

## Learning from the Real-World Web-Appointment System of the Hospitals in Taiwan

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*Abstract:* - In Taiwan, hospitals are stratified as academic medical centers, regional hospitals, community hospitals, and psychiatric hospitals by Taiwan Joint Commission on Hospital Accreditation. The prevalence of Internet is rather high in Taiwan. We argue that there is still lag for hospital to provide web-appointment service. And we want to learn from the real-world web-appointment system. The sample of hospitals came from the certified list of the hospital accreditation; there were 496 hospitals including 17 academic medical centers, 70 regional hospitals, 371 community hospitals and 38 psychiatric hospitals. The results of our survey showed that not all the hospitals offered web-appointment services to both first and subsequent visits. We concluded that there still has a long way for hospitals to take the advantage of the wide range of communications technologies available via the Internet to further their often-completing goals of increasing the quality of patient care and controlling costs.

*Key-Words:* Taiwan, hospitals, web-appointment, application of web

### 1 Introduction

In Taiwan, there are 496 hospitals located in 4 districts – northern, central, southern and eastern. These hospitals are stratified as academic medical centers, regional hospitals, community hospitals and psychiatric hospitals. Taiwan Joint Commission on Hospital Accreditation certifies the stratification [1]. Taiwan Joint Commission on Hospital Accreditation was established on March 16, 1999 with the support and donations from the Department of Health under the Executive Yuan (Cabinet) of the Republic of China (ROC), Hospital Associations and the Medical Association. The board of directors include members from the Department of Health, Hospital Association and Medical Association. Medical experts and patients are also represented on the board.

The purpose of hospital accreditation is to establish a safe, efficient, patient-centered, adequate, effective, and fair health service system, provide a list of qualified hospitals for patients, and improve medical teaching and research. The goal of the accreditation is to build an integrated quality medical network for the health care system in Taiwan.

According to the criteria of certification, the academic medical centers must be equipped with at least 500 beds. Both the regional and community hospitals should have no more than 250 beds. Furthermore, the academic medical centers must have the ability to transfer data on website.

In Taiwan, everyone is required to enroll in the national health insurance program. When one needs

health service, he shows his health insurance card for doctors or hospitals to start procedure of visiting. There are several ways of making an appointment. A person can either go to the hospital directly for consultation that day or make an appointment from home, by phone or web if his condition is not emergent.

## 2 Problem Formation

The Internet provides a wide range of technologies that enable hospitals to communicate with their patients. Recently, as the prevalence of Internet increasing, many hospitals initiated the website appointment system. Electronic patient-provider communication promises to improve efficiency and effectiveness of clinical care [2]. But in America, Gruca and Wakefield (2004) found that only a small group of hospitals enable their websites to interactively schedule appointment. About one fourth of the sample allows appointment scheduling via e-mail form.

Either phone or website can provide convenience for patients to make appointment at home. They need not wait in line at the hospital and stay long hours there under the traditional procedure. However, the hospitals in Taiwan are still always crowded with patients. Many of whom go there early in the morning to book an appointment.

Compared to other forms of electronic commerce, hospital websites lag very far behind in their capability to turn website visitors into patients [3]. In Taiwan, the prevalence of Internet is 54% [4]. And many hospitals have provided electronic brochures or marketing programs on the websites. We argue that there is still lag for hospital to provide web-appointment service in Taiwan. And we want to learn from the real-world web-appointment system. The aim is to understand the service of web-appointment offered by hospitals in

Taiwan, and to compare the differences in such services among the four districts.

## 3 Problem Solution

The sample of hospitals came from the certified list of the hospital accreditation; there were 496 hospitals including 17 academic medical centers, 70 regional hospitals, 371 community hospitals and 38 psychiatric hospitals. We searched on each hospital's website for the service of making appointment. It was found that there was limitation for the use of web appointment system. Some hospitals' web appointment system was only for subsequent visits, and others were for both first and subsequent visits.

The results of all hospitals' web searching were shown as table 1. We found that all of the 17 academic medical centers offered the website appointment service. Most of them offered the service for both first and subsequent visits, but 3 academic medical centers only offered the service for subsequent visits. More than 80% of the 70 community hospitals offered the website appointment service.

Table 1. Web-appointment service at hospitals

Hospitals	Total	Web-appoint	First and subsequent visits
Academic medical centers	17	17 (100%)	14 (82.4%)
Regional hospitals	70	58 (82.9%)	35 (60.3%)
Community hospitals	371	47 (12.6%)	9 (19.1%)
Psychiatric hospitals	38	8 (21.1%)	3 (37.5%)

Among the regional hospitals, over 60% offered the service both for first and subsequent visits. Of the 371 community hospitals, there was 12.6% offering the website appointment service. Less than 20% of such hospitals offered the service both to the first and subsequent visits. There were 8 psychiatric hospitals having the website appointment service, and 3 of them offered the service to both first and subsequent visits. Obviously, more hospitals with higher qualified stratification offered services for both first and subsequent visits.

Data was analyzed to compare the differences of appointment services of hospitals among the four districts - northern, central, southern, and eastern. The distribution of hospitals in the 4 districts was shown as table 2. The result showed that almost half of the academic medical centers were in the northern district. It seemed that there is an imbalance of medical resources between south and north. However, over than 40% of the community hospitals were in the southern district. It may make even. It was obvious there was the least number of hospitals in the eastern district. There were only one academic medical hospital, one psychiatric hospital, 4 regional hospitals, and 10 community hospitals.

Table 2. The distribution of hospitals

The comparisons among these 4 districts were shown as figures 1 to 3. Most of the regional hospitals offered the service of web-appointment. In eastern district, all of the regional hospitals offered this service. For the community hospitals, the proportion of web-appointment service was small.

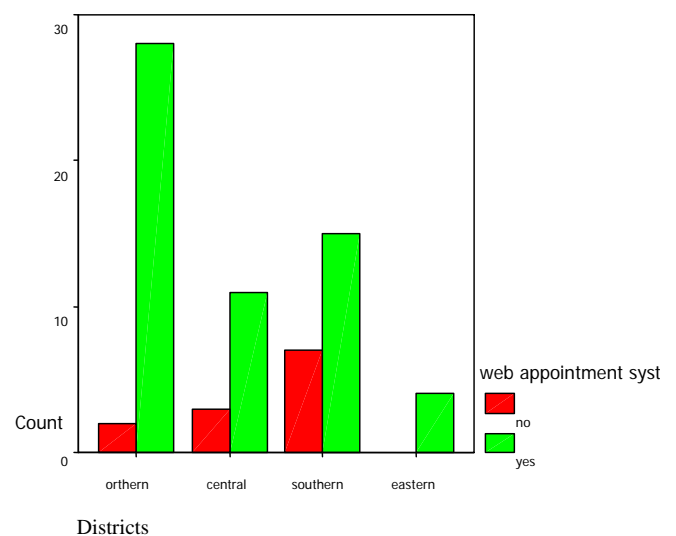


Fig 1. Web-appointment system of 70 regional hospitals in 4 districts

The one psychiatric hospital in the eastern district didn't offer the service of web-appointment. At the other districts, only small portion of the psychiatric hospitals offered web-appointment service.

Hospitals	Norther n	Central	Souther n	Eastern	Total
Academic medical center	8 (47.1%)	3 (17.6%)	5 (29.4%)	1 (5.9%)	17
Regional hospital	30 (42.9%)	14 (20.0%)	22 (31.4%)	4 (5.7%)	70
Community hospital	118 (31.8%)	93 (25.1%)	150 (40.4%)	10 (2.7%)	371
Psychiatric hospital	18 (47.4%)	8 (21.1%)	11 (28.9%)	1 (2.6%)	38

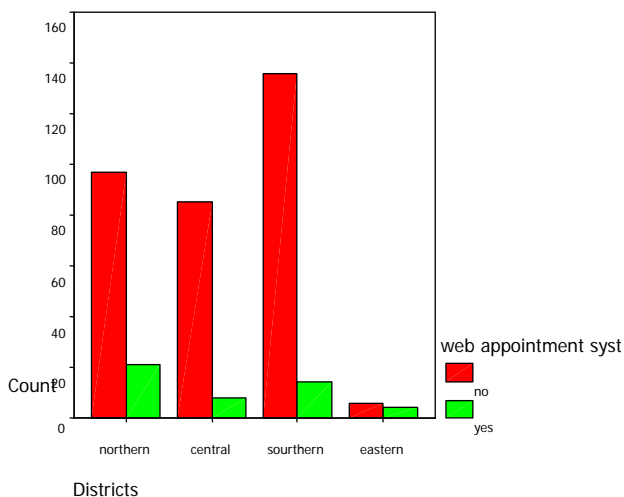


Fig 2. Web-appointment system of 371 community hospitals in 4 districts

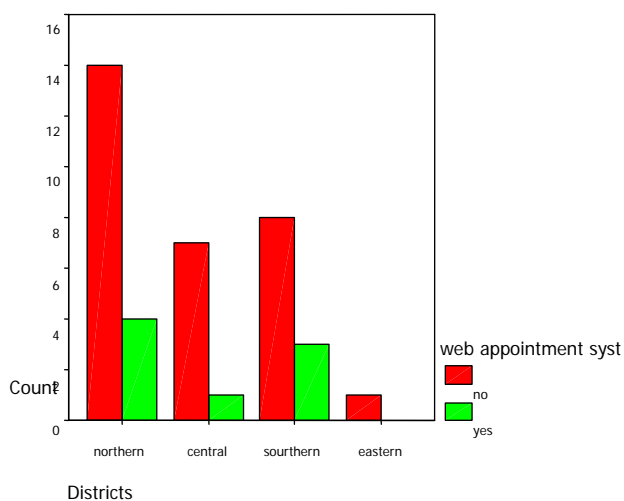


Fig 3. Web-appointment system of 38 psychiatric hospitals in 4 districts

## 4 Conclusion

The prevalence of Internet in Taiwan is high. We want to understand if there is any lag for hospitals in using the web for appointment service. The sample of hospitals came from the certified list of the hospital accreditation. The results of our survey indicated that all of the academic medical centers offered the web-appointment service, but not all from the other categories of hospitals. Further analysis revealed both the stratification and the districts were the important factor to be discussed.

The number of hospitals offered the service of web-appointment indicated that there was no lag in the service in general. However, there was a lag for the hospitals which offered the service only for subsequent visits using the web. The nature of the Internet is such that a website can simultaneously target many different groups [5]. If hospitals can effectively use Internet technology rather than more personnel, they will achieve their twin goals of better service for patients and higher efficiency. The academic medical centers enjoy reputation of good quality, according to Taiwan Joint Commission on Hospital Accreditation. The operation of their web-appointment system should be extended to both first and subsequent visits.

Psychiatric hospitals are different from the other hospitals. Almost all the patients need their family's assistant to utilize the medical care. If the hospitals could offer interactive schedule appointment service, it would help the family to make decisions.

The number of community hospitals with web-appointment service was the lowest. For adopting the forthcoming referral plans [6], they have to strengthen their web function and meet patients' needs.

The distribution of hospitals indicated an

insufficient medical resource for the eastern district. There is only one medical center in the eastern district. This medical center, a Buddhist hospital, was built by the Tzu Chi Foundation which is one of the largest charity organizations in Taiwan. The hospital's volunteers come from overseas and from every part of Taiwan to serve patients [7]. Having the experience of providing charity and medical services to the needy worldwide, the organization has utilized advanced technology to improve the efficiency of service and the health of patients. Their devotion would make up the inequality in the distribution of medical resources.

In the eastern district, nearly half of the community hospitals offered the web-appointment service. The long shaped geographic characteristics of the eastern district made scarcely distributed medical resources unavailable for patients. It might be the main factor of high frequency in adopting web-appointment system.

We concluded that there still has a long way for hospitals to take the advantage of the wide range of communications technologies available via the Internet to further their often-completing goals of increasing the quality of patient care and controlling costs.

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