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# Legal and theoretical foundations of the digitalisation of crime investigation

**Abstract.** With the rapid advancement of information technology and digitalization of society comes an ever-increasing emphasis on understanding its legal and theoretical foundations in crime investigation, specifically regarding digitalisation of crime investigation. This study is dedicated to an in-depth exploration of this topic from both legal and theoretical angles that cover its application within criminal proceedings.

Scientific research serves the dual purposes of evaluating existing legislation and theoretical approaches regarding digitalisation of crime investigation processes as well as identifying problems and suggesting ways to resolve them. Our primary areas of work involve studying legal norms regulating use of digital technologies in criminal procedure and forensics investigations as well as theoretical models of investigation.

Scientific and practical significance of this work lies in its in-depth examination of how legal norms interact with technological capabilities for crime investigation purposes. Research methods employed include legislation analysis, scientific literature reviews and real case examples as well as expert interviews.

The main findings of this paper demonstrate that digitalization of crime investigation requires not only technological innovations but also appropriate legal regulations and theoretical justification of methods and approaches. Furthermore, conclusions were drawn regarding further development of legal frameworks and theoretical concepts within this realm.

**Keywords:** digitalisation, digitalisation of investigation, crime investigation, innovations in criminal process, criminal process, cyber forensics.

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## Introduction

As information technology increasingly penetrates all spheres of life, digitalisation of crime investigation has become both trendy and necessary in modern life. Due to rapid technology development impacting law enforcement practices and significant research conducted within cyber forensics fields, digitalisation remains a hot topic despite extensive solutions being explored and attempted for legal/theoretical aspects.

In the Address by Kassym-Jomart Tokayev to the people of Kazakhstan "Kazakhstan in a New Reality: Time for Action" the Head of State noted that "lawfulness and justice should be

ensured by default. It should be remembered that people's fates depend on mistakes in criminal cases. It is important to ensure the stability of criminal and criminal procedural legislation... The criminal sphere should be modernised along the lines of developed OECD countries. We need a model that ensures timely protection of citizens' rights and meets high international standards" [1].

This article covers the digitalisation of crime investigation, with legal and theoretical framework serving as its focus. The goal is to analyse existing legal norms and theoretical approaches within this domain in order to identify problematic aspects, propose their removal and propose possible remedies. Toward that goal, three tasks were set: studying current legislation; reviewing scientific works related to digitalization in crime investigations; as well as using comparative and analytic methods in order to measure effectiveness of existing practices.

This study proposes the hypothesis that strengthening legal and theoretical foundations for digitalisation of crime investigation leads to improved efficiency and fairness in law enforcement, thus contributing to its efficacy and fairness. Of significance is its comprehensive examination of current legal/theoretical bases related to digitalisation investigations - providing a basis for further study as well as practical implementation within this arena.

As global trends and Kazakhstani state aspirations towards digitalisation continue, issues related to legal and theoretical foundations of crime investigation by using modern technologies are of increasing significance. Although significant progress has been achieved through cyber forensic research efforts in Kazakhstan, several aspects regarding modernizing criminal justice remain open questions.

The significance of this work lies in its comprehensive examination of legal and theoretical aspects related to digitalisation of investigations in Kazakhstan, making a substantial contribution towards strengthening Kazakhstan's legal system while acting as a basis for further study in this area.

## Research methodology

This study draws upon analysis of an extensive collection of materials, encompassing legal acts from Kazakhstan as well as international documents; scientific publications in law, forensics and IT; reports and analytical data regarding crime investigations using digital technologies; as well as reports and analytical data regarding investigations using these technologies for crime-fighting purposes. Qualitatively the materials include legal acts and international documents while quantitatively they consist mainly of scientific papers as well as legal acts.

As part of their investigation of this topic, this research used various research methodologies: document analysis, comparative analysis, qualitative analysis and expert interviews.

Analysing legal documents requires studying and interpreting legislation and regulations related to digitalisation investigations. As part of the research, comparative analysis methods were utilized. This involved comparing Kazakh legislation with international standards and practices related to digitalisation of investigations.

As part of our investigation, qualitative research analysis techniques were employed as well, such as content analysis methods to review scientific publications, reports and expert opinions. As part of my study of this research topic, the method of expert interviewing was of particular relevance; this involves conducting interviews with professionals from law and cybersecurity fields so as to gain an in-depth knowledge about current challenges and perspectives within digitalisation of investigations.

Research involves employing cutting-edge approaches for data analysis, such as using software to process large volumes of textual information. This allows a deeper investigation of legal and theoretical aspects as well as ensures the novelty and significance of research approaches and results.

Triangulating data sources and methods is used to ensure the objectivity and validity of study findings, providing multiple sources and means for analysing them simultaneously. Results are then verified against existing research papers and practical data in order to validate and substantiate them.

#### Discussion and results

Modern world development can be broadly summarized as being marked by widespread application of information technologies to all areas of society - with our country no exception to that rule.

Modern technological innovations and digital innovations are having an ever-increasing effect on many aspects of society, including the judiciary. Digitising criminal proceedings is one area of development within legal systems which has shown great promise to improve efficiency, accessibility and speed of justice delivery - particularly through digitalisation of proceedings. Recently digital technologies have been actively implemented into criminal proceedings processes providing new perspectives while altering traditional ways of working of courts and legal systems.

Due to advances in information technology and Internet usage, digital tools for use in criminal proceedings have greatly expanded over time. Electronic documents, videoconferencing services and other digital applications have become ever more widely utilized by judges; we will explore what digitalisation of criminal proceedings might entail as well as its effect on justice processes in this article.

Modern scientific and technical solutions in criminal proceedings is nothing new, yet digitalisation remains one of the primary focus areas. Digitalization already impacts many aspects of life; thus it should come as no surprise that its effects will also inevitably extend into criminal proceedings with already visible effects being felt today.

An important boost was provided in terms of digitalisation of state operations by first President of Kazakhstan address dated 31 January 2017 entitled, 'Third Modernisation of Kazakhstan - Global Competitiveness". Implementation of the Address involved adopting the state program "Digital Kazakhstan". The primary objectives were to accelerate economic development while improving life quality in Kazakhstan. Concerned with improving population life quality, the Ministry of Internal Affairs is engaged in extensive work to integrate information technologies into everyday activities. First and foremost, digitalisation has reduced contact between citizens and government services as a whole, reduced administrative and corruption barriers to procuring public services, and expanded criminal cases investigated electronically [2].

On 11 December 2017 and again 15 February 2018 respectively, President of Kazakhstan signed into law an act which introduced amendments and additions to various laws concerning modernisation of procedural foundation of law enforcement agencies. This is the Law of the Republic of Kazakhstan dated 21 December 2017 No. 118-VI "On Amendments and Additions to Certain Legislative Acts of the Republic of Kazakhstan on Modernisation of Procedural Basis of Law Enforcement" [3], providing first time ever access for digital criminal proceedings as an equal alternative for traditional paper format proceedings.

Under Kazakhstan's Strategic Development Plan to 2025 No 636 issued 15 February 2018, authorising "On approval of the National Development Plan of the Republic of Kazakhstan until 2025 and invalidation of some decrees of the President of the Republic of Kazakhstan" [4], approved by its president, law enforcement and judicial bodies must gradually convert criminal cases to electronic format.

The developed module "Electronic Criminal Case" utilizes the infrastructure of the information system "Unified Register of Pre-Trial Investigations". It covers all stages of criminal proceedings from recording criminal violations up until sentence execution.

As per Kazakhstan's Criminal Procedural Code, anyone charged with conducting criminal proceedings has the authority to handle their cases digitally, provided an appropriate reasoned decision exists that supports such conduct.

Court hearings for such cases typically occur in specially equipped computer-enabled rooms that enable all parties involved access to electronic case materials.

Digitalisation of criminal proceedings saves both time and resources by speeding up investigation and sanction approval processes, decreasing risks of forgery and increasing transparency of proceedings.

The "Electronic Criminal Case" module gives participants an innovative tool that enables them to access procedural documents online, file motions remotely and familiarise themselves with the case file once preliminary investigations have concluded.

Ongoing improvements have reduced unnecessary paperwork, leading to fewer offenses regarding criminal case management and recording.

Investigators and inquirers can now quickly obtain necessary information, certificates from state institutions, send legal sanctions and subpoenas via SMS and access data from psychiatric dispensaries without leaving their offices, saving time that would previously take up an entire day.

As well, the Electronic Criminal Records module has been upgraded with new functions including ERDR Offline, E-expertise and E-legal assistance.

For example, the "E-expertise" function allows law enforcement officers to assign forensic examinations and process their results electronically within the e-CID module, facilitating the process of assigning examinations directly from the office.

Similarly, the "E-Legal Assistance" project works in the same way, simplifying the procedure for appointing a lawyer for suspects in criminal cases. The system allows you to send a notification of the appointment of a lawyer with one click, and the duty lawyer, having received an SMS-notification, can confirm his consent to the defence of the suspect.

Implementing the State Program "Digital Kazakhstan", the Committee on Legal Statistics and Special Records at the General Prosecutor's Office of Kazakhstan created the application "ERDR-offline", designed specifically to conduct and record investigative actions off site - for instance at operational activity sites.

With this application, it is possible to easily create protocols relating to an inspection of an incident scene, interrogation of victims, petitioning for persons to be recognized as victims and drawing up statements of claim for civil claimants or defendants; drawing up protocols addressing interrogations of suspects or witnesses as well as drawing up inspection protocols of suspects/witnesses/victims etc.

This innovation has drastically decreased risks related to falsifying or misplacing criminal case files, thus significantly improving both quality and reliability of investigation process [5].

As should be stressed, videoconferencing in court proceedings not only reduces both material and time costs but also facilitates criminal proceedings by lessening subjectivity and interpersonal relations' effects on cases. Videoconferencing was introduced as a response to COVID-19 pandemic; however it raises some interesting issues regarding its application directly with regard to examination of evidence, prompting further legal development on both fronts [6, p. 114].

The main purpose and significance of introducing a digital mechanism for reporting crimes is not only for the convenience of the complainant, but also to enhance the efficiency of law enforcement structures. It ensures speed of response to the report, automation of the process of registration and identification of elements of the offence. Within the framework of such a digital service, it is advisable to distinguish crime reports from other types of applications and to create a specialised form that allows the system to automatically determine the existence of a crime and its components. However, it should be borne in mind that such automated processing is only preliminary and requires further review by the relevant officials, whose allocation between them could also be done automatically.

Digitalization of criminal proceedings has become more frequent, yet controlled approaches must be taken in order to limit unjustified and excessive transformations of proceedings. Digital technologies may cause errors during investigations and proceedings, infringe upon human rights laws and even lead to human rights violations. Before adopting digital solutions, a pilot period should be conducted in order to conduct tests, configure systems, train professionals and officials as well as inform the public of new procedures. Furthermore, it is imperative to assess risks related to loss or theft of electronic data while assuring its security and reliable system operation. While developing solutions may provide solutions in terms of cost efficiency and

convenience for criminal proceedings utilizing digital technologies is also an issue that should not be neglected.

Digitisation of criminal justice processes offers many advantages:

- 1. Productivity. Digital tools play a pivotal role in shortening court proceedings by automating various procedures, exchanging documents electronically and remotely accessing necessary information. This enables judges, defence lawyers and other participants to quickly obtain needed materials thereby speeding up decision making processes and ultimately reaching decisions faster.
- 2. Court proceedings have become more accessible thanks to digitizing criminal proceedings. Participants now find it simpler and cheaper to overcome geographical and financial hurdles and participate in sessions without physically attending, which is particularly valuable when participating from remote locations or limited travel options. Videoconferencing gives parties another option of participating particularly useful where travel restrictions exist or attendance at court is impossible.
- 3. Guaranteeing information preservation. Using digital format documents and electronic archiving of data increases their security, decreasing risks associated with accidental document loss or damage. Furthermore, employing digital signatures and encryption methods provides increased confidentiality protection of legally significant documents [7, p. 102].
- 4. Resource Conservation. Switching to digital helps lower document printing, delivery and other associated processing costs that come with handling paper documents leading to better resource use and lower overall costs associated with justice system operations.

Shulgin E. P's findings of public relations reform indicate that all aspects of state reform aim to further democratic restructuring of society by changing approaches to protecting rights, freedoms and interests of its members [8, p. 146]. One major element in implementing this line of restructuring society involves strengthening law enforcement system quality; to do this it requires conducting extensive scientific studies that investigate all facets of law enforcement system functioning to identify existing flaws as well as methods for improvement.

Balgyntaev A.O. stressed the necessity of taking into account several elements when increasing opportunities to use information systems in criminal proceedings:

- 1. Ensuring information security;
- 2) ensure equal justice before the law and court;
- 3) training of personnel possessing relevant expertise;
- 4) Establishment of legal framework to support artificial intelligence use.
- 5) Artificial Intelligence should only play an auxiliary role and should never replace human resources;
- 6) to identify participants in criminal proceedings, to assess the viability of using Digital-ID technology (identification by biometric data) remotely in work;
  - 7) to examine the ethical considerations regarding AI applications in legal proceedings [9].

Digitalisation of criminal investigation not only expedites investigations more efficiently and accurately but also contributes to creating a fairer and more transparent judicial system through automating processes, providing faster access to necessary data and decreasing human errors.

This study demonstrated how digitalisation significantly streamlines crime investigation procedures. Key aspects identified during investigation included:

- 1) Accelerated Data Collection and Analysis: Digital tools allow large volumes of information to be quickly collected and analysed, significantly shortening investigation times.
- 2) Automating processes and employing digital methods increases accuracy when collecting and analysing information, decreasing human error.
- 3) Improved Access: Digitalisation allows access to more resources and databases, which enables more effective investigations.

Comparable with prior works, this paper highlights how digitalisation helps improve crime investigations processes. While previous works focused solely on its technological aspects,

this investigation explores its legal and theoretical dimensions while emphasizing integrated approaches as an integral solution.

Larionova A.A. believes that digitizing criminal proceedings offers great potential to enhance efficiency, transparency and accessibility of justice. Introduce digital technologies like electronic filing, process automation, electronic documents and virtual court sessions can improve criminal justice processes while building confidence in our justice system. However, one must take into consideration any challenges related to data security, training of litigants or providing equal accessibility for all. Introduce digital technologies while adhering to principles of legality, fairness and protecting participant's rights within a judicial proceeding. Utilize appropriate digital tools as well as create policies and legislation which maximize digitalization's potential within criminal proceedings while maintaining fairness for all participants involved in proceedings [10].

Digitalization in crime investigations represents not just a technological update but an essential step in legal reform that demands further development on both technical and legal fronts. Additional research must take place within this arena so as to ensure digitalisation not only contributes to efficient yet fair legal processes but also maximizes efficiency of justice systems overall.

#### Conclusion

This research highlights several significant positives associated with digitalisation of crime investigation in contemporary Kazakhstan. Adopting digital methods for investigation brings significant improvements to criminal processes by increasing quality and efficiency of criminal procedures.

Positive aspects of digitalisation:

- 1) Speed up investigation process: Digital tools can significantly shorten the time required to collect and analyse data.
- 2) Increased accuracy and reliability: Automating processes with advanced technologies reduces human errors while increasing data collection accuracy.
- 3) Easier Access to Information: Digital databases and electronic archives offer quick and effortless access to relevant data.
- 4) Digitalisation facilitates greater process transparency, building public trust in law enforcement systems.

Digitalisation offers numerous prospects for improving both the efficiency and quality of criminal proceedings, including swifter data collection and analysis, improved accuracy and reliability of information, greater access to legal-relevant materials - which all add up to faster investigations with reduced human errors.

Review of legal and theoretical foundations of digitalisation has led us to the realization that, for effective use of digital technologies in criminal proceedings, an integrated approach must be adopted involving legislative norms development/adaption; training of law enforcement officers for professional growth; technical equipment requirements for effective functioning as well as developing reliable measures that assure information security are all necessary elements.

To implement full digitalization of crime investigation in Kazakhstan, several measures should be implemented:

- Training and professional development of law enforcement personnel: Personnel should receive instruction on using new digital tools and databases.
- Legal Framework Development: It is imperative to revise laws to take account of digital technologies' unique characteristics in crime investigation.
- Technical Support: It is vital for law enforcement agencies to have access to the appropriate technical equipment and software solutions.
- Data protection: Ensuring the security and confidentiality of electronic information is of utmost importance in order to thwart potential data leakages and safeguard its confidentiality.

In conclusion, digitalisation of crime investigation in Kazakhstan offers new opportunities to enhance criminal process quality by making it faster, more accurate, and transparent. But for

this goal to be reached successfully a holistic approach must be adopted including both technical and legal updates to the system.

However, one should bear in mind that digital technologies pose new legal challenges and tasks to legal systems around the globe. Therefore, continuous analysis of emerging issues as well as adaptation of theoretical approaches and legislative solutions in response to shifting conditions or technological development are required in order to keep pace.

Digitalisation of crime investigations represents an essential step toward modernising and improving criminal justice, which ultimately contributes to strengthening the rule of law while safeguarding individual liberties and protecting citizen rights and liberties.

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## Қылмыстарды тергеуді цифрландырудың құқықтық және теориялық негіздері

**Аңдатпа.** Ақпараттық технологиялардың қарқынды дамуымен және қоғамның цифрландырылуымен қылмыстарды тергеуде, атап айтқанда қылмыстарды тергеуді цифрландыруға қатысты олардың құқықтық және теориялық негіздерін түсінуге көбірек көңіл бөлінеді. Бұл зерттеу осы тақырыпты қылмыстық сот ісін жүргізуде қолдануды қамтитын құқықтық және теориялық тұрғыдан терең зерттеуге арналған.

Ғылыми зерттеудің екі мақсаты бар: қылмыстарды тергеуді цифрландыру процесіне қолданыстағы заңнаманы және теориялық тәсілдерді бағалау, сондай-ақ проблемаларды анықтау және оларды шешу жолдарын ұсыну. Біздің жұмысымыздың негізгі бағыттары қылмыстық іс жүргізу және криминалистикалық қызметте цифрлық технологияларды пайдалануды реттейтін құқықтық нормаларды, сондай-ақ тергеудің теориялық модельдерін зерделеу болып табылады.

Жұмыстың ғылыми және практикалық маңыздылығы қылмыстарды тергеу мақсатында құқықтық нормалардың технологиялық мүмкіндіктермен өзара әрекеттесуін терең зерттеу болып табылады. Зерттеу әдістері ретінде заңнаманы талдау, ғылыми әдебиеттерге шолу және тәжірибеден алынған нақты мысалдар, сондай-ақ сарапшылармен сұхбат қолданылды.

Жұмыстың негізгі нәтижелері қылмыстарды тергеуді цифрландыру тек технологиялық инновацияларды ғана емес, сонымен қатар тиісті құқықтық реттеуді, сондай-ақ әдістер мен тәсілдердің теориялық негіздемесін қажет ететіндігін көрсетеді. Сонымен қатар, осы саладағы құқықтық негіздер мен теориялық тұжырымдамаларды одан әрі дамытуға қатысты қорытындылар жасалды.

**Түйін сөздер:** цифрландыру, тергеуді цифрландыру, қылмыстарды тергеу, қылмыстық процестегі инновациялар, қылмыстық процесс, киберкриминалистика.

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# Правовые и теоретические основы цифровизации расследования преступлений

**Аннотация.** С быстрым развитием информационных технологий и цифровизацией общества все большее внимание уделяется пониманию их правовых и теоретических основ в расследовании преступлений, в частности в отношении цифровизации расследования преступлений. Данное исследование посвящено углубленному изучению этой темы как с юридической, так и с теоретической точек зрения, охватывающей ее применение в уголовном судопроизводстве.

Научное исследование преследует две цели: оценка существующего законодательства и теоретических подходов к процессу цифровизации расследования преступлений, а также выявление проблем и предложение путей их решения. Основными направлениями нашей работы являются изучение правовых норм, регулирующих использование цифровых технологий в уголовно-процессуальной и криминалистической деятельности, а также теоретических моделей расследования.

Научная и практическая значимость работы заключается в углубленном изучении взаимодействия правовых норм с технологическими возможностями для целей расследования преступлений. В качестве методов исследования использованы анализ законодательства, обзор научной литературы и реальных примеров из практики, а также интервью с экспертами.

Основные результаты работы свидетельствуют о том, что цифровизация расследования преступлений требует не только технологических инноваций, но и соответствующего правового регулирования, а также теоретического обоснования методов и подходов. Кроме того, сделаны выводы относительно дальнейшего развития правовых основ и теоретических концепций в данной сфере.

**Ключевые слова:** цифровизация, цифровизация расследования, расследование преступлений, инновации в уголовном процессе, уголовный процесс, киберкриминалистика.

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