

## DECISION-MAKING SYSTEM BASED ON ARTIFICIAL INTELLIGENCE ALGORITHMS

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**Abstract:** *in this article, a number of issues affecting the structure of decision-making based on artificial intelligence algorithms in secondary schools are considered and definitions of the main concepts of the topic are given. At the same time, we can see the main stages of decision-making based on artificial intelligence algorithms, teachers and students of secondary schools make decisions.*

**Key words:** *high school, decision making, analysis, learning, artificial intelligence, algorithms, organizational structure, system, technology.*

Increasing the level of digital competence of all subjects of education in secondary schools of the Russian Federation is a priority. The main obstacles to the introduction of artificial intelligence into education in Russian secondary schools are considered to be the uneven use of digital resources [8]. Artificial intelligence is capable of creating diverse content in real time, increasing the activity of students in the educational process, and increasing their attention and interest.

Today, great attention is paid to the education sector in our country, and we can find evidence of these thoughts in the work being carried out to introduce the possibilities of using modern technologies in this system, to adapt the education system to the needs of high-school and modern students. Currently, artificial intelligence consists of algorithms and software systems designed to perform various actions, and it can perform a number of tasks that the human mind can perform. In this case, if we apply an algorithmic decision-making system based on artificial intelligence in secondary schools, we can see the following results. Advanced methods and tools improve decision-making by rapidly

changing related processes [7], allowing leaders to make faster decisions even in times of great uncertainty.

Understanding AI in Decision Making - An AI system processes and analyzes large amounts of data in real time [2]. Adaptive learning algorithms are trained on relevant variables over a long period of time. Cognitive computing uses AI technologies to mimic human thought processes. The decision-making process is based on a cognitive computing algorithm, which is a branch of artificial intelligence that aims to mimic the human brain's ability to process information and learn from it, and includes systems that understand, reason, learn, and interact with humans in a natural way [6]. How cognitive computing transforms unstructured information into data-based understandings for school:

- AI gets context - after collecting data, the algorithm develops an understanding of the context in which decisions need to be made;
- algorithm uses recommendations to make artificial intelligence decisions;
- the algorithm synthesizes its analysis and recommendations into a consistent decision;
- AI decision making is fast, often within seconds, allowing the algorithm to optimize decisions in time to support decision makers allows to provide.

Artificial intelligence software developers develop and implement algorithms that enable cognitive computing systems to process information, learn from it, and make intelligent decisions. Decision-making in artificial intelligence uses artificial intelligence techniques to make choices or actions based on data[5], rules, and other information. Decision-making based on artificial intelligence typically involves several steps, such as data collection, processing, and analysis. Artificial intelligence can assist in decision-making in various ways:

- data analysis - AI algorithms can analyze large amounts of data and extract trends and insights that cannot be easily detected by humans. This information can be used to make informed decisions.
- optimization - artificial intelligence algorithms can optimize decisions taking into account several variables and find the best solution that meets certain criteria.
- automation - artificial intelligence using predefined rules and logic to make decisions without human intervention or in specific areas such as supply chain management can automate decision making.

The level of decision-making used in AI depends on several factors, such as the complexity of the decision, the level of trust in the AI system, and the possible consequences of the decision.[4] In some cases, a fully manual decision-making process may be preferable to ensure that decision-makers have full control and accountability over the decision. In other cases, a fully automated decision-making process may be preferable to increase efficiency and reduce human error.

The structure of an algorithmic decision-making system based on artificial intelligence is organized into the following main stages and components. With the help of this structure, the system is able to analyze data[3] and make optimal decisions. Below is a schematic description of the decision-making process:

**Data collection:**

- Raw data from data sources (sensors, internet, databases, user inputs, etc.);
- Data set (extended or structured data (images, text, numeric values).

**Data cleaning and preprocessing:**

- Identifying and cleaning null values or invalid data;
- Normalization (bringing data to the same size);

Digitizing categorical data (for example, replacing "yes" and "no" with 1 and 0).

**Feature extraction and learning:**

- Feature extraction (identifying important features within the data);
- Feature selection (selecting only those features that are relevant to the purpose).

**Model selection and training:**

- Model selection - artificial neural networks, classification algorithms (e.g., logistic regression, decision trees), regression models, or more powerful models;
- Model training (adjusting model parameters based on data);
- Training results (evaluating model accuracy and performance).

**Model evaluation and validation:**

- Assess accuracy using test data - measure the overall performance of the model using test data (e.g., accuracy, error);
- Identify overfitting or underfitting (optimize the model and reduce errors).

**Decision-making algorithm:**

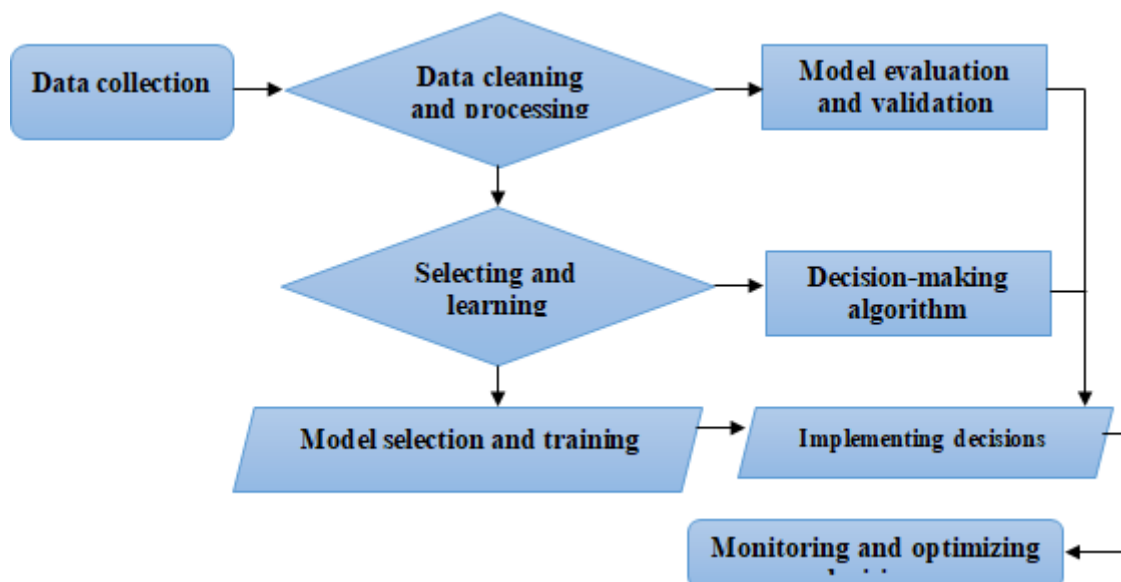
- Statistical or probabilistic approaches - using a model to make decisions (e.g., data-driven classification or regression);
- Optimal decision-making - appropriate algorithms for decision-making (e.g., dynamic programming, game theory);
- Advanced algorithms - use of genetic algorithms, reinforcement learning, decision trees, and other methods.

**Decision making:**

- Decisions are implemented in real time - based on decisions, the system automatically performs practical actions;
- User interface - decisions can be implemented interactively with the user.

**Decision monitoring and optimization:**

- Model performance monitoring (continuous monitoring of the system after decisions are made);
- Retrain the model (improve the model and update the training based on changes or new data).



Picture-1. Algorithmic decision-making scheme based on artificial intelligence.

The above diagram summarizes the algorithmic decision-making process[1], but the methods and technologies used at each stage vary depending on the system.

### CONCLUSION

In conclusion, an algorithmic decision-making system based on artificial intelligence in secondary schools includes several stages, from collecting data to making decisions and monitoring them. In this way, artificial intelligence speeds up the decision-making process, reduces errors, and enables more optimal decisions to be made, but the efficiency and accuracy of the system require regular updating and optimization. In the field of artificial intelligence software development, specialists develop algorithms that enable cognitive computing systems to process information, learn from it, and make intelligent decisions. Optimization and resource allocation - artificial intelligence algorithms help decision makers effectively allocate resources, simplify processes, and solve complex optimization problems.

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