



Sixth Annual  
eHealth Developers' Summit  
**Summary Report**

# **eHealth: the Momentum is Building**



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This entire report and additional information about the eHealth Developers' Summit are available at: [www.ehealthinstitute.org/summit/](http://www.ehealthinstitute.org/summit/).

The eHealth Institute ([www.ehealthinstitute.org](http://www.ehealthinstitute.org)) is a private, charitable 501(c)(3) nonprofit organization that explores ways to use emerging technologies, especially the Internet, to improve the health and well being of all people, including the underserved.

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# **eHealth: the Momentum is Building**

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# Executive Summary

**THE INTERNET HAS BECOME** a primary channel for health information and provider education/decision support, with search engines serving as a critical gateway to health content. Information gathered via the Internet appears to transfer readily to changes in the offline delivery of care. Although physicians and patients report that the Internet has changed their behavior, growth in patient/provider connectivity is slow. Patients want it, but most physicians are still reluctant to give up the office visit as the primary model for communication.

The Office of the National Coordinator for Health Information Technology (ONCHIT) is spearheading a move to promote widespread adoption of electronic health records (EHRs) by 2014. EHRs provide a digital means for documenting clinical information, supporting clinical and patient/consumer decision making, facilitating clinical and administrative transactions (e.g., processing of prescriptions, lab requests), and enabling direct patient/consumer input or communication. Although technical barriers to EHR adoption exist (e.g., numerous standards organizations, differing models for the archiving and exchange of information), the strongest barriers are economic and sociological. The lack of a proven business model is a critical issue. The benefits of adoption apply mostly to payors and public health, but health care providers are expected to purchase the EHRs and integrate it into their workflow. Creative incentives are needed to assist the majority of physicians who work in small practices and cannot afford to implement EHRs. Health plans are moving toward EHRs, thus eHealth products must be built for interoperability among vendors and end-users as well.

Health plans are becoming some of the most innovative users of the Internet. From administrative functions to online behavior change interventions, many payors are using their Web sites to creatively engage with consumers. Much of the growth in employer-sponsored health insurance is among minorities, with Hispanics comprising the largest group. In fact, Hispanics are using the Internet in record numbers. Developers, payors, and providers should think in terms of expanding products and services to meet this burgeoning market.

Vendors selling to health plans and managed behavioral health organizations should consider tailored, behavior change programs that can be integrated into multiple delivery channels, including telephonic counseling, individual use, group presentations, and linear video. There is a move away from anonymous data collection because health plans and managed behavioral health organizations must document engagement for the purposes of awarding incentives. Vendors must supply data, specifically reports that document returns on investment. Clinical outcomes and data demonstrating member participation, compliance with recommended strategies, and the impact on cost centers such as health care use, absenteeism, presenteeism, and work limitations are important. eHealth applications must include informative marketing materials to help health plans and managed behavioral health organizations motivate members to participate and reduce program attrition.

eHealth research projects are becoming more sophisticated in their methods. They include increasingly rigorous comparisons, the use of validated instru-

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ments, and consistent pre-post and follow-up designs using randomized control trials. Formative evaluation is also common with focus groups, interviews, and observation of users preceding the development of many interventions. Although research is important, it cannot drive the business agenda. It is helpful to look for research opportunities that can be completed in the context of business transactions.

Numerous Summit participants shared their insights regarding the critical steps developers must take to achieve commercial success. Chief among these observations was "Do not run out of cash, and do anything to make that first sale." Sometimes accomplishing this goal requires flexible thinking because the buyer may be different from the end-user. That is, individuals may be unwilling to pay for eHealth products/services, but organizations may be the actual purchasers. The organization then becomes the customer, and developers must address the needs of both audiences.

There are several options to consider for funding of eHealth ventures. Angel investors typically fund the seed development stage, whereas venture capitalists focus more on the post-product stage. Strategic partners tend to look for products and ideas that support their existing products or markets. Developers are encouraged to research investors to be sure there is a good fit before committing to a long term relationship.

"Branding" is the intentional cultivation of a reputation for a product or company and rests on emphasizing the perceived benefits of the product rather than its features. To identify the benefits or value proposition of a product/service, answer the questions, "Why is this feature important? Does it save time? Does it save money? Does it make the purchaser's life easier?" Commercial success depends upon understanding the needs and concerns of customers. To do this, developers are encouraged to

join their customers' professional associations, subscribe to their journals, go to trade shows, and sign up on mailing lists. Cultivate a research base by volunteering for positions of leadership in these associations. This generates a reputation and goodwill, and affords the ability to ask questions and learn from potential customers without pressure for sales. To generate sales leads, eHealth developers are encouraged to attend trade shows, participate in direct mail campaigns, become public speakers on topics of importance to the customer, and maintain a Web site that speaks to the needs of the customer.

Although the media can offer "free advertising" in the form of news articles, judicious use of press releases is encouraged. Regular and repetitive releases that lack substance become the equivalent of spam and will cause even newsworthy releases to be ignored. Developers are advised to cultivate a relationship with the media, even a particular reporter. They should also present themselves as a resource person in the topic area.

Developers interested in global markets must understand import/export laws, licensing requirements, the need for local business partners, and local laws regarding manufacturing and production. International ventures should look for legal and accounting assistance, and assistance in dealing with language and cultural issues. Governments and charitable organizations in developing nations are often receptive to eHealth solutions for their public health problems. Barriers to eHealth implementation include lack of infrastructure, limited user literacy, resistance by physicians, and lack of a business model. Developing nations seem to respond well to solutions that include small changes and an entrepreneurial return on investment. In this light, cell phones offer immense opportunities internationally, providing easy accessibility to wireless technology.

# Introduction to the Summit

**CONVENED BY THE EHEALTH INSTITUTE**, the Annual eHealth Developers' Summit (the Summit) is a national forum for eHealth developers and funders. The Summit promotes synergistic efforts to improve the quality, effectiveness, and availability of eHealth products by catalyzing business relationships and collaboration among developers, funders, and other stakeholders in the business, health, research, and technology fields. Attendees are invited on the basis of their direct involvement and leadership in some aspect of eHealth R&D (e.g., application or technology developer, funder, investor, purchaser).

The Sixth Annual eHealth Developers' Summit was convened September 29-30, 2005, at the Conference Center at Harvard Medical in Boston, Massachusetts. More than 100 eHealth leaders participated, from a range of disciplines including health care and medicine, business, public health, and computer science and technology. A major focus of the Summit is to foster business relationships and collaboration among developers from commercial entities, academia, government agencies, and nonprofit organizations. More than 90 organizations were represented, including eHealth companies, health care organizations, academic institutions, government agencies, technology corporations, pharmaceutical and medical device companies, nonprofit organizations, philanthropies,

and investors (Appendix A). About 35 percent of attendees were from small eHealth or technology companies, 21 percent were from health care organizations, 12 percent were from academia, 9 percent from government agencies, 7 percent from nonprofits, and the remaining attendees were from other organizations.

This summary report seeks to convey the rich discussions and insights of this distinctive gathering of leading eHealth developers and to share the lessons learned with the larger eHealth community. Consistent with the target audiences of the Summit, this report is primarily intended for eHealth developers and funders. For the purposes of this report, eHealth is defined as the use of emerging technologies, especially the Internet, to improve or enable health and health care.

The authors attempted to capture the major perspectives that seemed to be shared among Summit participants. However, because no attempt was made to form consensus during the meeting, this report does not necessarily represent the views and perspectives of most or all Summit participants. Readers should be aware that most of the data and statistics cited in this report were based on information provided directly by various Summit presenters and were not independently verified.

# The State of eHealth

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## Take-Home Messages

- The Internet has become a primary channel for health information and provider education/decision support, with search engines serving as a critical gateway to health content.
- Information gathered via the Internet appears to transfer readily to changes in the offline delivery of care. Both physicians and patients report that the Internet has changed their behavior.
- Health plans prove to be one of the most innovative users of the Internet. From administrative functions to online behavior change interventions, payors are using their Web sites to creatively engage with consumers.
- Growth in patient/provider connectivity is slow. Although patients desire it, physicians are still reluctant to give up the office visit as the primary means of communication.
- Hispanics are logging onto the Internet in record numbers. Developers, payors, and providers should think in terms of expanding products and services to meet this burgeoning market.

**THE INTERNET IS FAST BECOMING** the glue that binds the health care system together. Unlike the more nationalized models of health care delivery in other countries, the U.S. system has been likened to a large collection of cottage industries, each provider acting autonomously, with all the advantages and disadvantages that such a flexible but decentralized

system offers. The Internet is being embraced by government, payors, consumers, and reluctantly, physicians, as a viable means to connect disparate stakeholders, to increase coordination, and in the process, to reduce errors and inefficiencies. The following are six trends regarding health and the Internet that became evident during 2005.<sup>1</sup>

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## The Internet as the primary information and learning channel

In 2005, 100 million Americans turned to the Internet for health information. In fact, health consumers are now as likely to search the Internet for answers as they are to turn to their physicians. The younger the person, the more likely he/she will go first to the Web.

As for physicians, 99 percent are using the Internet, most often to gain information. Many Web sites cater specifically to the needs of physicians. Companies that facilitate connectivity between patients and physicians have seen some recent growth, but connectivity is not a primary driver in physician use of the Web.

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## Online search: A critical gateway

When researching health topics on the Internet, the average consumer spends 30 minutes per session;

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1. The data and information in this section are largely based on presentations by Mark Bard, president of Manhattan Research, Inc.; and Dirk Schroeder, executive vice president of Dr. Tango & HispaniCare, but this section does not necessarily represent their views.

half of those minutes are spent searching-accessing a search engine and sorting through its results. Physicians, by comparison, also spend roughly 30 minutes per session, but only 10 of those involve work with a search engine. Several health-related vertical search engines were introduced in 2005. Popular features include filtering results by quality, assisting users with appropriate search terms, and document selection. There is great potential for future development of applications that can help consumers and professionals find and select online health information.

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### **Internet activities transfer into the offline delivery of care**

Although the proliferation of online resources is undeniable, the question remains, "Do they translate into actionable change or results in day-to-day health care?" The answer appears to be "yes." Seventy-five percent of physicians say that their behavior has changed as a result of the Internet (e.g., how they access drug information, research practice guidelines, conduct literature searches). Forty percent of physicians report that the Internet has influenced their clinical decisions, capabilities, and knowledge. On the consumer side, 50 million Americans say they have printed out patient education materials from the Internet and taken them to their physician visit. Thirty-one million say that they have changed their actual lifestyle behavior as a result of online information.

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### **Health plans are one of the most innovative users of the Internet**

Many payors have embraced the Internet as a primary vehicle for interacting with members. This is not an altruistic move. Health plan portals have demonstrated high efficiency in the realm of

customer service, with high levels of consumer acceptance. In 2001, four million subscribers went to their health plan Web site; in 2005 that number grew to 26 million. Functionality of portals has expanded; some of the common features on health plan Web sites are the ability to access lab results, search the plan formulary, renew prescriptions, enroll with a primary care provider, and join an online weight loss or other health improvement program. Many sites also provide assistance to the employer, including information about plan services and common transactions.

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### **Growth in patient/provider connectivity is slow**

Although 50 million consumers would like to communicate with their physician via the Internet, physicians are still reluctant. Reimbursement seems to be a primary concern. Many visits could occur via the Web, but physicians receive an average of only \$25-\$30 per Web visit as compared with \$75 for an office visit. Despite physician resistance, the number of consumers who reported having online access to their physicians rose from 12 million in 2004 to 15 million in 2005. With an overall U.S. patient population of 100 million, this figure is still small. Most likely provider-patient connectivity will rise when it is strongly endorsed by hospitals and health plans.

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### **Hispanics are logging onto the Internet in record numbers**

According to the Pew Internet and American Life Project, 70 percent of English-speaking Hispanics now access the Internet, the same percentage as Caucasian Americans. Internet activities of Hispanics include going online to rate hospitals and get health information. Seventy percent of the growth in employer-sponsored health insurance was

among minorities, the largest group of which was Hispanics. Hispanic women are more likely to seek health information than are Hispanic men. Although about 60 percent of Hispanics have a high school education or less, they are more likely to have broadband access than dial-up.

Businesses are increasingly targeting the Hispanic population, especially in health care. In addition to the growth potential of this market, many companies view the provision of materials in Spanish as good public relations and a way to differentiate themselves from their competitors. Federal regulations also require that managed-care clinics and hospitals serving Hispanic communities provide materials in Spanish.

Offering translations of English Web sites is also an initial step to gaining a foothold with the Hispanic market. It is recommended that pages be written in English at the 6th grade level and then translated into Spanish. There are varying models for adapting materials to this population, ranging from simple substitutions of references to specific foods and recreational activities, to full localization in which the market is segmented by the ethnicity of the target audience and the translation focuses on tailored vernacular based on country of origin.

In the United States, the majority of Hispanics trace their ancestry to Mexico. Businesses catering to

specific regions of the United States, however, would be advised to consider the demographic composition of that locale. For instance, the northeast Spanish-speaking population is predominantly Puerto Rican, whereas Florida has a large Cuban and South American population. People from Mexico tend to live in the southwestern United States.

As with all Web applications, simple and clear usability is vital for the Hispanic market. Given the large percentage who have a high school education or less, this population tends to prefer video and animations over text-heavy materials. In addition, Hispanics may be best served by smart programs that have search functions capable of recognizing common misspellings, or that recognize both Spanish and English versions of a word.

Businesses seeking to engage the Hispanic market would be wise to look at the demographics of the community because they highlight specific needs. For instance, Hispanics have twice the rate of diabetes as do Caucasians, thus culturally and linguistically appropriate programs for diabetes management are promising endeavors. Hispanics also account for more than 50 percent of the births in this country. The population is young and one of the fastest growing markets in the United States. These demographics indicate that Hispanics will exert a steady strong influence on technology and eHealth in the future.

# Electronic Health Records: Promoting Adoption

## Take-Home Messages

- Electronic health records (EHRs) provide a digital means for documenting clinical information, supporting clinical and patient/consumer decision making, facilitating clinical and administrative transactions, and enabling direct patient/consumer input or communication.
- The Office of the National Coordinator for Health Information Technology (ONCHIT) is spearheading a move to promote widespread adoption of EHRs by 2014.
- Although technical barriers to EHR adoption exist, the strongest barriers are economic and sociological.
- The benefits of EHR adoption apply mostly to payors and public health, but health care providers are expected to purchase EHRs and integrate them into their workflow. Creative incentives are needed to assist the majority of physicians who work in small practices and cannot afford to implement EHRs.

## What are Electronic Health Records?

Studies have shown that computerized medical records have great potential to reduce errors, improve quality of care, and increase system-

wide efficiencies, especially in terms of sharing information between institutions.<sup>2</sup> But EHRs are more than simply a digital version of the paper-based chart. In addition to documenting clinical information needed for diagnoses and treatment, some EHR products provide just-in-time decision support, and check possible drug interactions. Many integrate administrative functions such as claims submission, insurance verification, formulary restrictions, referral processing, and the routing of prescriptions and lab requests. Some provide options for patient entry of information, including the results of home monitoring, or even secure patient-provider messaging and review/commentary on the physician's notes if the patient perceives an inaccuracy.

### Participant Perspectives

"Some have likened President Bush's declaration that we will have electronic health records in 10 years to President Kennedy's challenge to put a man on the moon. I think President Bush's endeavor is fundamentally much more difficult than a moon expedition and more readily likened to the 'Big Dig' here in Boston. Transitioning to EHRs is going to be like putting the entire interstate highway system underground while keeping the nation's freeways open and functioning the entire time."

- Ross Martin, director, Informatics, Pfizer Inc

2. The data and information in this section are largely based on presentations by Vish Sankaran, technical advisor, Office of the National Coordinator for Health Information Technology, HHS; John Halamka, CIO of Harvard Medical School and Care Group Health Systems; and Robert Mandel, COO of Massachusetts eHealth Collaborative, but this section does not necessarily represent their views.

Recognizing the potential of EHRs to improve the quality of care, the White House issued an executive order in 2004 promoting their widespread use within the next 10 years. Dr. David Brailer was appointed to head ONCHIT.

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## The activities of ONCHIT

The purpose of ONCHIT is to coordinate across the private and public sectors so that consumer-centric EHRs can be used to create an interoperable health care system that empowers patients, improves quality of care, enhances value, and increases patient safety. ONCHIT spent its first year of operations collecting input from a wide range of stakeholders. Health care agencies were consulted regarding the needs of the federal health architecture and coordinated with numerous groups, including the National Committee on Vital Health Statistics. Town hall meetings and site visits were conducted, along with outreach to state and regional health agencies. ONCHIT also met with international agencies responsible for national level information technology (IT) systems.

To gather input from the private sector, a health IT leadership panel was convened that comprised nine CEOs of large corporations who purchase health care but do not deliver it. The aim was to learn how information technology had changed their businesses and to transfer these lessons to the health care arena.

Three recommendations emerged from this panel:

- Widespread adoption of EHRs must be highly prioritized.
- The federal government should leverage its buying power.
- Private industry should cooperate to promote adoption.

To build a technological foundation to the initiative, ONCHIT sought input from 500 IT vendors.

Recommendations included:

- a mechanism to organize public and private stakeholder issues;
- decentralized, regionally brokered networks;
- patient-centric records (data move with the patient);

- a high priority placed on privacy safeguards;
- incentives to accelerate adoption of the Nationwide Health Information Network (NHIN).

On the basis of this input, ONCHIT assembled the American Health Information Community (AHIC), a panel of eight private sector and nine public sector members charged with delivering recommendations concerning privacy and security standards. In the near future, ONCHIT also expects to award contracts for standards harmonization and compliance certification to ensure that EHRs fit minimum criteria, security and privacy issues accommodating variations in state laws, and prototypes for the NHIN architecture to promote the exchange of health information. For more information on the activities of ONCHIT, go to [www.hhs.gov/healthit](http://www.hhs.gov/healthit).

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## Barriers to widespread adoption

Technical barriers to a nationally accessible EHR system are formidable. For instance, there are 129 different standards organizations, each with their own agendas and priorities. Privacy and security concerns are immense, in large part because all 50 states have their own Health Insurance Portability and Accountability Act (HIPAA) regulations, making it very difficult to share information (e.g., what is deemed restricted information in one state may be regarded as accessible information in another). The lack of a consistent architecture for information sharing is also challenging. Some suggest a platform based on peer-to-peer architecture and others prefer secure messaging within the context of centralized data storage. Most likely, future architecture will be based on a combination of centralized and decentralized networks.

There are also issues concerning EHRs themselves. A certification process must be developed to ensure minimum quality standards. For instance, the Massachusetts eHealth Collaborative identified 133 functional specifications for a usable EHR and then compared the results with the features available from more than 100 EHR vendors. Only seven of the

## Lessons Learned

### Often the barriers are not technological.

The double onslaught of Hurricanes Katrina and Rita provided the impetus to pilot a narrow application of EHRs. Ninety percent of the medical records of evacuees were paper records. Of particular concern were the prescription records. With evacuees scattered across the nation, new providers needed access to information that would help them coordinate care and avoid harmful prescription errors. In three weeks' time, a collaboration of government, nonprofit organizations, professional associations, and private industry was able to create an online, secure, read-only database for physicians and pharmacists to facilitate the appropriate dispensing of medications to Katrina survivors: [www.katrina-health.org](http://www.katrina-health.org).

The results are encouraging. As one Summit participant noted, "The barriers are sociological, not technological." Important concerns had to be deferred in the interest of public health and

safety. For instance, HIPAA procedures, such as the need for business associate agreements, were put off until after the site was launched. These requirements were not waived. The decision simply was made that timeliness took priority over privacy concerns. To quote a Summit participant, "No one has died from embarrassment, but lots of people could die for lack of care."

The Katrina-Rita experience spotlighted the need to have health data follow the patient wherever he/she may be. However, even if all the health records had been electronic to begin with, other problems would have required attention. For instance, much of the region was without electricity. How would these records be accessed when electricity is down across multiple states? And where and how are records backed up and archived? A mirror server across town, for instance, even in an adjacent state, might not have been adequate to salvage the records after such a widespread disaster.

products evaluated met all the criteria. (For more information about this evaluation, see the Massachusetts eHealth collaborative Web site at [www.maehc.org](http://www.maehc.org).)

Perhaps more important is the need for a business model and incentives for adoption. Error reduction, improved quality of care, and enhanced ability to share information across institutions are benefits for public health, payors, and large hospitals. But it is the physician who is being asked to purchase and implement the EHR. With an initial price tag of \$5,000-\$10,000, and the steep learning curve involved in assimilating EHRs into daily practice, only 20 percent of physician offices have transitioned to EHRs. Most of them work in large practices where expenses can be shared across many practitioners. The majority of physicians, however, work in practices of 10 or less, making such an expense

prohibitive relative to the perceived value for the physician.

Options exist for providing incentives for underwriting the cost. ONCHIT predicts that widespread adoption of EHRs could save the nation \$144 billion. In the state of Massachusetts, for example, it has been determined that 15 percent of procedures are redundant: the wrong prescription was filled, or patient X received a second MRI because the records from the first were not readily available. An EHR with direct e-prescribing, decision support, and the sharing of data could save the state as much as \$4.5 billion, which could be used to underwrite the adoption of EHRs. Both state and private insurers stand to benefit from the efficiencies garnered by an EHR system.

Other possibilities for underwriting EHR adoption include exploring private sector endeavors that

## Working Models

### Exploring barriers to and implementing pilots for EHR adoption

Massachusetts has several statewide initiatives designed to harness the power of health IT to improve quality and increase the efficiency of care. For 30 years, the Massachusetts Health Data Consortium has been meeting as a business incubator, bringing together chief information officers, payors, and providers to prioritize common problems and spin off business entities to solve them.

The New England Healthcare EDI Network is a nonprofit organization that handles financial data interchange for the state. Roughly 8 million transactions occur each month using open source software for activities such as claims processing, payments, and queries regarding eligibility and claim status. The architecture is a peer-to-peer network that is free and provides frictionless commerce for 42 payors and providers.

The clinical analogue to NEHEN is Mass Share, which serves as a clinical grid for the state. By providing a statewide master patient index, it offers seamless exchange of information regarding prescriptions and lab results. Mass Share is now working with the state of Indiana to set up a similar arrangement.

Although the presence of statewide grids is encouraging, only 15 percent of physicians in Massachusetts are using EHRs. To address this shortfall, the Massachusetts eHealth Collaborative

was formed to explore the barriers and pilot a project to promote EHR adoption by 900 small practice physicians. With funding from Blue Cross Blue Shield of Massachusetts, the eHealth Collaborative has identified seven EHR vendors whose products meet their criteria for decision-support tools and adequate documentation that can easily be incorporated into physician workflow and supported and maintained over time. In addition, the vendors' products were required to meet certain interoperability standards, including that information be exchanged readily with other institutions (e.g., pharmacies and local hospitals) and other EHR vendors.

Three communities have been chosen for this demonstration project: one urban, one rural, and one suburban. The seven vendors are currently showcasing their products; the communities will vote on the top three that will be offered to their providers. There are 450 physicians participating in this project, 90 percent of whom are in practices with two providers or less. None of them have IT staff in their offices.

Because the lack of incentives is a significant barrier to widespread adoption of EHRs, evaluation of this pilot project will focus heavily on the economic impact to the physician, time savings, and ease of use. Other considerations will include the impact of the system on quality of care (reduction of errors) and an analysis of any problems encountered with the sharing of information across institutions.

could be enhanced with access to widespread data collection. For instance, pharmaceutical companies might be willing to subsidize the development and dissemination of EHRs if they could have access to anonymous information concerning reactions patients have had to various medications. Or incentives might be made available to physicians through reduced malpractice insurance. There is some

evidence that EHRs seem to reduce liability issues because the collection of data appears to catch problems earlier. With the anticipated reduction in errors, perhaps malpractice insurers could offer reduced premiums for those who engage in e-prescribing or other forms of electronic record keeping.

# eHealth Needs of Health Plans and Managed Behavioral Health Organizations

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## Take-Home Messages

- Health plans and managed behavioral health organizations are seeking tailored, behavior change programs that can be integrated into multiple delivery channels, including telephonic counseling, individual use, group presentations, and linear video.
- eHealth applications must include marketing relevant materials to help health plans and managed behavioral health organizations motivate members to participate and reduce program attrition.
- Health plans are moving toward EHRs, thus eHealth products must be built for interoperability, specifically the sharing of data from one vendor to the next.
- There is a move away from anonymous data collection because health plans and managed behavioral health organizations must document engagement for the purposes of awarding incentives.
- Vendors must supply data, specifically reports that document return on investment. While clinical outcomes are important, more to the point are data demonstrating member participation, compliance with recommended therapies, and the impact on cost centers such as health care use, absenteeism, presenteeism, and work limitations.

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## Behavior change applications

Employers are attracted to behavioral programs that empower their employees to become healthier, and consequently more productive, individuals.<sup>3</sup> Simple health education articles and email reminders are not sufficient. Health plans and managed behavioral health organizations (MBHOs) must provide services that can demonstrate results and reach a broad group of end-users.

The Internet is an ideal vehicle, especially because large companies often have multiple campuses spread across the country and around the world. But employers also want a high-touch component to their employee offerings, thus call centers with coaches have become extremely popular, particularly for lifestyle related problems such as smoking cessation and chronic conditions that require ongoing monitoring and management. To meet this demand, health plans and MBHOs are seeking tailored, behavior change programs that can be integrated into multiple channels of delivery, including telephonic counseling, individual use, group presentations, and linear video.

Although purchasers (employers) are more sophisticated, the end-users may not be. Simple programs with high entertainment value are in great demand. Usability and interface design are significant criteria in the purchasing decision. Video is preferred over

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3. The data and information in this section are largely based on presentations by Scott Young, director of Client Services and Program Evaluation at Blue Cross Blue Shield of Rhode Island; and Bob Tavares, vice president, eBusiness Development, United Healthcare, but this section does not necessarily represent their views.

heavy reliance on text, and interactivity is a top priority.

Health plans and MBHOs are looking for programs that are personalized to the individual and that motivate employee users to become responsible health consumers. eHealth programs are expected, therefore, to include marketing materials to help health plans and managed behavioral health organizations encourage members to participate and reduce attrition. They are also expected to provide data concerning incentives that have worked to keep employees engaged. Beyond process outcomes, health plans and MBHOs need programs that can demonstrate clinical results. As a consequence, they are starting to lean more toward applications that require a multi-week commitment on the part of the employee. Parceling out information in smaller, more manageable portions is recognized to be more efficacious in the long run.

Interoperability is a key component and one that vendors will need to increasingly address. Health plans are looking to standardize record keeping, not only in the context of provider-based EHRs, but also in terms of the individual subscriber's record. With many employers changing health plans from one year to the next, portability of data between behavior programs is becoming a requirement.

Other expected features include the ability to brand the eHealth product, to customize content to the needs of individual clients, and to meet national and local HIPAA regulations. In fact, vendors are expected to be familiar with what is and isn't considered personal health information and to have safeguards in place to ensure compliance with privacy and confidentiality requirements.

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## Data drive the market

Return on investment and the achievement of corporate goals are the primary drivers in the purchase of eHealth applications, thus the watchword is "measure, measure, measure." Employers are demanding results,

### Participant Perspectives

"We prefer to engage the consumer over the long term. A several month program is preferable to a passive brain dump all at once. The latter is like getting a year's worth of the Wall Street Journal all in one morning. Even if the individual is hungry for information, it's too much. It's overwhelming."

- Bob Tavares, vice president, eBusiness Development, United Healthcare

which in turn causes health plans and MBHOs to place documented outcomes at the top of their purchasing priority list. Although clinical outcomes are important, more to the point are outcomes that document return on investment: For every dollar invested in a worksite health promotion initiative, how many dollars are saved in terms of lower health care use costs and increased productivity?

To this end, health plans and MBHOs are moving away from anonymous data and embracing a model based on tracking the end-user's engagement with the system, compliance with recommended therapies, and eventual outcomes. In return, the end-user receives significant incentives to participate. For instance, most employers request that the employee begin by taking a health risk assessment. Some participants receive cash, and some who continue in a recommended behavior change program are exempt from their self-pay portion of premiums.

eHealth behavior change applications are expected to collect participation and clinical outcome data and assemble quarterly, monthly, and sometimes daily reports on an individual's progress. Data must then be aggregated in a form that allows the health plan provider or MBHO to integrate it with the data of other vendors to make comparisons regarding significant cost centers. Such data may include appropriate health care use and measures of productivity such as absenteeism, presenteeism, and work limitations. Although self-reports and satisfaction surveys have their place, they are not sufficient. To measure return on investment, these other factors must be assessed or facilitated by features inherent in the eHealth product.

# eHealth Research

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## Take-Home Messages

- eHealth research projects are becoming more sophisticated in their methods, with increasingly rigorous comparisons, use of validated instruments, and consistent pre-post and follow-up designs using randomized control trials.
- Formative evaluation is commonplace with focus groups, interviews, and observation of users preceding the development of many interventions.

**THIS IS THE FOURTH YEAR** that the Health e-Technologies Initiative of the Robert Wood Johnson Foundation has sponsored a competition at the Summit for the best eHealth research project. Five research projects were chosen to present at the meeting. A panel of judges evaluated the presentations and delivered an award and a \$1000 check to the project that showed the most originality, overall quality, scientific rigor, and potential impact on health and eHealth.

By supporting applied research, the Health e-Technologies Initiative and the eHealth Institute hope to encourage developers to engage in rigorous evaluations not only to confirm positive outcomes, but also to reveal unintended consequences. eHealth developers have both an incentive and a responsibility to assess the efficacy, risks, and benefits of their products.

The five research projects presented at the Summit are summarized as follows:

*Kathryn Plant of the Stanford University of Medicine described their project to assist persons living with*

arthritis to engage in self-management techniques through participation in an online support group. Although 69.9 million adults in the United States suffer from arthritis, only 1 percent of them seek education and support. Healthy People 2010 has articulated an objective to increase the proportion of persons with arthritis who receive effective, evidence-based education as an integral part of their condition management. By using the Internet, the project hoped to reach a larger base of individuals with arthritis.

This intervention mimicked a six-week small group format, with cohorts of 20-25 people engaging in an asynchronous bulletin board discussion moderated by two peer-leaders who also have arthritis. New groups were formed once a week. Because of time zone concerns (e.g., a six-hour difference between New York and Hawaii), no live chats or "real time" requirements were built into the program. Participants were requested to log in two to three times a week for a total of one to two hours. The Web site included three main sections: The Learning Center, with articles on self-management techniques; the Discussion Center, with a bulletin board for threaded conversations typically centering on problem-solving, celebration of successes, and sharing of emotions; My Stuff, a private space where users could enter personal information, complete homework assignments, track progress in terms of exercise goals, and make confidential journal entries. The emphasis of the intervention was to promote participant self-help skills relating to medical management, role management (i.e., maintaining social functions such as worker, parent, spouse), and emotional management of their condition.

Recruitment occurred via links on the Web site of the Arthritis Foundation, health plans, worksites, and via search engines and media interviews. Participants ranged from 19 to 86 years old, with an average age of 54. Ninety percent were female, and 93 percent were Caucasian. The majority were college educated. The research design involved a randomized clinical trial with 577 participants completing a baseline assessment. This 2005 Summit presentation provided preliminary follow-up data at six months, but the study is intended to continue evaluating postintervention outcomes for two years.

Compared with those who did not use the program, those in the treatment group demonstrated significant improvements in disability, health distress, role function, self-reported health, and self-efficacy, all with moderate effect sizes. During the six-month period, 76 percent of the treatment participants saw improvements in at least one outcome; 50 percent saw improvements in two or more. Qualitatively, participants found the intervention quite useful, especially in the context of relieving isolation (many felt "alone" with their arthritis problems). They also noted that the program seemed especially supportive in helping them achieve and maintain goals relevant to increased physical activity. Although the population sample was not representative of the full range of arthritis sufferers, this study illustrates that Internet-based support functions hold promise for arthritis self-management.

*Alexander Turchin of Partners HealthCare System, Inc.*, evaluated the efficacy of a software program designed to automate the chart review process to ensure that a patient is receiving appropriate treatment adjustments based on presenting symptoms. For instance, many patients with increased blood pressure, increased cholesterol or unstable glucose readings are given physician advice to "wait and see." One study revealed that one of six diabetics with elevated blood pressure did not have records indicating that their blood pressure was being treated. Termed "clinical inertia," this relative inaction can be hazardous for the patient and costly for the insurer. Manual chart review, however, is a time-consuming and expensive solution. The goal of

*ClinDoc*, therefore, was to automate the process such that chart review could be accomplished with a relatively small investment of labor, a fairly quick turnaround, and an accuracy level that is comparable to manual chart review.

Using Perl extended regular expressions, *ClinDoc* scanned for blood pressure values (e.g., "Patient shows BP of XXX/XX"), and indicated whether a medication regimen was initiated or adjusted in the case of those with elevated blood pressure (e.g., "increase [name of medication]"). In a review of 35,936 visit notes across 5,131 diabetic patients, *ClinDoc* revealed that only 57 percent of records even documented the patient's blood pressure and of those, 38 percent exhibited values higher than the normal range. Of those with elevated blood pressure values, only 24 percent showed documentation of an increase in medication. To test the accuracy of the software, 400 notes were randomly selected for manual review.

In terms of identifying elevated blood pressure, *ClinDoc* exhibited a 97 percent agreement rating. In terms of medication adjustments, *ClinDoc* matched the manual review 89 percent of the time. The cause of *ClinDoc's* accuracy errors appears to be rooted in punctuation problems, misspellings, and local medical vernacular. Applications such as *ClinDoc* hold promise as a cost- and time-efficient automated chart review method.

*Marguerita Lightfoot of the UCLA Department of Psychiatry* presented their study of a Web site designed to teach communication skills to adolescents at risk for pregnancy and STDs. Nearly half of all adolescents report having had intercourse. The older the individual, the greater is the likelihood of sexual activity (e.g., 62 percent of high school seniors). In the US, there are 870,000 pregnancies each year among 15- to 19-year-olds. The incidence of STDs such as chlamydia and gonorrhea is frequent in the teen population. In terms of HIV, 110,000-250,000 infected persons are adolescents, with half of new infections reported occurring in individuals 14-25 years of age. Students in continuation high schools are much more likely than those in tradi-

tional high schools to be at risk for pregnancy and STDs.

Following participation in a series of focus groups, interviews with teachers, and observations of how students use computers, the UCLA team created a Web site that presented a cognitive-behavioral approach to building skills for behavior change. Strategies included acknowledging triggers or antecedents to risky behavior, socially acceptable communication and negotiation skills regarding condom use, and knowledge concerning condoms. Although abstinence was discussed, it was not offered as a primary strategy. Information was presented using video and animation sequences as well as text so that multiple learning styles could be accommodated. A total of six 20- to 30-minute sessions were created.

This study was evaluated with 133 continuation high school students who participated in either a treatment condition (viewing one to two of the six sessions each week) or a control condition consisting of a small, facilitated support group covering the same materials. Most of the participants were students of color. There was an equal distribution of males and females. Those who participated in the treatment condition reported significantly reduced frequency of sex and a reduction in the incidence of unprotected sex, although the latter did not reach significance. Students in the control group reported more difficulty attending sessions than did those in the treatment condition. Those who viewed the computer program expressed high satisfaction with the intervention.

*Stephen Porter of Children's Hospital in Boston* evaluated a kiosk located in the emergency room designed to help parents of asthmatic children to better communicate with emergency room (ER) physicians and jointly create a home management plan. Parents frequently bring their child with an acute asthma attack to the ER for treatment. ER visits for pediatric asthma are frequent and costly, but preventable with adequate education and behavior change. Poorly managed asthma results in important quality of life issues for the family. Months after discharge from the ER, for instance, families

frequently report that children still have not returned to school and that the parents have been forced to miss work as a consequence.

The goal of this intervention was to create better home management by removing barriers to a strong physician/parent dyad during the ER visit. Through increased communication, the hospital team hoped to cultivate informed and activated parents and prepared and proactive providers. To this end, a touchscreen kiosk was designed for parents that used the familiar format of a bank ATM. Information was available in multiple languages, and generous use of multimedia materials accommodated low literacy populations. Before seeing the ER physician, parents were requested to enter basic information via the kiosk, which then transferred the data into the patient's electronic medical record. The program consisted of three modules: one for reporting symptoms; one for reporting medication status; and one focusing on education, specifically in terms of knowledge of asthma and environmental triggers, expectations for the ER visit, and gaps in motivation, beliefs, knowledge, and ability to solve management-related problems. Information entered by parents via the kiosk appeared in the patient's medical record, with parental gaps in understanding highlighted for the physician as well as prompts for best practice recommendations. In addition, the kiosk enabled parents and physicians to jointly create an action plan and served as a tool for collaborative discussion of home management strategies.

This study involved a between-subject design. A baseline group of 101 parents used the kiosk to receive basic information; however, no parent-generated information was shared with the providers. During the intervention portion of the study, however, 138 parents used the kiosk to create an action plan that was shared with the provider. Both groups were contacted by telephone after the ER visit and asked to rate the number of problems related to the parent/physician partnership and lack of information. In all of the basic demographic measures, both the baseline and the treatment groups were similar with the exception of a slight but significantly older baseline population.

Although the kiosk format appeared to be well received by parents (more than 90 percent of those who started making an action plan, completed it), as a group, those who shared the kiosk output with the physician did not perceive any significant improvement in the number of problems relating to the parent/physician partnership. Problems based on information gaps on the part of the parent did, however, drop significantly among those who shared the report information with the physician as compared with the baseline group who did not. Among the intervention participants, there was a slight increase in the appropriate prescription of a medication for persistent asthma, but it approached significance only when compared with those physician/parent dyads who did not share the kiosk-suggested recommendations. This study focused only on the parents' perception of the relationship. This format will be implemented with two other chronic disease conditions, with future plans to study the perception of participating physicians as well as patients.

*Beth Casey Gold of the University of Vermont* conducted a comparison study of the efficacy of an existing online commercial weight loss program that offers a free-ranging self-help experience (*eDiet.com*) versus the more structured university-created online program grounded in behavior change theory (*V-trim*). Although commercial online weight loss programs are common, to date there has been very little efficacy data have been available.

Both programs offered components dealing with diet, exercise, and social support. It was primarily the mechanism and context of the offering that differed. For instance, *V-Trim* participants joined a cohort of 15-18 people with a facilitator to structure and monitor their group bulletin board and weekly chats. Those who worked with *eDiet* joined the entire community of 230,000 individuals also seeking to lose weight. Bulletin boards were topic-specific, chats were available multiple times of the day, and participants had access to a mentor and a 24/7 toll-free number for telephonic support as needed. *V-Trim* participants received prescribed exercise plans and weekly ongoing feedback, while persons using *eDiet* created their own plan and were responsible for their own logging and monitoring of progress. *V-Trim* enrollees chose their

own foods and made daily entries in a diet log about which they received feedback from a therapist. Enrollees in *eDiet* received tailored menus and shopping lists and did no specific journaling or feedback. Last, a key component of *V-Trim* involved structured lessons with homework assignments. There was no equivalent in the *eDiet* program.

For this comparison study, 124 participants were randomly assigned to either *V-Trim* or *eDiet*. All participants were 18 years or older and had a body mass index of 25 or greater. Participants were highly educated professionals, were mostly female, and were an average age of 46-49. The primary aims of the study were to look at use patterns and actual weight loss between the two groups and between subjects within each group. Data were collected at baseline and at six-month follow-up by means of an in-person interview. Weight was measured in person on a calibrated scale, and validated instruments measured dietary intake and eating patterns, physical activity, and perceived social support. Web logs were used to measure use patterns.

After six months, significant differences were found, with *V-Trim* participants losing twice as much weight than did *eDiet* participants (18.3 lbs vs. 9 lbs). Other significant changes involved eating behaviors and perceived social support, with *V-Trim* participants demonstrating greater improvements. *V-Trim* participants had a significantly higher number of log-ins and chat attendance. Within the *V-Trim* group, weight loss was significantly correlated to log-ins, self-report weigh-ins, facilitated meetings, and bulletin board usage. Among *eDiet* participants, weight loss was significantly correlated only with log-ins and self-reported weigh-ins. Preliminary data at 12-month follow-up indicate that both groups had gained back some of their lost weight, however the *V-Trim* group was gaining less. Although the structured, small group, behaviorally based *V-Trim* appears to be more efficacious, it is more labor intensive and therefore more expensive to administer. These data suggest that future research consider cost effectiveness of specific program elements.

# Commercializing eHealth

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## Take-Home Messages

- Businesses go through numerous phases as they evolve from a start-up to an established venture. Each phase has its unique opportunities and pitfalls.
- Do not run out of cash, and do anything to make that first sale.
- Sometimes the buyer is different from the end-user. For instance, individuals may be unwilling to pay for eHealth products/services, but organizations may be the actual purchasers. The organization then becomes the customer, and developers must address the needs of two audiences, not one.
- All investors seek a monetary return, but motivations and approaches vary. Angel investors may fund the seed development stage and venture capitalists typically fund the post product stage. Strategic partners tend to look for ideas that support their existing products or markets.
- Developers are encouraged to research investors to be sure there is a good fit before committing to a long-term relationship.
- Although research is important, it cannot drive the business agenda. It is helpful to look for research opportunities along the path of doing business, perhaps finding research partners to lead this aspect of development.

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## Growing an eHealth business

By a show of hands, at least 40 percent of Summit participants are actively involved in a business venture. Participants generously shared their insights regarding the evolution of the business side of their enterprises.<sup>4</sup>

*The Idea Phase.* This phase begins when creative people get together and start brainstorming. They have identified a need and are running on enthusiasm. The developer's job is to remove barriers and refrain from "getting in the way of a good idea." The most important resources during this phase are an experienced team and seed funding.

*The Spinout Phase.* During this phase, attention turns more to the logistics of running a commercial venture. Developers are advised to take their business plan seriously, but not to mistake it for their business. Building a small, trusted board or advisory group is recommended, one that will keep its sights set on the big picture. Slow, controlled growth is preferable to fast expansion, which usually leads to painful force reductions later. Keep careful records and control costs. Consider outsourcing key functions as a means of reducing expenses. Payroll, human resources, and the chief financial officer are cost centers that are relatively easy to outsource.

*The Hunt for Revenue.* Numerous Summit participants emphasized the maxim, "Do not run out of

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4. The data and information in this section are largely based on presentations by Chris Cartter, president and CEO of QuitNet, Inc.; and Ted Dacko, president and CEO of HealthMedia, Inc., but this section does not necessarily represent their views.

cash." Some recommended raising money only when needed and keeping the loan burden or dilution of ownership down. Others suggested raising as much money as possible but spending it wisely. A cash reserve allows for economies of scale, nimble shifts in direction, and the ability to jump on growth opportunities when they arise.

Above all, developers were exhorted to do anything to generate that first sale. Listen to the customer. If the original business model does not prove fruitful, look for alternatives. Be open to change, and do what is needed to address the concerns of the buyer, including re-interpreting who the buyer is.

*Gaining Traction.* As the company matures, it must solidify its foundation and then expand its revenue base. If outcome data have not been collected previously, then demonstrating results is the first order of business in this phase. Once credibility has been established, the question becomes how to diversify. *QuitNet*, for instance, began by working with the public sector (state health departments) and then expanded into the private sector with health plans and employers. *HealthMedia, Inc.*, began with individually tailored print materials and evolved to personalized Web sites with tailored, interactive behavior change interventions.

*Scaling Up.* Once a steady income stream has been established, the company must organize the sales and contracting process to streamline procedures and monitor trends. For instance, many transactions involve a long sales cycle, taking a year or more to bring a prospect to the point of signing a contract. Companies should build a pipeline and look for tools, or partners, to help track performance and make adjustments as needed.

## Lessons Learned

### Sometimes the buyer is different from the end-user

*QuitNet, Inc.*, is an online support community for smokers and ex-smokers helping others quit. It began in 1995 as a project run "under the radar" by Nathan Cobb, then an employee at Boston University. In 2000, it spun off from the university to become a commercial venture. Since then, it serves 1 million visitors a year, with members logging on from 165 countries. In 2005, it had \$3 million in revenues. The company anticipates that this trend will increase to \$10 million by the end of 2007. In October 2005, *QuitNet* was acquired by Axia Health Management.

Originally, the business model called for individuals wishing to stop smoking to purchase access to the support system. However, *Quitnet* rapidly learned that an individual subscription model was not practical. People are not willing to pay for social support, no matter how much more effective it has been proven to be. Management had to rethink its approach and shift to a sponsorship model to which organizations that would benefit financially from reduced smoking incidence would purchase a group subscription. Health plans, employers, and state health departments are now the purchasers of *Quitnet* services.

The result is that *Quitnet* has two audiences to serve: end-users who wish to quit smoking and organizations that wish to assist them. The *Quitnet* service itself addresses the needs of end-users, but *Quitnet* has had to develop support mechanisms for the purchasers, specifically promotional materials to get the word out about the availability of *Quitnet*. Branding and customizing these materials became yet another revenue stream and helped diversify *Quitnet's* revenue base.

- Chris Cartter, president and CEO, *QuitNet, Inc.*

When asked to present a set of "rules" to assist developers with the commercialization process, Summit participants offered the following strategies:

- *Mind the culture.* Those who develop the product and are part of the initial start-up must learn to share the stage with business people if the company is going to succeed.

- *Outcomes rule in health care.* eHealth products must have evaluation data.
- *Think "scalability."* Design systems and choose vendors in such a way that expansion is a built-in part of the process.
- *Product direction should be in the hands of marketing, not the sales staff or the researchers.* The market is going to tell you what is going to work or not work, not a sales person thinking about his last call, nor a brilliant individual in a cubicle who has thought about the topic all his life but never talked to a customer or competitor.
- *Listen to your gut, pick a strategy and follow it.* There is an art to knowing when to stay the course and when to be flexible. Responding to every little shift will lead only to exhaustion. Be open to input, but trust your gut. If you do what others want and it doesn't work out, you will have only your doubts to comfort you.
- *Learn from your losses.* When you lose a customer, follow up and find out why. Listening

to existing, satisfied customers is important. But those you lose have critical lessons to teach you about what is needed in the business. They can point the way to changes that will bring in more prospects and help you close more deals.

- *The best product rarely wins.* It's the best strategy—doing the right things for the right market—that carries the day.

Business books recommended by Summit participants include *Crossing the Chasm*, *The Innovator's Dilemma*, *Freakonomics*, and *The World is Flat*.

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## Financing

Three types of financing were explored during the Summit: angel investing, venture capital, and strategic partnerships (i.e., corporate venture capital). Motivations vary, but most funders are interested ultimately in return on investment.<sup>5</sup>

Angel investors typically engage in the business once funding from family and friends has been exhausted. It is estimated that in 2004, 250,000 angel investors funded 30,000 companies for a total of \$20-\$50 billion. Angel investors are sometimes interested in funding the idea stage, thus developers in need of capital to create a prototype are advised to seek angel funding. As a rule, angel funders are looking to participate in the business. Angels may invest as a group so they can share the risk and due diligence of the venture.

To highlight an angel's motivation, one investor explained that he preferred to apply his own business acumen to a venture in order to yield a better return rather than passively invest in the stock market and risk his capital on someone else's managerial skills. By participating in an angel group, he is able to make his own mutual fund and actively influence its success.

### Participant Perspectives

"When I think about innovation, my first response is 'Know your customer—their demographics, their equipment, their needs.' For instance, my staff thinks everything should be on an iPod, but they are all in their 20s and 30s. Our customers are 45 years old. We need to look at what they want, what is hot for them. And by that I mean, what is hot for them in Michigan, or Des Moines, Iowa, not in Boston or Silicon Valley. Certainly we are moving portions of our product to the iPod. But it doesn't make sense to move the whole product to that platform at this point."

— Ted Dacko, president and CEO, HealthMedia, Inc.

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5. The data and information in this section are largely based on presentations by Mark Donovan, Partner, Salix Ventures; Andrew Jay, managing partner, Medical Solutions Fund, Siemens Venture Capital; Gary Lubin, executive, Merck Capital Ventures; Richard Gill, member, Launchpad Venture Group and president & CEO, ActiveCyte Holdings; Valerie Mosley-Diamond, member, Investors' Circle and VP, Wellington Management; Michael Williams, chapter president, Keiretsu Forum Boston/New England; and Bernard Harris, president and CEO, Vesalius Ventures, Inc., but this section does not necessarily represent their views.

Some developers have used the government's Small Business Innovative Research (SBIR) program in lieu of angel investing. Although this program has the advantage of providing grant monies that do not need to be paid back, and does not involve dilution of ownership in the company, the SBIR program may take longer to obtain funding, does not offer business support or advice, and specifically prohibits the use of funds for commercialization.

Venture capitalists (VCs) are typically brought in after the product is developed, usually to fund the marketing and sales phase. Participation in the day-to-day running of the business may be less than that of an active angel, but VCs will often take a board seat. Venture capitalists tend to be highly specialized in their investment interests. Angel investors often work with VCs and may be able to make referrals.

It is best to negotiate with VCs when cash flow is still positive because the developer has greater leverage. One Summit VC participant suggested that his group was most interested in funding opportunities in which cash was needed to carry the business until an anticipated milestone was reached such as a clinical trial being completed or a marketing program being launched. Receipt of SBIR funding was not considered a positive differentiator by VC participants at the Summit. One VC commented that SBIR funding might indicate stronger academic rather than commercial leadership in the company.

Forming strategic partnerships is another option for eHealth developers. This may involve financing from the "corporate VC division" of the company. Strategic partners are looking for a return on their investment, but they are often more interested in small companies with products that are synergistic or complementary to the corporation's products and services. Developers are encouraged to choose their partners wisely and consider the following questions:

- How will the business be impacted by the strategic partner?
- What can the partner bring besides money (e.g., access to experts, sales channels, commercial arrangements)?
- What are the partner's strategic goals?

## Participant Perspectives

"Above all, do not be discouraged. If you get a 'no,' find out why and try again with someone else. There could very well be a 'yes' around the next corner."

- Mark Donovan, partner, Salix Ventures

- What is the exit strategy?
- What happens if interests diverge?

Before applying for funding, developers are advised to research the investors thoroughly to ensure a good fit. They should know the corporation's investment priorities, whether it has a philanthropic mission, the size of its typical investments, and if possible, the types of investments it has made in the past.

Investors at the Summit also emphasized the importance of having a succinct, one-page business plan describing the market, the "pain" or need the product/service addresses, the background/experience of the principals, and contact information for follow-up. Details are needed only at subsequent meetings. Presentations that anticipate the questions of investors are generally favored over those that give general information and do not address unit economics. PowerPoint should be used to spark a conversation, not supplant it.

Last, investors noted that they were "more likely to bet on the jockey than on the horse," meaning an experienced management team with a strong marketing plan was more important than a brilliant product. To this end, developers were encouraged to carefully hone the business aspects of their venture. Mentors are invaluable. Take a VC or banker to lunch or consider working with a hospital or university commercialization incubator or technology transfer department. Present to an angel group or a VC and ask for feedback. Even if the developer is denied funding, feedback regarding the reasons for refusal will be invaluable and can serve as a checklist for matters to address before presenting to another source of financing.

### Participant Perspectives

"There is only one thing that matters in health care: outcomes. You have to do at least some kind of research. Just know from the outset, no matter what you do, people will argue with you about your data, your sampling, and your methodology. But if you have done the research, at least you will have data."

- Ted Dacko, president and CEO, HealthMedia, Inc.

### Working Models

HealthMedia approached Kaiser Permanente to consider its tailored, online patient education programs relating to cardiovascular health (smoking, obesity, stress, and nutrition). Although the idea of tailoring materials to fit the individual situation of each viewer had appeal, Kaiser wanted outcome data before making a decision to forego its standard, one-size-fits-all education materials. In particular, they wanted to see whether the tailored materials could affect weight loss, health care use, or satisfaction with the plan. Together, HealthMedia and Kaiser entered into a comparative study. After one year, participants who used the tailored materials reported significantly higher satisfaction with their Kaiser health plan, had lost twice as much weight, and had 1.1 fewer doctor visits per year than did those who used only the generic materials. As a result of the study, Kaiser signed on with HealthMedia, and HealthMedia now has convincing data to present to other customers.

## The role of research in commercialization

Health care is an industry founded on outcomes, thus developers must be able to show credible results if they are to stay in business.<sup>6</sup> But it takes three to five years or more to establish useful outcome data. As one Summit participant observed, "A business can die in that time." There are, however, early adopters who will be willing to take a leap of faith. They may even be willing to become research partners to help verify the benefits of an innovation. Developers are encouraged to not confuse the early adopters with majority adopters. These later adopters will want and need data up front. A practical strategy that accommodates the need for outcomes and the need for income is to target the early adopters while doing the research and then approach majority adopters once the data have been analyzed.

Some organizations will purchase the product/service not because they want or expect results, but for PR reasons: it differentiates them from their competition, or they wish to generate an image of being a cutting edge company or a company that cares for their employees, clients, and others regardless of whether the innovation actually improves health.

Although research is important, it cannot drive the business agenda. It is helpful to look for research opportunities and research partners in the context of doing business. Because researchers usually do not have a finger on the pulse of the market, they should not determine product direction or marketing.

Although randomized trials are the gold standard, outcome data from controlled settings have limited usefulness compared with those from real-world trials. In the interim, as a new company gains momentum, data concerning end-user acceptance, usage patterns, and user satisfaction are easy to measure without sophisticated research protocols and are a good place to start.

6. The data and information in this section are largely based on presentations by Ted Dacko, president and CEO of HealthMedia, Inc.; and Chris Carrter, president and CEO of QuitNet, Inc., but this section does not necessarily represent their views.

# Branding, PR, and Generating Leads

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## Take-Home Messages

- "Branding" is the intentional cultivation of a reputation for a product or company and emphasizes the perceived benefits of the product rather than its features.
- To identify the benefits, or value proposition of a product/service, answer the questions, "Why is this feature important? Does it save time? Does it save money? Does it make the purchaser's life easier?"
- Commercial success depends upon understanding the needs and concerns of the customers. To do this, developers are encouraged to join their customers' professional association, subscribe to their journals, go to trade shows, and sign up on mailing lists.
- Cultivate a research base by volunteering for positions of leadership in a customer's professional association. This generates a reputation and goodwill, and affords the ability to ask questions and learn from potential customers without pressure for sales.
- To generate leads, eHealth developers are encouraged to attend trade shows, participate in direct mail campaigns, become public speakers on topics of importance to the customer, and maintain a Web site that speaks to the needs of the customer.
- Although the media can offer "free advertising" in the form of news articles or presentations, judicious use of press releases is encouraged.

Regular and repetitive releases that lack substance become the equivalent of spam and will cause even newsworthy releases to be ignored.

- Developers are advised to cultivate a relationship with the media, even a particular reporter. Become a resource person in the topic area, forwarding information of interest that is not specifically a promotion of the company, product, or service.

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## Branding

The first challenge in eHealth is often the question of technical feasibility. The second question, however, is the ability to sell the product. To achieve commercial success, eHealth developers must build a reputation for the business and the product. This is called "branding," and it targets four primary goals<sup>7</sup>:

- Create awareness of what you do.
- Create an understanding so clients will know when they need you.
- Create a preference so they will choose you over your competitors.
- Demonstrate your passion, excellence, and commitment to your client's success in everything you do.

To manifest these goals, eHealth developers must identify the value proposition in their product. The internal value consists of elements familiar to the

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7. The data and information in this section are largely based on a presentation by Darrell Atkin, president of the Launch Pad, but this section does not necessarily represent his views.

owner and employees, such as specific features of the product and its core competencies. Customers, however, are more interested in the benefits, sometimes called the "external value system" or "value proposition." These benefits are identified by asking, "Why is this feature important? Does it save time? Does it save money? Does it make the purchaser's life easier? What are the priorities and concerns of the customer, and how does this product address them?" A product may indeed be a better approach to a situation, but if the customer does not perceive it to solve a high priority problem, then the value and salability of the product will be diminished.

It is critical to accurately identify the customer who may not be the end-user. The purchaser is the individual who will benefit most from the value proposition. This is the person who will identify the need and want to buy the product. Although there may be several possible beneficiaries, at the outset, choose the customer who will have the greatest need and fewest barriers to making a purchasing decision.

Having defined the primary customer, to be successful, the eHealth developer must get to know that customer base deeply. Because eHealth products/services usually involve a business-to-business sale, subscribe to journals, go to trade shows, get on email lists, and join professional associations. In particular, eHealth developers are encouraged to choose one association and make leadership commitments (e.g., volunteer for the board, join work groups) to become highly visible. The point of this group is not to actively generate leads. In fact, selling to this group is not advised unless members initiate a transaction. The focus of this activity is to generate research resources—identify individuals who can answer questions or provide advice about a complicated problem.

Without a thorough knowledge of the customer base and industry resources, developers risk making strategic decisions in a commercial vacuum. This type of research requires "pressing the flesh" and must be a priority. Developers may wish to ask each member of their senior management team to pick a

professional association relevant to the customer base, cultivate relationships within it, and bring back their insights to share with the company as a whole.

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## Public relations

Building a positive relationship with the media is an art. It involves mutual respect and an acknowledgment of a win-win proposition. An article about a company or its products/services is imminently more valuable than a paid advertisement. At the same time, a news release must first and foremost report news. It must be relevant to things the media viewers consider important, and it should preferably highlight a new company development. If it impacts the core audience of a certain class of publication, all the better.

To appropriately use the media, developers should make a PR plan for the year that reflects and supports the business plan. Send out news releases judiciously. Regular and repetitive releases that lack substance become the equivalent of spam and will cause even newsworthy releases to be ignored if previous submissions were not well targeted.

A news release is more likely to be published if it is written objectively. Passionate language with superlative adjectives should be avoided. Claims must be backed up with research findings. Further written or electronic support materials must be available if requested, and a spokesperson should be identified in case a reporter wishes to follow up.

Developers are advised to cultivate a relationship with a single reporter who covers topics relative to their product or business. Read the reporter's columns regularly and send him/her helpful articles, information, and resources entirely separate from self-interest or personal promotion: "Ran across this, thought you might be interested." The goal is to be seen as a resource. If the developer is perceived as an expert in the field rather than a potential advertiser preferring not to spend money on an ad, his/her materials will stand out for the reporter and be more likely to receive attention and eventually, coverage.

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## Generating leads

Exposure is the key to generating sales leads. Developers who thoroughly understand the needs of the customer and can quickly articulate the benefits of their product/service are in the best position to get the message out succinctly and effectively.

Summit participants recommended four avenues:

- Become a public speaker on a topic important to the customer.
- Attend trade shows.
- Participate in direct mail campaigns.
- Develop a powerful Web site.

Organizations are always looking for interesting speakers. Part of creating awareness involves building credibility for the company, separate from the product. Most developers have at least two to three topics they can speak about that would be helpful or educational to their customer base but would not be an overt advertisement for their product. Begin locally, and branch out to regional and national events as the customer base grows. By becoming a recognized expert, developers who engage in public speaking will add credibility to the company and product, as well as exposure to potential customers who may well come up after the talk, providing an opportunity to discuss the product as appropriate.

Participating in the exhibit hall of trade shows is a convenient way to meet many customers all under one roof. Trade shows offer the advantage of quality face time and can be the beginning of lasting relationships (not only with customers, but also other vendors who sell complementary products).

Exhibiting is expensive, however, and involves significant travel time. It is easy to get spread too thin with this strategy, thus developers are advised to create a plan at the beginning of the year, with a budget and a calendar to avoid a shotgun approach.

Direct marketing is another option for generating leads. In particular, it allows the developer to concentrate on a narrow focus, starting small and ramping up. It also allows for fine-tuning of the advertising materials to determine which strategies generate the most sales. To be beneficial, direct marketing requires significant analysis and adjustments, as well as consistency, commitment, and follow-through.

The developer's Web site is one of the most important marketing tools. Long after personal and professional contacts are made, it is the Web site that consistently presents a public face to the customer. Especially in the context of an eHealth business, extreme attention must be spent on details. First impressions regarding the professionalism and credibility of the company will be made from a single exposure to the home page. Again, knowing the customer base and the value proposition is a must. These must be prominently displayed on the Web site. In addition, be very clear about the objective of the home page. If the desired effect is for visitors to contact the office, then make the contact information a prominent feature. If the desired effect is to build loyalty, include educational articles, or consider an "ask the expert" link. If the desired effect is to generate referrals, add an "email this page" feature to the site. In addition, give significant thought and attention to search engine placement strategies.

# Going Global: eHealth in International Markets

## Take-Home Messages

- Governments and charitable organizations in developing nations are often receptive to eHealth solutions for their public health problems. Barriers to eHealth adoption include lack of infrastructure, limited user literacy, resistance by physicians, and lack of a business model.
- Developing nations seem to respond well to solutions that include small changes and an entrepreneurial return on investment.
- Cell phones offer immense opportunities internationally, providing easy accessibility to wireless technology. For instance, it is estimated that there will be 2.7 billion cell phone subscribers by 2010, with 50 percent of those living in Asia.
- Developers looking to "go global" will need to understand import/export laws, licensing requirements, the need for local business partners, and local laws regarding manufacturing and production. International ventures should look for legal and accounting assistance, and assistance in dealing with language and cultural issues.

**THE DEVELOPING WORLD** holds great potential for eHealth solutions to significant public health problems. Governments are surprisingly supportive of technological solutions, as are charitable organizations. Barriers to overcome include the lack of infrastructure (e.g., no electricity, no access to equip-

ment), limited user literacy, resistance by physicians, and lack of a business model. These obstacles are not all that dissimilar to those encountered in industrialized nations; it's simply a matter of degree.

In the context of software, surveillance and the networking of records are critical. Comorbidities are common, but treatment is allocated "by disease" (i.e., an individual may go to one clinic for malaria, another for TB, and another for HIV). Without networking, and in the absence of portable records, clinics are unable to coordinate, and patients receive fractured care.

Not all eHealth solutions must be on the macro level. Many well-meaning companies and individuals become paralyzed because they are unable to conceptualize a single, fully sustainable program that will solve the given problem. Creative thinking is needed on the micro level, as well as a willingness to experiment. In developing nations with little to no infrastructure, it appears that small solutions hold the greatest promise for widespread dissemination.

### Participant Perspectives

"Given the life expectancy in Zambia, people in the United States lead two lives for every one life in Zambia. It behooves us here in the United States to spend one of our lives working on important and interesting problems."

- Vikram Kumar, co-founder and CEO, Dimagi, Inc.

## Lessons Learned

### Unintended results are sometimes the most meaningful

The World Health Organization uses a surveillance database, WHO-Net, to track microbial resistance patterns and identify new strains seen in clinics in 80 countries. An unanticipated side effect was the ability of the software to highlight quality control issues. For instance, with this software, the public health agencies observed that one clinic had better results than did the others. This prompted them to identify responsible factors and apply them to other clinics that were not doing as well.

Not all eHealth solutions must be on the macro level. Many well-meaning companies and individuals become paralyzed because they are unable to conceptualize a single, fully sustainable program that will solve the given problem. Creative thinking is needed on the micro level, as well as a willingness to experiment. In developing nations with little to no infrastructure, it appears that small solutions hold the greatest promise for widespread dissemination.

In developing nations, earning a living takes precedence over prevention, and even treatment, of illness. If eHealth developers can match their products or services to a business model—think Avon ladies for health care—the chances for success increase dramatically. For instance, the inventor of the Segway developed a water purifier that could be sold to entrepreneurs. These individuals in turn sold purified water to their friends and neighbors, readily recouping their initial investment. Cell phones in India were disseminated in much the same manner. One person bought a phone and rented time to others with a markup. Initial access was readily reimbursed while simultaneously creating a growing exposure and demand.

Mobile phones are an excellent example of a technology platform that is ripe for eHealth applica-

tions in the developing world. With a large and expanding installed base, this platform is a superb medium for the "think small" approach to big problems. Cell phone accessibility is high, there are reasonable prices for entry, and they require minimal literacy to use.

eHealth companies looking at global markets are encouraged to conduct demographic analyses to identify opportunities. North America, Australia, and Europe have the largest proportion of the population with Internet access. But 30 percent of all Internet users live in Asia, and by 2010, Asia will comprise 50 percent of the anticipated 2.7 billion mobile phone subscribers. Latin America holds great promise for the exportation of health care services. Mexico and Central America, for instance, are fertile ground for managed care systems. Brazil has perhaps the largest market, and Argentina spends the most per capita on health care.

Conducting business in other countries involves consideration of many of the same business considerations such as consumer demand, competition, installed base, and intellectual property protection, but there are additional rules and regulations to

## Working Models

Rather than network all the participating clinics to share patient records, Dimagi, Inc. has created a smart card that allows the information to travel with the patient, whether he/she is going to the HIV clinic, the malaria clinic, or the TB clinic. Using open source code, this 16 KB card helps clinics retrieve and enter data concerning patient history and medications. Currently, the patient is the transporter of the card and is not able to interact with it directly. The benefit is garnered simply by receiving better-coordinated care. Future visions include the possibility of using an open phone platform so the patient can also interact with the data.

## Working Models

The *HispaniCare* division of *Dr. Tango* is a U.S.-based company with associates throughout Latin America. It specializes in the "localization" of health materials for businesses targeting Spanish-speaking consumers. As it is with English, variations of Spanish are found in many countries and regions.

To accommodate these differences, *HispaniCare* offers three tiers of localization, depending on each client's goals and long range plans. Developers who expect only a single adaptation of an English Web site for a wide, nonregional market, typically elect to translate an English version written at the 6th grade level into "universal Spanish." Those who expect to target a

specific region would likely choose to have their materials translated by locals, with the insertion of regional phrases and mentions of regional foods and recreational activities. This middle tier also involves the creation of a glossary to ensure that future translations of other materials consistently use the same local phrases and vocabulary. Developers planning to actively update and maintain their materials would probably choose the top tier of localization, which includes regional translations and more in depth cultural modifications, for instance, suggestions regarding content changes to address attitudes and beliefs about particular diseases.

master. Some areas to consider include import/export laws, licensing, the frequent need for an indigenous business partner (especially true in Asia), and laws regarding manufacturing and

production. Developers considering international ventures should look for legal and accounting assistance, and assistance with language and cultural issues.

## Appendix A. Organizations Represented at the Sixth Annual eHealth Developers' Summit

AC Group, Inc.  
ActiveCyte Holdings  
ADP, Inc.  
Amedisys  
Baystate Medical Center  
Beth Israel Deaconess Medical Center  
Bibliomed  
Blue Cross & Blue Shield of RI  
Bluegate  
Brigham and Women's Hospital  
California Department of Health Services  
California Office of HIPAA Implementation  
Center for Excellence in Cancer Communication Research  
Center for Health Interventions, LLC  
Children's Hospital Boston  
CHRISTUS Health  
Cleveland Clinic  
Clinication, Inc.  
Clinisolutions Inc.  
Conceptual MindWorks, Inc.  
DocSite  
eHealth International, Inc.  
Harvard Health Policy Review  
Harvard Medical School  
Healia, Inc.  
Health & Risk Communication Center/Michigan State University  
Health Care Services Corporation  
Health e-Technologies Initiative  
Healthcare IT News  
HealthEra  
HealthMedia, Inc.  
Hewlett-Packard Company  
HispaniCare (Dr.Tango Inc.)  
HopeLab  
Humana Inc.  
iMetrikus  
InfoTech Inc.  
InnerWireless Inc.  
Intel Corporation  
invivodata  
Johns Hopkins HealthCare  
KDH Systems, Inc.  
Keiretsu Forum  
Maine Medical Center  
Manhattan Research  
Massachusetts eHealth Collaborative  
Massachusetts General Hospital  
McKesson  
MDdatacor  
MedSignals  
Merck Capital Ventures  
MIT Media Lab  
Mount Sinai School of Medicine  
National Cancer Institute  
Nemours Foundation  
Omron Healthcare, Inc.  
Oregon Research Institute  
Palaistra Systems Inc.  
Patient2Patient, LLC  
Pradot Technologies  
Pro-Change Behavior Systems, Inc.  
QuitNet  
Resources Online  
Robert Wood Johnson Foundation  
Saint Francis Hospital and Medical Center  
Salix Ventures  
Semel Institute for Neuroscience and Human Behavior at UCLA  
Simon School of Business, University of Rochester  
SmokeSignals  
St. Cloud Communications  
Stanford Patient Education Research Center  
State of Wisconsin/Division of Public Health  
SymTrend, Inc.  
TC Software, Inc.  
The Launch Pad  
Thomas Jefferson University  
UC Berkeley  
UCSD PACE Research Group  
UnitedHealthcare  
University of Rochester Center for Future Health  
University of Vermont  
US Department of Health and Human Services  
Vida Health Communications, Inc.  
Vivus Consulting Inc.  
Wellington Management Company, LLP  
Wellogic  
WGBH Boston  
WGBH Educational Foundation  
Wolf Greenfield

## Appendix B. Best eHealth Research Paper Award

The annual Best eHealth Research Paper Award, consisting of a plaque and \$1000, recognizes the best eHealth-related research conducted within the past year. The purpose of the award is to highlight and promote the application of scientific research methods for identifying effective eHealth solutions. A national call for papers was issued for eHealth research studies reporting on work completed during the previous one-year period. The Award is sponsored by the Health e-Technologies Initiative, a national program of the Robert Wood Johnson Foundation.

A review panel selected the top five papers for presentation at the Summit. Criteria for paper selection included 1) quality, originality, and timeliness of the study; 2) scientific rigor of the study design, analysis, and interpretation; 3) potential impact of study results to similar applications and the eHealth sector; and 4) clarity of writing and organization of the abstract. In addition to these evaluation criteria, presenters were judged on the quality and clarity of their presentation, and their ability to answer questions from the audience.

The five papers selected for presentation at the Summit were:

*Arthritis Self-Management Online: A Randomized 6-Month Trial.* Kate Lorig, Diana Laurent, Kathryn Plant, Philip Ritter, Stanford University of Medicine

*CLINDOC - a Software Tool for Detection of Clinical Inertia in Management of Hypertension through Analysis of Free Text Physician Notes.*

Alexander Turchin, Partners HealthCare System, Inc.; Merri L Pendergrass, Brigham and Women's Hospital; Jonathan S. Einbinder, Partners HealthCare System, Inc.

*An Efficacious eHealth Application of At-Risk Adolescents.* Marguerita Lightfoot and Gabriel Stover, UCLA Department of Psychiatry; Victor LaCour, USC Viterbi School of Engineering

*Impact of Patient-Centered Decision Support on Quality of Asthma Care in the Emergency Department.* Stephen Porter, Peter Forbes, Henry Feldman, Donald Goldmann, Children's Hospital Boston

*Weight Loss on the Web: A Pilot Study Comparing a Commercial Website to a Structured Behavioral Intervention.* Beth Casey Gold, University of Vermont (UVM); Susan Burke, eDiets.com; Paul Buzzell, UVM; Stephen Pintauro, UVM; Jean Harvey-Berino, UVM

The review panel awarded the "Best eHealth Research Paper Award" for 2005 to Beth Casey Gold from the University of Vermont.

### Research Presentation Review Panel

Kerry Evers, director of Health Behavior Change Programs, Pro-Change Behavior Systems, Inc.  
Christopher Sciamanna, associate professor, Department of Health Policy, Jefferson Medical College  
Pam Whitten, associate professor, Department of Telecommunications, Michigan State University



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