

# Technology and Transformation of Healthcare

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## Economy

Healthcare reform is a perennial crisis in full bloom this year. The primary attention is on how to control escalating costs, eliminate excess and wasted dollars, and address shortcomings in access and equitable coverage. The role that technology can play in reforming healthcare includes discussion of new service paradigms, therapies, drugs, and diagnostics. However, the centerpiece of technology discussion of late has been the adoption of electronic medical records. Unfortunately, this focus has overshadowed the fundamental role that technology can play in not just reforming, but transforming the way that healthcare is delivered. The potential impact of rapidly evolving technologies on healthcare is greater than ever before, and their economic and clinical benefits are profound. Although the final shape of reform remains unclear, hopefully it may very well provide room to support and foster the evolution of healthcare through applied science and technology.

Regardless of the final legislative specifics, once this reform storm has passed, the ongoing transformation of healthcare will accelerate because of fundamental enabling technologies. This wave of change will test the management skills and organizations across the healthcare spectrum – from suppliers to providers, physicians, and payers. Success will depend on savvy technological understanding and leadership from providers – some who may have survived in the past by merely catching the last wave of any given innovation. For device and life science companies and leading edge investors, the rapid change of foundation technologies may shorten the economic lifespan of products and services. Likewise, healthcare service companies will also be increasingly exposed to competitive overthrow of their business model by rapidly evolving technology that will introduce new applications and substitutions. More so than ever, understanding the technology landscape and intelligent decision-making will be crucial to effective management and achieving strategic objectives.

## Enabling Technologies and Healthcare

Core interrelated technologies are advancing at an accelerated pace and are driving the transformation of many areas of society – including healthcare. In “The Singularity is Near,” Ray Kurzweil presents a compelling analysis of the rate of change for key information and communication technologies. Kurzweil develops and supports his hypothesis that for a range of enabling technologies, exponential change will continue and will transform our lives and society in ways and at a rate that are nearly impossible to envision (e.g., consider the world before internet and broadband wireless).

That said, the business of healthcare, by its nature, is conservative. Rooted in the principals of medical training and science, healthcare is designed for evolution rather than revolution. The standards for displacing the status quo in clinical decisions are high compared with most other industries where new technologies may be able to take root and

explode almost overnight [e.g., mp3/iPod or short message service (SMS)]. This characteristic is present in managerial decision-making and organizational design of most healthcare delivery systems as well.

While conservatism will most likely remain a characteristic of healthcare even as it is transformed by technology, healthcare executives must not allow themselves or their teams to rely on this moderating tendency. Competitive positions will be more vulnerable than in the past for suppliers, hospitals, health systems, and physicians.

## Areas to Watch

With regards to healthcare, whether considering information technology, new diagnostic or therapeutic devices, or life sciences innovations, advances depend to some extent on one or more of the following enabling technologies, and leadership of all types of healthcare organizations should track these areas:

- Internet technology
- Wireless communications (coverage, access point, penetration)
- Broadband communications (speed, last mile, cost)
- Computational capability (speed, cost, size)
- Data storage (speed, cost, size)
- Genomics
- Robotics
- Nanotechnology

Advances in each of these core technologies have already had dramatic impact on healthcare –just in the last five years. When considering advances in the future, the tendency is to extrapolate from the most recent experience. In fact, it is likely that the changes that will take place – even in the next five years – will be dramatically greater.

As the enabling technologies continue to advance, applications in healthcare will emerge that will have significant impact on the methods and cost of care. Historical advances in medical devices and pharmaceuticals will continue to provide enhanced substitutions for existing methods, devices, and materials. While the normal clinical testing process may restrain the rate of change, the impact of new technology-based solutions will tend to:

- Push care out of acute, high cost environments
- Substitute tech-based solutions for professional and skilled labor
- Leverage specialized physicians/health professionals across networks

- Promote alternatives to traditional primary care practices
- Compress the drug discovery/clinical trial processes

Technologies that are likely to be in the forefront include:

- Telemedicine/Teleradiology/Telepresence
- Stereotactic radio surgery
- Minimally invasive/robotic surgery
- Biotechnology/Genomics/Personalized medicine
- Advanced diagnostics
- Remote diagnosis/monitoring/therapy
- Wireless healthcare
- Expert systems/Strong artificial intelligence

## Assessing New Technologies

The final healthcare reform legislation may inhibit or encourage specific technology-based changes either clinically or in other areas of healthcare. The rate of adoption for technologies in the short-term is affected by many factors. A framework for assessing adoption drivers as shown in the following table may help leadership visualize the obstacles or focus on the critical success factors relating to the success of new technologies. For a health system or physician group, this assessment should be specific to the organization's mission, objectives, and environment, as opposed to an industry-wide rating. A company selling a technology-based product or service can use this approach both for its broader strategic planning or to support business development and sales by tailoring the assessment accordingly.

## Example: Who is Driving EMR Adoption and Why?

### Key Constituents

Objectives for EMR Adoption	Physicians	Providers	Patients	Payers	Employers	State/ Federal Government
Clinical Improvement	↑	↑	●	↑	⊖	↑
Administrative Ease	⊖	↑↑	↑	↑↑	⊖	↑↑↑
Financial Investment	↓↓	↓↓	⊖	↓	⊖	↑↑↑

#### Key

- ↑ Adoption Driver (↑ = moderate, ↑↑ = strong, ↑↑↑ = intensive)
- ↓ Adoption Resistor (↓ = moderate, ↓↓ = strong, ↓↓↓ = intensive)
- Uncertain or Ambivalent
- ⊖ Neutral

## Implications for Hospitals, Health Systems, and Physician Groups

For hospitals, health systems, and physician groups, it will be more important than ever to stay abreast of new technologies that could play a significant role for the group or institution. Because of the likely emergence of significant new areas such as personalized medicine and remote services, opportunities will exist for the nimble organization to establish new leadership positions and extend its geographic reach in ways that could lead to meaningful gains in branding, market share, and strategic and financial strength.

As these groups look to new technologies, key questions to answer are:

- Is leadership assessing new technologies in the context of the organization's mission and objectives?
- How rigorous is this assessment? How frequent? Who is involved?
- What is the process for deciding when to adopt a new technology?

- Is there the capability in-house to evaluate competitive offerings?
- Should partners be used to mitigate the risks and enhance the likelihood of success? If so, what structure is best?
- Will early adoption lead to strong positive cash flow as a result of favorable early reimbursement? Or is low demand and initial reimbursement a real risk?

## Implications for Suppliers and Investors

For companies introducing breakthrough innovations in devices, drugs, biotech, services, or information technology, the market openness may be substantially influenced by the results of the current reform. Be prepared to find innovative ways to adapt strategy accordingly. Financial strength is likely to be of paramount importance to establishing or maintaining strategic leadership. Finally, the road to success will be wide open for clinical, business, or administrative solutions that lead to lower costs while preserving or improving quality.

Successful innovators are tirelessly optimistic and persistent about their ventures, whether these are emerging from a large corporate effort or a small, venture-backed entrepreneurial team. However, in this time of evolving technologies, it is very important to step back periodically and objectively assess:

- How will the organization protect itself from being leapfrogged after pioneering a new application or market?
- What is the best go-to-market strategy?
- How will new trends in payment such as accountable care organizations impact the organization's value proposition?
- Who are the influencers and decision-makers for the product or service? Have they changed as a result of current trends and new regulations?
- Are adequate financial resources in place?
- Are the right partners available and interested in rapid growth?
- Where are the gaps in the leadership team, and how will they be filled when needed?

When deciding to back scale-up or roll-up companies, private equity investors should be particularly careful and have fully vetted the risks of the business model being adversely impacted by rapidly evolving core technologies. In the right financial environment, it may be possible to get in and get out of an investment before a dramatic turn, but keep in mind that, particularly with services, the adoption cycle may be much shorter, leading to more competitive risk.

## Implications for Payers and Health Plans

Healthcare information technology will remain an important focus because of its role in controlling costs and identifying waste and overutilization. However, healthcare IT is particularly exposed to the rapid changes occurring in the cost and capability of computing, storage and communication systems. In some ways, computing technology has come full circle from mainframes with timeshared access to distributed processing through minicomputers and even PC networks and is now heading back to cloud computing and software as a service (SaaS). As a payer, questions to consider are:

- How can healthcare IT be used to lead and work with providers to reduce administrative costs while improving the effectiveness of all organizations involved in the healthcare cycle?
- In assessing new clinical technologies and pharmaceuticals, what are the benefits of being at the forefront of supporting innovations or just the costs?
- How involved and supportive is the company in the emergence of genomics and personalized medicine?
- Are reimbursement policies and processes inhibiting the adoption of new technologies that ultimately can reduce costs? Is the company willing to look at new technologies from a longer term, integrated perspective?

## Summary

Society and culture have changed dramatically over the last 30 years. Much of this change has been driven by technology. Healthcare has been transformed with innovations that save and extend lives, improve the quality of life, and enable what would have been considered near miracles only a half century ago. While the future remains unknown, it is certain that the continuing impact of technology on transforming healthcare will be significant.

For more insight on how your organization may capitalize on accelerating technologies, please contact Ron Van Horssen at 310.320.3990 or [rvanhorssen@thecamdengroup.com](mailto:rvanhorssen@thecamdengroup.com)