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## **THE INFORMATIONAL SYSTEM MODEL OF UKRAINIAN NATIONAL TRANSPORT WORKFLOW IMPROVEMENT BASED ON ELECTRONIC SIGNATURE INTRODUCTION**

**Summary.** Proposed model of informational system supposes improvement of new conceptual method on the work with e-signature in transport informational systems. Problems and aims that may be solved with the help of this system and the most important economical and technical advantages of the proposed system in comparison with traditional methods of e-signing use are marked out.

## **МОДЕЛЬ ИНФОРМАЦИОННОЙ СИСТЕМЫ УКРАИНСКОГО НАЦИОНАЛЬНОГО ТРАНСПОРТНОГО ДОКУМЕНТООБОРОТА НА ОСНОВЕ ВНЕДРЕНИЯ ЭЛЕКТРОННОЙ ЦИФРОВОЙ ПОДПИСИ**

**Аннотация.** Предложена новая модель информационной системы, которая предполагает внедрение концептуально новой схемы по работе с электронной цифровой подписью (ЭЦП) в транспортных информационных системах. Выделены: проблемы и задачи, решаемые предложенной системой, а также наиболее значимые экономические и технические преимущества использования предложенной системы по сравнению с традиционными методами использования ЭЦП.

Informational service and term resources for enterprises became one of the most valuable resources. Information and the speed of getting it became the main determinative of success leading shipping, trade and commercial work. It has opened the way to the new industry of informational technologies and telecommunications. The aim of each is to solve the problems of economy and to optimize the temporal, labor and other resources. Companies became more mobile. Today enterprises have to obtain and process more information, analyze more alternatives because of the market of propositions enlarging. All these aspects mean that decisions must be taken fast and experiment done.

Today not only concrete companies but national economy in general faces the problem of providing a comfortable and mobile way of negotiating, leading and contract acting. There are a lot of requirements such as: profitability, simplicity and cheapness of application in comparison with used method. Saving such characteristics as relevance in law of actions made through the informational system both during negotiations and during the arrangement of a deal is also very important. Invention of informational system using e-signature on corporations or national levels is the most widespread way in the world practice.

E-signature provides documents integrity checking, confidentiality, identification of a person signing documents. It allows improvement of the procedure of document preparation, delivery, registration and storage and also guarantees its faithfulness.

The main advantage of e-signing use is the great shortage of time and material costs on documents execution and exchange. In this case the package of documents may be signed and passed to the point on its destination in several seconds. The basic components of e-signing usage are electronic certificate, secret and public keys, and software which allows to put into effect the signature and encoding with the help of cryptographic operations.

The proposed model of informational system supposes the invention of conceptually and a new method of work with e-signing. The on-line informational system will allow to solve such problems and assignments.

*Assignments:*

- The mobile leading of relevant in low e-listing and express passing of documents signed with e-signature:
  - Replacing of fax and e-mail, which in consequence require the original paper with sign (stamp) sent by traditional post.
  - Passing of business documents signed by e-signing (e-stamp)
  - Contract acting with geographically remote counteragents (buying operations of personal and real assets with counteragents from other regions)
- The on-line closure of deals and express order of services which requires personal presence or notarization of documents' copies (official purchase of tickets and guaranteed reservation of places);
- Closure of goods and services on credit without obvious presence of a person;
- Creation of on-line offices by companies;
- B2b trading;
- Relevant in low organization of cargo transportation through on-line systems;
- Express passing and closure of customs and other documentation during export, import and transit of goods;
- Improvement of company business processes;
- *Problems Duties evasion (problems arising during communication with an imaginary person):*
  - Failure of documents confidence during the process of closure and exchange;
  - Transport delays;
  - Disruptions and delays of supplies;
  - Delays in internal and external business processes of company;
  - Buying goods and services in e-commerce systems without prepayment in full.

Today in Ukraine it is difficult for a user to estimate the efficiency of e-signing usage on the level of investments of material means into an electronic digital certificate, and this is the basic factor that limits express and general evolution.

The proposed informational system supposes payments after the fixed e-signing in the system and the free of charge electronic certificate issue.

The most important economical and technical advantages of using this system are presented in table 1.

Table 1

Economic
<ul style="list-style-type: none"> <li>• Having done the operation with using e-signature user levy a charge.</li> <li>• There is an opportunity for the companies to use single counting for all the employees of the organization (organization pays for e-signing used by workers, after the corresponding report for a certain period of time was received)</li> <li>• It gives the opportunity for the user to carry out a limited quantity of operations using e-signature on credit (in case when money on the balance of a personal user account of the system runs out).</li> <li>• Informational system provides a special offer (unlimited tariff) if the sum of all transactions for a year exceeds the cost of electronic certificate. The cost of unlimited tariff in the offered system is lower than the market-value of electronic certificate.</li> <li>•</li> </ul>
Technical
<ul style="list-style-type: none"> <li>• Opportunity of organizing relevant in law e-mail by means of using e-signature and the ability to indicate the status of sent mails (automatic fixing of the of inbox /outbox correspondence and the opportunity to get the delivery report).</li> <li>• The high level of safety and privacy of documents circulation by means of using the protected channels of communication, additional identifiers of the access to the system, which is realized in user software.</li> <li>• The economic risk of exposing and illegitimate use of a confidential key of the user by a third party decreases if creating the e-signing. The system provides the following policy: the document is officially signed and have a validity if it is signed by the confidential key and its transfer is fixed in the register of inbox and outbox documents of this user.</li> <li>• Creation by the user of additional sub storehouses with separate unique post sub numbers on the basis of the basic one in order to accept the correspondence from the senders of various categories (customers, suppliers, employees of the company, etc.).</li> <li>• Target address dispatches of the signed correspondence (for example, dispatch of the order by the head office to geographically remote branches)</li> <li>•</li> </ul>

After introduction of the offered system across the nation and its usage both by physical and legal persons (users), the system becomes an irreplaceable tool in daily human life, and also in business.

The offered model of informational system has the following structure:

- **The certification centre**- carries out a full service of the keys certification centre: beginning with issue up to blocking and response of the certificate during the exposing of a confidential key of the user, and also consultation and service of users.
- **The remote items of registration** - are represented by geographically remote centres working with new and already existing clients the purpose of which is attraction of new users, the conclusion of agreements and extended contracts with existing clients, delivery of the strengthened electronic digital certificates, identifiers of the access, consultation, etc.
- **The processing electronic center** - is the processing center which cooperates with removed automated workplaces of the users (automated workplace) by means of Internet with the help of protected channels. Processes inquiries of users, contains access identifiers and electronic certificates database, carries out the transfer of documents in protected mode and fixes the exchange of signed and coded documents between the users.

*e-Signing automated workplace* -is the automated workplace of the user presented in the form of the software which is adapted to various platforms of the user operational systems. The automated workplace performs a full complex of functions for realization of work with electronic documents:

- Enciphering and deciphering of files;
- The signature and check of e-Signing correctness;
- Conducting of inbox and outbox documents register;
- Certificates and keys of the user, lists of the withdrawn certificates management ;

The system does not provide restrictions for the quantity of users, business letters and agreements which are simultaneously fixed. Every day the quantity of agreements fixed in the offered system may be compared with the amount of agreements traced in all spheres of national economy.

Economic-mathematical models are developed in order to define the expenses of the enterprise on the usage of electronic document circulation through the offered informational system.

The developed mathematical models give the opportunity for the enterprise to calculate charges on introduction and use of the offered informational system in order to carry out the comparative analysis with current expenses for document circulation.

## CONCLUSIONS

The offered model of informational system has significant technical and economic advantages in comparisons with already existing systems using the electronic digital signature. The concept of the offered informational system will provide a fast growth of users amount due to small financial investments and the subsequent expenses.

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