iPHR Market Report

Analysis & Trends of
Internet-based Personal Health Records' Market

CHILMARK RESEARCH

About Chilmark Research

Chilmark Research is a global research and advisory firm focusing on consumer-facing, healthcare IT solutions. Our focus provides clients with in-depth, research on critical market trends driving the technology convergence and adoption of among others: Web-based health communities, Personal Health Records (PHRs), self-directed genetics testing, health monitoring via sensor networks and telehealth services.

Using a pragmatic, evidence-based research methodology, with a strong emphasis on primary research, Chilmark Research structures its research reports to serve adopters, investors and developers of these technologies. In addition to these research reports, Chilmark Research also assists clients through a variety of services including: vendor assessment and deployment strategies, case studies, best practices and market trend analysis.

Preface

By: John Moore, Founder & Managing Director, Chilmark Research

Quite suddenly, the Personal Health Record (PHR) market has taken on renewed interest. Countless press articles extol both the virtues and risks of PHRs. Government institutions are dedicating resources to understand how PHRs may affect the healthcare sector – driving needed change. Employers and health plans seek new ways of using PHRs to engage their constituents, encouraging them to adopt healthy behaviors. Providers are adopting PHR solutions to deliver added value to their customers and increase customer retention.

Against this back-drop, within the last year the PHR market has seen the entrance of two of the largest and arguably most significant consumer-driven software companies in the world, Google and Microsoft, who are each pursuing their own consumer-focused, personal healthcare strategies. Even the employer-led consortium, Dossia is back on track developing a personal healthcare platform with Children's Hospital of Boston that when complete may serve upwards of 8 million consumers.

Further, it is becoming increasingly clear that the U.S. healthcare market is in need of some serious restructuring. While PHRs are no panacea for the healthcare challenges this country faces, they have the potential to initiate change that is long overdue, change that will be consumer led and consumer driven.

Yet, despite this interest, a clear, pressing need, and the entrance of major players, the PHR market remains an elusive, challenging market to understand and predict its future outcome. A multitude of companies, large and small, have developed an equally broad array of PHR solutions. Some solutions reside on a consumer's desktop, others come on a USB and still others are offered over the Web. Beyond modalities, the capabilities of these solutions are even more wide ranging, from simplistic systems for filing of electronic records to sophisticated solutions with personalization tools that guide the user on not only how to manage their health and the health of loved ones, but, for example, provide advice on who may be the best physician in their area for a given aliment and the costs of treatment.

Over the last several months, Chilmark Research has interviewed a wide range of PHR vendors, users, employers, proponents, detractors and observers. One observation became readily apparent in these discussions, the future of the PHR market lies on the Web. Therefore, unlike other reports on this market, the focus of this report is strictly on Web-based PHR applications, that are referred to as iPHR solutions.

First in a series of reports, this report is designed to bring clarity to the reader on where the iPHR market is today, where it is headed and the adoption challenges that need to be overcome. Most importantly, the report will assist the reader in understanding who are the leading iPHR vendors today, what is their unique value proposition and areas they need to improve. Armed with this information the reader will have the knowledge necessary to initiate their own evaluation and selection of an iPHR solution that meets their personal needs or the needs of the organization they represent.

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Chapter 1: Executive Summary

"How you gather, manage and use information will determine whether you win or lose."
–Bill Gates, Chairman, Microsoft

INTRODUCTION

A Personal Health Record system (PHR) comes in many forms, from the most simplistic, a stack of various paper-based records stored in a folder or binder to a desktop computer program, to patient or member portals hosted respectively by hospitals or health plans. These portals provide the consumer the ability to view their records but not actively control them (e.g., defining access rights). Increasingly more prevalent is the online, Internet-hosted PHR service, which for this report will be referred to as an iPHR. This report focuses on the market for iPHR solutions.

Definition of iPHR

iPHR is an Internet-based PHR that allows a consumer to maintain their health records online within a hosted environment allowing easy access to their records 24/7, wherever there is an Internet connection, or even in some cases via their mobile phone or PDA. An iPHR allows the consumer to populate the record via self-entry and importing data from other sources that may include among others, providers, insurers, retail clinics, pharmacies, laboratories and numerous others depending on consumer needs, access rights, desire to store such records and other factors. Advertising revenue, consumer-direct subscription fees, or a sponsoring organization such as an employer, health plan, provider or other may support the iPHR on behalf of the consumer. The iPHR is portable allowing the consumer to "take" their iPHR with them should they change employer, health plan, or provider, preserving and maintaining a longitudinal record of their health for as long as they choose.

Though there are many references in the literature, press, and other sources stating that there are over 200 PHR solutions in the market, it is Chilmark Research's opinion that at most, 20% of these can be characterized as iPHR solutions. Of the potential 20% (40 vendors) of iPHR solutions in the market today, we estimate 40% are thriving, 35% are treading water and the remaining 25% are walking zombies, not quite dead, but not very alive either.

The remaining some 160 PHR solutions in the market, if there truly are that many, are dominated by tethered PHRs offered through a provider or health plan. The remaining balance of PHR solutions in the market are simple standalone offerings provided as desktop software and USB devices, such as that offered by EMRy Stick and PassportMD.

PHR Type	Description	(+)	(-)
Standalone	Independent system relying completely on consumer input. Records stored as paper files and/or on a PC and/or portable USB device.	♦ Consumer control ♦ Highly portable ♦ Secure, if encrypted	♦ Keeping it current ♦ Inflexible ♦ Trojans, security risk
Tethered	Consumer portal to their medical records. Typically view-only access, with little direct control. Hosted by providers, insurers or employers.	♦ Up to date info ♦ Trusted source(s) ♦ Secure(?) ♦ Value-add features	♦ Little control ♦ Portability ♦ View only ♦ Privacy
Non-Tethered	iPHR - Web-based service providing consumer control read/write access. Role-based access, defined by consumer, for others to view records.	♦ Consumer control ♦ Flexible ♦ Portability ♦ Value-add features	♦ Updating records ♦ Physician trust ♦ Security/privacy(?) ♦ Immature market

Prevalent PHR Architectures in Market Today

Who make up the balance of PHR providers? The vast majority are hospitals or integrated delivery networks (IDNs) that provide a Web-based patient portal based on their internal electronic medical records (EMR) system. A prime example is Kaiser Permanente's patient portal, MyHealthManager, which allows the consumer to view their medical record that is stored in Kaiser's internal EMR system from Epic Systems. In addition to viewing their record, MyHealthManager allows the consumer to schedule appointments with their physician, conduct online consultations and request prescription refills. These communication features are particularly attractive to consumers and Kaiser claims to have well over 800,000 users today of MyHealthManager. Most often these patient portals are built internally by a hospital's IT staff or in conjunction with their EMR vendor.

Many of the major health insurers also offer their customers (covered members) a PHR. As with hospital patient portals, insurer PHRs are often quite limited in scope, and rarely provide the consumer with direct control of the PHR. While provider PHRs really on clinical data from their EMR system, insurer PHRs are populated with a member's claims data, which may also include medications and lab results. Most insurers that provide a PHR also offer a number of consumer health tools to encourage healthy behaviors including health risk assessments, wellness programs, disease management and guidance. While many early versions of these PHRs were internally developed, increasingly, insurers are turning to iPHR vendors to provide the base architecture and functionality for their PHRs or in some cases, acquiring iPHR vendors.

These provider and insurer PHR portals are referred to as "tethered" systems as they are tied directly to the host system and rarely allow a consumer to take the PHR data with them should they change insurers or providers. With a tethered PHR, the consumer also has limited rights that may include an inability to limit access by others to sensitive records.

METHODOLOGY & SCOPE

Extensive secondary research was conducted initially where countless PHR solutions were identified and evaluated. This research combined a thorough review of published literature on the PHR topic, including reports from foundations such as the Markle and Robert Wood Johnson Foundations, associations including AHIMA, HIMSS, AHMA, academic papers from PubMed, BioMed Central, and numerous articles in the trade press and media such as the New York Times, Washington Post and LA Times to name a few.

Beyond the published literature, Chilmark Research performed in-depth research directly on the websites of over 50 PHR vendors to identify their overall platform, solution offering, target market(s) and other factors to assess these companies. Secondary research concluded with the identification of nearly 30 iPHR vendors that justified a deeper level of primary research.

Primary research was divided into two distinct steps beginning with soliciting targeted iPHR vendors for their involvement in the research project. Vendors were asked to complete a detailed questionnaire whose purpose was to collect quantitative information about the company and the markets they served. Questions included among others: 2007 revenue, number of active accounts (users), types of users served (physicians, consumers, etc.), growth in 2006, 2007 and projected growth in 2008, and number of employees. As this is still a very immature market, many were reluctant to share some metrics regarding their business for competitive reasons.

The quantitative stage was followed by a qualitative questionnaire that was conducted for most vendors via an in-depth telephone interview that was typically 45 minutes in length. Qualitative questions focused on numerous issues including among others; product features and attributes, competitive positioning, go to market strategy, partnerships, and privacy and security policies. On several occasions, these interviews were followed by in-depth demos of the solution and its capabilities

Upon completing the second stage of primary research, Chilmark Research performed a final analysis of the iPHR vendors via additional secondary research and through conversations with a number of companies that have adopted these solutions as a final check and verification. The conclusion of this extensive research resulted in the 20 iPHR profiles found in this report.

B2C IS OUT, B2B IS IN

The B2C model is fading. B2B is now the preferred route to market.

In the late 90's the majority of iPHR vendors targeted the end consumer for their services. But there were far too many challenges, both technical and logistical, that led to the demise of most vendors. Survivors realized that long-term success would require a realignment of their go-to-market strategy. While virtually all iPHR companies still offer a process by which a consumer can directly sign-up for an iPHR, most iPHR vendors today are directly targeting businesses to adopt their solutions. Businesses include provider organizations, insurers (health plans), employers, patient advocacy groups, government organizations, etc. These entities will then serve as the distributor of the iPHR to their respective constituents (the consumer).

It is still early in the adoption cycle of iPHRs and it is often difficult to point to any definitive return on investment (ROI) for those businesses who are adopting these solutions for their constituents. Most are relying on gut feelings, instincts, or a desire to differentiate themselves in the market. Time will tell what the final value proposition will be for these early adopters of iPHRs and their constituents.

Sponsor	Motivation(s)	(+)	(-)
Consumer	♦Chronic disease mgmt ♦Remote caregiver ♦CDHP mgmt	♦ Motivated ♦ Personal control ♦ Portable	♦Disconnected - self entry ♦Lack of consumer education ♦Privacy & security
Provider	♦Customer retention ♦Facilitate communication ♦Lower Readmissions	♦ Clinical & lab data ♦ Online consultations, appt scheduling, Rx refill ♦ Trust	♦Tethered ♦Not comprehensive ♦Not interactive
Health Plan	♦Lower medical losses ♦Behavioral change ♦Differentiator - CDHP	♦ Claims and lab data ♦ HRA & PBM ♦ Domain expertise	♦Privacy & control concerns ♦Claims data is not clinical ♦Often tethered
Employer	♦Lower costs ♦Increase productivity ♦Support CDHP	♦ Health & wellness ♦ Integrated to HR package ♦ Can be comprehensive	♦Privacy & control concerns ♦Often tethered ♦Incentives often required
NGO	♦Mission/Advocacy ♦Support research ♦Member service	♦ Deep domain knowledge ♦ Community ♦ Focus	♦Limited functionality ♦Ability to support ♦Control?
Others	♦Customer retention ♦Value-add service ♦Revenue	♦ Greater consumer choice ♦ Target niche requirements	♦Privacy & security ♦Scale, capabilities? ♦Long term support

PHR Sponsors & Motivations

Three major markets dominate the iPHR market today: health plans, employers and providers. Among these three, health plans and employers' iPHR solution requirements are similar with a focus on ultimately controlling costs by encouraging healthy behaviors and effectively managing chronic diseases. For providers, iPHR adoption is more marketing driven, specifically targeted at customer retention.

Employers

Increasingly, employers are seeing iPHRs as a key component of their total strategic health promotion program. Some employers are relying on their health plan providers to deliver such capabilities to their employees. But what is becoming increasingly common is the employer's desire to take direct responsibility for providing an employee iPHR, contracting directly with an iPHR vendor.

A couple of factors are driving the adoption trend among employers. First, large employers typically contract with a number of different health plans to provide employees coverage regardless of location. However, if an employee decides to switch plans during the annual renewal process a health plan sponsored iPHR would not be readily portable to a new insurer. This would quickly become a major hindrance for an employee and discourage adoption.

Secondly, there is a relatively high churn rate in the health insurance industry with an employer retaining a given insurer for an average of 3-4 years before switching or dropping the insurer. Again, with the lack of portability of today's health plan sponsored iPHRs, employers are increasingly reluctant to promote a health plan's iPHR, instead offering their own to employees. Insurers are striving to address the portability issue having released PHR portability guidelines among insurers in mid-2007, but these guidelines are new with adoption and proof of concept remaining in question.

Today, very few standards exist that define the employer's role in development and distribution of PHR capabilities to their employees, and subsequently their legal liability at a state or federal level.

The iPHR concept is still relatively new for most employers and their employees, which will create challenges for widespread adoption. Primary among these challenges is defining the goals for the PHR program that the employer intends to offer employees and subsequently, to what extent employee confidentiality is insured. The employer will need to clearly articulate and convey to employees exactly what health data the employer will have access to within an employee's PHR (if any) and why. In virtually all instances, to insure the broadest level of adoption, employers will need to adopt a third party iPHR solution that keeps them at a distance, despite their sponsorship, putting the employee in complete control of their PHR. In such a model, the employer will need to operate with a high level of trust that indeed the iPHR vendor, through their solution, will deliver healthcare savings with the employer sponsor receiving only broad, population health statistics provided by the vendor for program monitoring and assessment.

The immaturity of the iPHR market also creates challenges for the employer in their selection of an iPHR for their employees. First, is the challenge of choosing among numerous available solutions, as many are still unproven in large-scale deployments. Along with the immaturity of the market, there is scant evidence that iPHRs do deliver a clear demonstrable and repeatable return on investment. Early adopters are relying as much on faith as gut instinct in supporting PHR programs at their companies. Time will tell if such faith was justified.

Health Plans

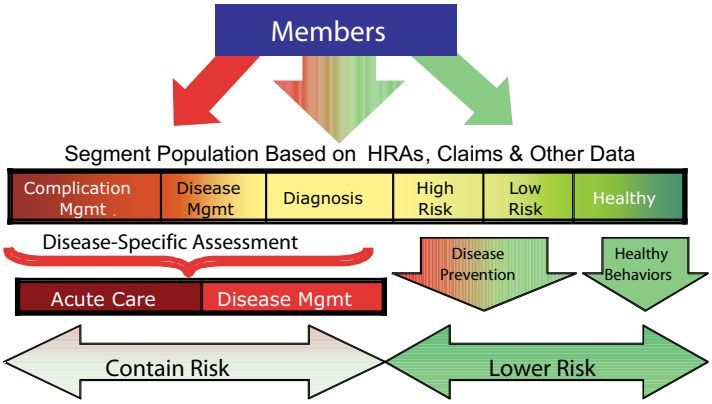
Health Plans have been trying for several years to promote adoption of iPHRs among their covered members. The motivations of health plans are quite clear: that by getting their members to use PHRs, the health plans can educate the consumer, promote better behaviors, offer guidance (wellness), facilitate disease management with the ultimate goal of lowering medical loss ratios (MLRs), and encourage member retention. Health plans can also highlight these member services to their large employer customers as another way that they are working to help employers control rising medical and insurance costs. And as with employers, health plans are looking to iPHRs to assist them in population health management across the care continuum.

Health Plans are also using iPHRs as the foundation for their Consumer Directed Health (CDH) plans. These plans typically rely on higher deductibles coupled with health savings accounts (HSAs) to mitigate rising health care insurance costs. By having members take more direct responsibility for medical expenses, CDH plans promote greater member involvement in managing their costs and taking a more proactive approach to managing their health. These CDH plans are seeing strong growth in the market as employers adopt them to control their healthcare coverage costs.

One of the challenges with CDH and most existing iPHR solutions is the lack of financial planning tools for the consumer to use for managing healthcare expenses. There is also the issue of cost transparency of medical procedures for the consumer. In addressing the first, both CIGNA and UnitedHealth are working closely with Intuit to embed Intuit's Quicken Health solution in a member's PHR. Regarding cost transparency, some insurers have begun offering visibility into provider costs for specific procedures by region based on claims data analysis. A prime example is the recently released SmartSource service of Aetna, which provides a member an ability to search on a procedure, identify physicians in one's plan that are in close proximity, and then review actual costs that these providers charge for such a procedure.

Therein is one of the key advantages that health plans are able to offer members who use their sponsored PHRs: a treasure trove of data. With the low adoption of electronic record keeping among providers, health plans bring a tremendous amount of value in the data they are able to offer members to automatically populate a iPHR. Data is derived from claims submitted by providers for reimbursement, but often includes information on a member's prescriptions, lab results, and, in some instances, images. For example, when Aetna went live with a limited rollout of its new iPHR in early 2007 for 800,000 members, Aetna was able to populate a member's iPHR with two years of claims data. This is a big benefit because it minimizes the need for self-entered data, an issue often cited as a barrier to adoption.

To date, consumer adoption of health plan sponsored PHRs remains lack-luster. There are a number of issues at play, many of them common across all sectors, such as consumer education and motivation. Where insurers face particular challenges is regarding consumer trust and addressing portability. Though the leading industry organizations AHIP and BCBSA have publicly stated that PHRs should be consumer-controlled and managed, including letting the consumer define access rights to their PHR and supporting portability of records, the consumer remains wary, particularly with either self-entered health information or clinical information from their physician(s) for fear of a future claims denial. As stated previously, though the leading industry group AHIP has formulate guidelines for PHR data portability across insurers, actual adoption and use is not widespread.



Dynamics of Population Health Management

Providers

Unlike employers and health plans, each motivated to adopt iPHR platforms for their constituents to lower MLRs and subsequently costs, providers have an entirely different motivation for adopting iPHR solutions – customer retention. By providing customers with tools that facilitate interaction with their care provider, they are able to enhance the value proposition they offer consumers, increase the "stickiness" of their services, and ultimately increase retention rates. This is why in most large provider organizations, such as hospitals' and IDNs', PHR initiatives are under the management of their marketing departments.

Provider-based PHRs provide some distinct advantages for the consumer that employer and health plan-based solutions have difficulty providing. First, they promote the physician-patient relationship by typically including some form of secure, online communication for scheduling appointments, reviewing lab results, renewing prescriptions and e-Consultations. Secondly, they provide a direct view of clinical data, which is of far greater use to physicians in a shared network of caregivers than claims data. Also, consumers have far greater faith in providers to insure that the security and privacy of their health record will be maintained versus the aforementioned sponsors of iPHRs.

Most providers today who offer a PHR to their customers are really offering nothing more than a consumer-centric portal to the clinical EMR solution that the provider is using. As clinical EMR systems are the basis for most PHRs in the provider market today, this market is difficult for iPHR vendors to penetrate.

There are a number of issues with EMR-based PHRs that limit their utility. First, as portals they do not offer the consumer the option to control the record nor who has access to it. Secondly, the PHR is typically tethered to the EMR and thus not portable. Third, many consumers interact with a number of care providers, both within and outside of a hospital and its IDN. As the PHR is tied to a specific IDN, caregivers outside that IDN cannot easily contribute to the PHR.

Unlike health plans and employers, the provider market does not face the same level of concern by consumers regarding privacy and security. Eliminating this major barrier to adoption would lead one to conclude that the provider market is potentially the most lucrative market for iPHR vendors, but the ambivalence that physicians have shown to other IT solutions, best represented by the abysmal adoption of EMR and the barriers to entry that existing EMR vendors have established, calls into question just how lucrative this market is for these vendors.

EMR vendors have an advantage in the PHR market with their patient portal solutions. This advantage is, however, confined to large hospitals and large physician practices. EMR adoption across all physician practices, regardless of size, remains quite low.

While these challenges are very real, a few developing trends may open this market up. First, many physicians are becoming more comfortable with the use of HIT in their practices. Physicians are also quickly realizing that customers seek more ways to interact with their physician that fits into their lifestyle. Increasingly, communicating via email is requested and with insurers beginning to reimburse for e-consultations, adopting an iPHR solution can deliver higher customer satisfaction as well as a new source of revenue. Some early adopters of iPHR solutions have found that these solutions ease some workflow constraints in patient registration and handling. As these constraints are removed, patient throughput has increased. Lastly, some physicians find these iPHR solutions are an alternative to a full-fledge EMR.

Consumers

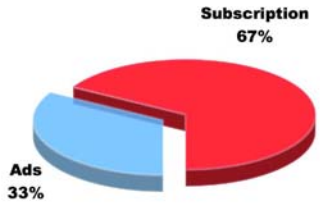
Direct to consumers was the purported path to success from the mid-90's up until a couple of years ago when investor funding dried-up and more than a few PHR start-ups collapsed. Those that survived and newer entrants to the iPHR market are focusing on an indirect model to consumer via the above profiled sectors of employers, health plans and providers.

While the direct to consumer market is not a primary market for most iPHR vendors, it remains a key secondary market comparable to the provider market. Apparently, vendors find the consumer market about as attractive as the provider market to penetrate, which may not be an unreasonable assumption as there are significant barriers to entry in the provider market. The higher level of attractiveness of the consumer as a secondary market, at least relative to the employer market, may also be a legacy effect from the time when many vendors went direct to consumer. iPHR vendors will be better served today refocusing their market efforts and pursuing an indirect route to the end consumer, targeting enterprise accounts.

There are two dominant reasons leading consumers to choose an independent iPHR rather than one sponsored by their employer, health plan or provider. First is control. Most iPHRs sponsored by others lack portability, should the consumer leave an employer, switch health plans or providers. The second is privacy. Consumers remain extremely wary of using employer or health plan sponsored PHRs for fear that their medical records will be used against them.

While the consumer market remains an extremely difficult market to gain sufficient volume to support most iPHR vendors, the market may begin opening up as leading consumer brands Google and Microsoft bring far greater visibility to the value of owning an iPHR that smaller vendors, including WebMD, could not accomplish.

While there remain several iPHR vendors that rely on advertising revenue to provide a free iPHR to consumers, a significant portion of iPHR vendors continue to charge a subscription fee. There is little consistencv in fee structures todav with prices ranging from $25/year to $30/month, more than a twelve fold difference. Increasingly, iPHR vendors will be challenged to charge such fees and will need to be creative in developing advanced PHR tools for their customers, maybe even exploring other revenue sources without betraying the trust of consumers (i.e., selling de-identified data to others). iPHR vendors that offer a generic iPHR for consumers, relying on advertising revenues may also find it difficult to compete with Google Health, who will not be embedding ads in its iPHR.



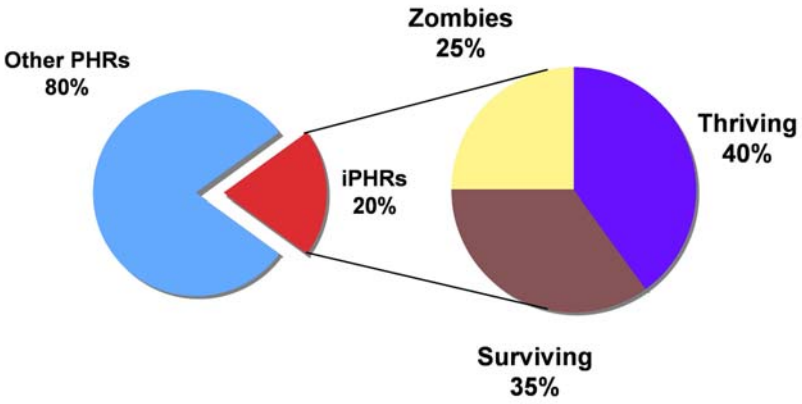
iPHR Vendors: B2C Revenue Models

Another challenge that direct to consumer iPHR solutions face is their lack of "connectedness" with primary personal health data

sources. Providers have clinical notes, lab results and images. Health plans have claims, medications and oftentimes lab results. Employers can import claims and medication data. But direct to consumer iPHR solutions most often must rely on the consumer to manually enter the data, a process that is only beginning to change. A leading change agent of the future will be Personal Health Systems (PHSs) such as Dossia, Google Health and Microsoft's HealthVault. Serving as "utility data services," these PHSs will serve to consolidate a consumer's medical records, regardless of source, and serve this data up to an iPHR via an application-programming interface (API). This has the potential to re-invigorate the direct to consumer iPHR model, but many challenges lie ahead for such PHSs and success of such is uncertain.

iPHR VENDOR PROFILES

There remain a multitude of iPHR solutions in the market, some are quite robust and well-architected, using state-of-the-art tools such as Web2.0 technologies. And then there are others that languish in an archaic backwater of dated technology, structure, tools and presentation. Unfortunately, for most, there is no easy way to quickly review and assess all the solutions available today to determine the solution most appropriate for a given enterprise need and/or market application.



iPHR Market a Subset of Larger PHR Market

Though there are many references in the literature, press, and other sources stating that there are over 200 PHR solutions in the market, it is Chilmark Research's opinion that at most, 20% of these can be characterized as iPHR solutions. Of the potential 20% (40 vendors) of iPHR solutions in the market, we estimate 40% are thriving, 35% are treading water and the remaining 25% are walking zombies, not quite dead, but not very alive either.

As a result of Chilmark Research's analysis of current iPHR vendors, further in-depth research on iPHR vendors was limited to 20 vendors to provide an accurate representation of solutions currently available and likewise focus predominantly on those that appear to be thriving or are up and coming.

Company assessments and ratings were based on numerous factors but were dominated by reviews of the product offering and a company's go-to-market strategy that included among other variables, partnerships, positioning, services, and management. This culminated in a scoring of iPHR vendors that included assessing vendor's product capabilities across 18 key functional areas and 8 key marketing attributes. Based on these scores, broader category ratings were calculated on an A (excellent) to F (failing) scale. Categories that vendors received scores for include: Overall, Product, Marketing and Domain Expertise.

Company	Contributing Factors
HealthAtoZ	◆ Broad product functionality with reasonable depth ◆ Significant resources ◆ Expansion opportunities
RelayHealth	◆ State-of-the-art platform ◆ Significant resources ◆ Largest user-base
WebMD	◆ Brand recognition ◆ Deep market penetration ◆ Broad product functionality with reasonable depth

Vendors Receiving Top Overall Rating

Overall Leaders

iPHR vendors are by and large doing a reasonable job serving the market. All have strengths, and likewise weaknesses, with three vendors clearly differentiating themselves from the rest with an A rating (technically, each of these three receive an A- rating). The remaining iPHR vendors received a B or C rating. The distribution of the B and C ratings would have been more heavily weighted towards a C if it were not for the high ratings most received in the Domain category.

LOOKING FORWARD

The iPHR market is in a high state of flux. The entrance of Google and Microsoft is generating interest, as well as creating visibility around the iPHR concept that goes well beyond anything the leading stalwart, WebMD has been able to accomplish, despite its dominance in the market. The technology is also changing rapidly providing consumers with a much deeper and richer set of tools to interact with their iPHR, as well as with others who may share similar interests and/or conditions. And there is simply the fact that the current healthcare system in the U.S. is deeply flawed and long overdue for a radical transformation. Could iPHRs enable the consumer to take a proactive role in their health and the health of loved ones leading to a restructuring of the healthcare system that is consumer-centric, not patient-centric?

That is a very difficult question to answer. There remain a number of challenges that are endemic to the healthcare sector, both on the provider and consumer sides that have been virtually intractable. While there are signs that change is afoot, it is change that will occur in incremental steps and not overnight. How many of these new iPHR vendors can survive the wait remains to be seen. What is fairly clear is that the iPHR market will see explosive near-term growth, growth that was recently validated through conversations in April 2008 with several vendors. This growth is largely being fueled by the three major enterprise markets that are adopting these systems for their constituents on faith without any clear ROI metrics. If that faith is rewarded, growth will continue to accelerate.

Opportunities

There are a number of activities occurring now and in the near future that will push the iPHR market forward. The most significant activities, which are outlined below, will contribute to a projected five-year compound annual growth rate (CAGR) of over 37% for the broad category of PHRs, with a five-year CAGR of nearly 53% for iPHRs. While this growth is impressive, the actual penetration among U.S. consumers will still be relatively low, at slightly less than 21% of the total U.S. population actively using a PHR by 2012.

Market Demand

Healthcare costs continue to escalate and numerous strategies are being deployed to mitigate such increases. The federal government is actively promoting the adoption of healthcare IT and the development of the National Health Information Network (NHIN). Employers are looking to incentives that will engage employees in better managing their health. Health plans, in support of their employer clients, are doing likewise. And consumers are becoming more active in managing their health, as well as loved ones, as they adopt high-deductible plans (and other value-based plans) and/or care for elderly parents.

Human Resources consulting firm Hewitt released a results of a survey of 500 employers in the Spring of 2008 that found 88% of employers responding that they intend to invest in long-term solutions to keep employees healthy. This was up a whopping 25% over last year's 63%. In a similar report from HR consultant Towers-Perrin, high-performing companies spent nearly $1,700 less per employee on healthcare costs versus low performing companies. Key to those savings was a long-term view and providing employees with the tools (education, support, risk assessments, etc.) to better manage their health. Clearly, iPHRs will play an increasingly important and growing role in assisting employers with these initiatives. Health plans will also look to provide such capabilities on behalf of their employer clients.

Consumers increasingly are turning to the Internet to perform a multitude of tasks from simple retail purchases to stock trading, electronic banking and bill paying. They are also using the Internet for searching on any number of health topics, searches not limited to the young Internet savvy, but even among the elderly, who of those with Internet access, some 80% perform health Internet searches.

With any activity that now occurs with regularity on the Internet, there was a time when the consumer market did not trust the Internet. We are now in a similar situation with the management of health records in an iPHR. Today, many consumers are reluctant to use an iPHR solution. Over the next 2-3 years, this reluctance will rapidly dissipate as consumers see greater value than risk in using such services. Certainly, heavy weights Google and Microsoft will contribute to this change in views.

Visibility, Education & Clarity

Until late 2006, the iPHR market lived in relative obscurity. That all changed when Microsoft's CEO, Steve Ballmer, gave a keynote presentation at the HIT industry conference, HIMSS 2007. At roughly the same time, Google VP Adam Bosworth started giving public presentations on the need to give consumers the tools they need to play a more active role in their healthcare. Concurrent with these activities was the announcement by several Fortune 500 employers to form a consortium, Dossia, to provide employees with an iPHR. Health plans, providers and other health stakeholders have also become much more pro-active in promoting consumer engagement in managing their health through PHRs and patient portals.

Combined, these actions have brought a tremendous amount of visibility and awareness to the public regarding the whole concept of a PHRs, their utility, value as well as risks, with articles appearing in countless consumer publications nationwide.

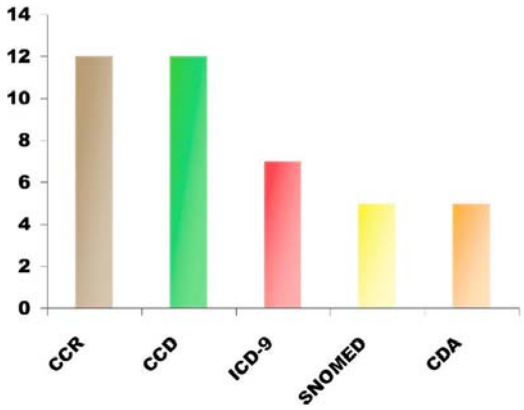
Technology

Early versions of iPHRs, and even some today, were static sites heavily reliant on consumer self-entry in simple fields with little if any flexibility to customize an iPHR to one's particular needs and wants. A number of technology advances have occurred in the interim that allow for a much richer and higher valued experience for the consumer. Following are a list of some of the technologies that will play an important role in furthering the adoption and growth of iPHRs.

- **Standards**: Facilitate the automation of populating an iPHR on behalf of a consumer.
- **Web2.0 Technologies:** Provide richer consumer experience and social networking
- **Connectivity to Mobile Devices:** Wherever, whenever access via mobile or smart phone.
- **Connectivity to sensors:** Direct data upload to iPHR from medical devices.

Challenges

The challenges facing this nascent industry are legendary and led to the demise of most early iPHR solutions that were introduced in the late nineties. The few that survived were most often led by a founder that had a personal, vested interest (far beyond monetary) to see this technology be put in the hands of consumers helping them to better manage, track and act upon their health information to live healthier and fuller lives. Many of the challenges early entrants faced remain with us today; data liquidity, privacy and security, and customer apathy.



Number of iPHR Vendors Adopting Specific Standards

Data Liquidity

A primary challenge for iPHRs is the lack of medical data in electronic form. Regrettably, the healthcare sector, for all its technology and advancements, has not been a strong adopter of IT for their clinical practices. Even among those practices that have adopted an EMR system, the majority of these practices and their EMR systems do not comply with any universal standards to allow data to be transmitted from one system to another. Only in the past year has the federal government set-up a certification program, now run by the non-profit CCHIT, which as part of the certification process requires EMR systems to support certain well-defined standards.

This lack of data liquidity is a difficult challenge that will take several years to overcome and is one of the main reasons why many iPHR vendors offer their customers a fax-in service so that their medical records can be faxed directly to the company for uploading into their PHR. Archaic yes, but it is the reality of the situation today.

Department of Health and Human Services estimates put current adoption of electronic medical records (EMR) at roughly 15% of all practicing physicians. Low adoption and little compliance to data standard hinder data liquidity.

Beyond the basic issue of adoption of HIT among providers, is the need for standards to enable data sharing (liquidity). In all industries there is a need to establish standards for both defining specific terms and the data models for digital exchange of information. Other industry sectors such as financial and manufacturing have been addressing this issue for years, with numerous standards now in place. The healthcare sector, however, has been slower to adopt HIT overall, and subsequently the standards for exchanging information remain immature and widespread adoption is modest.

It is within the payment and reimbursement process that one finds the most mature and widely used standards today. The most common are ICD-9 codes and more recently SNOMED, each providing codes defining specific disease types and treatments. As these standards are focused on coding diseases for eventual billing and reimbursement, information contained is often of limited value in clinical settings. In addition to these codes used for claims processing, there are also the standards used for medications for Pharmacy Benefits Management (PBM), which are maturing rapidly in conjunction with increasing promotion and adoption of e-Prescribing.

Both CCD and CCR standards are the most popular standards in use today by iPHR vendors and are quickly becoming the de-facto standards for exchanging electronic medical records. These standards use ubiquitous XML for mapping data to a specific Reference Information Model (RIM). This “mapping” greatly facilitates the exchange of data insuring that data transmitted between two systems populates the correct fields in an electronic health record, including a PHR.

Privacy & Security

The most controversial and contentious issue facing iPHR vendors and subsequently the future of this market’s growth is effectively addressing consumer privacy and security concerns. Medical records are extremely personal documents with consumers ranking security and privacy concerns for their health records higher than nearly all other types of information about them, including financial. Unfortunately, there is little consistency today in how iPHR vendors are addressing this critical issue.

Security is a much easier issue to address than privacy. With security one is simply looking for safe and secure ways to access, transmit, and store their records. It is by and large a technology issue and there are a number of demonstrated technologies and best practices in use today. Most iPHR vendors interviewed for this report use 128-bit encryption for sign-on, with many using Verisign certification and testing to validate their security. For many, but not all, Verisign encryption is also used for transferring files from a physician’s office to consumer’s PHR.

Security also extends to how and where records are stored. Nearly three-quarters of all iPHR vendors have chosen to use third party services to provide secure record storage off-site. These off-site third party facilities are typically very secure Tier 1 facilities with 24/7 on-site security personnel, redundant back up, and disaster recovery capabilities. Such services would be prohibitively expensive for most iPHR vendors to support in-house. The iPHR vendors who store records on-site are of two categories: either very large companies such as Google who can afford to support such activities in-house or those that serve the health plan sector as most health plans prefer to store records on-site.

Privacy is far more difficult to address for it is both a technology and policy issue. The technology is readily available to insure the privacy of a consumer's record. What are far less mature are the policies for insuring that privacy is maintained. While consumers apparently understand the benefits of using electronic medical records in spite of potential risks, consumers are also quite concerned as to who ultimately has access to their records. Consumers are particularly wary of health insurers and employers who might use such information to a consumer's detriment.

In conducting research for this report, very little consistency was found across iPHR vendors with regards to privacy policies. Some vendors have very tight policies and provide the consumer with capabilities to selectively share data at a very granular level. Yet others, provide no such capabilities, and any access a consumer may provide to another would give that third party full access to all information within their PHR. In case of emergency, some vendors provide one-time access for a specific amount of time, while others have no such restrictions. Several vendors request a consumer to "opt-in" before their information is shared with another party, others use an "opt-out" policy. There are countless examples such as these that require close scrutiny. This makes it extremely difficult for an individual or a company to chose an appropriate iPHR solution that they, or their constituents, will be comfortable using.

Where Health Records are Stored

Consumer Apathy

With healthcare costs continuing to escalate, both employers and health plans are looking to control their exposure by giving consumers tools, such as PHRs to better manage their health. The challenge, however, is that for several decades, the average consumer has been one step removed from their healthcare. Since employers covered the majority of healthcare costs, consumers had little need to understand the true costs of care. Thus, they did not feel particularly empowered to play a proactive role in managing their health.

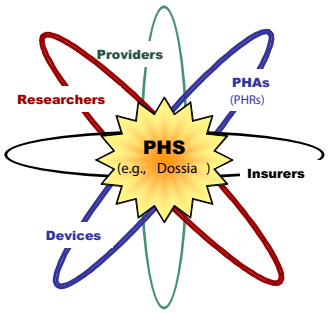
The numerous entities that are all promoting iPHRs today will continue to struggle to define "what's in it for the healthy consumer" to achieve broader adoption. To date, adoption of PHRs has remained mostly limited to those with a chronic care condition, or one who is caring for another. This represents about 20% of the entire US population, not enough to sustain all of the iPHR vendors in the market today.

The numerous entities that are all promoting iPHRs today will continue to struggle to define "what's in it for the healthy consumer" to achieve broader adoption.

Overcoming apathy across the broad spectrum of healthcare consumers will require a number of efforts on the part of interested stakeholders. Educating the public on the value they will receive from using an iPHR is the first step, but beyond that, iPHRs vendors and their solutions will need to increase the value they actually provide. Such value will require a far better analysis of consumer needs and structuring their solutions to meet those needs. It will result in solutions that go beyond being a simple repository of information (records) to more sophisticated solutions that securely and privately analyze those records to deliver the consumer personalized and actionable information that they can apply to their specific health and/or the care of loved ones. Future solutions will also go beyond the computer for both delivering actionable information as well as collecting data from the consumer via multiple modalities including medical devices, cell phones, smart phones or PDAs.

Farther Into the Future

There are numerous issues that could either contribute to explosive growth in the adoption and use of iPHRs, or severely constrain future growth. While it may be difficult to give absolutes in such a young and immature market, there are a several key developments that are now occurring in the healthcare sector that will have a significant influence on the iPHR market over a longer-term horizon beyond the next 3 years.



PHS Ecosystem

Dominance of PHS

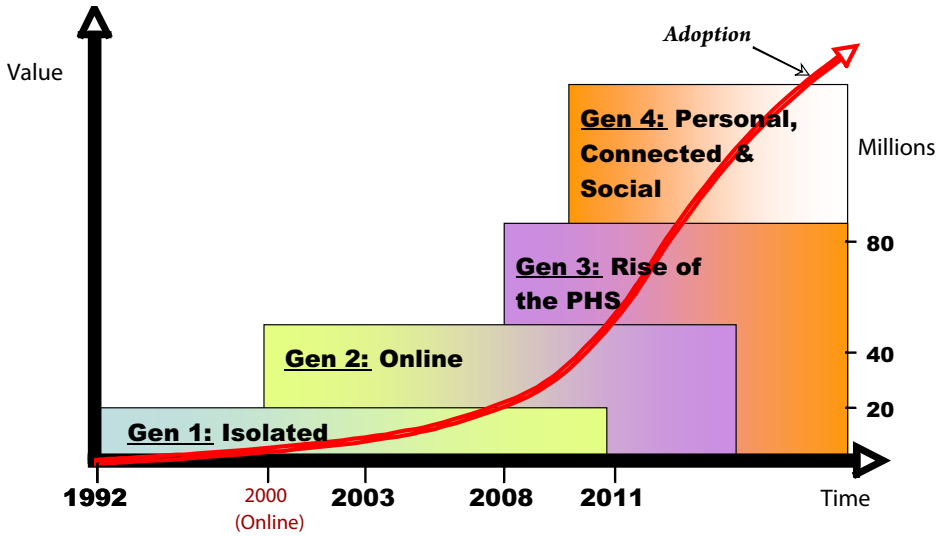
There are three major efforts currently underway that will forever change the landscape of the iPHR market. Each of these efforts, Dossia, Google Health and Microsoft's HealthVault are creating something much broader in scope than an iPHR; they are creating Personal Health Systems (PHSs). Applying massive resources and for Google and Microsoft, clear ability to take solutions to the consumer market, these PHSs will become core to iPHRs in the future, creating ecosystems with each PHS at the center of its own solar system.

The core value that these PHSs will provide the iPHR market is an ability to use their resources and marketing clout to gather medical records from multiple sources on behalf of the consumer and serve this data up into an iPHR. Providing such a "utility" service alleviates iPHR vendors of the difficult task of gathering this information themselves and assists them in providing greater value to th consumer. This is an enormous task and fraught with risks, but if these two behemoths cannot accomplish this task, no one else can or will.

Confluence

With the recent releases of several draft PHR frameworks, what is and is not a PHR is coming into clearer focus. These frameworks will culminate in a more concise definition of what is the minimum set of capabilities that all iPHRs will contain.

In addition to these frameworks, the market is also segmenting itself into the distinct markets of employers, providers, health plans ad consumers. Each of these markets has needs that are coming into greater focus that will enable iPHR vendors to provide solutions more in alignment with the stated needs of each market.



Four Generations of PHRs & Growth

Fragmentation

While the near term 2-4 year time period will see a significant confluence of iPHR solutions around better defined market needs and functional models, fragmentation will begin to dominate beyond the four year time horizon. This fragmentation will occur as existing and new entrants to the market seek to differentiate themselves and exploit new market opportunities. Fragmentation will lead to the fourth generation in iPHR solutions.

Market fragmentation will support a highly refined formed of personalized medicine specific to the individual, rather than a population sub-group. The capabilities that fourth generation iPHR solutions will embody will contribute to continued market growth for the foreseeable future.

RECOMMENDATIONS

While Chapter 2 of the report provides an extensive list of recommendations that are broken down to advise stakeholder groups; consumers, enterprise buyers and iPHR vendors, this Executive Summary, boils down these recommendations, for brevity's sake, into the simple acronym: PACS.

Personal

iPHR solutions are at the very early stages of providing a more personalized experience for the consumer and still have an extremely long ways to go before delivering a truly engaging experience. For example, only recently, have a couple of iPHR vendors begun to provide templates structured to help a consumer address specific chronic diseases, and even these are quite crude. iPHR vendors need to pay more attention to this need rather than developing "slick tools" that ultimately do not help the consumer manage their specific health requirements.

Consumers and enterprise buyers need to also begin paying closer attention to how a solution is structured and to what extent that structure supports more personalized health and wellness needs of the individual. Monolithic systems will have trouble supporting deep personalization. Solutions with a huge compendium of resources may also prove inadequate, as searching and filtering through such information to get at what is most important to an individual is often more trouble than it's worth. Careful evaluation (do they support your personal needs) and full vetting of the solution through actual demonstration and use is strongly recommended before making final decision.

Actionable

iPHRs that serve simply as an online filing system for medical records will become irrelevant. Even those solutions that provide physician-consumer communication capabilities will not be enough long-term. Going beyond simple data management and communication, future solutions will combine data analytics with personalization features and communication to deliver consumer-specific, clinically validated, actionable information. This will be especially important for those sectors of the population that are at risk or currently coping with a chronic condition. Some iPHR providers are beginning to provide actionable information, particularly those with strong disease management capabilities. Other vendors have strong communication capabilities. It will be melding of these that will result in truly personalized and actionable information.

Adoption and ultimately ROI of iPHR solutions will be highly dependent on the ability of a given solution to deliver actionable information to the consumer promoting changes in behavior(s) that reduce health risk(s). While the market has yet to see an iPHR solution that delivers a compelling platform for actionable information, the functionality required exists tucked within competing solutions. Through acquisitions, partnerships and to a lesser extent internal development, this capability will become more prevalent. Closely track these three approaches among iPHR vendors in assessing their ability to deliver actionable functionality in their solutions.

Connected

Consumers are on the move and want to be able to tap into the information they need regardless of their location. Likewise, not only do they wish to tap such information, they will also want to add information. Consumers also want a solution that connects to their primary caregiver(s) to enable file transfers and communication. Moving beyond all this, consumers (particularly younger ones) want to share this information within a network of "friends" that they define.

Connect, Connected, Connectedness is the game. Understand what makes your iPHR solution unique in the market and how you can leverage that uniqueness in the Connected world. Simply being online is no longer enough.

In a recent presentation by Humana of a pilot program to promote healthy behaviors, the big lesson learned was the value of peer support/encouragement that drove true change among participants. This is but one form of connectedness that adopters of iPHR solutions need to consider when evaluating solutions. Another is to what extent do the solutions allow a consumer to access information regardless of location as this capability will assist in making the iPHR become an integral part of their daily lives. And connectedness will play a crucial role in delivering actionable information to the consumer, regardless of location, further supporting healthy behaviors.

Secure

Personal, Actionable, and Connected are all lofty and worthy goals but mean very little if the user does not feel safe and secure using the iPHR. Secure goes well beyond having 128-bit encryption for sign-on and includes fully encrypted data on the servers (surprisingly few iPHR vendors encrypt data on their servers) and encrypted communication. Safe extends into the realm of privacy providing the consumer with assurances that they are safe putting their information in the iPHR.

Safe need not be confused with privacy, provided full transparency of what the iPHR vendor is doing, who they work with and how might data be used is fully vetted to the consumer in easily understandable terms that are prominently displayed on the website. The website, www.PatientsLikeMe.com does a superior job in this regard.

Enterprise buyers of iPHR solutions need to carefully evaluate the solutions on their shortlist for their ability to provide a safe and secure environment. This will require not only a contractual assessment, but a technical one as well. Either internal IT technical who are knowledgeable on the latest IT security tools and vulnerabilities, or an outside consultant should be used for this step in the evaluation process. Beyond that, internal policies must be clearly and openly stated to alleviate any concerns among constituents for whom this iPHR is meant to serve.

Consumers will simply need to read the fine print regarding an iPHR vendor's privacy and security policies. This is often difficult to find and far too often, difficult to understand. But one must make the effort to do so for the risks are very real. Do not put trust in any certifications prominently displayed on most iPHR vendor websites as most of these are meaningless or provide only a thin veil of protection.

Chapter 1: Notes