

1. Introduction

In an urban hospital, drug bottles are put into small cells in a cabinet due to the space limitation. More than 400 drugs are put together in a small working space. Since some drug titles, shapes, colors or packages are very similar, pharmacists should repeatedly check the patient information, drug items, and prescription data. We would like to design an efficiency assistant system to improve the dispensing process.

2. System Overview

2.1 Web-based Information System

We developed a web-based information system for drug dispensing in which database management and friendly interface were installed.

① Dispensing process module

Two processes, drug dispensing and drug inventory management, consist of the dispensing process module. According to the issued prescription, turn on the corresponding LED display for notification and monitor cell status from IR sensors for each action during dispensing. An alarm is given if any error occurs.

② Class management module

This module includes the user, barcode, cabinet cell, and drug classes. Create, add, delete, edit, query, and print operations are performed in each class.

2.2 Hardware Design For Notification and Monitoring

An integration method of cascaded micro-controller modules is proposed. The hardware design is presented in the following. A low-cost cascaded micro-controller loop is designed for notification and monitoring. There includes several low-level micro-controller modules (LMCM) and a high-level micro-controller module (HMCM) which are concatenated to be a loop and installed on a cabinet.

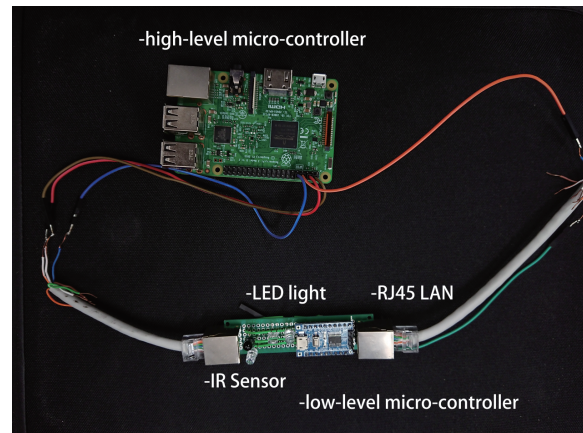


Figure 1 hardware design

If there are k cell in one cabinet, HMCM sends a bit stream of length k bits to LMCMs. One LMCM controls and monitors one cell. In every LMCM, the embedded program receives k bits from the previous module. The first bit is eliminated and used for driving LED. When IR sensor detects an item, a new bit is sent to the next LMCM. Finally, the HMCM collects all status data (k bits) and connects to a web-based information system for management.

3. Conclusion

In this study, an assistant system is proposed to improve the dispensing quality by notifying in time and monitoring in real time. The dispensing errors are reduced, and the goal 'zero dispensing error' will be achieved. With the recording of all pharmacists' actions, the dispensing quality of pharmacists will be measured. The retrieval model of each drug cell will be constructed by the monitored action data. The dispensing quality will be improved from the collected data. In the future, the collected data will be analyzed with the prescription for double checking in a long time. The analyzed results will be applied in dispensing measurement, medicine purchase prediction, expired drug control, and stock control.