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METHOD OF BUILDING AN INFORMATION SYSTEM FOR HEALTHCARE DISTRICT DIVISION

O. Zinchenko, O. Shevtsova
(State HEI «National Mining University»)

Formulation of the problem. Information resources are an essential foundation for the development of a scientific approach in decision-making. The scientific approach to the development of health policy allows to conduct reliable international comparisons, determine priorities for the development of national healthcare and predict the development of the health situation, depending on the conduct of various activities. This approach allows to make decisions and build sound forecasts, taking into account the peculiarities of national healthcare when implementing international recommendations and carrying out projects.

At the end of the twentieth century, the world community began an active process of establishing priorities in healthcare, since at that time awareness of the role of health as one of the most important factors in the development of society was emerging. The health of the population is the most important factor that allows raising the standard of living, promoting economic growth and economic development on a national scale. Therefore, the urgent task is to improve the efficiency of healthcare district division through the introduction of an automated information system with multi-regional nodes.

Analysis of recent research and publications. Modern medical organizations produce and store huge amounts of data. The quality of medical care, the standard of living of the population, and the development of the country depend on how effectively this information is used by doctors, managers, and governing bodies.

According to the requirements for the list of documents used in telemedicine systems, it includes medical records, medical images and graphic material.

To make it more convenient to store and transmit data, several international organizations and industrial companies have adopted the DICOM (Digital Image and Communication in Medicine) standard [1]. The DICOM standard is implemented in modern imaging equipment and medical equipment, which facilitates the exchange of data between imaging devices, postprocessing consoles and archiving systems. However, this standard does not cover all the RIS (Radiological Information System) properties related to data management and data access, and does not describe the archiving strategy.

The HL7 standard [2] includes the definition and structure of transmitted data, the synchronization of communication and application communications, and the detection and processing of message transmission errors. The standard currently addresses the interfaces of various medical systems that send or receive patient data: reception / registration, discharge or referral and various inquiries, for resource

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lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2006:0208:FIN:PL:PDF(access:17.02.2015).

planning, orders, fixing results, clinical observations, electricity calculations, storage and modification of information, medical records and patient control.

Formulation of the problem. The problem of standardization process in medical informatics is becoming one of the most urgent in the construction of telemedicine networks. Currently, it is receiving increasing attention in Ukraine in connection with the development of telemedicine technologies.

The work of telemedicine systems is supported by a number of communication standards that are successfully applied in most countries of the world. To effectively use telemedicine technologies in Ukraine, it is advisable to harmonize them. At present, only the first steps in this direction are being taken in our country. However, the wide use of digital diagnostic equipment requires their speedy implementation.

The idea of the work is to apply the principles of data transmission in systems with geographically distributed components to the design of the information system of the healthcare district division.

Main part. To solve the problem of synchronization of medical data between different regional nodes, it was suggested to use the Websocket protocol, which works on an encrypted SSL connection. This set of protocols provides the necessary degree of data protection and is a universal tool, allowing to scale the system in the future.

The data is transmitted in JSON format, since this format provides maximum flexibility, allowing the transfer of any content.

In terms of the proposed methodology, the client application periodically synchronizes with the server, which occurs in several stages:

1. setting up an encrypted connection to the server;
2. sending authorization data;
3. receipt of authorization notification;
4. sending data about the last synchronization time;
5. obtaining the value of the time interval of synchronization;
6. obtaining updated data for a set period of time;
7. sending local changes for a set period of time;
8. update the record of the last synchronization time.

The scheme of the developed protocol is shown in Fig. 1.

The database on the server of the healthcare district division stores data about patient cards and user accounts (family doctors). All tables with data being synchronized have the Update field which value is used for synchronization. The database on the client device stores only patient records attached to this family doctor. In each table to be synchronized with the server, there is the External_id field containing an external record ID, its presence determines the existence of a record on the server.

The developed protocol for medical data transfer is used in the information system of the healthcare district division, which has a client-server architecture. The server part is a system for collecting and storing medical data from the health department, which operates on the server of the organization. The client part is a mobile application under the Android OS installed on mobile devices of medical personnel under the jurisdiction of this regional health department.

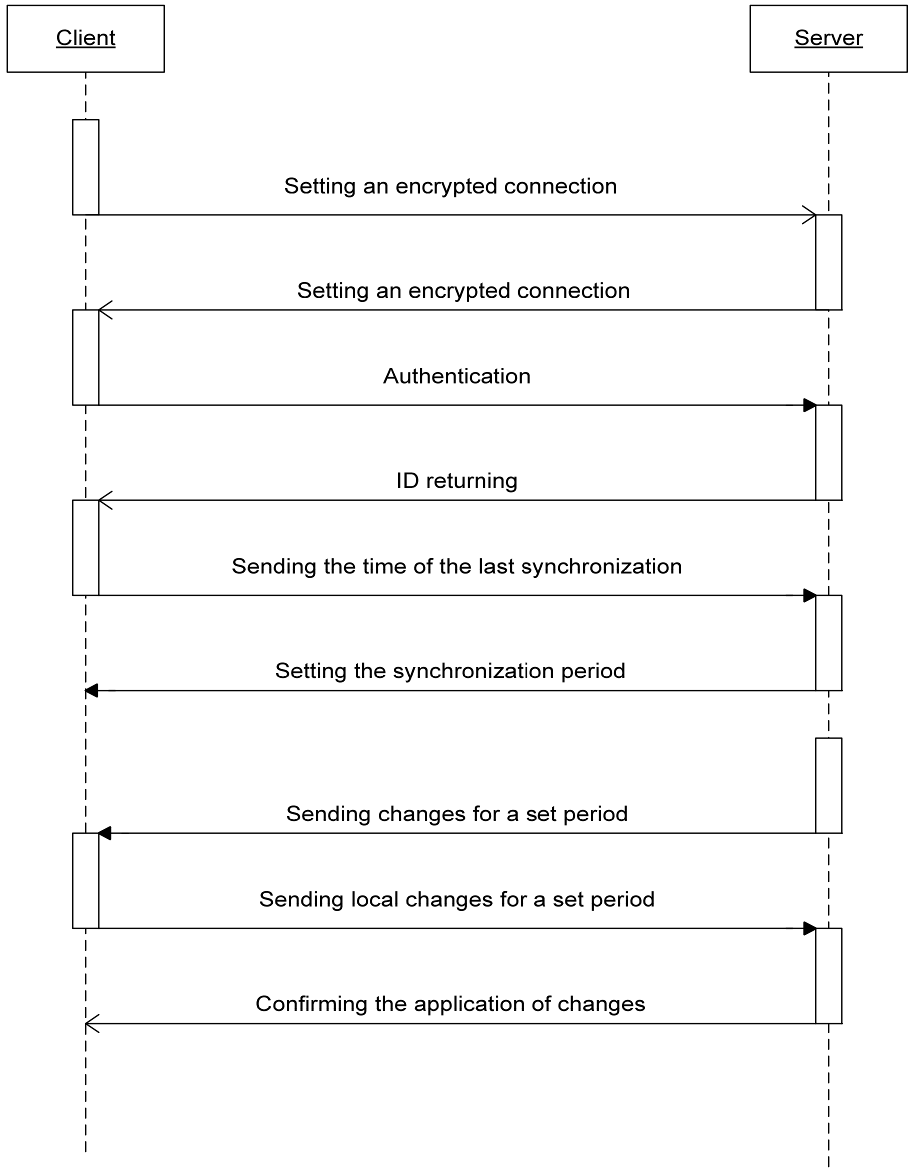

Fig. 1. Scheme of the protocol for the medical data transfer

Conclusion: Applying the principles of organizing data transmission in systems with geographically distributed components in the tasks of information support of the healthcare district division will increase the safety and productivity of the medical information system.

LIST OF REFERENCES:

1. DICOM Guideless (Interconnectivity Testing Guidelines: Introduction) Website [Virtual Resource] / Access Mode: URL: http://www.xray.hmc.psu.edu/dicom/guidelines/ l1intovr.html – Title from Screen. – Date of Access: 01.11.2016.

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