Case Studies of Implementation of Interactive E-Health Tools on Hospital Web Sites

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ABSTRACT

Using content analysis and in-depth interviews, this research has examined three best-practice hospitals in terms of their approaches to implementing interactive e-health tools on their Web sites. The study has demonstrated hospital administrations’ visions of and insights into developing e-health. It concludes that the implementation of interactive e-health tools can be area- and hospital-size-indiscriminative; such implementation accomplishes multiple goals, including service, communication, and education, and serves as an important differentiator in a competitive industry; by understanding the best practice, decision-making, planning processes, and outcomes of implementing e-health online, as well as potential obstacles to such implementation, hospitals can take the lessons learned and design effective interactive e-health tools on their Web sites.

Keywords: healthcare new media marketing, healthcare IT, e-health, hospital Web sites, interactive.

INTRODUCTION AND BACKGROUND

Over the past decade or so, thousands of U.S. hospitals shifted some of their business online (Huang, 2009; Huang & Chang, 2012; Shepherd, 2003). This shift is part of the trend called e-health, which is defined as “the combined use of electronic information and communication technology in the health sector for clinical, educational, research, and...”

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administrative purposes, both at the local site and across wide geographic regions” (Mukherjee & McGinnis, 2007). Many hospitals have conducted business online via interactive e-health tools, such as finding a physician, paying bills, using an interactive map, and accessing medical records online. Interactive e-health tool in this study is defined as an online mechanism that initiates an online transaction between a hospital and a user.

While it is common for hospitals to have their own Web sites and incorporate some interactive e-health tools, it is not clear what interactive features and functions are considered to be most helpful from the perspective of the users/patients. In addition, there is scarce research available regarding how hospitals make decisions about providing interactive e-health tools on their Web sites. Huang and Chang (2012) found that most hospitals were still on the level of implementing traditional functional tools on their Web sites, such as online search, interactive maps, and finding a doctor (each tool having a national adoption rate above 55%), whereas online core e-business tools, such as pre-registration (national adoption rate at 19.4%), making a doctor’s appointment (15.3%), accessing medical records and lab results (10.1%), and requesting for prescription refills (9.7%), were hardly available; the only e-business tool that was popularly implemented was paying bills online (40.2%). In the meantime, there appears to be a gap between what interactive e-health tools users/patients desire to see on hospital Web sites and what is really offered by hospitals. For example, 84% of the users express a strong wish to access to their medical records online, but only 10% of the U.S. hospitals are currently providing such a service (Huang, Chang, & Khurana, 2012). In addition, among all the interactive tools on hospital Web sites, users are least interested (10%) in socializing with hospitals even though 36% of the U.S. hospitals have actively tried to connect to their users on social media (Ibid.).

Research in the area of interactive e-health tools on hospital Web sites has been emerging. The purpose of this study is to investigate three best-practice cases of hospitals to understand the determinants and outcomes of successful implementation of patient-oriented interactive e-health tools on their Web sites. Specific research questions include:

1. How have these best-practice hospitals performed e-health on their Web sites?
2. What factors have driven their e-health development?
3. What barriers have they encountered while implementing e-health online?
4. What are the outcomes of and future plans for their e-health implementation?

Answers to these questions will provide insights to many hospitals interested in taking advantage of interactive e-health tools on their Web sites to serve their patients. By applying the findings from this study, hospitals will be able to adopt best-practice ideas, drive their e-health development efforts, foresee possible barriers and solutions, and evaluate the outcomes of their e-health implementation. This study will contribute to the literature of e-health by deepening our understanding of its current practice and providing practical implications.
As a matter of fact, the U.S. healthcare industry has been (in)famous for lagging behind other industries in adopting new information technology (Gallant, Irizarry, & Kreps, 2006). Gartner Inc., a New York-based research and consulting firm, found in a study that less than 1% of hospitals were aggressive about finding and implementing new technologies, and the vast majority of hospitals (84%) were risk-averse and would use only the technologies that have been on the market and that have a solid, proven track record (Gillespie, 2001). It is likely that pioneers, that 1% among the hospitals, have led the progress of information technology and e-health implementation for the entire healthcare industry (Ibid.). It is, therefore, instructive to conduct case studies of best-practice hospitals to demonstrate the industry’s best practice and shed light on their planning and decision-making processes and consequences of implementing e-health online.

In their study investigating hospital adoption of information technology, Burke et al. (2002) found that the average hospitals had adopted 57% of the total available IT applications (from a minimum of 8% to a maximum of 90%). Huang and Chang (2012) found that individual hospitals in the United States adopted, on average, 5–6 of the 21 identified interactive e-health tools on their Web sites. Therefore, there remains room for further adoption of interactive tools that are helpful to hospital Web site users.

The benefits of implementing e-health can be illustrated by the adoption of an electronic medical records (EMR) system. Every hospital has hundreds of forms to process on a routine basis. One of the main efforts of e-health in recent years has been to turn all major paper forms into EMR (Mukherjee & McGinnis, 2007). From the healthcare administration’s perspective, EMR can enable physicians to improve their quality of patient care, reduce the number of medical errors, and eventually save healthcare cost (Ibid.). For instance, Sentara Healthcare, a Norfolk, Va.-based, six-hospital delivery system, processes 1.3 million administrative forms in its hospitals per year. Fifteen different paper forms are used for different transactions, such as a change of address or purchasing requests. By automating the processing of those forms, Sentara Healthcare can potentially reduce costs by $3.4 million per year, said Bert Reese, vice president and CIO of the healthcare system (Gillespie, 2001). For Reese, the foundation of all Web portal strategies should be to either increase revenue or decrease costs. If portals don’t do either, then they’re just vanity pages, he affirms (Ibid.).

From the users’ perspective, EMR can bring great convenience and empowerment. For instance, filling out an online pre-registration form or checking out ER Wait Times online can greatly reduce the time a patient has to spend in a hospital/clinic before treatment. A patient can access his or her medical records and lab results online 24/7 without having to nag a doctor or nurse to mail them, make a doctor’s appointment easily online without being constantly routed by a robot phone system, or request for prescription refills with just a few mouse clicks (Mukherjee & McGinnis, 2007; Varshney, 2009).

Unfortunately, many hospitals have not taken advantage of these useful interactive tools that can facilitate their business online and achieve diverse goals, including saving
costs, reducing errors, improving transparency, increasing operational efficiency and patient-friendliness, and effectively marketing a hospital. In this article, the case studies of three best-practice hospitals, each of which has been aggressively implementing e-health on their Web sites, can help other hospitals better understand the what, how, and why of using interactive e-health tools.

**METHODOLOGY**

Case studies have been widely used as a research approach in government, military, information technology, law, businesses, education, and so on. Through comparisons of some chosen cases, themes can surface. Using more than one research method, a case study involves a holistic and in-depth investigation (Feagin, Orum, & Sjoberg, 1991). Common methods in a case study are in-depth interviews, surveys, focus groups, and content analysis. The triangulation of findings from different methods provides a systematic way to find out “What’s going on here” in each case’s real-world context and to ensure construct validity (Wimmer & Dominick, 2005, p. 129; Yin, 1994). This study has adopted both content analysis and in-depth interviews as research methods.

A case study often contains one or a few cases. Using “small sample” to discount a case study misses the point (Tellis, 1997). Although case studies generally do not require a random sample, uncovering best-practice hospitals, which can serve as models for others, demands a thorough investigation of the hospitals in the nation. Therefore, starting with a representative sample of 765 hospitals—roughly 12% of the hospitals in the nation, the authors of this study examined the presence of 21 interactive e-health tools on their Web sites and came up with a short list of 25 hospitals of different sizes (number of beds) and locations (urban verses rural) that had the most of these tools. Contact of these 25 hospitals for voluntary participation yielded the following three participating hospitals based on their representativeness in size, geographic location, and autonomy in Web marketing development:

- Eastern Idaho Regional Medical Center (http://www.eirmc.com), affiliated with Hospital Corporation of America (HCA, Inc.),
- Sycamore Shoals Hospital (http://www.msha.com), affiliated with Mountain States Health Alliance, and
- Sharp Grossmont Hospital (http://www.sharp.com/grossmont/about-us.cfm), affiliated with Sharp Healthcare.

Table 1 has presented an overview of these three hospitals.

HCA is one of the biggest healthcare systems in the United States, containing 40,500 beds across 20 states. The Web sites of the hospitals affiliated to HCA, Inc.

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2. Two studies based on the sample have been published in other venues.
Table 1. Facts regarding the three hospitals studied

<table>
<thead>
<tr>
<th></th>
<th>Eastern Idaho Regional Medical Center</th>
<th>Sycamore Shoals Hospital</th>
<th>Sharp Grossmont Hospital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web design autonomy</td>
<td>Independent</td>
<td>Relying on parent system</td>
<td>Relying on parent system</td>
</tr>
<tr>
<td>Number of beds in hospital</td>
<td>331</td>
<td>115</td>
<td>536</td>
</tr>
<tr>
<td>Parent system</td>
<td>Hospital Corporation of America (HCA)</td>
<td>Mountain States Health Alliance (MSHA)</td>
<td>Sharp Healthcare</td>
</tr>
<tr>
<td>Number of beds in parent system</td>
<td>40500</td>
<td>1500</td>
<td>1870</td>
</tr>
<tr>
<td>Location</td>
<td>Idaho Fall, ID</td>
<td>Elizabethtown, TN</td>
<td>San Diego, CA</td>
</tr>
</tbody>
</table>


featured drastically different looks, each having its unique domain name. In other words, Eastern Idaho Regional Medical Center (331 beds) and other HCA-affiliated hospitals enjoyed high autonomy in designing their own Web sites. In contrast, Sycamore Shoals Hospital (115 beds) is much smaller than Eastern Idaho Regional Medical Center, but its Web marketing depended entirely on its parent system—Mountain States Health Alliance. The hospital’s Web site was under the domain name of Mountain States Health Alliance—msha.com—and hardly had its own identity. Similarly, Sharp Grossmont Hospital, like other Sharp Healthcare-affiliated hospitals, was under the sharp.com domain. Therefore, in the next section, the analysis of Eastern Idaho Regional Medical Center will pertain to the hospital itself while the analyses of the other two hospitals will pertain to their parent systems because of the latter’s high conformity to the system-wide online marketing and branding strategy.

Content analysis on the above hospitals’ Web sites was conducted by two coders in late 2011 to early 2012. The intercoder reliability, using Scott’s Pi, reached an average of .93 for all variables (see the next section for results).

Each hospital went through two rounds of interviews. The first round was a standardized interview with nine questions. Based on the interview results and the content analysis of interactive e-health tools on the hospital’s Web site, each hospital then responded to customized questions in the second round of interview.

**FINDINGS**

Basic facts regarding the implementation of interactive e-health tools on each hospital’s Web site are described below and listed in Table 2 for easy comparison.
Table 2. How the three best-practice hospitals have implemented patient-oriented interactive tools on their Web sites

<table>
<thead>
<tr>
<th>Interactive tools</th>
<th>Eastern Idaho Regional Medical Center</th>
<th>Mountain States Health Alliance</th>
<th>Sharp Health-care</th>
<th>Nationally adopted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traditional functional tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online search</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>66.6%</td>
</tr>
<tr>
<td>Interactive map</td>
<td>X</td>
<td></td>
<td>X</td>
<td>60.8%</td>
</tr>
<tr>
<td>Finding a physician</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>56.7%</td>
</tr>
<tr>
<td>Contact us</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>46.1%</td>
</tr>
<tr>
<td>Interactive calendar or event finder</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>42.8%</td>
</tr>
<tr>
<td>Virtual tour</td>
<td>X</td>
<td></td>
<td>X</td>
<td>8.6%</td>
</tr>
<tr>
<td>Core e-business tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paying bills online</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>40.2%</td>
</tr>
<tr>
<td>(Pre)registration online</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>19.4%</td>
</tr>
<tr>
<td>Making a doctor’s appointment or communicating with a doctor online</td>
<td></td>
<td></td>
<td></td>
<td>15.3%</td>
</tr>
<tr>
<td>Accessing medical records and lab results</td>
<td>X</td>
<td></td>
<td></td>
<td>10.1%</td>
</tr>
<tr>
<td>Refilling prescriptions online</td>
<td></td>
<td></td>
<td></td>
<td>9.7%</td>
</tr>
<tr>
<td>Patient support tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive patient education or health risk assessment</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>47.0%</td>
</tr>
<tr>
<td>Patient caring and support through CarePages, blog, or chat room</td>
<td>X</td>
<td></td>
<td>X</td>
<td>16.2%</td>
</tr>
<tr>
<td>Visitor-related tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-card or email for a patient</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>28.2%</td>
</tr>
<tr>
<td>Online nursery for viewing/purchasing baby photos</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>27.7%</td>
</tr>
<tr>
<td>Online flower/gift shop</td>
<td>X</td>
<td></td>
<td>X</td>
<td>9.3%</td>
</tr>
<tr>
<td>Public relations tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Presence on social media, such as Facebook, Twitter, and YouTube</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>35.7%</td>
</tr>
<tr>
<td>Online caregiver recognition</td>
<td>X</td>
<td></td>
<td>X</td>
<td>3.9%</td>
</tr>
<tr>
<td>Emerging functional tools</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER wait times</td>
<td>X</td>
<td></td>
<td>X</td>
<td>5.6%</td>
</tr>
<tr>
<td>Interactive cost estimator</td>
<td></td>
<td></td>
<td></td>
<td>3.5%</td>
</tr>
<tr>
<td>Site or application for mobile devices</td>
<td></td>
<td></td>
<td></td>
<td>2.0%</td>
</tr>
<tr>
<td>Total number of tools</td>
<td>15</td>
<td>14</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Interface</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online service menu*</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>11.0%</td>
</tr>
<tr>
<td>Secure and personalized account*</td>
<td></td>
<td></td>
<td></td>
<td>10.7%</td>
</tr>
</tbody>
</table>

Note. The list of the 21 interactive e-health tools and the numbers in the National Adopted column are from Huang and Chang (2012). Percentage calculations are based on 712 sampled hospitals that had a Web presence. * These are interface designs that promote some of the interactive tools.
Eastern Idaho Regional Medical Center (EIRMC), as the largest medical facility in the region, is a modern 331-bed full-service hospital, located in Idaho Falls, Idaho. EIRMC serves as the region’s healthcare hub, offering specialty services including cardiovascular surgery, cutting-edge cancer treatment, trauma, neurosurgery, intensive care for adults and infants, and a helicopter and ground medical rescue service. EIRMC had 15 of the 21 identified types of interactive e-health tools. In addition, it had an Online Tools menu that featured many of these tools. It did have ER Wait Times tool, but it was informational only and did not allow a user to “Hold My Place in Line.”

Mountain States Health Alliance (MSHA) is a large regional healthcare system with 1,500 beds in 13 hospitals operating at approximately $1.0 billion in net revenues. MSHA provides an integrated, comprehensive continuum of care to people in 29 counties in Tennessee, Virginia, Kentucky, and North Carolina. Four Mountain States Health Alliance (MSHA) hospitals were recognized by U.S. News and World Report as the Best Hospitals in 2011. In addition to its hospitals, MSHA’s integrated healthcare delivery system includes 21 primary/preventive care centers and numerous outpatient care sites. MSHA had 14 out of the 21 e-health online tools. In addition, MSHA had an Online Tools menu for convenient access to its online services. It did have an online patient records system, but they were only accessible to physicians.

Sharp Healthcare (Sharp) has approximately 2,600 physicians on medical staffs and more than 1,000 physicians in affiliated medical groups in 57 medical facilities with a total of 1,870 beds throughout California, mostly in metropolitan areas. It has $1.2 billion in assets and $1.7 billion in revenue. Sharp has been named one of the nation’s “Most Wired” healthcare systems by Hospitals & Health Networks magazine for 11 consecutive years. The results of the content analysis from this study show that Sharp is a national leader in implementing interactive e-health tools. Sharp had 18 e-health online tools. In addition, it had both a dedicated and secure patient portal and an online tools menu. The patient portal, mySharp, allowed a patient to send secure messages to a physician’s office, schedule appointments, review selected lab results, review patient health profile, request prescription refills, and pay bills online. A secure and personalized patient portal is a feature that is available only among less than 11% of the hospitals in the nation (Huang and Chang, 2012).

The interviews with these three healthcare systems yielded many comparable results. Therefore, instead of reporting the results case by case, as traditional case studies

3. Such public information can be verified at www.eirmc.com.
4. This is a feature that some hospitals have begun to use. See an example at St. Anthony Hospital’s Web site at https://inquicker.com/facility/st-anthony-hospital?
5. http://www.msha.com/body03.cfm?id=43
usually do, the authors of this study have elected to combine similar results and contrast the differences among the hospitals as follows.

**The meaning and practice of e-health**

All three hospitals used electronic tools, including e-mail, Web site, and social media, to connect themselves with patients/users. These hospitals recognized e-health as a competitive differentiator for swaying consumer preference. Based on the interviewers, the primary goals for their e-health efforts were as follows:

1. Establishing relationships and communication between the hospital and the patient (e.g., “… the overall intent is to provide online tools, resources, services, and interaction that…create relationships with patients, prospective patients, physicians, community.”—MSHA),
2. Educating and empowering the user (e.g., “At Sharp we look at e-health as the electronic connection between the health system and the patient so the patient is directly involved in managing his/her own health.” “Since statistics bear out that most people first hit the Web when seeking medical information, we hope they reference our several Medical Libraries.”),
3. Delivering and enhancing healthcare procedures (e.g., “On mySharp they can schedule appointments; review selected lab results; pay bills; send secure messages to their physician’s office; review their health profile; request prescription refills.”), and
4. Increasing overall satisfaction and market share (e.g., “Our ultimate goals...are to increase awareness, preference, utilization and market share for EIRMC services among consumers.”).

**Decision-making for e-health implementation on hospital Web sites**

All three hospitals had taken both top-down and bottom-up decision-making approaches when implementing e-health tools on their Web sites. In EIRMC’s case, the architecture and functionality of such tools as “find a physician,” “health library,” “online pre-registration,” and “online bill pay,” were provided by the corporate. On the other hand, “virtual tours,” “thank an employee,” “email a patient,” linking to social media, and many other features were developed by the hospital. At MSHA, while some initiatives had come from the executive team, their e-health efforts primarily stemmed from various departments, specifically its Communications and Marketing Department (on the corporate level). Sharp’s Web strategy team in marketing examined the idea of a patient portal in 2000. It took eight years of discussions and lobbying before medical group and system leadership began to make commitments. In 2007, the CIO and the CEO of Sharp Rees-Stealy, one of the Sharp medical groups, approved the initiative and put the structure in place for
multi-disciplinary teams to begin designing and implementing the patient portal, mySharp, based on customer research (What did our patients want?) and feasibility analyses (What could we implement? What data could we access? What workflows could be moved online?). “We used a Six Sigma Black Belt to facilitate the process and help the teams prioritize the development,” said John Cihomsky, Vice President of Public Relations & Communications at Sharp.

**Barriers to implementing e-health on hospital Web sites**

Resource shortage, lack of medical practice standardization, and insufficient infrastructure were cited as major problems for all three hospitals when they implemented e-health. EIRMC was highly self-driven in creating its own Web marketing development strategies; however, the pace at which EIRMC could implement facility-originated ideas was constrained by the fact that scarce resources had to be shared among many HCA hospitals. MSHA had a two-person communications team responsible for a healthcare system that consisted of thirteen facilities. At Sharp, the physician practices encountered the challenge of standardization across organizations, which was required for implementing online tools. All three hospitals raised the issue of insufficient infrastructure since data or content sources, as well as backend systems automated with electronic medical or health records, had to exist in order to make e-health feasible. Limitations and poor integration of the information system (e.g. policy restrictions that prevented team members from participating in social media during work hours) (MSHA) and encryption functionality on the main Web site (EIRMC) were also acknowledged as barriers to interacting with users online.

**Outcomes of implementing e-health on hospital Web sites**

All three hospitals used some form of analytics to document the outcomes of implementing e-health on their Web sites. EIRMC’s data showed that “find a physician,” “online bill pay,” “online search,” and “contact us” were among the most-used interactive tools for patients on its Web site. MSHA indicated (1) that over 1,400 visitors visited its women’s services page each month (more than half of them looked at photos in the online nursery), (2) that there were over 900 downloads in the previous month for their smartphone application, and (3) that other popular features included health risk assessment tool and ER wait times. As for Sharp, there were nearly 60,000 patients with mySharp accounts at Sharp Rees-Stealy, one of the affiliated medical groups. The hospital was seeing an average of 0.9 logins per user per month; the most popular tools were the access to lab results and secure emailing with physicians via mySharp. The data also showed female mySharp users were the majority (63%); the 35–49 age group was the largest segment, followed by the 50–64 and 18–34 segments.
Less clear are the business implications of e-health implementation. Cindy Smith-Putnam, Executive Director of Business Development, Marketing & Community Relations at EIRMC mentioned: “It is difficult, if not impossible, to isolate the ‘cause’ and ‘effect’ revenue value of e-health strategies from all other growth strategies.” None of the healthcare systems had hard data to support a business case for e-health implementation. John Cihomsky at Sharp mentioned anecdotal evidence and survey results to suggest that patients “have selected Sharp Rees-Stealy or have selected to stay with Sharp Rees-Stealy because of their experience with mySharp.” He also suggested that savings to the organization could be measured; that is, online tools that help patients make bill payments, schedule appointments, access lab results, and communicate with staff ultimately reduce unnecessary calls to the call center or physicians’ offices.

**Closing the gap: using core e-business tools, including providing a patient portal**

Huang, Chang, & Khurana, (2012) found that hospital Web site users highly desire core e-business tools, especially access to medical records and lab results; however, hospitals’ e-health implementation on their Web sites has greatly lagged behind the users’ needs. While EIRMC and MSHA provided only the interactive features of paying bills and (pre)registration on their Web sites, Sharp had already implemented a secure and personalized system, mySharp, in which patients could use all the core business tools listed in Table 2 and more. John Cihomsky from Sharp emphasized the competitive advantage gained from implementing core e-business tools. He said, “We felt it was a strategic priority because our patients were requesting these tools…. If we are to compete in a world that is increasingly driven by consumerism, we needed to put these tools in place.” MSHA already had an online patient medical record system, but it was open only to physicians. MSHA was evaluating the possibility of integrating its information systems so as to deploy a robust EMR system with patient access sometime within the next two years. Shane O’Hare, Communications & Marketing Corporate Director at MSHA, said:

Ultimately, the Electronic Medical Record and personal portal will allow us to give patients access to their information (also in a secure setting), and combine that information to reduce human error, duplication of diagnostics and create a valuable history of patient information for solid decision-making (this initiative is well underway and would address all of the pillars of excellence).

Cindy Smith-Putnam from EIRMC said,

…all our hospitals will move in the direction of a secure Patient Portal for all purposes, but many interim steps need to occur first, and it is unlikely the
Portal concept will be realized in the near future.” “We are not Mayo, and we were arguably slow to retool our Website to be more than a glorified brochure.”

Emerging trends: social media, ER wait times, mobile phone applications

All three hospitals had a presence on social media (i.e. YouTube, Twitter, and Facebook). Sharp’s John Cihomsky commented, “For us, participating in this space is a must-have. When our customers are on the social media sites talking about us and trying to talk to us, we have to be there.” MSHA illustrated how a hospital may use these social media platforms, “YouTube as a resource to our creative team, Twitter to speak to our friends in the media, and Facebook as a tool to communicate with and engage our community.” MSHA shared its NurseLink tip of the day on Facebook to ensure a daily presence. In addition, recognizing social media as an interactive relationship-building tool, EIRMC had two Facebook pages that specifically connected with two respective groups of potential patients—women of child-bearing age and people who may be bariatric surgery candidates—with success in terms of the total number of Facebook fans and daily gross impressions of posts. This targeted use of Facebook was considered by EIRMC as a better way of connecting with prospective patients.

While Sharp was considering adopting the tool of interactive ER wait times, EIRMC and MSHA already had an information-only ER wait times feature on their respective Web sites. The latter hospitals’ ER wait times feature was not interactive9 because the hospitals were not keen on the “hold my place in line” concept. The reasons given by both hospitals were that this practice would run counter to the concept of emergency care, which should be based on acuity, not arrival time, and that this practice could create unmet expectations and possible legal complexity.

MSHA was the only hospital among the three that had a mobile phone application, whereby users could check ER wait times to pick the most appropriate ER, use a symptom navigator, gather information on their physicians, and get driving directions. Sharp was in the final stages of developing an iPhone application and would also add a mobile site and/or Android apps in the future.

Plans for future implementation of e-health

Responses to the question concerning future plans of e-health implementation varied across the three hospitals, depending on their specific situations. EIRMC would focus on implementing full-blown e-commerce capabilities, which will include pre-registration,

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9. Some hospitals in the nation have already adopted an interactive ER Wait Times model on InQuicker.com.
online payment, making appointments online in outpatient services, and making encrypted medical records accessible online. While Sharp was adding discharge instructions for hospital patients and visit summaries for ambulatory patients at the time of interview, it would, in future years, “provide tools for patients to submit forms, participate in health management/chronic care management activities, and other tools that drive health improvement,” said Cihomsky. Shane O’Hare at MSHA touched on two issues: customization and integration. The former had to do with customized communications with patients, depending on their disease conditions and life stages. MSHA was in the beginning stage of a CRM (customer relationship management) initiative to ensure that “patients get the messages that are most pertinent to them, regardless of the medium used to convey the message.” Regarding integration, MSHA had set a goal to integrate risk assessment tools, which were functioning as stand-alone products rather than being integrated into any medical record system. MSHA wished to be proactive in helping address the health issues of its population and expected these tools it offered online, including health screening assessments, heart coach screenings, symptom checkers, health articles, to serve as catalysts for engaging patients in addressing their healthcare needs.

DISCUSSION AND CONCLUSIONS

This study has examined three best-practice hospitals concerning their approaches to implementing patient-oriented interactive e-health tools on their Web sites. While prior research indicates discrepancies between hospitals’ execution of e-health online and users’ preferences of interactive e-health tools, this study, through content analysis and in-depth interviews, has demonstrated hospital administrations’ perspectives and provided insights into developing e-health. There are many implications to hospitals that aim to be more involved in e-health by offering interactive tools online.

All three hospitals have each applied more than half of the 21 identified interactive e-health tools on their Web sites and continued to develop e-health based on their own strategies. They all promote these interactive tools through a service menu on their Web sites. Both MSHA and EIRMC are taking steps to build a secure and personalized patient portal, which Sharp has already put in place, to enable more core e-business functions online. Such efforts have made a hospital Web site action-driven rather than merely information-oriented though the sites do contain a significant amount of static information as well. These hospitals are well ahead of the crowd because they provide not only the traditional, functional tools but also advanced and technologically savvy features, including emerging interactive tools, such as ER wait times and mobile site or application). These best practices have set the three hospitals apart in the industry.

A lesson from this study is that the implementation of interactive e-health tools can be area-indiscriminative as well as hospital-size-indiscriminative. Among these three hospitals, both Sycamore Shoals Hospital and Sharp Grossmont Hospital almost totally rely
on their parent systems—MSHA and Sharp—to present them online so that these individual hospitals do not have to worry much about building everything or most things online from scratch. Though affiliated to HCA, one of the largest healthcare systems in the United States, EIRMC—a 331-bed hospital—probably has the least resources since it has to largely rely on itself for online marketing and online business. Neither EIRMC nor Sycamore Shoals Hospital is located in a large city, such as Chicago or New York. Nevertheless, both hospitals still have been highly aggressive in conducting hospital businesses online. Cindy Smith-Putnam from EIRMC said,

Hospitals lacking robust marketing and communications budgets may be MORE likely, not less likely, to consider technology investments a major priority. This is because compared to traditional communication channels (paid advertising, print publications, direct mail, etc.), Web sites and social media are relatively less expensive ways to interact with prospective consumers, with the added benefit of facilitating more two-way (rather than one-way) communication.

However, more advanced e-health implementation does require significant investment in information communication technology. “A sound technical infrastructure is an essential ingredient to the undertaking of e-health initiatives,” as Wickramasinghe, et al. (2005, p. 326) said.

The ultimate driver of these hospitals’ e-health development is their vision and strategic planning. Sharp and MSHA indicated that their hospitals’ “pillars of excellence” (e.g., service excellence, stakeholder safety, clinical excellence, and operational excellence at MSHA) have driven their comprehensive planning process, including e-health; EIRMC has offered e-health tools to meet consumer expectations, consumer satisfaction, consumer preferences, and consumer education needs. Further, the hospitals all share the crucial vision that e-health is the source of competitive advantage. They have used interactive e-health tools to engage patients/users, thus empowering patients and enhancing healthcare.

The decision-making process of implementing e-health has involved both top-down and bottom-up approaches across the three cases. While various departments such as marketing and communications often initiate useful ideas to benefit patients/users, management support is extremely important as exemplified in the case of developing mySharp at Sharp. The key is for management to realize the strategic importance of e-health and coordinate the resources necessary to make it happen. The most important function of such management support from the corporate level is to help standardize policies, protocols and procedures and reduce many structural impediments since e-health spans many parties and geographical dimensions, as Samiee (1998) pointed out.

Indeed, resource issues, along with information system infrastructure, integration, and standardization, are significant barriers to implementing e-health. These limitations,
however, should not hinder the adoption of interactive e-health since the favorable outcomes, shown in these healthcare systems’ Web analytics or consumer survey results, are well worth pursuing. While it is not yet easy for hospitals to obtain financial data to demonstrate the benefits of implementing e-health, Web analytics is useful for providing behavioral data and holding e-health initiatives accountable. All these hospitals studied have collected diverse Web analytical data to keep track of the impact of their e-health implementation.

Planning for e-health implementation is dynamic and evolving, according to the findings of this study. Each hospital has its agenda for the near future based on its specific situation. Remarkably, following Sharp’s footsteps, both EIRMC and MSHA are exploring the possibility of providing patients with online access to their medical records—the most desired interactive e-health tool (Huang, Chang, & Khurana, 2012). Matthew McCahill, the e-health marketing chief at the ten-hospital Alegent Health, based in Omaha, Nebraska, predicted that future Web site developments would probably center on the patient portal to determine what patients want it to provide (Robeznieks, 2011). In fact, out of the six categories of interactive e-health tools (Table 2), the core e-business category is considered to be the most useful by hospital Web site users (Huang, Chang, & Khurana, 2012); all three hospitals have been making inroads in this specific area to better serve their customers. Furthermore, managing healthcare online through a secure and personalized account or patient portal appears to be an effective way for hospitals to provide customized services and execute core e-business functions. The process of laying an infrastructure for a patient portal, as well as coordinating across departments, is complex; hospital administrations have to weigh the cost involved against the benefits for both patients/users and operational efficiency to come to a sound decision.

This study has its limitations. Responses from independent hospitals that are not associated with any parent system may add additional perspectives to the current results. How hospitals have taken advantage of social media to connect to patients needs further investigation. Longitudinal studies will be desirable for tracking e-health development, including its latest trends, obstacles, and outcomes.

For future research this study provides some insights to be tested formally. To begin with, it will be beneficial to demonstrate, with empirical data, how the extent of e-health implementation on hospital Web sites is related to hospitals’ performance, as revealed in such outcome measures as return on investment and customer satisfaction. Clarifying the business implications of e-health implementation will encourage more hospitals to get involved, making effective use of available interactive e-health tools to achieve diverse goals. In addition, given the determinants of e-health implementation identified in this study, including resources, top management support, marketing or customer orientation, and company visions, a conceptual model may be proposed and tested to understand what factors are most relevant in hospitals’ e-health adoption decision, as
well as the interplay between these factors and different types of hospitals (e.g., networked vs. independent). Finally, it will be useful to examine individual interactive e-health tools, such as mobile phone application and a patient portal, to gain an in-depth understanding of how each tool is used and evaluated by users/patients and how these tools contribute to the overall service quality perceptions and patronage decisions.

In conclusion, offering interactive e-health tools on a hospital’s Web site accomplishes multiple goals, including service, communication, and education, and serves as an important differentiator in a competitive industry. Hospitals of various sizes and in different geographic areas can all take advantage of what interactive e-health tools have to offer to gain a competitive advantage. The case studies of best-practice hospitals’ e-health implementation show that hospitals should design action-driven Web sites by applying interactive e-health tools to conduct more core business online and presenting them in a service-menu and on a patient portal, that hospitals should foster strategic visions for e-health and garner top-management support and necessary resources while being open to both top-down and bottom-up perspectives, and that hospitals can analyze the outcomes of e-health development through Web analytics and consumer surveys and eventually connect e-health implementation to financial or other performance measures. Ultimately, the quality of health care will be enhanced by engaging patients/users through interactive tools on hospital Web sites.

REFERENCES


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