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Benefits of IT Investments in U.S. Hospitals

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Hospitals seeking rapid returns on their information technology (IT) investments need to bear in mind an ancient Chinese proverb: "With time and patience, the mulberry leaf becomes a silk gown."

In both the U.S. and Europe, governments and other agencies have adopted policy stances that reflect the belief that quality of care may be improved, and cost of care reduced, through wider use of electronic health records. While the evidentiary basis for this policy stance is suggestive, it remains surprisingly weak, providing little support for cost/benefit decisions necessary for acquisition of healthcare information systems.

To contribute to this debate, a team of researchers from the Wharton School of the University of Pennsylvania and PricewaterhouseCoopers LLP conducted a study to quantify the benefits of IT investments in U.S. hospitals. We found that the benefits of IT are indeed real, but can be slow in coming. Moreover, technology sometimes results in higher operating costs before reaching a tipping point at which savings from performance improvements begin to accrue. Until then, hospital administrators need to remember that time and patience are as essential for technology investments as they are for the silkworm's time-consuming production of silk.

Finding a way to measure technology-driven improvements The need for patience with IT investments may run counter to hopes that such spending will result in significant and rapid payback. This sometimes has been true for industries such as financial services and retail, which have broadly deployed IT and generated productivity increases amounting to as much as five times the original investment. However, the results of our study, which evaluated performance data collected from nearly 2,000 U.S. hospitals, indicates that healthcare in fact may be different.

The problem that observers face, both in generating improvements and in quantifying their value, is the complexity of healthcare and the resulting difficulty in disentangling the contribution of technology from all the other factors that affect performance such as case mix, bed size, or ownership structure ('for profit' versus 'not-for-profit').

The Quantitative Benefits are Real – But May Come Slowly

We found that more than 60 percent of the U.S. hospitals in the study group have made IT investments large enough to begin seeing an impact on their operating costs.

Overall, hospitals that have made high levels of IT investments as measured by the IT Capital Index perform at superior levels of efficiency than hospitals with lower levels of technology deployment. This is consistent with the belief that technology investments can generate efficiencies that yield real cost reductions.

However, a corollary finding was that the hospitals with the lowest levels of investment in IT have lower overall operating costs than hospitals with moderate levels of IT investment. Many hospitals that have made moderate investments are seeing returns that are lower than anticipated.

One explanation may be that hospitals see increased operating expenses as they implement new technologies – not only capital costs but also for other project costs such as training, conversion and process redesign, which may continue for a long period after the initial investment. Eventually, these hospitals reach a tipping point at which the productivity and efficiency improvements are large enough to outweigh their costs.

Additionally, changes in hospital operations during the period of implementation may have a significant - and hopefully temporary - impact on overall performance. Until such impacts have been played out, the cost-effectiveness of such hospitals may lag that of those hospitals that have made little or no investments in technology.

As hospitals improve their IT Capital Index ranking, their costs eventually level off. This suggests that IT investments pay for themselves at some point by displacing costs elsewhere in the organisation. In addition, there is evidence that such organisations also provide higher quality of care.

Finally, as hospitals move up the scale of the IT Capital Index, their investments result in cost reductions as they improve their ability to leverage the technology in their operations.

A likely lesson is that hospitals cannot expect significant increases in value from technology investments alone. It appears they also must make clinical and operational process changes that leverage the technology. By redesigning clinical and business processes, hospitals can increase efficiency and reduce redundancy, errors, paperwork and manual administrative processes that increase costs. The difficulty of making such changes in an organisation as complex as a hospital may help account for the apparently lower levels of reported impact of IT in healthcare compared to other industries.

Our “tipping point” finding also is consistent with the concept of complementarities, in which the interconnected nature of hospital processes means that incremental technology investments not only benefit targeted processes but also enhance the value of other technology investments. Complementarities between different IT applications, as well as complementarities between technology investments, and process and staffing changes, have been shown to be important in realising value from IT in many industries outside healthcare.

Quality Improvements can Build Support for IT Investment

While our analysis focused primarily on quantitative measures of financial performance and cost efficiency, it also examined quality, specifically through a single metric: hospital mortality rates adjusted for risk, case mix and state averages. This evaluation identified a statistically significant correlation between technology investment and mortality rates, with noteworthy differences between hospitals at the low end of the IT Capital Index versus those at the high end. While mortality rates alone are not a good measure of quality of care, this finding implies that hospitals deploying IT may be able to improve care and reduce mortality rates without producing a parallel increase in operating costs.

If hospitals can improve quality outcomes without increasing costs, that by itself may serve as ample justification for investing in IT. Applying econometric models to quality metrics using other relevant measures of clinical quality can provide a clearer understanding of the indirect benefits of technology investment.

How Administrators can Make the Case for IT Investment

While some observers have asserted that healthcare lags behind other industries in technology deployment because of a lack of investment, this is not necessarily the case. Indeed, our data suggest that the typical hospital has deployed most of the basic administrative and clinical applications available. Investments are being made, but too often their immediate impact is oversold, especially without concurrent changes in operations.

Moreover, concern over the relatively disappointing results to date can be exacerbated by inappropriate comparisons with other industries. Because of the crucial role of quality in healthcare, the value of technology improvements cannot be based on cost reduction alone but must reflect less easily quantified improvements in clinical care.

Some hospital administrators are increasingly skeptical whether the investment in new technology, including training and conversion costs, can be justified. The answer is a qualified yes. Administrators must take a comprehensive approach to technology investment, simultaneously making operational changes that leverage the technology and also taking a holistic view that reflects clinical quality.

The benefits of technology investment cannot always be realized immediately. Hospital administrators need to plan carefully, take a comprehensive view that incorporates quality, implement related process changes and not oversell the short-term benefits of their investments.

In Europe, hospitals may work more with public healthcare administrators to promote investment and standardisation in IT, through both national and pan-European organizations. Those hospitals which take a measured approach are more likely to generate support from stakeholders and see genuine returns on their investments.

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