

## Volume 3 / Issue 5 / 2008 - Management

### Healthcare IT and ROI

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#### A New Element in an Old Equation

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**How times have changed? A decade ago, IT in healthcare was seen as little more than a country cousin of sectors like banking, retail, transportation or manufacturing. Its status, even in a pioneering country like the US, was summed up in 2001 in a report by the prestigious Institute of Medicine that "IT has barely touched patient care." (Crossing the Quality Chasm: A New Health System for the 21st Century. National Academy Press, 2001).**

#### Distributing and Digitizing Healthcare

Today, hospitals across the US and Europe are in the throes of major modernization. Some are being privatized. All are investing heavily in IT, and healthcare looks set to become one of the key areas of IT spending in the years to come.

Most of the drivers of such a process involve the fast-growing promise of e-Health, symbolized by the new EHR or Electronic Health Record (in its various forms). While e-Health simply means increasing the reach of healthcare service delivery, electronically and digitally via secure networks, the EHR (in a secure database) will become the cornerstone of such a distributed healthcare architecture. Under such conditions, IT is clearly the engine for the new shape of healthcare.

#### ... But Questions Remain

And yet, many questions remain about how exactly such new IT spending will be channelized. As shown by the UK's massive healthcare IT modernization programme, Connecting for Health, there are not only many promises to keep, but also many miles to go. One of the key challenges is that time does not stand still. New equipment and technologies (from diagnostic and lab information systems to RFID and patient monitors) are emerging by the day. Many (though clearly not all) entail mini-revolutions in efficiency. Nevertheless, they have to be integrated into the still functional 'old' IT backbone in a hospital - and the wider healthcare environment.

In an environment like banking or finance, errors may entail huge costs, but they are rarely issues of life and death. In healthcare, on the other hand, there are several examples of faulty implementation of systems leading to huge problems. In the US, Medicare and Medicaid have planned to stop reimbursing so-called Never Events – the term for the most serious medical mistakes such as wrong site or wrong patient surgeries, mismatched blood transfusions etc.

#### Sharing Experiences = Flattened Learning Curves

In healthcare IT, therefore, the imperative for zero learning curves is stronger than anywhere else. This is indeed one of the major reasons for resistance to change in the healthcare IT and wider healthcare management profession.

Nevertheless, as more and more hospitals modernize, implement new systems and successfully re-engineer their old, a critical mass of expertise is accumulating, which will certainly make it easier for others to take the plunge. A magazine like Healthcare IT Management is playing a laudable role in not only bringing new developments to light, but also enabling their dissemination to peers across borders. In my own career, I have seen that there is little as powerful a tool as sharing experiences and learning from others in the IT profession.

## **Justifying (New) Investments**

The second question which faces healthcare managers and CIOs in particular is justifying investments in healthcare IT. As one of the principal economic sectors in industrialized countries, healthcare currently faces massive pressure for cost-containment and efficiency. And even though the lifetime capital costs of a new IT system (or modernization project) pale into insignificance compared to other spending headings in a hospital budget, they are not the smallest categories either.

It is therefore no surprise that issues of return on investment (RoI) – hitherto confined to sectors like manufacturing and retail have begun steadily emerging in the field of healthcare IT too.

## **Healthcare IT and RoI: Unique Challenges**

However, measuring RoI in healthcare faces a host of unique challenges. These have to be first understood, accommodated and mastered to sell the concept of RoI itself – before making RoI the centerpiece of a case for an investment in healthcare IT.

Traditionally, ROI measures the financial impact of operating expenses against revenue gains from service delivery. If the latter exceed costs, RoI is positive and an investment is justified.

In healthcare, however, benefits have so far been usually aimed at avoiding costs rather than increasing revenues. In Europe, in particular, the enormous complexity of the healthcare payment system has resulted in making revenue measurement (along the lines of commonly accepted principles in other economic sectors) a Herculean task.

This was, of course, not the case, when healthcare IT principally involved isolated applications, such as payment and invoicing, appointments scheduling, or even lab reporting. Such early-stage developments essentially involved PC packages, and off-and-on, a mid-range computer such as an AS/400 or HP 3000 for departmental applications, especially in large general hospitals.

## **E-Health Persuades Holdovers**

The wheel has now turned full circle, and the key driver is e-Health.

In the past, while investing in devices such as CT scanners or PACS systems provided an instant revenue stream for a specific hospital, few facilities saw an EHR yielding 'measurable' revenues in less than 3-5 years; it thus stayed on the perceived cost side of the balance sheet. This is no longer the case, where hospitals are obliged under new EU rules (and corresponding national laws) to ensure that their IT systems are (or will become) interoperable. Failure to comply carries penalties, and this too is/will become a cost. In addition, a longer-running reorganization of healthcare (principally to unbundle specialties from general hospitals) has also been slowly but surely increasing the costs of non-interoperability.

In the US, on the other hand, an almost perverse logic militated against increased IT. Senior officials from payers such as Medicare and Medicaid publicly noted that efficiency in services provision ensured higher payments in all sectors bar healthcare. In 2006, Mark McClellan, then director of the Centers for Medicare and Medicaid Services, pointed out to The Detroit News that "in health care, you're paid more if there are more complications and you provide more services. If payments drop when you provide better care, it's difficult to convince providers to invest in IT."

## **A Brief Glimpse at the Past**

The Electronic Health Record has its roots in what was previously known as the Computer-based Patient Record (CPR), with an impetus provided for its development by the US Department of Defense and its clinical information management mission for the 21st century (see N. Stammers and A.V. Leaderman, 'The Vision for the Department of Defense's Computer-Based Patient Record', *Military Medicine*, 2000, Vol. 165, No. 3).

Like much else in IT inspired by the US Defense Department (not least the Capability Maturity Model or CMM certification system), quality standards played a key role in the development of CPRs, and a CPR Institute conceived an Award of Excellence for computer-based patient record implementations in the early 1990s, named after Dr. Nicholas Davies (the designate President of the American College of Physicians who was killed in an airplane crash a few days before he took up his post).

The CPR Institute set up a work group to determine evaluation criteria for the assessment of CPRs: management, functionality, technology and impact (rather than the 'value' used in current assessments of healthcare IT systems, when metrics for its assessment are far more mature than a decade ago). In spite of the lack of capacity to quantify financial outcomes, the Davies Program consistently focused on the costs and benefits of CPRs, which could in turn be used as a benchmark for CPR/EHR buyers to anticipate costs and expected returns. These benefits included a reduction in adverse events such as medication errors, enhanced treatment protocols and quality/ continuity of care.

## Key Aspects of RoI in Healthcare IT

While a field like RoI in healthcare IT has drawn a blizzard of academic papers and guidelines, its key elements consist of three: financial, quality of care and business/organizational, much along the lines of the CPR Institute criteria for the Davies Award, with 'quality of care' straddling both 'functionality' and 'technology', and 'business/organizational' corresponding to 'management'. These are described below.

### Financial

Financial RoI in healthcare IT consists of cost savings from decreased staffing and resource requirements. Examples include automated LIMS which reduce the need for data entry personnel, speech recognition devices which eliminate manual transcription, or appointment and treatment scheduling systems which reduce waiting times from order entry to procedure completion and reporting. IT systems which enhance throughputs and achieve scale efficiencies also fall under this heading.

### Quality of Care

Efficiencies in the care pathway range from IT systems which provide higher adherence to clinical protocols, enhance the speed of consultation and decision making, and above all, reduce medical errors. More efficiency in simpler systems, such as call centers and hotlines, can also impact on both quality of care (and thereby on financial RoI). In the US, for example, a government investigation in 2006 found that operators on Medicare hotlines provided accurate information to callers only 40 percent of the time in certain instances.

### Business/Organizational

Across Europe, a growing measure of business/organizational RoI has been length of stay (LoS). This is now routinely monitored by hospital management to identify overall business/organizational efficiency. The LoS indicator also correlates strongly with patient outcomes, with lower lengths of stay and quicker discharges - accompanied by a lower incidence of readmission. In addition, LoS is directly related to bed capacity and utilization rates, and this form of RoI is widely used across a whole range of sectors.

Softer issues such as higher satisfaction on the part of healthcare professionals and patients, reduced waiting times and quicker information are also factored into business/organizational RoI. Indeed, hospitals in some central and eastern European countries have already begun monitoring patient satisfaction via questionnaires, and such a practice – once formalized – will no doubt be brought into the matrix of RoI measurement.

### RoI and Healthcare IT – the Future

In October 2006, the EU's eHealth Impact project was used to demonstrate that selected e-Health projects were already promising 2:1 payback ratios between economic benefits and costs.

In addition to making making RoI calculations, the project team identified some of the key Best Practices in the most effective efforts.

The project focused on the three stages in the lifecycle of e- Health investments – planning and development, implementation, and routine operation. Its team developed a set of tools to collect relevant information on each stage. They found that among other things, successful e-Health projects included all key stakeholders, allowed for changes in workflow and got staff members on board.

In spite of the findings of eHealth Impact, it will be some time before RoI is formalized and used routinely to make healthcare IT investments. The EU project acknowledged that it limited itself to assessing "the cumulative average from ten of the best eHealth implementations we could find." Meanwhile, across the Atlantic, a Congressional Budget Office report in May 2008 found that the ROI of healthcare IT was not "uniformly positive". One of its key conclusions, which will no doubt have relevance here in Europe too, was that the potential of healthcare IT will depend on "how effectively financial incentives can be realigned to encourage the optimal use of the technology's capabilities."

While the former remain competencies of governments and hospital managers, the definition of IT capabilities and the clarification of its optimal use are clearly areas where healthcare IT managers may be advised to already make themselves heard.

Published on : Sat, 3 May 2008