

DIGITALISATION IN THE CRIMINALISTICS

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Abstract: In this paper the authors attempt to briefly characterize the specific evolution in criminalistics in recent years. Basic evolutionary processes concentrate not on biology and genetics, despite this area is preferable by practitioners. The biggest changes in objects for research are concentrating in digital traces. Similar evolution in content and scope of methods and their parts are oriented on digitalisation processes. Especially documentation of criminalistics traces including traces ensuring, and criminalistics or forensic methods and processes in connection with their relations, applications and technologies. Authors analyse this non-marginal actual situation, needs and possibilities for the explanation of their place, importance and relatives in the system of criminalistics, too. These are recognized in the uncovering and clarifying activities performed by police officers. Authors demonstrate the ground conditions under which such crimes are revealed and documentation is effective with criminalistics methods. This study is a free continuation of the knowledge presented in 2018 at Archibald Reiss Days. The study is the result of the project Security Centre of Excellence research European ESF grant no. NFP26240120065.

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INTRODUCTION - SIGNIFICANCE AND CONTENT OF CRIMINALISTIC DOCUMENTATION

Content of criminalistic documentation, as well as the content of the term is connected predominantly with the process of criminalistics research (Krajník, 1996) and criminal investigation (Viktoryová & Blatnický, 2007).

Criminalistic research begins at the very moment of searching the criminalistic trace. Therefore, the criminalistic documentation is a part of criminalistic

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research and is liable not only to its rules and the principles valid for criminalistic methods, but the substantive influence upon its form and content are born also by other procedural principles – principles connected with the technology of its acquirement. From the most commonly practical usage of the outcomes of criminalistic documentation it is obvious that it should count the principles related to theory and practice of criminal investigation and penal process (Kurilovský, 2018).

The structure of the content of criminalistic documentation is afterwards the reflection of developmental trends in cognitive processes and technologies, which the documentation is based on. This is mirrored in particular ways – some authors talk about methods and others about types of criminalistic documentation in general, as well as about other forms – the majority of authors, however, do not distinguish this fact and they talk only about the types of documentation (Straus, 1999, Doležalová 2012).

Substance of documentation

Basic tasks for documentation are not oriented to one way only. Criminalistic traces are oriented, but also every interference and manipulation with the criminalistic trace. These facts are taken into account not only in the criminalistic research, but also in the criminalistic identification. Traditionally, criminalistic text books emphasized the documentation of traces, however the need for documentation of processes related to searching, asking research and research of traces in broader context were minimized in practice.

Criminalistic traces are submitted for the criminalistic research in the form of:

- criminalistic documentation,
- traces ensured “in natura”.

The aim of criminalistic documentation is predominantly to ensure all the objects - especially criminalistic traces and especially those, which are hardly insurable “in natura”.

The core of the documentation is therefore ensuring of traces and objects related by information and the surroundings. By means of ensuring, the criminalistic traces are submitted for criminalistic research in several ways – methods of ensuring:

- In natural form – „in natura“,
- By ensuring the signs of functional and dynamic manifestations,
- By scanning the outside signs,
- By imprinting,
- By casting,
- By making photographs,
- By drawing,
- By describing,

- By ensuring memory traces by describing and ensuring the signs including of functional and dynamic manifestations (witness, etc.).

From the mentioned results, the criminalistic documentation is, apart from other and predominantly, the means for ensuring the criminalistic traces for the purposes of criminalistic research.

Object of criminalistic documentation

Object of criminalistic documentation is the process (approach) of:

- Providing the criminalistic traces for research, and
- Providing the documentation of the course and results³ of criminalistic research.

Forms and ways of criminalistic documentation

Style, or in scientific knowledge often called method and form of manifestation, have in the knowledge, research and substantiation very close – immediately existential relationship – one cannot exist without the other. In the criminalistic documentation it is the same in scientific point of view, or different in connection with prescientific or practical point of view.

Methods of criminalistic documentation

In their substance, criminalistic traces are provided and presented in four ways, in the criminalistic understanding – methods – for the purposes of research by means of criminalistic documentation:

- In writing,
- Acoustically,
- In optical records (a form of photography), and
- Topographically.

Within the criminalistic documentation we could still talk about a more general division into methods of displaying and methods of describing.

Forms of criminalistic documentation

Criminalistic traces, or their displaying in a form of a record, are ensured and presented for the purposes of research by means of criminalistic documentation. Form is the outside manifestation of the respective method. Criminalistic documentation often comprises the combination of methods:

³ Including their presentation, e.g. during the trial.

- With the written method we actually present forms of our conditions – minute-books, references, statements, record (written);⁴
- With the method of acoustic record it is most often in all forms and formats of phonogram;
- With the photographic method (optical records), there are very lively forms – photographs, photogrammetric record, holography, film record, video record;
- With the topographic method we talk about the forms such as sketches, plans, schemes, and graphs.

In some criminalistic concepts of criminalistic documentation, video-documentation, TV documentation, PC documentation, or other similar concepts appear as independent concepts. We put all these forms among the above mentioned ones.

Not all the forms of documentations have to be used for successful result and fulfilment of the aim of criminalistic documentation. Methods and forms of documentation are chosen according to the need, in order to reach the determined aim.

Defining the term and content of criminalistic documentation

Different problems are connected with trends of criminalistics definitions of criminalistics documentation. One of this is problem non acceptance of documentation as a self-standing method in criminalistics which is historically conditioned probably for hundreds of years. The second one is connected with the concept of criminalistics research oriented only to the “white coats researcher”. In this concept based on similar orientation as in forensics concepts, only onto technique, it is not an accepted need to make research in investigators activities, from crime scene investigation to recognition or interview.

Attempts of defining in criminalistic documentation

In some criminalistic text-books the criminalistic documentation is denoted as specific criminalistic method. We are also of the opinion that criminalistic documentation fulfils the needs of criminalistic method in the entire range and it is, therefore, an independent and special method of criminalistics – in the sense of method classification (Krajník, 2005). There is an open theoretical discussion whether it is the method of criminalistic tactics or the criminalistic technique. Our opinion is that it is the tactical method with the significant utilization of technical tools and approaches. The problem may be in the fact that criminalistic

⁴ Term “protocol” was taken from the Czech language into the Traffic Service, however, it can be accepted only as a jargon. Specific problems are connected with transformation and language translation into English. English reality is fully different from Slovak, Czech or German one. But we need make transformation in language content.

documentation has been perceived for a long time as the photographic documentation, somewhere commented in a broader scope also as video-documentation, PC documentation, etc. (Metenko, 2008).

Instead of using the term criminalistic documentation when characterizing the criminalistic documentation, several authors use the term fixation as the synonym.⁵ According to Musil, however, it is more suitable to use the term documentation, which is in the language of criminalistic practice generally used. The process of fixation constitutes only of the part of documentation activity. Fixation as a synonym is used also by Straus, who works with criminalistic-technical documentation and mentions that it is one of the most important sources of permanent and objective information.

Musil understands the criminalistic documentation as a complex of activities of the investigator, retrieving body, operative–searching body or expert from the field of criminalistics, realized with criminalistic actions and oriented towards objective and permanent interception of criminalistically relevant information. He calls the criminalistic documentation also the result of this activity. (Musil, 2008)

Problematic of criminalistic documentation is also dealt with by Hupka. He characterizes it as a specific method of criminalistic clarification, which documents, in a verbal and visual way with the assistance of technical tools, the course and results of investigative actions and expert research, and by means of accessible forms it documents material situation and status of relevant objects in the sense of criminalistic recommendations. (Šimovček, 2008)

Criminalistic-technical documentation is for some Czech authors one of the most important sources of permanent information, it is a reflection of the course and result of time, space and, under certain conditions, performed actions and the used criminalistic and criminalistic-technical methods, ways and means of fixation of course and results of these specified actions (Suchánek, Porada, Padyšák, 2002).

Relation of criminalistic documentation to criminalistic-technical methods is manifested mostly in criminalistic expertise and criminalistic-technical research. For example, snapped trace, as a disputable material with visible marks can serve for the comparison with traces from other unsubstantiated scenes of crime or with the snapshot of comparing trace of a suspect. Similar relation can be seen with the comparison of micro-photographs of dactyloscopic, mechanoscopic traces and micro-traces. It is used for a production of snapshots from the research and comparison with the use of comparative microscopy.

Very often used is also the comparative method – connection of visualization of two photographic snapshots. Each of the compared objects is photographed separately and the snapshots are cut in a way, so that the cut goes through the highest number of identification signs.

⁵ Fixation means stabilization, capturing of something in some shape or state.

When connecting the snapshots, the identification signs continue through the cutting line from one snapshot to another one.

That is the evident proof of utilization of the criminalistic documentation as a method of research of criminalistically significant objects. But all of these concepts are not oriented to general object of criminalistics – all criminalistics traces, not only technical. Those concepts did not accept tactical objects, traces as memories and tactical methods.

Relation of the documentation towards criminalistic-tactical methods is manifested especially in the fact, that basically documentation is an inseparable part of all criminalistic methods. Its significance is vividly expressed predominantly during interrogations, reconstructions, proving the statements on the spot, recognitions, searches of premises, criminalistic experiments, criminalistic versions, etc. Information snapped during the actions is used by almost every investigator participating in the process of detection and clarification. Such documentation later serves also as evidence. Research and assessment of information from the evidence can also lead to identification of persons and things. For example, minute-book on recognition has to contain data on who, when, where and why performed the action, under which conditions, who the identification person was, which object was identified, content of instruction of participating persons, how many and which objects were included, what the level of their similarity was, what the trail was of individual identified acts, what their result was, etc. (Krajník, Straus, 2002)

By criminalistic documentation we most often understand the process of verbal and visual ensuring of traces, things and relations among them, as well as other relevant information about the course and results of criminalistic and expert search, ensuring and research. In the same way we assign the results of this process, which can have different form (Metenko, 2007).

Criminalistic documentation constitutes a complex material about the course and results of all used criminalistic methods in the particular case. Documentation is also a tool of recognition of what happened in the past and what left its reflection in the material environment (Suchánek, 2014).

Definition of connections of criminalistic documentation and modern technologies

Recent post-modern human society is characterized by the development of new technologies. Automatic processing of data and information is being developed, which penetrates into all areas of life. Similarly significant becomes also their transmission, especially as a tool of management of complex processes in various, predominantly technical aspects of life. Fast development in the area of information and communication technologies has a direct influence upon all the areas of today's society. Integration of telecommunication and information systems en-

ables acceleration and better reliability of processing, storage and transmission of information. It happens with no respect to distance and way of communication, which opens a broad spectrum of possibilities in both positive and negative way. This development, in a positive sense, creates and supports enormous economical and social changes also in the Slovak Republic (Metenko, 2004).

Technique and technologies are generally created for the purpose of serving people. Development of information and communication technologies (ICT) is very fast. Capacity value of the technique and technologies grows, but the number of areas where they are used grows, too. Worthily this is preliminary implicated in government services.

Practically, there is no sector of human activity today where we cannot see the electronics and its applications. For the period of the near future even greater and deeper integration of information and communication technologies with other ones, recent home and office appliances (TV set, telephone, fridge, etc.) is going to be typical. We will be surrounded by technologies everywhere and in broader extent (Rak, 2000).

Capacity value of profession, but also the realization of free time, is more and more dependent on correct, reliable and uninterrupted performance of complex computer and communication systems. In their way, the information and communication technologies started to create a new form of behaviour of individual subjects in economical and management sphere. These technologies significantly influence our daily life. Development is so fast, that tracing new information is a must, otherwise a huge gap between the reality and knowledge rises. Information technologies expand very quickly also into a daily life and a very fast development in the area of technologies themselves occurs at the same time.

We can state that the phenomenon of criminality is a social appearance, which is directly connected with the societal development, with the development of the mankind. We can also state without any doubt that as the development of human civilization in different communities is on different levels, the criminality development has its shoals and peculiarities, too and it does not develop in an immediate connection of direct proportion with the advance of the mankind. Knowledge of criminology, as well as development of criminality within Slovakia (Chalka, Holcr, Holomek, 1998), point out that democratization trends in societal relations lead to their release, but at the same time, to the growth of criminality. Therefore, the level of security gets worse and investments into security and safety significantly grow, with this, logically, by the use of modern technologies and technique. To the third instance, we take the liberty to state the premise also towards the question of mutual relativity of societal advance and its structures against "development of technologies of criminality". It is so, because technologies and technique are used in every human activity not only for the positive aims, but naturally for the negative, even abject aims. Neither the technique, nor technology has the possibility to select the result or the way of its accomplishing.

This feature is own only to the human as a creator and, at the same time, abuser of the mentioned “means for improvement of life”.

Trends and future of criminalistic documentation

Accepting the before presented means, we prefer in the future all trends and possibilities in criminalistics documentation. Preferable are technical and technological processes especially ICT and their application and concept of transmission documentation outputs due to digitalisation forms as actual trends all over the world.

In their paper related to the relation of traffic accident documentation, as a specific case of criminalistic documentation, towards knowledge and principles of criminalistics about documentation, Krajník and Meteňko (2004) state that there is not a principal difference between the criminalistic documentation and the traffic accident documentation. In this case of the broadest aspect, too, it is an example of application of the knowledge of criminalistics as a general source of knowledge about traces and their handling, for the particular and narrower intention of police sciences and a need of traffic-safety actions, as the main subject of Traffic Police service performance and related methods and processes (Holomek, Stacho, 2001, *sim.* Peťovský, Lofler, 2017). Other basic knowledge we present in the past as a part of criminalistics education processes and training for the criminalist, especially for technician as outputs from any other scientific researches (Metenko, Metenková, Rybář, 2013).

Such sort/method of criminalistic documentation is often, still only in some text-books, marked as computer documentation. Considering our questions of terms computer, information, cybernetic, digital (Metenko, 2004), we suggest to use the term digital documentation for the purposes of complex documentation realized in the digital format.

As an active possibility, we present frequent cases of solving the criminalistically relevant events in a form of the so called “small traffic accidents” under a time stress led to the requirement for a fundamental fastening and making effective the traffic-safety actions, which can, in their substance, serve also for other ways of technical, organizational, legal, and criminalistic solving of documentation of the scene of criminalistically relevant event.

If the member of Traffic Police, in our case in the position of a criminalist, talks over a traffic accident in a block proceeding, or if there is no other substantiation performed in that case, he/she will fill in the record on traffic accident. In this case such documentation will contain the sketch of the situation from the scene of traffic accident and the photo-documentation (Felcan, 2003). Thus, simplified and accelerated graphical ways of documentation based on photographic documentation substitute classical ways – written, topographical, with the common forms – minute-book, sketch, plan.

Attached negative of photo-documentation, however most frequently the visual information recorded in electronic form on magnetic or optical carrier, enables – thanks to its statement value, accuracy, availability and objectivity – gradual substitution of relatively complex, demanding, and thus expensive ways and forms of classical documentation. Photo-documentation in an electronic form is stored and archived in compliance with the specific regulation (Nariadenie, 2002). That is exactly the example and possibility of how the legal norms, although so far only on internal level, can accept the quality of electronic/digital carrier of information (Štefanovská, Meteňko, Hrvol, 2003). Members of the Traffic Police do not prepare the plan of the scene of traffic accident and the minute-book on the search of spot in mentioned case anymore (Felcan, 2003).

It is very important to mention here that the results and individual methods of measurement to a large extent are used by experts called to the reconnaissance of the scene of traffic accident, but especially for the purposes of working out the expert opinion. More complicated methods and processes, which require relatively time-consuming progresses and, of course with the demanded accuracy, and for which there is not created sufficient time space during the search of the scene of traffic accident, are applied predominantly by the forensic engineering (Bradáč, Porada, Straus, 2001).

Measuring on the scene of traffic accident is *de jure* considered as one of the most important and demanding activities. However, it is also very time-consuming as such and those are the reasons, which lead to its unification and making it effective. Such practical experiences from the traffic-safety actions enable the criminalistics to utilize the processes and techniques, which are used as a result of criminalistic or traffic-safety, or forensic engineering research (Porada, 2000, Porada, Vajda 1993).

There are three basic ways of measuring on the scene of traffic accident, which are known from practice and used for a long time – similarly as with the work on the scene of any other criminalistically relevant event:

- Method of rectangular projection,
- Measuring by intersection method,
- Measuring by triangle method,

which are known and used also in other criminalistic practice. Through their development the criminalistic documentation climbed to stereo-photogrammetry, which happened to be the most effective method used in the criminalistic documentation for a long time. It was exactly the development of computer technique and software, which enabled the further development and which we can observe even today.

But not only classical stereo-photogrammetry outputs are the base for actual and perspective using. Application of classical photogrammetry to new technologies application such as a laser, polarised and other frequency of light using is the basis for its future. But technological development and evolution of application

was based on photogrammetry and actual application is really complicated and needs huge specialised equipment and knowledge.

In the past years, with respect to already mentioned process of effectiveness, the mentioned classical and photogrammetric advances have been accompanied with the fourth method, based on the utilization of connection of photographic documentation, known geometric principles with the use of computer technique and measuring (Felcan, 2003) - rectification of photographs with the assistance of PC – Rect, which the Traffic Police of the Police Force has started to use in on a large scale since 1998.

This, but also other new demonstrated progresses and methods of utilization of favourable parameters of visual information record about traces, realized in electronic ways on magnetic and optical carriers, enable gradually to realize effective progresses and methods in criminalistic documentation, too (Metenko, M 2018). These significantly shortened the reaction and action times connected with the documentation of criminalistically relevant scene, eventually event (Metenko, Baĸikov, Samek, 2008). Taking into account the mentioned possibilities and needs of development, it is desired to prepare new criminalists in a way, so that they are capable to handle the needed technique on a standard level, accordingly to the needs of developing practice. Recent stage in this field requires overcoming several types of resistance related to application of technique, which permits such a progress. Primarily, it is the disbelief of one's own abilities and skills, and then the overcoming of routine connected with the utilization of usual or rather common advances.

DIGITALISATION OF TRACES

In examining our issues, we have come up with a discussion with interview researchers on the answering sheets of the question of what is and may be the content of police, especially criminal, filing and database systems. That is, basically the basic group of information police systems that are under investigation. Our knowledge thus led to the need to solve the problem of duplication of classical criminalistic traces, e.g. traceological, dactyloscopical, ballistical or other, which are ensured during their reinsurance or exploration - recorded as their digital image (Metenko, 2010).

Criminalistics has not solved this problem for a long time and leaves the system of work with traces - where they include their digitization, for individual forensic areas, or rather individual experts who directly deal with archiving, filing and increasingly their research in digitized form.

Despite the seeming simplicity and smoothness of digitizing criminalistic traces, there are at least a few issues that will need to be resolved systemically in the future. These relate to acceptance problems, whether in the whole of criminalistics or in the individual sectors of investigation of criminalistic traces. Above all,

there is the question of the originality of the examination and the accuracy of the display. This is certainly related, for example, to the issue of digital record resolution, which then limits not only the accuracy of the survey, but also the format of the appropriate record, the possibility of transforming the record into other - for example, foreign information systems.

Given the scope of the issue, which is far from being related only to the criminalistic documentation of criminalistic traces, but also directly to their examination and research - for example, methods of comparison and its automation. Practical knowledge of critical factors related to the digitization of forensic traces would be appropriate to examine the future, for example, on the findings of criminalistic dactyloscopy. In the field of digitization of the dactyloscopic record, this sector was probably the most widely used in criminalistic practice (Metenko, Masnicova, Nemethova, Deščikova, 2010, *sim.* Nemethova, Marak, Hambalik, 2014).

In addition to dactyloscopy, these problems are already directly related, for example, to the field of criminalistic/forensic biology, ballistics and are also intensively being introduced in the field of trasology and mechanoscopy. The timeliness of the issue is a challenge for criminalistic/forensic research, which has to address the issue now.

Since this problem is not a major issue in our work, it is advisable to orient ourselves on this issue by analyzing the signs of the digital traces, which formed the very analysis devoted to this issue published last 2018 at such a conference in Odessa (Metenko, J. Metenko, M., Metenkova, 2018).

CONCEPTIONS OF DIGITAL DOCUMENTATION

General requirements for such a complex form – digitalized documentation – come out from our researches, so far realized within the project 9/2008 - Methods and advances of work at the scene of crime. The task is being solved by the Academy of the Police Force in Bratislava. Solving of the task is long time planned for the period 2008–2021. It comprises a realized international project with a perspective of utilization of European funds, which already presents its outcomes also in this area recently (Metenko, 2008).

By means of applying the gathered data we can set a group requirement for the digital criminalistic documentation. This requires especially:

1. Full value implementation of electronic file,
2. Automatic records of all relevant registry documents (records and files),
3. Automatic creation of all records instruments (e.g. registry diary) in electronic and printed form,
4. Automatic assigning of number of the report and number of file,
5. Unified formal layout of records from the work of organization – set of templates, generating of number of the paper (our brand), etc.,

6. Control of all obligatory data,
7. Automatic circulation of records in electronic form with the use of scanning,
8. Monitoring of working out the records and files.
9. Maintenance of the history of record and file,
10. Sophisticated and fast search of information,
11. All needed functions for the administrator of registry, e.g. yearly balance of files, etc.

At the same time, the application has to go over the scope of requirements valid for the area of registry and are presented for the set up by the legislation and has to meet the requirements of criminalistic digital documentation. Basic problem is a long time of acceptance in legislation in Slovakia. Finally late last year – 2018 we started testing digitalisation in processes of criminal and investigation files in Slovakia.

For the fulfilment of operation demands in the field of crime scene, but also the entire criminalistics, inclusive investigation, it is required, after our research in the project Security Centre of Excellence research European ESF grant no. NFP26240120065:

1. To create central storage of all documents;
2. To have fully electronic internal correspondence within the organization, without the need of paper sheets;
3. In an electronic way to pass any documents for communication, marking, requesting the consideration and approval – support of process management;
4. To provide fully electronic circulation of special types of files (abstract sheets);
5. To create the grounds for gradual full automation of all administrative activities and process management of organization, e.g. process of elaboration of delivered invoices, etc.;
6. To have the possibility to use secure electronic signature;
7. To have integration with other applications;
8. To create the grounds for gradual full automation of all administrative activities and process management of organization by means of building further specialized applications.

General scenario of work with the system is as follows:

1. Electronic registry⁶ records the delivered record and sends the addressee (organizational unit) within the organization;
2. Responsible employee in the organizational unit assigns the delivered record to the contact person for processing and determines instructions for processing;
3. Contact person inserts the delivered record into the file or creates a new file for the record;

⁶ In our case, it is recently substituted by the system “Evidence / KEU NEO“, until the complete application of electronic file in the Police Force is done.

4. Contact person executes the file (creates sent/internal records in the file, inserts delivered records into the file, gives to understanding, requests remarks, prepares responses, etc.);

5. Within creation of the response (sent record) the contact person uses the process of approval and signing;

6. Contact person marks the file as settled (after eventual control of the superior) and then as closed (after eventual control of the superior);

7. File is saved in the reference registry, after operation period – currently 2 years, it is transferred into registry centre; and

8. After passing the period of deposition the file becomes a subject of the process of deletion.

System has to provide extensive and rich functionality – it has to be sufficiently universal. Even in spite of demands, the work with the system has to be simple as each of the users has at his/her disposal only those parts and functions of the system, which he/she needs for his/her work, independently from his/her category in which he/she is assigned (e.g. registry employee, criminalistic technician, contact person – shortened investigation, investigator, head of organizational unit, etc.) (Metenko, 2010).

Among the most important requirements for the legal adjustment of operational registry administration belong:

1. Distinct identification of records and files,
2. Elaboration of every record within the file,
3. Keeping the prescribed way of manipulation with the file – from its origination up to archiving/deletion,
4. Maintenance of related documentation about the registry administration.

Application has to meet all the legal and security requirements all the time, and it has to ease and simplify work and administration – maintenance for the registry of the entire Police organization at the same time.

Functionality for the registry administrator

Application provides the registry administrator with all the functions necessary for professional maintenance of registry, which is required by the legislation.

In bigger organizations, which have several registry administrators, it is possible to define various roles, that is individual role for the central administrator and the roles for local registry administrators. Central registry administrator has access to all files/records within the entire organization and is allowed to perform functions related to the whole organization (e.g. actualization of registry plan, actualization of template categories, yearly balance). Local administrators have access only to selected part of files/records and perform work related to this part of data (e.g. yearly balance of files, transfer into registry centre, etc.). For his/her performance, the registry administrator has an independent portal at his/her disposal, which appears after switching into particular role.

Application offers the following functions:

1. Maintenance of registry plan,
2. Maintenance of types of files (template categories,
3. Balance of the current year,
4. Collective balance of accumulating files,
5. Yearly balance of files,
6. Transfer of files from the reference registry into registry centre,
7. Deletion proceeding,
8. Schemes.

Guaranteed management and flow of information and documents are essential for a safe and reliable operation. It concerns “Document Management and Workflow”,⁷ administration of standard documents and transition for the use of intelligent documents.

System for administration of documents (Document Management System - DMS) is a computer system or set of applications used for tracing, management of circulation and saving electronic documents and visions of paper documents. It includes capturing, searching, fulfilment, safety, archiving, destruction, work advances (workflow), authentication and approval of documents.

The most frequent cases of application of the Document Management System in practice, from which it is recently possible to swab in the current police operation:

1. Publication of documents, annotations and marking up, scanning, OCR and archiving of documents,
2. Intelligent forms,
3. Electronic file, electronic signature, authenticity and safety of information.

Requirements for systems of paper circulation management are of broad scope; generally, they can be divided into several categories:

1. Functional coverage of all “lively” stages of papers (origination, complementing, marking up, flow of information, arrangement, storage for necessary period),
2. Inerrability (Inerrability with other systems, multi-functionality and open architecture of services, that is cooperation with applications on the level Web Services and XML),
3. Safety (certification, support of electronic signature, security of the document during its entire viable cycle, ability of audit and tracing selected actions independently on application),
4. Legislation (e.g. archiving in compliance with valid legislation),
5. Technology (platform of electronic document based on recognized open standards, independency of document from application, minimization of user restrictions, optimization of widening of technical tools, stability of future development and support).

⁷ As components to see on: <http://www.anasoft.com/sk/pages/dms.shtml>

For the purposes of safe operation of the system of digital criminalistic documentation and electronic file, the key criteria of safety are secured by the document:

1. Intimacy – securing the content against abuse,
2. Authorization – who and what is allowed to do with the document,
3. Responsibility – what the particular person did with the document,
4. Integrity – attestation that the document was not changed,
5. Originality – verification of the origin of document,
6. Indisputability – guarantee that person cannot deny his/her own signature on the document.

POSSIBILITIES AND TECHNIQUES OF ASSURANCE OF RELIABILITY IN DIGITAL COMMUNICATION

Our opinion is, that each one of us can imagine realization of the entire documentation in such form – as we showed on the example of students in connection with the training reconnaissance and work on the crime scene. Significant problem connected with the application of modern technologies is the question of need and possibilities of verification of originality of results of this activity – digital (electronic) documentation.

One of the possibilities is the electronic signature, which is already adjusted by the law and it is used in some performances (bank sphere, state administration and control, etc.). Electronic signature is defined by the Act on Electronic Signature No. 215/ 2002 from 15 March 2002 and on amendments of and supplementation to some acts. From its provision § 2 the following important terms result for the purposes of our analysis:

- a) Document is any final non-empty sequence of signs,
- b) Digital document is a numerical coded document,
- c) Electronic document is a digital document preserved on a physical carrier, carried or elaborated by technical means in electronic, optical or other form,
- d) Signed electronic document is electronic document, which the electronic signature was created for, if this electronic document is accessible together with electronic transcription of the given document.

This problem is addressed in a more detailed way, for example, by D. Gregušová (2003) or Z. Veiner (2003) in the Czech provenience.

Steganography is another possibility of quality protection of the content of digital communication against penetration into the content – respectively, possibility of decoding the information about such penetration. Considerably simpler possibilities of control provide system logs, but also usual documents, created or revised by the users. In many cases they provide information on authorship and time data (the so-called time tokens), performing particular actions (Metenko,

2004). We can find such data in a form of “metadata“, with manifold formats of digital communications.

Apart from classical possibility to find out information about the file and its handling from the content of the so-called “document revision” in the well-known MS Office, pdf formats, etc., using of steganography as control steganographic techniques is much more sophisticated form. The most effective of them appears to be the technique of “digital watermarking“ (Čandík, 2004).

Even though the original purpose of use was the covering transition technique, its utilization for the purposes of verification is very suitable.

CONCLUSION

Actual action in Slovak Police is based on the SAP system (Metenko, M 2018). The use of information systems in police activities or in criminalistics is not at such a level and is not used to the extent that it offers information value. In particular, the use of combinations of different information systems for obtaining information useful for criminal investigation is underused. Paper forms of forensic documentation clearly show the same level of inefficiency and inaccuracies in criminal documentation. The need for intensive integration into a single information system has also been confirmed temporarily. In the follow-up research discussions, the need for a unit information system that has not yet fulfilled any partial integration efforts (a unit lustration console, integration in SAP) has been expressed.

By analysing and evaluating research and knowledge in the field of information systems for the needs of police activities, it was also possible to state by comparing the years 2015 and 2017 that the use of information systems in police practice is expanding. There is a large number of information systems that provide the necessary information support to detect and clarify crime in clarifying crime. But their effectiveness is low just because of their disintegration.

By analysing research results in the digital traces, we find a much worse situation. Knowledge, orientation, practical skills and the ability to respond to the new digital footprint environment are alarmingly inadequate. Also, entities directly responsible for investigative processes are not, according to the results of their testing, eligible for qualified activities linked to the processes of searching, securing and investigating this type of track. Perhaps only the immediate onset of training and training activities would help minimize this handicap, with an expected increase in the usable digital traces for investigating all kinds of crimes by 80 percent by 2020.

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REFERENCES

1. BRADÁČ, A, PORADA, V, STRAUS, J, (2001) *Soudní inženýrství*, PAČR Praha 2001, ISBN 80-7251-059-2.
2. CANPEAN A., COPREN C., NAIBA I. D. (2008) Technical applications of Spheron Tecnology in car crash investigation, Ed. Meteňko, Bačíková, Samek. „*Pokroky v kriminalistike 2007*“ Zborník z medzinárodnej konferencie 5.11.2007. A PZ, Bratislava 2008. (190s.) ISBN 80-969471-0-9. EAN 9788096947102. s. 167 a nasl.
3. ČANDÍK M. (2004) Steganografické prenosové techniky. In.: Kubíková, I., Samek, M., *Kriminalistika jako teória, praktická veda a učebná disciplína*. Zborník z medzinárodného seminára: Bratislava 2004, Akadémia PZ v Bratislave. ISBN 80-8054-338-0 (180 s.) s. 59-63.
4. DOLEŽALOVÁ, B., (2012) *Kriminalistická technika*. - 1. vyd. - Pezinok: Stredná odborná škola Policajného zboru, 2012. - 117 s. ISBN 978-80-970154-2-8
5. FELCAN, M, (2003) *Dokumentovanie miesta cestnej dopravnej nehody*, Bratislava, Akadémia PZ v Bratislave. 2003. ISBN 80-8054-285-6. (2003), - s. 32-50. (2003), - s. 19-20.
6. HOLOMEK, J., STACHO, P, (2001) K pojmom policajné orgány, policajné služby a policajné činnosti. In. *Policajná teória a prax* 4/2001, ročník IX. Akadémia Policajného zboru v Bratislave. ISSN 1315-1370. s. 6 - 15.
7. HOLCR, K., Akadémia PZ, Akadémia PZ, Akadémia PZ, 2008 Výsk 139
8. METEŇKO, J., (2010) New aspects of using criminalistics documentation. In. *7th International symposium on forensic sciences 29th September - 1st October, 2009, Piešťany - Slovak republic*. Kriminalistický a expertízny ústav Policajného zboru. Bratislava 2010. 229 s. ISBN 978-80-969471-5-7. EAN 9788096947157. s. 16-40.
9. METEŇKO, M., (2018) *Stopy v informačných systémoch*. Dizertačná práca, Katedra informatiky a managementu Akadémie Policajného zboru v Bratislave, školiteľka doc. RNDr. Ľudmila Gragušová, CSc.. Bratislava 2018, 167 str.
10. MUSIL, J. (2008) *Podstata kriminalistickej dokumentácie*, 2008, s. 203-210.
11. PEŤOVSKÝ, M., LÖFFLER, B., (2017) Teoreticko-metodologický rozbor prípustnosti zásahov do základných ľudských práv a slobôd pri výkone policajno-bezpečnostných činností. In *Teória a prax vyšetrovania - interdisciplinárne aspekty : zborník vedeckých prác*. Bratislava : Akadémia Policajného zboru v Bratislave, 2017, s. 185.
12. PORADA, V, a kol. (2000) *Silniční dopravní nehoda v teorii a praxi*, Linde, Praha 2000.
13. PORADA, V, VAJDA, L, (1993) *Metodika vyšetřování silničních dopravních nehod*, VŠ dopravy a spojov, Žilina 1993.

14. RAK, R. (2000) *Informatika v kriminalistické a bezpečnostní praxi*. Praha, Policejní prezidium ČR, 2000. (471),
15. SUCHÁNEK, J., a kol. (2014) *Kriminalistika*, 2014, s. 310.
16. SUCHÁNEK, J., PORADA, V., PADYŠÁK, P. (2002) *Kriminalistické praktikum*, s. 109.
17. ŠIMOVČEK I. a kol. (2007) *Kriminalistika*, Bratislava : Akadémia Polica-jného zboru v Bratislave, 2007 s. 310.
18. ŠTEFANOVSKÁ, S, METEŇKO, J, HRVOL, M, (2003) Kriminalitaet im Zusammenhang mit Informations-und Kommunikationstechnologie.. In. : *Computerkriminalität, MEPA – Fachseminar*, BRD – Wertheim, 5.5.-9.5.2003. Bundesministerium für Inneres, Wien 2003.