Abstract

Nowadays, medical staffs need new wireless system to improve their work circumstance. Notebook computers and PDAs are some kinds of choice, but they can’t fully satisfy doctors. This paper introduces a new kind of system in a new hardware, which includes some functions doctors interested, and it is popular by staffs.

Keyword medical digital assistant, PDA, electronic patient records

Introduction

Many health care professionals already use local or long distance computer networks to manage administrative, pharmaceutical, patient record, and laboratory & image information. [2] As a mobile, wireless terminal, the Personal Digital Assistant (PDA) devices become increasingly popular for a wide variety of tasks, ranging from simple tasks such as storing information, phone numbers, documents, or maintaining to-do lists, to more advanced activities like searching databases and web browsing. However, there also are several disadvantages on PDA, such as data losing, difficulty on inputting data, and too small screen.

This paper describes a new system which can be used to help doctors to manage individual affairs, for instance, medical formula calculating, reference searching, aided diagnosis. And we call this kind of technique the Medical Digital Assistant (MDA).

The MDA consists of six modules: doctor
directories, medical inference, agenda, ambulance booking, electronic patient records and pre-surgery work.

If you are a physician, you can enter the corresponding section to search your patients’ information conveniently. Then, the list appears quickly, from which you can get his or her case history. If you are a surgeon, when you are prepared for your surgery, take it easy, click the pre-surgery button, and preview the whole work with it, the process of the surgery will occur in front of your eyes, just like to see a short film. If you want to look in your friends, click the relative button, and the list of it could appear in a second.

Similar to PDA, the MDA provides a completeable database and convenient Internet Explore browsing. Through the database, lots of relative values, medical images, and expressions become accessible. But different from PDA, the MDA has a larger screen, a more memory (flash memory and SDRAM), and a higher revolution.

Nowadays, more and more health care professionals in hospitals, for example, the clinical workflow and ambulance telecommunication, adopt the technique mentioned above.

**Method**

We design the proposed MDA on new hardware with software embedded Visual C++.

**Hardware**

Our study is based on the hardware that is an embedded system. The concrete standards are as follows: CPU is S3C2410 203Mhz; OS is Windows CE, the same as most embedded system, which supports Internet Explorer. It supports writing hand. Compared with usual PDAs, it has a long working time and sleeping time because of its large-scale capacitance battery.

**Software**

We hope to identify what kinds of programs are currently used and considered valuable by our residents. Our expectation is to use these results to identify potentially valuable tools and features for future residents. [4] In our project we use embedded VC++ to make web pages.

Our system included six modules: doctor directories, medical reference, agenda, ambulance booking, electronic patient records and pre-surgery.

Doctor directories: here registers doctors communication lists, including telephone numbers, e-mails, departments, and names.

Medical reference: through this module, medical calculations and reference searching become much more easily for doctors to handle with.

Agenda: this is just like a private secretary who could remind you of your daily arrangements.

Ambulance booking: used for doctors to communicate with the staffs in ambulance, thus, doctors could get key information of the patient ahead of time by the communication, and make out scenarios arrangements before the ambulance arrives.
Electronic patient records: consists of individual information, inherited diseases, and diagnosis conclusions, drug records, etc. Doctors could fill in patient’s basic information just like names or hospital codes by our system with a hand pen, and the information can be transferred into server computers wirelessly, which searches patient’s detail information, then the patient’s details will feedback to doctors by displaying on our terminal. According to the history records, doctors would make diagnosis and prescription, and what they do will be recorded to server.

Pre-surgery: it stores some simple surgery points and images, so doctors can prepare for surgery by it.

In our system, you can find your interested parts easily, and you will find it so easy to use just like to use a PC.

Results and discussion

The MDA techniques are becoming increasingly popular among medical professionals. The advent of wireless communication introduces the possibility of remote medical consultation. [6]

Several earlier reports of clinical applications based on wireless technology exist. In the pre-Internet era, development of such applications was extremely complex both technically and logistically, requiring integration and coordination of pocket computers, wireless modems, and connectivity from diverse providers, as well as the development of custom software in C/C++/EVC++ or assembly language. [7]

Compared with hand-held computers, PDAs take advantage of its weight, convenience and low power-expenditure. But, PDAs’ screens are not large enough to display a full picture (especially
medical pictures such as CT, MRI), its resolution is not satisfied by most medical staffs yet. Our system is a preferably combination between hand-held computers and PDAs. Before our study, we had made some researches about the MDA. So our design is based on the results of the survey, from which we’ve realized that the MDA has a promising blueprint as an eventually new idea. Nevertheless, the functions of our design are limited within doctors. In fact, we will take up with the communication between doctors and patients; both of who possess the MDAs that have relative functions meets their needs.

**Conclusion**

A new system of the Medical Digital Assistant has been described. This system can be used to help doctors to manage some medical affairs such as common medical formula, literature searching and business. We design our system with a special embedded hardware that has a screen as large as notebook computer and a body as light as pocket computers. And the results indicate that our design is popular among the doctors.

**Acknowledgment**

The authors wish to thank for Dr. Mei Jong, Tongji hospital in Shanghai and the EMB lab in Shanghai University.

**Reference**


[7] James R. Barrett, Ph.D. 1, Scott M. Strayer, M.D 2,and Jane R. Schubart, M.S. 1 “ Assessing the Personal Digital Assistant Uses and Needs of Medical Residents” University of Virginia Health System, Charlottesville, VA 22908