

# Telemedicine System Creation Using Programmable Logic Integrated Circuits

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**Abstract** – This article suggests creation of a telemedicine system using programmable logic integrated circuits for the Lviv Regional Clinical Diagnostic Centre.

**Keywords** – Telemedicine system (TMS), programmable logic integrated circuit (PLIC).

## I. INTRODUCTION

Currently, telemedicine is used almost in all branches of clinical medicine. Using telemedicine improves the quality of health care and is necessary for the maintenance of the population in remote areas.

## II. MAIN PART

Telemedical real-time system can be simple to operate with a limited set of medical diagnostic equipment using available telecommunications. Complicated system always requires a synchronous interaction between the two sides, allowing the system to operate in real time. Accessories video-conference equipment and Telecommunications is one of the forms of technology that takes place in synchronous telemedicine. It also is possible to connect peripherals to computers and other video equipment, which contributes to an interactive expert diagnosis.

Telemedicine also includes the accumulation of medical data (eg images, electroencephalography etc.) and transfer them to the doctor offline that does not require the presence of the two sides at one time.

TMS implemented using powerful computers and expensive and complex mathematical software. Such systems are available for highly developed countries. TMS are developing and improving constantly. Due to the globalization of the world community, many countries make their TMS, which would be compatible with the systems of other countries.

For countries with less developed economies such systems is practically inaccessible, so there is a need for a somewhat simplistic TMS, which would be consistent globally, but require much less financial cost and provide the opportunity of diagnosing major vital organs.

Proposed creation of TMS made with programmable logic integrated circuits that allow using computers, communication devices and available medical diagnostic equipment of hospitals, clinics.

In case of the football championship "EURO-2012" there is an urgent need for creation of TMS in Lviv. The first step to realize this is system based on the Lviv Regional Clinical Diagnostic Centre (LRCDC). Part of diagnostic centre equipment is compatible with the DICOM standard (Digital Imaging and Communications in Medicine).

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DICOM make possible to establish digital communication between the different diagnostic and therapeutic equipment used in systems of different manufacturers. Workstations, computer tomography (CT), magnetic resonance tomography (MRT), microscopes, diagnostic sonography, public archives, host computers and mainframes from different manufacturers, which are located in the same place or elsewhere and may "communicate" with each other with help of DICOM, using open standard network protocols, for example, TCP/IP.

Implementation of TMS is shown in Fig. 1.

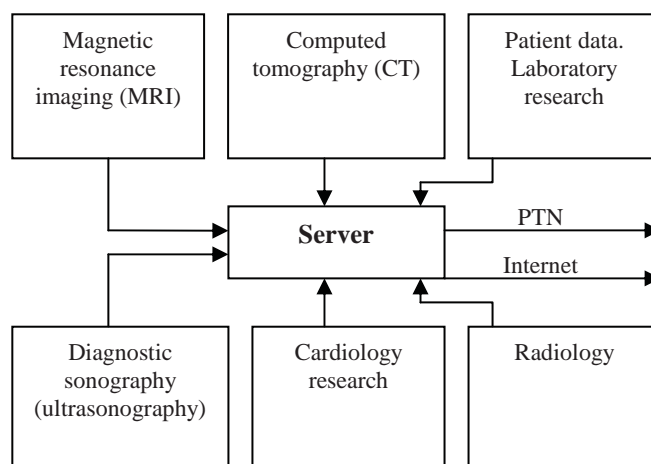


Fig. 1 Fragment of TMS based on LRCDC

For diagnostic equipment incompatible with the DICOM standard we can use a universal system of the image capturing on video monitors. Then these images can be processed by specialized (research method) software and transferred via computer network to the central server. This method allows connecting to the diagnostic devices of different manufacturers, which is very important for medical institutions.

## III. CONCLUSIONS

The advantage of telemedicine is possibility of better access to medical services, improving communication between doctors, comprehensive and continuous diagnostics, simple access to information, efficient use of resources and reduces costs.

## REFERENCES

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