Web-Based 診間醫令系統之開發與建置

Development and Deployment of a Web-based Physician Order Entry System

中文摘要

近幾年來，Internet 的快速成長與普及，對於我們的生活產生重大衝擊。而目前大部份的診間醫令系都是採行傳統的兩層式主從架構，尙有一部份系統仍架構在大型主機上。參考新一代的使用者界面和資訊架構，本研究開發、建置三層式架構之 Web-based 的診間醫令系統，並成功地於一台北市立醫院上線運作。

本系統是台灣首創採三層式架構的 Web-based 診間醫令系統。它提供了 SOAP 的看診結構，可在診間輸入主觀、客觀的描述和診斷、用藥劑量、治療與檢驗、處置。並列印出處方和其他相關醫囑。醫師同時可以查看病人之前的看診紀錄。本系統的另一項特色便是個人化的設計。醫師可以定義其個人之常用診斷、用藥、處置和以上三者的組套，以便利於看診時使用。

三層式架構的 Web-based 診間醫令系統包括展示層、邏輯層和資料存取層三個層次。資料存取層爲該院已採用之運作於 Unix 平台上的 Oracle 資料庫系統，邏輯層則採用 Microsoft''s Internet Information Server（IIS）4.0 and Microsoft Transaction Server（MTS）2.0，並透過 ODBC 和 Oracle 資料庫系統連接。而展示層則採用 Microsoft Internet Explorer（IE）5.0 版，透過 DHTML、ActiveX 和 XML 來建構 web 上的使用者介面。透過本架構可以降低資料庫的負載以及提供更多和其他系統整合的彈性，並且是相當簡易與功能強大的開發平台。

透過和在同一醫院上線運作，依據相同的功能規劃與資料庫設計的非 Web-Based 診間醫令相比較，以及對實際使用診間醫令的醫師們進行滿意度的問卷調查，來試圖了解 Web Application 相關技術和傳統應用程式在開發、建置上的不同，以及在醫療系統應用上的可行性。在受訪的 47 位醫師裡，其中有 75%的醫師分別使用過 Web-Based 和非 Web-Based 兩個版本的診間醫令。在使用診間醫令的經驗裡，醫師最在意的是系統反應速度，經卡方檢定發現，醫師對於診間醫令的滿意度和其反應速度相關。

英文摘要

The exponential growth of the Internet has had tremendous impact on our society in recent years. Most of the Physician Order Entry Systems (POES) were developed in the two-tier client-server architecture and large portion of the POES systems were constructed on a mainframe. In consideration of the sfuture user interface and system architecture, we have developed a three tier web-based POES and successfully deployed in a municipal hospital in Taipei.

The system was the first POES based on three-tier and World Wide Web (WWW) in

Taiwan. The system provided the Subjective, Objective, Assessment, and Plan (SOAP) structure for the physician to enter subject, object, diagnoses, medicine dosage, treatment and laboratory test request, and printed out the prescription and necessary document. The doctor can also retrieve the patient''s medical record on the system. One of the special characteristics of the system was its personalized design. The doctor can define his own diagnosis, medicine and treatment database and any combination of these to facilitate his clinical work.

The three-tier web-based architecture used for POES included the presentation tier, the logic tier, and the data access tier. The database tier was the Oracle database (Oracle 7.x) and the UNIX operation system, which have already been used in the participating hospital. Microsoft''s Open Database Connectivity (ODBC) was used to communicate with the Oracle database. The logic tier was based on Microsoft''s Internet Information server (IIS 4.0) and Microsoft Transation Server (MTS 2.0). The presentation tier is based on Microsoft Internet Explorer (IE 5.0) and the web user interface was implemented with DHTML, ActiveX, and XML. The three-tier structure reduced the loading of the database server and had more flexbility when integrated with different systems. This architecture has shown its flexbility and had provided powerful development platform in this study.

In addition to the web-based POES, a non-web-based POES was also developed and deployed in the participating hospital for the investigation of the differences between the web-based and the non-web-based applications. These two systems had the same functions and shared the same database architecture. We examined and compared the design considerations, techniques used and performances for the two systems. A questionnaire was also executed to obtain the user''s judgments and degreed of satisfaction about the two different systems. We found that the users were most caring about the response time of the system. The Chi-Squire test shown that there was a significant correlation between the degreed of satisfaction and the system''s response time.