CHAPTER 2

LITERATURE REVIEW

The literature review on Internet usage among doctors was segmented by demographic variables.

The landmark study on Internet usage among doctors worldwide by the Canadian PSL Group in 1998 is the most comprehensive study to date. Internet usage among European doctors was studied in the British Healthcare Internet Association (BHIA) survey in 1997 and two other studies in 1998, ISIS Research and NOP Report. Cyberatlas showed Internet usage among American doctors in the Healtheon's survey in 1999. There were only two minor local studies available that reflected solely on computer ownership among Malaysian doctors. To date, there were no studies on Internet accessibility of Malaysian doctors.

Also reviewed were the latest research in year 2000 among doctors' worldwide - Canadian PSL Group Study and Harris Interactive Poll. Doctors' negative perception towards Internet was reflected in two studies, one by Forrester Research and the other by Ziment.

A large-scale study on the future of Internet in Healthcare was undertaken by the Californian Healthcare Foundation.

2.1 Internet usage among medical doctors

The internet usage among doctors worldwide were reviewed first, followed by Europe, America and Malaysia. Then the latest reseach conducted among doctors worldwide was discussed including the current negative perception on Internet by doctors.

2.1.1 Internet usage among doctors worldwide

A survey conducted in September 1998 entitled 'Global Survey Points to Increasing Use of Internet by Physicians (Doctors) from the Canadian PSL Group[5], which is still widely quoted today, stated that, 'A recently conducted study on physicians' Internet usage documents the pervasive and growing use of the Internet by doctors around the world. This trend is altering, and will continue to alter, the face of communications aimed at medical audiences and the ways in which physicians communicate with their colleagues and patients.'

The first phase of the two-phase study found that:
80% of physicians across eleven North American, European and Asian countries own a computer. 44% of these physicians had accessed the Internet. The predominant place of Internet access is in the home. Among physicians who had not yet accessed the Internet (56% of the physicians in the eleven countries surveyed), two-thirds said that they intended to do so soon. The overall results were that more than 80% of the physicians were on-line or intended to be on-line in the near future.

The second phase of the study was conducted with over 2,500 Internet-connected physicians in 105 countries. It found that excluding all time spent on e-mail, these doctors reported spending half of their Internet surfing time seeking information pertaining to medicine. Almost all of them (95%) said they used the Internet to access information regarding disease, 88% reported reading medical

journals on-line and 86% said they used the Internet to obtain information on drugs.

Nevertheless, academic and independent scientific sources are not the only ones accessed. Over three-fifths or 63% of the Internet-connected physicians reported having visited the website of at least one pharmaceutical company. When visiting these sites, the information physicians stated they most wanted to see was "product information" (51%), "R&D information" (27%) and "disease information" (16%). In a finding that is both surprising and indicative of a general trend toward patient empowerment, 62% of the net-connected physicians reported that they had suggested their patients to obtain medical information via the Internet. Almost one third of physicians reported that patients had brought to them medical or health-related information that they had found on the Internet.

These findings strongly suggest that physicians may soon be obtaining a significant portion of the information they utilise to practice medicine online. As patients become more informed, the demands placed upon physicians to stay abreast of medical news will grow.

2.1.2 Internet usage among doctors in Europe

In 1997, The British Healthcare Internet Association (BHIA) [2] initiated their own survey of United Kingdom General Practitioners' (UK GPs), led by Dr. Trefor Roscoe. The results were presented at MEDNET 97 and indicated that less than 13% of UK GPs had an Internet connection in summer 1997 and used it on an average of four times a week. Unfortunately, this survey was not repeated as planned in summer 1998 when it could have been an interesting comparison with ISIS Research surveys.

ISIS Research [3] ran a series of annual telephone surveys of GP Internet usage around Europe. In Spring, 1998 their figures suggested that maybe 38% of UK GPs were using the Internet compared with less than 10% in Spring 1997. ISIS Research then repeated the exercise in January 1999, but only for GPs in UK and Italy, and again found a significant increase in usage. Their summary results suggested that now 58% of UK GPs and 32% of Italian GPs used the Internet.

In the Summer of 1998, NOP [4] published results from their report, "Internet will be a significant information source for GPs in the new millennium", in which they refer to their findings that 15 % of UK GPs had Internet access, though it is not clear when this data was established. They also reported that four out of five (81%) of GPs said that they had accessed the Internet during the previous four weeks. On average, this represents 12 visits to Websites over a four-week period by each GP, spending an average of almost 30 minutes on their most recently visited Website. They also make the point that more than half (52%) of GPs who had accessed the Internet during the previous four weeks say that they had never visited a pharmaceutical company Web site.

2.1.3 Internet usage among doctors in America

In May 1999, CyberAtlas reported the results from Healtheon's survey on US Internet usage. "Doctors' Net Use Keeps Increasing" [6] revealed that "85% of physicians surveyed were using the Internet, an increase in regular online activity by doctors in a quantum of 42% from the previous three months and a jump of 875% from 1997. The ongoing research project has chronicled almost 10,000 physicians' computer needs and expectations over the last three years. The survey also found that more than 63% of the physicians used e-mail daily and 33% had used e-mail to communicate with patients. Doctor-patient communication via e-mail has jumped 200% in the last year.

2.1.4 Computer Ownership in Malaysian doctors

Currently, there is no research on Internet usage among the Malaysian doctors.

In a study published in Malaysian Medical Tribune, December 2000 – "Are doctors and pharmacists computer savvy?" [10] conducted by the Medicines Surveillance Centre (Medsurv), Dept. of Pharmacy, University of Malaya, aimed to determine the source of which medical practitioners and pharmacists preferred to get their information on pharmaceutical products.

The number of medical professionals who responded to the survey was 1,075 medical practitioners and this consisted of 31.8% specialists, 29.6% medical officers and 35.6% general practitioners. The study also claims that 97% of medical practitioners were surveyed but this claim can be questionable since the medical practitioners in Malaysia totals to 15,503 doctors (according to Malaysian Medical Council Registry 2001).

The results of this 3 months survey revealed that 62% of medical practitioners use computers, in particular personal computers (53.3%), notebooks (8.7%) and both (9%). 79.3% of medical practitioners rank attending medical symposiums as the number one way of acquiring product information followed by reading medical journals. Brochures presented by MSR's ranked third. Internet was ranked at number eight.

Diethelm Malaysia Sdn. Bhd. a distributor of pharmaceutical products in Malaysia also published the results of a nation-wide survey it conducted that involved 1,700 customers (includes doctors, pharmacies and private hospitals) recently in the Diethelm Healthcare News [13]. In this survey, out of 1,124 doctors in general practice (GP's), 58% had computers, but this does not indicate Internet access and 28% of these doctors were interested in B2B (business to business) trading.

2.1.5 Latest research on Internet usage among doctors worldwide

The second wave of PSL's[5] ongoing I.MD 2000 study of 1,750 primary care physicians (PCPs) in USA, Canada, UK, Germany, France, Italy, Spain and Brazil was released in Spring 2000. I.MD 2000 provided a detailed, global perspective of usage and attitudes towards the Internet by Primary Care Physicians.

A short report on this study published on InPharm.com in June, revealed that the percentage of physicians having accessibility to the Internet in Germany was 55% and 93% in USA. PSL predict that by Q2 2001, anywhere between 75% of PCPs in Germany and 97% in USA will have used the Internet. Results showed that over 80% of PCPs who search for health information online, look for information about side effects and drug interactions. The least searched for information was for 'drugs not yet launched in the physician's country or available in other countries'.

A Harris Interactive Poll from April 2000, reported on Nua [7] website, revealed that 89% of doctors are online at home or work. However, the article does not say whether the results were from a US only poll. Interestingly, despite the fact it is reported that each doctor spends an average of six hours a week surfing the Internet, only a very small proportion of this time (15%) is spent looking for clinical information. At the moment only 30% of doctors work in practices that have Internet connections, but this is expected to rise to 50% by the end of 2001.

However, whilst there are some report showing that doctors are getting over their Internet scepticism, others seem to suggest the opposite. 'Why Doctors Hate the Net' [8] - a study carried out by Forrester Research and reported in Wired News in April 2000 - suggests that far from embracing the Net many doctors seem to view it as an unwelcome annoyance in their work lives. Patient e-mail seems to be a

burning issue. A large proportion of doctors surveyed (72%) said that in future they would not personally respond to patient e-mail and 19% said that they would, only if they were compensated for doing so. Many doctors surveyed also viewed consumer-orientated websites negatively because they often caused patients to make inappropriate demands. However, the article pointed out that sites that are fast gaining support amongst the physician population are those that are run by non-profit organisations or the government, which have tightly restricted access. Example: Global Health Network , Healthfinder, HealthWeb, Medline Plus, Martindale's Health Science Guide 2000.

This negative feeling towards the Internet by physicians is echoed in updated results from the WebSurveyMD.com, run by Ziment [9] . This study reveals that only 27% of American physicians believe that Internet will save money for the healthcare system in the next five years. Less that half believe that it will improve doctor-patient communications. Ziment's Managing Director warns e-health technology developers that they need to try and understand physician needs and interests better or otherwise their efforts will fail. The strangest observation was that the Internet-savvy doctors were the ones least interested in e-health technologies, such as platforms for writing online prescriptions.

2.2 Future of Internet in Healthcare

A Californian Healthcare Foundation[14] study revealed that healthcare professionals are using the Internet for research, to access the latest information in their field, to consult with their colleagues and to keep in touch with their patients. Almost every type of healthcare business has a website e.g. medical insurer, hospital and pharmaceutical company.

Several pertinent questions have been raised and need to be addressed. They are as follows :

Why is the use of Internet in healthcare growing so quickly?

How sustainable is this growth?

What kinds of health-related applications will develop over the next five years?

How will Internet affect healthcare delivery and health outcomes?

In all this excitement about the Internet, there inevitably will be unrealistic expectations about its impact on the healthcare industry.

A realistic assessment of the pace and direction of change for the next five years is stated below.

2.2.1 DRIVING FORCES

The major driving forces pushing the Internet into healthcare are strong and irreversible; they will ensure that Internet is increasingly integrated into the healthcare systems [14].

- **Twenty First Century Healthcare Consumers**

By 2005, more than half of U.S. consumers will have high household incomes, some college education and access to a computer at home or at work. Healthcare consumers of the future will be more actively involved in making decisions about the healthcare that they receive. They will expect high levels of choice, control, customer service, interactions with their healthcare providers, and access to information. They will use the Internet to help them meet those expectations.

- **Consumer Experiences with Other Industries**

Consumers' experiences in the responsiveness and choice they get from Internet shopping and interaction they get from using electronic mail will shape their expectations on Internet healthcare. Internet healthcare sites must be able to meet the consumer's expectations to remain viable.

- **The Characteristics of the Internet**

The Internet as a channel for health information and communications is well suited to fulfill consumer expectations. It is inexpensive, easy to use, provides a diversity of health care information, and opens its users to a global network of people with common interests.

- **Market Forces in Healthcare**

Market forces will always influence the healthcare system, in the form of managed care, employer purchasing coalitions, assertive government payers and regulators and consumer organizations. Web technologies such as intranets, extranets and the Internet will serve as a low-cost, rapidly deployable platform for disseminating information across vertically and horizontally integrated healthcare organizations. Managed care increases the diversity and urgency of information flow and more of that communication will move to the Internet. Competitive healthcare organizations will use the Web as a channel to promote their services.

2.2.2 BARRIERS

At the same time, a number of barriers will impede the development of the Internet in healthcare. They will not stop its use by any means but the magnitude of these barriers ensures that Internet use will not be all pervasive in health by 2005[14].

- **Security Concerns**

If there's one thing people are even more guarded about other than their financial information; it's private information about their health. Even though technologies are in place to safeguard electronic health information, the perception of a lack of security will inhibit the use of Internet for personal clinical information in the near term. In the long run, we will reach a combination of technological solutions, public policies and cultural habits that will allow health information to flow freely in the Internet.

- **The Characteristics of the Internet**

Just as there are characteristics of the Internet that will drive its use in healthcare, it also has several that will impede its diffusion. The rapid pace of change in the Internet will outstrip the ability of many healthcare organizations to keep pace. Weaknesses in Web browser and search engine technologies, including the inability to interact well with legacy databases and to find dynamic Web pages, will limit the appeal of the Internet to healthcare providers.

- **The Mixed Quality of Information on the Internet**

The flip side of the diversity of content that is available on the Internet is that a great deal of poor-quality information is currently available. That uneven quality will turn off some consumers and keep away medical practitioners from enthusiastically embracing the Internet.

- **Specialists' Ambivalence**

The poor quality of some health information on the Internet is not the only reason that the physicians (specialists) will resist. Medical culture is extremely

conservative and cautious, especially so when it comes to new technologies. The Internet is one of such technology that could alter the doctor-patient relationship.

- **The Disarray of Healthcare Information Systems**

The legacy of information systems of most healthcare players such as insurers, hospitals and physicians are not ready to be used together with Internet. Substantial restructuring and "housecleaning" must take place before the systems are ready for prime time.

- **Lack of Resources for Web Development**

Information systems departments in most healthcare organizations are not Web-oriented. They are poorly funded. Even when they are enthusiastic about the Web, healthcare organizations are competing with almost every other industry for scarce Web designers, technicians and engineers.

- **Too Many Standards**

Healthcare has many standards for electronic communications and transactions. The parochial and vertically differentiated nature of standards in healthcare will inhibit the near-term development of electronic commerce in the industry and its move to the Internet.

2.2.3 FORECAST: LEADING-EDGE APPLICATIONS

2.2.3.1 Consumer usage of Internet to seek information about healthcare will move the fastest [14]

- **Consumer Health Information Services**

Consumers will seek information from thousands of websites dedicated to healthcare. The number of healthcare websites will proliferate as established healthcare organizations, new Web-oriented health start-ups and interested individuals put up their content. A number of approaches, including ratings services and trusted brands, will help consumer's sort through the noise. Online purchases of both prescription drugs and over-the-counter items will increase during the forecast period.

- **Online Support Groups for Patients and Caregivers**

Online support groups for patients with a given disease and the people who care for them will continue to develop rapidly. Patients participating in the groups will feel more in control and for many diseases have better outcomes. There will be points of strain between patients and some physicians who feel a loss of control over their patients' care.

2.2.3.2 Use of Internet and electronic mail will proceed more slowly than consumer-oriented applications [14]

- **Health Care Provider Information Services**

Use of online information by healthcare professionals has become increasingly common. There is no forecast on breakthrough applications, but

sites that can filter out most of the random content for doctors will be developed. Medical journals and eventually continuing medical education will go to the Web.

- **Provider-Patient E-Mail**

In certain communities, consumer pressure will push physicians to overcome their fears of being overwhelmed with electronic messages, breaches in security and liability. In most places, physicians will be reluctant to embrace e-mail with their patients. In future, despite the lack of reimbursement for e-mail communications, physicians will come to embrace it as they did to the telephone in the early part of this century.

2.2.3.3 Internet as replacement or complement to existing information systems, communications infrastructures and transaction services [14]

- **Communications Infrastructure and Transaction Services**

The justification for using the Internet to transmit electronic insurance claims, conduct remote telemedicine consultations and transmit data from clinical trials or FDA filings will be largely economic. The Internet will replace other communications channels that are more costly or less capable. Large claims clearing houses, which have taken a wait-and-see approach to the Web because of security concerns, will move rapidly to the Web once security regulations are clarified. Many other healthcare transactions, including eligibility, enrollment and utilization review, will take longer to move to the Web.

- **Electronic Medical Records**

Health care providers are near the beginning of a slow transition to electronic patient records. One approach to overcoming the fragmented nature of existing electronic records is to use Web technologies as a "front end" to a range of clinical systems. In those applications, the Web browser displays in a common format (but usually not well integrated) content from several information systems. It is forecast that, although there will be a lot of activity in Web-based front ends, it won't be capable of providing the type of decision support that the eventual full electronic medical record will give to providers.

The summary of Future of Internet in Healthcare is shown in Table 2.1

Table 2.1 : Summary of Future of Internet in Healthcare

DRVING FORCES	BARRIERS	FORECAST
♦ 21st Century Healthcare Consumers ♦ Consumers experiences with Other Industries ♦ The Characteristics of the Internet ♦ Market forces in Healthcare	♦ Security Concerns ♦ The Characteristics of the Internet ♦ The Mixed Quality of Information on Internet ♦ Specialists Ambivalence ♦ Lack of Resources for Web Development ♦ Too many standards	♦ Consumer usage of Internet to seek information about healthcare will move the fastest ♦ Use of Internet and electronic mail will proceed more slowly than consumer-oriented applications ♦ Internet as replacement or complement to existing information systems, communications infrastructures and transaction services