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ASSESSMENT OF IMPLEMENTING THE NEW INFORMATION TECHNOLOGIES AT PROVIDING BANKING SERVICES

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Abstract

Nowadays the credit institutions apply methods for calculating the economic efficiency of the introduction of information technologies assessing the statistical indicators for recording income and costs of innovation. The disadvantages of such approaches are considered subjectivity or inability to assess some parameters (quality of service) and the fact that an assessment of the current market situation is made, while market conditions are changing rapidly, new participants and regulations of their activities appear. The factors that lead to changes in the banking business itself are not taken into account. Implementation of identification systems based on the Touch ID technology at providing banking services is one of the most popular recent projects in the IT area. The implementation of these systems should lead to faster customer service, lower operational risk, increase the level of security of stored information, and so on. The article describes the methods for assessing the effect of using the identification system based on the Touch ID technology at providing banking services. The described methods help to calculate the coefficient of increasing the number of bank clients, the coefficient of operating risk reduction, the coefficient of increasing the speed of customer service and the degree of cost reduction during operations after the implementation of the Touch ID technology. These methods can be extrapolated to any other financial institution and the operated security system.

Keywords: New information technology, Touch ID technology, banking services

1. Introduction

The development of information technology is accompanied by an increase in the number of computer crimes and related information theft (Anikina et al., 2019). To solve this problem, three conditions must be met: the availability of information, the integrity and confidentiality of information resources, or, in other words, it is necessary to ensure the safety and reliability of electronic document flow (Chouprov et al., 2017).

By information security, we mean the security of an information system from accidental or deliberate interference that damages the owners or users of the system (Nikulin, 2015). The formation of an information security regime is a complex problem (Ragozina et al., 2020a). Measures for its solution can be divided into five levels: legislative, moral and ethical, administrative, physical, hardware and software (Ogloblin et al., 2019). The first four do not give 100% of the result of the security and confidentiality of the stored information. The latter is the most reliable and demanded in the information technology market (Ragozina et al., 2020b).

A modern security system is not only the usual means of ensuring the security of an object, but a combination of the latest automated software systems (Shcherbatov, 2019). The need to differentiate access to ever-increasing amounts of information in the modern world poses an acute problem of user authentication.

2. Problem Statement

Today, credit institutions use methods for calculating the economic efficiency of implementation of information technologies, which are based on an assessment of statistical indicators for recording income and costs of innovation (Nikulin, 2016). The disadvantages of such approaches are considered subjectivity or inability to assess some parameters (quality of service) and the fact that an assessment of the current market situation is made, while market conditions are changing rapidly, new participants and regulations of their activities appear. The factors that lead to changes in the banking business itself are not taken into account.

3. Research Questions

Due to the use of Touch ID technology, both the bank and the client receive certain benefits, including economic ones. The introduction of identification systems based on Touch ID technology in the provision of banking services is one of the most popular projects in the field of IT in recent years, and a lot of articles have been written on the topic of determining the effect of it. Many people already know that the implementation of these systems should lead to faster customer service, lower operational risk, increased security of stored information, etc. (Nikulin & Ragozina, 2015).

At the same time, each financial institution wants to have as many specific indicators calculated on the basis of real data as possible, and there is little information on how to get them and where to get the data for their calculation (Nikulin & Ragozina, 2016).

Methods for calculating the effect of implementation are usually the "know-how" of each organization conducting such an assessment, on the basis of which, we propose to consider a new system of indicators for assessing the effectiveness of the implementation of Touch ID technology in the provision of banking services, which can be used to calculate the effect of the implementation of systems identification in the banking sector.

4. Purpose of the Study

- to formulate the principles for the implementation of information technologies at providing banking services;
- to describe the possibilities of using Touch ID technology at providing banking services;
- to propose a system of indicators for assessing the effectiveness of the Touch ID technology implementation at providing banking services.

5. Research Methods

The research uses the following methods of scientific knowledge: observation, comparison, analogy, synthesis and analysis, induction and deduction, factor analysis. The theoretical and methodological basis of the study is represented by the works of domestic and foreign scientists on the problems of the functioning of the banking system.

Having analyzed the main technologies of authentication and identification and systematized them in Tables 1 and 2, it comes to the understanding that for the successful functioning of a security system with the required levels of performance and reliability, it is necessary to choose correctly what to use as an identifier and authenticator and, as an option, to consider their consolidation.

Table 1. Identification technologies

Technology name	Essence	Disadvantages
Barcode	It is based on the application of graphic information in the form of successive black and white stripes or other geometric figures on the surface of something, which makes it possible to read it by technical means.	identification tag data cannot be supplemented; small amount of data (usually no more than 50 bytes); the data on the tag is presented in clear text and does not protect against counterfeiting and theft; barcode marks are short-lived, because not protected from dust, moisture, dirt, mechanical influences.
Radio Frequency Identification Device	It uses radio waves to automatically identify objects. The technology is based on the use of the energy of an electromagnetic field, which allows reading and writing data to a special device - an RFID tag. The received information can be supplemented or rewritten.	the operability of the tag is lost in case of partial mechanical damage; the cost of the system is higher than the cost of the barcode system; the complexity of self-manufacturing; susceptibility to interference in the form of electromagnetic fields;

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		distrust of users due to the possibility of using it to collect information about people; insufficient openness of the developed standards.
Magnetic Stripe Identification	It implies the use of cards that have magnetic strips intended for storing information. Information is recorded by magnetizing tiny particles on the surface of the strip containing iron (a magnetic material). Magnetic cards are triggered when you swipe in a certain direction along the reader slot.	limitation on the amount of information that can be recorded on the magnetic stripe; insecurity from copying; sensitivity to dirt, mechanical damage (for example, scratches, breakage), moisture; short service life (no more than 1-1.5 years).
Biometric Identification	The technology is based on the use of statistical analysis of biological observations and phenomena - an automated method, with the help of which unique anatomical and physiological characteristics and behavioral characteristics of a person are recorded for further identification of his personality.	high cost; maintenance problems.

Table 2. Authentication technologies

Technology name	Essence	Disadvantages
Multiple password authentication	It is based on the constant use of one iteration of the entered data when registering in the system. The principle of operation is to compare the login / password pair with a reference value from the user account database.	interception of the entered data and their use in other people's interests; limited scope of data entry.
One-time password authentication	Uses different passwords for each new access request.	all passwords are required for access, which creates inconvenience in storage near the user; unreliable storage of passwords and insecurity from copying.
Authentication upon presentation of a digital certificate	According to the protocol with a request and a response, the authentication server sends the user a sequence of characters called a request, and the software of the client computer to generate a response generates a digital signature under the request from the authentication server using the user's private key.	insecurity from copying; high vulnerability to spyware.
Smart cards	Standard bank card size cards that have a built-in chip.	high cost; susceptibility to interference in the form of electromagnetic fields; insufficient prevalence of interoperable hardware.

Biometrics plays an increasingly important role in the organization of business information security, in protecting against leaks of the most valuable corporate data. In addition to the high-tech approach to

authentication, biometrics is also attractive for cost optimization, for example, by saving on password administration.

The future of identification and authentication, according to some experts, is in biometric technologies. From their point of view, this is the easiest way to reduce the risk of loss or theft of both gadgets and information (Nikulin & Ragozina, 2015).

When implementing new information technologies, it is important for banks to develop a strategy for improvement, i.e., to determine what and by what means to innovate (Ragozina et al., 2020a). The wrong choice is expensive, so the principles of implementing information technologies at providing banking services were formulated in Table 3.

Table 3. Principles of information technologies implementation at providing banking services

Principles	Requirements
Functional completeness principle	Information technology should have a wide range of components to perform specified functions, ensuring the most complete compliance of the system with information needs.
Resource principle	When implementing information technologies, it is necessary to have the financial, technical and human resources of the bank.
Customer focus principle	Banking innovation in information technology must be geared towards customer satisfaction.
Internal integration principle	When implementing information technologies in various areas of the bank's activities, the integration of various information flows into a single whole of business processes of a financial organization should be ensured.
Efficiency principle	The efficiency of the implementation of information technologies should lead to an increase in profits, an expansion of the scale of business, and to enhance the competitiveness of the bank.
Security principle	Information technologies should provide for the security of the system from accidental or deliberate interference in the normal process of its functioning, as well as from attempts to steal, modify and destroy its components. The safety of an automated system is achieved by ensuring three characteristics: Integrity of information. Assumes that information is changed during the operation of the system, only by users who have the right to do so. Availability of information to an authorized user at any time. Confidentiality of information. It is provided with the required degree of information secrecy and is provided only to the authorized users.

The formulated principles form the basis for the implementation of the Touch ID technology at providing banking services, which adequately reflect the features and development trends of the research object.

For calculating the economic efficiency of the information technologies implementation, the credit organizations use methods based on the assessment of statistical indicators for accounting of income and costs of innovation. The disadvantages of such approaches are considered subjectivity or inability to assess some parameters (quality of service) and the fact that an assessment of the current market situation is made, while market conditions are changing rapidly, new participants and regulations of their activities appear. The factors leading to changes in the banking business itself are not taken into account.

There is no doubt that both the bank and the client will benefit from using the Touch ID technology, including economic benefits. Only the actual implemented system should be assessed. If the

implementation is incomplete or failed, the effect will be low or non-existent. Before calculating the impact on the project, it is necessary to understand whether the system is really implemented and fully integrated into the daily work of the enterprise.

Methods for calculating the effect of implementation are usually the "know-how" of each organization that conducts such an assessment, on the basis of which a system of indicators for evaluating the effectiveness of the Touch ID technology implementation in providing banking services was proposed, which can be used to calculate the effect of the identification systems implementation in the banking sector (Nikulin, 2016).

The coefficient of increasing the number of clients C_1:

$$C_1 = 1 + \frac{BC_T}{BC_{total}}, \tag{1}$$

where BC_T – the number of new bank customers using the Touch ID technology; BC_{total} – the number of bank clients before the implementation of the Touch ID technology.

Using this coefficient, one can compare the growth rate of new customers who came to the bank due to the use of the Touch ID technology in relation to other implemented technology with a similar purpose.

The coefficient of operating risk reduction C_2:

$$C_2 = 1 - \frac{L}{(BC_{total} + BC_T)} \div \frac{L}{BC_{total}}, \tag{2}$$

where L – losses related to remote banking.

Using this coefficient, one can compare the degree of reduction of operational risks due to customers using the implemented the Touch ID technology.

The coefficient of increasing the speed of customer service, C_3:

$$C_3 = \frac{T_0}{T_1}, \tag{3}$$

where T_0 – time of operations before the implementation of the Touch ID technology; T_1 – time of operations using the Touch ID technology.

This coefficient shows the degree of cost reduction during operations after implementing the Touch ID technology, C_4:

$$C_4 = \frac{I_T}{BC_T + BC_{total}} \div \frac{I_0}{BC_{total}}, \tag{4}$$

where I_T – income per client after implementation of the Touch ID technology; I_0 – income per client before implementation of the Touch ID technology.

Using this coefficient, one can see the degree of increase in the bank's profitability due to the use of the implemented Touch ID technology by clients when providing banking services via remote services.

6. Findings

Assessing the project effectiveness is necessary to determine the prospects for the development of an identification system based on the Touch ID technology at banking services providing, especially if the project is pilot and will be replicated to other bank divisions (Nikulin & Ragozina, 2015). It is good if the

calculation of efficiency is carried out by an independent third-party organization, although this requires additional costs, it will add objectivity, and, therefore, increase the reliability of the assessment. But every IT company that pays great attention to the high-quality implementation of its products must have a methodology to assess the quality.

7. Conclusion

The above described methods for assessing the effect of the implementation of an identification system based on the Touch ID technology at banking services providing must be adapted to a specific financial institution and to the system being implemented, but they really allow assessing the effect. And this can be a good incentive for those organizations that have not yet decided on the implementation of the system, as well as those that have started implementation and want to make this effect as successful as possible. Thus, having clearly set goals, formulating the tasks of implementing information technologies at the beginning of the project, the organization thereby itself determines the results to be achieved.

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