

Modern intellectual systems: status, functions, technologies and development tendencies

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Abstract: This article provides information on the status, functions, technologies and development trends of modern intelligent systems. It also analyzes the advantages and disadvantages of intelligent systems, as well as the types and areas of application of intelligent systems.

Keywords: Intelligent systems (IT), modern intelligent systems (MITs), system, model, algorithm, artificial intelligence, machine learning, technology, education.

Introduction: Modern intelligent systems (MITs) are currently widely used in many areas, including education, healthcare, industry and others. They are systems that include artificial intelligence (AI) technologies and are an effective tool for analyzing data, making decisions and implementing automated processes. The role of MITs in the field of education is of special importance, because they help to make the educational process more effective and personalized. The use of MITs in the educational system creates new opportunities aimed at improving their teaching and learning processes. For example, there are opportunities to adapt teaching methods, support teachers and increase the effectiveness of education, taking into account the individual characteristics of students in the learning process. At the same time, the development and further improvement of MITs technologies further enhances their role and importance in the teaching and learning processes. This article provides detailed information about the current state of modern intelligent systems, the functions they perform, their technologies and development trends. The importance of MITs in the educational system, their role in the optimization of teaching and learning processes, as well as their future development prospects are analyzed.

METHODOLOGY

There is a large body of literature on the use of MITs in education. While Siemens's theory of "Connectivism" emphasizes the network of information in education, the work of Davenport and Harris develops an analytical approach. Other authors, in particular Woolf and Roll, propose approaches aimed at creating intelligent teachers and providing interactive learning systems.

MITs provide the opportunity to individually support students in the learning process, which is important for making education effective and personalized. At the same time, there are opportunities for collaboration between systems, sharing resources and improving teaching strategies through the network. Through the ability to share knowledge through the network, monitor student performance and provide individual assistance to teachers, MITs provide more effective solutions in education.

In addition, MITs can be used at all stages of education, including interactive learning for students, support for teachers and data-based decision-making. During the development of MITs, new technologies, algorithms and systems make the teaching process more efficient. Below, we will review the status of MITs, their main functions, technologies, and development trends.

The state of intelligent systems. Today, intelligent systems are developing in the following main directions:

- Artificial Intelligence (AI)-based systems: Play a key role in data processing and decision-making.
- Mechanical engineering and robotics: Used to control automated production processes.
- Educational systems: Aimed at creating an individual approach and flexible learning paths.
- Healthcare systems: Enables automation of diagnostic, treatment, and prevention processes.
- Financial services: Used in fraud detection, customer service, and credit risk assessment.

Main functions of intelligent systems. Intelligent systems perform the following main functions:

- Data collection and processing: Creating useful analyses based on large amounts of data (Big Data).
- Decision-making: Making optimal decisions in specific situations without human assistance.
- Interactive communication with the user: The ability to interact with the system through natural language processing and voice commands.
- Problem solving: The ability to spontaneously suggest solutions to problematic situations.
- Automation: Increasing efficiency by automating daily operations and processes.

Technologies that are used in intelligent systems. Modern intelligent systems operate on the basis of the following technologies:

- Artificial intelligence and machine learning: Enables learning independently from data.
- Natural Language Processing (NLP): Used for processing text and speech.
- Computer vision: Processing and recognition of visual information.
- Robotics: Used for controlling automated systems.
- Big data analysis (Big Data): Effective analysis of large data sets.
- Cloud computing technologies: Used for fast implementation of data storage and processing processes.

Trends in the development of intelligent systems. The following main directions are observed in the development of intelligent systems:

- Autonomous decision-making systems: Creating the ability to work with minimal human intervention.
- Real-time data analysis: The ability to process rapid data streams.
- Cloud technologies: A convenient operating environment for intelligent systems.
- Cybersecurity: Technologies to ensure data protection.
- Network collaboration: The ability of multiple systems to work together.
- Development of decision-making systems: The ability

to make more accurate and optimal decisions using artificial intelligence.

Benefits of using intelligent systems:

- Increased efficiency: Save time and resources through automated systems.
- Accuracy and reliability: Reduce human errors.
- Continuous monitoring: Continuously monitor and optimize processes.
- Interoperability: Flexible structures for use in different industries.

Challenges of implementing intelligent systems:

- Technological complexity: The complexity of integrating new technologies.
- Human resources: Lack of qualified specialists to manage intelligent systems.
- Security issues: Data protection and privacy issues.
- Technical infrastructure: Increased resource and technical requirements required for new systems.
- Legal issues: Privacy and ethical issues related to the use of intelligent systems.

RESULTS

According to the results of the research, the development, creation and use of "Intelligent Systems" for various industries accelerates the development of these industries. For example, in the field of education, an objective evaluation of the acquired knowledge and mastery of a new topic of science, receiving recommendations from the system on which topics to improve knowledge in the future, and the production of high-quality, intellectual potential mature personnel and specialists in these selected fields will increase by 70-80%. In addition, transparency in mutual relations, the feeling of relying on one's own knowledge and strength in students, as well as recognition of familiarity and corruption situations are ensured. In other fields, the use of these systems is also emphasized by scientists and experts, which automates labor activities and increases efficiency indicators.

DISCUSSION

The use of modern intelligent systems in education creates great opportunities, but there are different opinions about the effectiveness of these systems and their role in the educational process. This section analyzes the positive and negative aspects of the introduction of intelligent systems into the educational process, as well as future development prospects. Positive aspects: Personalized learning: MITs allow you to personalize the learning process, taking into account the individual characteristics of students. With the help of artificial intelligence, students' learning styles, pace and interests are identified, and customized educational materials and strategies are offered to teachers. This makes the learning process effective and provides suitable solutions for each student.

Data-driven decision-making: MITs collect data from

the educational process and use it to make effective decisions. They have the ability to analyze student activity, track results, and provide timely support. This allows teachers to optimize their work and improve student development.

Teacher support: MITs help teachers improve their work. They are used to analyze teaching methods, select effective methods, and provide individual support to students. This helps to reduce the workload of teachers and improve their participation in the educational process.

Cons: Overreliance on technology: Some experts argue that the introduction of MITs into the educational process can lead to an overreliance on technology. In this case, the role and expertise of teachers may be reduced, and the role of personal communication may be lost. The complete replacement of the role of teachers by technology can lead to a lack of human aspects in education.

Security and Privacy of Personal Data: MITs often collect personal data of students. The security and privacy of this data can pose serious risks to education systems. Without proper regulations and laws in place regarding personal data and how it is used, this can increase distrust in these systems.

Integration and limited access to resources: Full integration of modern intelligent systems (MITs) into the education system requires a high level of technological infrastructure and qualified personnel. The resources required for the effective use of MITs in all educational institutions are not available everywhere. Also, the use of MITs in developing countries may be limited, as the technological infrastructure and education system are still not up to the mark.

Future development prospects:

Integration of modern technologies: With the further development of artificial intelligence and machine learning technologies, the use of modern intelligent systems (MITs) in education will expand even further. With their help, the teaching process can be organized in an effective and globally personalized way. Also, new technologies such as virtual and augmented reality (AR/VR) can be integrated into educational systems, creating a more interactive and engaging learning environment for students.

The new role of teachers: The development of modern intelligent systems (MITs) is changing the role of teachers and their pedagogical strategies. Teachers will focus more on tasks such as advising, motivating students, and solving complex problems. This, in turn, will increase the professional skills of teachers and further improve the quality of education.

Development of appropriate normative and ethical principles: For the successful use of modern intelligent

systems in education, new ethical, legal, and security principles must be developed. It helps to ensure transparency of systems, strengthen protection of personal information and ensure fairness in education.

CONCLUSION

In conclusion, modern intelligent systems are making major changes in various areas of human life. As a result of their development and introduction, the processes are becoming more efficient, accurate and interactive. At the same time, technological complexity and security issues remain a pressing issue in this field. In the future, intelligent systems will develop further and become an integral part of human life. Modern intelligent systems have the potential to create great changes in the educational system, but for them to work effectively, several issues need to be resolved. The integration of technology into the educational process offers many advantages, but its negative aspects must also be taken into account. In the future, these systems will play an important role in supporting teachers and making education more effective, but it is important to create the necessary resources and regulatory documents for their development.

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