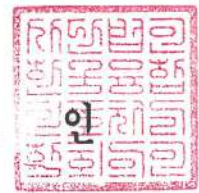# 우수 발표 논문상

An Excellent Paper Award

제목 : 서면의료기록을 대체하기 위한 새로운 병원 관리 시스템의 설계
및 구현

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(General chair of KICSP Summer Conference 2020 Jun-Mo Park)

서면의료기록을 대체하기 위한 새로운 병원 관리 시스템의 설계 및 구현

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NamCity HMS: Implementation of a New Hospital Management System to Replace Paper-Based System

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Abstract Over the years, technology has revolutionized our world and daily lives. Information Technology has created amazing tools and resources, putting useful information at our fingertips. With all of these revolutions, computers have also made our lives easier, faster, better, and more fun. As a result, software engineering has been very useful to facilitate every occupation sector. Among them, the Hospital Management System is creating new opportunities and reshaping healthcare system applications by providing new functionalities, services, and progress. Unfortunately, many hospitals around the world, including the ones in Uzbekistan, still rely on paper based-medical records to manage their large amounts of such important data which belong to their patients, doctors, and staff members. The target audience of this application includes doctors, medical personnel, hospital staff who still manage medical records on paper. This application can help in making the whole functioning paperless in especially Uzbekistan hospitals because they need an innovative healthcare system. In this paper, we design and implement a new hospital management system that facilitates managing the database of doctors, staff nurses, and patients to replace the current manual, paper-based system in the workplace.

● Key Words : Healthcare systems, ERM Software, Database Management, Hospital Management System,

Ⅰ. Introduction

Whether it is content created internally or documents and files received from customers, patients, partners, or suppliers, businesses today are drowning in a sea of information that grows bigger and bigger each day. In particular, the doctors and HR(Human Resources) department of hospitals must manage and control a large volume and variety of information that is often highly confidential. Employee records, medical records of patients, payroll information, and diagnostics data and learning requirements barely scratch the surface when it comes to the plethora of information and related processes managed by the HR department. According to the survey findings that were done by EDMS in 2017, quite simply, many are not coping effectively. The HR decision-makers questioned 41% of waste over 10 minutes a day searching for the documents and information they need to carry out their jobs. Of those people, almost half spend more than 20 minutes. This is a hugely inefficient use of time, 65% of people surveyed admit that HR information is still managed using paper documents, paper-based processes, and stored in filing cabinets [1]. This application, that we created, integrates all the information regarding patients, doctors, staff, hospital administrative details, etc. into one software. It has sections for various professionals that make up a hospital. In our opinion, it is time for every country to modernize internal record systems and create a centralized database, making it easier for doctors, physicians, and nurses to access health records. With the help of this system, one can access all the essential information anytime and anywhere. Another advantage is that it can be modified and customized to suit a small hospital or a big multi-specialty hospital. As it provides multiple facilities, it helps in reducing hospital costs, which in turn reduces the expense of quality healthcare for the patient.

Besides, electronic health records are far more secure than paper records as they are not at risk during a catastrophic event. For these reasons, in this paper, we designed and developed a new hospital management system called NamCity HMS to provide straightforward ERM (Enterprise Resource Management) solution by replacing the current manual, paper-based system, and to avoid human errors and a loss of data integrity.

Ⅱ. Implementation of proposed NamCity HSM

The proposed NamCity HSM was implemented using C# and MySQL in Microsoft Visual Studio 2017. The application works on .NET Framework above 4.5 so it is currently only for Windows Operating system users. This ERM software that provides digital healthcare service can be used in any hospital, clinic, or nursing school for maintaining the date of the doctor, staff nurse, patient details, and their test results.
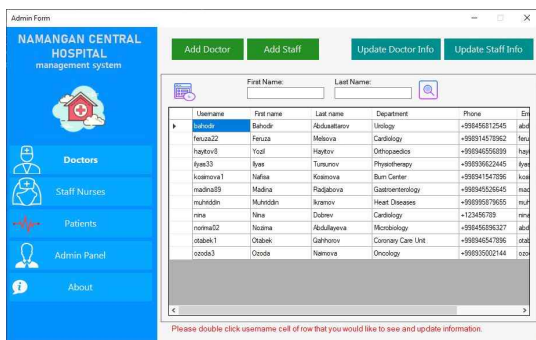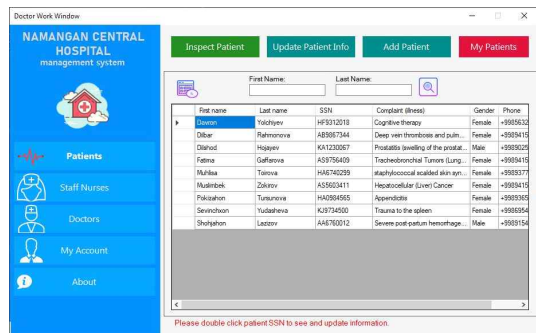

Fig. 1 Admin Window

Fig. 2 Doctor Window

When the user launches NamCity HMS, it is required to log in as Admin, Doctor, or Nurse. After authentication, the user will be redirected to the Admin Form (Fig. 1). Admin has the right to add a new doctor and nurse details when the hospital hires new employees. Admin can change their details later if needed or even delete them from the database. Admin can also search for doctors, patients, or nurses details but he or she cannot add or edit patient details because that is done only by doctor or nurse. Generally speaking, admin is a person who works as HR in the hospital.
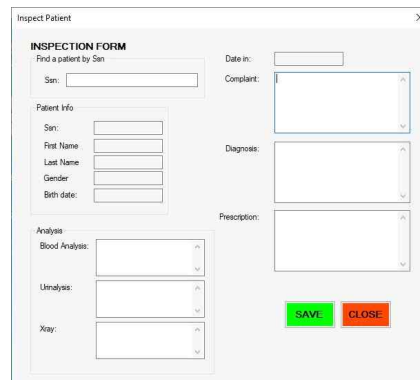

Fig. 3 Admin Window

When the doctor logs in to NamCity HMS, the first thing that is shown is a list of patients. Doctors' two primary responsibilities are to add new patient details and inspect them (as shown in Fig. 3). Patient SSN is needed to search the patient when the doctor has to inspect a patient. Following this, the doctor must save diagnostics results into the database so that it can be accessed and changed later. The nurse Account is also almost the same. The only difference is that nurses do not have the permission to do full patient diagnostics.

Ⅲ. Conclusion

To sum up, the time has come to modernize current paper-based medical record-keeping systems around the world because they are inefficient, time-consuming, error-prone, and has a lack of backups and limited security. That is why in this paper we designed and developed ERM software for hospitals that can provide a stable and generally beneficial solution.

ACKNOWLEDGMENTS

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