

УДК 343.98

DOI [10.17150/2500-4255.2016.10\(3\).579-589](https://doi.org/10.17150/2500-4255.2016.10(3).579-589)

РАЗВИТИЕ КРИМИНАЛИСТИЧЕСКОЙ ИНФОРМАЦИОННОЙ СИСТЕМЫ В КОНТЕКСТЕ МЕЖДУНАРОДНЫХ ОТНОШЕНИЙ

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Информация о статье

Дата поступления

10 декабря 2015 г.

Дата принятия в печать

22 июня 2016 г.

Дата онлайн-размещения

30 сентября 2016 г.

Ключевые слова

Криминалистика; информация;
компьютерные системы и технологии;
Европейская криминалистика — 2020;
электронная юстиция; решение Prüm

Аннотация. Процесс глобализации затрагивает не только область экономики, но и преступную среду. Это касается всех стран мира, в том числе и европейских. Соответственно, в целях борьбы с преступностью требуются совместные усилия государств. Экономическая, культурная, политическая или социальная глобализация создает необходимость правовой глобализации. Европейский союз поставил перед собой цель поддерживать и развивать безопасность и правосудие на своей территории, гарантируя совместную деятельность государств-членов в области полицейского и судебного сотрудничества по уголовным делам. Исследование международной преступности требует объединения усилий сотрудников правоохранительных органов различных стран. Этой цели может служить развитие коммуникаций и компьютерных сетей, инновационных технологий в работе правоохранительных органов. Совет Европейского союза считает, что пространство европейской криминалистики должно быть создано к 2020 г. Для этого необходимо развитие криминалистической информационной системы в общем пространстве Европейского союза. Такая система должна стать частью европейской системы электронного правосудия. Целью данной статьи является анализ развития криминалистической информационной системы Литвы в рамках общего пространства Европейского союза. Литовская криминалистическая информационная система разрабатывается в соответствии со стратегией электронной юстиции Европейского союза и решением о создании европейского криминалистического пространства. Условия и проблемы развития криминалистической информационной системы в Литве ранее не были достаточно изучены. В связи с этим в статье представлены результаты исследования, проведенного в ходе осуществления проекта «Концепция реализации видения Европейской криминалистики — 2020 в Литве». Методологию исследования составила совокупность теоретических и эмпирических методов. В качестве эмпирического метода сбора данных была использована экспертная оценка. Современное состояние криминалистической системы оценивалось с помощью SWOT-анализа (сильные и слабые стороны, возможности и угрозы). В данной статье представлена только часть результатов исследования и анализа теоретического материала. По итогам рассмотрения современной литовской криминалистической системы были определены ее сильные и слабые стороны, ее возможности и угрозы ей. Это необходимо для осуществления второго этапа проекта. В первой части статьи проведен анализ аспектов реализации стратегии электронного правосудия и развития европейской криминалистики, во второй части охарактеризованы условия европейского трансграничного сотрудничества, в третьей — условия интеграции литовской криминалистической системы в европейскую. Четвертая часть статьи объясняет методологию исследования, пятая часть представляет его результаты. В завершение мы делаем выводы и описываем дальнейшие возможности в области обозначенных исследований.

DEVELOPMENT OF FORENSIC SCIENCE INFORMATION SYSTEM IN THE CONTEXT OF INTERNATIONAL ENVIRONMENT

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Article info

Received

2015 December 10

Accepted

2016 June 22

Available online

2016 September 30

Keywords

Forensic science; information; computer systems and technologies; European Forensic Science 2020; e-justice, Prüm decision

Abstract. Globalization requires joint actions in order to combat crime. The aim of this paper is to analyze the development of forensic science information system in the common European Union area. The Council of the European Union acknowledges that European Forensic Science Area has to be created by 2020. The article presents the results of an expert evaluation carried out in the course of the project «Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania». Lithuanian forensic science information system is being developed according to the European Union e-Justice Strategy and the decision to create the European Forensic Science Area. However, conditions and problems of developing the forensic science information system in Lithuania have not been sufficiently analysed. This paper presents only part of the survey results and the analysis of theoretical material. The results of our analysis of current Lithuanian forensic science system allow to identify the strengths, weaknesses, threats and opportunities of the current Lithuanian forensic science system. This is necessary for the second stage of the project.

Globalization involves not only economics but also criminality in both Europe and the world. Economic, cultural, political, or social globalization establishes the need for legal globalization [1]. The European Union (EU) has set itself an objective to maintain and develop the security and justice environment ensuring joint activities of Member States in the fields of the police and judicial cooperation in criminal cases. Prospects of the EU forensic science space are analyzed by scholars such as M.A. O'Neill [2], H.J. Salize and H. Dressing [3], E. Malkoc and W. Neuteboom [4]. Investigation of criminal activities requires joint efforts of law enforcement employees in different states, utilizing the opportunities for international cooperation better. The development of communications and computer networks, innovative law enforcement technologies can serve this purpose. The need for the reform of forensic science models and systems in order to improve the process of justice is discussed by J.D. Gabel [5], Koehler [6], J.E. Laurin [7], and A. Widener [8].

The EU Strategy *A Digital Agenda for Europe*¹ was approved in 2010. The strategy provides measures to be used for increasing interoperability of electronic media, introduction of innovations of information and communications technologies

(ICT). There is no doubt that the development of information dissemination processes by using modern electronic means is significant to the law enforcement and judicial system. The e-Justice strategy was described in the Communication of the Commission of the European Communities *Towards a European e-Justice Strategy*². E-Justice can be defined as the use of information and communication technologies in order to improve the implementation of citizens' rights to justice and to enhance the efficiency of judicial activities, i.e. any activities associated with dispute settlement or criminal sanctions for certain activities. Problems associated with the investigation of criminal cases are closely related to the problems of forensic science investigations. The implementation of e-Justice is analyzed by M.S. Pardo [1], M.A. O'Neill [2], and T.J. Wilson [9]. When considering the establishment of the European forensic science environment and the development of forensic science infrastructure in Europe, the European Union Council noted that forensic science can make a significant contribution to a greater efficiency and effectiveness of law enforcement, to crime prevention and the fight against crime. An important role is played by information exchange, including biometric and other data, in the field of crime and criminal activity prevention and the

¹ European Commission Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. *A Digital Agenda for Europe* COM (2010) 245 final/2 [Electronic resource]. URL : <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0245:FIN:EN:PDF>.

² Commission of the European Communities. Communication from the Commission to the Council, the European Parliament and the European Economic and Social Committee. *Towards a European e-Justice Strategy*. COM(2008)329 final [Electronic resource]. URL : http://ec.europa.eu/civiljustice/docs/com_2008_329_en.pdf.

fight against these phenomena [7]. New criminal methods in the e-space are analyzed by B. Etter [10], J.M. Butler [11], D. Meuwly and R. Veldhuis [12]. Some scholars separately analyze the problems of international exchange of criminal data according to Prüm Decisions [13–16].

Current e-Justice solutions are mainly intended for the computerization of the current legal system. However, merely changing technologies is not sufficient; it is necessary to also have a new approach of scientists-lawyers that could facilitate the interconnection of different chains of law enforcement and legislation [1; 5; 17].

The research purpose of this article is the development of the forensic science information system in the context of international environment, and the assessment of possibilities. Our research objectives were to conduct an expert evaluation in order to determine the conditions and opportunities of the Lithuanian forensic science system, joining the common European forensic science space, and implementing the «Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania». Our research methodology was chosen as a combination of theoretical and empirical methods. The expert opinion evaluation was used as an empirical data collection method. The current situation in forensic science research in Lithuania was assessed using the SWOT analysis (strengths, weaknesses, opportunities and threats).

This article has several practical implications. We prepared conclusions and recommendations for the improvement of Lithuanian forensic science system. These recommendations will be used in the second stage of the project implementation. The paper presents only a part of the survey results. The first part of the article analyzed the aspects of the e-Justice strategy and the development of the European forensic science environment. The second part of the article analyzes the solutions for the European cross-border cooperation. The third part of the article analyzes the solutions for the Lithuanian forensic science system joining the European system. The fourth part of the article explains the research methodology. The fifth part of the article presents research results. Finally, we present the conclusions and the followup development of research opportunities.

E-Justice strategy and development of the European forensic science environment. The purpose of the European e-Justice is the establishment of the European judicial environment by using in-

formation and communication technologies. The principles of the European Community's spatial information infrastructure (INSPIRE) have been described in the INSPIRE Directive: «Inspire should be based on the infrastructures for spatial information that are created by the Member States and that are made compatible with common implementing rules and are supplemented with measures at Community level. These measures should ensure that the infrastructures for spatial information created by the Member States are compatible and usable in a Community and transboundary context»³.

On 6 December 2013, the Justice and Home Affairs (JHA) Council adopted the new Strategy on European e-Justice 2014–2018 (Published in the *Official Journal* on 21 December 2013 (2013/C 376/06)). This strategy defines the general principles and objectives of the updated European e-Justice System. The Council of the EU, discerning the relation of freedom, security and justice triad with criminology, has made a step in the development of forensic science from the national to the international level thus creating conditions for entering the optimal security of the EU: it has approved the document of strategic importance — the Conception of the vision for European forensic science 2020⁴. The European Union Council emphasized that by 2020 it is necessary to establish European forensic science environment where the usual forensic examinations intended for the collection and management of forensic data, for using and providing these data are performed based on equivalent basic forensic science standards and where entities performing forensic examinations follow a common approach to implementation of these standards, and this encourages a closer cooperation between them and the criminal justice systems⁵. It is necessary to follow the objectives set in the Framework Decision 2009/905/JHA of the European Council⁶:

³ Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (Saliz) // *Official Journal of the European Union*, L 108/1.

⁴ Council of the European Union. Draft Council Conclusions on the vision for European Forensic Science 2020 including the creation of a European Forensic Science Area and the development of forensic science infrastructure in Europe. 17537/11 [Electronic resource]. URL : <http://db.eurocrim.org/db/en/vorgang/286>.

⁵ Ibid.

⁶ Council framework Decision 2009/905/JHA of 30 November 2009 on Accreditation of forensic service providers carrying out laboratory activities. OJ 2009 L 322 of 2009-12-09, pp. 14–16.

to provide the European Union with modern world-class forensic science infrastructure which would contribute to the implementation of cross-border cooperation, ensuring an overall high forensic science level as well as to invest in the research and development of new technologies and innovative products by simultaneously using both legislative and non-legislative measures [4; 10].

The project of creating the European forensic science area and forensic sciences infrastructure in Europe provides additional objectives for the European forensic science space. It intends to support the cooperation of the Member States in the field of European forensic science by facilitating the conditions, the exchange of European forensic science results and the encouragement of high quality forensic science. It is necessary to maintain and improve the quality of forensic science in the Member States, helping the Member States to develop methods which promote closer cooperation between their criminal justice systems and cooperation between forensics entities [6; 7]. However, each EU Member State has its own unique system of forensic science institutions and own understanding of forensic science, therefore, each Member State requires separate research and individual model for the implementation of the Conception of the Vision for European Forensic Science 2020 [4]. The Council of the European Union «emphasizing therefore the need to define commonly accepted minimum forensic science standards for the collection, processing, use and delivery of forensic data relating inter alia to data concerning DNA profiles, as well as dactyloscopic and other biometric data, and to equip the Union to meet the new challenges that it is facing in the field of high tech and cybercrime»⁷. It is stated that cross-border cooperation is necessary to ensure a common high level of the forensic science, along with investment in the research and development of new technologies and innovative products [9]. An important trend in the development of forensic science is the application of information technologies in the field of forensic science and the investigation of criminal offences [18].

«Lithuanian scientists have consolidated to implement a project named «Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania» with the objective to create a conception of implementation of the vision for European Forensic Science 2020 in Lithuania

by 1) evaluating the current status of Lithuania's forensic system and opportunities for its improvement; 2) analysing achievements and knowledge in investigation of crimes listed in conclusions of EU Council on the vision for European Forensic Science 2020 including creation of a European Forensic Science Area and the development of forensic science infrastructure in Europe: trafficking in human beings, organised crime and terrorism; 3) analysing conceptions of forensic science, which differ in different EU member states due to the variety of forensic schools, and finding means for their harmonization» [19].

Solutions for European cross-border cooperation. New opportunities for pre-trial investigation officers to make use of dactyloscopic data systems appear not only at the national but also at the international level along with the development and introduction of new technologies. The implementation of some functions is at the level of international undertakings: *PRÜM*, *Eurodac*, and *ECRIS* [15].

PRÜM — direct exchange of dactyloscopic data between states that have implemented Council Decision 2008/615/JHA of 23 June 2008 on stepping up cross-border cooperation, particularly in combating terrorism and cross-border crime and Council Decision 2008/616/JHA of 23 June 2008 on the implementation of Decision 2008/615/JHA on stepping up cross-border cooperation, particularly in combating terrorism and cross-border crime. *PRÜM* includes automatic transfer of DNA, dactyloscopic data, and national vehicle registration data. *PRÜM* data exchange is strictly regulated [13; 14]. The European Union Council Decision of 13 December 2011 on the launch of automated data exchange with regard to dactyloscopic data in Lithuania⁸ was used by Lithuania to fully implement the general provisions of Decision 2008/615/JHA on data protection in the field of automatic search for dactyloscopic data, so it became entitled to receiving and submitting personal data since the effective date of this decision. Since 1 January 2012 the Member States that have implemented *PRUM* requirements and arranged the systems with the Lithuanian CAFIS, have been entitled to accessing the dactyloscopic data register of Lithuania via *PRUM* channels.

⁷ URL : <http://db.eurocrim.org/db/en/vorgang/286>.

⁸ Council Decision of 13 December 2011 on the launch of automated data exchange with regard to dactyloscopic data in Lithuania (2011/888/EU) // Official Journal of the European Union, L 344/36, 28.12.2011.

The Council of the European Union in March 2015 presented «Prüm Decisions» statistics on automated data exchange for 2014⁹. Leaders of *DNA operational data exchange* by the number of contact parties include Slovakia, Austria (18 countries), Poland, Lithuania, Germany (15 countries), Romania (14 countries) and France, Spain (13 countries). Leaders of *Dactyloscopic reference operational data exchange* by the number of contact parties include Austria (15 countries), Slovakia, Bulgaria (14 countries), Romania, Luxembourg, Cyprus, Czech Republic and Spain (13 countries). The number of parties practicing *DNA operational data exchange* and the intensity are higher than for *Dactyloscopic reference operational data exchange*. This demonstrates the effectiveness and popularity of the new approach. Analyzing the presented data we could see that only part of the EU Member States actively participate in digital exchange of data. Lithuania also is on the list of such active countries.

EURODAC is an electronic system of the European Union Member States for controlling the flows of illegal migrants and asylum seekers crossing the borders of the European Union by means of fingerprint identification technology (System of EU Member States for processing flows of asylum seekers and illegal migrants by means of dactyloscopy). *EURODAC* System was established in 2000 and it operates in accordance with the regulations of the Dublin Convention adopted by the European Union States during their meeting. Each European Union Member State must get involved in the operation of *EURODAC* System and establish a national subdivision of *EURODAC* [13; 14]. In 2004 Lithuania also joined *EURODAC* System. *EURODAC* tasks in Lithuania are carried out by the Criminal Investigation Centre of the Lithuanian Police, the State Border Guard Service under the Ministry of the Interior of the Republic of Lithuania, and the

Migration Department under the Ministry of the Interior of the Republic of Lithuania.

Since 2004 the Criminal Investigation Centre of the Lithuanian Police has been assigned to carry out the functions of the national subdivision of *EURODAC*. New *EURODAC* Regulation (EU) No. 603/2013 was passed by the European Parliament on 26 June 2013 enabling law enforcement authorities and Europol to use *EURODAC* for the investigation of criminal offences (i.e., to run through it the fingerprints of suspects — dactyloscopic cards and palm prints taken at crime scenes). New *EURODAC* Regulation will come into force on 20 July 2015 and by then the European Operation Management Agency for Large-Scale IT System Freedom, Security and Justice in the Environment must introduce a completely new *EURODAC* System; meanwhile each Member State of the European Union must perform the technical work in order to be able to operate the new *EURODAC* System [11]. The Criminal Investigation Centre of the Lithuanian Police has been assigned to carry out the preparatory work. *EURODAC* tasks in Lithuania are implemented by the Criminal Investigation Centre of the Lithuanian Police together with the State Border Guard Service under the Ministry of the Interior.

ECRIS is the European Criminal Records Information System. Council Framework Decision 2009/315/JHA of 26 February 2009 on the organisation and content of the exchange of information extracted from the criminal record between Member State¹⁰ and Council Decision 2009/316/JHA of 6 April 2009 on the establishment of the European Criminal Records Information System (*ECRIS*) in application of Article 11 of Framework Decision 2009/315/JHA¹¹ were implemented in 2009; since 27 April 2012 Lithuania started exchanging information on criminal records via the established European Criminal Records Information System *ECRIS*. *ECRIS* should become another efficient investigator's tool for using new dactyloscopic data in crime investigation and identifying the location of fugitives from the law enforcement

⁹ Council of the European Union. Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border-crime, Council Decision 2008/616/JHA of 23 June 2008 on the implementation of Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border-crime («Prüm Decisions») — statistics and reports on automated data exchange for 2014, Brussels, 16 March 2015 (OR. en) 5503/2/15 REV 2 [Electronic resource]. URL : <http://www.statewatch.org/news/2015/apr/eu-council-prum-statistics-5503-rev2-15.pdf>.

¹⁰ Council Framework Decision 2009/315/JHA of 26 February 2009 on the organisation and content of the exchange of information extracted from the criminal record between Member State // Official Journal of the European Union, L 93/23, 7.4.2009.

¹¹ Council Decision 2009/316/JHA of 6 April 2009 on the establishment of the European Criminal Records Information System (*ECRIS*) in application of Article 11 of Framework Decision 2009/315/JHA // Ibid., L 93/33, 7.4.2009.

authorities. Project EFEN (ECRIS Fingerprint Exchange Network) was finished in 2014. Currently, 26 Member States exchange data via ECRIS System. Lithuania can be mentioned as one of the 3 most advanced Member States in this field having an automatic link between the national criminal records register, the fingerprint register, and ECRIS System.

Analysis of the overview of the total amount of EUCARIS/Prüm-inquiries in 2014¹² shows that more outgoing than incoming queries are processed only in Germany, Spain and Netherlands. Incoming queries dominate in other countries (Lithuania). It can be said that the majority of outgoing queries are processed in the countries with high numbers of immigrants.

Lithuanian forensic science system joining the European system. Forensic science data bases, records, collections play a major role in crime investigation. Their efficiency and benefits increase as a result of application of computer data registration and new technologies. Some of them are used very efficiently, some of them are less important, but the information about their potential is essential to officers [3; 9].

The Criminal Investigation Centre of the Lithuanian Police is the manager of two departmental registers: Dactyloscopic Data and DNA Data. The Dactyloscopic Data Register is the corpus of dactyloscopic filing. The Department of Information Technology and Communications under the Ministry of the Interior of the Republic of Lithuania ensures interaction with related registers and provides resources for the telecommunication network of the internal affairs. The register data are provided to the law enforcement authorities of the European Union Member States and countries having implemented the Council's decisions automatically via national contact centers. Lithuanian Dactyloscopic Data Register is managed via automated dactyloscopic identification system — CAFIS (*Cogent's Automated Fingerprint Identification Systems*).

In 2008 the European Union Council approved the so-called *Prüm Decision*¹³ for a better cross-border cooperation of law enforcement authorities. This EU legislation provides opportuni-

ties for checking information in the databases of another EU Member State based on the available DNA, finger prints, or vehicle registration data by using automated measures. The implementation of the aforementioned legislation in all EU Member States requires the implementation of a number of technical solutions. Therefore, the EU Council established expert subgroups for DNA and dactyloscopic data. Experts of forensic science investigations attend meetings of these subgroups [10; 12].

As more advanced technologies were developed for implementing the European Council Decision 2008/615/JHA¹⁴ on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border crime, in 2009 the Government of the Republic of Lithuania passed resolution «Regarding Approval of an Action Plan for Implementation of the European Council Decision 2008/615/JHA on the Stepping up of Cross-Border Cooperation, Particularly in Combating Terrorism and Cross-Border Crime» (resolution of the Government of the Republic of Lithuania, 2009). Based on this Resolution, in December 2009 the Criminal Investigation Centre of the Lithuanian Police replaced the Automated Dactyloscopic Identification System; it was operating based on the USA-Austrian company *Cogent Systems Gmb's* (now 3M Cogent, Inc) product (CAFIS) used by many countries in the world, including the European Union Member States. It is a high quality standardized product tested in practical conditions of foreign countries and a properly operating product which meets and ensures all the requirements applicable to Dactyloscopic Data Register (order of the Commissioner General of the Lithuanian Police, 2007) as well as the requirements of European Council Decision 2008/615/JHA on exchange of data. The purchase of this software was combined with the purchase of a lot of new modern equipment for central workplaces equipped at the Criminal Investigation Centre of the Lithuanian Police with additional dactyloscopic scanning equipment (LiveScan) installed at county police headquarters of the Lithuanian Police. Rapid identification devices were also purchased and installed at subdivisions of the Lithuanian Police and the State Border Guard Service under the Ministry of the Interior of the Republic of Lithuania.

CAFIS has given tangible results since installation, namely, automated mass comparison of

¹² URL : <http://www.statewatch.org/news/2015/apr/eu-council-prum-statistics-5503-rev2-15.pdf>.

¹³ Council Decision 2008/615/JHA of 23 June 2008 on the stepping up of cross-border cooperation, particularly in combating terrorism and cross-border crime // Official Journal of the European Union, L 210/1, 6.8.2008.

¹⁴ Council Decision 2008/615/JHA of 23 June 2008...

palm traces and palm prints previously converted and entered in the system. During this comparison, over 750 matches were confirmed, although the previous Automated Dactyloscopic Identification System has failed to identify them. «3M Cogent's Automated Fingerprint and Palm Print Identification System is a multifactor, scalable, and customizable software package that allows you to perform a wide range of tasks for processing, editing, searching, retrieving, and storing fingerprint images and subject records»¹⁵. The Criminal Investigation Centre of the Lithuanian Police currently operates CAFIS Version 6.1.

CAFIS System operates twenty fingerprints and palm prints. This has significantly increased the likelihood of identifying individuals. The prints are scanned by using 1 000 DPI thus ensuring the high quality of images. Scanned palm prints are processed automatically. The system has a quality control ensuring correct placement of finger prints on the electronic dactyloscopic card and makes a composite out of the dactyloscopic cards. The system allows to import and export a variety of image formats. Based on the consistent practice, latent palm traces are first processed by automated means, when general and individual properties of the papillary pattern are marked by the system. CAFIS can be accessed from distant workplaces. The system ensures *PRÜM* function. Digital images of the face and other distinctive features can be accumulated in the system when an electronic scanning device LiveScan is used for dactyloscopic scanning.

LiveScan dactyloscopic scanning device is compatible with CAFIS and allows taking twenty finger prints and palm prints without using a paint roller or dactyloscopic scanning. Thanks to the quality control mechanism, dactyloscopic scanning can be done by an officer having no qualification of a dactyloscopy specialist or dactyloscopic scanning skills. Scanned palm prints are uploaded to CAFIS for processing. CAFIS automatically processes the uploaded palm prints. This ensures speed and saves additional office and postage expenses incurred when mailing dactyloscopic cards to the Criminal Investigation Centre of the Lithu-

anian Police¹⁶. The equipment ensures EURODAC functioning.

The Criminal Investigation Centre of the Lithuanian Police together with the Department of Information Technology and Communications under the Ministry of the Interior successfully implements automated exchange of electronic fingerprint dactyloscopic cards with several foreign countries under the Project *ECRIS Fingerprint Exchange Network*. ECRIS is European Criminal Records Information System, where finger prints are used as an additional measure for identification of the EU citizens convicted in other EU states. Currently, the European Commission funds the Project «Improving Data Quality of EU Criminals», which will last 2 years. The main purpose of the project is to collect and generalize information about national individual identification procedures used by all Member States and to develop a measure to enable law enforcement authorities to promptly find out about the identification procedure applicable in a specific Member State as well as obligatory and additional identification data to be used.

Factors affecting the Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania. Lithuanian scientists did the SWOT analysis according to the project «Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania». SWOT analysis provides an opportunity to examine the strengths and weaknesses of the organization evaluating its ability to adapt to external environment changes. The respondents were given a thematic SWOT analysis questionnaire. Questions were based on theoretical analysis. Respondents rated the importance of each problem and the result achieved in a 5-point system. Relevance of factors in Lithuanian forensic science system is evaluated on a scale from 1 (not important at all) to 5 (very important). Operating results in this area are scored from 1 (completely unsatisfactory performance) to 5 (excellent performance). External factors (opportunities and threats) are listed in Table 1, internal factors (strengths and weaknesses) are listed in Table 2. A total of 103 respondents were interviewed — law enforcement personnel, including investigators — 32,0 per cent, specialists — 10,7 per cent, experts — 39,8 per cent, prosecutors — 11,7 per cent, others — 5,8 per cent.

¹⁵ CAFIS — Cogent Automated Fingerprint Identification System [Electronic resource]. URL : http://solutions.3m.com.sg/3MContentRetrievalAPI/BlobServlet?lmd=1318828957000&locale=en_SG&assetType=MMM_Image&assetId=1273693021373&blobAttribute=ImageFile.

¹⁶ Fingerprint recognition. Lithuanian police forensic science research center, methodical recommendations // *Daktiloskopavimas. Lietuvos policijos kriminalistinių tyrimų centras, metodinės rekomendacijos*. Vilnius, 2009.

Statistical analysis was performed using the SPSS. Reliability of Questionnaires was assessed using Cronbach's α coefficient. Calculation results show that in the analyzed case, Cronbach's coefficient $\alpha = 0,958$. This indicates that the questionnaire was drawn up correctly. This paper presents only a part of survey results.

After the analysis of test results, averages of evaluation were calculated. Assessment averages of external factors (opportunities and threats) are presented in Table 1.

The analysis of the research results shows that the importance of all the external factors was on average estimated at more than 3 points. The most important factors were the «Need for international cooperation and sharing of best practices with foreign investigating bodies» and the «Need for the renewal of criminal investigations tools, appliances, equipment and infrastructure». The analysis of the estimated performance averages shows that the results of all factors were estimated below the importance of problems. The average assessment of performance exceeds 3 points for only 1 factor, namely, «Need for accreditation». This factor can be seen as a major opportunity.

It can be stated that the share of assessment of the performance result of all factors comprises more than 50 per cent of performance importance. It means that all of the above-mentioned factors can be seen as opportunities. The results of research are summarized in Table 1.

The results of research suggest that there is a need for a lot of work to implement the Conception of the Vision for European Forensic Science 2020 in Lithuania and to improve international cooperation, although specialists evaluated Lithuania's potential sufficiently highly.

Assessment results of internal factors (strengths and weaknesses) are presented in Table 2. It may be noted that only the importance of three of the internal factors was evaluated on average at less than 3 points. These are the factors: «Need to have institution to coordinate the activities of all forensic science and forensic institutions», «Activities of the Coordination Council», and «Implementation of the research of the Vision 2020». The importance of other internal factors was measured above the average of 3 points.

The analysis of the estimated performance averages shows that the results of all problems were estimated below the importance of problems. The average assessment of performance exceeds 3 points only on 4 factors: «Workload of employees of expert institutions and officials of pre-trial investigation», «Qualification level (need for continuous in-service training)», «Level of communication and cooperation between the Lithuanian Police Forensic Science Centre and Lithuanian Forensic Examination Centre and other judicial and law enforcement authorities», «Duration of expert examinations». These are the key strengths. All other performances are listed below.

Given the importance of the problem assessment, it is possible to determine what part of evaluation of results has the importance. In this case, it can be stated that the share of assessment of the performance result of all factors comprises more than 50 per cent of operational importance. It means that all of the above factors can be treated as strengths. The research allowed to identify the main problems whose solution will contribute to the integration of Lithuania into common European space of forensic science.

Table 1

External factors (opportunities and threats)

Fext	Factor	Operating result	Importance of factor	Part
1	Need for international cooperation and sharing of best practices with foreign investigating bodies	2,57	4,06	0,63
2	Response to international crime	2,23	3,36	0,66
3	Need for accreditation	3,38	3,98	0,85
4	Need for creating a common database among all EU Member States	2,64	3,81	0,69
5	Regulation of unanimous evidence collection in the EU Member States	1,87	3,26	0,57
6	Joint forensic science exercises of several Member States	1,85	3,43	0,54
7	Need for involvement of other areas of scientists in the development of criminal investigations tools and methods	1,96	3,70	0,53
8	Need for continuous update of criminal investigations methodologies	2,15	3,75	0,57
9	Need for the renewal of criminal investigations tools, appliances, equipment and infrastructure	2,60	4,36	0,60

Table 2

Internal factors (strengths and weaknesses)

Fint	Factor	Operating result	Importance of factor	Part
1	Need to have institution to coordinate the activities of all forensic science and forensic institutions (need for scientific institution)	2,06	2,81	0,73
2	Part of specialists travelling to conferences and business trips abroad	2,90	4,07	0,71
3	Motivation for professionals	2,66	4,44	0,60
4	Qualification level (need for continuous in-service training)	3,27	4,45	0,74
5	Need for compulsory forensic studies, wider studies, more practical workshops	2,60	3,67	0,71
6	Need for long-term financing for the implementation of the Vision 2020 program	2,12	3,34	0,64
7	Workload of employees of expert institutions and officials of pre-trial investigation	3,46	4,30	0,80
8	Competitiveness of remuneration	2,57	4,43	0,58
9	Condition of forensic police station premises	2,56	3,99	0,64
10	Timely payment for forensic services by the courts	2,59	3,31	0,78
11	Activities of the Coordination Council	2,11	2,86	0,74
12	Legislation regulating the procedure for the appointment of private expert examinations and their legal effect	2,72	3,57	0,76
13	Financing of criminal investigation of offenses	2,56	4,16	0,62
14	Level of communication and cooperation between the Lithuanian Police Forensic Science Centre and Lithuanian Forensic Examination Centre and other judicial and law enforcement authorities	3,15	4,03	0,78
15	Duration of expert examinations	3,08	4,27	0,72
16	Appointment of re-examinations	2,73	3,33	0,82
17	English language proficiency level for investigating officers	2,45	3,75	0,65
18	Implementation of research on Vision 2020	2,01	2,94	0,68
19	Avoidance of application of expert bodies	2,55	3,45	0,74
20	Bridging the gap between science and practice of forensic science	2,81	3,84	0,73
21	Reduction of human resource shortages	2,97	4,24	0,70
22	Public attitudes to the work of investigating officers and crime investigation	2,80	4,07	0,69
23	Need for university-level programs that focus on the preparation of relevant experts in Lithuania	2,66	3,94	0,67
24	Need for political decisions on the improvement of law enforcement activities	2,23	4,14	0,54
25	Need for database update and rearrangement of Lithuanian expert examination institutions	2,86	4,08	0,70

Conclusion. Globalization affects not only the economy and politics. Criminality also becomes an international process. Successful investigation of crimes requires international cooperation among lawyers and criminalists. Speed of forensic data exchange is of great importance. This can be realized using modern innovative information technologies. The e-Justice and Forensic Data Exchange Systems are being implemented in the EU. Lithuanian law enforcement are joining them.

The Council of the EU, acknowledging the relation of freedom, security and justice triad with criminology, has made a step in the development of forensic sciences from the national to the international level thus creating conditions for entering optimal security of the EU: confirmed the docu-

ment of strategic importance — the Conception of the Vision for European Forensic Science 2020. Exchange of data between the EU Member States requires unification of the data because individual forensic science data systems applied in each Member State complicate cooperation and automation of data exchange. So far, only some of the EU Member States (including Lithuania) take part in the active forensic data exchange process. The E-Justice portal still does not enable forensic data reporting and exchange. It must be addressed not only by improving technical solutions, but above all, by developing a common European legal framework.

The European Council emphasizes the important role of the exchange of information, including biometric and other data, in crime investigation,

prevention and combating. It is important that, where necessary, Member States support, complement and enhance the free movement of information crucial for law enforcement. *Prüm* functions implemented in Lithuania provide investigators with opportunities to use dactyloscopic data systems not only at the national level but at the international level as well. EURODAC and ECRIS systems provide new opportunities for the identification of individuals in the international environment.

Our research and the SWOT analysis provided the opportunity to examine the strengths, weaknesses, threats and opportunities of Lithuanian forensic system. The research has shown that for both the external and the internal factors, all performance results were rated below the importance of factors. This shows the need for improving the organization of Lithuanian forensic system and the performance of criminal investigators. But while determining which part of the importance evaluation includes the evaluation of

results, it can be said that it comprises more than 50 per cent for all factors. This means that practically all of the analyzed factors may be viewed as strengths and opportunities. It also means that Lithuanian criminologists have good prospects of integrating into the common European space of forensic science. The following factors may be identified as the main strengths: «Workload of employees of expert institutions and officials of pre-trial investigation», «Qualification level (need for continuous in-service training)», «Level of communication and cooperation between the Lithuanian Police Forensic Science Centre and Lithuanian Forensic Examination Centre and other judicial and law enforcement authorities», «Duration of expert examinations». However, it is necessary to stem the majority external and internal factors. The results of research will be used in the second stage of the project «*Conception for the implementation of the vision for European Forensic Science 2020 in Lithuania*».

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БИБЛИОГРАФИЧЕСКОЕ ОПИСАНИЕ СТАТЬИ

Биливичене Т. Развитие криминалистической информационной системы в контексте международных отношений / Т. Биливичене, Э. Биливичюте, Р. Дракшас // Всероссийский криминологический журнал. — 2016. — Т. 10, № 3. — С. 579–589. — DOI: 10.17150/2500-4255.2016.10(3).579-589.

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BIBLIOGRAPHIC DESCRIPTION

Bilevičienė T., Bilevičiūtė E., Drakšas R. Development of forensic science information system in the context of international environment. *Vserossiiskii kriminologicheskii zhurnal = Russian Journal of Criminology*, 2016, vol. 10, no. 3, pp. 579–589. DOI: 10.17150/2500-4255.2016.10(3).579-589. (In Russian).