

Health Information Provision on the Web via Comparison-Shopping: A Preliminary Investigation

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INTRODUCTION

The public access to health service information is critical for the general welfare of the society. In the United States, there are many efforts being spent by the government and independent non-profit organizations on improving the *quality* and *accessibility* of such information. Recently, comparison-shopping as an innovative way to increase the efficacy of health service information access is emerging. Depending on the geographic location, an individual could conduct comparison-shopping on health service information ranging from health insurance cost, service quality of hospitals and physicians, to price of prescription drugs.

This new way of obtaining healthcare information may have important social consequences. Essentially, it empowered individuals (including new immigrants) to obtain health information and making comparison with zero searching cost. If such practice is being widely adopted, it may increase the efficiency of the whole health system by reducing cost of patients, increasing service quality of health providers, and improve the welfare of the society in general.

Currently, comparison-shopping for health services and health related information are being provided by various entities like commercial enterprises, non-profit organizations, and government agencies. We see forces converging to make such services available in more sectors of the health system. So it is both academically interesting and practically relevant to study this phenomenon and predict the future development of this phenomenon.

To analyze this topic, we need to address the complex structures of the U.S. health system. This complexity makes both the momentum and impact of comparison-shopping in health industry different from its counterpart in electronic commerce market.

For the remaining of this paper, we first introduce the concept of comparison-shopping and how it is being used to provide health related information on the Web. Then we reviewed the major stakeholders of the system. We analyzed the competing forces of comparison-shopping in healthcare industry and compare them to those in electronic commerce industry. Finally, we proposed future research directions. Since this is a preliminary investigation, our focus is not proposing theory but identifying empirical facts and aims at providing basic references for interested practitioners in this field. We also hope this paper may draw interests of academic researchers.

WEB-BASED COMPARISON-SHOPPING AND HEALTH INFORMATION PROVISION

Web-based comparison-shopping refers to the comparison of product and service information from different online sources in the same Web interface via aggregation and pre-processing work done by comparison-shopping agents or Shopbots (Maes, 1994).

As early as in 1995, we witnessed the first online comparison-shopping service, BargainFinder, developed by then Andersen Consulting in the United States. BargainFinder became a killer app and gained public attention almost instantly (Krulwich, 1996). The success of BargainFinder stimulates more sophisticated comparison-shopping services subsequently like mySimon.com and Pricescan.com in late 90's. Comparison-shopping entered into the mainstream B2C market when the second generation services like shopping.com and pricegrabber.com

came onto the stage. Recent survey statistics indicate comparison-shopping ranked among Yahoo, eBay and Amazon as the most visited websites (Nielsen//Netratings, 2004).

In health industry, though comparison-shopping had been used in some sectors like health insurance in very early stage of WWW, most other sectors are lagging behind due to its distinctive market structure compared with commodities.

The health insurance field becomes the pioneer in the U.S. health system to provide comparison-shopping service. Actually this is a natural business extension for insurance agents since they already have the various insurance products data in hand and all they need is to make them available online for the general public to use. Further, this move could actually improve their reach to potential customers, reducing their operation costs in hiring new agents and employees in customer services. Thus, we found established comparison-shopping services in this field emerged quickly like insurable.com, healthinsurance.com, ehealthinsurance.com, etc. from 1995.

Other sectors of health industry were not influenced by this comparison-shopping way until late into 2000. It was not until in the last 2 years, we observed comparison-shopping service on prescription drugs, hospitals, and physicians.

The comparison-shopping service on prescription drugs is mainly due to the rising cost of healthcare. The service providers are mainly non-profit organizations and government agencies like:

1. The U.S. Department of Health and Human Services provides comparison information on hospitals. (www.hospitalcompare.hhs.gov/)
2. The Joint Commission provides information on hospitals as well as other health care service providers (www.jcaho.org)

Some state governments have begun to provide state specific hospital information for their resident patients. Massachusetts Health Quality Partners (MHQP), for example, is an independent state agency that looks at the quality of health services in Massachusetts. It provides side-by-side comparisons on clinic data via different search criteria based on different information needs¹. MHQP also looks at the quality of health service through the patient experiences. This information is then used to compare patient experiences across the state via a tabular comparison-shopping format for easy comparison on the Web².

Comparison-shopping on physician services is also provided by some state governments. For example, New York State provides such service and allows individuals to review a physician's profile information which includes the medical education, legal actions taken against the doctor, translation service at the doctor's office, etc.³

Probably, the most widely available comparison-shopping services are prescription drugs due to the cost issue patients experienced in recent years, which are mainly provided by state governments. For example, the Connecticut attorney general's office provide a comparison-shopping services on prescription drugs and allows patients to compare pharmacy prescription drug prices across the state of Connecticut⁴. The State of Illinois makes similar comparison-shopping information available to its residents⁵.

THE HEALTH SYSTEM IN THE U.S.

The foundation for our understanding of the complexity of the health information provision is the overall structure of the health system in the US, which can be illustrated from the three basic groups of stakeholders, the *patients*, the *providers* and the *payers*.

The patient population consists of the general public seeking health services. The health providers include physicians, clinical technicians, pharmacists, nurse practitioners, allied health specialists and many other healthcare professionals. Most of them provide the health service via hospitals or similar health service facilities. The payers include self-pay patients, private insurance companies, indemnity plans and government payers (such as Medicare and Medicaid). The majority of the stakeholders are connected via three basic organization forms: HMO (Health Maintenance Organizations), PPO (Preferred Provider Organizations), and (POS) Point of Service Plans.

There is a variety of health services available to patients. They include the ambulatory care, assisted living, behavioral health care, and home care & hospice. The most frequently used health services are provided and received in hospitals. The hospital system in the US is very complex and there are several ways to classify them. Overall, there are over 6,500 hospitals in the United States. The majority of them are general hospitals set up to deal with the full range of medical conditions most people require treatment for. However, more than 1,000 hospitals specialize in a particular disease or condition (cancer, rehabilitation, psychiatric illness, etc.) or in one type of patient (children, the elderly, etc.).

Among these hospitals, some are *teaching or community hospitals* that are affiliated with medical schools. Some are *voluntary hospitals*, which are nonprofit community facility operating under religious or other voluntary auspices. There are also for-profit commercial hospitals or *proprietary hospitals*. They are profit-making institutions and owned by corporations or, less often, by individuals such as doctors who practice at the hospital. Finally, there exist *government-supported hospitals*, which government owned facilities and can include facilities such as the VA (Veterans Administration health facilities).

The different origins and operation styles of these hospitals makes their motivation of providing health information to the public varied. For example, teaching hospitals are usually in the position of providing cutting-edge new health services so they have the motivation to compare their service to others to let the patient know their advantage. Proprietary hospitals might have higher motivation to compare their quality of service information than those government-supported hospitals because they want to attract more patients.

On top of the physical structure of the health system, public policy and accreditation are two other forces that shaped this market.

The public policy for health related information is mainly protecting privacy and patient health information⁶. It has not direct influence on adoption of comparison-shopping for health information provision because the latter is mainly in public information domain.

To regulate the quality of health service, there are also accreditation organizations in the US. The Joint Commission on Accreditation of Health Organizations is the primary accreditation body in the US⁷. It evaluates and accredits approximately 16,000 health care organizations in the United States. The information collected in the Joint Commission surveys is of benefit to the healthcare facility, and is especially beneficial to the Patients considering utilizing a healthcare facility.

The Joint Commission Survey Teams composed of health care professionals gather information by visiting health facilities, interviewing staff and patients and examining records and procedures. The survey performance is compared to Joint Commission's standards and quality expectations. Hospitals must meet or exceed the requirements in order to achieve or maintain accreditation.

The accreditation decisions are assigned in different categories based on their level of compliance. They range from fully accredited, provisional accreditation and conditional accreditation to denial of accreditation.

Another important evaluation survey is conducted by Center for Medicare and Medicaid Services (CMS). In order for a health care organization to participate in and receive payment from Medicare or Medicaid programs, it must be certified as complying with the standards set forth in federal regulations, which is based on a survey conducted by a state agency on behalf of the CMS (JCAHO, 2006).

Organizations seeking Medicare approval may also choose to be surveyed by Joint Commission or other accrediting organizations. In this case, CMS may grant the

accrediting organization "deeming" authority and deem each accredited health care organization as meeting Medicare and Medicaid certification requirements. For the time being, the deemed status options are available for ambulatory surgical centers, clinical laboratories, critical access hospitals, HMOs and PPOs, home health, hospices, and hospitals.

To monitor the quality of health service, CMS conducts random validation surveys and complaint investigations of organizations with deemed status through Joint Commission accreditation. In addition, the Joint Commission is obliged to provide CMS with a listing of, and related documentation for, organizations receiving conditional accreditation, preliminary denial of accreditation, and accreditation denied. The Joint Commission also provides CMS with accreditation decision reports for hospitals involved in CMS validation surveys and any other survey report CMS requests. (JCAHO, 2005)

As described above, the health system in the US is very complex in structure. Ordinary patients usually have difficulty obtain the specific service quality information about the providers like doctors or hospitals, not to mention comparing them. In addition, the useful evaluation information mainly comes from a few accreditation organizations or government agencies. These evaluation surveys are targeting the bottom line of the service quality and, beyond which, there is no information to make a more informed decision.

THE CHALLENGE OF HEALTH INFORMATION PROVISION TO THIRD PARTY COMPARISON-SHOPPING SERVICE PROVIDERS

A constant issue facing the American population is continuity of care when changing physicians, insurance plans and locations. Finding new health service providers for their health needs is a constant demand especially with the spiraling cost of health insurances and costs (Baker et al., 2003). The society calls the expertise in providing convenient health information to support individual health service selections. Though there are emerging online comparison-shopping services available in health service selection as we investigated above, we identified a few challenges that could hinder the momentum and sophistication of information delivery in this direction. We summarize them below.

First, unlike comparison-shopping in ecommerce industry, health information provision especially information on hospitals, physicians, and prescription drugs price comparison provided by non-profit organizations does not have similar commercial motivations behind them to support their further development.

In the ecommerce industry, the product information providers (online retailers) actually pay to participate in comparison-shopping because of the potential revenue it could bring back. The more online retailers join the comparison-shopping, the more the remaining online retailers also have to join to maintain their competitiveness – as a result, it forms a positive feedback loop and established the prosperity of comparison-shopping service providers. At the same time, competing comparison-shopping service providers have to improve their technology of information delivery to remain in the market.

In health service information provision, such commercial motivation is not strong for a majority of the entities especially public ones though some private hospitals and doctors who own their clinic may be interested in such comparison. In addition, the ways a health service provider (usually non-profit in nature) operates to attract patients are traditionally different from those in business world. So we might not be able to see a change in near future. In other words, the sophistication and breadth of comparison-shopping on health services may not develop as fast as its counterpart in ecommerce industry.

Second, intertwined with first challenge, the intellectual property especially copyright issues for information on the Web are still pending in many aspects (Lindberg and Humphreys, 1998). For the time being, the health information provided on the Web is mostly owned by non-profit organizations and government agencies, which may not have the commercial motivation or right to sell it or allow it to be used by commercial organizations to generate profits. Without such mechanism, the core technology of comparison-shopping, which is aggregating data from multiple sources and presenting them in a value-added way to users, can not be conducted efficiently. Again, in ecommerce field, comparison-shopping service providers also experienced copyright issues in the beginning when they retrieve data from different online vendors for comparison. However, when online vendors found comparison-shopping could actually increase their revenue, they changed their attitude and begin to pay to participate (Plitch, 2002).

But in health service industry, this change is unlikely due to the non-profit nature for most part of the system. So how to protect a third party comparison-shopping service provider from being sued via appropriate public policy is important.

There are some moves in this direction recently. For example, Illinois enacted a law in 2005 (The Prescription Price Disclosure Act) and ensure that consumers can compare-shop to find the lowest price for their prescription medications. It requires pharmacists to disclose the current retail price of any brand or generic prescription drug or medical device that the pharmacy offers for sale. As we can see from this case – if we lack the invisible hand of the market to encourage the voluntary participation as in e-commerce industry, the state government could step out and use the visible hand of legislation to force the participation (basically sharing the drug price data) of comparison-shopping by drug vendors.

We expect more public regulations will have to be enacted as a compensation for lacking commercial motivation of comparison-shopping by health service providers in the near future to promote the services.

FUTURE RESEARCH DIRECTIONS

We think the first priority in research of this field is establishing a proper framework on the classification of health information as needed by patients. This framework should include all aspects of health information a patient needs to make healthcare decisions.

We also need research on how to standardize health information so as to make the electronic transaction of information retrieval and aggregation by comparison-shopping search engines easier to perform. A related project that has been underway for quite a while is the concept of regional health exchanges (Havenstein, 2005). In this plan, the U.S. Government hopes to provide a backbone for a national health information infrastructure where all hospitals will be connected and patient information is stored electronically in real time. The comparison-shopping search engine could utilize such a network to retrieve necessary information in the future.

Another imperative topic in future research might be a detailed analysis on the impact of public policies on health information provision in comparison-shopping mode. In health information provision, the motivation of providing comparison information is both non-commercial and complicated. So the impact needs to be investigated in detail.

CONCLUSION

In this paper, we investigated comparison-shopping as a new way for health information provision in the United States. We introduced the emerging field of comparison-shopping and its application in several aspects of health information provision such as health insurance, hospital, physician, and prescription drug selection.

We identified the challenges of the development of this field by contrasting it with comparison-shopping industry in electronic commerce world, where a more efficient mechanism is driving the sophistication and maturity of this new mode of decision support. We argue that public policy is the most effective way currently

in health information provision to influence the development of comparison-shopping on health services.

Finally, we proposed several future research directions in this new field.

REFERENCES

- BAKER, L., WAGNER, T. H., SINGER, S. & BUNDORF, M. K. (2003) Use of the Internet and E-mail for Health Care Information: Results From a National Survey. *JAMA*, 289, 2400-2406.
- HAVENSTEIN, H. (2005) Regional health exchanges slowly start to share data. *Computerworld*.
- JCAHO (2005) 2004 General Public Quality Report User Guide. Joint Commission on Accreditation of Healthcare Organizations.
- JCAHO (2006) Federal Deemed Status and State Recognition
- KRULWICH, B. (1996) The BargainFinder Agent: Comparison Price Shopping on the Internet. IN WILLIAMS, J. (Ed.) *Bots, and Other Internet Beasts*. Indianapolis, Macmillan Computer Publishing.
- LINDBERG, D. A. B. & HUMPHREYS, B. L. (1998) Medicine and Health on the Internet: The Good, the Bad, and the Ugly. *JAMA*, 280, 1303-1304.
- MAES, P. (1994) Agents that reduce work and information overload. *Communications of the ACM*.
- NIELSEN//NETRATINGS (2004) Web Surfers Comparison Shop Online For Mother's Day Gifts. NetRatings, Inc.
- PLITCH, P. (2002) Are Bots Legal? *Wall Street Journal*, 240, R13.

ENDNOTE

- ¹ This service is available from their official site: <http://www.mhqp.org/quality/clinical/cqSearch.asp?nav=032400>
- ² This service is available from following URL: <http://www.mhqp.org/quality/pes/pesSearch.asp?nav=031600>
- ³ The service is available from URL: <http://www.nydoctorprofile.com/welcome.jsp>
- ⁴ Available via URL: <http://www.dir.ct.gov/ag/DrugSearchGIS.asp>
- ⁵ Available via URL: http://www.consumeraffairs.com/news04/2006/01/il_drug_shop.html
- ⁶ According to a recent survey by Forrester Research (which is a follow up to a similar survey conducted by California Health Foundation in 1999) to detect if there is any reduction for individuals in concerns over their privacy, there are still 67% of national respondents "somewhat" or "very concerned" about the privacy of their personal medical records (Bishop et al., 2005). In line with such concern, the Health Insurance Portability & Accountability Act of 1996 (or HIPAA) are probably the most well known and widely sweeping of the continuous effort by government to regulate access, transport and availability of patient health information. HIPAA has brought about more sweeping changes in health transactions and administrative information systems than any other regulation in recent times.
- ⁷ More information about this organization could be obtained from their official website: <http://www.jointcommission.org/>

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