

Information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex*

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Abstract

Information technology for verification of the legality of a mortgage agreement for an enterprise as a single property complex provides a comprehensive analysis of contracts, minimizing legal risks and increasing the efficiency of legal due diligence. The use of modern information technologies, such as NLP, machine learning, and integration with state registries, ensures high quality analysis, reliability of verification and compliance with the law, as well as a high level of automation. Such information technology is particularly relevant for financial institutions that provide loans secured by property, as well as for large enterprises that often use mortgages in their operations. The advantages of the proposed information technology for verification of the legality of a mortgage agreement for an enterprise as a single property complex are automation and speed; significant reduction of time and effort for legal analysis of mortgage agreements; increased accuracy and reduction of human error and possible errors during verification; reduction of legal risks and avoidance of litigation due to early detection of potential problems and reduction of the likelihood of entering into invalid or risky agreements; saving resources by optimizing the work of legal departments through automation of routine tasks; improving control over compliance with the law; increasing transparency of mortgage lending processes.

Keywords

Information technology, artificial intelligence, blockchain, mortgage agreement for an enterprise as a single property complex, mortgage legal relations.

1. Introduction

Information technology has become an integral part of modern legal practice, significantly increasing the efficiency of lawyers and law firms. They allow automating routine tasks, improving case management, providing quick access to important documents, and enhancing customer service [1-3]. Let's consider the key aspects and benefits of using information technology in the field of law.

Specialized software allows you to automatically generate legal documents (contracts, agreements, lawsuits) based on templates. This significantly reduces the time required to prepare documents and reduces the likelihood of errors [4-6]. Automated case management systems (e.g., Clio, MyCase, PracticePanther) help to optimize processes, track deadlines, remind you of planned activities, and organize workflow [7, 8]. Document Management Systems allow for centralized storage, organization, and quick retrieval of legal documents. This is especially useful for law firms

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with a large volume of cases. Cloud storage (Dropbox, Google Drive, OneDrive) provides access to documents from any location and device, allowing lawyers to work remotely. Online databases and legal systems (Westlaw, LexisNexis, Liga) provide quick access to legislation, case law, legal opinions and commentaries. This makes it easier to conduct legal research, search for precedents, and prepare for court hearings [9-11]. Analytical software helps analyze court decisions, predict case outcomes, and assess risks. Electronic filing of documents with the court (e-filing) greatly simplifies the process of filing lawsuits, appeals, and other legal documents. It avoids queues, reduces delivery time, and increases work efficiency [12, 13]. Online court hearings (via Zoom, Microsoft Teams) have become especially relevant during the COVID-19 pandemic, allowing for remote hearings. Data encryption and two-factor authentication help to protect confidential client information. Specialized access control software (e.g., NetDocuments) allows you to control who has access to certain documents and track the history of changes. Thanks to the development of cloud technologies and mobile applications, lawyers can work from anywhere, access cases in real time, participate in court hearings online, and respond promptly to client requests. Mobile applications for case management (Rocket Matter, Zola Suite) allow you to keep deadlines and communication with clients under control [14, 15].

Artificial intelligence is actively used for automated document analysis, identifying risks in contracts, searching for precedents, and legal research. The use of artificial intelligence allows automating the process of contract review, reducing the risk of human error and reducing the time required for their analysis [16-18]. The LawGeex and SuperLegal platforms use artificial intelligence to review legal documents, allowing you to quickly find risky provisions and ensure that contracts comply with standards [19, 20]. The Westlaw Edge and Ravel Law platforms use artificial intelligence to provide lawyers with relevant legal materials and precedents, and can also conduct searches based on context and text analysis [21, 22]. The Relativity and Everlaw systems use artificial intelligence to automatically sort and classify documents, identify relevant evidence, and identify potentially important materials among a large amount of data [23, 24]. Statistical forecasts indicate that artificial intelligence will deprive almost half of lawyers of their jobs by 2050 [25].

The use of artificial intelligence is becoming increasingly common in judicial practice as well, as these technologies can increase the efficiency of litigation, automate routine tasks, and improve access to justice [26]. Platforms such as Lex Machina and Premonition analyze millions of court decisions and provide statistics on the probability of success in court, the likely time frame for consideration, and even show the history of the results of judges and lawyers [27]. In the United States, the COMPAS system is used to assess the risk of recidivism of criminals [28]. The system analyzes data on the defendant and predicts the likelihood of reoffending, which is used when making a decision on parole. The Verbit and Otter.ai systems are used to automatically generate transcripts of court hearings, reducing the cost of hiring stenographers and speeding up document flow. The Modria platform uses artificial intelligence to resolve disputes online. It helps to automate the negotiation process between the parties by using algorithms that analyze the arguments of both sides and provide recommendations.

The global artificial intelligence market was estimated at \$136.55 billion in 2022 [29]. The distribution of the global artificial intelligence market is shown in Figure 1 [29].

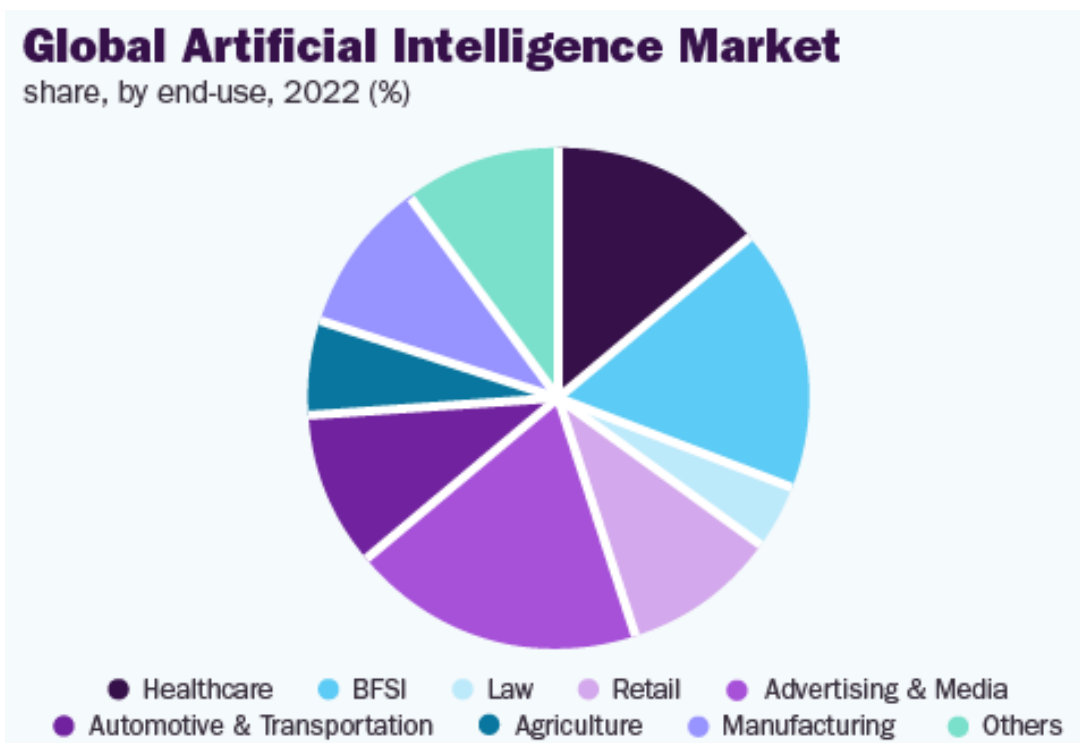


Figure 1: Global Artificial Intelligence Market Segmentation [29].

Chatbots can answer basic legal questions of clients, automate service, and reduce the workload of lawyers [30]. DoNotPay is a well-known chatbot that helps users appeal parking fines, prepare lawsuits in small claims courts, and receive compensation from airlines. It also helps citizens to protect their rights without the need to hire a lawyer. CRM systems (Legal CRM) help lawyers track communication with clients, analyze needs, and improve service levels. CRM systems also allow you to automate marketing and sales management of legal services. Websites, blogs, social media, SEO optimization and online advertising have become important tools for promoting legal services and attracting clients. Content marketing allows lawyers to demonstrate their expertise by creating articles, videos and infographics on legal topics.

In sum, the use of information technology in legal practice allows lawyers to work more efficiently, faster and at lower costs. This allows not only to increase productivity but also to improve the quality of client service, which is an important competitive advantage in today's legal services market. The introduction of modern IT solutions opens up new opportunities for law firms and can become the basis for increasing their competitiveness, especially in the context of digital transformation. In this case, the development of information technologies, including intellectual technologies, for various legal areas, including, for example, verification of enterprise mortgage agreements, is an *urgent task*.

2. Mortgage agreement for an enterprise as a single property complex

Let's analyze the subject area of information technology for verification of enterprise mortgage agreements.

The institute of mortgaging an enterprise as a single property complex deserves special attention in the Civil Law of Ukraine. Gaps in the study of the institution of enterprise mortgage as a single property complex have led to the fact that many problematic issues remain unresolved.

Pursuant to Article 1 of the Law of Ukraine "On Mortgage", real estate is considered to be land plots, as well as objects located on land plots and integrally related to them, the movement of which is impossible without their depreciation and change of their purpose [31].

A similar interpretation of real estate is contained in Article 181 of the Civil Code of Ukraine [32]. The main act of civil legislation uses the terms “immovable things”, “real estate”. The category of “real estate” is a broader concept and includes the category of “immovable thing”, and, accordingly, we cannot speak of their identity. At the same time, part 1 of Art. 190 of the Civil Code of Ukraine defines property as a special object, which is considered to be a single thing, a set of things, as well as property rights and obligations.

Characteristic features of real estate include the impossibility of moving such property without depreciating it or changing its purpose; registration of rights to such property; and individual certainty.

An enterprise is a special complex object of civil rights, which is a single property complex, the totality of property and property rights of which ensures the conduct of separate economic activities, is recognized as real estate in general, and which requires constitutional (state) registration in accordance with the procedure provided by law.

Property complex is a broader concept than real estate. Article 191 of the Civil Code of Ukraine specifies the types of property that are part of an enterprise as a single property complex. A single property complex is used to carry out business activities, and an enterprise as a single property complex is treated as real estate.

The legal concept of property is reduced to the following: a separate thing; a set of things belonging to a person on the basis of ownership or other rights; property rights, claims; obligations, debts that encumber property.

Therefore, an enterprise as a property complex and real estate is, first of all, always an unchanging individually identifiable thing, represents significant property value, often has social significance and is non-consumable in general or has a long term of use.

The emergence of a mortgage on the basis of a contract is most common in a multi-structured market economy and is based on the free will of the parties to civil legal relations.

The mortgage of an enterprise as a property complex should be understood as a type of security for the fulfillment of an obligation with tangible and intangible assets of a business entity with a completed production cycle of products (works, services) and with the land plot on which it is located.

In order for a mortgage legal relationship to arise regarding the property complex, concluding a mortgage contract for the property complex is not enough. In this case, it is necessary for the mortgage legal relationship to have an actual structure, or rather a system of legal facts. Such a system consists of:

- concluding an agreement
- notarial certification of the agreement
- state registration of the agreement

The peculiarity of the mortgage agreement of the enterprise of the property complex is, first of all, the essential conditions laid down in it. The essential terms of the mortgage agreement of the enterprise as a single property complex will be determined as follows:

- data that allow in a certain way to establish the presence of a single property complex of the enterprise and its composition, i.e. to identify and evaluate in general and by object
- the value of the enterprise as a single property complex
- description of the land plot on which the enterprise is located as a property complex

The mortgage agreement of the enterprise as a single property complex can be considered valid if the following documents are available:

- inventory act
- accounting (transfer) balance

- conclusions of an independent auditor on the composition and value of the enterprise as a single property complex
- list of all types of debts (obligations) that are included in a single property complex, with an indication of creditors, the nature, size and terms of their claims
- in fact, the mortgage agreement of the enterprise as a single property complex in the form of a single document - a general agreement signed by the parties, which contains elements of various agreements (Part 2 of Article 628 of the Civil Code of Ukraine)

By its nature, a mortgage is an additional means of proper fulfillment of obligations and a derivative contract from the main contract, therefore, a reference in the mortgage contract to the relevant terms of the credit agreement is sufficient. There is no need to duplicate these conditions even in the mortgage contract (interest and interest on the loan, as well as their payment terms).

There is no provision in the Law of Ukraine "On Mortgages" that would regulate the issue of the place of certification of mortgage contracts of an enterprise as a property complex. In accordance with Article 55 of the Law of Ukraine "On Notaries" [33], the certification of real estate mortgage contracts is carried out at the location of the specified property.

In the context of the mortgage of the property complex, it is important to find out the place of notarial acts. The place of performance of notarial acts can be the location of the creditor and can also be the place of residence of an individual.

The current legislation does not contain restrictions on the subject structure of the mortgage relationship. Subjects of a mortgage legal relationship can be natural persons and legal entities (organizations) that are endowed with civil legal personality. The grounds for the right to transfer property are the right of ownership and the right of full economic control. The enterprise, for which the property is secured by the right of full economic ownership, is entrusted with the obligation to obtain the consent of the owner of this property or the body authorized by him to implement the pledge of the enterprise as a whole, its structural units as property complexes, as well as individual premises and buildings.

It should be noted that the transfer of the property complex of the enterprise into a mortgage is possible with the consent of the owner of the enterprise's property or the body authorized by him or based on the decision of the body authorized by the founding documents of the enterprise.

The parties to the mortgage agreement of the enterprise as a single property complex are always the mortgagee and the mortgagor. A mortgagee is a person to whom real estate, property complexes, etc. are transferred as a means of securing the main obligation. The mortgagor is a legal entity or an individual - the owner or a person authorized to transfer real estate to ensure the fulfillment of the obligation.

So-called third parties can be participants in mortgage legal relations. These include: a person who receives certain rights, powers or obligations under the mortgage agreement, but does not act as a mortgagee or mortgagor; a person, a debtor under a credit agreement, in whose interests a mortgage agreement is concluded, when the mortgagor acts as a property guarantor.

A study of the legislation allows us to assert that the person who owns the subject of the mortgage is obliged, according to Art. 587 of the Civil Code of Ukraine: take measures necessary to preserve the subject of the mortgage; keep the subject of the mortgage properly; immediately notify the other party of the mortgage contract about the threat of destruction or damage to the single property complex transferred under the contract.

In Art. 191 of the Civil Code of Ukraine, the enterprise is considered as a single property complex that is used to carry out business activities.

Therefore, the composition of the enterprise as a single property complex includes all types of property intended for its activity, including land plots, buildings, structures, equipment, inventory, raw materials, products, claims, debts, as well as rights to designation that individualize the enterprise, its products, works and services (brand names, trademarks, service marks), and other exclusive rights, unless otherwise provided by law or contract.

The mortgage of the enterprise as a single property complex and its structural subdivision, unless otherwise provided by law or contract, applies to all its property, including fixed and working capital, as well as other values reflected in the independent balance sheet of the enterprise.

Taking into account the above, it should be noted that if the subject of the mortgage is a single property complex, then the pledged property includes all tangible and intangible assets, fixed assets and working capital, other assets, the value of which is reflected in the independent balance sheet, belonging to the enterprise as a legal entity with the right of ownership enterprises, right of claim. The collateral property includes the received income of the enterprise, the property acquired by it, as well as the debts acquired by the enterprise during the mortgage period.

3. Information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex

In [34], the authors developed intelligent information technology for verifying the correctness of the mortgage agreement based on ontologies, which provides verification of the correctness of the structure of the mortgage agreement from a legal point of view; forms conclusion on the correctness of the structure of the mortgage contract; helps to avoid signing a mortgage contract with an incorrect structure, the signing of which may lead to negative consequences for one or both parties to the contract.

Checking the legality of the mortgage agreement of the enterprise as a single property complex is a complex process that requires detailed analysis of legal documents, compliance with legislation, assessment of the legal status of the property and counterparties. Information technology can greatly simplify this process, providing lawyers with tools to automate checks, document analysis and identify possible risks. Let's develop information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex (Fig. 2), which consists of the following processes:

- collection and preliminary analysis of documents (mortgage agreement, statutory documents of the enterprise, property title documents, etc.)
- automatic analysis of the text of the mortgage contract using natural language processing (NLP) and machine learning (ML) technologies to identify inaccuracies and anomalies in the contracts, during which the structure of the contract is checked (presence of mandatory details – subject of the contract, parties, terms, rights and obligations parties' ties, mortgage object), analysis of legal provisions (checking the presence of key conditions – liens, sanctions, liability), detection of critical conditions (search for potentially risky provisions – for example, unauthorized changes to conditions or hidden encumbrances), detection of inaccuracies or inconsistencies in the text of the agreement
- automatic verification of compliance of the terms of the mortgage agreement with current legislation (Civil Code of Ukraine, Law of Ukraine "On Mortgages", etc.) using databases of regulatory legal acts (for example, Liga, LexisNexis) and artificial intelligence algorithms – assessment of compliance of the provisions of the agreement with the latest changes in legislation, analysis of court practice to determine potential risks
- automatic verification of the legal status of the enterprise acting as a mortgagor (automated verification of state registers to determine the status of the enterprise – for example, the Unified State Register of Legal Entities and Individual Entrepreneurs; assessment of the financial stability of the counterparty, verification of the history of the enterprise and its reliability)
- automatic verification of property rights (authority documents for the enterprise as a single property complex) using blockchain technologies to audit data and ensure their immutability and smart contracts for automatic confirmation of ownership rights, namely: automated verification of ownership rights to all elements of property of the complex by automated

checking of state registers – for example, the State Register of Real Property Rights, detection of possible encumbrances (arrests, other liens), analysis of the history of changes in ownership rights

- risk assessment and forecasting of potential legal problems (for example, analysis of the financial condition of the enterprise and its ability to service debt, detection of disputes regarding property rights or other claims to the enterprise) using artificial intelligence algorithms – for example, using machine learning algorithms based on historical data (court cases, typical errors in contracts, etc.)
- automatic generation of an inspection report with identified risks, recommendations for correcting identified deficiencies, and an assessment of the agreement's compliance with current legislation
- remote signing and registration of a legally correct contract - electronic signing of the contract and subsequent registration in the State Register of Mortgages, verification of documents using electronic signatures and other means of authentication, automatic sending of the contract for registration to the relevant authorities
- use of smart contracts for automatic fulfillment of mortgage conditions
- monitoring of changes in the legislative base and automatic updating of verification criteria, automatic updating of the legislation database, notification of lawyers about changes that may affect the legality of mortgage contracts – using databases of regulatory legal acts (for example, Liga, LexisNexis) and artificial intelligence algorithms intelligence to analyze the impact of legislative changes on concluded agreements
- electronic document management using the blockchain to ensure the immutability of documents and confirm authenticity – support for electronic signature and verification of documents, automatic creation and storage of electronic versions of contracts, integration with DocuSign or Adobe Sign systems for signing contracts

Information technology for verification of the legality of a mortgage agreement for an enterprise as a single property complex provides a comprehensive analysis of contracts, minimizing legal risks and increasing the efficiency of legal due diligence. The use of modern information technologies, such as NLP, machine learning, and integration with state registries, ensures high quality analysis, reliability of verification and compliance with the law, as well as a high level of automation. Such information technology is particularly relevant for financial institutions that provide loans secured by property, as well as for large enterprises that often use mortgages in their operations.

The advantages of the proposed information technology for verification of the legality of a mortgage agreement for an enterprise as a single property complex are automation and speed; significant reduction of time and effort for legal analysis of mortgage agreements; increased accuracy and reduction of human error and possible errors during verification; reduction of legal risks and avoidance of litigation due to early detection of potential problems and reduction of the likelihood of entering into invalid or risky agreements; saving resources by optimizing the work of legal departments through automation of routine tasks; improving control over compliance with the law; increasing transparency of mortgage lending processes.

4. Results & discussion

Let's consider the work of information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex. Thus, a mortgage agreement and the necessary accompanying documents were formed for Enterprise1 as a single property complex. These documents were transferred to the input of the developed information technology.

Information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex technology performed a preliminary analysis of the provided documents, automatic analysis of the text of the mortgage agreement and automatic verification of compliance of the terms of the mortgage agreement with the current legislation of Ukraine. In

addition, there was a check of the legal status of Enterprise1, its property rights, risk assessment and forecasting of potential legal problems, etc. As a result of the actions taken, the information technology generated the following verification report: "Enterprise 1 is in the state of detection of disputes regarding property rights to land. Enterprise 1 has a seizure imposed on the premises of one of its workshops. The provided mortgage agreement does not comply with current legislation – it does not contain the determined value of the enterprise as a single property complex, does not contain conclusions of an independent auditor on the composition and value of the enterprise as a single property complex." It is obvious that further work with such a contract and such an enterprise is not possible, therefore the signing and registration of the contract did not take place.

Thus, the developed information technology helped to avoid the signing of a legally incorrect and risky mortgage contract of an enterprise as a single property complex, which made it possible to avoid negative consequences and recognition of such a contract as invalid based on a court decision.

With the help of the developed information technology, another 234 mortgage contracts of the enterprise as a single property complex, prepared for concluding by the enterprises, were checked. Information technology showed that only 98 contracts (42%) out of 235 analyzed received a positive report and were concluded – Fig. 3. If mortgagors and mortgage holders had not used the developed information technology before signing, then 137 legally incorrect or risky contracts would have been concluded, which would have had significant negative consequences.

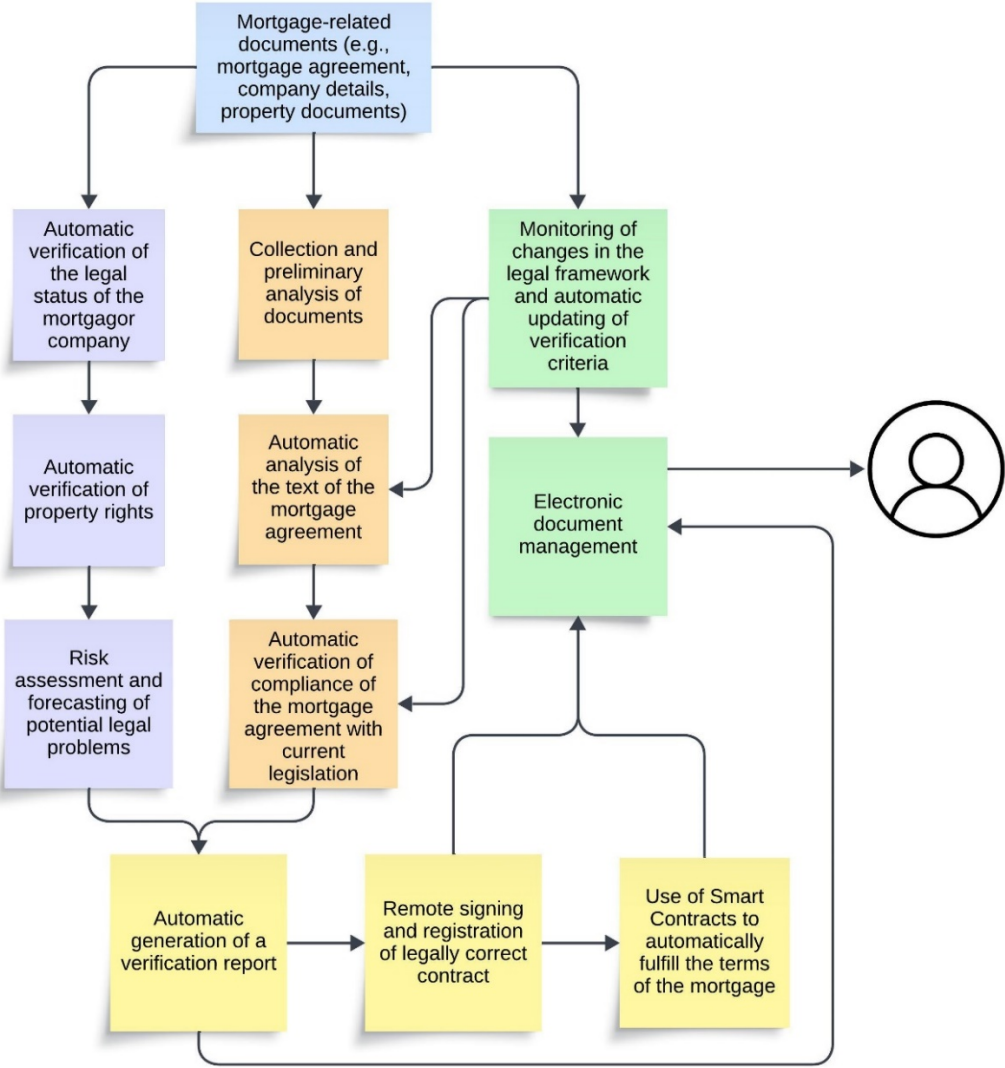


Figure 2: Information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex.

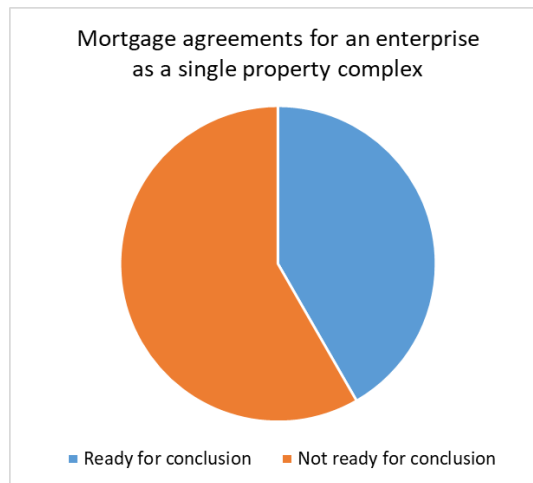


Figure 3: Results of inspection of 235 mortgage agreements by information technology for verification of the legality of the mortgage agreement for an enterprise as a single property complex.

5. Conclusions

The use of information technology in legal practice allows lawyers to work more efficiently, faster and at lower costs. This allows not only to increase productivity but also to improve the quality of client service, which is an important competitive advantage in today's legal services market. The introduction of modern IT solutions opens up new opportunities for law firms and can become the basis for increasing their competitiveness, especially in the context of digital transformation. In this case, the development of information technologies, including intellectual technologies, for various legal areas, including, for example, verification of enterprise mortgage agreements, is an urgent task.

Checking the legality of the mortgage agreement of the enterprise as a single property complex is a complex process that requires detailed analysis of legal documents, compliance with legislation, assessment of the legal status of the property and counterparties. Information technology can greatly simplify this process, providing lawyers with tools to automate checks, document analysis and identify possible risks.

Information technology for verification of the legality of a mortgage agreement for an enterprise as a single property complex provides a comprehensive analysis of contracts, minimizing legal risks and increasing the efficiency of legal due diligence. The use of modern information technologies, such as NLP, machine learning, and integration with state registries, ensures high quality analysis, reliability of verification and compliance with the law, as well as a high level of automation. Such information technology is particularly relevant for financial institutions that provide loans secured by property, as well as for large enterprises that often use mortgages in their operations.

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A further priority direction for the authors' work is the implementation of the proposed information technology in the form of a web-oriented or mobile-oriented application with a simple and intuitive interface for downloading mortgage agreements with all related documents and obtaining inspection results, which allows viewing the analysis results, reports and recommendations in real time.

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Declaration on Generative AI

During the preparation of this work, the authors used Grammarly in order to: grammar and spelling check; DeepL Translate in order to: some phrases translation into English. After using these tools/services, the authors reviewed and edited the content as needed and take full responsibility for the publication’s content.

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