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**DIGITAL TECHNOLOGIES AND INNOVATIONS IN PREDICTING RISKS
FOR INMATE MISCONDUCT**

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Abstract

Digital technologies and innovations are developing rapidly in all spheres of life. The Russian Federal Penitentiary Service (FSIN of Russia) goals and objectives are to ensure the rule of law and security in prisons. Modern approaches to the digital system for the assessment and prediction of risks for FSIN of Russia are aimed at adapting the digital innovation systems and their key indicators to predicting techniques in penitentiary institutions. Based on the analysis of special Russian and foreign literature, we studied inmate misconduct and its manifestations in prisons using digital tools. The study of inmate misconduct and its qualitative and quantitative indicators allowed us to ascertain the heterogeneity of their destructive manifestations. It was suggested to identify risk categories of the inmates based on the Big Data technologies. We proposed the algorithm for recognizing misconduct risks using the capabilities and distinctive characteristics of digital technologies, innovative modeling and forecasting methods, which were taken as the foundations for constructing an abstract inmate's risk misconduct model. Based on comparative analysis and Big Data, the necessity of integrating the existing types into a comprehensive system was substantiated. The importance of analytical technologies for predicting inmate misconduct was emphasized.

Keywords

Data sources – Prediction – Inmate misconduct – Digital model – Misconduct prediction

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Introduction

The penitentiary system as an integral part of law enforcement system in the Russian Federation includes institutions and bodies that carry out criminal penalties and other restrictive measures.

The requirements of the state and modern society to penitentiary institutions, the staff of their structural divisions are aimed at solving the problems associated with inmates' correction, their life and health protection, maintaining safe and stimulating prison environments. Social rehabilitation and reintegration for the persons released from prisons is impossible without modern digital technologies and innovations. In this view it is useful to consider international approaches to solving these problems, taking into account the achievements of scientific and technological progress.

Official statistic data in the Russian Federation confirmed that preventive work in penitentiary institutions is inefficient, therefore the new forms of supervision and control over the inmates' behavior should be developed.

In 2018, 1,338 crimes were recorded in penitentiary correctional institutions:

murders (Art. 105 of the Criminal Code of the Russian Federation) – 6;

attempted murder (Art. 30, Art.105 of the Criminal Code of the Russian Federation) – 5;

causing death by negligence (Art. 109 of the Criminal Code of the Russian Federation) – 5;

intentional infliction of grievous bodily harm that resulted in the death of victim (Art. 111, part 4 of the Criminal Code of the Russian Federation) – 18;

intentional infliction of grievous bodily harm (Art. 111, part 1 of the Criminal Code of the Russian Federation) – 18;

escapes from correctional institutions (Art. 313 of the Criminal Code of the Russian Federation) – 199,

disorganization of the normal activities of correctional institutions (Art. 321 of the Criminal Code of the Russian Federation) – 235;

crimes related to the illegal purchase, sale of narcotic drugs (Art. 228 of the Criminal Code of the Russian Federation) – 297¹.

The current situation is due to a number of factors:

conservatism of the penal legislation regarding regulation of the means of predicting inmate misconduct;

¹ Otchet o sostojanii prestupnosti sredi lic, sodержashhihsja v uchrezhdenijah UIS za 2018 g. Forma 02-UIS.

staff discretion (in some cases, inertia of thinking), their low qualifications;

insufficient level of material and technical support of security units².

In recent years the opportunities appeared to change these negative trends. The increase in the material and social levels of the staff prevented the outflow of qualified personnel from the department. The technical equipment level has sufficiently increased, access to telecommunication networks has expanded. The Cronos Pro database management system has been created, combining most databases with the ability to quickly process and organize information. However, functional development and the qualitative growth of informational database should not be equated with communication processes in law enforcement agencies. There is a need for a thorough study of the use of advanced scientific and technical means in predicting inmate misconduct.

These circumstances indicate the need for information and analytical technologies aimed at comprehensive study of the multiple manifestations of destructive behavior as the basis for penal crime prevention. The obtained data could be concentrated in heterogeneous information repositories accessible for staff members. The implementation of proactive analytical research is of particular importance. The data should be based on the continuous processing of multilevel flows of information about events, inmates' movements, the results of security measures, incoming money transfers, telephone conversations and the identification of other misconduct indicators.

Thus, we conclude that the content of proactive analytics could be considered as a continuous process of permanent automated processing of information flows, adapted to the needs of solving problems of penitentiary practice, which is expressed in a specific information-analytical product (reference, report, profile etc.) indicating the probability of misconduct.

Visual analysis tools open up the most complex relationships and dependencies identified in a form that allows to perceive the encoded data in its entirety open up additional possibilities. The use of Big Data technologies could help to solve a wide range of tasks related to collecting Big Data, fixing illegal activities, connections, and creating electronic dossier (profile) of inmates. When developing complexes of specialized models, these technologies allow to predict a possible performer or organizer of mass riots, focusing on personal and physical qualities of an inmate, up to the appearance, character traits and behavior.

The development of society nowadays is largely determined by the introduction in of the latest achievements of digital technologies in all spheres of its life.

The Russian state powers emphasize the need to use these technologies to modernize the country, improve living standards, and confirm the status of Russia as a modern state that achieved success on innovative basis. The constant decrease in the cost of storing and processing digital information has led to a tremendous increase in data volumes. Big data massives are represented in a wide variety of formats, stored in various nodes of the global Internet and could be potentially used for automatized processing.

² K. K. Gorjainov, "Operativno-rozysknoj kontrol' za osuzhdennymi k nakazaniyam bez lisheniya svobody", *Chelovek: prestuplenie i nakazanie* Vol: 26(1–4) num 4 (2018): 396–400.

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Literature review

It is necessary to point out the contribution to the optimization of scientific and technical support of the following Russian scholars: O. A. Belov, V. B. Vekhov, A.F. Volynsky, G. I. Gramovich, N. A. Moiseev, R. O. Nikitina, A. L. Osipenko, I.P. Pampushko, V.Yu. Rogozin, A.F. Rodin, A.I. Sadovsky, V.M. Tekutiev, A.E. Fedyunin, V.N. Khrustalev, P.S. Elkind, I.N. Yakovenko, etc.

Prof. M.P. Kleimenov defines criminological predicting as the systematic collection and processing of information, allowing to predict the future state of the criminological situation based on various methods and procedures³. Foreign criminologists consider predicting as a kind of foresight, a judgment based on a thorough analysis of the collected information. It is based on the knowledge of the laws governing the development of misconduct, reliable representation of the main destructive trends and assessment of tactical possibilities for influencing them⁴.

The main requirement for predicting is the continuous monitoring of various situations and their objective assessment. Criminological predicting, according to G.A. Avanesov, is constantly repeating and long-term process, requiring systematic clarifications, as new data about inmate misconduct, its causes and conditions accumulate. Criminological predicting also considers the activities aimed at eliminating them⁵. In this regard attention should be paid to the positive experience of Russian and foreign criminological research works concerning the use of digital analytical and forecasting tools, which incorporate proven methodological foundations for choosing forms of adequate response to various types of misconduct, the use of corrective measures, and the offense prevention.

The applied analytical techniques are based on the use of previously obtained relevant information that allows to establish (identify, determine) what has already happened (event, phenomenon) and its manifestation in certain situational, temporal and spatial conditions. First of all, we mean the analysis of the properties and characteristics of various categories of objects of interest, identifying the causes of inmate misconduct in prisons, depending on the offender qualitative characteristics of the personality, the relation between personal characteristics and prisoner misconduct. Most scholars believe that the study of inmate misconduct is mainly carried out by representatives of the law sciences, as a result the methodological tools are assigned to them by the legal plane, leaving beyond the scope of other research procedures. In predicting unlawful behavior, the statistical laws established by quantitative methods do not reveal the internal and external causes of the phenomenon being studied. Such patterns act only as an approximation to reality, and the statistical indicators reflecting them indicate the boundaries within which such approximations could act. So, in logical and mathematical analysis, statistical modeling, an unlawful act is considered from the formal sides, neutral to its essence, without receiving an adequate critical assessment.

³ M. P. Klejmenov, *Kriminologija* (Moscow: Norma: INFRA-M, 2020).

⁴ T. N. Fawn; R. Govindu y A. Agarwal, "Traditional Regression Methods versus the Utility of Machine Learning Techniques in Forecasting Inmate Misconduct in the United States: An Exploration of the Prospects of the Techniques", *International Journal of Criminal Justice Sciences* Vol: 13 num 2 (2018): 420–437.

⁵ G. A. Avanesov, *Kriminologija* (Moscow: JUNITI-DANA, 2010).

Russian criminologist S.S. Ovchinsky considered prognostic work as a specific form of socially useful practice, requiring the application of ever-increasing intellectual capabilities, their proper organization⁶. Obviously, penal practice needs new technologies, and the task of law science is, firstly, to contribute to the acquisition of knowledge about modern analytical techniques for studying the problem; secondly, to develop the methodological foundations of digital forecasting in penitentiary system.

For decades, foreign criminologists directed their efforts at developing guidelines for digital predicting of inmate misconduct and identifying risk factors. In our opinion, the innovative information and analytical methods used in prisons of different countries deserve attention. Their purpose is to develop prescriptions and recommendations, the verification of which is carried out in practice by implementing preventive measures to respond to destructive manifestations in prisons⁷.

An international literature review and our research results allowed us to identify an important stage in the theoretical achievements in solving this problem. We propose a complex concept, which include the following dimensions:

- the need and ability to predict individual misconduct;
- the theory of the crime causes and the causes of individual criminal behavior;
- a comprehensive cognition technique aimed at interconnection and prediction of such complex phenomena as inmate misconduct.

The use of latest achievements of science and digital technologies in modern conditions is a guarantee of the continuous receiving and updating of significant information. It is considered the key to improving the activities of enforcement bodies.

Modern analytical technologies are based on mathematical methods. They lead to the increasingly sophisticated artificial intelligence systems development with the possibility of expanding the use of proactive law enforcement methods, building digital models of inmate misconduct. The perspective areas of analytics could become a true scientific breakthrough and consequently bring the information support to the penitentiary system. Innovative analytical systems could play a key role in solving hot pursuit crimes, collecting data in a digital environment, identifying security threats, responding to challenging situations and conflicting phenomena⁸. This emphasizes special importance of analytical work, associated with scientific and technological progress and social changes.

Its relevance is due to several factors:

⁶ S. S. Ovchinskij, *Operativno-rozysknaja informacija: monografija* (Moscow: INFRA-M, 2018).

⁷ B. E. McDermott, J. F. Edens, C. D. Quanbeck, D. Busse, C. L. Scott, "Examining the role of static and dynamic risk factors in the prediction of inpatient violence: Variable- and person-focused analyses", *Law and Human Behavior*, 32 (2008): 325-338.

⁸ A. L. Osipenko. *Operativno-rozysknaja dejatel'nost' v period chetyvertoy promyshlennoy revolucii [Investigation activities during the fourth industrial revolution]. Aktual'nye problemy teorii operativno-rozysknoj deyatel'nosti* (Moscow: INFRA-M, 2017).

- special importance of analytical activities in the system of counteracting the criminal environment, the ability to create behavioral profiles;

the misconduct models based on behavioral hypotheses;

- the need to improve the organization and tactics of using digital analytical technologies, due to the socially abnormal environment;

- the difficulty of detecting criminal manifestations, the use of special technical means, the combination of deep conspiracy with the variability of illegal manifestations, and active opposition to staff members;

- practical need for the scientific development of a comprehensive methodology for improving the use of scientifically based information and analytical tools in the information departments.

Methods

General description

The methodological basis of this study is a complex of research approaches, principles and methods. The study relied on a universal method of the phenomena cognition and processes of objective reality in their development and interdependence. The following scientific research methods were used: analysis and synthesis, comparative legal and historical legal analysis, systemic method, specific sociological (questioning, interviewing, documents analysis, criminal cases analysis) techniques, formal-logical, statistical, etc. methods. This study was based on the fundamental provisions of general sociology, sociology of law and management.

There are different methods and approaches for the wider and more effective use of innovations in penitential system. Of most interest for our research purposes is the so-called WIRE method.

The WIRE is a method for implementing innovative ideas in practice. The WIRE method involves consistent implementation of answers to questions What? When? Where? Why? How?

W – What, when, where, why, how? What area needs innovation? What is the schedule? Where will the innovation take place? What are you trying to achieve with this innovation? What are the necessary steps?

I – Implementation. Step by step is a way from idea to product.

R – Risk Analysis. What are the expected problems?

E – Expertise. Do we have easily accessible and reliable accurate knowledge on this issue? Can we use the available resources of our partners to save time and effort?

This method is called the Five Question Method in heuristics. It was developed in the 1970s to enhance innovations in the American industry. Since then, it has shown high

efficiency and has been extended to many other areas far from business, including the solution to the problem of increasing the effectiveness of law enforcement agencies. The method involves the development of organizational plans, where the timeframes, performers and resources necessary to turn an innovative idea into an innovative technology are accurately planned, as well as the development of a roadmap. It is a set of instructions for each of the performers involved in the implementation of the project⁹.

As practical experience shows, it is advisable at all stages of the organization of an innovative project to carry out an advanced analysis of risks associated with confidence in the timing of the successful completion of a particular stage or solution of a subtask, and with the ability to keep within the resources available to the organization engaged in the development of innovations.

Algorithm

Today the need for inmate misconduct prediction in penitential institutions is one of the most urgent problems. It is determined by a number of factors:

- lack of primary information about the circumstances of the offense, the behavioral characteristics of individual, facts and phenomena concerning inmates;
- complexity of the timely recognition of intentions of various categories of inmates, the presence of a large number of factors requiring knowledge (qualitative composition, individual indicators, relationships between elements);
- the need to anticipate the operational situation in the institution based on the existing situation;
- counteraction to the disclosure and investigation of a wrongful act by interested parties, criminal subculture, etc.;
- dynamics of criminal situations;
- presence of a significant number of uncertainties and variables that need to be foreseen (intensification of contradictions in the interests of certain categories of inmates, struggle for leadership, spheres of influence, an increase in the level of dissatisfaction with the conditions for serving sentences and the actions of the staff, increased emotional tension in the social environment of inmates (increased irritability, aggressiveness or depression), opposition to the legitimate requirements of the staff, their insult, etc.);
- the need to adjust operational search versions;
- inadmissibility of operational-service errors.

It is necessary to determine the development of integrative and interdisciplinary relations in modern scientific studies. It seems appropriate to use the extrapolation

⁹ Ju. N. Zhdanov y V. S. Ovchinskij, *Kiberpolicija XXI veka. Mezhdunarodnyj opyt.* (Moscow: Mezhdunarodnye otnosheniya, 2018), 24–25.

method, which is associated with innovative approach to the classification of sciences, according to which criminology is considered as a methodological multidisciplinary approach for so-called criminological sciences. Criminology is an interdisciplinary field in both the behavioural and social sciences. Criminological disciplines include investigative activities and inquiries and the functioning of the system of legal norms in this field¹⁰.

We are faced with all groups of phenomena that characterize the chain of causal relationships: the results of the causes of crime and the unfavorable formation of personality, the sources of criminal activity of particular individuals, the conditions that stimulate misconduct. Obviously, the problem of risks prediction acquires information in many respects. Prediction becomes possible when we can actually select information elements from the whole variety that reflect a certain range of social characteristics and personality manifestations, as well as factors determining criminal activity.

Hardware and software and technical devices (automated information retrieval, expert and logical-analytical systems) are referred to the main means of analytical activity of information units¹¹. It is of their help, processing of operational information, factual and forensic information is carried out with high quality of the final results. Their functioning is providing invaluable assistance in preventing and solving crimes, as well as in preventing violations in penal institutions.

Recently, predictive (forecasting) analytics are rapidly gaining popularity in Russia and abroad, including various analytical tools in their arsenal, such as artificial intelligence, machine learning technologies, and Big Data analysis¹². In this segment of analytics, an extensive set of data mining methods and tools are used that provide the development and generation of a forecast, based on which decision-makers can evaluate possible options for the development of the situation, which reduces the risk of making ineffective or erroneous decisions.

The structural-systematic approach allows us to consider the trends and patterns of penal crimes in the context of its causes and conditions, to determine the nature of the process. Knowledge of diverse and interconnected phenomena and processes that affect penal crime objectively determines this type of intellectual activity of staff as a necessary property of the management process, which provides useful scientific information for making complex decisions in the field of inmate misconduct. Such approaches are stipulated by the criminal policy, the ever-growing needs of practice in the field of law enforcement and crime prevention, the penitentiary system itself.

Effective solution of the prognostic nature tasks determines a complex of diagnostic sub-tasks, among which specialists include recognition of a foresight object. Recognition of the foresight object can be explained as finding similarities with previously known¹³. The content of this forecasting element is individual risk behavior, knowledge of the properties

¹⁰ K. K. Gorjainov y V. S. Ovchinskiy, *Teorija operativno-rozysknoj dejatel'nosti: uchebnik* (Moscow: INFRA-M, 2018).

¹¹ E. N. Yakovec, *Problemy analiticheskoy raboty v operativno-rozysknoj deyatel'nosti organov vnutrennih del* (Moscow: Publishing house Shumilova, 2005).

¹² D. A. Andrews; J. Bonta y R. D. Hoge, "Classification for Effective Rehabilitation: Rediscovering Psychology", *Criminal Justice and Behavior* num 17 (1990): 19–52.

¹³ Ju. G. Koruhov, *Kriminalisticheskaja diagnostika pri rassledovanii prestuplenij* (Moscow: Izdatel'skaja gruppa NORMA-INFRA-M, 1998).

and states of the personality of the offender. Two tasks are solved in the process of predicting a wide range of misconduct: identifying the person and determining the probability of committing an offense.

The algorithm for predicting the illegal inmate misconduct is formed by a system of sequential steps and operations based on the use of digital methods of Big Data analysis. Along with inmates inclined to misconduct, positively characterized inmates are studied as control groups. The reliability of the predictions increases with an increase in the volume of data included in the analysis. Therefore, methods of predictive analytics, as a rule, are based on automated processing of Big Data. Risk factors for inmate misconduct are defined as static (usually unchanged) or dynamic (modifiable). This implies one of the methodological postulates regarding, in particular, the goals of criminological predicting: an effective primary information base for predicting diverse illegal manifestations should be structured according to the criteria of significant risk factors.

The collection of primary predictive background data involves the clarification of a wide range of information: individual characteristics of the inmate’s behavior, personality traits and manifestations, which together form the basic risk criteria. Digital sources are playing an increasingly important role in predicting. Using digital methods allows the staff to get a wide range of information, which forms the basis for the subsequent multivariate analysis of each of the obtained components from the point of view of the interaction of individual with social environment. The system of successive stages and operations of predicting inmate misconduct, based on the use of digital methods of Big Data analysis, is presented in Table 1.

Stage	Content
initial steps	analytics software for the misconduct prediction: data are gathered from electronic inmate profiles which include a wide range of information; working hypotheses is constructed
Defining penitentiary risk factors (static and dynamic)	a) socio-demographic characteristics (gender, age, nationality, family status, stable low financial status and lack of social ties); b) penitentiary characteristics (procedural status, regime of serving a sentence (conditions of detention), set of criteria and indicators of maladaptation (current behavioral risks and (or) during the past sentence, conflicts, malicious violations of the order when serving a sentence); c) criminal block of variables (length of sentencing and misconduct, relationship with the victim, unlawful or violent behavior at a minor age, violent acts, drug or alcohol abuse); d) moral and psychological characteristics (immunity to psychological or psychiatric correction in the past, a tendency to actual violence or self-harm) ¹⁴ .
elementary informational inmate behavioral model creation	both static (e.g., criminal past) and dynamic risk factors (e.g., criminal infection) suggest relapse, as they are the markers for the same individual inclinations (e.g., antisocial orientation). Inclinations, as well as personal qualities, are considered as relatively stable social factors, acquiring an anthropomorphic

¹⁴ K. Arbach-Lucioni; M. Martines-García y A. Andrés-Pueyo, “Risk Factors for Violent Behavior in Prison Inmates”, *Criminal Justice and Behavior* Vol: 39 num 9 (2012): 1219–1239.

	essence and the ability to manifest or not manifest for a certain period of time ¹⁵ . At this stage, a hypothesis is put forward (as a new clarifying task), according to which the structure and sequence of bases for destructive manifestations are determined
hypothetical informational inmate misconduct model creation	it is formed on the evidence-based data, risk indicators, and the analysis of operational information obtained as a result of the continuous collection and processing of the entire data volume of regime violations of a potential object of operational impact
Using informational inmate misconduct model as the basis of analytical estimates and predictions for decision-making	1) determining the direction of influence on inmate, neutralizing the influence of persons of the high level of risk; 2) assessment of the unlawful manifestations of the offender's personality and its interaction with society, based on empirical knowledge of dynamic risk factors and needs; 3) maximizing rehabilitation corrective techniques through cognitive-behavioral treatment, taking into account the ability to learn, motivation, personal abilities and strengths ¹⁶

Table 1
The algorithm for inmate misconduct prediction

This approach is due to a deep study of the object as a source of information on the basis of a pre-established range of certain characteristics, the properties of personality. Structuring the properties and conditions of the studied object depends on the proposed criteria and contributes to a reasonable judgment about the probable future, based on the facts of the past. From the researchers' point of view, this hypothesis acts as the basis of the forecast, contributes to its development being a heuristic method of cognition¹⁷. The main goal of constructing a hypothesis is to establish the connections between phenomena, identify the causes of their occurrence, reconstruct the past, and predict the future. Hypothesis and prediction are not identical concepts. Firstly, according to their place in a logical chain, hypothesis is always included in the premises, and prediction could be defined as a conclusion. Secondly, according to their purpose, hypothesis is aimed at explaining the connections between phenomena, and prediction is to identify the possible consequences of the event. Thirdly, the dialectical logic laws and methods are used to construct hypotheses, and therefore, the use of purely prognostic knowledge is required. Thus, the ratio of the concepts under consideration can be represented as understanding and foresight.

Flow chart

Thus, for our research purposes we define innovations and analytical technologies as an element of technical and analytical support for the process of executing criminal sentences in the form of imprisonment. This is a regulatory system of scientifically grounded methods that provide the law enforcement with the ability to detect, collect, store, analyze, transfer and use evidence-based and orientation information on inmates.

¹⁵ R. E. Mann; R. K. Hanson, D. Thornton, "Assessing risk for sexual recidivism: some proposals on the nature of psychologically meaningful risk factors", *Sexual Abuse* Vol: 22 num 2 (2010): 191–217.

¹⁶ D. A. Andrews; J. Bonta y J. S. Wormith, "The Risk-Need-Responsivity (RNR) Model: Does Adding the Good Lives Model Contribute to Effective Crime Prevention?", *Criminal Justice and Behavior* Vol: 38 num 7 (2011):735-755.

¹⁷ K. K. Gorjainov y V. S. Ovchinskiy, *Teoriya operativno-rozysknoj dejatel'nosti: uchebnik* (Moscow: INFRA-M, 2018).

Realization of the innovation analytical digital technologies in predicting inmate misconduct predetermines the development of a fundamentally new specialized software that allows:

- to monitor the interaction of subjects by transmission of video signal, sound, files;
- synchronization of processes at both points of contact;
- visualization of the transmitted information by means of the text protocol, video sequence, combined video sequence from different sources in one window;
- ensuring the security of the transmitted information.

Results

The algorithm for predicting inmate misbehavior is formed by a system of sequential steps and operations based on the digital methods of Big Data analysis. Along with inmates inclined to misconduct, positively characterized inmates were studied as control groups. The reliability of the prediction increases with an increase in the volume of data included in the analysis; therefore, methods of predictive analytics, as a rule, are based on automated processing of Big Data. Risk factors for inmate misconduct were defined as static (usually unchanged) or dynamic (modifiable). This implies one of the methodological principles regarding, in particular, the goals of forecasting: an effective primary information base for predicting diverse illegal manifestations should be structured according to the criteria of significant risk factors.

The collection of primary predictive background data involves a wide range of information: individual characteristics of inmate behavior, personal traits and manifestations, which together form the basic risk criteria. Digital technologies play an increasingly important role in predicting, providing analytical possibilities for information sources. Digital methods allow processing a wide range of information, which forms the basis for the subsequent multivariate analysis of each of the obtained components from the point of view of the interaction of individual with social environment.

As the result of our study we developed original method for using of digital and analytical technologies as a basis for predicting inmate misconduct. A comprehensive study of interdisciplinary, methodological and practical foundations of innovative digital tools and methods use for predicting inmate misconduct is suggested in the research. We formulated and scientifically substantiated a concept, and on its grounds the recommendations were developed aimed at improving the tactics and organization of information and analytical technologies use in for predicting inmate misconduct. It is essential for the further development of law science and improving the effectiveness of law enforcement. Suggested approaches to the implementation modern scientific and technical means in the process of executing criminal sentences of imprisonment can significantly affect the effectiveness of counteraction to penal crime, namely, to reduce the risks of misconduct, to identify and timely eliminate the causes and conditions of their occurrence.

The structure of technological support for predicting inmate misconduct includes horizontal and vertical levels. Horizontal level includes two levels of digital technological

support – conditional and activity-based. At the conditional level, conditions are created for the staff to be constantly ready to solve the problems of digital technological support. At the activity-based level, these tasks are directly solved. Thus, we confirm the rationality and effectiveness of digital analytical technologies in the process of executing sentences of imprisonment.

The vertical elements of digital technological support include the following types of activities for predicting inmate misconduct, immanent to both of its horizontal levels: legal, scientific, technical and organizational-resource.

The system of elements of digital technological support is presented in Table 2.

Element	Content
Legal support	Formation and adoption in accordance with the established procedure by authorized state bodies of standards for the application and use of information and analytical technologies
Scientific and technical support	One of the key conditions for solving the problem of achieving the criminal punishment goals is the widespread introduction of innovative scientific results and technological progress into the penitential practice.
Organizational and resource support	The organizational platform for the use of digital technologies can be defined as a normatively fixed system of measures to increase the effectiveness of the application of information and analytical forecasting technologies in penitential practice.

Table 2

The system of elements of digital technological support

The authors acknowledge the need for the development and implementation of relevant technical and analytical recommendations, methods and tools into law enforcement practice. However, equipping law enforcement agencies with modern means of combating crime does not yet provide an increase in the effectiveness of their activities as a matter of course. It should be carried out in parallel with the improvement of the organizational and legal aspects of such activities. The use of modern scientific and technical achievements is the necessary condition for research from the position of identifying and formalizing on a legal basis both complex and typical situations in identifying inmate misconduct. Legal requirements determine the system of technical and analytical support in the activities of law enforcement agencies, organizationally specifying it and developing it.

Conclusion

We came to the conclusion that it is necessary to conduct comprehensive studies of inmate deviant behavior for crime prevention. Preventive information models should be used in penitentiary practice to detect illegal manifestations at the earliest stages.

It is important that the information should be placed in heterogeneous information repositories, accessed by all administration staff. Of particular importance is the implementation of proactive analytical research, the organization of continuous processing of information flows about events, movements, money transfers, telephone conversations

in order to identify possible criminal content and premises for committing offenses¹⁸. Such analytics is based on the permanent automatized analytical processing of information and the detection of combinations of data in them, indicating a high probability for illegal actions or taking measures to conceal them. With this approach, Big Data processing could serve as a means of prevention.

Visual analytics tools provide additional opportunities that clearly reflect the most complex relationships and dependencies identified in a form that allows the user to perceive encoded data in its entirety. The use of Big data technologies can help solve a wide range of problems. The collection of data, recording illegal activities of inmates help in the formation of electronic dossier (profile). When developing complexes of specialized models, the considered methods allow identifying the performer or organizer of excesses based on personal and physical qualities, up to the appearance, character and behavior¹⁹.

The accumulated information in the data management systems of penitentiary institutions forms a unique database for modeling and predicting the possible inmate misconduct, whose behavior and actions give reason to believe that they are related to risk groups. Such information allows to build multidimensional prognostic models of their individual misconduct by translating it into a system of relevant indicators. These indicators include the following:

- changes in the quantitative composition of inmates,
- individual characteristics,
- probability of deviant behavior,
- violation of the established procedure for serving a sentence,
- types and quantity of contraband items seized,
- the presence and nature of interpersonal conflicts among inmates,
- causes of negative processes and phenomena occurring in the environment of inmates, their nature and degree of criminality,
- complications of the operational environment²⁰.

The opportunities opened up by the digital transformation largely determine further scientific research on countering illegal behavior in prison practice. First of all, this is customization in accordance with organizational needs based on the analysis of Big Data. Secondly, it is necessary to develop flexible processes that could respond to a changing

¹⁸ L. F. Jones, Offence paralleling behavior (OPB) as a framework for assessment and interventions with offenders. In A. Needs, G. Towl. *Applying Psychology to Forensic Practice* (Oxford: BPS-Blackwell, 2004).

¹⁹ K. K. Borzunov, "Kiberanalitika v obespechenii antikriminal'noj bezopasnosti", *Voprosy kiberbezopasnosti* Vol: 2 num 20 (2017): 39–44.

²⁰ N.P. Barabanov, A.N. Zhuravlev. *Vidy, istochniki i sposoby poluchenija informacii dlja ocenki operativnoj obstanovki v ispravitel'nom uchrezhdenii* (Rjazan': Akademija FSIN Rossii, 2011).

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situation in real time. Thirdly, we recommend to increase the efficiency of the system, reducing the number of hierarchical levels. Digital predicting has been endowed to meet these challenges.

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