System for Medical Equipment Management Based on Open Source Software

Shotaro Watanabe¹, Noritaka Mamorita², Masataka Kitama¹, Hisae O. Shimizu¹, Masaji Yamashita¹, Kazuyuki Kimura¹, Junji Arisawa¹, Hiroaki Arisawa³, Taketoshi Saka³

Abstract—The aim of this study is a construction of a system to support the maintenance management work of medical equipment. We developed the package software for maintenance management that we could introduce easily, and customizable by using the open source software. This package software is configured from the database server that manages the medical equipment information, and web server that provides the web application. By installing the package software on the PC, the server for medical equipment management is constructed. This study conducted input-output of the periodic check records of dialysis machine with the data of Saka Urology Hospital in order to inspect the effect of the package software. The test results indicate the value of the package software based on open source software.

I. INTRODUCTION

Medical institutions must perform the appropriate medical equipment maintenance management, in order to provide safe and effective medical care. To facilitate this work, a clinical engineering department requires the medical equipment management software that is commercially available. Several commercial software are available for this purpose, including HOSMA (Mutoh Technos, Japan) and MARIS (Fukudadenshi, Japan). However, none of these software offer the free use of combination with a rich customizable. In addition, much of this software requires many functions to control management work for medical equipment.

We newly developed the package software for maintenance management that we could introduce easily and allows customizable by using open source software. We used the periodical check records of dialysis machine that were used in Saka Urology Hospital.

II. MATERIALS AND METHODS

The package software is configured from PostgreSQL of the database server that manages the medical equipment information, and web server that provides Tomcat of the web application. By installing the package software on the PC, the server for medical equipment management is constructed. Therefore, we suggest the client-server system, centering the server for medical equipment management that while installing the package software that we have developed. A web browser on the client terminal was used for the enforcement of medical equipment management. The trial package software was installed on the server (OS: CentOS 6.0, CPU: Pentium4 (2.8GHz), RAM: 512MB, HDD: 250GB), and maintenance management using Internet Explorer 9.0 and an Android 3.2 loading default web browser was conducted.

III. RESULT

An example of a periodic check record output, as accessed by a tablet PC, is shown in Fig.1. This displays equipment information, such as a management number and the equipment name (top). It also displays the time of a check operating date and the check operating person (middle). In addition, a radio button is displayed, which refers to a check item and a pass-fail decision, along with a text box that can record a measured value. The application was customized for the periodical check records of dialysis machine that are used in Saka Urology Hospital.

IV. DISCUSSION

In order to perform proper maintenance, it is necessary to introduce the equipment management software. However, in many medical institutions have not led to its introduction because of its high cost and complexity, difficulty of customization. We developed a prescribed form of the package software for medical equipment management based on open source software. It can be customized by adding the check items to meet the specific needs of each hospital. In addition, it is possible to introduce easily the package by we had made. We desire that induction of medical equipment management software is promoted.

1S.Watanabe, M.Kitama, H.O.Shimizu, M.Yamashita, K.Kimura, J. Arisawa with the Division of Applied Electronics, Graduate School of Hokkaido Institute of Technology, Sapporo, Japan (e-mail:11601@hit.ac.jp).
2N.Mamorita with the Department of Clinical and Rehabilitation Engineering, Hokkaido Institute of Technology, Sapporo, Japan.
3H. Arisawa, T. Saka with the Saka Urology Hospital, Medical Corporation Hokujinkai, Sapporo, Japan.

Figure 1. User interface of a check record for equipment, as accessed by a Tablet PC (Android 3.2 with a default web browser).