

- simplifies the consistency of existing information and the addition of new information;
- standardizes support for methods and tools to enhance existing information;
- enables the creation of a personalized experience for any end-user.

It is also worth noting that the solution proposed within this paper — *OSTIS Glossary* — is:

- a part of the *OSTIS Metasystem* Knowledge base, as known the *OSTIS Standard*, which allows:
 - to develop the *OSTIS Glossary* by the same means by which any intelligent computer system based on the *OSTIS Technology* is developed;
 - use the same tools to view and navigate the text of the *OSTIS Glossary*;
 - automatic consistent development of the *OSTIS Glossary* and the *OSTIS Standard*;
- a simplified version of the *OSTIS Standard*, which allows:
 - to quickly search and reuse existing information;
 - to quickly provide consistency and integrate new information;
 - to reduce the circle of entry for new people to develop the *OSTIS Technology*;
- an environment for social and creative learning and development of new staff in the field of Artificial Intelligence.

The introduction of such information resources can significantly improve the quality and efficiency of various activities.

The authors believe that this paper will be useful not only for those who are researching innovative methods and technologies for more effective organisation of teamwork, but also for those who are just beginning research in this area.

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**ГЛОССАРИЙ OSTIS —
ИНСТРУМЕНТ ДЛЯ
ОБЕСПЕЧЕНИЯ
СОГЛАСОВАННОЙ И
СОВМЕСТИМОЙ
ДЕЯТЕЛЬНОСТИ ПО
РАЗРАБОТКЕ
ИНТЕЛЛЕКТУАЛЬНЫХ
СИСТЕМ НОВОГО
ПОКОЛЕНИЯ**

Зотов Н. В., Ходосов Т. П., Остров М. А., Позняк А. В., Романчук И. М., Рублевская Е. А., Семченко Б. А., Сергиевич Д. П., Титов А. В., Шаров Ф. И.

Данная работа включает подробный анализ проблем организации различных видов коллективной деятельности, сравнительный анализ текущих решений по обеспечению согласованности и совместимости информации из различных областей знаний, а также анализ методов и технологий для создания единых информационных пространств для обеспечения согласованного и совместимого хранения, обработки, накопления и распространения знаний. В работе предлагается один из вариантов реализации единого информационного ресурса для обеспечения согласованной и совместимой деятельности по разработке интеллектуальных компьютерных систем нового поколения — Глоссарий OSTIS. Описывается его структура, правила структуризации, размещения и идентификации знаний в нём, а также принципы работы с ним.

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Fundamentals for the Intelligent Non-Invasive Diagnostics

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Abstract—The article elaborates the needs of the design and implementation of a intelligent non-invasive diagnostics system. Technological basis for development and different variants of non-invasive diagnostics are proposed as two fundamental components of such system.

The domestic Open Semantic Technology of Intelligent Systems (OSTIS) is proposed to be used as a core technological foundation while designing the intelligent diagnostic system. The adaptation of diagnostic tasks within logical-semantic approach will allow to carry out differential diagnostics (i. e. formulating several diagnostic hypotheses). Various approaches towards the non-invasive diagnostics have been considered: functional-spectral diagnostics (FSDdiagnostics), bioimpedance analysis, preliminary diagnostics based on the assessment of the basic parameters of functional state, diagnostics by Zakharyin-Ged zones, diagnostics by Nakatani method, frequency-resonance diagnostics.

Keywords—non-invasive diagnostics, artificial intelligence, diagnostic decision support system

I. Introduction

Health is the most valuable resource of the state. One of the task of modern society is to timely detect the disease risk. The implementation of this task requires new diagnostic tools based on the latest technologies. Risk diagnosis will provide significant economics savings towards disease prevention and treatment, as well as improve the quality of primary health care. Risk is the probability of developing a disease [1].

The current problem in the area of risk diagnostic is the creation of non-invasive technology for examination and detection of diseases at early stages in order to carry out individualized prevention. The emerging modern technologies provide ample opportunities for solving this problem [2]. At the same time, let us quote a doctor's critical statements about informatization of medicine:

"The global problem is the lack of resources. And we are not talking about the shortage of money, but about the shortage of time. The time of professionals is the main world deficit. Information technology offers great opportunities to save money. Telemedicine, for example, has a huge potential.

Support for medical decisionmaking is of enormous value, but it is not being deployed and practiced"[3].

The importance of the intelligent non-invasive diagnostics problem has several aspects. Firstly, it is **caring** for people's health that leads towards the individual health improvement and preventive care. Secondly, it is an **increase in the quality** of individual preventive care to the population. Thirdly, it is **beneficial** from the economic point of view, as the costs of prevention and treatment are minimized. Taking into account the problem of "time shortage it is important to minimize time costs, as the procedures are carried out quickly enough. It is important that non-invasive diagnostics procedures are safe and painless.

Therefore, there is a need to continue to investigate and develop the intelligent non-invasive diagnostics, with the primary focus on the development of an intelligent system to support the decision making for non-invasive diagnostic.

The proposed architecture for the intelligent diagnostic ostis-system allows to assess the risk of diseases in patients, and creates the "windows of opportunity" not only for patients and doctors, but also for developers in terms of expanding the functionality of the system.

The main aim of this paper is to create an intelligent non-invasive diagnostic system architecture suitable for screening of systemic and nosological risks and early diagnosis of diseases, i. e. for diagnosing latent and initial stages of pathological process development for the purpose of primary and secondary prevention or timely treatment.

II. Overview of Existing Solutions

The quality of medical care depends on the level of doctors' training and on systems that support decisionmaking, including in the field of diagnosing the diseases at various stages.

While there are many medical decision support systems in various fields, the deployment of such systems into the everyday practice is relatively slow.