FEATURES OF THE APPLICATION OF DIGITAL TECHNOLOGY IN CRIMINAL PROCEEDINGS OF THE BRICS COUNTRIES

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https://doi.org/10.21684/2412-2343-2023-10-1-35-58

The current pace of technological development creates new opportunities for improvements in various spheres of human activity, including the sphere of criminal proceedings. In the BRICS countries, the achievements of modern technological developments, in particular the use of digital technology in criminal proceedings, have their own unique characteristics. This article describes the current state of criminal proceedings in the BRICS member countries. The authors analyze practices in criminal proceedings with the aim of identifying best practices, advantages and disadvantages of using digital technology in the criminal justice sector, as well as outlining prospects for the development of this technology in the BRICS countries. The authors come to the conclusion that the use of digital technology in criminal proceedings should contribute to increased access to justice, procedural economy and effective investigation, and as a result, a fair verdict in criminal cases in all of the BRICS member states.

Keywords: criminal proceedings; digital technologies; BRICS countries; artificial intelligence; electronic evidence; 3D technologies.

Recommended citation: Galina Rusman et al., *Features of the Application of Digital Technology in Criminal Proceedings of the BRICS Countries*, 10(1) BRICS Law Journal 35–58 (2023).

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Introduction

In the modern world, one of the key roles is played by advanced technologies that are able to adapt to the realities of the world and respond to the challenges they present. The current state of development in digital technology creates new opportunities for improvements in various spheres of human activity. This is also confirmed by the fact that the use of technical means and scientific achievements in criminal proceedings is becoming more widespread every year.

The COVID-19 pandemic contributed to the accelerated introduction of new technologies into the judicial system, including within the sphere of criminal procedure. The urgent need for digital technologies was manifested in the decision to ensure the right of citizens to personal participation and respect for their procedural rights as participants in the court session. Digital technologies such as artificial intelligence, videoconferencing, electronic courts and 3D technologies are particularly important in this context.

In order to fully realize the right of citizens to access justice, criminal proceedings must respond in a timely manner to changes taking place in the modern world's political, economic and legal environments, including taking into account such processes as epidemics. In this regard, legal scientists are increasingly turning to the use of digital technologies in their research in criminal proceedings. Moreover, particular attention is paid to the prospects of their application in the BRICS countries.

The use of digital technical means, in particular videoconferencing, artificial intelligence and 3D technologies, opens up new prospects for the further improvement of criminal procedural activities, significantly increasing the chances of an effective investigation of crimes and, as a result, the imposition of a fair sentence.

At the same time, the need to optimize criminal proceedings through the use of such technologies, while ensuring the constitutional right of citizens to access to justice and the integrity of criminal procedural evidence, requires the adoption

of appropriate legal regulation. Paramount importance is given to the features of the admissibility of evidence obtained as a result of the use of such digital technical means. This is especially important since the main trend in the use of digital technology in the criminal proceedings of the BRICS countries is the introduction of electronic evidence; however, the regulatory framework for these types of evidence has not yet been fully formed.

Digital technologies are characterized by a high degree of novelty, due to which they are becoming increasingly important in the development of criminal proceedings and having a significant impact on the resolution of criminal procedural tasks. It should be noted that modern technologies play a significant role in the digitalization of criminal proceedings. Therefore, the use of these technologies during the preliminary investigation of a crime or a court hearing should contribute to improving the efficiency of the justice system, as well as the quality of the evidence base and the level of access that citizens have to justice.

1. Electronic Justice and Features of the Use of Electronic Evidence

Due to the widespread use of digital technologies in criminal proceedings, the possibility of performing procedural actions in digital form, also known as electronic justice, is becoming increasingly in demand. In response to the challenges of the modern world, a growing number of countries, including Brazil, Russia, India, China and South Africa, are adopting laws aimed at combating the rise in cybercrime and working with evidence in electronic form.

To date, the main forms of electronic justice currently in use, including in the BRICS countries, include remote judicial proceedings using real-time video and audio transmission technology (videoconferencing), electronic evidence and electronic services, such as informing the parties or exchanging relevant court materials with the parties, as well as information databases of national judicial systems.[1]

In Russia, in order to implement the strategy of electronic justice, the state automated system "Justice" and the "My Arbitrator" systems are in operation.

In India, a deep learning chatbot is being developed that could have the capability to engage in interactive dialogue and also offer suggestions on future courses of action. In addition, such a development would aid in the analysis of various laws, including the criminal procedure legislation of India in its different states.[2]

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[1] *Luo Y.* Practice of E-Justice in China // Государство и право во времени и пространстве: сборник тезисов докладов Республиканской научно-практической конференции с международным участием студентов, магистрантов, аспирантов, 3 декабря 2021 г. / под ред. Д.В. Петроченкова [Ye Luo, *Practice of E-Justice in China*, in Dmitry V. Petrochenkov (ed.), The State and Law in Time and Space: A Collection of Abstracts of Reports of the Republican Scientific and Practical Conference with International Participation of Students, Undergraduates, Postgraduates, 3 December 2021] 350–51 (2022).

[2] Adv. V.K. Singhal, *An Advanced Deep Learning Based Approach for Judicial Decision Support Process*, 13(2) Int'l J. Electronics Engineering 18 (2021).

In China, the active process of digitalization in the courts began in 2016. Thus, the Shanghai Court initiated the development of an intelligent criminal case processing system in order to clarify the guidelines on the basic standards of evidence at different stages of the trial and to assist court personnel in collecting and reviewing evidence in accordance with the law in a comprehensive and standardized manner.[3] As a direct consequence of the implementation of the "smart courts" system, it is now possible to submit documents, present evidence, hold court sessions, make decisions, as well as conduct proceedings under review of a court decision online.

By 2019, China had developed a court system that offered its citizens access to online services for the entire judicial process. The advantages of such systems of electronic justice, carried out with the help of "smart courts," have emerged as a timely and effective solution to the problems that have arisen due to the COVID-19 pandemic. As a result, "smart courts" are aimed at solving one of the tasks of the Criminal Procedure Law of the People's Republic of China, namely, to "accurately" and "timely" establish the facts.[4]

Furthermore, "smart courts" in China should make full use of information and communication technologies, including the Internet, cloud computing, big data and artificial intelligence, in order to modernize the judicial system and judicial capacity.[5]

The widespread development of digital technologies has led to the fact that there is a pressing need to improve criminal justice and criminology, which has forced legislators and scientists to immediately begin working to address this urgent need.

Indian researchers B. Mishra, S. Chatterjee and S. Mishra believe that

> in general the Indian government is trying to adhere with the fast paced technological developments by following the process of adjusting with the current scenario by following three major steps of making adjustment with the already prevalent National Laws, identification of gaps in the existing legislations and drafting of new legislation to comply with the existing legal loopholes.[6]

In order to implement the planned goals, India has implemented legislative, institutional and procedural changes to effectively respond to cybercrime. Thus, in

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[3] Jia Yu & Jun Xia, *E-Justice Evaluation Factors: The Case of Smart Court of China*, 37(4) Info. Dev. 658 (2021).

[4] Changqing Shi et al., *The Smart Court – A New Pathway to Justice in China?*, 12(1) Int'l J. for Ct. Admin. 3 (2021).

[5] Mimi Zou, *'Smart Courts' in China and the Future of Personal Injury Litigation*, J. Personal Injury L. (June 2020) (Jan. 3, 2023), available at https://ssrn.com/abstract=3552895.

[6] Banipriya Mishra et al., *Traditional Judicial Systems Need Ammunition for Future*, 24(2) J. Legal, Ethical & Reg. Issues 1, 3 (2021).

order to respond to cybercrime, amendments were adopted to the Indian Penal Code of 1860 as well as the Information Technology Act of 2000, which form the basis of legislation relating to cybercrime. In addition, the Evidence Act of 1872 has been amended to make electronic evidence relevant and acceptable in Indian courts.[7]

South African companies are also actively exposed to cyberattacks. However, despite this, South African legislation currently does not regulate in detail the general standards of information security in companies. If the organizations responsible for the processing of information, as well as the security and confidentiality of the personal information processed by them, do not take these measures, then they are in violation of the Cybercrime Act of 2020.[8]

With the improvement of modern information technologies in the criminal process, the need for the regulation of their application is also increasing. In today's world, it is extremely difficult to avoid leaving a digital fingerprint.

It is impossible to ignore the fact that, as a result of the inherent nature of digital criminology, which provides means for collecting, examining, analyzing and presenting evidence as well as using it in trial, it is becoming one of the most developed areas in the field of criminal procedure. Digital forensics has developed so rapidly over the past decades thanks to the outstanding progress of information technology. These advancements have made it possible to find non-standard solutions to the challenges of cloud forensics, network forensics and mobile device expertise.

Additionally, with the global digitalization of society, information about people, information processes and events is frequently contained in discrete form on electronic media. As a result, there is an urgent need to optimize the collection of evidence in electronic form by converting it into an analog, readable form.

Brazilian researchers E. Oliveira, Jr., T.J. Silva, A.F. Zorzo and C.V. Neu are of the opinion that the process of experimentation in the field of digital forensics should be improved. It is proposed that special attention be paid to its procedural fixation and the ability to exchange data in order to ensure their repeatability. The issue of conducting an experiment in the field of digital forensics is especially important, since its absence puts the reliability and potential of the evolution of science at risk, and consequently, the level of reliability and evidentiary value of electronic evidence in court.[9]

N.P. Mailis notes that the study of digital footprints in Russia receives considerable attention. Different approaches have been developed not only for terminology but

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[7] Urvashi S. Mishra, *Application of Cyber Forensics in Crime Investigation*, Research Paper (2018) (Jan. 3, 2023), available at http://ijrar.com/upload_issue/ijrar_issue_1227.pdf.

[8] Nathan-Ross Adams, *South African Company Law in the Fourth Industrial Revolution: Does Artificial Intelligence Create a Need for Legal Reform?*, LLM dissertation, University of the Western Cape (2021) (Jan. 3, 2023), available at http://dx.doi.org/10.2139/ssrn.4052285.

[9] Ednei Oliveira, Jr. et al., *Digital Forensics Experimentation: Analysis and Recommendations*, 34(1) Forensic Sc. Rev. 21, 40 (2022).

also for the processes of detecting and removing such traces, understanding their nature and determining which category of traces they should be assigned to.[10]

In the Russian scientific literature, it is customary to understand a digital footprint as:

> criminalistically significant computer information about events or actions, reflected in the material environment, in the process of its origin, processing, storage and transmission. Digital traces are characterized by a high speed of transformation, are easily destroyed and modified, can be represented by an almost infinite number of copies, are easily distributed in computer networks and are available at any point where there is a connection to the Internet.[11]

Furthermore, E.R. Rossinskaya and T.A. Saakov note that digital data can be processed by a computer, but cannot always be presented in the form of electrical signals. Thus, the quick response (QR) code, which incorporates standardized coding modes, can be recorded not on an electronic data carrier, but on paper, wood or polymer material. And although the QR code cannot produce any electrical signals, the digital information encoded in it can still be processed by an electronic device.[12]

However, such a controversial issue as the use of digital evidence in courts still remains unresolved. For example, in India, there is a lack of interaction between research institutes, forensic laboratories, investigative bodies and prosecutor's offices. It is emphasized that "law enforcement agencies lack adequate training in collection and use of evidence using cyber forensics."[13]

There is an ongoing debate among the scientific community and the BRICS countries on whether electronic evidence presented in criminal proceedings is admissible as evidence in a criminal case or not. However, the criminal legal system does not always keep up with the pace of technological development, especially in terms of the use of digital technical means.

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[10] *Майлис Н.П.* Роль инновационных технологий в развитии цифровой трасологии // Теория и практика судебной экспертизы. 2022. Т. 17. № 2. С. 19 [Nadezhda P. Mailis, *The Role of Innovative Technologies in the Development of Digital Traceology*, 17(2) Theory & Pract. Forensic Sci. 18, 19 (2022)].

[11] *Россинская Е.Р.* Проблемы использования специальных знаний в судебном исследовании компьютерных преступлений в условиях цифровизации // Вестник Университета им. О.Е. Кутафина. 2019. № 5(57). С. 35 [Elena R. Rossinskaya, *Problems the Use of Special Knowledge for the Judicial Investigation of Computer Crimes in the Conditions of Digitalization*, 5(57) Courier of Kutafin Moscow State Law University (MSAL) 31, 35 (2019)].

[12] *Россинская Е.Р., Сааков Т.А.* Проблемы собирания цифровых следов преступлений из социальных сетей и мессенджеров // Криминалистика: вчера, сегодня, завтра. 2020. № 3(15). С. 111 [Elena R. Rossinskaya & Tigran A. Saakov, *The Problems of Collecting Digital Footprints of Crimes in Social Networks and Messengers*, 3(15) Criminology: Yesterday, Today, Tomorrow 106, 111 (2020)].

[13] Mishra, *supra* note 7.

In terms of electronic evidence, one of the features of the Code of Criminal Procedure of the Russian Federation is that the emphasis is shifted to the information carrier, since the legislator uses the term "electronic information carrier." However, scientists note that the very concept of electronic evidence has a broader meaning than simply "electronic media." This is explained by the fact that the primary aspect of electronic evidence is the information itself, while the medium on which it is contained is of secondary importance.[14]

It is worth noting that investigators, in accordance with paragraph 6, Part 2 of Article 74 of the Russian Code of Criminal Procedure, are permitted to attach emails, messages, screenshots, subscriber connections, video recordings and other information recorded on special media as additional documents to the materials of criminal cases. At the same time, the question of the admissibility of such electronic documents as evidence is of central significance.[15]

Article 474.1 of the Code of Criminal Procedure of the Russian Federation establishes the procedure for the use of electronic documents in criminal proceedings. Participants in criminal proceedings can now submit various procedural documents as well as documents attached to them to the court in electronic form through the official website of the court using an electronic digital signature. Scientists believe that the very provision of this article implies the permissibility of submitting written evidence to the court in the form of an electronic document signed with an electronic signature.[16]

Thus, since the path to electronic document flow in criminal proceedings in Russia has already been opened, the reasonable continuation of the development of criminal procedural legislation should be the formation of an electronic criminal case during the pre-trial stages.

P.K. Shrivastava draws attention to the fact that in India it is necessary to take added special precautions for the identification, collection, preservation and examination of electronic evidence as it can be easily altered, damaged or destroyed as a result of improper handling or inspection.

The author emphasizes that:

> the electronic evidence should essentially satisfy the following conditions:

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[14] *Ким Д.В. и др.* Современные направления развития криминалистических методик и технологий в уголовном судопроизводстве [Dmitry V. Kim et al., *Modern Trends in the Development of Forensic Techniques and Technologies in Criminal Proceedings*] 138 (2020).

[15] *Палиева О.Н., Семенцова И.А.* Использование искусственного интеллекта и информационных технологий в ходе расследования уголовных дел // Вестник Московского университета им. С.Ю. Витте. Серия 2: Юридические науки. 2021. № 2(28). С. 38 [Oksana N. Palieva et al., *The Use of Artificial Intelligence and Information Technology during the Investigation of Criminal Cases*, 2(28) Moscow U. Bull. named after S.Yu. Witte Series 2 Legal Sci. 38 (2021)].

[16] Kim et al. 2020, at 142.

1. It should be produced by a computer which has been used regularly to store or process information for the purposes of any activities regularly carried on over that period by the person having lawful control over the use of the computer;

2. The information derived in the electronic record, was regularly fed into the computer in the ordinary course of activities;

3. The computer was operating properly;

4. The duplicate copy must be a reproduction of the original electronic record.[17]

According to the Indian Evidence Act of 1872, if a document is required to prove a fact, only the original document must be presented in court and not a copy, photograph or any other type of reproduction. Since any reproduction of a press release or document has a lower level of reliability than the original source, which opens up the possibility for fraud or falsification, the original must always be consulted.

Initially, electronic documents, if printed, were treated as secondary evidence in accordance with the strict provisions of the Indian Evidence Act. However, this attitude changed after the adoption of amendments to the Evidence Act in the year 2000:

> Section 65B provides that shall be considered documents, thereby making it primary evidence, if the pc which produced the record had been regularly in use, the knowledge fed into the computer was a part of the regular use of the PC and the PC had been operating properly. It further provides that each one computer output shall be considered as being produced by the pc itself, whether it had been produced directly or indirectly, whether with human intervention or without.[18]

Thus, the information contained in an electronic record is considered to be the original or source of documents, even if it is printed on paper, stored, recorded or copied on computer-generated media, if special conditions are met.[19]

In China, electronic data were not recognized at the legislative level as an independent type of evidence until 2012, despite their appearance in judicial practice. An amendment to the Criminal Procedure Law of the People's Republic of China in 2012 established that electronic data is recognized as an independent type of evidence, that is neither material evidence nor documentary evidence:

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[17] P.K. Shrivastava, *Electronic Evidence in Crime Investigation-Darknet & Policing*, The Indian Police J. 43, 45 (2021).

[18] Nilima Prakash & Roshni Duhan, *Computer Forensic Investigation Process and Judicial Response to the Digital Evidence in India in Light of Rule of Best Evidence*, 8(5) Int'l J. Mgmt. & Soc. Sci. 1, 7 (2020).

[19] *Id.* at 9.

> Article 48 of the Criminal Procedure Law of the People's Republic of China (2012 Amendment) provides that electronic data shall be the eighth category of evidence, separating electronic data from physical evidence, documentary evidence, and audio-visual materials.[20]

After the adoption of this amendment, the Chinese scientific community turned its attention to the prospects for improving the relevant Rules of Obtainment of Electronic Data as Evidence by Public Security Authorities in Handling Criminal Cases (hereinafter, the Rules) for the use of electronic data, including their collection, storage and authentication. As a result, the application of these Rules in relation to electronic data is not possible without a specialist and the technical means used by the specialist.

Up until 2014, it was generally accepted that the collection of electronic data should be carried out by a minimum of two investigators with the relevant expertise. However, in 2016, this specified requirement for the mandatory availability of relevant specialized knowledge was abolished. Nevertheless, according to Article 6 of the Rules, adopted in 2019, the collection of electronic data must be carried out by two or more investigators, and if necessary, a specialist, "professional technician," may be involved at the direction of the investigators.[21]

At the same time, in accordance with the Rules established in China in 2019, investigators have the right to select the most appropriate method of seizure in order to complete the procedural action effectively and reasonably.[22] One should agree with the researchers who argue that

> practical needs and procedural issues are supposed to be taken into consideration before specific technologies are applied in the custody process of electronic data.[23]

In South Africa, even at the draft law stage, the Cybercrimes Act of 2020 provided for a set of procedures specifically designed for the seizure and storage of electronic evidence, as well as technical assistance from electronic service providers, financial institutions and individuals to the investigator in their search and seizure.[24]

In addition to increasing access to justice, electronic justice should also contribute to increasing the level of professionalism of investigators and judges, transparency of

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[20] Fan Yang & Jiao Feng, *Rules of Electronic Data in Criminal Cases in China*, 64 Int'l J. L. Crime & Just. 3 (2021).

[21] *Id.* at 5.

[22] *Id.*

[23] *Id.* at 6.

[24] Eveshnie Reddy, *Analysing the Investigation and Prosecution of Cryptocurrency Crime as Provided for by the South African Cybercrimes Bill*, 41(2) Statute L. Rev. 226 (2020).

the criminal process, as well as increasing the level of efficiency, economy and public confidence in the judicial system as a whole. That is why it is extremely important to review the current rules governing the use of electronic data in criminal proceedings to ensure that they meet the modern requirements imposed by the legal systems of each of the BRICS member countries as well as society as a whole.

2. Videoconferencing Technologies and Criminal Proceedings

Another priority area for the use of digital technology in criminal proceedings is the introduction of videoconferencing, the large-scale adoption of which is directly related to the onset of the COVID-19 pandemic in 2020. During this period, there was a pressing need to create conditions that would allow for remote work. Courts around the world were forced to respond quickly to the problems associated with the need to ensure social distancing in the context of the pandemic. The rapid transition from traditional to online procedures helped citizens gain access to the justice system even during the period of the established restrictions.

In Brazil, the problem of participation in court sessions via videoconference is still not fully resolved. In 2020, virtual hearings were held in the first instance in criminal cases and were regulated by Resolution 329 of the National Council of Justice. In addition, the application process has already been fully digitized in all Brazilian courts, with this being mandatory in higher courts.

Nonetheless, researchers continue to wonder whether the use of videoconferencing will not worsen the problems already existing in Brazil, namely the lack of universal education, a lack of resources, access to lawyers, etc. In this way, several virtual hearings were appealed, as detrimental to the right to a fair trial, on the grounds that

> Article 3(1) of Resolution 329 establishes that virtual hearings will not take place if any of the parties involved declare a "technical or instrumental impossibility" of participation.[25]

In this regard, the Brazilian Bar Association petitioned the National Council of Justice, demanding that virtual hearings be held only on a voluntary basis, subject to the consent of all parties.

The practice of using individual programs and messengers as an audiovisual contact during court sessions is interesting. In Russia, in 2020, the Nevyansky City Court of the Sverdlovsk Region began using the WhatsApp messenger in its hearings, and by the end of 2021, amendments were made to the Criminal Procedure Code of

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[25] Octávio L.M. Ferraz et al., *Brazil: Legal Response to COVID-19*, in Jeff King & Octávio L.M. Ferraz et al. (eds.), The Oxford Compendium of National Legal Responses to COVID-19 9 (2021).

the Russian Federation, according to which it is now possible to use videoconferencing both at the stage of judicial proceedings as well as the preliminary investigation during such investigative actions as interrogation, confrontation and presentation of identification.[26]

In India, during the spread of COVID-19, "important issues" were heard in the Supreme Court via videoconference.[27] The use of videoconferencing, which was implemented to reduce the risk of COVID-19 spreading in court, helped reduce the attendance of courthouses and, as a result, contributed to the subsequent transition to virtual courts. Indian researchers believe that "within a couple of years, a well-established system of virtual vessels will appear in India."[28] It is noted that it is more difficult to organize the provision of judicial services online than a videoconference, given the large number of nuances associated with the process of introducing digital technologies into the field of legal proceedings.[29]

In *Twentieth Century Fox Films Corporation v. NRI Film Production Association (Pvt) Ltd.*, the Court pointed out the conditions that must be met in order to confirm the authenticity of the video conference:

> i) Before a witness is examined in terms of the audio-video with as is to file an affidavit duly verified before a notary or a judge that the person who is shown as the witness is the same person who is about to depose on the screen. A copy is to be made available to the opposite side.
>
> ii) The person who examines the witness on the screen is also supposed to file on undertaking before examination along with a copy to the opposite counsel/party with regard to identification.
>
> iii) The witness has to be examined during working hours of Indian court and oath is to be administered through the media.
>
> iv) The witness should not plead any innocence on account of time difference between Indian and United States of America.
>
> v) The learned judge is to record such remarks as is material regarding the demeanour of the witness on the screen.
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> vi) Before examination of the witness, a set of plaint, written statement and other documents must be sent so that the witness becomes acquainted

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[26] *Дударев В.А.* Пандемия COVID-19 как катализатор цифровизации российского уголовного судопроизводства // Уголовная юстиция. 2021. № 17. С. 40 [Vitaly A. Dudarev, *COVID-19 Pandemic as a Catalyst for Digitalization of Russian Criminal Justice*, 17 Russ. J. Crim. L. 39, 40 (2021)].

[27] Tania Sourdin et al., *Court Innovations and Access to Justice in Times of Crisis*, 9(4) Health Pol'y & Tech. 447 (2020).

[28] Anku Anand, *Virtual Courts: The Changing Face of Indian Judicial System*, SSRN Electronic J. (2021) (Jan. 3, 2023), available at https://doi.org/10.2139/ssrn.3865629.

[29] *Id.*

with the document and an acknowledgement is to filed before the court in this regard.[30]

In China, court sessions have been held using the Internet since the early 2000s, and their progress has been recorded using technical means, such as audio and video recording. According to researchers, the first full-fledged hearing held via videoconference in China took place in 2007 in a criminal case related to a theft in Shanghai.[31] The most advanced courts in the Chinese legal system have evolved into specialized Internet courts, created to quickly and cost-effectively resolve the rapidly growing number of disputes on the Internet. The first Internet court was established in Hangzhou in 2017, and in 2018 two more were established in Beijing and Guangzhou.

> The Internet courts are the first courts in China where the entire litigation process can be conducted online, including filing and service of documents, collection and presentation of evidence, preservation of assets, the trial, judgment, enforcement, appeal and other processes. The Internet Courts have integrated mechanisms and network solutions to build a multi-level, diversified online dispute resolution system, which includes pre-trial mediation before initiating the litigation process. The online trial uses a videoconferencing system. Any parts of the proceedings can be conducted offline upon the request of the parties involved or the needs of the trial.[32]

One of the main technological subjects in the "informatization" of Chinese ships is the company "Xinshiyun," which specializes in cloud computing technologies and related services, including live streaming of court sessions and video recording. Thus, the company possesses the largest video storage facility for court trials in the country.[33]

It is worth noting that there are several circumstances in which a live or recorded broadcasts of hearings are prohibited. These include

> the explicit objection of disputing parties in civil and administrative cases, the explicit objection of the procuratorate in criminal cases and cases involving national secrets, commercial secrets, young offenders etc.[34]

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30 Prakash & Duhan 2020, at 7–8.

31 Shi et al. 2021, at 7.

32 Zou, *supra* note 5.

33 Shi et al. 2021, at 18.

34 *Id.*

In South Africa, in 2020, in an effort to reduce the risks associated with the spread of COVID-19, the chairmen of the courts were given the right to decide at their discretion the format in which the hearing of their cases would be held. Thus, the hearing of the case could be held virtually, subject to the previously existing guarantees regarding virtual or absentee proceedings specified in the Criminal Procedure Act of 1977 of South Africa. A cloud-based collaboration solution was also implemented in the Supreme Courts of South Africa, which enabled the parties to file their objections electronically.[35] Nevertheless, despite the measures taken to ensure citizens' access to justice, there were concerns that there might be problems; for instance,

> there have been reports expressing concern that access to justice may be compromised by teething problems in conducting hearings via video conferencing, especially given uneven access to technological resources in remote areas.[36]

One of the primary advantages of using videoconferencing in criminal proceedings is that it increases the level of citizens' access to justice as a result of reducing time and financial costs, since participants in the process do not have to spend time and money travelling to and from court, particularly in cases where the parties reside in another city. Furthermore, the use of videoconferencing is considered justified if a participant in an ongoing investigative action cannot personally participate in it for such objective reasons as

> being in a different locality, in correctional institutions, in medical institutions where even a short-term violation of the regime prescribed by a doctor is impossible (for example, connected to medical equipment, a serious health condition, quarantine measures), compliance by a citizen with the regime of self-isolation and quarantine in a pandemic, etc.[37]

Additionally, the use of videoconferencing technology makes it possible to ensure the safety of participants in the criminal process. In cases where it is necessary to keep the identity of a participant in criminal proceedings confidential so as to prevent the participant from being recognized, then in the process of conducting such investigative actions as a confrontation or interrogation, as well as a court

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35 Sourdin et al. 2020.

36 Petronell Kruger et al., *South Africa: Legal Response to Covid-19*, in Jeff King & Octávio L.M. Ferraz et al. (eds.), The Oxford Compendium of National Legal Responses to COVID-19 10 (2021).

37 *Буфетова М.Ш., Кобзарь Д.Н.* Применение систем видеоконференц-связи в уголовном судопроизводстве: перспектива изменения законодательства // Адвокатская практика. 2021. № 1. С. 17 [Maryam Sh. Bufetova & Dmitry N. Kobzar, *The Application of Video Conferencing in Criminal Proceedings: Prospects of Legal Changes*, 1 Law Prac. 14, 17 (2021)].

session, video conferencing that allows for the possibility of changing appearance and voice can be used. The use of videoconferencing in this manner allows for the avoidance of any physical or mental impact on witnesses or victims, thereby reducing the likelihood of their refusal to participate in the process.[38]

All of these factors working together lead to an increase in the reliability of testimony since participants safety concerns diminish and the honesty and frankness of their testimony increases.[39]

Nonetheless, despite these advantages, a number of issues related to technical equipment may arise in the criminal process. For example, participants should have the necessary technical resources in order to be able to hear and see the progress of an investigative action or a court session, as well as to connect at the right time to the process of their conduct. In addition, power outages, poor image quality and sound distortion, load from network users, poor Internet connection quality, etc. may lead to the results of the investigative action being deemed unacceptable or to the postponement of the court session.

The reliability and acceptability of the results of the hearing are thus directly related to the quality of image and sound, protection from external interference in the videoconferencing process, as well as the security of obtaining and preserving personal data. To solve these problems, it is necessary to allocate significant funds for the purchase of special equipment as well as to create specialized software to organize a secure videoconferencing session.

3. Application of Artificial Intelligence Technologies in Criminal Proceedings

To date, scientists believe that the main and most realistic way to use artificial intelligence technologies in criminal proceedings is to use them only as an auxiliary tool to assist in the work of the investigators, judges and other participants in criminal proceedings in order to increase the efficiency of their activities and reduce subjective errors to a minimum. This option is already firmly established in criminal procedure practice and will continue to remain widely prevalent for the foreseeable future.[40]

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[38] *Силантьева И.Р.* Проблемы и перспективы использования систем видеоконференц-связи в процессе правореализации // Вектор науки Тольяттинского государственного университета. 2013. № 1(23). С. 248 [Inessa R. Silantieva, *Problems and Prospects of Use of Systems of a Video Conferencing in the Process of Right Realization*, 1(23) Science Vector of Togliatti State University 245, 248 (2013)].

[39] *Жайворонок Д.А., Бокова О.И.* Проблемы организации видеоконференц-связи в суде // Вестник Воронежского института высоких технологий. 2021. № 2. С. 41 [Denis A. Zhaivoronok & Oksana I. Bokova, *Problems of Video Organization in Court*, 2 Bulletin of the Voronezh Institute of High Technologies 40, 41 (2021)].

[40] *Соломатина А.Г.* Допустимость использования искусственного интеллекта в уголовном судопроизводстве // Вестник Московского университета МВД России. 2020. № 3. С. 97–99 [Anna G. Solomatina, *Admissibility of the Use of Artificial Intelligence in Criminal Proceedings*, 3 Bulletin of the Moscow University of the Ministry of Internal Affairs of Russia 97 (2020)].

When examining the problems surrounding the permissibility of using the capabilities of artificial intelligence in the investigation, researchers from both Russia and other countries have pointed to the prospects[41] and increasing introduction of these technologies into investigative activities,[42] despite the possible difficulties in the assessment and admissibility of certain types of evidence in the future. This state of affairs is connected with the increasing volume of data subject to analysis (videos and images, information about telephone calls of subscribers, the content of content posted on social networks, etc.) and has the potential to significantly alter the investigative situation, reduce the time spent by the investigator (inquirer) and make the conduct of an investigative or other procedural action more effective.[43]

It should be noted that currently, artificial intelligence systems are not used in the production of investigative actions "in their purest form."

In Brazil, an experiment was conducted that was aimed at solving problems with the help of artificial intelligence related to the growing workload due to the large number of criminal cases opting for pre-trial detention. One of the objectives of the experiment was to investigate the possibility of artificial intelligence making a decision to release a prisoner in accordance with the decision on pre-trial detention. At the same time, the researchers emphasized that the experiment was in the nature of creating a model based on previous court decisions and not on their automatic issuance, since such decisions would typically be made by a human judge after an assessment. As a result, the researchers obtained satisfactory results on this question. The authors of the study believe that

> in terms of application, while the classification results can speed up the judgment, for example, when the period of pre-trial detention has already expired, the association results can identify patterns in judgments and thus reduce biases.[44]

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41 *Бахтеев Д.В.* Искусственный интеллект в следственной деятельности: задачи и проблемы // Российский следователь. 2020. № 9. С. 3–6 [Dmitry V. Bakhteev, 9 *Artificial Intelligence in Investigative Activities: Tasks and Problems*, Russ. Investigator 3 (2020)].

42 Xiaoyu Du et al., *SoK: Exploring the State of the Art and the Future Potential of Artificial Intelligence in Digital Forensic Investigation*, Proceedings of the 15th International Conference on Availability, Reliability and Security 1 (2020).

43 *Русман Г.С., Смолин М.С.* Возможности использования искусственного интеллекта при производстве следственных и иных процессуальных действий // Использование искусственного интеллекта при выявлении, раскрытии, расследовании преступлений и рассмотрении уголовных дел в суде / под ред. С.В. Зуева, Д.В. Бахтеева [Galina S. Rusman & Mikhail S. Smolin, *The Possibility of Using Artificial Intelligence in the Production of Investigative and Other Procedural Actions*, in Sergey V. Zuev & Dmitry V. Bakhteev (eds.), The Use of Artificial Intelligence in the Detection, Disclosure, Investigation of Crimes and Consideration of Criminal Cases in Court] 84 (2022).

44 Thiago R. Dal Pont et al., *Classification and Association Rules in Brazilian Supreme Court Judgments on Pretrial Detention*, 10th International Conference on Electronic Government and the Information Systems Perspective (2021) (Jan. 3, 2023), available at http://dx.doi.org/10.1007/978-3-030-86611-2_10.

Furthermore, in Brazil, the Prosecutor's Office of the State of Rio Grande do Norte (MPRN), in collaboration with the Federal University of Rio Grande do Norte (UFRN), developed the platform INSIDE (Integration, aNalySis, vIsualization of Data for invEstigation). This platform was conceived to process big data and speed up the procedures for their research, which in and of itself is a very time-consuming process.

> As a result of this paper, we can conclude that the proposed architecture is a viable option as a system to help the analysis of digital evidences. The architecture ability of reading, processing, and classifying large amounts of images, with agility and precision, allowing the forensic analyst to have an easier and faster process in the analysis of these digital evidences.[45]

In the Russian Federation, the use of artificial intelligence is most pronounced in the work of criminologists. As a result, in order to conduct a preliminary analysis in the course of an expert study of handwriting, a neural network was created at the Ural State Law University. This neural network was trained on the basis of handwriting samples and is capable of analyzing 480 parameters that are inaccessible to a human expert. As a result, the system is able to identify, with a high degree of accuracy, the signs that differentiate between genuine and forged signatures, as well as the private and general signs that characterize the person who executed them.[46]

Moreover, in Russia, artificial intelligence technologies are also used in the system of forensic registration of internal affairs bodies, in particular, forensic accounting is being developed in the country.[47]

As a rule, one of the advantages of using artificial intelligence in criminal proceedings is the possibility of the system making decisions in lieu of a judge. In support of this judgment, it is argued that the technology in question cannot be negatively influenced by emotions on decision-making and instead is able to adhere to the norms established by law. This can help reduce the likelihood of corrupt actions and decisions. Additionally, it is impossible not to mention the fact that artificial intelligence is able to process incomparably larger amounts of data and operate them significantly faster compared with the cognitive abilities of a human judge. Artificial intelligence makes decisions based on the analysis of a variety of

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[45] Iaslan Silva et al., *Using Micro-Services and Artificial Intelligence to Analyze Images in Criminal Evidences*, 37 Forensic Sci. Int'l: Digital Investigation 301197, 301205 (2021).

[46] *Ушаков Р.М.* Технология Big Data как вектор развития криминалистической техники: перспективы применения в контексте их правомерности // Уральский журнал правовых исследований. 2020. № 2(9). С. 65 [Ruslan M. Ushakov, *Big Data Technology as a Direction of Development of Criminalistic Technique: Prospects for Application in the Context of their Lawfulness*, 2(9) Ural J. Legal Res. 54, 65 (2020)].

[47] Kim et al. 2020, at 14, 161.

data, in particular information characterizing the participants in the case. These advantages can be crucial when working with data from the repositories of public services, including criminal cases that have remained undisclosed for a long time for one reason or another, as well as when working with the archives of court cases and reference legal systems.[48]

However, there is also a significant drawback to the use of artificial intelligence, which, according to A.V. Kholopov, practically excludes the use of artificial intelligence in criminal proceedings. The process and logic of decision-making developed by artificial intelligence, as well as their objectivity and impartiality, cannot be rechecked, and therefore, it is impossible to implement the verification principle.[49]

As an example, we can cite the computer program "Laser," which was created to save time and improve the accuracy of the work of judges as well as help them in making decisions and sentencing. After the judge enters certain data from the materials of the criminal case into the program, the program issues a draft reasoned decision. However, "many judges do not see the point in its application because of a possible violation of the principles of criminal procedure."[50]

India also pays special attention to the development of artificial intelligence technologies aimed at collecting criminally significant information. A number of cities in India use facial recognition technology via a network of closed circuit television (CCTV) cameras to identify and track criminals. For example, in 2020, the Delhi police used artificial intelligence, along with other digital technical means, during the investigation of 755 cases of violence in Northeast Delhi. The criminals were arrested as a result of 945 recordings obtained from surveillance cameras and videos from smartphones that were analyzed using artificial intelligence capable of recognizing faces.[51]

In China, artificial intelligence, being one of the leading trends in the development of criminal justice, has found its application in electronic justice, for example, as part of the 'Smart Courts' system as well as a separate tool aimed at improving the efficiency of investigative actions.

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[48] *Воскобитова Л.А.* Уголовное судопроизводство и цифровые технологии: проблемы совместимости // Lex Russica. 2019. № 5(150). С. 91–104 [Lydia A. Voskobitova, *Criminal Justice and Digital Technology: Compatibility Issue*, 5(150) Lex Russica 91 (2019)].

[49] *Холопов А.В.* Человек в условиях цифровизации права: проблемы и пути развития // Юридическая наука. 2020. №. 6. С. 10 [Alexey V. Kholopov, *A Person in the Conditions of Digitalization of Law: Problems and Ways of Development*, 6 Legal Sci. 8, 10 (2020)].

[50] *Степанов О.А., Басангов Д.А.* О перспективах влияния искусственного интеллекта на судопроизводство // Вестник Томского государственного университета. 2022. № 475. С. 232 [Oleg A. Stepanov & Denis A. Basangov, *On the Prospects for the Impact of Artificial Intelligence on Judicial Proceedings*, 475 Tomsk St. Univ. J. 229, 232 (2022)].

[51] Dr. O. Gambhir Singh, *Artificial Intelligence in Forensics & Criminal Investigation in Indian Perspective*, 7(8) Int'l J. Innovative Sci. & Res. Tech. (IJISRT) 142, 144 (2022).

Tools that are based on artificial intelligence can assist judges in making decisions, provide the parties with legal reference information, as well as scan and accept case materials in electronic form and compile and form procedural documents for the participating parties. This use of artificial intelligence significantly accelerates the presentation and classification of evidence, as well as the transfer of case materials between courts of different instances.[52]

To prevent possible contradictions that may arise as a result of the use of artificial intelligence technologies, scientists from China propose introducing a state policy aimed at prohibiting the use of artificial intelligence in the role of a judge. Such restrictions are related to the fact that the use of artificial intelligence can influence judges and make them hesitant to state in detail their position on the decision being made in the case. As a result, decisions made without the participation of a human judge may be unclear and difficult for the rest of the participants in the criminal process to understand.[53]

In addition to courtroom proceedings, artificial intelligence has found other applications, for instance, as a camera system aimed at recognizing faces for the subsequent arrest of suspects. Thus, the "Tian Yan" camera system, after an identity has been identified, can provide personal information, such as a name and a national identity card, using databases of police departments and state archives.[54]

Thanks to the 3.0 System, it became possible to automatically determine the importance of the content of evidence and create preliminary "chains of evidence" in criminal cases. These "chains" form the basis of investigative versions and are available for further correction by the investigator. This helps investigators determine the completeness of the investigation and judicial officers estimate the sufficiency of the sentence.[55]

Thus, participants in criminal proceedings should not rely solely on the results obtained through the use of such a useful tool as artificial intelligence technology. Unfortunately, the criminal procedure legislation cannot keep up with the rapid pace of technological progress and its incorporation into everyday life. This, in turn, causes serious gaps in the regulation of the permissibility of the use of digital technologies. That is why the advantages of using artificial intelligence in criminal proceedings, such as increasing the accuracy and speed of work, objectivity and reliability of evidence, should encourage scientists and legislators in the BRICS countries to clearly address the existing gaps in the system.

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52 Zou, *supra* note 5.

53 Shi et al. 2021, at 10.

54 Nyu Wang & Michael Y. Tian, '*Intelligent Justice': AI Implementations in China's Legal Systems*, in Artificial Intelligence and its Discontents 202 (2022).

55 *Id.* at 208.

4. 3D Technologies in Criminal Proceedings

With regard to the issue of the use of technical means in criminal proceedings, particular attention is paid to the possibility of using various 3D technologies.

Researchers from Brazil reported on the successful implementation of forensic approximation (reconstruction) of a face based on photogrammetry. As a result, the visual representation of an appearance recreated in the virtual environment led to a successful identification.

> The methodology employed in the collection contemplated taking 22 digital photographs at a resolution of 300 ppi (pixels per inch) stored in JPG format with a high-quality factor, portraying the skull from several angles, totaling 360°. This process was repeated in two distinct positions, enabling the generation of a model that included all sides of the photographed piece. The images were then copied to the hard disks of the computers, without any modification, so that they could be processed in accordance with the examination needs.[56]

The appearance, which was recreated with the help of special software, was then adapted and modeled in 3D format. The resulting face was superimposed on the skull and its soft tissue markers, taking into account anatomical features, similar to how it would be done in a manual technique. On the basis of this information, the researchers came to the conclusion that such an approximation of a face, while not the predominant method of identifying a person, may be employed to identify a person. However, it is noted that although 3D facial reconstruction is widely researched and distributed in scientific circles, its use in criminal proceedings is extremely rare.

Russian scientists also believe that the use of a 3D scanner can significantly improve the quality and quantity of evidentiary information obtained, which can then be used during situational examinations, thereby allowing for the reconstruction of an event in conjunction with the actions of the criminal and the mechanisms of the incident event.[57]

The authors of this article conducted an experimental examination of the type of scene mentioned above using a software sample that creates a virtual copy by processing the results of a spherical panoramic survey conducted indoors from five different shooting points. The specified software sample combines spherical photography technologies and virtual reality. Such 3D modeling of the scene of the

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[56] Rosane P. Baldasso et al., *3D Forensic Facial Approximation: Implementation Protocol in a Forensic Activity*, 66(1) J. Forensic Sci. 383, 384 (2021).

[57] Mailis 2022, at 20.

incident will contribute to increasing the level of detail, clarity and reliability of the presentation in the field of criminal proceedings and also:

> will solve a number of problems that arise during the examination the crime scene and further use of its results. These problems include: the incomplete view of the space during photographing, the variability of examination conditions due to objective and subjective factors, the insufficient reliability of the results of the examination the crime scene and the impossibility of reexamination the crime scene due to distortion of the situation.[58]

Researchers from South Africa conducted a large-scale systematic study of the literature, in which they analyzed research trends in the field of 3D reconstruction of the crime scene, as well as the tools, technologies, methods and techniques used in it over the last 17 years. However, as these researchers also point out, although 3D reconstruction of crime scenes has already been studied as an additional tool in the investigation process, such technology has not yet been widely used nor is it actively implemented in the regular operations of law enforcement agencies and courts, including in South Africa itself.[59]

Researchers from India also evaluated the knowledge and practical application of 3D scanning and 3D printing by criminologists. However, their results allowed them to conclude that these digital technologies are used only by researchers in a select number of laboratories and that knowledge about such technologies is limited among practicing criminologists in India.

> On assessing the knowledge regarding 3D scanning and printing technology, it was observed that, while the practitioners are aware of the technology, they had limited expertise because their primary source of information was either the internet or research publications.[60]

Therefore, the researchers propose to draw the attention of criminologists throughout India as well as the legal system of the state, to the importance of using these technologies in practice, which is especially important, since the researchers are confident that 3D printed models will become an integral tool for comparative identification of unidentified corpses. In addition, fired bullets can be scanned and

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[58] Galina Rusman & Elizaveta Popova, *Development of the Software for Examination of the Crime Scene by Using Virtual Reality, Based on Spherical Panoramic Shot and 3D-Scanning*, 2020 Global Smart Industry Conference (GloSIC) 297 (2020).

[59] Mfundo A. Maneli & Omowunmi E. Isafiade, *3D Forensic Crime Scene Reconstruction Involving Immersive Technology: A Systematic Literature Review*, 10 IEEE Access 88821, 88849 (2022).

[60] Abraham Johnson et al., *Application of 3D Scanning and 3D Printing in Forensic Practices – A Preliminary Survey among Forensic Practitioners in India*, 28 Forensic Imaging 200498 (2022).

printed in 3D format for subsequent comparison of the degree of deformation with analogues.[61]

In China, special attention is paid to forensic imaging, namely 3D technology such as virtual autopsy (otherwise known as "virtopsy"). Virtual autopsy

> is a noninvasive or minimally invasive approach to autopsy that uses modern medical imaging and computer technologies, together with anatomical principles and technical adjuncts, to obtain both internal and external positive information and to ascertain the cause of death without causing damage – or at least mitigating damage – to the body.[62]

Virtopsy uses digital radiological methods to scan corpses and obtain their images in 3D format. This method meets the requirements of objectivity and repeatability in addition to being non-invasive. The resulting images are objective and independent of viewing at any time after the scan is completed, and therefore, they can either complement or become an alternative to traditional surgical autopsies. According to M. Zhang, such non-destructive 3D scanning can reveal damage as compared to the traditional way that can destroy or accidentally damage a part:

> For example, in forensic ballistics, it is important to find out the bullet path in victims, forensic imaging is definitely a fantastic method to investigate the original trajectory instead of destructively dissect the paths.[63]

Later, when the results of such a virtual autopsy are presented as evidence at a court hearing, all of the participants in the criminal process will be able to intuitively understand and easily perceive them.[64]

As a result of such advantages as three-dimensional visualization and the high accuracy and speed of the results obtained, the quality of perception and visibility of the materials presented to the participants in the criminal process increases. All of these factors together lead to an increase in the efficiency of law enforcement agencies and contribute to fair sentencing in the courts.

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61 Gargi Jani et al., *Three-Dimensional (3D) Printing in Forensic Science – An Emerging Technology in India*, 1 Annals of 3D Printed Med. 1, 5–6 (2021).

62 Ligang Tang et al., *Application of Virtopsy in the Police Activities in China*, 7(1) J. Forensic Sci. & Med. 24 (2021).

63 Min Zhang, *Forensic Imaging: A Powerful Tool in Modern Forensic Investigation*, 7(3) Forensic Sci. Res. 385 (2022).

64 *Id*.

Conclusion

Currently, legislators in the BRICS member countries, including the Russian Federation, have not yet enacted any specific regulations regarding the potential of applying the results and findings of the use of digital technical means in criminal proceedings. At the same time, legal regulation is especially important in connection with the emergence of completely new technologies as well as the obsolescence of existing technologies and their replacement.

Scientists from each of the BRICS member countries have repeatedly emphasized the lack of a legal framework as the main problem faced by investigators and courts. Criminal proceedings are a highly formalized type of process due to the nature of coercion that they involve. Untimely amendments to the legislation lead to the appearance of significant gaps, which may consequently result in the failure to establish the circumstances of the criminal case. In order to ensure a fair trial, it is necessary to adapt to the latest realities of our time, namely, to introduce digital technologies and timely create the necessary regulatory framework aimed both at combating cybercrimes that are spreading today and at protecting the rights of individuals involved in criminal proceedings.

The researchers pay special attention to the conditions governing the use of the latest digital technical means in criminal proceedings, since their use entails new challenges for the legislative and judicial authorities. It is widely believed that even the most advanced technologies will never be able to replace a highly qualified lawyer. This applies, first and foremost, to the use of artificial intelligence and further evaluation of the results of its work.

The dominant place among the recent trends in the development of criminal proceedings in the BRICS member countries is occupied by the use of electronic evidence in proving cases. The advantages of using digital technology in the criminal proceedings of the BRICS countries include an emphasis on the introduction of electronic justice and the use of electronic data, which opens up new prospects for the further improvement of both the regulatory and theoretical frameworks.

In turn, the expanding introduction of videoconferencing, especially during the preliminary investigation, necessitates amendments to the criminal procedure legislation. In other words, it requires regulating the procedural process for the use of technology and subsequent consolidation of the results of such investigative actions. This is necessary in order to provide an opportunity to use the results of the use of videoconferencing in establishing proof and to ensure their compliance with the criteria of admissibility and reliability of evidence.

At the same time, it is necessary to pay due attention to problems such as the lack of specialized bodies, the insufficient level of qualification of investigators and specialists, as well as the vagueness of wording in the criminal law legislation of all the BRICS member countries and the provisions of relevant regulations. In order for

participants to be able to adapt to the rapidly changing global trends, they need to have an understanding of the modern technologies that are capable of radically changing the law, improving it, and thereby increasing its overall effectiveness with the help of modern digital technical means. To accomplish this, it is necessary to involve experts from a variety of fields to understand the nuances of each of these technologies, as well as to train law enforcement officers and courts; for example, in the field of 3D technologies, in order to promote their dissemination and implementation in practice.

Thus, the prospects for further development of criminal proceedings based on the use of advanced digital technologies depend on the results of their application being permissible and not violating the rights of the individual involved in criminal proceedings. It is necessary that the introduction and use of such technologies at any stage of the criminal process comply with the criminal procedure legislation so as to ensure maximum objectivity of criminal procedural activities as well as procedural efficiency and efficacy.

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