

eHealth Overview

Evolution of the eHealth Space

Stan Bernard, MD, MBA

Consider the following: More than a quarter of a billion Internet users worldwide send an average of eight billion e-mail messages each day to 263 million e-mail boxes. Of those Internet users, 110 million are Americans, 70 million of whom have searched the web during the past year for health information. Those “healthmed retrievers” are more likely to be female, more affluent, better educated, and in their forties. They typically search the web for information on diseases, nutrition, pharmaceuticals, and related topics. Even when using the top search engines, healthmed retrievers will only average finding about 17 percent of the relevant information on the web. Increasingly, they are turning to health care portals and other content sites for health care information. Currently, consumers can choose from more than 20,000 health care sites; every month, 1,500 additional health care sites come online.



The growth of “eHealth” has paralleled—and in many ways helped drive—the growth of the Internet. eHealth refers to those sites or entities leveraging the Internet to provide health care information, products, technologies, or services. Those four offerings, in turn, form the basis for segmenting the eHealth space into four markets: content, commerce, connectivity, and an emerging segment that I have termed the “care space.” (See “eHealth Segments.”) This article

defines and describes the evolution of each eHealth space, highlighting the key subsegments, players, strategies, metrics, challenges, and future trends.

Content Counts

The content space includes those sites that offer health and disease information, online communities, and, in some cases, simple self-care tools. The most popular content sites are portals. Portals include two major categories: consumer and health care profes-

sional. Consumer portals consist of commercial portals and organizational portals. Leading commercial portals include DrKoop.com and OnHealth. Various types of health care organizations have also developed consumer portals, including managed care organizations such as Kaiser Permanente's KPOne.org; hospital systems such as MayoHealth.org; government agencies such as FDA.gov; and advocacy groups such as AmericanHeart.org.

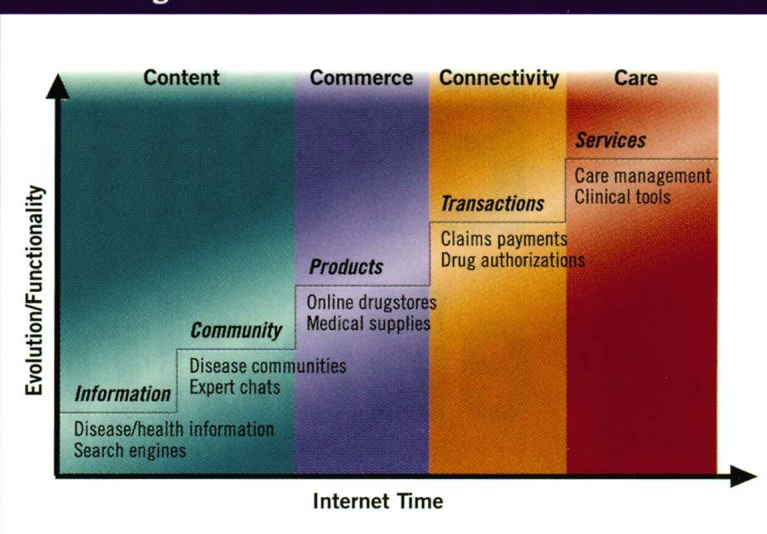
Professional portals include Medscape and WebMD. Increasingly, the portal space is converging: the professional sites are creating associated consumer portals like Medscape, and the consumer portals are licensing their content or co-branding their sites with organizational portals. Licensing content, e-commerce transaction fees, and advertising—for example, banner ads or site sponsorships—are the primary revenue sources for portals.

Because advertising revenue is so important, portals usually are measured in number of visitors to the site, or "eyeballs." Specific viewer metrics include unique and total visits to the site, time on site, unique and total page views, and ad impressions. Other performance metrics for portals are advertising/sponsorship revenues and licensing fees; Internet exposure or "footprint," measured in syndication or links to other sites; and the "buzz" surrounding a particular site, usually gauged by media coverage.

Portals have used a variety of strategies to attract eyeballs and create buzz. Originally called "Empower Health," DrKoop.com used a "key man strategy," changing its name to take advantage of its celebrated co-founder and former U.S. Surgeon General. DrKoop.com built on its name-sake's reputation to position itself

There will be a significant "e-shake-out" among health care portals.

eHealth Segments



Source: Stan Bernard, MD, MBA

The eHealth space has traditionally been divided into the three 'C's'—content, commerce, and connectivity. A fourth space, the care space, is emerging to provide Internet-based care services.

as the "trusted source" among eHealth portals. Other sites have used the "halo strategy" by affiliating with respected medical institutions, such as The Mayo Clinic (MayoHealth.org) and Johns Hopkins Medical Center (Intelihealth.com).

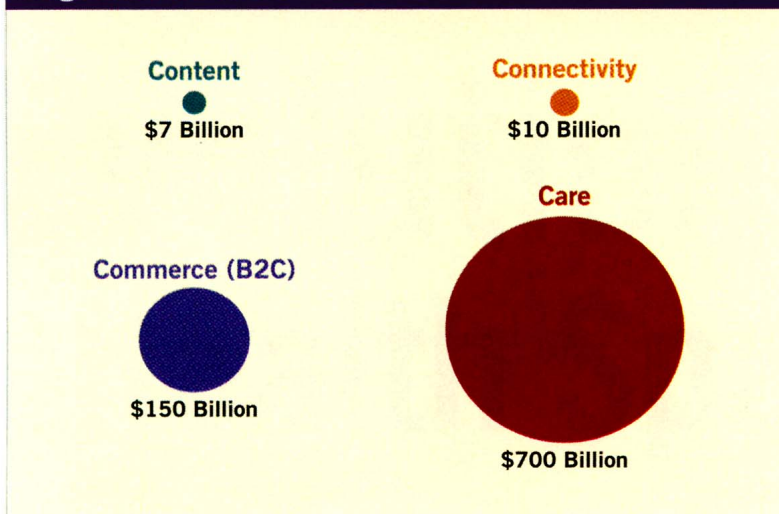
Health care portals have also used more traditional Internet strategies, including "first mover" advantage, public relations and advertising campaigns, and strategic partnerships with online and offline players. Several portals have forged high-profile strategic alliances with major media players (CBS-Medscape, WebMD-News Corp.) and leading portals or Internet service providers (America Online-DrKoop.com).

Recently, portals have received criticism for bias and inaccuracy in their health care content offerings. As a result, a number of other internal and external initiatives are under way to ensure objectivity and quality of content, particularly in light of studies revealing that a significant percentage of web-based health care

content is incorrect or out-of-date. A second major challenge for eHealth portals is whether they have a sustainable revenue model. Advertising dollars are harder to come by as health care content becomes a free and ubiquitous commodity; competition increases as 1,500 new content sites come online monthly; and pharmaceutical companies and other advertisers question the effectiveness of banner ads and site sponsorships.

There will likely be a significant "e-shakeout" among portals as they consolidate to build eye-share and acquire complementary content offerings. Commercial consumer and physician portals will partner with and license content to hospital and physician sites to reach patients locally. Portals will also move to personalize and customize their offerings to retain viewers, perhaps by partnering with care management sites that offer patient-specific information, instructions, and professional expertise.

Target Market Sizes



Source: Hambrecht & Quist HealthNet Industry Report; HFCA; Stan Bernard, MD, MBA

The care space has the market potential to be larger than the other three eHealth spaces combined.

Commerce Consolidation

The commerce space refers to those sites or companies that offer web-based abilities to research, compare, and purchase health care products. There are two models of commerce companies: business-to-consumer (B2C) and business-to-business (B2B). To date, the B2C space has been dominated by the high-profile activities of the online drugstores, or "e-tailers."

In fact, no eHealth space has consolidated as quickly as the online pharmacy space. In the first half of 1999, there were three "hot ramp" online drugstores launched: Soma.com, Drugstore.com, and PlanetRx. At that time, the offline pharmacy space was led by three bricks and mortar pharmacy chains (CVS, Rite Aid, and Walgreens) and three pharmacy benefit management companies or PBMs (Merck-Medco, PCS, and Express Scripts). The online drugstores soon realized that they needed the support of PBMs to obtain insurance reimbursement for online prescription pharmaceutical pur-

chases. Simultaneously, the offline players recognized the potential efficiencies and consumer appeal of Internet-based pharmacy sales.

Within six months, those three distinct segments converged, resulting in the formation of three "clicks, bricks, and claims" coalitions: CVS/Soma/Merck-Medco; Rite Aid/Drugstore.com/PCS; and Planet Rx/Express Scripts. Those three coalitions and other smaller players are vying for the approximately \$150 billion in potential sales from the pharmacy, OTC, and health and beauty product categories.

Other B2C plays have targeted health care insurance products (HealthAxis.com) or physician products, including medical books or "doctor's bag" equipment (Medsite.com). B2C sites measure performance by site traffic, purchase rate trends (for example, buy-to-browse conversion rates), average order size and price, total revenues, and margins.

In contrast to the B2C space, the eHealth B2B space has evolved more slowly and used different business models. However, the "B2B Boom" is coming: For-

rester Research predicts that within five years, online B2B sales will soar to \$348 billion. New B2B business models, called electronic hubs or market makers, are catalyzing that sales surge.

There are two different types of electronic hubs. Vertical hubs focus on sales of products in a particular industry segment or subsegment. SciQuest.com is a vertical hub that sells laboratory supplies to companies conducting life sciences research. Functional hubs mediate business transactions that are common across industries, such as employee benefits management like Employeease.com.

There are several different models of vertical and functional hubs. Catalog models such as MedicalBuyer.com sell large volumes of smaller-ticket items like medical supplies. Auction models such as Neoforma.com typically offer nonstandard, used, or decommissioned products like medical equipment. Exchange models such as Promedix.com are used for near-commodity or hard-to-find specialty items.

Increasingly, traditional, offline health care intermediaries, such as group purchasing organizations, for-profit hospital chains, and distributors, are jumping into the B2B space. Bergen Brunswig, a large distributor, has announced plans to create an online auction for blood products and other items. To stay ahead, Internet-based B2B hubs will converge to offer diverse business models and product offerings. Neoforma now offers medical product catalogs in addition to its used medical equipment auction. Chemdex, a life sciences vertical hub, recently acquired Promedix.com, a health care products hub.

B2C players will also be diversifying their product offerings and abilities to maintain market leadership. Drugstore.com recently

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Distinctions		
Space	First Generation Content	Second Generation Care
Objective	Better information	Better health
Primary offering	Information	Services
Information attributes	Generic	Patient-specific
	Third-party-validated	Provider-validated
Interactions	Consumer–consumer	Patient–provider
Revenue models	Advertising	Reimbursement
	Sponsorship	Subscriptions
Market opportunity	\$7 billion	\$700 billion

Source: Stan Bernard, MD, MBA

The first-generation content sites offer general health information and consumer–consumer communications, while the second-generation care sites provide patient-specific clinical information and patient–provider interaction.

acquired Beauty.com, a seller of high-end cosmetics. However, the biggest challenge going forward for online drugstores will be government regulation. Concerns about the legitimacy and legality of some online pharmacies will spur increasing government oversight. That high-profile regulatory activity will actually legitimize and enhance the leadership positions of the major online pharmacies, including CVS.com, Drugstore.com, and PlanetRx.

Connectivity Links

The connectivity space refers to web-based transaction processing, communications, and networking. Connectivity companies have the potential to be an affordable, ubiquitous, and practical solution to the enormous challenge of managing health care data transactions and communications. In fact, one-seventh of all data transmissions in the United States are related to health care. Annually, there are 30 billion eligibility, claim, laboratory, and referral

transactions in health care.

The goal of connectivity companies is to link parts or all of the major health care stakeholder segments electronically—payers, providers, and patients—to share and communicate pertinent administrative, financial, and clinical information. Some of the major eHealth connectivity players include CareInsite, Healtheon/WebMD, and Pointshare. They are competing with the traditional, offline technology vendors such as McKesson/HBOC and IDX that are transitioning their products to the web.

The new connectivity companies are using different strategies to penetrate the market and build the critical mass necessary to create an online community of health care stakeholders. First-mover advantage and rapid customer adoption are critical success factors because the value of connectivity increases exponentially with the number of users. Some of these companies are taking a

“build the field” approach: create an information infrastructure and encourage providers and others to adopt it. Others are using a “work the field” approach: partner or merge with an offline technology vendor that has an installed base of users, particularly physicians. CareInsite is 72 percent owned by Medical Manager, which has 120,000 physicians using its practice management systems. Connectivity players are also targeting different geographic demographics: some, like Healtheon, are taking a national approach while others are pursuing regional (CareInsite) or local (for example, PointShare) markets.

Currently, the primary revenue streams for these companies are transaction costs, licensing and service fees, and commissions. However, a subscription revenue model will likely emerge over time. The key performance metrics for assessing connectivity companies include total revenues; the total number and costs of transactions; and the number, types, and concentration of electronic partners (physicians, hospitals, labs, etc.). High concentrations of electronic partners in a particular locale are more valuable because health care delivery remains a local phenomenon.

The connectivity companies face many challenges in trying to link health care stakeholders, including physician resistance to computerization, concerns regarding patient confidentiality, the fragmentation of health care data, and difficulty transitioning from legacy systems. Consequently, most of the connectivity companies have focused on a limited number of processes, such as connecting payers and providers for claims processing.

However, even web-based claims processing has proven to be so elusive that Healtheon recently purchased Envoy, a large

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offline electronic claims processing company, to catalyze its efforts in that area. Although Internet connectivity shows great promise, it will take significant time before the industry sees systemwide real-time claims processing and remittance, widespread use of computerized health records, and extensive communication and care integration among health care professionals.

Care Emerges

There is an emerging fourth segment, the care space, which includes those entities or sites that are leveraging the Internet to record, measure, monitor, manage, and deliver care. The care space market potential is projected to be \$700 billion, 10 times the potential market size of the content space. (See "Target Market Sizes.")

The care space differs from the content space in several important ways. (See "Distinctions.") The most important differences are that the information in the care space is patient- and condition-specific and comes from a patient's own health care provider. Also, care sites deliver health services, not just information.

The care space is divided into two categories. Care management companies provide comprehensive patient care services by leveraging the Internet. Those companies typically offer disease-specific training, clinical tools, and assistance from health care professionals. The companies may be clicks and mortar models that provide online and offline services, for

example Accordant.com, or "clicks only" companies like DiabetesWell.com.

Care tools companies provide clinical interventions to support health care delivery services. They usually have recording, monitoring, or measurement capabilities. WellMed.com provides an online, patient-generated health record. ImpactHealth.com offers a variety of Internet-delivered health risk assessments, point-of-care home tests such as colon cancer screening, and monitoring devices such as web-based glucose monitoring instruments.

Care sites generate revenue primarily from third-payment insurance reimbursement or consumer out-of-pocket subscriptions. Other potential sources of revenue include e-commerce transaction fees such as online drug purchases, and licensing fees. Key metrics used to analyze care sites include the number of enrolled patients; length of time managed; clinical, economic, and quality-of-life outcomes; and patient satisfaction measures.

Legal and regulatory issues are the biggest challenges for care sites. Patient care services delivered through the Internet must be provided by clinicians licensed in the patient's state. In the future, it is likely that the government will take legislative action to facilitate web-based care services delivered by a patient's own providers. Other future trends include the substitution of telemedicine services with Internet-delivered services, particularly as broadband technologies become more devel-

oped. For example, Image Medical enables radiologists to take and receive x-rays via the Internet that are comparable to those delivered through telemedicine installations.

These second-generation care sites will increasingly partner with first generation health care portals that are looking to add highly "sticky" applications. In fact, convergence across eHealth spaces will dramatically change the virtual landscape to the point where the industry will no longer be able to distinguish sites as members of the content, commerce, connectivity, or care spaces. That reshaping of the eHealth space will likely happen in Internet time. ■



Stan Bernard, MD, MBA (SBernardMD@aol.com) is president of Bernard Associates, an eHealth business consulting firm providing strategic planning, business development, and marketing services. Dr. Bernard teaches the eHealth course at the Wharton School of Business and writes a monthly column, "Health eTrends," for *Internet Healthcare Strategies*.