Automatic Management Control-system of Nursing Center in Hospital

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ABSTRACT: *For a long time, in Taiwan, hospitals have trouble with lack of nursing staffs especially in wards. During to overloading works and taking turns day and night even in mid-night, such burden often leads to carelessness or neglect action during caring patients and even causes some patients death cases. Eventually, some nursing staffs have an attempt to quit or transfer their jobs owing to this situation of overloading and hard works.*

Actually, supposing that we take advantage our web-net knowledge combining how to build inner-net between wards and nursing center to construct an automatic management control-system in hospital, we can shift most part of management works to computers including automatic tracing for nursing work, arranging transferring assignment, setting up complete service records which would be used for fair assessment for accountability of staffs and avoiding conflicts resulting from error curing processes. Recently, all over the world has involved in a huge crisis of Sever Acute Respiratory Syndrome (SARS), especially in Taiwan. The government adapted quarantine policy to SARS patients, but the effect was limited owing to people lacking of obeying laws and morality.

This study is to design a full-purposed automatic management control-system of nursing center in hospital to find out an optima solution for problems mentioned above.

1 INTRODUCTION

Recently control system ability has greatly improved on account of progress of semi-conductor industry and this indirectly make upgrade in electronic products, especially for those controlled by single-chip microprocessors. Easily design and cost-down make all kinds of products controlled by microprocessors available such as producing machinery, testing facilities, and monitoring facilities, that is called "Automation"; therefore, that industry steps forward to upgrade with automation derived Engineering Automation, Manufacturing Automation, House-appliance Automation. Almost "Automation" intruded every field of human life, and this has practically improved our life all these years. According to newspaper, Taiwan nursing care system has problems such as error injection for born babies in Bei-cheng Hospital and that caused great social cost. Basically, all these curing errors were mostly caused by overloading works of nursing staffs who had taken turns in day and night tasks.

Actually, supposing that we take advantage our web-net knowledge combining how to build inner-net between wards and nursing center to construct an automatic management control-system in hospital, we can shift most part of management works to computers including automatic tracing for nursing work, arranging transferring assignment, setting up complete service records which would be used for fair assessment for accountability of staffs and avoiding conflicts resulting from error curing processes. Recently, all over the world has involved in a huge crisis of Sever Acute Respiratory Syndrome (SARS), especially in Taiwan. The government adapted quarantine policy to SARS patients, but the effect was limited owing to people lacking of obeying laws and morality.

How to set up an automation management system between nursing center and wards in hospital becomes a critical motivation, in which we try to design a mechanism combined with modern technology

to both create an automation management system between nursing center and wards in hospital (see Figure 1) and automatically trace quarantined SARS patients.

2 STUDY PURPOSES

(1) Design a sub-system, which is constructed by an inner-net between wards and nursing center with RS-422 interface technique controlled with core of 8051 CPU to monitor every possibly abrupt condition of patients from wards, this function was traditionally and in-conveniently notified nurses by patient's family or push a button. In this sub-system, the nursing sending for and curing processes will be recorded and printed out step by step and coming nursing procedures will be notified patient's family through inner-net with a displayer on controlled box beside patient's bed by computer. This bi-direction and multi-task communication system can guarantee service level and makes transfer assignment for nursing staffs clear and fair as well as a record to assess accountability at some period by hospital authority.

(2) Design a auto-detecting system for intravenous drips (see Figure 2), especially during whole night attendance and care for the patients, patient's family dare not fall asleep for fear of running out of the intravenous drips that might cause blood reverse flow in vein or air intrude into blood which causes dangerous condition or death of patients. Not only will the system detect running out of intravenous drips, but also it will inform nursing center the situation through inner-net control system as to send nurse to replace the empty intravenous drips.

(3) The curing processes ought to be classified clearly as to assign curing procedures what belongs to doctors or nurses; therefore, supposed that specified doctor or nurse not on-line service and the specified patient to the doctor and nurse happens to an emergency, the system will trace the related curing staff through auto-dial system which can accomplish by pushing a key on keyboard and all works are automatically accomplished by computer. In addition, the system is designed GPS auto-tracing function in which the precise position of wanted doctors, nurses, or patients infected by SARS disease can be located by decoding responded signals from satellites after nursing center dial the wanted person's mobile phone. All the decoding system was designed in a subsystem controlled by EM68000 microprocessor.

(4) The nursing center has a monitor screen displayed all information transmitted from wards and can send response information to patients in which the graphic interface system was designed with Visual Basic Language and has greatly readable, operating, real-time characteristics. The monitor system also was constructed huge database collecting doctors, nurses, and patients, curing procedures, schedules, and problems solving results etc. All these information can be printed out as assessment reference. The monitor screens are shown in Figure 4, Figure 5, Figure 6, and Figure 7.

3 HARDWARE & SOFTWARE DESIGN

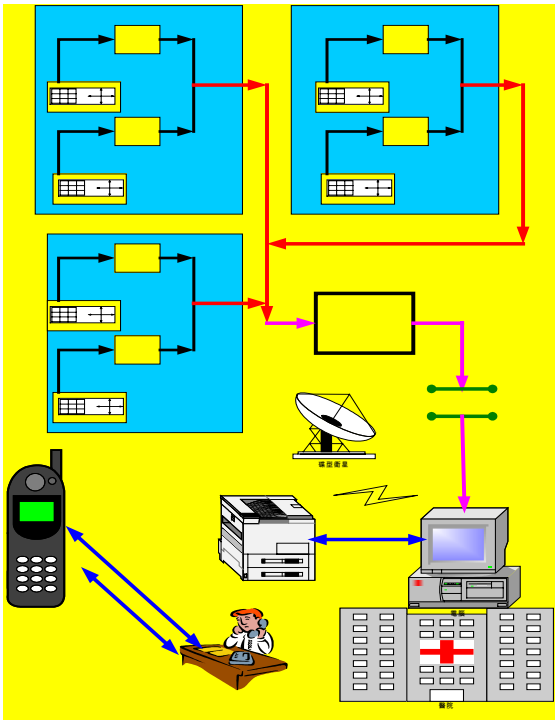

Figure1 – Systemstructure of design conception

Figure 2 – Intravenous auto-detected systems

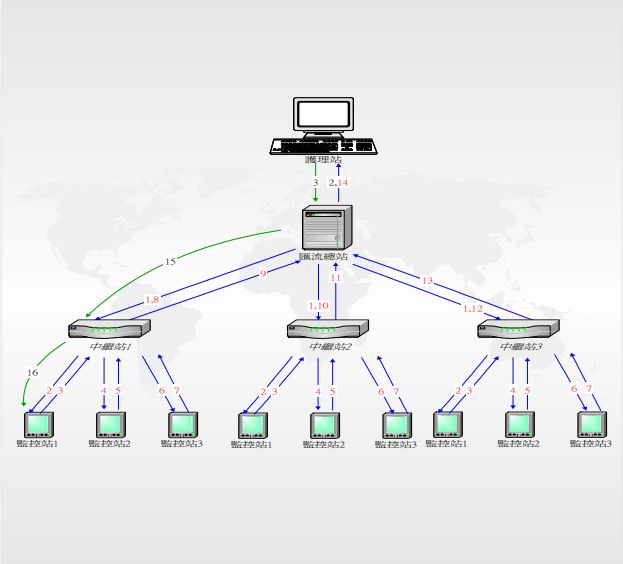

Figure 3 – communicational systems with time-sharing Structure

Figure 4 – monitor screen on nursing center sever computer showing auto-tracing for curing processes

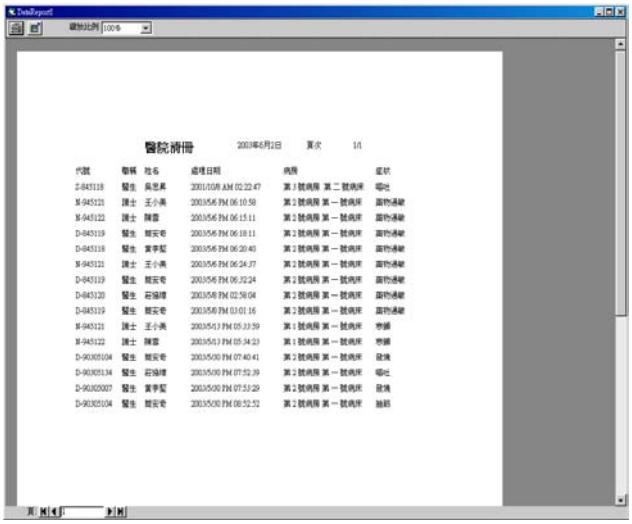

Figure 5 – print information of treatment missionary for future assessment on nursing staffs

Figure 6 – monitor screen on control box of patients' room

Figure 7 – monitor screen on nursing center sever computer showing treatment of nursing staffs

Figure 8 – Front view of completed project

Figure 9 – Side view of completed project