



cutting through complexity

# Accelerating innovation: the power of the crowd

Global lessons in eHealth  
implementation

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## About the research

This research is based on in-depth interviews and discussions with 39 health leaders from across 15 countries and three different regions – Europe, ASPAC and the Americas. The individuals interviewed for this report are those with national and international reputations in the field of health management, health policy and eHealth across the world. Insights from these interviews were augmented with existing published literature from leading academics and practical examples of eHealth around the world.



A word on our approach. eHealth covers an increasingly wide range of activities and approaches. It is commonly understood as encompassing electronic health records, personalized or remotely delivered healthcare (including diagnostics, monitoring, advice, appointments and prescribing), mobile health devices, virtual teamwork, and electronically enabled disease and knowledge management. We have used eHealth as a broad term to include all the information and communication technologies, tools and services for health. It includes health information networks, electronic transmission of data, health portals, telemedicine services and patient owned devices supporting self management and disease prevention.

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# Executive

# summary

The case for eHealth has never been more compelling yet its performance globally has never been more mixed. Our research, which covers many executives working across many different countries, points to successful examples of both the conceptualization and execution of value adding eHealth initiatives.

For too long, eHealth strategies have focused on 'pushing' people to accept, often as an article of faith, promised high level benefits which do not fully materialize. We might rather, take inspiration from successful 'pull' movements which attract and harness the power of the crowd. The explosion of social networking is perhaps the greatest example of how individuals are 'pulled' together to rejoice in the power of the crowd. Today's 'crowd' are tomorrow's patients. Increasingly therefore, 'tech-savvy' clinicians need to be seen not as a block to be 'won over' but as a catalyst to be nurtured and supported. This approach will deliver sustainable success and avoid costly failures.

Before we address the health industry specifically, let us, for just a moment, pause and think about e-trends in our wider society because they offer valuable insights for the possibilities in healthcare. While, as consumers, we may struggle to comprehend the gigabyte and terrabyte, we now have to be prepared for new binary prefixes – peta, exa and zetta which respectively denote 1 million, 1 billion and 1 trillion gigabytes. The amount of digital data is exploding, up by 30 percent in just one year with an estimated 1.8 zettabytes in use in 2011. Technically there is no limit in the amount of data that we can store in different systems and in the cloud. At the moment the 'T' in Information Technology (IT) is pretty much solved. The real challenge for the future of healthcare is how do we get a grip on the 'I'. In other words, how do we extract reliable information out of all the data that will be available?

In 2012, we can expect the possible initial public offering (IPO) of Facebook with its 800 million users while Twitter will host 500 million 'tweets' per day. This awesome force and the power of the crowd can be used to push eHealth into new areas of support and care. eHealth will no longer be seen as an IT solution in the same way the Internet is no longer seen as an IT solution. eHealth will become mainstream, part of our daily lives and ultimately synonymous with health.

Few would argue over the power technology will have to help solve the many challenges now facing healthcare. Yet, around the world, there has been a largely inconsistent approach to eHealth. Many jurisdictions are either developing or implementing large scale change programs, the likes of which have not been seen in healthcare for the last hundred years.

While some projects have ultimately been successful, more often they have lost momentum after the pilot phase, collapsed under their own complexity, or become irredeemable thanks to spiraling implementation costs. Recently both the Netherlands and the UK have scaled back their eHealth initiatives, reflecting the significant challenges faced by some of the larger, government-led programs.



**Mark Britnell**  
**Chairman, Global Health Practice**  
KPMG in the UK



**Jan de Boer**  
**Global Health IT leader**  
KPMG in the Netherlands

Based on KPMG's global experience and interviews with 39 eHealth leaders, planners, experts and implementers around the world, we have developed three concepts that – in our experience – can help eHealth participants to develop and implement a holistic and integrated approach.

This change can be facilitated with three basic concepts:

- 1. Crowd accelerated innovation** suggests that eHealth becomes more sustainable based on the size of the program and breadth of stakeholder adoption. Participants will need to share a clear vision, strive for full transparency in processes and objectives, and use the power of the crowd – of bringing doctors and patients together – to create an economy of scale to cut costs and bolster innovation.
- 2. Collaborative alignment** recognizes the importance each player has in the healthcare continuum and places a high value on their active participation in the development and operation of the system. Aligning the interests and efforts of stakeholders is key to the success of eHealth, and to enabling its lasting presence in healthcare organizations.
- 3. Creative dislocation**, thanks to eHealth's transformative nature, is essential. The introduction of new methods will make many legacy processes and approaches redundant. Stakeholders must be prepared to change the way they work, rather than just seeing eHealth as an 'add-on'. This is one the best way to integrate eHealth into the fabric of the healthcare environment.

How will eHealth programs move beyond the pilot stage through implementation to a state of sustainability? The truth is that there

is no single global path to eHealth transformation. Each jurisdiction will need to face the specific challenges and complexities in their own markets to find a unique path to success.

A good example of these concepts can be found in the Hong Kong Health Authority. In this 'tech-savvy' Chinese Special Administrative Region (SAR) clinicians, facilitated by executives, have developed a high value, relatively low cost eHealth tool which provides personalized, preventative and purposeful care for patients. The system, known as HARRPE (hospital admission and risk reduction programme for the elderly) provides algorithm based data extraction of 44 key sentinel social and medical markers to analyze – every night – patients that might be vulnerable to re-admission. Nurse-led outbound and inbound care, advice and support reduced re-admissions by 25 percent. More remarkably, this system, which is gradually being extended across all 7 million citizens in Hong Kong, takes an average of two, twelve minute calls from a nurse practitioner: 24 minutes to reduce admissions by 25 percent!

This successful example also reinforces the three key basic requirements that were repeated time and time again by our respondents. While separately these requirements are patently obvious, it is still surprising to see that they are not always managed together.

- 1. Create a strategic plan** that provides clarity, vision and a consistent approach to eHealth. Without a shared vision and consistent policy on eHealth, governments and system managers will find it increasingly difficult to achieve value for their investment or better clinical outcomes for patients. This doesn't necessarily mean mandating a system-wide approach, but it does require everyone to be heading in the same direction.

- 2. Focus on core elements** that drive the greatest benefits for the largest number of people. eHealth initiatives are massive projects and simply can't be done in one step. Some of the more successful systems are the ones that start by focusing on the most common elements of the healthcare process (such as discharge letters, diagnostic tests and prescription records) and then incrementally add components once the core system has been developed and adopted.

- 3. Healthcare professionals and patients in the lead.** The level of change around processes, eHealth and empowered patients can be daunting to healthcare professionals. But by ensuring that clinical staff own and drive eHealth program development, and then demonstrating the program's benefit through evidence based clinical outcomes, health system managers are able to drive adoption and become significant evangelists.

But across this spectrum of successes and failures, there are a number of key lessons to be learned by eHealth pioneers which will help refine strategies throughout the industry and narrow the focus of eHealth programs.

Indeed, for eHealth to deliver on its promises it must not only be implemented – it must also be sustained. This means evolving eHealth from a lab-bench innovation in healthcare into a full scale and sustainable model that ultimately leverages the power of the crowd and transforms the whole industry.

We would like to thank our healthcare clients, Manchester Business School (MBS) and all those who participated in this work and hope that the report makes a contribution to the development of eHealth.

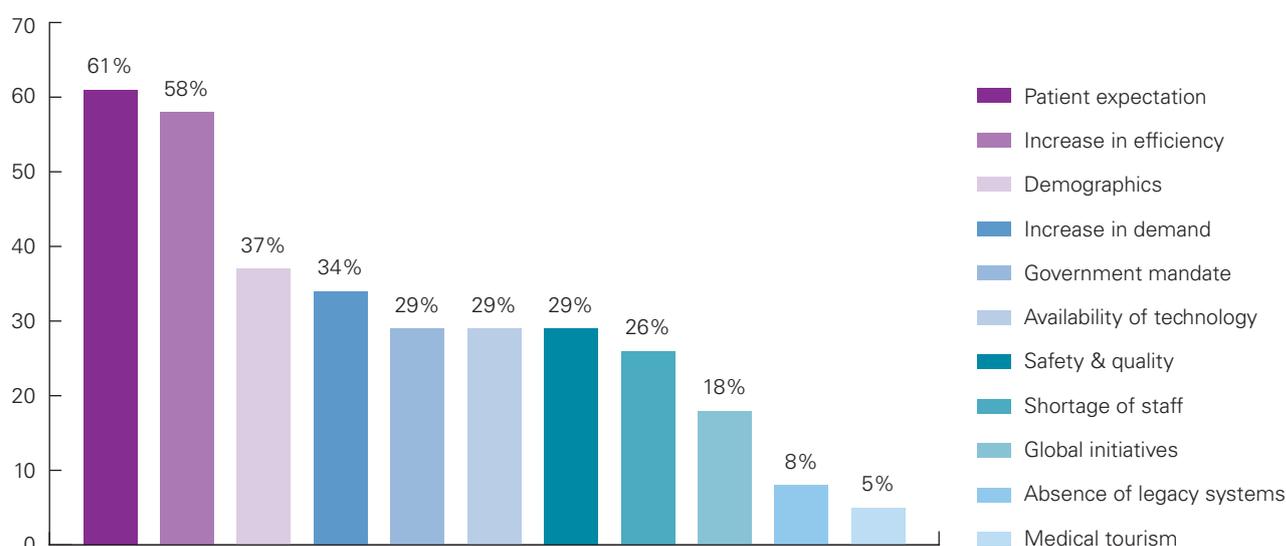
# The case for eHealth

There is little doubt among healthcare professionals, governments and system managers that eHealth has the potential to redefine the healthcare industry. Indeed, the combination of mobile devices, cloud computing and networking capability presents a great opportunity to promote eHealth.

The potential benefits of eHealth are not disputed. Freed from the burden of paper files, advocates envision a world where patients are empowered with access to their own records where healthcare facilities are interconnected, sharing everything from patient records and diagnostic images to operating room bookings and accounting platforms.

The resulting system would not only be patient-centric in its approach. It would also deliver a cost-effective way of building the capacity of health systems, both in the developed and developing worlds. In some cases, this metamorphosis could not come too soon.

## Key drivers for eHealth



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

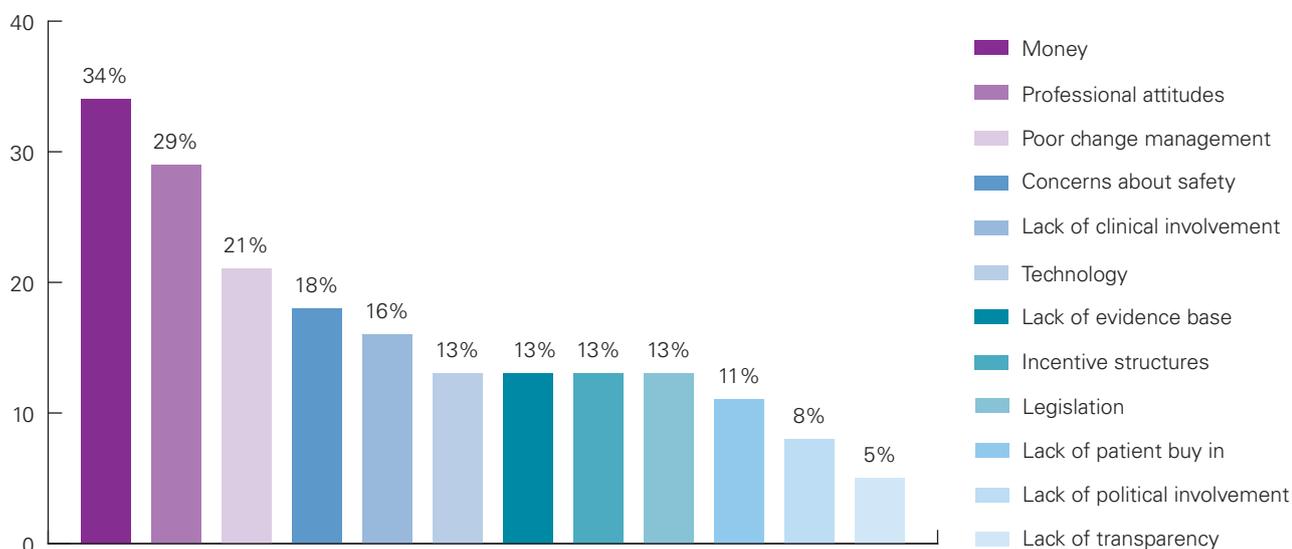


Facing an era of greater financial austerity and rising healthcare costs, many governments and health systems are now taking a closer look at eHealth as a sustainable way to deliver cost savings, better patient outcomes and greater accessibility of healthcare for all.

There is certainly anecdotal evidence that patients are ready for eHealth’s benefits. Beyond the ultra-tech-savvy early adopters, many baby boomers are also technologically adept and, as they retire and come into greater contact with the health and social care systems, they are increasingly taking a greater role in their own healthcare decisions. These consumers already bank and book holidays online, and are starting to ask why they can’t book a doctor’s appointments and review health information in the same way.

Already we are seeing patients take greater control of their medical information and data. PatientsLikeMe.com, a patient-driven health site that leverages social media approaches to connect patients suffering from similar conditions, already has more than 120,000 members. But with greater patient empowerment in controlling their data will come additional responsibilities. Patients will need to support the accessibility of their data and permit the transfer of their personal health information throughout the patient pathway if they are to enjoy the full benefits of eHealth.

### Barriers to eHealth



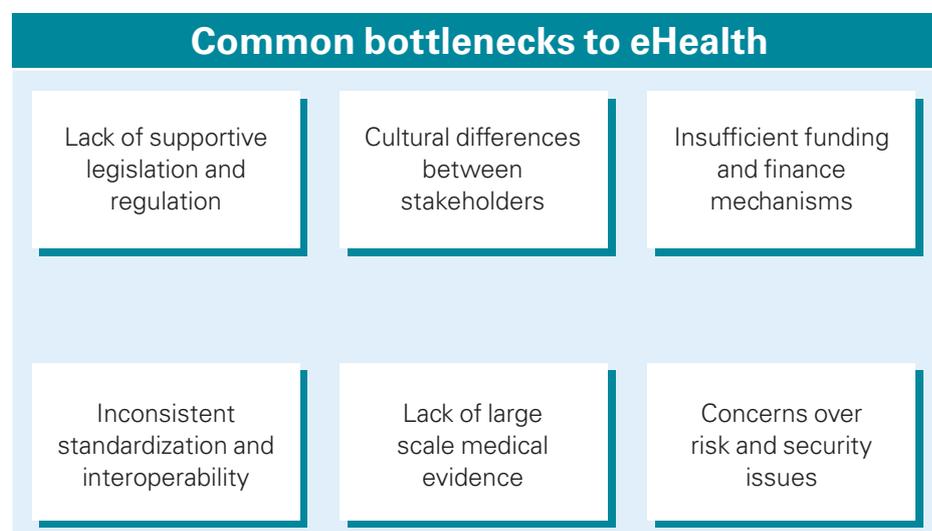
Source: Accelerating Innovation KPMG International/Manchester Business School, 2011



There are a number of common bottlenecks to eHealth (see chart below) and – from the outset – eHealth promoters and advocates will need to manage expectations, since long, complex change programs tend to lose momentum as time passes. Moreover, some eHealth objectives – particularly a significant improvement in patient health – may take years to achieve, making it all the more important that funders, patients and healthcare professionals share the same long-term vision.

And while demand from healthcare professionals may build slowly, the profession is recognizing the potential clinical benefits of having the whole patient record at their fingertips. As a new generation of medical professionals gains seniority in healthcare practices, demand and acceptance will sharply increase.

Around the world, we have seen plenty of pilot programs, but often there is a lack of clear vision on how to properly adopt eHealth in the clinical setting; an issue that urgently needs addressing. Indeed, in our experience, healthcare professionals start to become voracious users of eHealth systems as they begin to see the clinical and efficiency benefits that a well-designed system can deliver.



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

# Three concepts for **sustainable eHealth**

Implementing eHealth programs and sustaining them are very different ventures. Sustaining eHealth requires programs to move beyond the pilot stage in such a way that promised benefits are consistently and universally delivered.

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To become sustainable – indeed, to become the new standard of healthcare delivery – radical change will be required in every aspect of the healthcare system.

eHealth must move from being simply an innovation in healthcare through a sustainable change process to ultimately transform healthcare delivery. The simple truth is that, until eHealth becomes the status quo rather than the outlier, governments and funders will not see the full value of the transformation.

Through this research and our extensive experience in the field, we have developed three concepts that, when used as lenses through which to view planning, may well help achieve sustainability.

# Crowd accelerated **innovation**

For eHealth programs to become sustainable, they must reach critical mass.

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In part, this is because small initiatives will never achieve the benefits that scale brings to a project of this magnitude; also, the real value of eHealth is only unlocked once the program permeates the system and patient population.

One of the most successful examples of this concept is the Human Genome Project. By leveraging the power of thousands of researchers, all working towards a common goal with a transparent approach, the project overcame massive challenges and has changed the way we understand our species.

Crowd accelerated innovation relies on three basic principles to succeed.

The first is that a clear goal must be identified and shared by participants; there must be a desire for the benefits of eHealth. All too often, governments, hospitals and health systems take a tempered approach to eHealth that cuts the program into single, short-term projects or focuses on a single disease category. Sustainability requires health leaders to be clear and committed to a larger change.

Secondly, for crowd accelerated innovation to work, the program must be fully transparent. Health leaders and governments must consistently and transparently communicate the benefits, progress, results, security, costs, and ultimate goals of eHealth across all stakeholder groups.

The final principle for crowd accelerated innovation is the need for critical mass. eHealth planners must strive to expand the audience for eHealth as much as possible to enhance adoption and gain value from the system. While some pundits, particularly in Europe and the Americas, continue to argue that eHealth is not scalable to entire national populations, other countries such as Singapore and China clearly disagree. In particular, China's progress towards a national eHealth system should demonstrate that crowd accelerated innovation is not only possible, but critical to achieving sustainability.

## Kaiser Permanente and the Care Connectivity Consortium (CCC)

### *Building critical mass to drive sustainable change*

In April 2011, five of the US's largest health systems came together to announce a plan to securely share patient-specific data through a collaboration called the Care Connectivity Consortium. The companies – Kaiser Permanente, the Mayo Clinic, Geisinger, Intermountain Healthcare and Group Health – share a mission to deliver patient-centred, high-value health care to US citizens, and believe that achieving electronic health information interoperability and connectivity will be critical to achieving that mission.

“The goal of the consortium is clear and is to provide better and safer care through greater data availability,” noted Jamie Ferguson, Vice President of Health IT Strategy and Policy at Kaiser Permanente. “Not only are we committed to sharing patient records in a secure and transparent way within our consortium, but we are also ensuring that any standards we develop are open source and the infrastructure is available to all healthcare providers in the US.”

Individually, each of the five member organizations have been electronic health record pioneers in their own right and have seen first-hand the benefits of greater access to patient data

on the care provided within the system. As a group, they have a clear goal to extend the same benefits that exist in each of the systems individually to all patients by connecting all communities – and eventually the nation – in order to improve health care for Americans.

And while the consortium is currently focused on gaining critical mass within the private healthcare system, they have not lost sight of the need to build a fully interoperable and transparent system.

“All of the partners in this collaboration understand, agree and believe that using standardized computable information for systematic integration of care delivery really improves health,” noted Mr. Ferguson. “And by following the national content and exchange standards set out by the government, we know it will be scalable and interoperable with government systems in the long-term.”

By setting a clear goal, emphasizing transparency between participants and the healthcare system, and building critical mass, the CCC is successfully driving crowd accelerated innovation through the US health system.

# Collaborative **alignment**

Sustaining the eHealth transformation requires everyone in the health system to work together to achieve results.

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eHealth cannot focus on physicians alone, but must involve the active participation of patients, medical IT firms, insurance providers, governments and healthcare providers as well. This idea brings together long-held concepts in participatory medicine and integrated healthcare to move the healthcare delivery paradigm from one where the system is the arbiter of care to one that revolves around patient-centric personal healthcare.

Collaborative alignment has been crucial to sustainability in many other industries, such as the automotive industry, where suppliers and manufacturers align their operations and interests to produce better cars, but has yet to be widely adopted in the health sector.

For the health sector to embrace collaborative alignment, it must first consider the context from which each stakeholder approaches the program. The drivers for patients will differ greatly from those of insurance companies or governments; each will affect the way they participate in the project.

There must also be alignment in the level of maturity of each party, as more evolved groups tend to take a broader view of collaborative participation.

eHealth planners will also need to understand that sustainable and successful eHealth programs and participatory medicine tend to shift the power to the patient. Few stakeholders in the system are participating for purely altruistic motives, and each has a self-interest to gain from their participation. For patients and physicians, there is also the mutual benefit of better clinical outcomes. For insurance providers and governments, it also involves cost savings.

## Denmark: Sundhed.dk

### *Working across the patient pathway to drive success*

Denmark currently enjoys one of the best eHealth systems in the world. Launched in 2003, Sundhed.dk is a public web-based portal that collects and distributes key healthcare information to citizens and healthcare professionals, and empowers patients to access the healthcare system more effectively. Developed as a joint regional and national effort, the portal was developed on a modest budget, but has delivered massive returns.

“The system started to get its basics in place back in the 1990’s,” said Claus Pedersen at OUH Odense Hospital. “It started with an understanding that there are some basic common denominators that are the foundations of any eHealth system such as referral letters, discharge letters, prescriptions and lab results.”

By focusing on these commonalities, the system was able to standardize large volumes of daily transactions. This created a critical mass in favor of the electronic management of key transactions and processes. The strategy was uniquely ‘bottom up’ in nature: the 1990s saw the emergence of a large number of small projects, which merged into a network of integrated projects. From there, and with government support, a national body was formed in 1999 as a co-operative venture

between government, local authorities, public and private organizations focused on eHealth.

Today’s system brings together a user-friendly interface that adapts its presentation to suit its users’ needs. As a result, patients now enjoy a very different experience when interacting with their healthcare system. Every Danish citizen has their own personal web page, can view treatment/diagnoses from their own hospital record, book appointments with general practitioners, send secure emails to health authorities, order medication from pharmacies, monitor self-compliance with medication, and get access to local disease management systems.

The program has already resulted in significant financial savings and enabled the government to merge 15 counties into five distinct regions without any interruption to health services.

According to our interviewees, much of the success is due to a clear and strategic vision delivered by Danish health authorities, combined with strong management and the engagement of stakeholders. Denmark’s experience shows that it is possible to work across sectors and specialist fields by leveraging ‘collaborative alignment’.

# Creative **dislocation**

There is one certainty of eHealth: things are going to change. eHealth planners must recognize that change is inevitable and be willing to engage in creative dislocation to eliminate outdated concepts and tools.



To help achieve real and lasting change, eHealth planners need to be bold and lead the transformation of business and economic models to allow the adoption of new technology and innovations. Healthcare lags behind other industries, where structures, systems and incentives have made it far easier to embrace creative dislocation. Consider, for example, changes in the music industry over the past few decades: just 20 years ago, consumers purchased music on either vinyl records or cassette tapes, allowing music producers to bundle dozens of songs together to increase the value of their products. Today, however, digital technology has enabled consumers to purchase individual songs online, thereby changing the fundamental business model of the industry and forcing producers to explore new revenue streams.

Of course, creative dislocation is infeasible unless the replacement systems are affordable and have critical mass in the marketplace. This will require investment and innovation to reduce prices, and a certain level of standardization to enable

new technologies to be successfully integrated. At the core, this requires healthcare operators to have the courage to identify and eliminate processes and technologies that are no longer relevant to the system, rather than finding ways to append eHealth components to existing systems. Once again, respondents suggest that eHealth planners focus on developing the systems and processes that underpin the program. "The technology should come last," said Dr. Seher Korkmaz with the Stockholm County Council in Sweden. "eHealth strategies shouldn't be driven by technocrats; rather, it is health strategy that should be at the heart of eHealth implementations."

Technology clearly represents one of the biggest and most expensive challenges in developing an eHealth system. But, as Dr. Seher Korkmaz points out, "We have all made the same mistakes in every country. We have tended to make things too complicated. The simpler the technical solution, the better."

## UK Department of Health: Whole System Demonstrator (WSD) program

*Changing the model of care to enhance patient outcomes*

Having undertaken a series of clinical trials, small pilots and meta-data reviews, the UK's Department of Health (DoH) recognized that – while the case for telehealth was strengthening – the evidence lacked scale, statistical significance and robust cost-savings data. As a result, the DoH launched the Whole System Demonstrator (WSD) program in May 2008. Preliminary findings from this, the largest randomized control trial of its kind in the world, prove how eHealth delivers on its promise to be truly transformational.

WSD sought to build the evidence for a new way of providing patient care through integrated health and social care provision, supported by advanced assistive technologies such as telehealth and telecare. It involved more than 6,000 participants across three locations.

The program selected five main themes upon which to evaluate the system:

- the impact upon service utilization and costs across health and social care
- the impact upon the lives of participants and carers
- the cost and cost-effectiveness of the service
- the views and experiences of users, carers and professionals involved in the program
- the impact of change, collaborative working and large-scale programs on the organization and individual.

"What we have seen in preliminary results is that telehealth and telecare – when applied to chronic disease areas such as diabetes, COPD and heart conditions – can provide a valuable alternative to the current model of patient care in the UK," noted Andrew Hine, a Partner with KPMG in the UK. "And by treating patients outside of the emergency or ambulatory wards, the program has effectively changed the model of care that is provided to some of the most frequent users of health services."

The project represents a strong example of all three eHealth concepts: collaborative alignment (bringing together multiple stakeholders across the health care continuum), crowd accelerated innovation (building the mass required to generate change), and creative dislocation (changing the way chronic disease sufferers interact with the system).

The WSD "Headline Findings – December 2011 – released by the Department of Health" reveals the significant benefits of telehealth: "... If used correctly telehealth can deliver a 15 percent reduction in A&E visits, a 20 percent reduction in emergency admissions, a 14 percent reduction in elective admissions, a 14 percent reduction in bed days and an 8 percent reduction in tariff costs. More strikingly they also demonstrate a 45 percent reduction in mortality rates."

# Accelerating eHealth implementation: **get the basics right**

Create a

**strategic plan**

eHealth systems do not develop in isolation. Rather, they demand a long-term perspective and strategic approach; planners must ensure that the right environment has been created to support the transformation.

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“While our respondents all identified the basics (a strategic plan, focus on core elements, and the need to win over health professionals) it was surprising to see that few projects attended to all of these critical issues in a systematic way,” said Mark Britnell, KPMG in the UK.

#### **Adequate and sustained funding is critical**

One of the primary considerations for strategic planners is funding. Participants in our survey were clear that any eHealth system would depend on adequate long-term funding to achieve its long-term goals. In part, this is because eHealth carries high upfront implementation costs for technology and systems. An industry so young lacks a variety of service providers and platform developers, which are essential to building a large market – a real “catch-22”.



“When money is lacking or tight, what can happen is that the overall scope of a project can be sacrificed in order to balance budgets,” notes Roger Girard, CIO at Manitoba Health. “But reducing expected functionality is the best way to start the spiral of disengagement with end-users.”

A number of interviewees asserted that their countries had significantly under invested in eHealth. Some blamed the lack of funding on the cyclical nature of government budgeting; others saw a need for clear metrics-based Return on Investment (ROI) models. It is clear that both eHealth leaders and the IT industry are actively seeking innovative funding alternatives such as contracting to deliver more secure sources of investment (see sidebar).

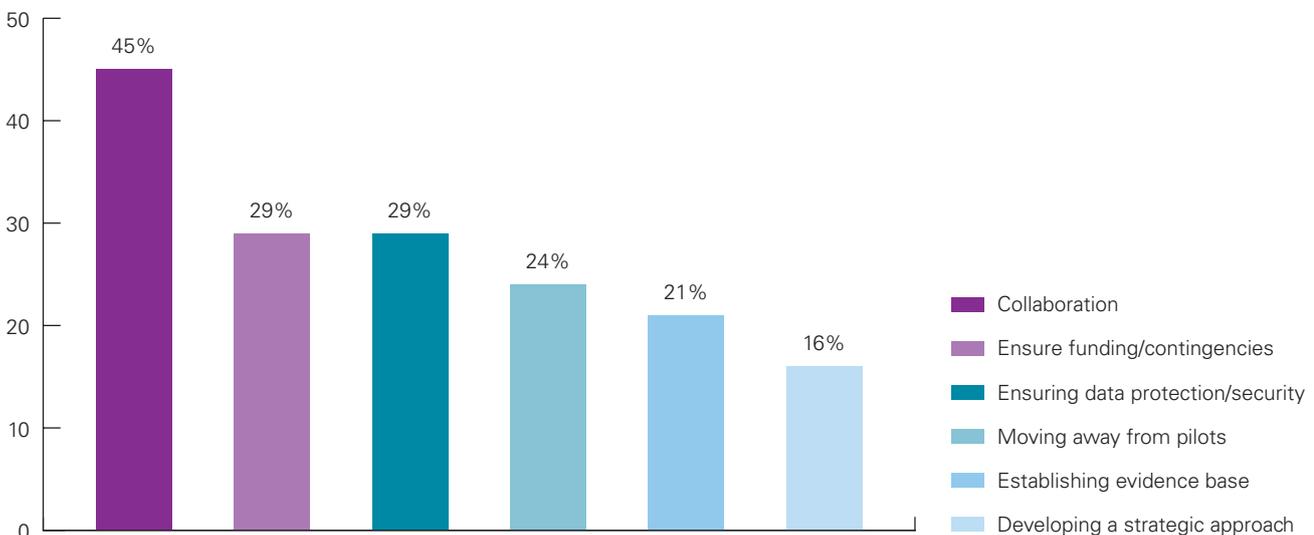
### Creating a sound governance and policy framework

Building the right environment to support an eHealth structure also requires active participation from policy makers. “I am convinced that eHealth cannot be developed at the national level if there is no political strategy, and no change in health care organization,” commented Dominique Acker, Général Inspector of Social Affairs, with the French Ministry of Health.

**A social impact bond (or pay for success bond)** is a vehicle to encourage private investment in social outcomes. Under a social impact bond model, a government contracts with a private sector ‘bond issuer intermediary’ organization to obtain social services. The bond issuer is paid based on the achievement of certain targets (whether cost savings or clinical outcomes) that are specified in the contract. Often, bond issuers obtain additional funds by raising capital through private investors who pay up-front in exchange for a share of the future government payments. While the approach has yet to be fully tested in the healthcare arena, the UK’s Ministry of Justice is currently trying the approach in the prison system, with success measured by changes in re-offending rates.

According to Andrew Donald, Chief Operating Officer for Birmingham East and North NHS in the UK, “To bridge the gap between where we are now and where we need to be, we should investigate the use of social impact bonds to fund investment in eHealth.”

### Developing a strategic approach for eHealth



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

## United Kingdom: National Programme for IT in the National Health Service (NPFIT)

*Developing a common infrastructure to support collaboration*

Launched in 2002, the NPFIT was a large-scale, ambitious project aimed at establishing comprehensive national Electronic Health Records (EHR) for everyone in the UK. With an estimated cost of more than £12.4 billion over ten years, it was planned to be the world's largest IT project, covering 330 acute hospitals and mental health trusts across England.

The service was centralized around its 'Data Spine,' which integrated patient registers, electronic prescription services, summary care records and a patient-facing portal for communicating with health professionals and updating medical details called Health Space. The spine was also expected to support radiology picture archiving, electronic prescription transfer and NHS email.

As a result of NPFIT, the National Health Service (NHS) expected to deliver better, safer and more efficient care by improving clinical decision making, reducing medication errors, speeding up the consultation process and reducing test duplication. By providing patients with easy access to both their personal health records and their medical professionals, the system also aimed to increase patient satisfaction.

However, the implementation of summary care records and Health Space was significantly delayed and eventually scaled back in mid-2011. Many issues, including

insufficient clinical engagement, gaps in stakeholder expectations, and problems with technology, held the program back. "Doing things electronically takes time initially ... and adopting technology is hard," noted Simon Eccles, Medical Director at NPFIT. "Things will go wrong so the technology has to be flexible."

The NPFIT experience provides a number of key lessons to those starting out on an eHealth initiative. For one, its implementation required collaboration between many different sectors: political, clinical, academic, technical, commercial and personal. Differences in values, norms, priorities and methodology for each of these stakeholders were among the most challenging aspects of implementing NPFIT.

It is also important to create a favorable environment before purchasing IT systems and services. The UK system, for example, procured large commercial contracts from IT companies, before creating important structures in information governance, clinical coding and standards and information system architecture. Respondents to our survey also argued that the strategy for national electronic health records should not be left to the IT departments, since this scale of transformation requires fundamental changes to protocols, ways of working and organizational cultures that go far beyond systems implementation.

Governments and regulators will need to consider the broader implications of eHealth. They must go beyond creating a supportive policy environment for transformative change – they must also deal with more technical considerations of issues like data ownership and the role of third parties. Participants in this research also stressed the benefits of eHealth in addressing access disparities, suggesting the universal nature of a system will open doors. “The Chinese government is actively engaged in a program to drive universal access to eHealth,” said Egidio Zarrella, a Partner with KPMG in China. “By raising the standard of care through eHealth, the government is, in one fell swoop, extending access to more than 1.3 billion people.”

eHealth also creates a number of complex challenges in medical ethics. In this regard, medical authorities and physicians’ colleges will need to carefully consider the broader implications of eHealth on key medical principles such as informed consent, privacy and patient confidentiality. Sound governance models and clear policy in this area will be critical to facilitating the new provider-patient relationship under eHealth, as will the important concepts of crowd accelerated innovation, collaborative alignment and creative dislocation.

“Good governance is critical to the enablement of eHealth, but it is often tough to get right and slow to evolve,” notes Dr. Sarah Muttitt with MOH Holdings in Singapore. “It is important to remember that good governance is not static and requires constant attention, support and creativity to get right.”

Most of all, political leaders and top administrators will need to articulate a strong vision for eHealth that engages all stakeholders and formalizes the integration of care as the predominant objective.

The importance of this cannot be overstated. eHealth initiatives focused primarily on cost-cutting or back-office consolidation will never add up to a whole system. Instead, eHealth must be championed as a method for delivering a safer, more responsive and more efficient form of healthcare; only then will it win the support and active engagement of stakeholders. Indeed, the top-down approach of mandating a certain software or program will likely not succeed in eHealth, particularly given that healthcare professionals need to be convinced they are making the right investment decisions for their patients.

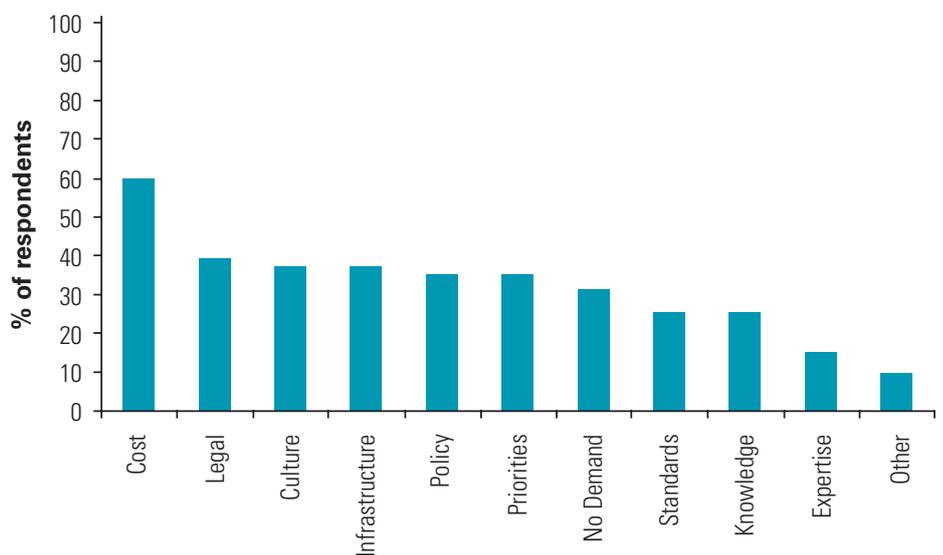


### Collaborate across the system

Taking a strategic approach to eHealth requires planners to work throughout the healthcare industry to ensure that eHealth solutions meet the needs of professionals throughout the care continuum.

“To achieve the breakthrough levels of care that are possible with eHealth, you need systematic integration,” notes Jamie Ferguson with Kaiser Permanente. “Schemes like the Care Connectivity Consortium are going to be absolutely critical to achieve those types of benefits for all patients.” (See page 9 for more on the CCC.)

### Barriers to telemedicine globally



Source: Barriers to telemedicine (Global Observatory for eHealth, 2011)

In part, this is because much of the value of eHealth is driven by a strong network effect – where the sum value of a system grows each time a new node joins the network – that underpins the system. “To be widely adopted, eHealth needs to have input from patients, doctors, and other medical professionals,” said Jerold Howell, a Partner with KPMG in the US. “You are much more likely to meet the requirements of the users if you have their input early on in the process.”

Yet eHealth also demands a more holistic view of the way the patient interacts with the health system, from their first contact with a general practitioner or hospital admission, through to the completion of treatment (otherwise known as the ‘patient pathway’). This is critical to ensuring that everyone – from primary care providers to payers – understands the role they play in the system. According to some interview respondents, this alignment of stakeholder interests can also be used to identify and develop innovative ideas to make the system more valuable.

### **Focus on clinical outcomes, then technology**

Participants in our research were overwhelmingly clear that any eHealth strategy – whether on an institutional, regional or national level – must have improving clinical outcomes as its overarching goal. “Clinicians need to point to clinical outcomes they want to see, like shorter patient wait times or reduced obesity, and then you can line up an eHealth strategy to respond to that,” added Tim Beasley, an eHealth Consultant with KPMG in Canada. “Then it comes down to the IT guys developing a technology solution around that priority.”

Too often, eHealth is positioned more as a technology to implement than what it actually is: a clinical transformation. And while technology will certainly be a key enabler of any eHealth strategy, planners must be careful to make sure that any IT decisions are carefully aligned to a specific clinical objective.

#### **KEY TAKEAWAYS**

- eHealth requires stable and secure funding to achieve system-wide goals.
- Supportive policy and political vision are critical to long-term success.
- End-users, such as doctors, nurses and patients, must be involved early in the process to achieve participatory medicine.
- Program focus should always be based on clinical outcomes, with technology as an enabler.

# Focus on core elements

eHealth programs are massive and highly complex to implement. Left unchecked, the scope of eHealth can easily overwhelm the project and stall momentum. Many participants in our research cited the need for strict focus in a number of key areas to reduce overall complexity and achieve measurable results.

## Start with core systems and services

Many successful eHealth programs have purposely narrowed their scope, prioritizing one or two key elements common to patients. A number of jurisdictions, such as Singapore (see case study on page 23), have focused their attention on consolidating all patient records into one electronic health record that is accessible throughout the healthcare system, thereby creating a very obvious and patient-centric tool around which to rally the wider program. “To realize our aspiration of patients being cared for in the most appropriate setting, and at the lowest cost, the sharing of records between the various care settings becomes crucial,” said Wah Yeow Tan, a Partner with KPMG in Singapore. “In many cases it is quality of care and efficiency that is driving the need for these programs.”





## Australia: National E-Health Transition Authority

*Accelerating eHealth through national infrastructure and leadership*

In order to achieve a consistent national vision of eHealth, the Australian State and Territory governments established the National E-Health Transition Authority (NEHTA) to develop enhanced ways of electronically collecting and securely exchanging health information.

In part, the program was intended to create greater equity between the federal governments and the individual states and territories. But it was also expected to tackle some of the challenges in treating chronic diseases such as diabetes and asthma. According to its five strategic priorities, NEHTA aims to deliver, establish and enhance the essential foundations of eHealth; coordinate the progress of key eHealth initiatives; and accelerate national adoption of the program.

One of the more immediate benefits of NEHTA has been the ability to provide leadership and a national focus on implementing eHealth. The organization has also accelerated the development of national eHealth infrastructure and, as a result, has effectively shifted the national focus from using a range of different products

across the system to “full end-to-end interoperability based on national standards,” according to Stephen Moo, CIO of the Northern Territory.

NEHTA and its partners have learned several lessons along the way. Echoing the basic premise of collaborative alignment, the program found that engaging with all stakeholders was critical to ensuring that technology is adopted and fully utilized. In the Northern Territory, for example, a ‘consumer registration team’ worked closely with the community to encourage user adoption, and has resulted in a 70 percent coverage of the target population. At the same time, clinician commitment was encouraged through dedicated clinical engagement teams who focus on making sure professionals understand the benefits of the system in terms of enhancing their clinical practice.

Where will NEHTA take the program from here? According to John Zelcer, Head of Strategy for NEHTA, the program has “significant capacity to drive improvements in the delivery of safer, quality healthcare for many years.”

In Denmark, the eHealth program started by automating referral letters, discharge letters, prescriptions and lab results (see case study on page 11), which led to the integration of other key programs in later phases. This strategy has effectively allowed organizations to focus all of their resources on achieving a set goal, learning key lessons that can be adapted into the next phase, and building adoption through a step-by-step program.

In both cases, authorities focused their attention on creating effective change within a small number of common elements that would have the largest impact on both the program and the patient experience.

### **Target chronic diseases**

Respondents indicated that eHealth could have the biggest impact on patients that suffer from chronic diseases such as asthma, diabetes and COPD (chronic obstructive pulmonary disease). These patients are high-frequency users of health services and tend to require ongoing monitoring and treatment. Indeed, this segment should be of particular importance to eHealth planners for a number of reasons.

For one, they are the audience that is most likely to see immediate benefits from an eHealth system. By leveraging technology, chronic disease sufferers can be empowered to self-manage their condition, reducing the need for on-site testing, and eliminating unnecessary hospital visits. “eHealth really enables out-of-hospital care such as homecare and community care,” added Tim Beasley. “As a result, it could both reduce system costs and improve clinical outcomes for those with chronic diseases.”

This will not only improve the patient's quality of life, but also free up valuable healthcare facilities and professionals to focus on emerging cases. According to Dorte Stigaard with the Region of North Denmark, "If we can deal with chronic diseases in another way, with patient empowerment supported through information and communication technologies, we can have a win-win all the way round." For eHealth planners, this patient segment can also help to deliver strong evidence-based clinical results that demonstrate the program's value. Key metrics such as number of hospital visits, disease progression and pharmaceutical compliance are all straightforward to measure and clearly relate to enhanced clinical outcomes.

## Singapore: National EHR system

*The benefits of strong government support and accessible infrastructure*

With one of the most advanced economies in the Asia Pacific region, Singapore enjoys an established healthcare system, a robust national broadband infrastructure and an internet-savvy culture. But with one of the fastest-aging populations in the world, more than a fifth of Singapore's population is projected to be over the age of 65 by 2030.

"Singapore is a good example of where the pervasiveness of IT and connectivity has been a strong enabler for the adoption of eHealth," noted Dr. Sarah Muttitt, with Singapore's MOH Holdings.

For Singapore, eHealth is widely seen as a means of meeting future healthcare challenges. The country has been making significant progress: most individual healthcare operators have already implemented their own electronic medical record system and, in April 2011, the government rolled out the National Electronic Health Record system (NEHR).

The system is a significant move toward achieving the 'One Singaporean, One Health Record' vision by enabling individual EHR systems to interoperate. The NEHR acts as

a consolidator by extracting all clinically-relevant information from the records of each encounter a patient has with the healthcare system, forming an integrated healthcare record centered on the individual. Data captured in the EHR system includes diagnoses, allergies, immunizations, current medication, investigations, procedures administered, referrals and care plans.

Participants in our survey highlighted a number of key enablers that have helped drive the system, including: a clear government push, patient demand, the desire for more transparency between healthcare organizations and payers, and the desire for increased access.

Singaporean eHealth executives were quick to acknowledge the catalyzing role of government and the pervasiveness of IT as key ingredients to their success, as well as the importance of strategic leadership, broad stakeholder engagement and bold innovation. But they also noted the need for appropriate and sufficient funding mechanisms to encourage continuous, consistent and coordinated investment into the system.

### Put the basic technological infrastructure in place

The most obvious prerequisite for eHealth is a basic technical infrastructure, including crucial components like telecommunications networks, internet access, and high device penetration.

Respondents from jurisdictions that enjoy advanced technology infrastructure reported fewer barriers to both eHealth implementation and adoption. For example, by implementing a national high-speed broadband network, eHealth authorities in China are creating capacity to confidently roll-out programs to both patients and professionals over a very reliable system. “China is working to virtualize the entire country,” noted Egidio Zarrella, a Partner with KPMG in China. “And by making sure every member of the population is technology enabled, they are also driving the market for eHealth.”

From an enabling perspective, this often means developing systems that house data, compile records and control access to patient records. By developing a scalable platform that can easily interoperate with a wide variety of systems, eHealth planners can build a level of flexibility into the system that enables the consolidation of future technology and programs. Dr. Siobhan O’Halloran, Head of Acute Hospitals at the Health Service Executive (HSE) in the Republic of Ireland, reminds us that, “what we couldn’t even dream of ten years ago is now possible.”

Developing a core set of technology standards and processes will be crucial to accelerating eHealth implementation. While on a regional or institutional level individual stakeholders must be encouraged to select the platforms and systems that best reflect their unique clinical needs, it will be vitally important to provide standard guidelines to facilitate interoperability of systems. As Petra Wilson, a senior director at Cisco and Secretary-General of Continual Health Alliance in Europe notes, “industry standardization is a big driver for adoption.”

#### KEY TAKEAWAYS

- By focusing on core elements, eHealth managers can scope their efforts to areas that create the widest benefits to the system as a whole.
- Electronic Health Records (EHR) are often the catalyst to widespread healthcare system transformation.
- The largest impact is often achieved in patient segments that suffer from chronic diseases.
- While technology infrastructure is a necessary enabler of eHealth, every effort should be made to ensure it is simple, accessible and affordable.

# Harness health

## professionals

The implementation of a truly successful eHealth project requires the support and engagement of a wide variety of stakeholders. While each has a role to play in driving the strategy, one group has the potential to make or break the system entirely: healthcare professionals.

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### **Involve clinicians in design**

According to our respondents, involving end-users in the development of eHealth is critical to ensure the system's eventual adoption. "Let the clinicians rule what goes into the system, not the researchers and technicians," advised Chris McLean, Senior VP and CFO of Methodist Health in the US.

Clinician-led design is important for a number of reasons. For one, it ensures that the program remains focused on addressing clinical issues and outcomes. But it also allows planners to identify both user-interface challenges and opportunities to enhance the system. "If you design it poorly, you are going to alienate the nursing and clinical staff," added McLean.

By including clinical staff in the development process, eHealth planners can create a ready-made group of peer evangelists that can be harnessed to drive greater clinical adoption. "You need to get the opinion leaders in the healthcare network involved in the project," notes Anssi Ylimaula, Chief Operating Officer with Mawell in Finland. "If you can convert them to like the solution, it is possible."

However, it must be stressed that participation should include a wide cross-section of clinical staff, such as nurses, diagnostic technicians, specialists and pharmacists, in order to provide a holistic approach and ensure that strategies are mapped across the patient pathway. “It is critical to be constantly reinforcing the message of collaboration and communication between all the stakeholders in the health continuum,” added Michael Beaty, a Partner with KPMG in the United States. Many program leads have found that, by focusing their training efforts on frontline and nursing staff, they have accelerated the system’s adoption while simultaneously building a critical mass of capacity within the clinical setting. “Frontline staff have to see the benefit of the system,” cautioned Simon Eccles, a consultant physician in Emergency Medicine and Medical Director for the National IT Programme in the UK. “Frontline staff can be very quick to adopt technology if they see the benefit.”

### **Empower the patient**

In the eHealth system, patients are ultimately the owners of their personal health information and data. Rather than the traditional “trust my doctor” approach, this will result in patients taking a greater role in the management, treatment and monitoring of their health information, which will ultimately redefine the doctor-patient relationship.

What is more, eHealth systems will need to clearly define how patient information is accessed and shared across the healthcare spectrum, while maintaining the privacy and security of the patient. “In the US, we have rules that prohibit the government from creating a national patient identifier system,” noted Jamie Ferguson at Kaiser Permanente. “And yet the ability to uniquely identify individual patients and providers is absolutely critical to health information sharing.”

## United States: Veterans Health Information Systems and Technology Architecture (VistA)

*Going 'open source' to reduce cost and drive adoption*

As one of the largest medical systems in the United States, the Veterans Health Administration (VHA) provides care to over 4 million individuals. The organization is widely seen as an eHealth pioneer, having implemented automated clinical and administration capabilities as far back as 1985. The system that evolved from that innovative idea has become the Veterans Health Information Systems and Technology Architecture (VistA).

As an enterprise-wide information system focused on electronic health records (EHR), VistA was built from the ground up, designed by clinicians with a primarily clinical focus. Given the size and scope of the VHA (170 hospitals, 800 community clinics and myriad other facilities), planners quickly recognized that cost could become a major barrier. In response, VistA was developed as an open source, public domain platform that is available to download (free of cost) from the VHA website and highly adaptable to the needs of the local organizations.

VHA invested around US\$3.6 billion to implement the program, but research shows that the organization had already yielded more than US\$3 billion in savings – after

factoring in investment costs – by 2007. This included savings resulting from reduced workloads, freed-up workspaces, the near-elimination of unnecessary lab tests and avoided hospital admissions.

The program has also improved patient safety. As a result of VistA, the VHA has achieved pharmacy prescription accuracy rates of 99.97 percent. The system also enables authorities to use the data to pinpoint problem areas such as medication errors and track how closely professionals are following evidence-based treatment standards.

For the VHA, the most challenging aspects of implementation were organizational factors, change management and the task of training the approximately 180,000 health professionals it employs. The organization also found that many of the commercial 'off-the-shelf' systems were designed from a financial perspective and did not adequately serve the clinically-driven needs of the organization. Those involved in the program are also quick to note that setting up an EHR system is every bit as much a clinical transformation as it is an IT implementation project.

### **Focus on evidence-based outcomes**

Real change is often unsustainable without strong evidence to demonstrate its value. While more than one-in-five interview respondents stated that a lack of robust evidence is likely to threaten the widespread adoption of eHealth, a larger number noted challenges in developing a consistent set of metrics to measure. But measurement and the communication of findings are critical steps to driving adoption by healthcare professionals.

“It is interesting that when a new medication with clear clinical benefits passes rigorous research and testing, the entire health industry quickly adopts it, but when it comes to eHealth, which has also passed rigorous testing and research, we don’t have the same reactions,” noted Iain Gravestock, a Partner with KPMG in the UK.

### **Do not underestimate the behavioral changes required**

Even the best eHealth system will fail if the users do not have the right knowledge and skills to use it effectively. Respondents were clear that proper skills training and education are key components to driving clinician adoption. “For a lot of them, it’s scary,” admits Lucien Engelen, eHealth Director with University Medical Centre Radboud Nijmegen in the Netherlands.

While many eHealth initiatives include technical training and manuals for the specific platform, far fewer focus on the behavioral changes that must accompany the adoption of eHealth. These will be particularly important in engaging clinicians who may be less tech-savvy and more resistant to changing their habits.

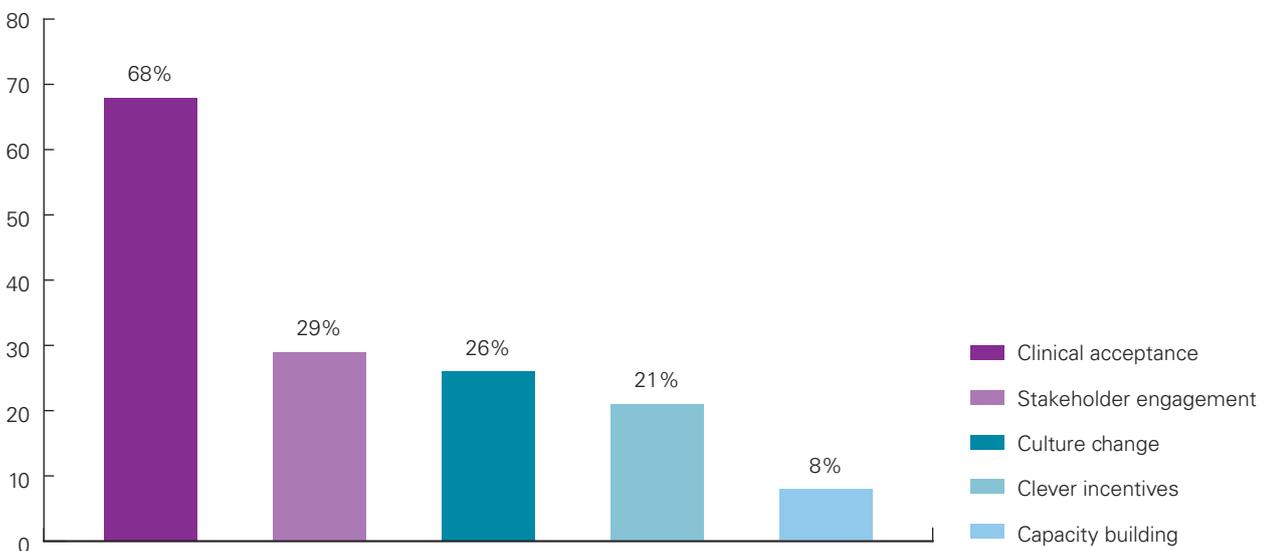
Some interview respondents suggest a need to redefine the patient-physician relationship, to embrace the idea of an ‘intelligent and informed patient’. This will also require medical schools to revisit their training programs and rethink many of their approaches to education. As one respondent put it, “I’m not sure that the preparatory program will deliver the kind of professionals that will be needed in a system that is underpinned by technology and driven by the intelligent patient.”

## Manage the change process

eHealth represents a fundamental transformation for the healthcare system that, if poorly planned, has the potential to be highly disruptive. “Change management should be as important as the technology or the idea itself,” notes Jerold Howell. From the start, eHealth leaders must apply a change management approach that recognizes barriers and works with stakeholders to enable transformation. More than a quarter of our respondents identified cultural change as one of the most important aspects in this change process.

Once again, respondents warn against thinking of eHealth simply as a technology implementation. “Don’t treat eHealth as an IT project,” says Dr. Sarah Muttitt with MOH Holdings in Singapore. “It is a business transformation project.” eHealth planners must consider the implications of eHealth on both people and processes.

### Harness health professionals



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

## Manitoba, Canada: Computerized Provider Order Entry

### *Gaining clinical support by communicating evidence-based results*

For the Canadian province of Manitoba, eHealth is seen as a significant opportunity to improve patient health and make the existing system more transparent. In 2009, the province's second largest hospital launched a Computerized Provider Order Entry (CPOE) system as a way of moving documented patient treatment plans electronically. The system allows an authorized provider to initiate individual orders and order sets, which are communicated over the network to the appropriate medical staff or departments.

The CPOE system has already delivered significant value. It enables the real-time tracking of critical safety information such as patient IDs, adverse drug reaction reviews, recommended dosages and cross-checks for allergies. Patient safety has also been enhanced by providing a strong mechanism for identifying prescribing errors.

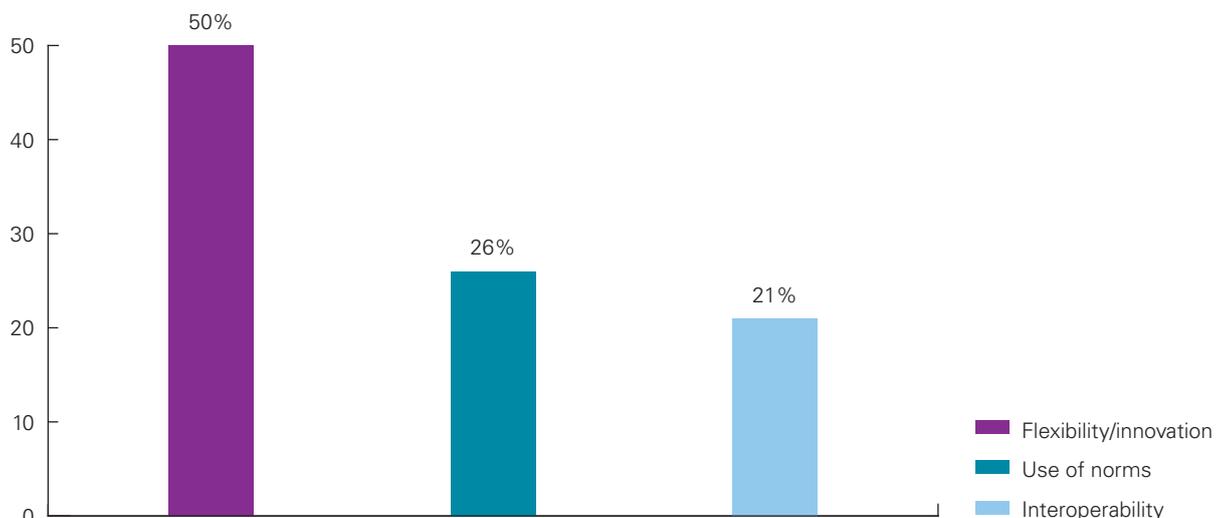
CPOE also provides benefits on the operational side. The system delivers statistical reports online so that managers can quickly analyze patient statistics and make appropriate

changes to staffing and inventory. Audits can be conducted to ensure that patient privacy and confidentiality are properly protected, and to monitor utilization throughout the organization.

Those close to the project identify a number of key takeaways. "Having strong clinical leadership is the single largest factor to the success of an eHealth initiative," said Roger Girard, CIO of Manitoba eHealth. To achieve this, planners collected and communicated evidence of improved care to clinician groups to gain their support and engagement. Planners also engaged clinicians in the development of evidence based content.

Participants in our study noted the need to develop contingencies to help the project remain focused and on schedule, as well as the importance of secure funding commitments. Maintaining momentum was highlighted as key, with experience showing that long lags between the first and second versions can often deter clinical champions.

### Technical development for eHealth



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

### Align incentives in the system

Medical professionals must be properly compensated for providing eHealth services. However, many jurisdictions have not revisited their reimbursement policies to reflect the very different needs of eHealth. “The physician has to be able to see the value and benefits in the form of efficiency, outcomes and compensation,” added Michael Beaty.

A number of respondents also cited the need to incentivize institutions to implement eHealth systems through government grants, loans or cost-reduction measures. The ‘Meaningful Use’ provisions in the Obama Healthcare Reforms, for example, offer significant incentive payments for the implementation of Electronic Health Records (EHRs), but ties those payments to the provider’s ability to make significant improvements in patient care.

#### KEY TAKEAWAYS

- Clinician-led eHealth systems will enjoy higher adoption rates and greater clinician acceptance.
- Clinical value must be demonstrated to healthcare professionals, particularly through evidence-based outcomes.
- This requires the scaling up of eHealth project which would otherwise not deliver conclusive evidence.
- Many clinicians will require significant capacity-building in technology and the behavioural changes that accompany eHealth.
- Health professionals and organizations must see value and benefits from the system in the form of efficiency, clinical outcomes and financial compensation.



# Conclusion

Ultimately, there will be as many different models of eHealth as there are healthcare systems, and each will take a unique approach to both implementation and long-term sustainability.

But, to move from being simply an innovation in healthcare through to being a sustainable change process to transform healthcare delivery, we believe eHealth planners will benefit from considering their initiatives against three fundamental concepts: crowd accelerated innovation, collaborative alignment and creative dislocation.

Our research also shows that, almost regardless of the underlying market characteristics, building a successful and efficient eHealth system comes down to the strength of strategic planning, the communication of a clear vision and the ability to harness professionals.

So while there is no single path to eHealth transformation, we firmly believe that eHealth is too important, and too expensive, for implementing organizations to repeat the mistakes of their peers. Indeed, much value will come from sharing lessons and best practices between countries, systems, institutions and professionals.

We hope that this report adds to the global dialogue on eHealth and helps healthcare systems achieve sustainable and valuable benefits for governments, system managers, payers, healthcare professionals and, most importantly, patients.

# The eHealth diagnostic test

Around the world and in virtually every region, eHealth is rapidly becoming a reality. Some providers are moving ahead with full-scale roll-outs that aim to transform the health system with one huge leap forward; others are taking an incremental approach that slowly but surely evolves into an integrated eHealth network.

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So how can eHealth participants use the information learned in this research to move their own strategies and programs forward?

KPMG's Healthcare Practice has developed a quick and simple eHealth diagnostic test to help gauge their progress on the path towards building a sustainable transformation in health. Executives may also want to check the potential sustainability of their eHealth programs against our eHealth Barometer (see page 35) to see how our three eHealth concepts might help drive their program to sustainability.

## eHealth diagnostic test

### How to get from pilot stage to a sustainable transformation in health

On a scale from 1 (No) 5 (Yes).

Questionnaire	No				Yes
	1	2	3	4	5
<b>Crowd accelerated innovation</b>					
• Is a strategic plan, supported by clear goals, in place to achieve your eHealth program?					
• Is there open communication and a transparent environment in sharing knowledge and outcomes from your eHealth program?					
• Is there a sustainable crowd involved in developing and embracing your eHealth program?					
<b>Collaborative alignment</b>					
• Do we really understand the perceptions of all of the stakeholders involved in the eHealth program (patients, physicians, medical firms, insurance providers, governments, healthcare providers)?					
• Are all key stakeholder groups at a sufficient level of maturity?					
• Can we clearly describe how each stakeholder group will benefit from the program (focus on core elements like improved quality, better access and/or lowering costs of healthcare)?					
<b>Creative dislocation</b>					
• Are financial mechanisms in place to get beyond the pilot stage (change and run cost)?					
• Are we using proven technology, standardized components and open solutions used to get critical mass (ease to expand the program)?					
• Are we focusing on how this initiative can transform the way that healthcare is delivered (to substitute current way of working)?					

Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

## Results in...

### Score 9 to 20:

Your eHealth program is not sustainable enough to rise beyond the pilot stage. There is not sufficient innovation led by a crowd, collaboration between stakeholders is an issue and there is a lack of commitment to transforming the existing way of working.

### Score 21 to 32:

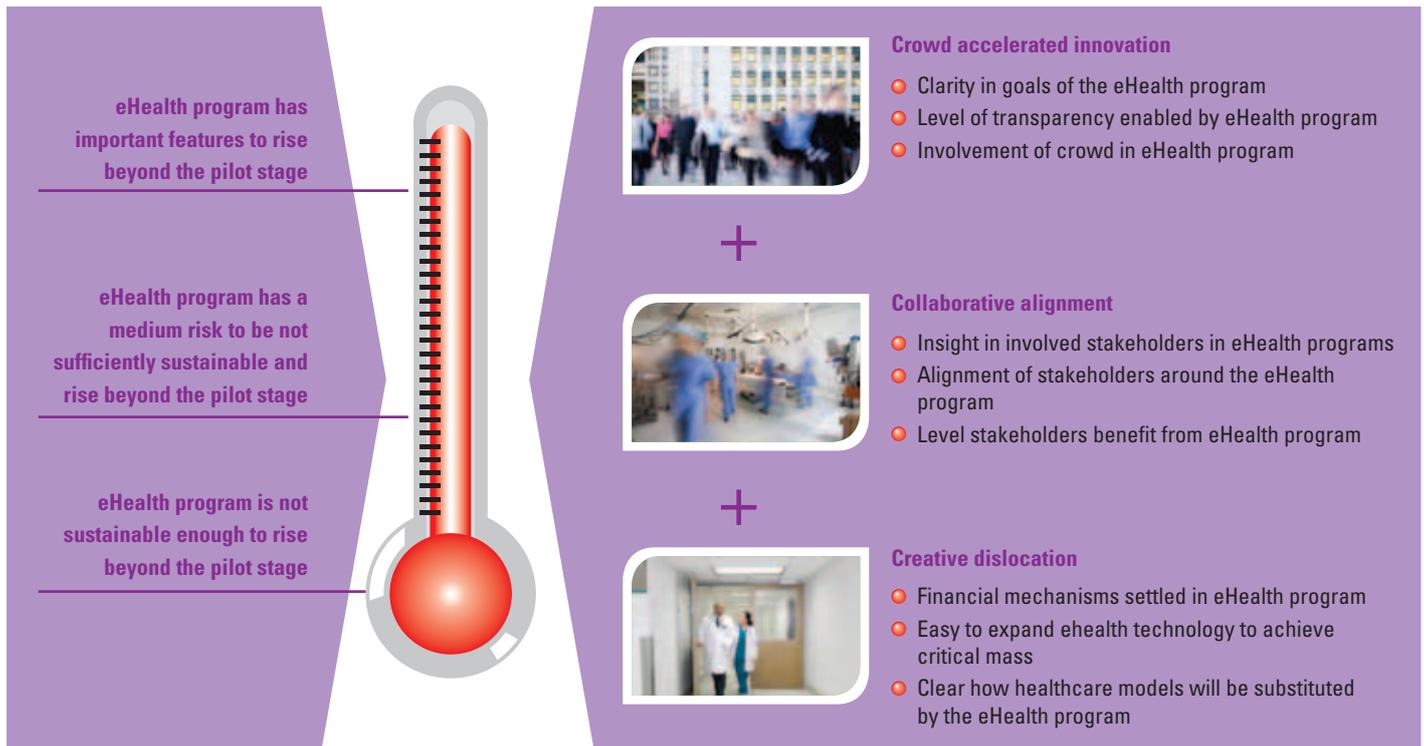
There is a medium risk that your eHealth program initiative is not sufficiently sustainable to rise beyond the pilot stage. Additional effort is required in getting more crowd support, to align the stakeholders and substitute the existing way of working.

### Score 33 to 45:

Your eHealth program has important features to rise beyond the pilot stage. Innovation is led by a crowd, collaboration between stakeholders is in place and serious effort has been put towards changing the existing way of delivering healthcare to patients.

Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

## The eHealth sustainable barometer



Source: Accelerating Innovation KPMG International/Manchester Business School, 2011

### KEY TAKEAWAYS

- Crowd accelerated innovation suggests that eHealth becomes more sustainable based on the size of the program and breadth of stakeholder adoption.
- Collaborative alignment recognizes the importance each player has in the healthcare continuum and places a high value on their active participation in the development and operation of the system.
- Due to eHealth's transformative nature, creative dislocation is essential.



cutting through complexity

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