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

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상기논문은 (사)한국 융합신호처리 학회가 주최한 2020년 하계학술대회에서 우수한 논문 내용과 뛰어난 발표력으로 세션 좌장들이 추천한 우수발표논문으로서 학술이사회의 결정에 따라 이 상을 수여합니다.

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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.

NAMANGAN CENTRAL HOSPITAL management system	Add Doctor	Add Stat	f	Jpdate Doctor Info	Update Staff In	nfo
		First Name:	Last Na	me:		
	Usename	Frat name	Last name	Department	Phone	Б
	 bahodr. 	Babodr	Abduaatiarov	Urology	+998456812545	ab
	feruza22	Feruza	Melsova	Cardiology	+996914578962	ter
Doctors	havtov8	Yoal	Havtov	Othoosedics	+996946556899	ha
	fven33	lives	Tursunov	Physiotherapy	+998936622445	in.
	kosimova1	Nafina	Kosimova	Burn Center	+998941547896	ko
Staff Nurses	madina89	Madina	Radjabova	Gastroenterology	+998945526645	102
	muhriddin	Muhriddin	kranov	Heat Diseases	+998995879655	110
	nina	Nna	Dobrev	Cardiology	+123456789	nin
	norima02	Nozima	Abdullayeva	Mcrobiology	+598456896327	ab
	otabek1	Otabek	Gahhorov	Coronary Care Unit	+998946547896	ot
Admin Panel	ozoda3	Ozoda	Namova	Oncology	+998935002144	oz
About						
- House						
	<					

Fig. 1 Admin Window

NAMANGAN CENTRAL HOSPITAL management system		Inspect Patien	t Update	Patient Info	Add Patient	My Par	ients
1000	E		First Name:	Last Nar	¹⁹⁸		
	1	Č	ļ				
		First name	Last name	SSN	Complaint (liness)	Gender	Phone
	•	Dawron	Yolchiyev	HF\$312018	Cognitive therapy	Female	+998563
		Dibar	Rahmonova	AB5057344	Deep vein thrombosis and pulm	Fersale	+9589419
		Dishod	Hojayev	KA1230067	Prostatitis (swelling of the prostat	Male	+9989025
		Fatima	Gaffarova	AS9756409	Tracheobronchial Tumors (Lung	Female	+998941
		Muhisa	Toirova	HA6740299	staphylococcal scalded skin syn	Fersale	+993937
Staff Nurses		Muslimbek	Zokirov	AS5603411	Hepatocellular (Liver) Cancer	Fenale	+998941
		Pokizahon	Tursunova	HA0584565	Appendicitis	Fersale	+9989368
Doctors		Sevinction	Yudasheva	KJ9734500	Trauma to the spleen	Female	+998695
		Shohjahon	Lazizov	AA6760012	Severe post-partum hemorrhage	Male	+998915
My Account							
My Account							
j About							
	<						

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.

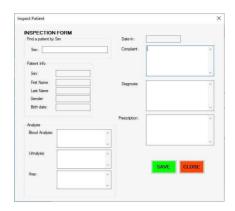


Fig. 3 Admin Window

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.

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