An Immature Industry

As industries mature, they tend to consolidate and standardize. Over time, a dominant design often emerges, while other designs wither. The once diverse American automotive industry has long since consolidated into The Big Three. Apple eventually switched from manufacturing computers with PowerPC processors to manufacturing computers with x86 processors, like its competitors. Standardization and consolidation are signs of industry maturation. As of February 2007, the diversity of available systems for storing Personal Health Records—patient-maintained medical information accessible on the Internet, regardless of where a patient is seeking care— is a strong indicator that consolidation and standardization have yet to occur. This fact was best summarized by the U.S. Department of Health and Human Services, which stated "Currently, PHRs and their associated health management tools are heterogeneous and evolving. There is no uniform definition of 'personal health record' in industry or government."[1]

During the first decade of the 21st Century, many of America's largest Managed Care Organizations (MCOs) were in the process of developing Personal Health Record (PHR) systems for use by their clients. The PHR systems available in 2007 were highly diverse in their capabilities and status in the development cycle. While many of the PHR offerings were promoted by MCOs, there were also PHR systems under development by third parties. Although many MCOs felt at the time that they were best equipped to be the owners of PHRs, in my opinion, the majority will ultimately not succeed in retaining ownership of them.

[1] "Personal Health Records and Personal Health Systems: A Report Recommendation from the National Committee on Vital and Health Statistics." U.S. Dept. of Health and Human Services. Feb. 2006. p. 6.

While MCOs had excellent access to information on the medical care of patients, they did not have high continuity in their subscriber base. Subscriber churn potentially reduces the return on investment for MCOs that have created PHR systems, as it is estimated that membership churn is often around 25% per year.[2] Likewise, if PHRs were not designed to be portable from MCO to MCO, subscribers would have a poor return on investment from the time spent inputting their data. If full portability were to have existed, MCOs would have had a reduced return on investment, as they would not have been able to offer PHRs as a competitive advantage, or have used them to drive vendor lock-in. If MCOs were to have created portable PHRs, they would have been only useful in advancing the technological frontier, possibly increasing the quality of medical care across the board.

Who should control Personal Health Records?

Personal Health Records offer benefits to patients, employers, providers, and health plans. Each of these stakeholders has a vested interest in insuring that an adequate PHR system exists. Employers have a vested interest in PHRs, as illness-related absenteeism is bad for business. Furthermore, employers funding ERISA-style self-funded health insurance have an economic incentive to invest in any technology that will reduce improper or error-related utilization. When MCOs have had been liable financially for any unnecessary or error-induced utilization, they too have had the incentive to invest in PHRs.

[2] Caroll, John. "Health Plans Demand Proof That DM Saves Them Money." Managed Care. Nov. 2000. <http://www.managedcaremag.com/archives/0011/0011.dm_roi.html>

Managed Care Organizations (MCOs) often see themselves as the natural owners of PHRs. As MCOs process medical claims, they have access to claims data that can be used to populate PHRs. Auto-populated data is likely to be of very high quality, as clinicians have a financial incentive to avoid omitting any possible billable claims. (Unfortunately, they also have an incentive to "upcode"—to assign patients diagnoses that are both more severe and more costly.) MCOs are likely to have many more members than most companies have employees. As a result, they can achieve economies of scale in creating a PHR infrastructure, or possible receive volume pricing when licensing an infrastructure from someone else.

One of the problems that MCOs face when offering PHRs to their members is churn in enrollment. As a result, MCOs face a dynamic membership base. People are much more likely to change MCOs in a given year than they are to change jobs, and whenever people change jobs, they nearly always change MCOs. If data cannot be easily migrated from one PHR system to another, members may not be willing to reenter data after having entered it once. In February 2007, users were seldom willing to enter data, even though most had not experienced PHR churn, as PHRs had only been briefly in existence. According to Forrester Research Inc., although "28% of all U.S. consumers report tracking their health information in some form of a medical record, only 7% say they are taking advantage of the personal health records (PHRs) offered by their health plan."[3] Thus, if resistance to data reentry occurs, once most MCO members have churned plans once, PHRs will only be populated with the claims data from the most recent MCO. To reduce this problem, MCOs can make their PHR data exportable, so that it can be

[3] "Today in E-Health Business." AIS E-Health. 6 Feb. 2007. <http://www.aishealth.com/EHealthBusiness/020607.html>

inputted easily into other PHR systems, in the event that a member changes plans. However, MCOs have the incentive not to make their PHRs exportable in order to increase their user lock-in. In the individual health plan market, there may be stronger resistance to changing plans among those who have PHRs but cannot export them than among individuals without PHRs or with exportable PHRs.

Due to issues related to high health plan churn, it may appear more sensible for PHRs to remain under the control of employers. Employer-based PHRs present problems of their own. Many employers do not want to have access to the medical histories of their employees, as having such access could increase their liability in the event of a discrimination lawsuit. By knowing as little as possible about the health of individual employees, an employer can shield itself from allegations of health-based discrimination.

While large employers may have the resources to develop their own PHR systems, small employers are unlikely to have the resources to develop PHR systems for their employees. Thus, if they are unable to provide such systems through their health plan providers, they must license with a third-party provider to offer them. In firms with only a handful of employees, the efforts involved in such licensing may outweigh the administrative and financial costs.

Since there are disadvantages to personal health records being held by either the employer or the health plan, there is a market for their third-party management. Third party providers have the benefit of neutrality. When employers change health plans, they can potentially continue to use the same third-party PHR system. If an employer has licensed a third-party system, it can isolate itself from the problems created as a result of having access to data on employee health.

Third-party providers solve one of the biggest conundrums faced by health plans: how to receive data from a member's pre-existing PHR. If two health plans utilize the same third-party PHR provider, it should be easy for health plans to exchange data with each other. However, this cannot occur unless third-party providers insist upon reciprocal data sharing agreements for their licensees.

While third-party providers help ensure interoperability, they also turn PHRs into a commodity. If a company is deciding between two health plans that have both licensed the same PHR, the PHR ceases to be a factor in the company's choice of health plan. Although third-party licensing makes PHRs an expense and not a competitive advantage, licensed PHRs may still be beneficial if they are shown to reduce costs.

In theory, either the employer or the health plan could license a PHR system from a third-party provider. The benefit of having the employer license such a system is that they could have guaranteed continuity of personal health records in the event that they changed health plan providers. As was mentioned earlier, this may be a dangerous strategy, however, if it places employers in contact with sensitive medical information about their employees. If an employer licensed a PHR system, it would be very important for them to have reached an agreement with their health plan provider to populate the system with claims data. While health plans might be willing to make special arrangements to provide very large customers with claims data, it is unlikely that they would be willing to accommodate smaller customers. This problem, too, could be circumvented if there were a standard format by which health plans provided PHRs with claims data. Due to all of these theoretical difficulties, at the moment, most PHRs are being domiciled at the health plan, or at a third-party licensed by the health plan.

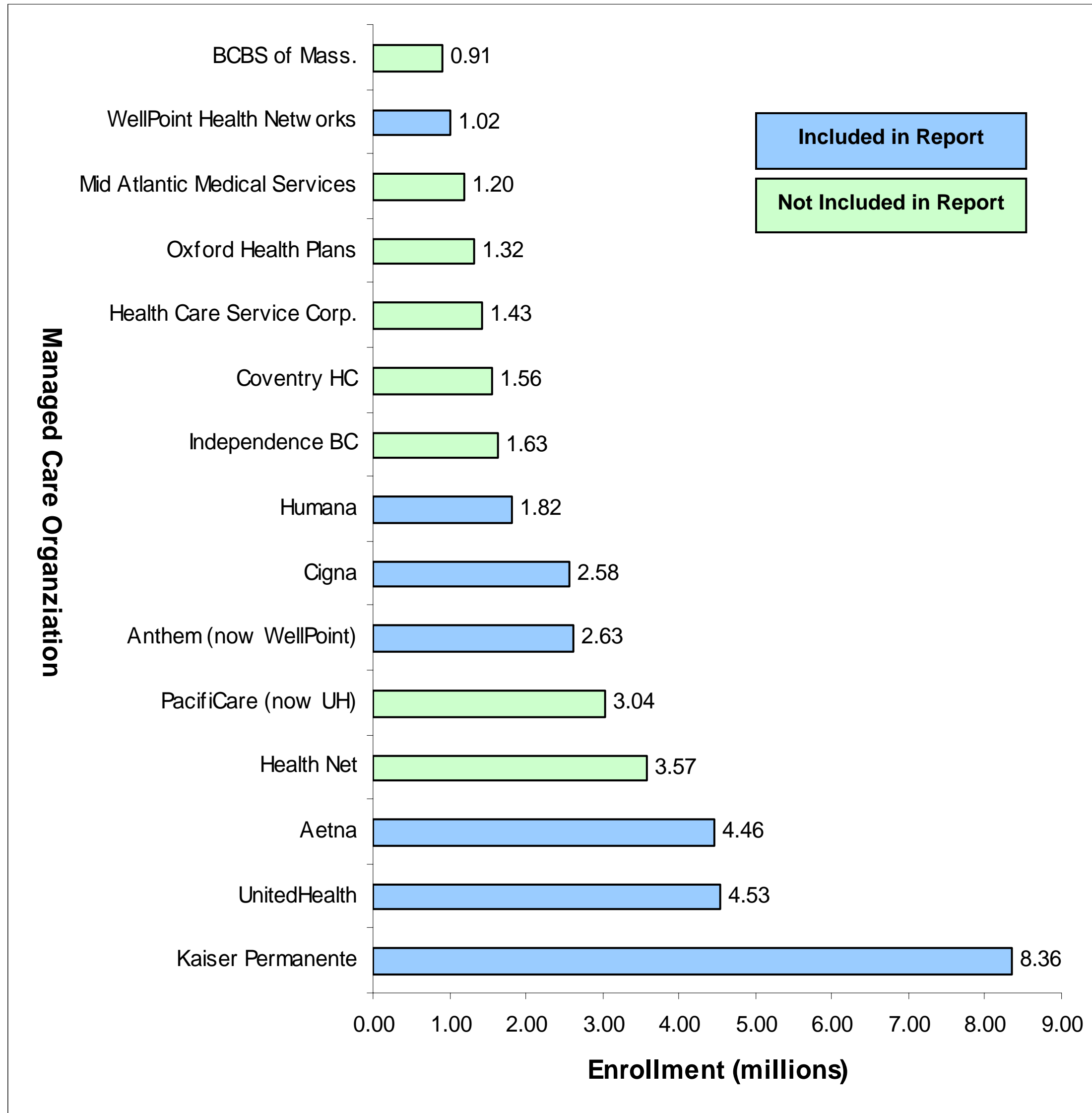

Figure 1: Managed Care Organizations, by 2002 Enrollment[4]

In order to support these claims, this paper examines the status, as of February 2007, of Personal Health Record systems at several of America's largest Managed Care Organizations. The systems varied greatly in their capabilities, completeness, and value. Through understanding the state of the industry in 2007, we can better project the long-term sustainability of these efforts.

[4] "Largest Managed-Care Organizations." Modern Healthcare. 21 Apr. 2003. Vol. 33, Issue 16, p. 30.

Aetna

Aetna began its electronic efforts by partnering with ActiveHealth Management on October 10th, 2002. ActiveHealth Management offered CareEngine® Service (later referred to as CareEngine® System), a decision support system that enabled Aetna to analyze its claims, laboratory, and pharmacy data.[5] The decision support system provided evidence-based care suggestions, which were made on the basis of the information that Aetna had on file about the patient. These suggestions were then sent to the patient's clinician in order to improve the quality of care and reduce errors. At this time, Aetna offered the services of CareEngine® System using the private label name MedQuery℠.[6]

On May 13th, 2005, Aetna acquired ActiveHealth Management. The CareEngine® System gave Aetna the access to the data that it needed to create automatically populated Personal Health Records for members. On October 3rd, 2006, Aetna announced the future availability of a CareEngine-powered PHR. Using this technology, by January 2007, Aetna had offered its members a basic online Health History Report generated from claims data. A month later, Aetna began testing a more comprehensive PHR system. Aetna anticipated that patients would bring printed copies of their PHR to their clinicians during medical visits, in an attempt to improve the transparency of their medical histories. In order to protect the time investment of the member in the PHR, the information was portable to other PHR systems.[7] Although the exact content of Aetna's PHR system was not known at the time of writing, as it had yet to be fully deployed,

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[5] "Aetna Selects ActiveHealth Management's CareEngineSM Service To Support Physicians' Efforts To Improve Clinical Outcomes, Reduce Medical Errors." Aetna. 10 Oct. 2002. <http://www.aetna.com/news/2002/pr_20021010.htm>

[6] "Aetna to Acquire ActiveHealth Management." Aetna. 13 May. 2005. <http://www.aetna.com/news/2005/pr_20050513.htm>

[7] "Aetna Introduces Powerful, Interactive Personal Health Record." Aetna. 3 Oct. 2006. <http://www.aetna.com/news/2006/pr_20061003.htm>

Aetna contemporaneously offered access to information about the cost of care and practitioner quality through other sites.

Anthem Blue Cross and Blue Shield (Subsidiary of WellPoint)

Anthem's online personal health solution, MyHealth@Anthem, utilized technology licensed from WebMD. Anthem's site was hosted on the server webmdhealth.com, making the licensing very transparent to users. Anthem had labeled its service a "Personal Health Manager," and considered a PHR to be one of the components of its offering. According to Anthem's promotional materials, MyHealth@Anthem featured "thousands of health and wellness articles, newsletters, tools, and databases."[8] In order to accommodate America's increasingly Hispanic population, much of the content on the site was additionally available in Spanish. The site contained a medical questionnaire, a prescription and over-the-counter medication history, a vaccination history, and a test result history. Users could elect to have the site automatically populated with claims data.

MyHealth@Anthem allowed for several modes of communication. Data from the site could be communicated with clinicians and family members by printing out the information contained on it. Members could interact with each other through anonymous forums, enabling them to discuss their conditions with others who may have undergone similar experiences. Communication with Anthem occurred through a secure, private messaging center. Reminders were sent through the messaging system when vaccinations were overdue or routine tests needed to be conducted.

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[8] "MyHealth@Anthem Online Service for Anthem Blue Access Members" MedPlan Access. <http://www.medplanaccess.com/anthem/myhealth@anthem.htm>

Several of the features of MyHealth@Anthem promoted behavioral change. The site contained health trackers enabling people to monitor their achievement of numerical health objectives (weight loss, cholesterol maintenance, etc). Members were encouraged to increase their physical activity through LEAP® (Lifetime Exercise Adherence Program), which created an exercise program customized to the individual needs of a member. The "Ready, Set, Stop!" smoking cessation program assisted members in tracking their efforts.[9]

CIGNA

CIGNA offered online services to its members through its website, myCIGNA.com. Like the site provided by Anthem, myCIGNA.com "helps consumers manage health care benefits and provides access to WebMD's suite of health information and decision support tools."[10] On February 19th, 2007, CIGNA unveiled a redesigned version of its myCIGNA.com site. The revised site featured medical and dental claims data, as well as information on expenditures occurring from a member's Flexible Spending Account, Health Savings Account, or Health Reimbursement Account. Just as many cellular telephone carriers had made utilization information easily accessible through their websites; CIGNA increased the ease with which members could determine their medical expenditures. CIGNA's site also provided online access to common forms and a means for printing ID cards.[11]

Overall, the site was geared towards users of consumer directed healthcare. In order to help members more efficiently access care, the revised site featured a provider

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[9] "MyHealth@Anthem Demo." Anthem. <http://www3.anthem.com/flashtour/MyHealth/index.html>
[10] "myCIGNA." CIGNA. <https://my.cigna.com/corp/portal/app/member/public/guest>
[11] "myCIGNA Relaunch." CIGNA. <http://www.cigna.com/myCIGNArelaunch.html>

directory that displayed quality and cost-effectiveness information on in-network providers. A hospital comparison tool enabled members to select the care facilities best suited to their needs. Members were also provided with tips for decreasing out-of-pocket expenditures. In order to help consumers make decisions, the CIGNA Health Advisor medical decision assistance tool was offered. When more human advice was needed, members could speak to a registered nurse through the CIGNA HealthCare 24-Hour Health Information Line.[12]

The myCIGNA.com site also provided tools to help members educate themselves about their own health status through the HealthQuotient™ risk assessment system and the Healthwise® medical encyclopedia. Condition-based content was also available on the site.

Kaiser Permanente

In 2005, Kaiser Permanente deployed HealthConnect, a system that integrated a PHR with other features that took advantage of Kaiser's unique dual status as payer and provider. The HealthConnect system enabled members "to schedule appointments, refill prescriptions, request advice, access a health encyclopedia," and manage their benefits.[13] Kaiser Permanente felt that it had to construct its very own PHR system in order to assure that the system would be adequately integrated into the Kaiser Permanente delivery system. For instance, Kaiser Permanente members were able to manage their benefits and financial transactions via the HealthConnect system; two features not typically contained in PHR systems. While Kaiser Permanente claimed that members would be able to

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[12] "Getting to know myCIGNA." CIGNA. <http://www.cigna.com/gettingtoknowyou.pdf>
[13] Wiesenthal, Andrew M. "Personal Health Records—Barriers and Benefits, Real and Imagined: Testimony for the Department of Health and Human Services." Kaiser Permanente. 5 Jan. 2005.

migrate their data to other providers, they simultaneously stated that “the PHR itself is not freely moveable.”[14] Like many other such systems, HealthConnect provided members with recommendations for managing their chronic conditions and reminders to receive preventative care.[15]

Kaiser Permanente’s HealthConnect initiative was not universally praised. On November 6th, 2006, Cliff Dodd, Senior Vice President and Chief Information Officer for Kaiser Foundation Health Plan Hospitals resigned. He had been responsible for creating the HealthConnect “automated medical record system.”[16]

At the time of Dodd’s resignation, there were several allegations posted on the Internet that Kaiser’s HealthConnect system was more designed to fill a marketing niche than to properly function in the delivery of quality medical care. According to one anti-Kaiser site, “HealthConnect is not a system: it's a fancy new label for a motley collection of old ‘legacy’ applications combined with some new components from a vendor called Epic.”[17] The site continued to allege that Kaiser Permanente had combined Epic’s billing module with pre-existing systems, and then simply grafted a new user interface on top of it. The extensive use of legacy systems caused HealthConnect to have a set of application programming interfaces (APIs) that were difficult to utilize, and offered inefficient and incomplete access to data.

There were allegations that the deficits in HealthConnect had resulted from managerial impropriety, and had negatively impacted Kaiser Permanente’s delivery of

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[14] Wiesenthal, Andrew M. “Personal Health Records—Barriers and Benefits, Real and Imagined: Testimony for the Department of Health and Human Services.” Kaiser Permanente. 5 Jan. 2005.
[15] “In-depth focus: Kaiser Permanente HealthConnect.” Kaiser Permanente. <http://ckp.kp.org/kpindepth/archive/indepth_key_points.html>
[16] Halvorson, George C. “Kaiser Permanente Memorandum – Re: Cliff Dodd Resignation.” Kaiser Permanente. 6 Nov. 2006. <http://www.kaiserthrive.info/pdfs/DoddThrownToWolves.pdf>
[17] “HealthConnect: Kaiser Swindling Congress.” Kaiser Papers Hawaii. 9 Nov. 2006. <http://www.kaiserpapershawaii.org/waste.htm#HC>

care. One Kaiser Permanente employee, Justen Deal, sent a mass e-mail to his fellow employees complaining that CEO George Halvorson had wasted money by dumping Kaiser Permanente's previous IT initiative.

> *On George Halvorson's first day here, he cancelled KP's existing project to implement electronic health records. He wrote off the $442 million KP-CIS system that we had built with IBM. Instead of continuing to build on KP-CIS, Mr. Halvorson selected a company he was quite familiar with, Epic Systems of Wisconsin. Mr. Halvorson had also pushed through the selection of Epic at the health plan he previously had led, in Minnesota.*[18]

He further alleged that Dodd had a conflict of interest when he consulted Tanning Technology (at the cost of $1 million) to assess the viability of using the Epic system. At the time of the consultation, Dodd had simultaneously served as a director for Tanning Technology. Dodd had justified the decision to use the Epic system instead of the KP-CIS system built with IBM by stating, "We're not a systems company…. It's a waste of our time to write our own programs. We can get what we need off the shelf."[19] Deal did not agree with Dodd's assessment of the situation and decided to take matters into his own hands.

Deal alleged that outages of the Epic system had "increased from just over 9,000 user hours per month in June [2006] to over 59,000 last month [October 2006]." When commenting on Deal's allegations, the blogger *meilin71* wrote:

> *As an employee at the only Northern California Kaiser that has gone live in the inpatient setting. The Health Connect outages now called "code white" are dangerous to patient care. The Key is that THERE IS NO BACKUP. When the system is down, RNs cannot lookup key information like vitals, lab work, medication orders. THERE IS NOTHEING ON PAPER. We may not know what*

[18] Deal, Justen. Internal Memorandum. <http://histalk.blog-city.com/internal_email_criticizing_kaisers_healthconnect_lands_emplo.htm>
[19] Rothfelder, Jeffrey. "Growing Pains – Pulling Kaiser's IT Out of Intensive Care." CIO Insight. 15 Oct. 2005. <http://www.cioinsight.com/article2/0,1540,1875013,00.asp>

> *Mrs. Jones last blood pressure was, or when or what her next medication is due. This is scary!!!* [sic][20]

From this comment, it appears that the integrated nature of Kaiser Permanente's HealthConnect system was both its biggest asset and its biggest failing. Kaiser Permanente's CEO, George Halvorson, attempted to counter Deal's allegations in a letter. However, he inadvertently verified one of Deal's allegations. Halvorson wrote:

> *The e-mail writer used somewhat problematic outage numbers in his e-mail message. To show the rate of increase, he chose a uniquely and unusually low problem month for outages as his performance comparison base. That's a bit misleading. Our systems availability percentage goal by year end is 99.5 percent. For the last six months, we have been averaging 99.54 percent availability. That's significant progress since roughly a year ago when we were below 98 percent.*[21]

If the system were in fact experiencing 99.5% uptime, it would have been down on average 7.2 minutes per day. When the system had an uptime of less than 98%, it was unavailable on average over 28.8 minutes per day. These figures hardly indicate six-sigma quality, and were clearly unacceptable to people such as *meilin71*. In a medical environment where a few minutes delay in treatment can mean the difference between life and death, people have the right to be upset when they experience lengthy and frequent interruptions in accessing critical information.

Kaiser Permanente had hoped to weave one IT infrastructure, which included a PHR, throughout its entire system. When that IT system faltered, the organization struggled to continue producing quality medical care. In 1990, Michael Hammer famously urged companies reengineering their processes to follow the maxim "don't

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[20] meilin71. "HealthConnect outages." LiveJournal: *corphq*.7 Nov. 2006. <http://corphq.livejournal.com/71838.html?thread=283550#t283550>

[21] Halvorson, George. Internal Memorandum. <http://www.kaiserthrive.info/pdfs/HalvorsonBlather.pdf>

automate, obliterate."[22] While reengineering its medical record management process, in a quest to produce an "automated medical record system," Kaiser Permanente obliterated its previous process and had nothing to fall back on when its system periodically malfunctioned.

UnitedHealth Group

UnitedHealth Group's UnitedHealthcare PHR was unique in that members were issued a "health card" from Exante Financial Services (the UnitedHealth Group bank), which documented both financial transactions and medical transactions. Members using the card could elect to have their usage information immediately populated into their online PHR, accessible at myuhc.com.[23] The myuhc.com portal featured a PHR that contained an automatically populated list of conditions, medications, procedures, laboratory tests, and allergies. Members could comment upon the automatically populated information, but could largely not modify it or add to it. However, members could add information about allergies and immunizations previously unknown to UnitedHealthcare.[24]

In addition to the PHR, myuhc.com contained a confidential health assessment designed to help members determine their health goals. To help people understand their care and treatment, myuhc.com provided information on common medical conditions,

[22] Hammer, Michael. "Reengineering Work: Don't Automate, Obliterate." Harvard Business Review Jul.-Aug. 1990. Reprint 90406.
[23] "Portable Personal Health Records Let Consumers Access Health History Anywhere, Anytime." Hub Magazine. Fall 2006. <http://www.hubmagazine.net/articles.php?ID=110>
[24] "My Personal Health Record." UnitedHealthcare. <http://www.welcometomyuhc.com/myuhc/phr/phr.htm>

treatments, and medications. Members were additionally provided with information on alternative and complementary medicine.

The UnitedHealthcare site contained interactive as well as static content. Members could consult with nurses online in order to better assess their medical needs. There were also chatroom-based events and classes featuring medical professionals. As members were becoming increasingly financially responsible for their care at the time of launch, the site featured a treatment cost estimator, as well as articles on how to pick a hospital and physician. Furthermore, members could view their previous claims and were shown both the total charge and their personal payment responsibility. A complete explanation of benefits was available on the site.

WellPoint (Blue Cross Blue Shield)

In May 2005, WellPoint launched a pilot program to offer members WebMD-based PHRs, under the name MyHealth Record. The pilot was deemed a success, and in September 2006, WellPoint announced that it would be offering PHRs to all of its members. WellPoint's Blue Cross of California division launched 360 Degree Health®, its PHR system, on February 7th, 2007.[25] Like many of the other WebMD-based systems, the WellPoint system was automatically populated with claims data, contained condition-specific content, in addition to tools for managing consumer driven health expenses. The site also enabled members to compare the cost and quality of providers.

The 360 Degree Health® initiative was designed to make medical information, such as the information stored in the PHR, accessible at all times. Members could access

[25] "WellPoint Takes the Personal Health Records Leap." Health Data Management. 1 Sept. 2006. <http://healthdatamanagement.com/portals/article.cfm?type=managed_care&articleId=13926>

the system via telephone, electronic mail, and the Web. WellPoint's member website helped promote investments in wellness by offering discounts on health products and gym memberships, as well as information on other non-virtual resources available to members.[26]

WellPoint rapidly realized the benefits of its PHR system after Hurricane Katrina destroyed the paper records of many of its members. In order to help out the affected members, WellPoint quickly produced PHRs for them using claims data, so that they would have access to their previous medical history as they reestablished their lives. [27]

Although WellPoint merged with Anthem in 2004, both continued to offer services under separate brands. It is perhaps not surprising that both have chosen to license WebMD's PHR technology. However, there may be some slight differences (marketing or functional) between the Anthem PHR and the WellPoint PHR, as Anthem makes no mention of a 360 Health® initiative.

What Exactly Did WebMD Offer?

Given the large role that WebMD played in the PHR solutions offered by many MCOs, it is worth exploring what WebMD was offering. WebMD was a company of many faces. Founded in January 1996 as Healtheon Corporation, the company renamed itself Healtheon/WebMD Corporation in November 1999, and then renamed itself WebMD Corporation in September 2000. WebMD offered a large array of services, of which health portals were but one component. In order to reduce confusion, WebMD

[26] "Blue Cross of California Announces Launch of 360 Degree Health(R)." Forbes. <http://www.forbes.com/prnewswire/feeds/prnewswire/2007/02/07/prnewswire200702071300PR_NEWS_B_MWT_CL_CLW020.html>
[27] "WellPoint Takes the Personal Health Records Leap." Health Data Management. 1 Sept. 2006. <http://healthdatamanagement.com/portals/article.cfm?type=managed_care&articleId=13926>

Corporation changed its name to Emdeon Corporation in November 2005, concurrent with the initial public offering of shares of its newly formed WebMD Health Corp. subsidiary. Upon the initial public offering, it was decided that the subsidiary would have sole use of the WebMD name.[28]

As of December 2005, Emdeon Corporation consisted of four operating units: Emdeon Business Services (formerly WebMD Business Services), Emdeon Practice Services (formerly WebMD Practice Services), WebMD (formerly WebMD Health), and Porex, a manufacturing division. Emdeon Business Services automated administrative and business functions for healthcare payers and providers, in addition to providing clinical communications services. It also provided decision support services, data warehousing, and consulting. Meanwhile, Emdeon Practice Services created information technology systems for use by healthcare providers. The systems enabled physician offices to automate billing, scheduling, and other administrative functions, as well as to maintain electronic medical records. Emdeon's Porex division manufactured porous plastic products for use in the healthcare industry and other industries. Porex also created finished goods for use in the medical device and surgical markets. [29]

The WebMD division of Emdeon Corporation was responsible for creating the PHRs licensed by many MCOs. It provided "health information services to consumers, physicians, healthcare professionals, employers and health plans through public and private online portals and health-focused publications."[30] Its public portals were

[28] "Form 10-K/A: Emdeon Corporation." Securities Exchange Commission. 31 Dec. 2005. p. F-10 <http://www.sec.gov/Archives/edgar/data/1009575/000095014406008386/g03056e10vkza.htm>
[29] "Form 10-K/A: Emdeon Corporation." Securities Exchange Commission. 31 Dec. 2005. p. F-10 <http://www.sec.gov/Archives/edgar/data/1009575/000095014406008386/g03056e10vkza.htm>
[30] "Form 10-K/A: Emdeon Corporation." Securities Exchange Commission. 31 Dec. 2005. p. F-11 <http://www.sec.gov/Archives/edgar/data/1009575/000095014406008386/g03056e10vkza.htm>

supported by advertising revenue, while its private portals were licensed to both employers and health plans. The private portals provided access "to personalized health and benefit information and decision support services." [31] The WebMD division also published medical textbooks, provider directories, and a consumer-oriented magazine for display in physician waiting rooms.

Although this report focuses on private portals licensed to MCOs, WebMD also licensed its portals to large companies and human resources outsourcing firms. For example, in 2004, WebMD agreed to license its portal to Fidelity Human Resources Services Company, a firm that provided human resources and benefits administration services to other employers. [32]

Conclusion

After having researched the Personal Health Record initiatives of several major Managed Care Organizations, it appears that there were two main approaches being taken. Companies either contracted with WebMD to handle their PHRs, or built a custom, internal system. Unsurprisingly, the MCOs that constructed their own PHR systems had far more members than the MCOs that those that licensed technology from WebMD. In general, software projects have a fixed development cost, and then next to zero marginal cost for each additional user. This cost structure creates economies of scale for firms with many members that simply do not exist for smaller firms. As a result, WebMD appears to have received the vast majority of the medium-to-small MCO market share for PHR

[31] "Form 10-K/A: Emdeon Corporation." Securities Exchange Commission. 31 Dec. 2005. p. F-11 <http://www.sec.gov/Archives/edgar/data/1009575/000095014406008386/g03056e10vkza.htm>
[32] "Form 10-K/A: Emdeon Corporation." Securities Exchange Commission. 31 Dec. 2005. p. F-52 <http://www.sec.gov/Archives/edgar/data/1009575/000095014406008386/g03056e10vkza.htm>

systems. Although the fate of this industry after February 2007 has yet to be determined, WebMD is far from immune from competition. Aetna, Kaiser Permanente, and UnitedHealthcare are all large MCOs that have independently created PHR systems. While they are currently not in the business of licensing them, they could do so if licensure became worthwhile.

What remains to be seen is what will happen when PHR users churn health plans. Will members diligently re-enter information, or will the PHR systems be sufficiently interoperable? Both are unlikely, as members are not very willing to enter their information once, and are thus not likely to be willing to enter it again. Furthermore, health plans do not have the incentive to create strong interoperability. (They do, however, have the incentive to market interoperability, as if they do not, people may be resistant to inputting their information.) The problem of interoperability is exacerbated by the lack of a clear definition of what a PHR contains. While many PHR systems have privacy policies that state that information inputted by the member will not affect coverage, users may be wary that this policy will eventually change.

At the time of writing, WebMD had become the dominant provider of PHRs for all but the largest health plans. By adopting WebMD, these plans have created a de facto standard for their records. This de facto standard is advantageous for health plan members, as it can potentially ease data migration from plan to plan. Additionally, it takes the health plan out of the equation, allaying consumer fears related to disclosing information to their health plans.

As none of the PHR systems examined in this report had been in existence for over two years, and several had only been in existence for a few months, it is unlikely

that the landscape of systems that existed at the time of writing will continue to exist in the future. As Aetna's PHR system had yet to be fully launched, and Kaiser Permanente's PHR system suffered serious malfunctions, the only strong PHR contenders examined were those created by UnitedHealthcare and WebMD. Judging by the failure of Kaiser Permanente's HealthConnect, it is clear that implementing a stable PHR system is not a simple task. It appears that the majority of health plans have chosen to relegate this task a 3rd party vendor. Whether WebMD will eventually hold a monopoly on the PHR market remains to be seen.