

## **Forensic Examination of Plastic Identification Documents**

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### **Abstract**

The relevance of this paper lies in the investigation of plastic identification documents, since they are becoming widespread and are positioned as modern and offering better data protection. The purpose is to examine the features of plastic identification documents, as well as to expand knowledge about the essence and content of these documents and their purpose and adaptation to present-day realities. The results constitute the establishment of the specific features of issuing plastic identification documents, their use in practice, as well as the characteristics of individual documents that certify identity or certain property rights. The study clarifies the definition of the term “document”; identifies and describes the features of the development and application of plastic identification documents; indicates their practical value; lists the main types of such documents; characterises two types of plastic identification documents — an identity document and documents for a vehicle, as well as studies the phenomenon of forgery.

**Keywords:** Vehicle Registration Certificate, ID Card, Identification, Forgery, Investigation.

### **Introduction**

During the establishment of market relations and in the phase of European integration, Ukraine is at a stage of development, which is described by an increase in the number of identity documents or documents certifying ownership of movable or

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immovable property, which contain certain information (Dragos & Przybytniowski, 2022). The above list of documents that certify certain facts, and which are intended for long-term use, often become objects of criminal encroachments on the part of third parties.

It is impossible to overestimate the value and importance of various types of documents in any sphere of public life and people's activities. There is a considerable number and variety of documents. In the modern world, different countries of the world have been using plastic documents for quite a long time (Titarenko, 2014; Chochia et al., 2018).

The current pace and people's living conditions necessitate a more frequent use of documents. Technological advance has also led to the improvement of documents, which are becoming easier to use every year and are being improved with more reliable means of protection against forgery. However, despite the methods and forms of document protection, the practice of forgery continues to exist in Ukraine. In any case, forgery considerably disrupts the activities of individuals, enterprises, public formations, the state and, as a result, causes substantial losses and damage (Naumenko, 2019; Sannikov, 2017). Documents act as a means of certifying facts and are of great legal importance. As carriers of certain information, documents are factors and objects contributing to improved organisation of enterprises and institutions, and serve as grounds for decision-making (Pirig, 2019; Cherniavskiy et al., 2021).

To date, enterprises and companies producing forms for documents have at their disposal a considerable amount of material necessary for the production of plastic identification documents, which includes, for example, paints containing protective properties or types of lamination film. In the day-to-day life of people, documents act as a means of recording information about events, facts, and phenomena of human mental activity. S. I. Ozhegov (1986) defined the term "document" as follows:

1. Something that officially certifies an identity (passport, etc.);
2. A business paper that certifies certain facts, as well as the right to something (travel document);
3. A written certificate of something.

Among researchers, as well as in the legal literature, there is no unanimous generally accepted definition of a document. Documents act as a means of securing, storing, and processing data, and constitute a unique corporeal entity (Getman & Karasiuk, 2014). At present, the document should mean not only a record of legal

relations, but also management of social activities. Automation and computerisation of data processing have changed the appearance and properties of documents, and therefore they have acquired a new content and form (Bychkov et al., 2019; Prylipko et al., 2023).

In recent years, as a result of technological advance, new means and methods of forgery and introduction of forged documents into the general document flow have emerged. It was with the advent of new devices for printing documents with high resolution that led to an increase in cases of forgery of plastic identification documents. This can be explained by the fact that documents produced by these methods are subject to an increasingly complex distinction in terms of print quality, and accordingly it becomes increasingly complicated to establish the fact of their forgery. This is also conditioned upon the fact that in present-day realities, anyone can purchase equipment for printing documents and independently produce documents made at bench scale that will correspond to the originals according to the printing method (Tatsyi et al., 2010).

The main objectives of the present study are as follows:

- to formulate the definition of a document and specifically a plastic identification document;
- to consider the history of the establishment and development of documents;
- to describe and determine the main features of plastic identification documents;
- to describe certain types of documents;
- to identify and investigate the phenomenon of forgery and give it a detailed description.

### **Materials and Methods**

The study is based on a systematic approach, conditioned upon the specific features of the subject under study and associated with application of general scientific and special scientific methods. General methods define philosophical and ideological approaches expressing the most universal principles of research, namely dialectical and phenomenological methods, used to analyse the essence, concept, meaning, and practical value of plastic identification documents.

Using the historical method, the study investigated the ways and means of establishment and development of documents and stages of their formation; Statistical

and comparative legal methods were used to outline the vectors for improving the legal framework and practices of applying the legislative norms governing these issues by state bodies and practitioners, whose activities are aimed at resolving issues arising in the development and application of plastic identification documents. The study also employed such theoretical and logical methods as deduction, induction, system approach, methods of analysis and synthesis, which allowed obtaining reliable knowledge about the role of plastic-based documents in people's lives. The system method allowed determining the scope of issues under study and developing proposals for their solution.

The dialectical method underlies this study since it was used to cognise all the research processes concerning the subject of this paper. The use of this method in the study of this subject has led to a theoretical and practical investigation of issues relating to the use, application, and forgery of plastic identification documents. In addition, for a more complete and effective study of this subject, the following methodology is employed: hermeneutical method, applied to cover the essence of the terms “documents” and “plastic identification documents” and the ability to identify the essence and features of this concept in practice; analysis, which enabled the division of the object of this study into components for their independent study, and also helped connect individual legal phenomena that were the subject of analysis into a logically structured legal reality; analogies through the establishment of similarity in certain features of legal phenomena and in legal relations, this method also allowed gaining knowledge about objects and phenomena on the grounds that they are similar to others.

For a more detailed investigation of this subject, the semantic method was used as a tool for clarifying the content of the main concepts of research through the semantic side of language units and the theoretical and predictive method, which allowed formulating conclusions and proposals, as well as the means of their implementation and became the basis for determining the expediency and prospects of the proposals put forward. The method of legal analysis was used to examine the corresponding provisions of forensic science, criminal and criminal procedural legislation, and departmental regulations of Ukraine governing issues arising in the use of plastic identification documents. The theoretical framework of this study comprises studies of Ukrainian and foreign researchers from various branches of legal science, which cover issues related to the use of plastic identification documents and the specific features of their forgery.

The above methods were employed by the authors to investigate the problems of this study. Through them, the authors identified the main concepts and provisions noted in this paper and developed recommendations for improving this area.

### **Results and Discussion**

To protect plastic identification documents, modern technologies are used, including various types of personalisation. Document protection always contains a set of certain features and characteristics that documents are equipped with during their production and that need to be examined. Notably, there are two types of plastic identification documents:

1. Decentralised—made in institutions issuing the relevant documents.
2. Centralised—processed at the manufacturer's enterprise, which produces the form of the corresponding document (Naumenko, 2019; Kumisbekova et al., 2019).

There are many types of plastic documents; therefore, for the sake of this paper, the authors describe several types of forgery of various documents.

According to the international qualification, plastic identification documents are divided into three main types: ID 1, ID 2, ID 3. ID 1 is a document issued in the format of a bank card; ID 2 is a document format that has dimensions of 105x74mm; ID 3 is a document in the format of a foreign passport. The first type (ID 1) is described by printing banking details using a laser or inkjet colour printer, and personal data of the individual who owns the document is applied by thermal sublimation printing. The second type (ID 2) is described by the use of a form on which secondary personal data of a person is applied through the use of a monochrome laser printer. A special feature of the third type (ID 3) is the use of the form of a paperback edged book sewn with threads, and all pages of the form are printed on protected paper with 100% wood pulp content. At present, the most secure types of documents are modern passports in ID 1 and ID 2 format, which have a polycarbonate data page (Bocharova et al., 2014).

Investigative and judicial practices demonstrate a considerable number of crimes related to forgery. Forgery is the unauthorised production of false documents having a similar appearance to real documents, as well as introduction of changes into the original document. Forged documents are considered one of the most important and oldest objects of forensic research. For instance, in Ancient Rome, there were even special handwriting specialists who worked as so-called experts in the court.

Sources of Roman law indicate that these specialists had an extensive expertise and could notice the most perfect forgeries that were contained in the documents (Alekseev et al., 2015; Getman et al., 2019).

The history of forgery dates back to the time when the first documents on clay tablets appeared. Even at that time, history has cases when even such documents were forged for personal gain. A case in point would be the history of Ancient Rome, where forgery of documents was common; various documents were often forged, which eventually became a means of enrichment (Vorobey, 2008). Throughout all times and centuries, there have been cases of forgery of documents by all segments of society, and accordingly, punishment for this pursuant to the laws of those times. Below the authors of the present study provide some examples of punishment for forgery, contained in various acts of those times. Thus, Article 5 of the Charter of the Grand Duchy of Lithuania described the punishment for a person who forges Grand Ducal letters and their seals. In the “Pskov Court Charter” of 1424, severe punishment was provided for the production of “false charters”. In turn, the “Sudebnik” of 1550 consolidated the death penalty for forgery.

There are two types of forgery: partial and complete. According to the method of implementation, partial forgery is classified into additions, corrections, erasure, wash-out, etching, and changing parts of the document, while complete forgery is classified into copying, drawing, typographic forgery, using cliches, as well as photomechanical forgery (Prylipko et al., 2021).

The scientific literature interprets forgery as the entire set of techniques and tools aimed at changing the original document or creating a new completely forged document. Technical means used for forgery can be divided into certain groups, namely tools (for example, writing devices); equipment (photographic, computer, etc.); devices; materials (ink, paper, etc.) (Zaki et al., 2023).

Among the crimes committed using forged plastic identification documents, it is necessary to distinguish forged plastic documents for vehicles. Documents accompanying vehicles play a vital role in the operation of the corresponding vehicle, ensuring road traffic and transferring ownership of such a vehicle. In accordance with these documents, there should be more stringent conditions for their protection and operation.

Adaptation of Ukrainian legislation to international legislation, unification of regulations in accordance with international standards, and innovations in the sphere of document flow require specialists of the expert service of the Ministry of

Internal Affairs of Ukraine to rise up to numerous challenges. According to the statistical data gathered by specialists of the Ministry of Internal Affairs of Ukraine in 2017, the expert service of the Ministry of Internal Affairs conducted 1,868 examinations, the objects of which were certificates of registration of vehicles (Statistical report..., 2017). A case in point would be the checkpoint located in Lvivregion, called “Rava-Ruska”, where over three months in 2016, during illegal movement across the border, more than thirty vehicles with forged accompanying documents were identified (Ukrainians are increasingly..., 2017).

The development of the latest technologies is reflected in the technology used to produce the above documents. In this regard, persons engaged in forgery have found ways to improve the forgery of driver's licences and other documents using computer systems and the latest technologies. The difficult situation that has developed in Ukraine, namely the waging of war against Ukraine and the temporary occupation of the Autonomous Republic of Crimea has led to an increase in the level of crimes committed in the field of illegal possession of vehicles for their further sale. Proceeding from the above, the actual issue is the study of the certificate of vehicle registration, since the illegal automobile business is a fairly common type of crime that brings large amounts of profit to persons engaged in such illegal activities.

The history of the Ukrainian vehicle registration certificate and driver's licence dates back to 1993, from the printing companies Photon and Oriana, which placed documents on unprotected paper and without any system of protection against forgery. However, the State Enterprise for the Production of Securities–“Ukraine” Printing Plant in 1995 began to print completely new certificates of vehicle registration.

The transition from paper vehicle registration certificates to a new model in the form of plastic cards began in 2005 in accordance with the requirements of the European Union, which related to the protection of documents according to international standards. Such plastic cards included all the information necessary (Document security..., 2012; Berezanska & Drok, 2022). At that time, plastic identification documents were printed by the Limited Liability Company “Znak”, and since 2012 this activity was transferred to the Printing Plant “Ukraine”.

The practice of experts working in the field of questioned document examination indicates that there are difficulties in conducting an appropriate expert examination to establish the fact of forgery of plastic identification documents. Very frequently, such forgery concerns the certificate of vehicle registration, which acts as

the main document certifying ownership of an automobile (Periokaite & Dobrovolskiene, 2021).

Upon investigating the authenticity of the plastic certificate of vehicle registration, the expert must adhere to the following stages of examination: to establish the authenticity of the form on which such a certificate is made; upon examining the authenticity of the vehicle registration certificate, it is necessary to establish the entire set of signs of technical forgery in this certificate, e.g., traces of additions, erasure, etching, changes in the original content of the document text, etc. If the expert, upon examining the authenticity of the certificate, established at least one of the above signs, then it is possible to state the fact of forgery of the corresponding vehicle registration certificate.

The vehicle registration certificate is first issued on a paper plastic form and contains all the necessary security elements and data, which in turn will indicate the type of such document and the right that it certifies. After that, the individual's personal data is applied to the corresponding form, that is, the car owner and the car itself are personalised.

Experts of the Khmelnytsky Forensic Research Centre of the Ministry of Internal Affairs of Ukraine established that vehicle registration certificates were installed on the territory of Khmelnytskyi region, which, however, are not indicated in the corresponding state records (Bychkov et al., 2019). In addition, specialists in the technical study of documents of the above-mentioned centre of the Ministry of Internal Affairs of Ukraine conducted an experiment with the original form of the vehicle registration certificate, which indicated all the necessary personal data about the vehicle and the owner of such a vehicle, that is, it was such a form original. The essence of this experiment was that the certificate form was divided into four equivalent parts. In each of the corresponding parts, the protective film was removed in several ways. In the first case, this was done mechanically, using a blade. In the second case, this was done by exposing the protective film to chemical reagents, and in the last two cases, the protective film was removed by boiled water. When using these methods in different places where text information is placed, the personalisation text was separated from the plastic base. During the subsequent experiment, microscopic examination of areas with deleted text discovered the absence of any signs that would indicate the flushing of personal data (Bychkov et al., 2019; Koziy & Pochtarev, 2023). Thus, from the above experiment, it can be concluded that on the forms of the vehicle registration certificate and other plastic identification documents,



it is possible to enter any information in personal data without the appearance of obvious signs of any interference with the original version of the document text. This experiment also demonstrates that persons who intend to commit a criminal offence can make changes to the required document without obvious signs of interference.

The next documents that can be described in this paper are the passport of a citizen of Ukraine in the form of an ID card. The study of this document is primarily conditioned upon the fact that recently there has been an increasing interest in reliable identification of the person who owns such a document, primarily due to the increase in illegal migration and the commission of terrorist acts in the world. Therefore, to preserve public order in the state and ensure national security, it is necessary to create conditions under which it will become impossible to use identity documents and personal data for further commission of criminal offences.

In turn, based on the Decree of the President of Ukraine on the decision of the National Security and Defense Council of Ukraine No. 478/2015 "On Additional Measures for the Introduction of a Visa-Free Regime between Ukraine and the European Union," (2015), the concept of creating a national identification system for Ukrainian citizens, foreigners and stateless persons was developed. According to this concept, one of the areas of implementation of identification reform is the introduction of protected, forgery-proof identity documents by state bodies. An identity document in the form of an ID card ensures that a person is protected from theft of their personal data, the so-called "identity theft" (Order of the Cabinet..., 2015). Such document must contain certain forensic requirements and meet them, namely: the details of such document must ensure their purpose, and the corresponding document must also have a perfect protection system. The National System of Identification of Citizens of Ukraine, Foreigners and Stateless Persons establishes that the functional characteristics and security signs inherent in a citizen's passport in the form of an ID card help reduce falsification of the form to a minimum.

When issuing a citizen's passport in the form of an ID card, to establish valid data about the person, the future owner of such a document, a two-level verification is established:

– data about a person is established through the use of information resources, namely: the civil registration database and the database of the State Migration Service;

– establishment of personal data through the use of all external resources. This paragraph refers primarily to the databases of other state bodies listed in the first paragraph, namely the databases of the Ministry of Justice of Ukraine. However, all necessary verifications are ultimately performed by the State Migration Service (Yaroshenko et al., 2019).

When issuing a citizen's passport, a reliable mechanism for verifying the personal data of the person holding such a document is introduced in the form of an ID card, which in turn reduces the risk of falsification of information in this document. The corresponding passport is developed and issued in accordance with national and international document security standards, which ensures special protection of the document (Kaplina & Sharengo, 2020). A new method of protecting the data of a person, the owner of a citizen's passport, which is issued in the form of an ID card, has also been created, namely entering data about a person on the built-in contactless electronic carrier (Order of the Ministry..., 2017).

In forensic science, the identification of a person is understood as the establishment of the identity (identification) of a person by a certain set of features in the way of their comparative study. In judicial and investigative practice, identification is used primarily to establish the identity of a suspect in the commission of a crime, a victim, identify persons detained by law enforcement agencies, etc. Biometric data contained in a citizen's passport issued in the form of an ID card provide and allow the identification of a person detained by law enforcement agencies; increasing protection against forgery; identification of persons who are unconscious or helpless (Law of Ukraine No. 187-IX..., 2019; Mernyk et al., 2021).

In 2020, in the Rivne and Lviv regions, employees of the Security Service of Ukraine exposed the scheme of forgery of passports of citizens of the European Union. Underground printing houses that were engaged in forgery carried out their activities on the territory of the cities of Drohobych, Lviv, and Rivne region. According to the facts of this case, two residents of Lviv region and one resident of Rivne region were engaged in this forgery. They searched for people who wanted to work in Europe and made fake ID cards of citizens of Eastern European countries for them. For a set of documents, they charged 300 euros or more (Lazurkevich, 2020). Another case of forgery of documents is the exposure of a criminal group engaged in forgery of documents and advertising them on the Darknet by employees of the Security Service of Ukraine together with law enforcement agencies of the United

States of America. This criminal group operated on the territory of Lviv. The attackers produced high-quality fakes, mainly ID cards of European Union countries, as well as other permits (Fake ID-cards..., 2021).

Based on the practical activities of employees of expert services specialising in technical expertise of plastic identification documents, most of the forged documents are still in circulation, but experts in such cases, unfortunately, are incapable of establishing the authenticity of these documents (Kluev et al., 2019; Shinkaruk, 2017).

The above-mentioned issues can be solved only if there is close interaction and cooperation between the pre-trial investigation bodies, an expert who examines plastic identification documents, and an enterprise whose activities are aimed at issuing such documents. In addition, the problems can be solved if the expert services of the Ministry of Internal Affairs of Ukraine cooperate and assist the court and pre-trial investigation bodies in resolving all issues arising upon the study of offences committed in the field of plastic-based document production. Such cooperation will ensure full, objective, impartial, and comprehensive detection of crimes.

### **Conclusions**

In the course of this study, the term “document” was defined, the features of plastic identification documents were determined, and certain types of documents were characterised.

Documents act as a means of securing, storing, and processing data, and constitute a unique corporeal entity. At present, the document should mean not only a physical carrier of record of legal relations, but also management of social activities. Automation and computerisation of data processing have changed the appearance and properties of documents, and therefore they have acquired a new content and form.

Plastic identification documents are primarily aimed at protecting the personal data of persons owning these documents. Documents act as a means of certifying facts and thus are of great legal importance. As carriers of certain information, documents are factors and objects contributing to improved organisation of enterprises and institutions, and serve as grounds for decision-making.

A considerable number of offences in Ukraine are committed using forged documents. Forgery is the unauthorised production of false documents having a similar appearance to real documents, as well as introduction of changes into the original document. There are two types of forgery: partial and complete forgery. In turn, partial forgery is classified into additions, corrections, erasure, wash-out,

etching, and changing parts of the document, while complete forgery is classified into copying, drawing, typographic forgery, using cliches, as well as photomechanical forgery.

The practical activity of employees and specialists engaged in solving crimes committed in the field of forgery demonstrates that many forged documents are still in circulation, and experts simply cannot identify all forged documents. The paper cited several cases solved by employees of the Security Service of Ukraine in the field of forgery. The author provided recommendations for improving and solving issues arising in regulation of plastic identification documents.

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