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Separate Issues of Applying Artificial Intelligence in Forensic Expertise

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Abstract: The article examines the use of artificial intelligence in conducting forensic examinations, as well as the specifics of applying artificial intelligence, taking into account the procedural significance of the expert's conclusion. Requirements for the process of developing artificial intelligence systems for their use in forensic activities have been proposed.

Keywords: Forensic examination, artificial intelligence, assessment of the expert's opinion, application of artificial intelligence in forensic activities.

Introduction: Today, computer technologies are increasingly penetrating all spheres of human activity. Computer tools are widespread that allow for the acceleration and simplification of various human operations - writing and editing texts, creating, correcting, and analyzing images, performing various mathematical calculations, automatically managing production processes, etc.

Computer technologies are also actively used in law enforcement activities. Currently, in Uzbekistan, systems for computer identification of license plates of vehicles that have violated traffic rules, and systems for determining the appearance of persons who assist in the search for offenders are widely used.

In recent years, with the development of computers and the increase in their capabilities, the processes within computers have begun to be compared with human mental activity. As a result, a new term - artificial intelligence - appeared.

Currently, the concept of "artificial intelligence" is not yet fully formed. A legal framework for the implementation and use of artificial intelligence technologies has been developed in our country. For example, the Decree of the President of the Republic of Uzbekistan dated October 5, 2020 No. UP-6079 "On Approving the Strategy "Digital Uzbekistan - 2030" and Measures for its Effective Implementation" approved the Strategy "Digital Uzbekistan - 2030". The Strategy "Digital Uzbekistan - 2030" defines the strategic goals, priority areas, and medium- and long-term prospective tasks for the development of the digital economy and e-government of the Republic of Uzbekistan, and also serves as a basis for the further widespread introduction of digital technologies based on the priorities defined in the UN Sustainable Development Goals and the e-government development rating [1].

Currently, artificial intelligence is developing and being widely implemented in various spheres of modern society, including law enforcement activities and the practical activities of forensic experts. In forensic examination, artificial intelligence is used for the primary processing of large volumes of data contained in databases for the study of papillary patterns, DNA samples, objects of ballistic examination. With the help of artificial intelligence, large volumes of textual information on social networks are analyzed. "It is known that modern artificial intelligence consists of algorithms and software systems designed to perform various operations, and performs several tasks that human consciousness can perform based on information entered into the database" [3].

The discussion on the main possibility of using artificial intelligence in law enforcement activities has concluded. The very practice of law enforcement agencies has confirmed the effectiveness of using

artificial intelligence. At the same time, the question remains open about the limits, forms, and methods of using artificial intelligence, for example, whether it is possible to fully rely on it when conducting a forensic examination. Currently, most authors believe that this is impossible at the current stage of development of legislation, expertise methodology, and artificial intelligence.

The limitation on the use of artificial intelligence in forensic examination is explained by the specifics of expert research and its position in the modern judicial process.

These features are that the expert's conclusion does not have a predetermined force, and "the expert's conclusion is assessed by an official of the body conducting the pre-investigation check, an investigator, an inquiry officer, or a court, together with other evidence collected on the materials of a criminal case or pre-investigation check, from the point of view of its scientific validity and compliance with all procedural rules established for conducting the examination" [2].

In particular, the expert opinion is assessed in accordance with:

- compliance with the established procedural requirements for the appointment and conduct of the examination;

- the reliability of material evidence submitted for expert research, their sufficiency to resolve the issues posed to the expert;

- the expediency and scientific validity of the research methods and methodology chosen by the forensic expert for the case under consideration;

- completeness and comprehensiveness of the research conducted by the forensic expert, compliance of the research with the chosen methods and methodology;

- logical justification of the intermediate and final results of the research;

- the correspondence of the expert's final answers (conclusions) to the evidence available in the case.

The most difficult task for evaluating an expert's conclusion is related to the research methodology. When it comes to the assessment of traditional forensic examinations conducted using an approved and scientifically based methodology, this, of course, does not present much difficulty.

However, when it comes to modern complex, scientifically demanding examinations requiring a deep knowledge of chemistry, physics, or other sciences, for example, genetic or biological examination, physicochemical research, financial-economic, computer-technical, and other similar forensic examinations, assessing their results often presents difficulties. Because for the purpose of assessing the results of forensic examinations of this type and the actions of the expert, the subject of assessment must have minimum knowledge of the methodology of the examination under consideration.

Currently, in the practice of law enforcement agencies, such problems are solved as follows: preliminary (preventive) verification by authorized bodies of the correctness of the relevant research methods and methodology and development of instructions for forensic experts on the application of this methodology (in cooperation with forensic experts); independent education, advanced training, etc. of subjects of assessment (for example, investigators, inquiry officers, courts); obtaining explanations on the necessary issues from the forensic expert who conducted the examination, or from another specialist in the relevant field.

After all, the forensic expert who conducted the examination must be able to fully understand and explain what actions he took during the examination and exactly why he did so, what scientific principles his actions were based on, where he could have made mistakes, and why he obtained the specific results noted in his conclusion.

However, the development of digital technologies and the expansion of their use in forensic examinations leads to the fact that it is no longer enough to be a specialist in any field of knowledge, for example, forensics, to conduct forensic examinations and assess the accuracy of their results, and knowledge in the field of computer technologies is also required. Initially, this knowledge should have been at the level of an ordinary user of computer technology, but with the expansion of the scope of computer use, the required level of this knowledge increases.

Today, in many forensic examinations, computer technologies are used as an auxiliary tool in the following processes: obtaining and processing digital images, audio recordings, preliminary processing of various databases located in computer memory, computer modeling, comparison of digital copies of objects, etc. In such cases, the forensic expert has the opportunity to control computer operations and, if necessary, verify the objectivity and validity of the obtained results using other means.

With the advent of artificial intelligence, computers became capable of independently performing a number of separate (individual) practical intellectual tasks, for example, recognizing a person's oral speech or face (called "weak artificial intelligence") and even creative thinking and self-awareness as a person

("strong artificial intelligence") [4]. This makes it very difficult to effectively manage the "mental thinking activity" of the computer.

In this regard, two questions arise regarding the use of artificial intelligence for conducting forensic examinations. One of them is that if the expert's conclusion is incorrect, who will be responsible: the forensic expert, the artificial intelligence manufacturer, or the artificial intelligence itself? The second question is related to the methodology for assessing the accuracy of conclusions obtained as a result of expert research. Since the first question is mainly related not to the methodology of conducting the examination, but to the legal regulation of the use of artificial intelligence in criminal proceedings, let's focus on the second issue in this case.

In this article, we did not examine cases where the examination is conducted entirely by artificial intelligence, and as a result, the forensic expert receives a conclusion prepared only as a result of research conducted by a computer system. Because in this case, it is necessary to return to the first question - who is the subject of the forensic examination.

In our research, we will focus on cases where the subject of the examination is the forensic expert and, accordingly, the forensic expert is responsible for the accuracy of the obtained results. In this case, the forensic expert must monitor the research process to one degree or another and, if necessary, coordinate it.

When using artificial intelligence, this is a very difficult task. Because in such a situation, the verification of results is complicated by the multitude of reasons that can lead to various errors. The following can lead to incorrect results obtained during this activity using artificial intelligence: errors in choosing a research methodology; errors in the software of artificial intelligence; errors in teaching artificial intelligence.

Errors in artificial intelligence training can be errors in the selection of curricula or errors in the incorrect selection of objects necessary for conducting artificial intelligence training. Training on artificial intelligence has a great influence on the objectivity of the results of its use and application. Because this process is based on the analysis of a large amount of data.

For artificial intelligence to function correctly, the data used must be sufficient, systematized, and reflect all possible situations. In training on artificial intelligence, it is necessary to create independent models not only for the initial state of the start of expert research, but also for subsequent stages of research that determine intermediate and final results, for example, situations that reflect the degree of expression and the quantity of features reflected in objects.

Some authors correctly emphasize that to solve each new task of artificial intelligence, a large amount of data is needed, based on specific and real examples related to solving this problem, therefore, when teaching artificial intelligence, it is necessary to take into account all the tasks that artificial intelligence can perform, and include in its memory examples of solutions to these tasks [5, p.288]. For example, if artificial intelligence doesn't have enough information in its memory to solve any task, it can fill existing gaps with what it considers right.

It should also be remembered that one of the functions of artificial intelligence is the ability to learn independently, in the process of which all new data entering the system are analyzed for further use in performing various tasks. Therefore, it is important to regularly monitor the correctness of learning algorithms embedded in artificial intelligence and the appropriateness of newly introduced data.

Another factor that creates difficulties in assessing the results obtained by artificial intelligence is the degree of "closeness" of its work, the ability to study it independently. The essence of this fact lies in the fact that even the developers of such computer systems do not have complete information about what happens inside the program after the "independent life" of the system begins, how the individual algorithms of its operation change.

This creates a requirement for the forensic expert for the transparency of artificial intelligence work (for example, the possibility of constant monitoring and supervision of processes). The forensic expert must monitor the functioning of artificial intelligence at any stage of the forensic examination, verify the correctness of not only the final but also any intermediate conclusion; the correctness of the system of features selected for evaluation, etc.

Thus, it is possible to formulate the main requirements for the processes of creating an artificial intelligence system for conducting forensic examinations:

1. Artificial intelligence systems should be created with the participation of forensic experts of the relevant specialty, based on the methodology for conducting a specific type of forensic examination. The processes of developing, implementing, and using artificial intelligence should be monitored by departmental and interdepartmental organizations. This circumstance protects developers from possible errors in the selection of system algorithms and increases the transparency of the system for forensic experts.

2. Artificial intelligence systems should be created on the basis of transparency and accountability. The subject responsible for conducting the forensic

examination must monitor and control the results of artificial intelligence actions (operations) at each stage of the forensic examination.

3. Training on artificial intelligence should be conducted at specific objects under study, taking into account all possible preliminary and intermediate expert situations in the process of conducting certain types of examinations.

4. Before implementing a specific artificial intelligence system in expert practice, it is necessary to develop a methodology for checking the correctness of its operation and, if necessary, eliminating the errors that have arisen.

5. In the process of using artificial intelligence, it is necessary to periodically monitor the correct functioning of artificial intelligence.

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