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EXPLORING THE USE OF ELECTRONIC MEDICAL RECORDS FOR PATIENTS

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Abstract. The article is devoted to the study of the information system of electronic medical records of patients in order to improve the work of the ambulance service. Scientific research in the field of medicine is given. This article discusses medical information systems and the principles of their functioning. It also shows the process of effective work due to medical information system. A user-friendly interface is used. The following functions are touched upon: elimination of paperwork, transition to electronic system, additional medical services. All available methods are presented, which are the key factors in optimizing all medical processes. Also considered options for modeling and system development, taking into account all the relevant issues of automation of medical information systems. The developed information complex can be used both in polyclinics and in pharmacies, as well as individually for patients. The article deals with the study of electronic medical records system. In this work developed a medical information system and ER system as an application. The possibility of processing, storing and conveniently viewing the created data system is provided.

Key words: ambulance, electronic medical record, medicine, medicine, website.

ПАЦИЕНТТЕРДІҢ ЭЛЕКТРОНДЫ МЕДИЦИНАЛЫҚ ЖАЗБАЛАРЫН ҚОЛДАНУ МҮМКІНДІКТЕРІН ЗЕРТТЕУ

Г.З.Зиятбекова[1,2*], P.Kisala[3], М.Қ.Өмірзақ[2]
[1]Қазақстан Республикасы Ғылым және жоғары білім министрлігі Ақпараттық және есептеуіш технологиялар институты, Алматы, Қазақстан,
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Аннотация. Мақала жедел жәрдем жұмысын жақсарту мақсатында пациенттердің электрондық медициналық картасын жүргізудің ақпараттық жүйесін зерттеуге арналған. Медицина саласындағы ғылыми зерттеулер келтірілген. Бұл мақалада медициналық ақпараттық жүйелер және олардың жұмыс істеу принциптері қарастырылады. Медициналық ақпараттық жүйенің арқасында тиімді жұмыс процесі де көрсетілген. Пайдаланушыға ыңғайлы интерфейс қолданылды. Келесі функциялар қозғалады: қағазбастылықты жою, электрондық жүйеге көшу, қосымша медициналық қызметтер. Қазіргі уақытта барлық медициналық процестерді оңтайландырудың негізгі факторлары болып табылатын барлық қол жетімді әдістер ұсынылған. Сондай-ақ, медициналық ақпараттық жүйелерді автоматтандырудың барлық өзекті мәселелерін ескере отырып, жүйені модельдеу және әзірлеу нұсқалары қарастырылған. Әзірленіп жатқан ақпараттық кешенді емханаларда да, дәріханаларда да, пациенттер үшін де жеке пайдалануға болады. Мақалада электронды медициналық жазбалар жүйесін зерттеу қарастырылады. Бұл жұмыста қосымша ретінде медициналық ақпараттық жүйе және жедел жәрдем жүйесі жасалды. Құрылған деректер жүйесін өңдеу, сақтау және ыңғайлы қарау мүмкіндігі қарастырылған.

Түйін сөздер: жедел жәрдем, электронды медициналық жазба, медицина, дәрі-дәрмек, веб-сайт.

ИССЛЕДОВАНИЕ ВОЗМОЖНОСТЕЙ ИСПОЛЬЗОВАНИЯ ЭЛЕКТРОННЫХ МЕДИЦИНСКИХ КАРТ ПАЦИЕНТОВ

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Аннотация. Статья посвящена изучению информационной системы ведения электронной медицинской карты пациентов с целью улучшения работы скорой помощи. Приведены научные исследования в области медицины. В данной статье рассматриваются медицинские информационные системы и принципы их функционирования. Также показан процесс эффективной работы благодаря медицинской информационной системе. Использован удобный интерфейс. Затрагиваются следующие функции: устранение бумажной волокиты, переход на электронную систему, дополнительные медицинские услуги. В настоящее время представлены все доступные методы, которые являются ключевыми факторами оптимизации всех медицинских процессов. Также рассмотрены варианты моделирования и разработки системы с учетом всех актуальных вопросов автоматизации медицинских информационных систем. Разрабатываемый информационный комплекс можно использовать как в поликлиниках, так и в аптеках, а также индивидуально для пациентов. В статье рассматривается исследование системы электронных медицинских карт. В данной работе разработана медицинская информационная система и система Скорой помощи в качестве приложения. Предусмотрена возможность обработки, хранения и удобного просмотра созданной системы данных.

Ключевые слова: скорая помощь, электронная медицинская карта, медицина, лекарства, веб-сайт.

Introduction. There are many automated control systems designed to automate the work of emergency stations and departments, but they are mostly expensive tools and require expensive equipment and skilled professionals. This raises the challenge of creating an automated workstation for an ambulance dispatcher "ambulance". In recent years, not only has the number of computer equipment in medical institutions increased, but also the quality of communication has improved significantly, allowing the system to move to a web-based platform. The complexity of managing and maintaining the current version of the system does not allow it to be used in small, private and remote medical institutions, which makes it difficult to automate the exchange of information. The transition to the Web platform will allow to expand the range of medical organizations and implement the system [1].

Theoretical methods and research analysis were developed as a research method. Theoretical methods of research allow you to systematize information, reveal the nature of various phenomena and objects, to identify relationships between processes. 7 main problems and 7 principles of their solution:

1.The lack of the principle of normative regulation and incentives to conduct EMC.

2.Problems and principles of integrated document management in medicine.

3. legal significance

4. ensuring of reliability and rules of collective work

5. defining the right of access to electronic medical document

6. structuring and standardization of medical information for electronic exchange of medical documents

7. principle of systematic sufficiency

According to electronic medical records management, when developing new rules, they should include balanced requirements for technical means used in combination with carefully considered organizational measures.

Development of a web application for the ambulance medical information system, which allows to automate the work of an ambulance dispatcher in private and remote municipal health care facilities with the ability to work remotely. It is designed to increase the productivity of ambulance workers and reduce processing and data entry time. It also provides various opportunities for immediate contact with ambulance staff.

Materials and methods. The general system and the medical laboratory information system can be integrated with modern medical equipment. In addition, medical IS make it possible to promptly bring general statistics about the state of health of the population to municipal authorities and other state institutions. In this connection, the electronic medical record is used.

The main goals of the electronic medical record:

- To collect and store electronically as much information as possible about a specific person's health;
- Promptly provide access to this information to authorized medical workers, the individual himself and his authorized representatives in the most convenient and accessible form for a particular user;

- Creation of specialized electronic services based on this information, aimed at medical personnel, at the individual himself, and providing improved safety and quality of medical care, as well as improved quality of life and health of citizens [2].

These software packages offer the optimal solution for preparing reporting documents and, in the opinion of many users, are a necessary component of any ambulance station. But not every ambulance station allows for the implementation and maintenance of these software packages. As before, the main problem of widespread implementation of these systems and their analogues remains the limitation of financial availability of these programs at the municipal level.

The next step is to describe the Web technologies for creating an electronic medical record information system for patients. The server-side programming language for Web applications is Python. Python is an interpreted, interactive, object-oriented programming language. It is created in the django framework to create web applications with little code. A database is used to systematically store an array of data collected and easily accessible by an authorized user. It is stored to retrieve the necessary data from the database as needed. Therefore, the database was implemented using a SQLite database. The client part and GUI were implemented using JavaScript language, which allows for a user-friendly and responsive interface. This allows users to access and interact with basic data in the database. These actions can range from simple data querying to defining database schemas that radically affect the database structure.

Results and discussion. According to electronic medical records, when new regulations are developed, they must include balanced requirements for the technical means used, combined with carefully considered organizational measures (Fig. 1).

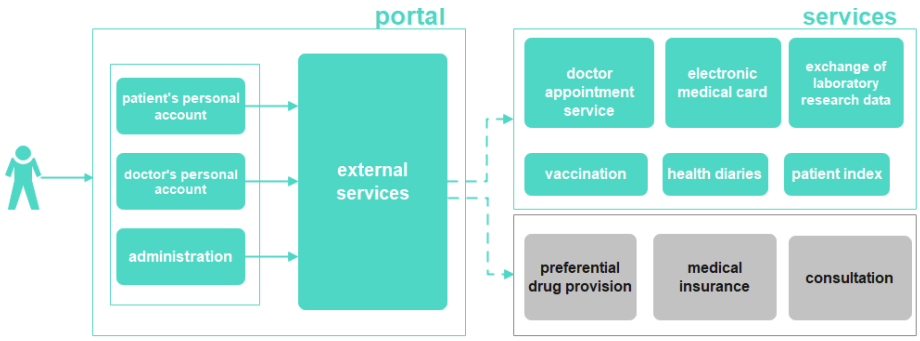

Figure 1 - Vision for the medical center portal

Information system for electronic medical records of patients before compiling the technical part of the web-application, it is necessary to define the requirements to the web-application.

The following requirements apply to a web-based information system for maintaining electronic medical records:

- Patients must be able to provide complete information;
- Patients should be able to register and then log in to the system;
- information about the patient, records of doctor's visits should always be available in the personal account;
- the doctor must be able to see the patient's medical history, to make records in the medical history;
- the administrator of the web application must be able to view, customize information about patients and doctors and arrange for the patient to contact the doctor.
- the administrator and physicians need to have separate registration and login pages.

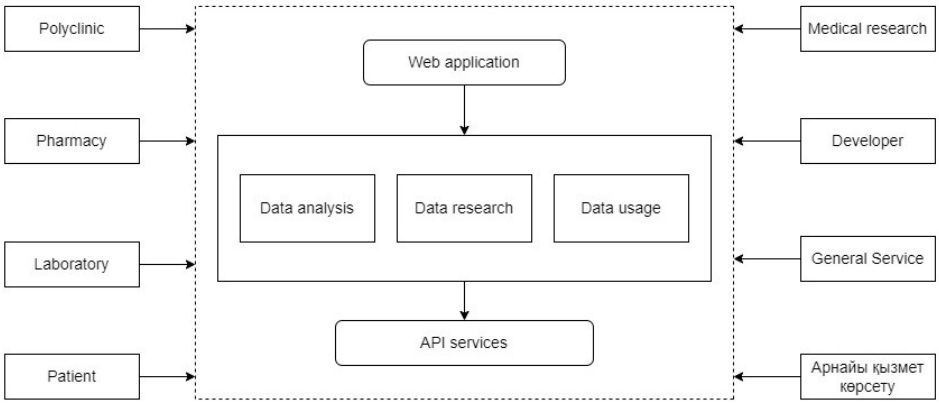

Figure 2 - Medical Web Application Connection Diagram

The web-based patient application contains an electronic health record, as described in the previous electronic health record in addition to including other types of services(Fig. 2). This system establishes communication with institutions that have access to internal data. Through the outpatient clinic, pharmacy, and laboratory, certificates issued by the doctor are indicated. The service and medical research departments also have the ability to obtain the necessary data [3-4].

Each patient has a unique opportunity to receive the following information:

- Information about the prescription written by the attending physician;
- Vaccination schedule;
- Information about pharmacies that provide free medications;
- diagnoses;
- hospitalization records.

The information received cannot be processed. For visitors to the e-Health Passport, only training mode is available.

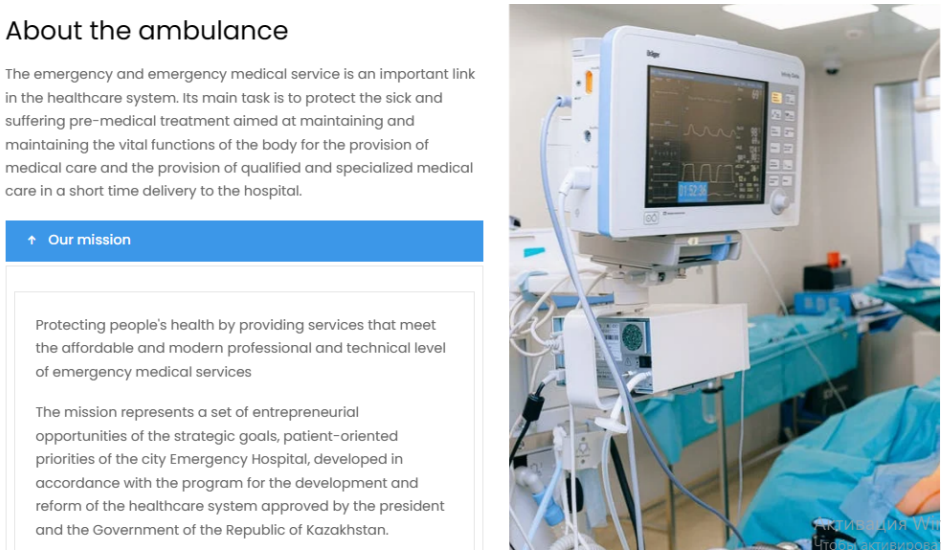

Figure 3 - "About the ambulance"

Under the ambulance data, we can see our mission, the staff. If we click on it, we can see information about it (Fig. 3).

The ambulance is an emergency medical service. Therefore, the emergency medical service is of great importance in the health care system. Its mission is to protect people's health by providing services that are affordable and meet the current professional and technical level of emergency medical care.

Types of service we provide:

- diagnosis and emergency care;
- Doctors who are invited to come to the home;
- full supervision.

For more information, click on the button to see the types of services. Long-term hospital care provides long-term care measures for patients who are in serious condition. Specialized care is provided with full monitoring of patients in need of medical care. Along with sleepwalking, each place of care was also fully monitored by medical transport [5-6].

Providing first aid to patients in need of emergency care, through a set of diagnostic and emergency services of a comprehensive type for those who are referred. Median locations through house call physicians are for regular patients in certain rural areas and patients who must be checked regularly over a period of time [7-8].

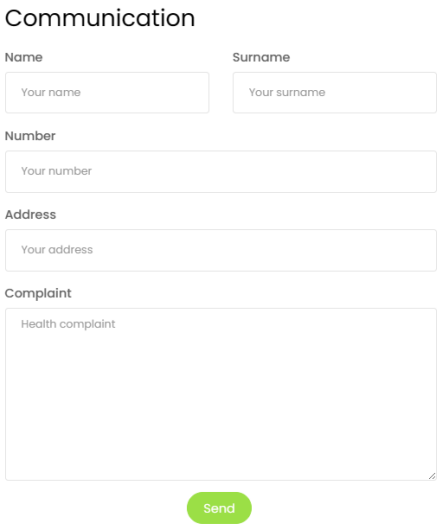

Figure 4 - Emergency communication menu

In the event of a specific emergency, by visiting the site, you can go to the emergency communication menu and drop off an application (Fig. 4). The following form is required to be filled out in full.They:

- first name;
- your last name;
- your phone number;
- letter.

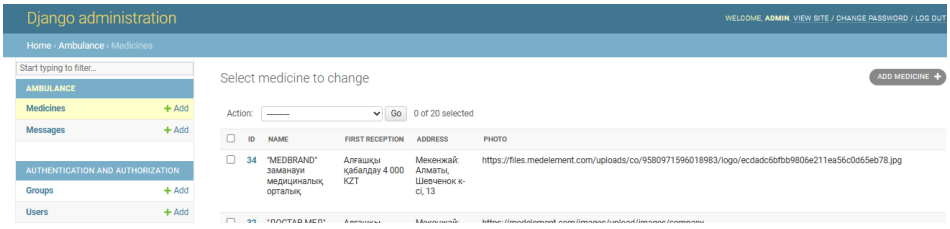

Figure 5 - Representation of saving in the database

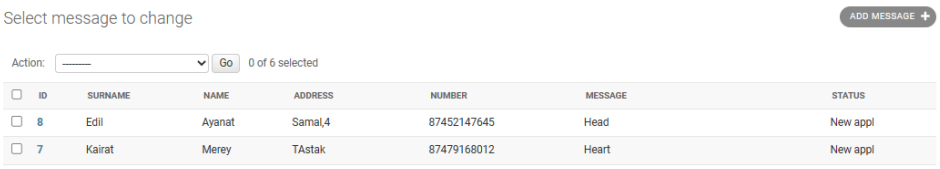

Figure 6 - Storing in the database

The completed emergency form goes into the database.

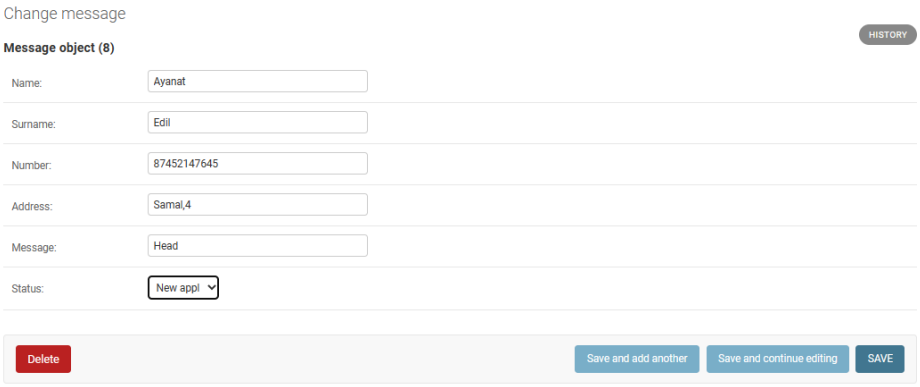

Figure 7 - Changing the status in the database

You can change the status of incoming data in the database. Also saves again, changing the status(Fig. 5-6).

You can change the status in the data. The status consists of:

- new request;
- sent;
- completed;
- invalid application.

For example, highlight the status "sent" and click the "Save" button. At this point, the status of the data sent to the database changes (Fig. 8).

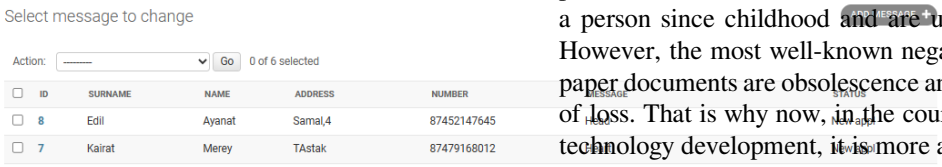

Figure 8 - Database when changing and saving the status

The results of the study show that the web application, working through a medical information system, has the ability to communicate with patients. As a result of the work the following results were achieved:

- Subject area analysis and problem statement;

- analysis of existing software for the automation of emergency medical care;

- definition of requirements to the developed software.

The sent protocol is processed in the database and is in the row of new letters. In this way, patients can report their illness in advance. This will not only eliminate paperwork at medical centers, but also make the work of medical professionals easier. As a result, efficiency is increased and the quality of work is improved through possible implementation in remote and small medical centers.

Conclusion. The module was developed using web-programming technologies. The client part and the graphical interface were implemented with the help of JavaScript language, which allowed to get a convenient and responsive interface. The server part was implemented in python with the help of a framework.

The result of the work is a full-fledged web application with the possibility of implementation in remote and small medical institutions.

An outpatient record in any paper form, that is, a patient's records of illness, treatment, are compiled by a person since childhood and are updated over time. However, the most well-known negative properties of paper documents are obsolescence and high probability of loss. That is why now, in the course of information technology development, it is more and more common to develop electronic versions of such documents.

The EMR can be used in any medical facility. When using this system, all processes that take place will be exactly the same as when an outpatient record is created and maintained. That is, the administrator of the institution first registers the patient, and then the patient's personal account appears. Then personal meetings are held with the doctor, as a result of which the doctor registers the necessary records - diagnosis, prescriptions for treatment, necessary documents in the EMR, and information about this record appears in the personal office of both the patient and the doctor and administrator, in the form of an EMR record. These appointments will be held and the patient's EMR will be filled out.

While doing this article, I delved into Python and

SQLite databases and programming languages. In doing so, choosing the necessary languages to create the site, it stopped at the pros and cons of the language.

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