設計檢驗資訊系統 **HL7** 整合機制

Designing a Unified Approach for Integrating Laboratory Information System using HL7 Standards

中文摘要

由於醫療資訊系統的多元化以及電子病歷共通與分享的需求增加，一套共通的交換標準愈形重要。HL7 經過十餘年的標準研發工作，已然成爲成熟並且具備國際共識之交換標準，使用 HL7 作爲國內醫療資訊系統的交換標準不但爲衛生署所支持並且能夠降低重新設立標準的社會成本。醫療領域的大量資料中，檢驗資訊之產生來源爲醫療儀器因此較具客觀性，也使得醫院對於分享與交換之意願較高，能夠整合檢驗資訊符合 HL7 以處理後續交換的系統需求則更爲殷切。

本論文探討現有的整合機制方法以及商品化的 HL7 導入工具，並且研究 HL7 訊息結構、檢驗資訊系統的資料結構與層次關係、綱要對應機制。藉以提出使用視覺化簡易設定使用者介面，進行綱要轉換對應、編碼資料庫整合、觸發事件制定的方式，克服傳統電子文件交換導入需增加或修改程式碼的缺點。

本論文所提整合方法比目前商品化的整合工具更爲簡單，並且對於使用者所需的 HL7 標準相關知識需求較低，可加速導入 HL7 的建構週期，增加 HL7 導入的可行性，減低導入 HL7 標準於檢驗資訊系統的成本。

爲了評估本論文所提方法，本研究更進一步設計以 HL7 標準爲整合基礎的檢驗資訊標準化雛形系統，由於該系統須與檢驗資訊系統緊密結合，因此本研究並進行效能影響評估，評估結果證實本系統對於檢驗資訊系統運作的額外延遲時間在隨機評估上不超過 20%，循序操作總延遲時間比率更僅有 6.21%。因此，檢驗資訊系統 HL7 整合機制對現有資訊系統的影響有限，應有推廣價值。

英文摘要

In the era of Internet knowledge economic, the requirement of exchanging and sharing electronic medical record is increasingly. A common electronic data interchange standard become more important. After thirty years development experience, HL7 has become a mature and conformance standard. On one hand, using HL7 as the primary exchanging standard for the medical information system support by Department of Health, on the other hand, it can reduce the cost and increase the public welfare. Laboratory information produce from medical instrument, the character of objectivity makes hospital rise the willing of exchanging and sharing. Hence, the requirement of the HL7 integrated system that focused on the laboratory information system is getting higher.

This thesis researched the heterogeneous integrated methodology and commercialized tool kit about introducing HL7. We explored the HL7 message structure, data

structure of laboratory information system, the hierarchical relationship, schema-mapping and integration method, and the integration mechanism about coding system. Then we proposed a mechanism which using visualization method to setup and convert the schema. The mechanism didn't need to add or modify the programming code while introducing HL7.

This thesis proposed a simpler method compare to the commercialized integration tools. The method required lower know-how about HL7 from the configuring user, it also speed up the implementation cycle, lower the entry barrier of introducing HL7, and reduce the cost while introducing HL7 standard to the laboratory information system.

In order to evaluate the methodology, this research implemented an HL7-based prototypal standardization system focused on laboratory information system. We also evaluated the performance about the effect of the prototypal system, the result shown the extra effective delaying time per transaction were less than 20%, the total effective delaying time were only 6.21%. Hence, the effect to the current system from Unified Approach for Integrating Laboratory Information System using HL7 Standards is very limit and the system is valuable and practical.