objectives?

(% respondents)

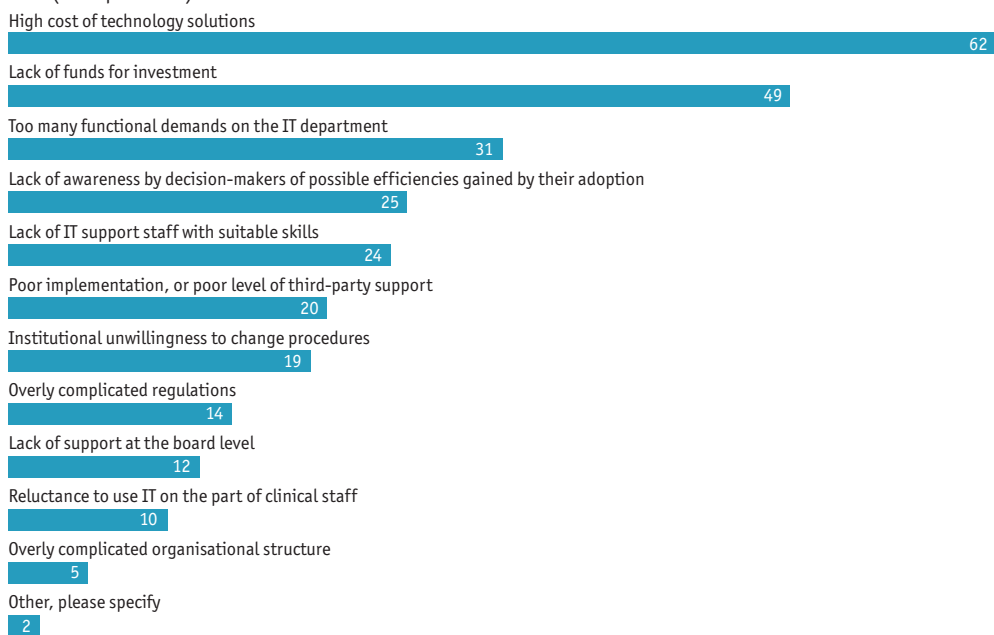


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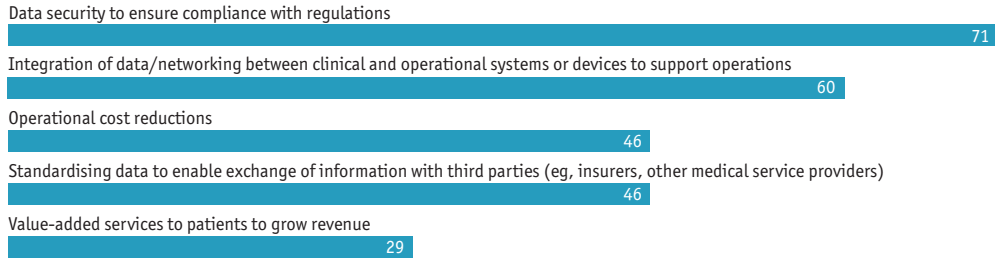
10a. Regarding these clinical objectives, how do the following issues rank in terms of priority? Rate on a scale from 1 to 5, where 1 = highest priority and 5 = little or no priority.
(% respondents)



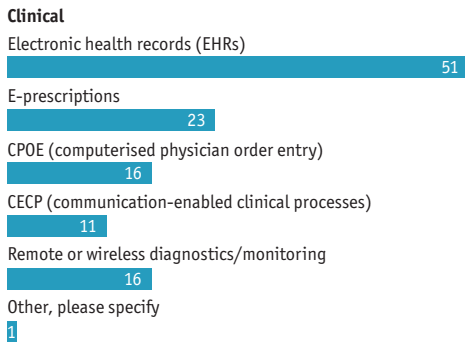
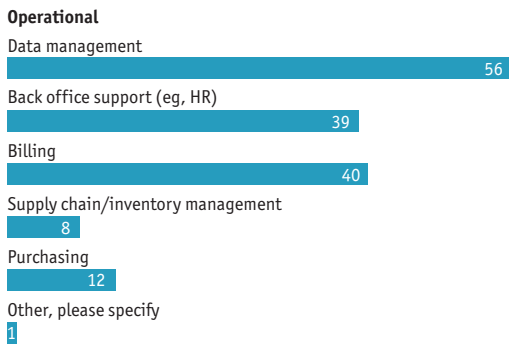
11. Which of the following do you think are the biggest challenges to the adoption of cutting-edge information technologies in your organisation? Please select the top three.
(% respondents)



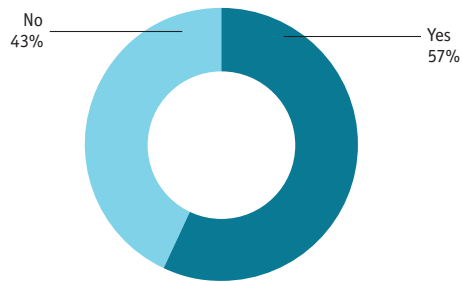
12. Which of the following benefits would your organisation prioritise when considering the adoption of new IT systems? Please select the top three.
(% respondents)



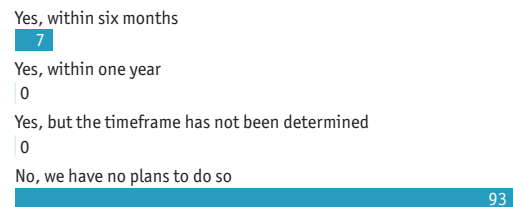
13. In which of the following areas/technologies has your organisation been most successful in deploying new IT systems? Please select the top three.
(% respondents)



14. Does your organisation have a director of clinical informatics?
(% respondents)



14a. Does your organisation have plans to introduce this position and, if so, when will it be introduced?
(% respondents)

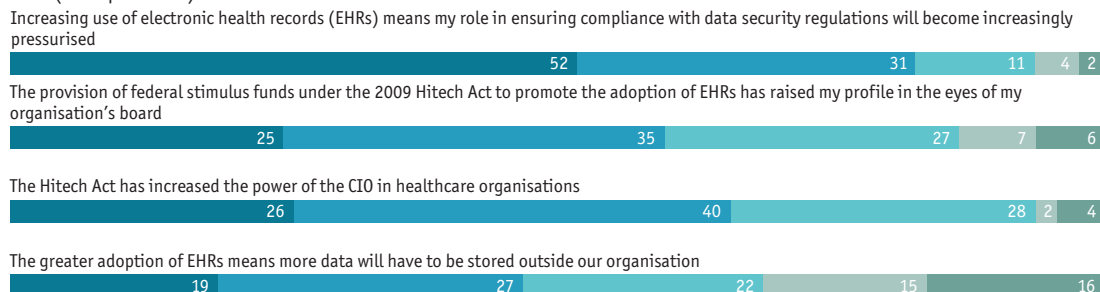


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15. Please rate your level of agreement with the following statements. Rate on a scale from 1 to 5, where 1 = strongly agree and 5 = strongly disagree.

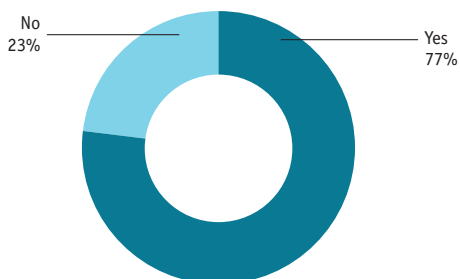
(% respondents)

■ Strongly agree 1 ■ 2 ■ 3 ■ 4 ■ Strongly disagree 5



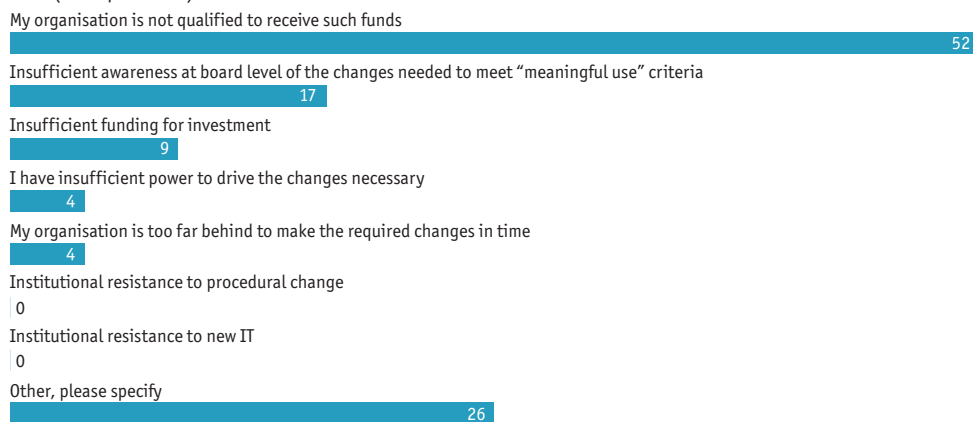
16. Is your organisation likely to qualify for federal funds under the HITECH Act in 2011?

(% respondents)



16a. Why not? Select all that apply.

(% respondents)



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