Chapter XII

Toy or Useful Technology?
Diffusing Telemedicine in Three Boston Hospitals

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EXECUTIVE SUMMARY

In response to increasing competition and cost pressures from managed-care practices, healthcare organizations are turning to information technology (IT) to increase efficiency of their operations and reach out to new patient markets. One promising IT application, telemedicine, enables remote delivery of medical services. Potentially, telemedicine could reduce costs and increase the quality and accessibility of medical services. However, the diffusion of telemedicine has remained low. We present case studies of telemedicine programs at three healthcare institutions in Boston, Massachusetts to better understand why telemedicine has not spread as quickly or as far as one would expect, given its promise. These case studies describe the environmental and organizational context of telemedicine applications, their champions, strategies and learning activities. Since the three cases represent varying levels of diffusion of telemedicine, they enable the reader to understand how and why some institutions, champions and approaches are more successful than others in diffusing a new technology like telemedicine.

BACKGROUND

Boston, Massachusetts is a city that hosts world-renowned medical schools such as Harvard, Boston University, and Tufts and 25 high-tech, specialty-care hospitals. While noted for their world-class medical expertise, Boston hospitals have also been notorious for oversupply of beds, high costs, and high-use rates. In the 1990s, cost pressures on Boston hospitals increased as many health plans instituted more stringent managed-care tactics and the selection of hospitals for patients. The hospitals responded by entering into merger and acquisition agreements to achieve economies of scale and increase their negotiating power (Katz, 1996). These agreements created integrated healthcare networks (IHCN) spanning the continuum of care from primary care practices to community and teaching hospitals. The challenge for IHCNs is to compete on cost and quality of care by consolidating resources and leveraging expertise within their networks.

One promising approach to these challenges is telemedicine. Broadly defined as the use of IT to deliver medical services at a distance (OTA, 1995), telemedicine is proposed as a solution to problems of accessibility, quality, and costs of medical care (Bashshur, Sanders, & Shannon, 1997). Telemedicine can increase access to care by eliminating distance barriers between patients and caregivers. It can improve quality by enabling medical experts to collaborate on complex clinical problems when patients' disorders cannot be diagnosed or treated at referring sites. It can also reduce costs by enabling in-home monitoring of patients and by eliminating the need for on-call expertise, maintenance of expensive facilities, and transportation of physicians to patients or vice-versa.

Telemedicine systems are based on two types of technologies: (1) "Store and forward" telemedicine uses image capture, storage, and transmission technologies to enable asynchronous exchange of images (e.g., for radiology, dermatology, or pathology images); and (2) "real-time" telemedicine uses videoconferencing technologies to enable synchronous interactions between referring physicians, patients, and consulting physicians (e.g., in psychiatric or rare tumor consults).

Although telemedicine applications have proliferated in recent years (Grigsby & Allen, 1997), the volume of actual telemedicine consultations has remained low (Hassol, 1996). One of the challenges is to develop sustainable business models (i.e., finance systems which demonstrate the attainment and maintenance of profitability over time) for telemedicine applications. Capitated and fee-for-service payment systems are the traditional business models in healthcare. In the capitated payment system, physicians and hospitals agree to accept a set advance payment in exchange for providing healthcare services for a group of people, usually for a year. In the fee-for-service model, they receive a fee for each service they provide. Business models for telemedicine must balance the often conflicting demands of numerous stakeholders. Medical institutions, wishing to reach out to new patient markets, can invest in the development and support of telemedicine applications, but they cannot achieve profitability until physicians use them consistently and frequently. Physicians are primarily interested in models that guarantee their reimbursement for telemedicine consultations (Fendrick & Schwartz, 1994). Medical insurers, on the other hand, will only reimburse consultations once cost-effectiveness has been proven. And regulatory agencies will only certify a telemedicine application once it has been proven that it does not degrade the quality of medical diagnoses.

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