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MINISTRY OF EDUCATION AND SCIENCE
OF UKRAINE
V. N. KARAZIN KHARKIV NATIONAL UNIVERSITY

**IT-SPACE OF TODAY:
TRENDS, INNOVATIONS
AND DEVELOPMENT PROSPECTS**

Collection of abstracts
of the II International Scientific and Practical
Student Conference

(October 21, 2026, Kharkiv, Ukraine)

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APPLYING AI TECHNIQUES TO CREATE TYPICAL WEB APPLICATIONS

The purpose of the study is to improve the process of developing typical web applications, maximizing the optimization of human and material resources at each of the main stages of development. The result of the study is the use of the information obtained in order to facilitate the development and development of applications in accordance with the user's own needs.

Often, developers around the world develop a huge number of new web applications: useful and meaningless, large and one-page, commercial and for their own use. But no matter how different and original they are, the process of their development is quite little different and, as a rule, consists of the same stages, for example: monotonous writing of components, interface design, different types of testing, etc. Each task of a certain stage separately requires a small amount of resources, but in the aggregate and in a large-scale project, a certain amount of human and, accordingly, material resources are needed significantly, which becomes a significant problem for both managers and customers. Optimization of resource costs in the modern world is a necessity for any institution to always stay afloat in a fierce competitive environment. For the development of web and regular applications, there are now methodologies for optimizing this process, however, they use rather outdated tools and are too dependent on the human factor, which significantly reduces their

efficiency, reducing the already small amount of saved resources. Now it is impossible to surprise anyone with a voice assistant or, for example, searching the Internet by photo, because modern artificial intelligence systems already know how to draw images and can even completely replace a person in correspondence and conversations. This has become possible thanks to modern artificial intelligence and machine learning tools, the limits of which do not exist. The use of these tools can significantly help in solving the problem of optimizing the process of developing web applications, but in order to improve the results, compared to existing methodologies, these tools need to be integrated at every stage of development, namely: from design to testing. For this, tools such as NLP and GPT, which use artificial intelligence, as well as machine learning methods for text and language analysis, in order to synthesize new text, including program code, will be useful. Nowadays, it is not enough to create a high-quality and ideal product to be competitive, so each enterprise tries to optimize the use of material and human resources, in order to increase profits or reduce the cost of the final product. Таким чином, сам процес проєктування та розробки веб-додатків є вже достатньо вивченим і вдосконаленим, а оптимізація за допомогою традиційних методів не дає потрібного результату, щоб виправдати значні додаткові витрати. Therefore, it is necessary to use the most modern methods of artificial intelligence and machine learning. They have almost unlimited potential in many areas of activity, and the chosen subject area is no exception. Artificial intelligence systems usually consist of quite different components to represent their intellectual behavior. Some of these components include learning, perception, knowledge representation and reasoning, execution and planning. The diagram shown in Figure 1 shows the interaction of an AI system with its environment and the components involved.

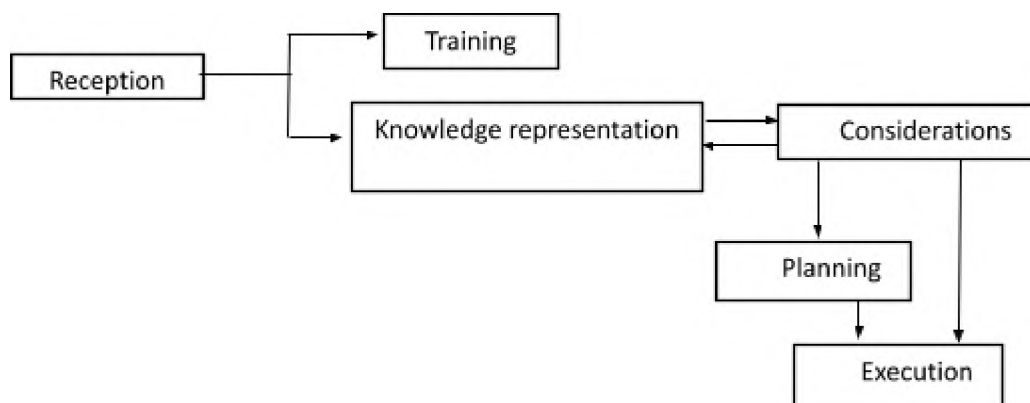


Figure 1 – Diagram of the ties of the components of the AI representation

The Perception component receives data and information from the environment. With this component, you can obtain data from the environment, identify the source of the noise, and check if the artificial intelligence is damaged by something. In addition, it determines how to react when any logical result is detected. The learning component analyzes the data received by the perception component. The goal is to create computers that can be trained and not programmed. Learning is aimed at the process of self-improvement: to learn new things, the system requires

knowledge, conclusions, heuristics, faster searches, etc. The main component of the model is the representation of knowledge and thinking, which demonstrate human intelligence in machines. The representation of knowledge is a sign of intelligence's understanding of information. In contrast, instead of trying to understand or build the brain from the bottom up, its goal is to understand and create intellectual behavior from the top down and focus on what the agent needs to know in order to behave intelligently. In addition, it determines how automated thinking procedures will be able to make knowledge available when needed. The components of planning and execution depend on argumentation, analysis, and presentation. Planning includes the task of the initial state, the search for prerequisites and consequences, and the sequence of actions to achieve a state in which a certain goal will be achieved. Once planning is completed, the final stage is to execute the process as a whole. There are four methods of presenting the knowledge gained, namely: logical, semantic, frame method, and production rules. The machine learning method allows a computer system to predict or make decisions using historical data without explicit programming. Machine learning uses vast amounts of structured and semi-structured data so that a machine learning model can generate accurate results or make predictions based on that data. Machine learning has the following definition: it is the use of algorithms and computational statistics to study data without explicit programming. Machine learning has become popular due to its ability to process large amounts of data, store that data more efficiently, and the advent of faster computers. As a result of the study, the module "Using AI tools to create typical web applications" was introduced, and the relevance and necessity of using artificial intelligence methods in the development of software in general, as well as individual typical web applications, was considered and assessed. However, this is possible only with the help of modern tools of artificial intelligence and machine learning. To strengthen knowledge in this area, the work considered existing methods of artificial intelligence and machine learning, and each of them was described in detail. Based on the results of the analysis, the appropriate AI methods that will be useful in the selected field were identified. These include methods and models, such as: neurolinguistic programming, computer vision, and generative pre-trained transformer of the third version. The advantages and disadvantages of each of the selected methods were carefully confirmed and taken into account at the next stage — their practical application. During practical application, the toolkit has finally confirmed the feasibility and effectiveness of the selected AI methods, which will provide a high level of performance and reliability, flexibility and convenience of settings, as well as the ability to edit the appearance of the interface. As a result, typical web applications and their components, which were created exclusively from human natural language, are a convincing example of demonstrating the capabilities of artificial intelligence tools. The technologies in question have a real future not only in the form of separate full-fledged systems, but also as a complement to existing software products for software development, such as graphic editors for creating user interfaces and code editors. The research will contribute to drawing attention to existing AI tools and creating new tools in the future.

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DEVELOPMENT OF AN INFORMATION SYSTEM FOR DISTANCE LEARNING TO SUPPORT THE PROCESS OF STUDYING HISTORY

The purpose of the study is to develop the "History" module within the distance learning information system, which will allow distance learning of the subject area, namely history. The object is the design of computer problems, information, software and hardware support of the "History" module of the distance learning information system. To solve the tasks, methods of website development, algorithms for searching information by keywords, recommendations for the appearance of the user interface were used. The result of the project is a software module that allows you to study the subject area, namely history, remotely. The application of the developed module will make it possible not only to learn important information about historical events and outstanding personalities, but also to discover little-known, but quite interesting historical facts. This opens up additional opportunities to increase the level of interest of the user in more thorough learning. The developed software module also significantly expands the opportunities for communication between participants, which contributes to a detailed discussion of an interesting topic, its comprehensive

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Електронне наукове видання
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Можна використовувати в локальному та мережному режимах

ІТ-ПРОСТІР СЬОГОДЕННЯ: ТЕНДЕНЦІЇ,
ІННОВАЦІЇ ТА ПЕРСПЕКТИВИ РОЗВИТКУ

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