HealthCare, The Internet and The Consumers

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Introduction

Excellent healthcare demands that physicians provide the patients with accurate and current information in a timely manner. Recently, there have been several revolutionary innovations in globalization of information with controlled data flow. Search Engines, Wikis, Blogs and Forums; some of the most famous mass collaboration means; have proved to be the most disruptive development in the today's business.

Knowledge boundaries (in health care) are becoming more porous. The patients are becoming more knowledgeable. The care providers are gaining more knowledge on the technological front. The author's objective is to help identify the domain areas that are involved in bringing availability and sharing of data in a global environment where everybody is a patient and everybody can be defined as a care provider.

Entities

Today, Internet is one of most commonly "referred to" resource material. People use the Internet for obtaining information ranging from cooking recipes to finding new ways to save money by using appropriate preventive measures and actions for health issues.

Internet allows computer users to connect to experts' knowledge and free decentralization of information. Users are able to query log on to the Internet search engines, enter the search criteria, and within milliseconds, the search engines filter out information from over a billion web sites and web pages and present the same to the end users in the order of relevance.

Let us consider the following Venn diagram showing the relationship between people who use the Internet for HealthCare purposes. We already know that a consumer is one who uses goods and services. So, in our case, the consumers for health care data over the internet are:

1. **Patient** - Patient; a person who requires medical assistance.

2. **Care Giver** - Healthcare professional; family member or friend who attends to the needs of a patient; who helps in identifying or preventing or treating illness or disability. (Provider of Care)

3. **ROW** - Rest of the world who use the Internet to gain information – General internet users

The Venn diagram below depicts the relationships between the three entities. We see that patients are the ones who on a periodic basis use information on the internet to understand the symptoms, cause and cures for day-to-day diseases and health related problems.

The physicians on the other hand post information on the Internet. Being a part of the "Human Ecological System", they are sometimes victims to the diseases and thus also a part of the Patient group. No person has complete information. Hence, when the physicians are affected by some disease or ailments, the physicians may refer to the Internet public domain for sharing and gaining additional knowledge.

Rest of the World: People who do not have direct access to the Internet ask for assistance from their friends, family members to look information about a particular ailment. Off these, there are people who are not doctors but have a wealth of informal information care of the people. They may have gained the insight through practical and family experiences. One refers to the Internet to even sharpen and widen his knowledge base. On the other hand there are people who refer to the Internet just for quenching the thirst of knowledge.

Patients

ROW

Physicians

Users of the Internet (Everyone is actually a Patient)
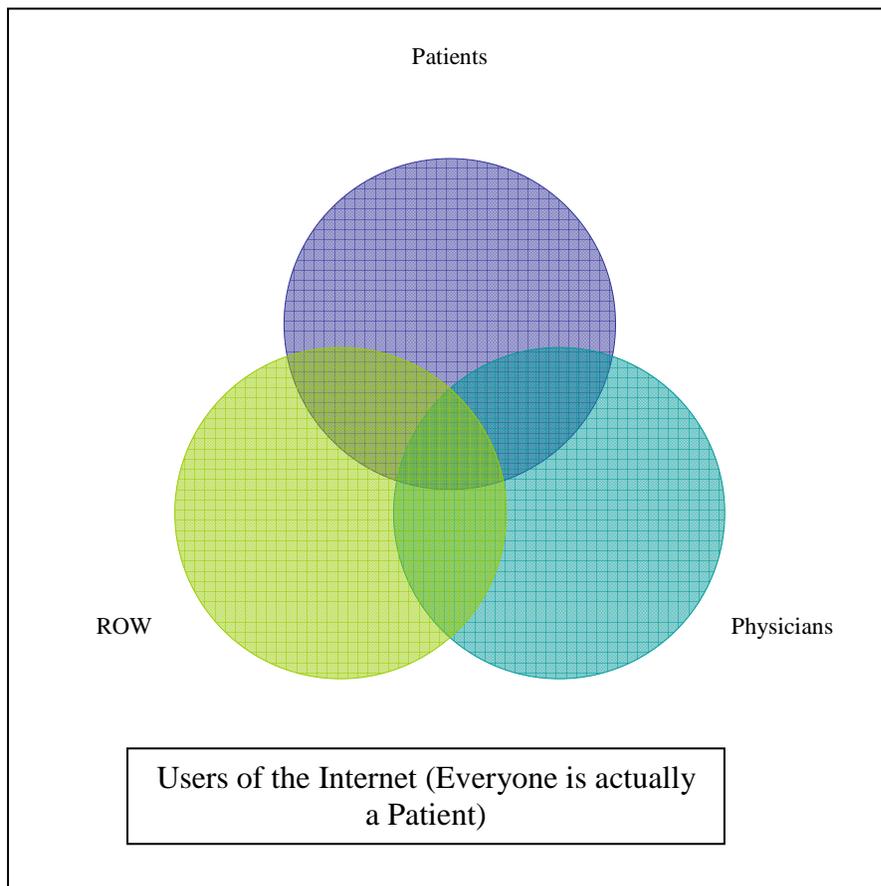
Consumer – Internet Relationship

This shows that the Internet has had a profound impact on the world and it will continue to be source of inspiration to the needy and curious minded. We have seen that the consumers (Users of the Internet) rely on the Internet to gain proper knowledge and use it to save people. People's lives rely on the Internet. This makes it utmost important for the consumers to make maximum use of the Internet and ensure that the content on the Internet is accurate to the last word.

Areas of Internet

Search Engines

It is virtually impossible for the common people to know each and every web site in the cyber space with relevant information each web site hosts. It is always beneficial to have a repository where information about the web pages on the Internet is available. Search Engines represent nothing but a

repository of web sites containing "metadata" (information about the information of a particular web site). People visit the search engines and query it to look for information. The Search Engines are the saviors of the Internet.

Because Internet is available to the public domain and there is no particular body which controls and governs the Internet, there are users who would try and provide "false" information on the Internet. Such users for example could put wrong prescription information about "illegal" drugs for ailments. There are several phony websites being put up by people just to gain "site hits" with the hope that it would in turn increase the "popularity" of the sites. The search engines not manual laborers. Search engines are programmed in a way to capture information from the web sites. We have not received technological superiority where in the Search engines can match the complex working of human mind. Nor has the mankind been successful in creating and imparting "artificial" intelligence to the computers to work like humans. These fallacies can fool the search engines to accepting "bad" information as "good" information and post it to the user search results. If the search engine provides certain information the users are tricked into accepting whatever information the search engines provide as completely authentic even though it is phony.

Blogs

"A **blog** (short for **web log**) is a website where entries are written in chronological order and displayed in reverse chronological order."[3]

Blogs provide commentary or news on a particular subject such as food, politics, or local news; some function as more personal online diaries. The awareness of the Internet has made it easy for the people to share ideas and information. The blogs usually contain the "real" hands-on experience of the users. Definitely, one cannot rely on the blogs for accuracy as with the search engines. Because

most of the blogs are available to public, it is assumed that the information present on the blogs is accurate.

Health Care Forums

There are several forums (aka discussion boards), which facilitate an interactive mode of discussion on a particular topic related to health care. These forums are generally started off and maintained by trained healthcare professionals like physicians so that everyone can be benefited by them. The health care forums serve as a one-place solution for the consumers looking for some specific information. They also serve as a medium to let users post their experiences for the use by other consumers.

PodCasts

One of the latest buzzwords in the Internet users is "podcasting". It refers to the act of distributing audio/ video content over the Internet. There are podcasts for almost any and all topics of health care. People now-a-days store all the seminars in a digital format and then publish them over the Internet as podcasts.

Wikis

Wiki is a new form of collaborative authoring of information. The wikis allows the visitors to add/ modify or remove content. One of the most popular wikis on the Internet is WikiPedia. Thousands of people have come together to make the internet a better place to gain information. When people see certain information on wiki which does not make any sense to them, they can edit the content by providing valid references to the new content which they want to put. In this way, the content on the wikis become more and more accurate for the society.

Really Simple Syndication (RSS) feeds

RSS content can be read using software called a "feed reader" or an "aggregator." The user subscribes to a feed by entering the feed's link into the reader or by clicking an RSS icon in a

browser that initiates the subscription process. The reader checks the user's subscribed feeds regularly for new content, downloading any updates that it finds". Health care Blogs, Wikis use RSS feeds to pass on information to other websites.

Patient Portals

A **patient portal** is an easy-to-use patient management system which facilitates and streamlines patient interaction with the care-provider and enhances the patient-physician relationship. The portal system also enables improving the employee efficiency. It is also a single point of contact for the physicians to get in touch with their patients and vice versa. [5]

Physician Portals

A **physician portal** is a central repository for a physician to have access to all their patients' data in a secure and comprehensive way. The patient portals allow the physicians to allow schedule meetings and appointments from any place. The patients are notified about any changes in the same. It also allows secure messaging to the patients. They also feature some kind of patient education by providing relevant care information which can be accessed by the patients. The patients can easily clear off their bills online directly. [6]

Government regulated organizations

These are organizations that are funded and governed by the Government towards the betterment of Health Care. Such organizations include CMS, HHS etc.

- **www.FloridaHealthStat.com** provides health care information to assist consumers, health care professionals, and researchers in making well-informed health care decisions and in researching the status of health care in Florida.

- **www.MyFloridaRx.com** provides consumers with the retail prices of the most commonly used prescribed drugs by pharmacy across Florida.

Non Government Organizations

These are organizations which are privately funded and are again geared towards the betterment of Health Care. These organizations include PDF-H etc.

Medical Schools and Universities

Most of the medical schools and universities around the world have a medical portal in place providing educational information about healthcare. Being affiliated universities, the content is usually accurate and reliable. The medical schools provide information ranging from day-to-day common cure ailments to non-curable diseases.

Pros and Cons of HealthCare on the Internet

A small section about SEO

A Search Engine is nothing but a robot known as a "crawler" or "spider" which would go around the Internet scouring for web sites. It starts saving the pages in its repository catching and recording certain keywords which allows the search engine to identify the potential fit for any user query. But, there are hundreds of web sites offering similar information about any and all information. So, how does a search engine get to understand which web site page is more important than other? How does it order the pages by relevancy? The answer lies in Search Engine Optimization or "SEO".

There is something known as "Meta Tags and Keywords" which are usually available in the beginning of every web page. These content tags are invisible to the human eyes, but are the means by which the search engines rank a particular web site higher than other web site. Next, we have the concept of "Back links". They simply refer to the number of "outside" linking which a web site has from different sources. The more the linking from external sources, the higher is the rating of the web page by the search engine. Next comes the design of the web pages. The search engines being robots cannot see the images and the contents in it. So, if a web site has proper and accurate content

on its web page, however, it is in the form of images, the search engine would not be able to decipher and identify the content, rendering the web site with little or no relevancy. If there is another site with improper content, but, with proper content alignment of the Keywords, the meta Tags and less use of the images, there is a high probability that the page would be considered as a high ranking and relevant page than the page with many images which the search engine robots cannot read.

There are professionals in the Internet who check the major search engines for information about how the search engines interpret and rate a page for a particular search term. The Search Engine Optimizers "modify/ optimize" the web page content to suit the search engines needs. It's only due to them that we may find scam links in the listing of the search engines.

Importance of the Internet

The Internet is a wide mesh of inter-connected computers; given blood and life by the Search Engine giants like Google, Microsoft and MSN. If it was not for these players, the Internet would have been nothing more than a "geek" thing with just a few people sharing information with each other. It has become a daily norm of life to hit Google (or any other Major Search Engine) to hunt for the minutest of information. The search services of Google are not just limited to "information" search. They offer a plethora of services as finding medical ailment symptoms, get contact information etc. One such use has been given as a testimonial on their web site [19]. The user "Ann" specifically says that she was able to successfully identify the problems she was facing to a heart-attack. Due to which she was able to secure timely help from the local hospitals and gave herself a new life. So, with availability of information in the shortest possible time is nothing more than a boon to the Internet users; esp. health care, where people can get a second life.

Healthcare for correctional facilities (prisons)

There are more than 1.7 million people laundering in the correction facilities in the United States. This leads to a mammoth task to ensure that the correction facilities inmates are adhered with proper health care. If the inmates are not tendered proper care, there is a high probability of the common man being highly taxed to cover the litigation and top of health-care costs. The Michigan Department of Corrections is working on making sure the delivery of health care is as cost-effective as possible by providing good medical care through a variety of methods including Telemedicine, health-care co-pays and managed care. [16].

Telemedicine

"The delivery of health care services, where distance is a critical factor, by health care professionals using information and communications technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interest of advancing the health of individuals and their communities."[17]

In a nutshell, this means that the patient and doctors are located in different places. The distance is not an issue because the patient's entire health data

(**Text**: History, examination, blood reports etc.

Audio: heart sounds, murmurs, voice, etc.

**Still Images**: ECG, X-Rays, UltraSound, CT Scan, MRI etc.

Video: Operative procedures, Echocardiograms, Angiograms, TeleConsultation etc.)

is carried via the internet to the care-provider and formal data exchange takes place between the two parties. This facilitates proper examination, treatment and monitoring of the patients over distances. Such a facility is useful in Emergency Medical Care where the in-person presence of the care-

providers is not possible immediately; however, there is some care-provider who is willing to work on the patient remotely. Because it's an emergency, delay could be fatal to the patient.

Because telemedicine requires transmission of patient data in formats ranging from plain text to complex and huge video files, there is a requirement of a whole communication system which would facilitate continuous exchange of the patient data. In addition to the connectivity, it is important that the patient data reaches the care-provider in time. If there is a huge latency between the sending and receiving of the data, the methodology could not effective.

The Advantages of Telemedicine
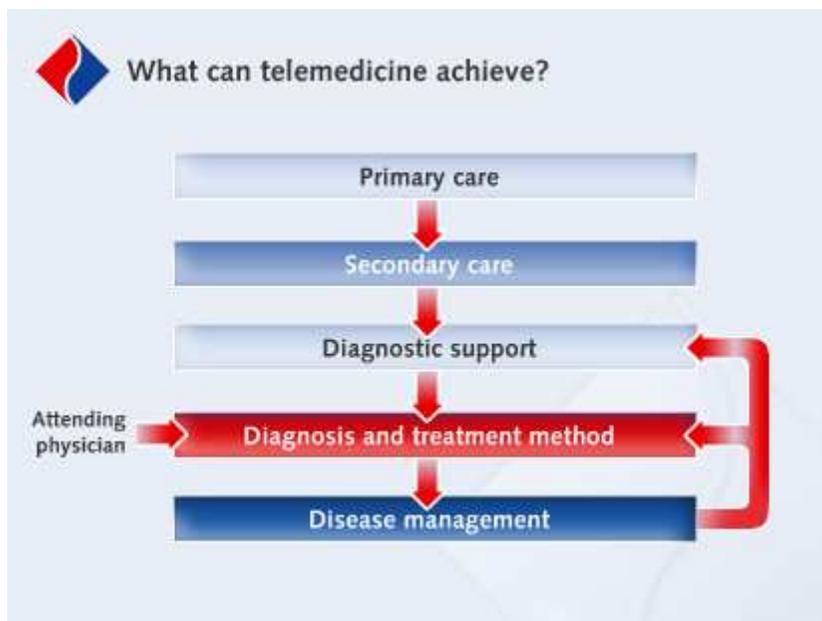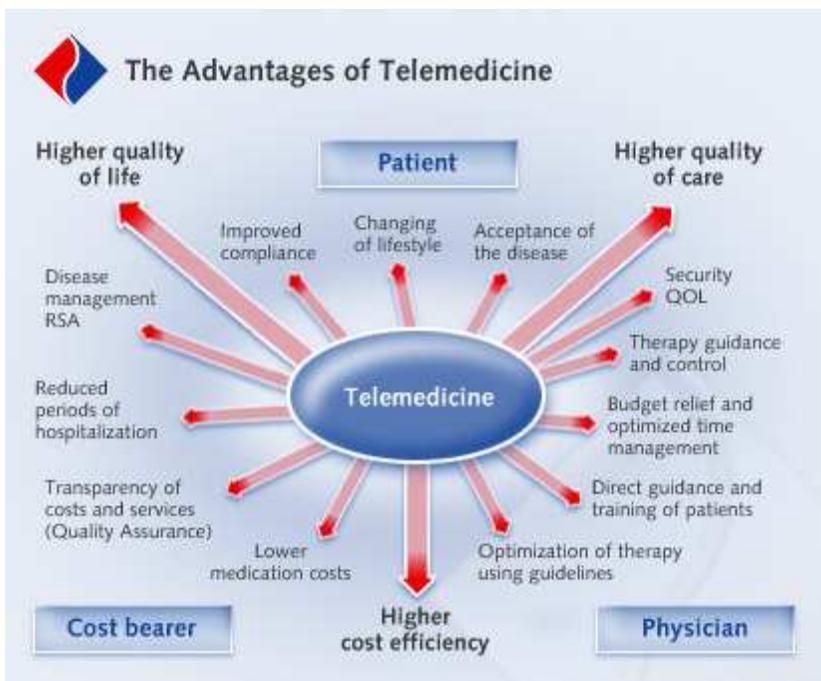
Some of the advantages of the telemedicine are:

1. Cost Savings:

2. Availability for future diagnosis:

3. Prompt care

4. Efficient Care

Elderly People

One of the most important sections of the human race who are kind of not benefited by the real advantages of the Internet and HealthCare are the elderly. Well, technology has been growing and improving at a pace which is difficult to keep abreast with by most of the people. Not many people have access to the computers. Off the people having a personal computer access (public/ private) do not have the means to connect to the Internet. Most of the people use the computers/ Internet for entertainment purposes only. Very few people have actually taken interest in harnessing the real power of the Internet for their benefits. So, the elderly people are the most affected people because most of them do not know how to use a computer. Again, if they start learning how to use the

Internet to their benefit, most of them are a bit slow in the same. They take lots of time to understand the integrities. Due to the rapid change pace, they are unable to grasp some feature which they have used for a particular thing earlier.

Repetitive Stress Syndrome

There are instances where a person knowingly or unknowingly affected by what is known as "Repetitive Stress Syndrome". The best example is sitting in front of the computer for hours and hours without getting up. This leads to severe problems like dried eyes, fatigue, drowsiness etc. Because the Cyber world is so addictive, people tend to roam in a virtual world altogether and forget completely about the real world. Now, there are certain software applications which repeatedly remind people to stop doing their current work and do something different. For e.g. If a manager is sitting in his office continuously, the software would randomly come up on his screen with messages like "Please get up from your seat", "Lets do some basic exercise to get you afresh", "Please look out of the window to the green world" etc. This helps people focus better and accomplish their tasks with greater accuracy and efficiency.

Social Stigma

Not everyone is too comfortable in sharing his/ her problems to any one except himself. The patient may be afraid that if someone in the society becomes aware of his problem, he may be declared unfit to be in the society. There is a social stigma attached to the patients. Also, many people are afraid that if someone comes to know about their ailments, they would be shunned away. People believe that they might loose the love and care which they receive from their parents and family members if the relatives come to know of a particular disease inflicted to their sibling. The Internet is the biggest savior for such people. There is a wealth of information available for them. They can try using the help of the Internet to at least try some cures and preventive measures by them.

Privacy and Confidentiality

Privacy and Confidentiality of patient's data is of utmost importance for the success of the e-Health initiative. If the privacy and confidentiality of the patient data is breached, the patient could be doomed, his future would be questionable, he and his family might even be abandoned from his community; there is a very thin line.

For e.g. let's take the case of a CEO of a multi-national company. Suppose he is suffering from chronic diseases like erectile dysfunction or a heart disease. Till date, the data is stored securely in his Patient portal and his Physicians' portal. However, due to some vulnerability in the system, the data gets leaked to the public. Now, because of the ailments people could get wrong notions that if the CEO is not able to take care of himself, how well could he manage his company? The situation could get really tense and complex. The company stocks might come under direct scrutiny. Due to the insecurity, the stake holders might sell off their stake in the market resulting in a major downfall for the company's stock. For the CEO, immediate resignation is the only recourse. If things go bad, he might even have to file for bankruptcy or even flee the country amidst fear.

Standardization activity

CCR-Continuity of care records

The **ASTM Continuity of Care Record** (CCR) was developed in response to the need to organize and make transportable a set of basic information about a patient's health care that is accessible to clinicians and patients. The CCR is intended to foster and improve continuity of care, reduce medical errors, and ensure a minimum standard of secure health information transportability. Adoption of the CCR by the medical community and IT vendors will be a great step toward achieving interoperability of medical records (one of CHiT's guiding principles). [7]

PDF/H

PDF for Healthcare is a new emerging standard forwarded by Intel & Adobe. It is geared towards bringing portability of health care via the Portable Document Format medium.

HL7

Health Level Seven, Inc. (**HL7**), is an all-volunteer, not-for-profit organization involved in development of international healthcare standards. "HL7" is also used to refer to some of the specific standards created by the organization (i.e. HL7 v2.x, v3.0, HL7 RIM etc.). [8]

Organizations to facilitate Health Care over the Internet

ASTM

ASTM International is an international standards developing organization that develops and publishes voluntary technical standards for a wide range of materials, products, systems, and services. ASTM International develops standards using a consensus process. [9]

HL7

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HITSP

The mission of the **Healthcare Information Technology Standards Panel** is to serve as a cooperative partnership between the public and private sectors for the purpose of achieving a widely accepted and useful set of standards specifically to enable and support widespread interoperability among healthcare software applications, as they will interact in a local, regional and national health information network for the United States.

Comprised of a wide range of stakeholders, the Panel will assist in the development of the U.S. **Nationwide Health Information Network** (NHIN) by addressing issues such as privacy and security within a shared healthcare information system.

The Panel is sponsored by the American National Standards Institute (ANSI) in cooperation with strategic partners such as the Healthcare Information and Management Systems Society (HIMSS), the Advanced Technology Institute (ATI) and Booz Allen Hamilton. Funding for the Panel is being provided via the ONCHIT1 contract award from the U.S. Department of Health and Human Services. [10]

ANSI

As the voice of the U.S. standards and conformity assessment system, the **American National Standards Institute** (ANSI) empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment.

The Institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accrediting programs that assess conformance to standards – including globally-recognized cross-sector programs such as the ISO 9000 (quality) and ISO 14000 (environmental) management systems. [11]

AIIM

For over 60 years, **AIIM - The Enterprise Content Management Association** has been a neutral and unbiased source for helping individuals and organizations understand the challenges associated with managing documents, content, records, and business processes. AIIM is international in scope,

independent, implementation-focused, and, as the representative of the entire ECM industry - including users, suppliers, and the channel - acts as the industry's intermediary.

The AIIM community has grown to 70,000 professionals from all industries and government, over 150 countries, and all levels of management, including senior executives, line-of-business, and IT. With every organization in the world handling some type of paper or electronic content, the ECM industry will continue to grow. As the industry grows, AIIM can be counted on to provide market education, peer networking, professional development, and industry advocacy. [12]

HIMSS

The **Healthcare Information and Management Systems Society** (HIMSS) is the healthcare industry's membership organization exclusively focused on providing global leadership for the optimal use of healthcare information technology (IT) and management systems for the betterment of healthcare. Founded in 1961 with offices in Chicago, Washington D.C., Brussels, and other locations across the United States and Europe, HIMSS represents more than 20,000 individual members and over 300 corporate members that collectively represent organizations employing millions of people. HIMSS frames and leads healthcare public policy and industry practices through its advocacy, educational and professional development initiatives designed to promote information and management systems' contributions to ensuring quality patient care. [13]

FDA

The U S. **Food and Drug Administration** is a scientific, regulatory, and public health agency that oversees items accounting for 25 cents of every dollar spent by consumers. Its jurisdiction encompasses most food products (other than meat and poultry), human and animal drugs, therapeutic agents of biological origin, medical devices, radiation-emitting products for consumer, medical, and occupational use, cosmetics, and animal feed. [14]

HHS

THE DEPARTMENT OF HEALTH AND HUMAN SERVICES is the United States government's principal agency for protecting the health of all Americans and providing essential human services, especially for those who are least able to help themselves. [15]

A bottoms up approach

As per an article in Amednews [20] there is one main cause for failure of an EHR:

* A Top-Down Approach: which means that it is the failure in educating the providers and the patients on the use of EHR systems which leads to lesser availability of patient data electronically to run secondary reports.

In a more similar fashion the approach towards educating patients is to bring awareness amongst them by the government and the providers. If proper information is available on the authenticity of the sites over the internet the patients can feel safe while browsing.

Conclusion

Yes, there's opportunity in health care delivery for those who can thread their way through the thicket. It is perhaps ironic, but nevertheless true, that only the most sophisticated computer users make use of search engines and internet in a proper fashion. The physician offices represent the least sophisticated stratum of computer users. We have a tendency in the field of medicine and informatics to focus on how different health care is than everything else. As information technology over the internet becomes more useable and more sophisticated, it starts to look more similar.

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