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USE OF MACHINE LEARNING (ML) ALGORITHMS IN THE CREATION OF WEB EDUCATION PLATFORMS

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Abstract
This article analyzes the possibilities of using machine learning (ML) algorithms on web educational platforms. Unlike the traditional education system, modern web-education platforms provide an interactive and personalized learning experience. With the help of machine learning algorithms, adaptive learning materials can be recommended to students, assessment systems can be automated, and the effectiveness of communication can be increased through natural language processing technologies. The study extensively discusses the influence of ML algorithms on the learning process, their advantages and prospects. This article highlights the scientific foundations of implementing ML technologies on web educational platforms and defines future research directions.[1]

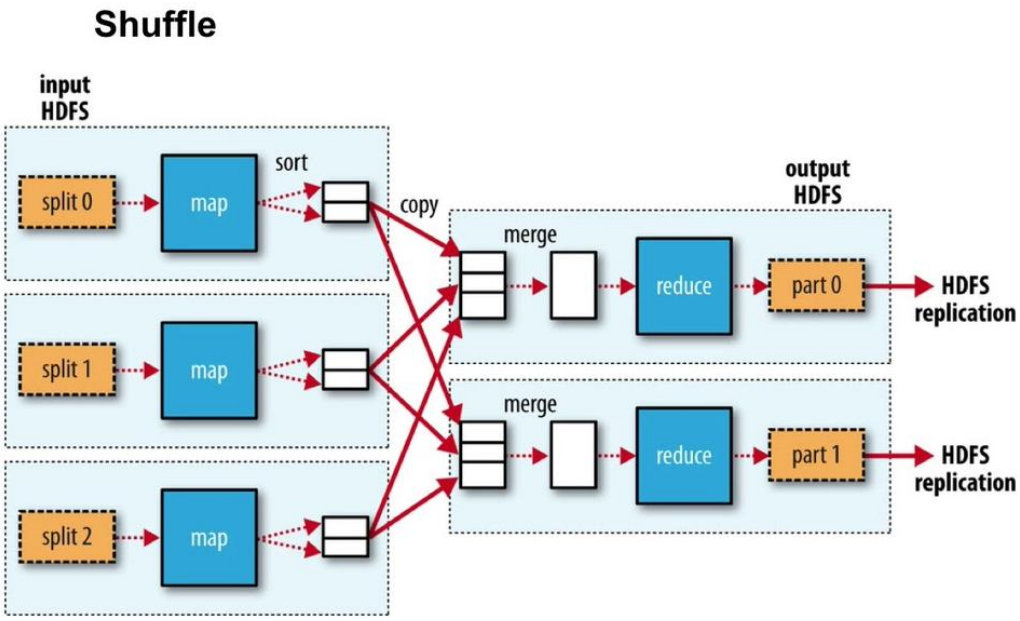
Keywords: Web learning platforms, machine learning, automatic assessment, personalized learning, recommendation systems, natural language processing, artificial intelligence.

Introduction

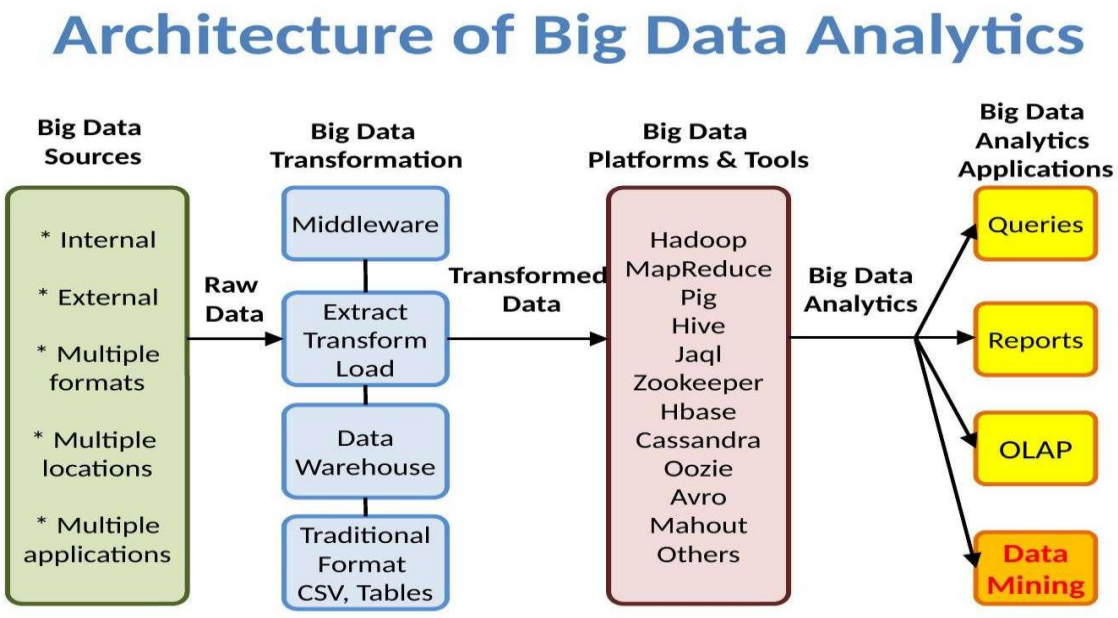
The modern education system, combined with digital technologies, has increased the importance of web educational platforms. Unlike the traditional education system, web-education platforms provide students with personalized and interactive learning opportunities. These platforms allow both teachers and students to effectively manage the educational process.

Machine Learning (ML) algorithms play an important role in the development of the education system. With the help of ML algorithms, users can adapt educational materials to their personal needs, use real-time assessment systems, and find appropriate educational resources. Also, natural language processing (NLP) technologies serve to make communication with students more effective. This article analyzes the application of ML algorithms in web educational platforms, their capabilities and prospects.[2]

The use of ML algorithms on web educational platforms includes various directions. These methodologies monitor the actions of ML users in the learning process and offer them appropriate educational materials. Through this, an individual approach is implemented. ML algorithms are used to create personalized learning opportunities and individual curricula.[3]



For example, a corresponding course or topic is recommended based on the student's level of mastery. At the same time, ML models are used for automated analysis and evaluation of test results through automatic assessment systems. This saves teachers' time and ensures the accuracy of the assessment process. Providing individual recommendations for students, recommending courses that meet their interests. This system works similarly to recommendation mechanisms on platforms like Netflix or YouTube. Chatbots and automatic response systems are created through NLP. Through this, students can get quick and accurate answers to their questions and create interactive lessons for students, automatically add subtitles to video lectures, or use voice assistants.[4]



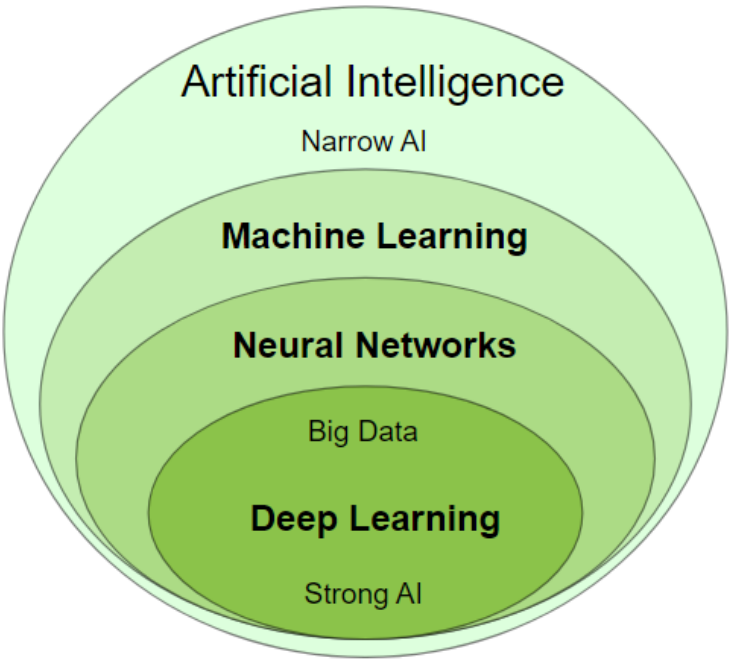
The application of ML algorithms in web educational platforms serves to increase the effectiveness of the educational process. According to the research results, on platforms using ML algorithms:

• The level of completion of courses by students has increased.

• The level of knowledge has significantly improved thanks to the personalized learning approach.

• Assessment systems worked more accurately and reduced the burden on teachers.

• Recommendation systems made it easier for students to find suitable courses.[5]



Machine Learning (ML)

Traditional programming **uses algorithms** to produce results from data:

Data + Algorithms = **Results**

Machine learning **creates algorithms** from data and results:

Data + Results = **Algorithms**

Neural Networks (NN)

Neural Networks is:

- A programming technique
- A method used in machine learning
- A software that learns from mistakes

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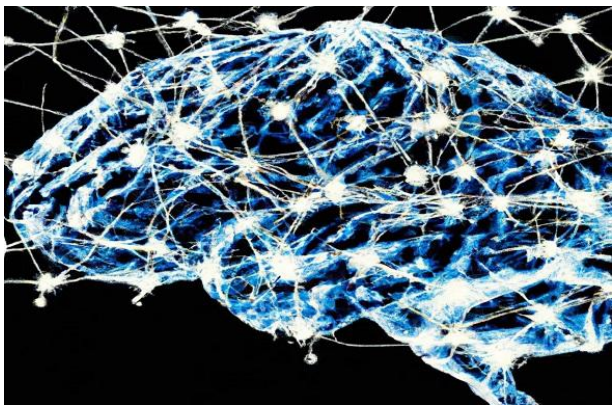
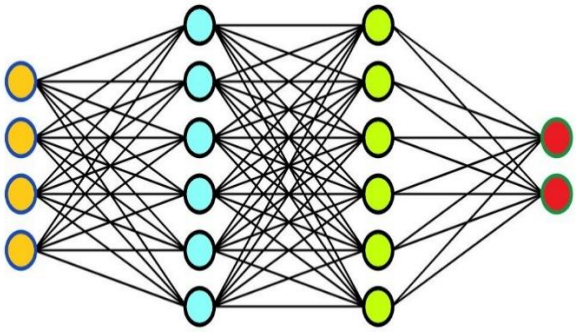
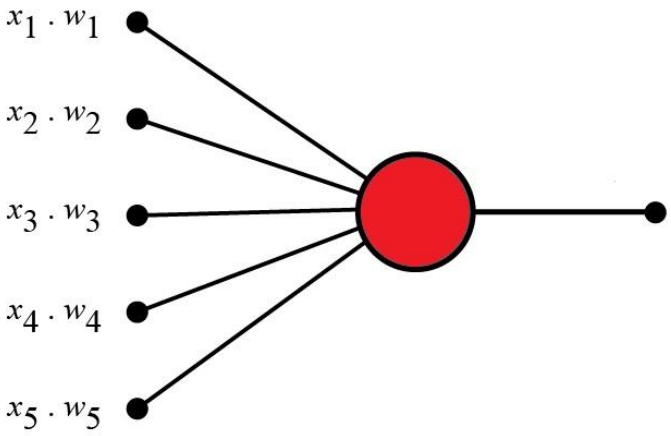
Neural Networks are based on how the human brain works:
Neurons are sending messages to each other. While the neurons are trying to solve a problem (over and over again), it is strengthening the connections that lead to success and diminishing the connections that lead to failure.[6]





Perceptrons
The **Perceptron** defines the first step into Neural Networks.
It represents a single neuron with only one input layer, and no hidden layers.



Deep Learning (DL)
Deep Learning is a subset of Machine Learning.
Deep Learning is responsible for the AI boom of the last years.

Deep learning is an advanced type of ML that handles complex tasks like image recognition.[7]

Machine Learning	Deep Learning
A subset of AI	A subset of Machine Learning
Uses smaller data sets	Uses larger datasets
Trained by humans	Learns on its own
Creates simple algorithms	Creates complex algorithms

[8]

The implementation of ML algorithms on web educational platforms provides a number of important advantages. However, the implementation of this technology also creates a number of problems, including:

• Data privacy and security issues.

• Requires a large amount of high-quality data for the proper functioning of ML models.

• The need for a technical infrastructure for the effective use of ML technologies in the education system.

However, the development of ML serves to solve these problems and will make it possible to further increase the effectiveness of web educational platforms in the future.[9]

Conclusion

The use of ML algorithms on web educational platforms contributes to the organization of the educational process based on innovative approaches. Through technologies such as an individual approach, recommendation systems, automatic assessment, and NLP, the learning process of students is simplified and the effectiveness is increased. In the future, further development and the introduction of new technologies in this area are expected, which will serve to make the education system more efficient and adaptable.[10]

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