

ФІНАНСИ. БАНКІВСЬКА СПРАВА

UDC 336:004.032.2 (477)

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**STRUCTURE AND CONCEPT OF THE
 AUTOMATIC BANKING SYSTEMS
 OPERATING: DOMESTIC AND FOREIGN
 EXPERIENCE**

Urgency of the research. Urgency of research of the banking information systems peculiarities of the developed countries of the world and the European Union with the purpose of using them in the domestic practice.

Target setting. It is reasonable to study the world experience for the perspectives of the banking system automation of Ukraine.

Actual scientific researches and issues analysis. Scientific works of such researches as O. Ananyev, V. Antonuyik, P. Belkin, V. Gizhevsky, A. Gurzhiy, N. Eriomina, F. Mashykhin, O. Mikhalsky, I. Matskevych, A. Oliynyk, T. Pysarevska, L. Ponomarenko, I. Rogach, L. Strelbytska, M. Tatarchuk, V. Shatska, N. Yurchuk and others founded theoretical bases of the development of the world banking information system.

Uninvestigated parts of general matters defining. The scientists haven't until now worked out in full amount issues of the ways search of automatization the Ukrainian banking system using the world experience of the countries in the world.

The research objective. The article is aimed to structure the best practices of the world experience of the ways of automatization of the banking system of Ukraine considering the ideas of the scholars and experience of the leading countries of the world.

The statement of basic materials. Creation of the definition of automatic banking system is researched in the article. The main problems of introducing modern information technologies and specific banking electronic products are determined in the article. Author structure of creating banking informational system is suggested. The most spread electronic systems of the world and recommendations concerning rational use of separate commercial automatic products in the banking system of Ukraine are given.

Conclusions. In the process of work essence of the definition "automatic banking system" was studied; retrospective of information technologies in the banking activity of Ukraine was investigated; current state of automatization of this sphere in our country and states-members of the EU was diagnosed that gave the possibility to track the main drawbacks and define priority directions of reforming the domestic informational banking system.

Keywords: bank; banking system; information technologies; automatic banking system; banking information system.

УДК 336:004.032.2 (477)

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**СТРУКТУРА ТА КОНЦЕПЦІЯ
 ФУНКЦІОНУВАННЯ АВТОМАТИЗОВАНИХ
 БАНКІВСЬКИХ СИСТЕМ: ВІТЧИЗНЯНИЙ ТА
 ЗАКОРДОННИЙ ДОСВІД**

Актуальність теми дослідження. Важливість вивчення особливостей банківських інформаційних систем розвинутих країн світу та Європейського Союзу задля використання їх у вітчизняній практиці.

Постановка проблеми. Доцільним є вивчення світового досвіду задля перспектив автоматизації банківської системи України.

Аналіз останніх досліджень і публікацій. Наукові праці таких вчених, як О. Ананьєв, В. Антонюк, П. Белкін, В. Гіжевський, А. Гуржій, Н. Єрьоміна, Ф.

Машихін, О. Міхальський, І. Мацкевич, А. Олійник, Т. Писаревська, Л. Пономаренко, І. Рогач, Л. Стрельбицька, М. Татарчук, В. Шацька, Н. Юрчук та інші заклали теоретичні основи розвитку світової банківської інформаційної системи.

Виділення недосліджених частин загальної проблеми. Науковцями ще недостатньо опрацьовані питання пошуку шляхів автоматизації української банківської системи з використанням світового досвіду провідних країн світу.

Постановка завдання. Стаття покликана структурувати країні практики міжнародного досвіду шляхів автоматизації банківської системи України з врахуванням ідей науковців та накопиченого досвіду передових країн світу.

Виклад основного матеріалу. В статті розглянуто формування поняття автоматизована банківська система. Виявлені основні проблеми запровадження сучасних інформаційних технологій та специфічних банківських електронних продуктів. Запропонована авторська структура формування банківської інформаційної системи. Приведені найпоширеніші електронні системи світу та надані рекомендації щодо раціонального використання окремих комерційних автоматизованих продуктів в банківській системі України.

Висновки. У процесі роботи було вивчено суть поняття «автоматизована банківська система»; розглянуто ретроспективу інформаційних технологій у банківській діяльності України; діагностовано сучасний стан автоматизації даної сфери в нашій країні та державах-членах ЄС, що дало змогу прослідкувати основні недоліки та визначити пріоритетні напрями реформування вітчизняної інформаційної банківської системи.

Ключові слова: банк; банківська система; інформаційні технології; автоматизована банківська система; банківська інформаційна система.

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DOI:10.25140/2410-9576-2017-2-2(10)-94-103

Urgency of the research. Rapid scientific and technological breakthrough demands the search of new solving the issue of automatization of the banking activity. Suggested by the domestic scientists ideas need systematization with the purpose to define the most efficient ones, and, at the same time, the most optimal from the point of view of resource costs of the defined purpose.

Investigation of the peculiarities of the banking information systems of the progressive states of the world with the purpose of using their achievements is reasonable. Performed investigations in combination with diagnosing the existing problems of the banking activity automatization shall allow to suggest new, relevant to the current stage of the scientific development, solutions.

Target setting. Scientific and technical progress caused drastic changes in all spheres of human activity. Development of the information technologies influenced on the banking system operating, efficiency of its work in considerable degree is dependent on rapidness and quality of processing the flows of economic data.

Banking information technologies of Ukraine are on significantly lower level then in high developed states of the world [1; 2].

With the purpose to increase efficiency of the banking activity in Ukraine it is reasonable to modify the banking system directed to its automatization.

This issue got problematic character that can be explained by the necessity of big capital investments and quite considerable pay back period. However, as the world experience shows, not automatic banking system is not competitive.

Development of the newest technic and modern technologies in combination with the financial possibilities will allow to automatized the execution of the most complicated financial operations, and that will not only accelerate information processing, which is very important for making efficient managerial decisions, but as well increase quality of the analysis of the financial data flows.

To define the perspectives of the banking system automatization of Ukraine it is actual to investigate its retrospective, diagnose the current state of the automatization process, to analyze the peculiarities of the banking information technologies of the leading world states (including the state-members of the EU, in particular, by increasing integration processes in Ukraine) with the purpose of using their experience.

Analysis of the recent researches and publications. Within continuous period the problem of the banking system of Ukraine automatization attracts attention both of the domestic and foreign scientists, among them the most important are : O. Ananiev, V. Antonyuk, V. Antonov, P. Belkin, V. Gizhevsky, V. Guzhva, A. Gurzhiy, N. Eriomina, F. Mashykhin, O. Mikhalsky,

I. Matskevych, A.Oliyuk, T. Pysarevska, L. Ponomarenko, I. Rogach, L. Strelbytska, M. Tatarchuk, V. Shatska, N. Yurchuk and other scientists that founded theoretical bases of the world and domestic banking information system.

Using accumulated achievements and experience of the foreign colleagues (T. Williams, U. Albrecht, I. Matskevych, L. Knudsen, M. Matsui, F. Mashykhin, A. Pattoks and others), their scientific works are directed to elaboration of the optimal variants of introducing the ideas of the banking system of Ukraine automatization in practice.

Identifying not investigated parts of the general problem. The researches have not until now in full extent worked out the issues of searching the ways of the banking system automatization using the world experience of the leading world countries.

The research objective. The main purpose of this work is search of the optimal ways of the banking system of Ukraine automatization considering suggested ideas of the scientists and accumulated experience of the leading countries.

Statement of the basic material. World breakthrough in the development of the information technologies reasons the acute need in the banking system of Ukraine transforming in direction of its au-

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tomatization with the purpose to increase efficiency of operating, competitiveness support in satisfying the needs of the clients by banking products and services.

As of 2016 index of network readiness of Ukraine was considerably lower than in majority of the countries with developed economy. By the level of the information and communication technologies development (ICT) Ukraine tool the 64th place among 139 participants of the World economic forum (Fig. 1) [3].

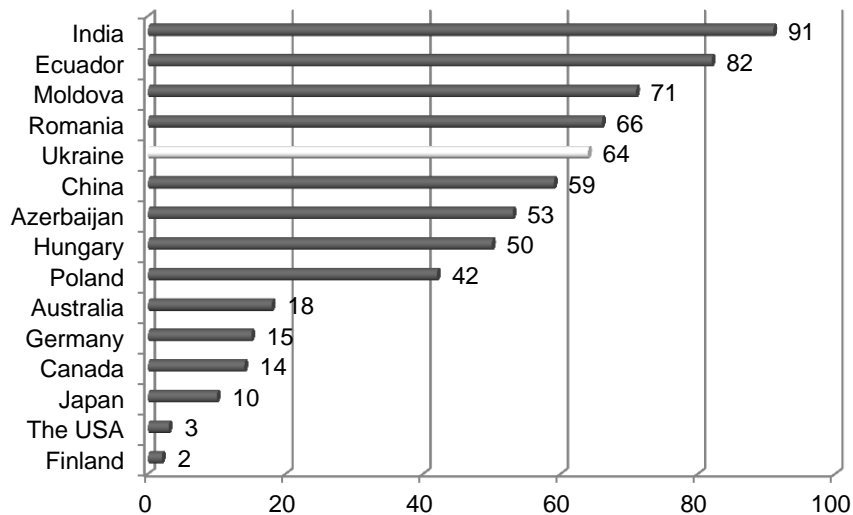


Fig. 1. Position of individual sates of the world by rating of the World economic forum by index of ICT

Development of the banking system of Ukraine is possible only on condition of the efficient implementation of its automatization.

On the base of investigation the essence of the definition “automatic banking system” that is given by leading scientists (Tab. 1), we suggest to use the following its definition: automatic banking system – is a complex of technical aggregates, mostly electronic devices and programs that by participating the staff provide organized and structured processing of economic information with the aim of productive operation of the banking system.

Table 1

Interpretation by the scientists the concept “automatic banking system”

| Scientist | Definition of the term “automatic banking system” |
|---|--|
| Yurchuk N. P. | System that operates on the base of computer and other technical means that provide processes of accumulating |
| Scientist | Definition of the term “automatic banking system” transaction, registration, storing and actualization for tasks solving of the banking activity management [1] |
| Fedyk M. V. | specific technological system that provides the banking establishment functioning [4] |
| Snishchenko R. G., Gladky V. V., Ardashov S. A. | set of tools that perform in the bank operations with deposits, credits and payments; complex of apparatus provision, program means, methods and procedures of information processing that by the staff management provides the bank functioning as a subject of economic activity [5] |

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Evolution of the automatic banking systems covers six generations (Fig. 2).

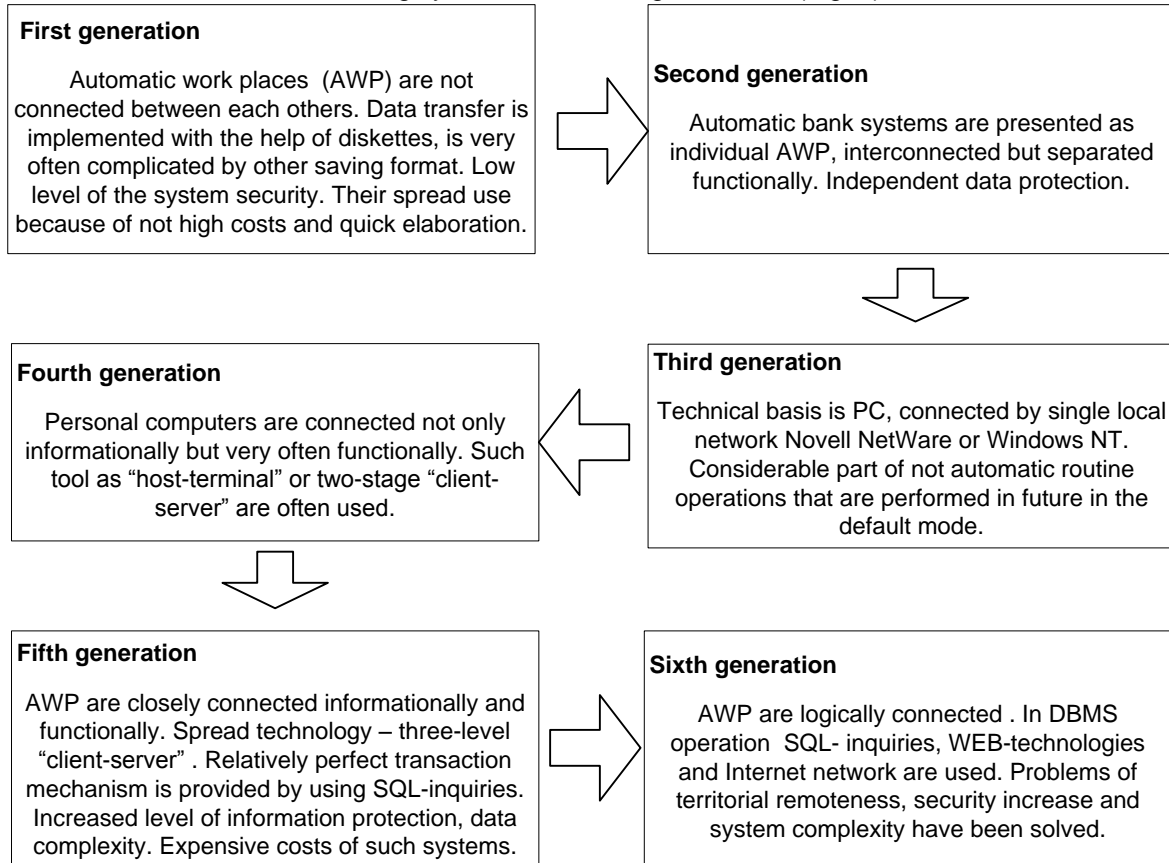


Fig. 2. Evolution of the automatic bank systems
Worked out by the author on the base of the sources [1; 5]

Current state of the development of the information technologies is significantly different in various banks of Ukraine, that at the present moment use of the second-sixth generations [4]. Information providing of the banking sphere of Ukraine can be presented as three layers (Fig. 3): data base; processed information storing; operation system of transactions OLTP processing (input of the documents and performing the operations) and OLAP service of the providing the work of the processed information storing and data use with the purpose of managerial decisions making [2].

Implementation of the bank information system operation is provided by closely interconnected structure subdivisions of the banks: front-office, (provides input of the original data and their preliminary processing, establishes relationships with the clients, financial and other establishments), back-office (processes documentary information submitted by front-office), middle-office (provides financial and management accounting, creates information exchange among all members of the system).

Continuous and efficient functioning of the banking system is possible on condition of using perfect software, the most popular of which at the present moment are SABO BARS БАРС Millennium; SABO RS-Bank; Scrooge; SABO ProFix/Bank; SABO Б2; SBON+ and others. Notwithstanding the big amount of existing software, these systems cannot provide complex automatization of the banking activity in the state, all standard operations performing [2] and of the d control the work of commercial banks by defined norms of the NBU.

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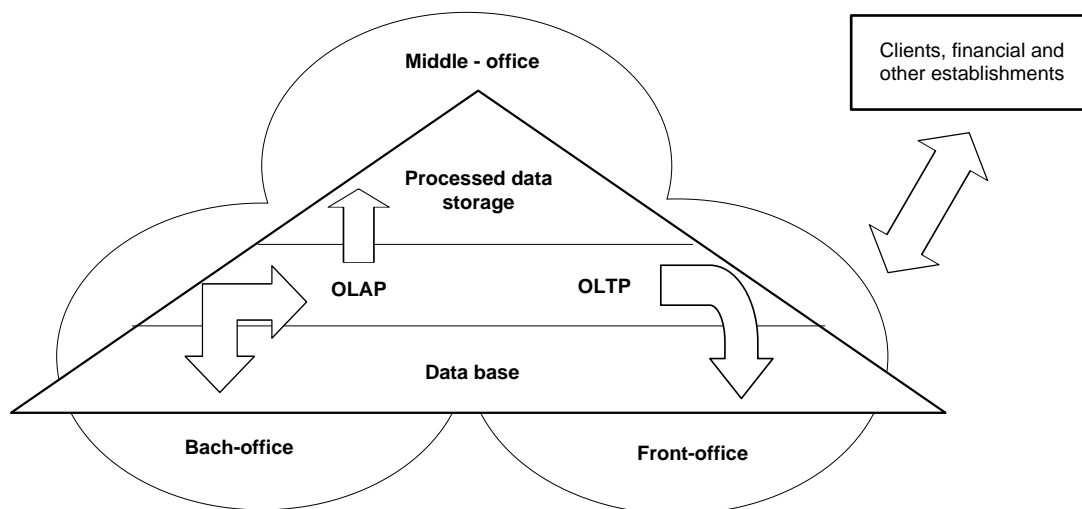


Fig. 3. Structure of the bank information system

To the most spread electronic systems of the world that are used by the banks for information processing are related SWIFT, Bank Wire Transfer, FedWire, CHIPS, CHAPS, TARGET 2.

SWIFT – the base of the global financial communication. This computer system provides efficient and safe interrelation of the correspondent subjects. SWIFT puts as a purpose immediate exchange of the information on conditions of confidentiality, complexity, protection from not sanctioned access to data. The system provides notices transaction, their receiving, but doesn't perform settlement actions of the information processing. Number of the members of SWIFT union at the present moment grows very fast, including today more than 11000 financial establishment all around the world [6].

In Ukraine organization UkrSWIFT was created that combines financial establishments of our state that are the users of SWIFT (81 participants), among which the most active can be determined, in particular : JSC "Reiffeisen Bank Aval", UkrSibbank, JSC "Oschadbank" [7].

Bank Wire Transfer – electronic system to conduct big payments between the banks or other subjects that is characterized by rapidness and safety of operations. Works with the help of the network SWIFT or FedWire [8].

FedWire – electronic system of immediate performing settlement operations that is a property of the Federal reserve system of the USA.

We'd like to note that the system of money transfer in Ukraine, especially funds of foreign members, requires considerable reforming. Distrust to the existing technologies reasoned development of informal means of funds transaction, in particular private transfers (Fig. 4).

TARGET 2 – payment system of the European Union created with the purpose to combine individual countries-members of the EU [9].

Strategic task of TARGET 2 is supporting stability of the banking structures operating on the European market on account of creating its continuous functioning. Transactions are possible only in EURO, but operations take place rapidly and safely.

TARGET 2 is implemented through tree stage management. On the first stage Management Counsel of ECB (European Central Bank) performs general management TARGET 2, solves serious crisis situations, solves the questions of certifications, etc. The second level is provided by work of the European System (the banking system of the European Zone that comprises ECB and national central banks of the EU countries-members), that bears the responsibility for work of individual systems, including in case of crisis phenomenon arise. On this stage contacts establishing is performed with the users of TARGET 2, daily monitoring of its activity is made, perspectives of business-activity develop-

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ment are investigated. The third level is realized through SSP- providing of the central banks and means decisions making concerning daily processes circulation on single common SSP platform.

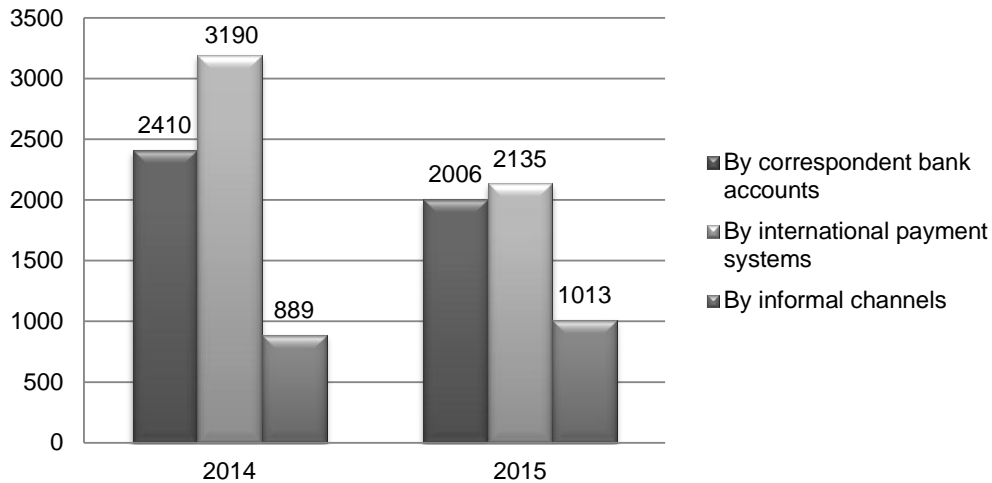


Fig. 4. Dynamics of the private funds transactions from abroad in terms of flow channels, mln USD

Technical structure of TARGET 2 (Fig. 5) – it is SSP platform with the services of accounting information and payments processing (PAPSS), as well connection with the customers (CRSS). PAPSS, in its turn, comprises payment modul (PM), module of constant payments, for example, interest payments (SF), management module (RM), home accounting module (HAM), statistic data module (SD), unpredictable situations module (CM) and information control mode (ICM). An important role plays interface T2S (T2SI), that provides interrelation between SSP and T2S platforms. Subsystems of Central Banks include PHA (reserves and credits management) and CMS (management software) subsystems. To SSP auxiliary systems are connected through the investigated network SWIFT.

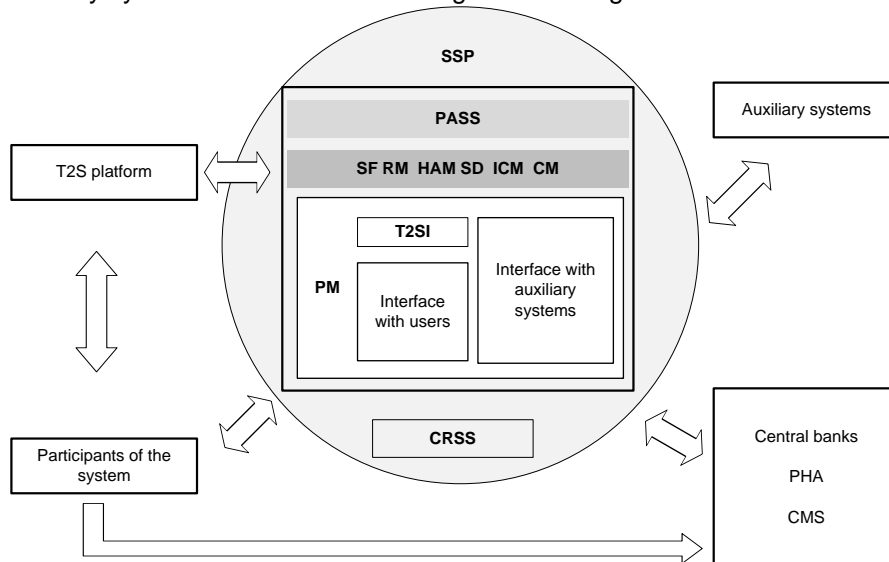


Fig. 5. Technical structure TARGET 2

Theoretically based and practically perfect is the organizational structure TARGET 2 (Fig. 6).

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All central banks-members of this system obligatory have established national support service that provides connection with the users of TARGET 2. Service is presented by managers, responsible for daily operations performing. They are connected between each other by specially created telecommunication forum. Besides, each central bank has manager on crisis situations management that exchange the information with authorized chiefs of ECB using SSP- platforms in the same way.

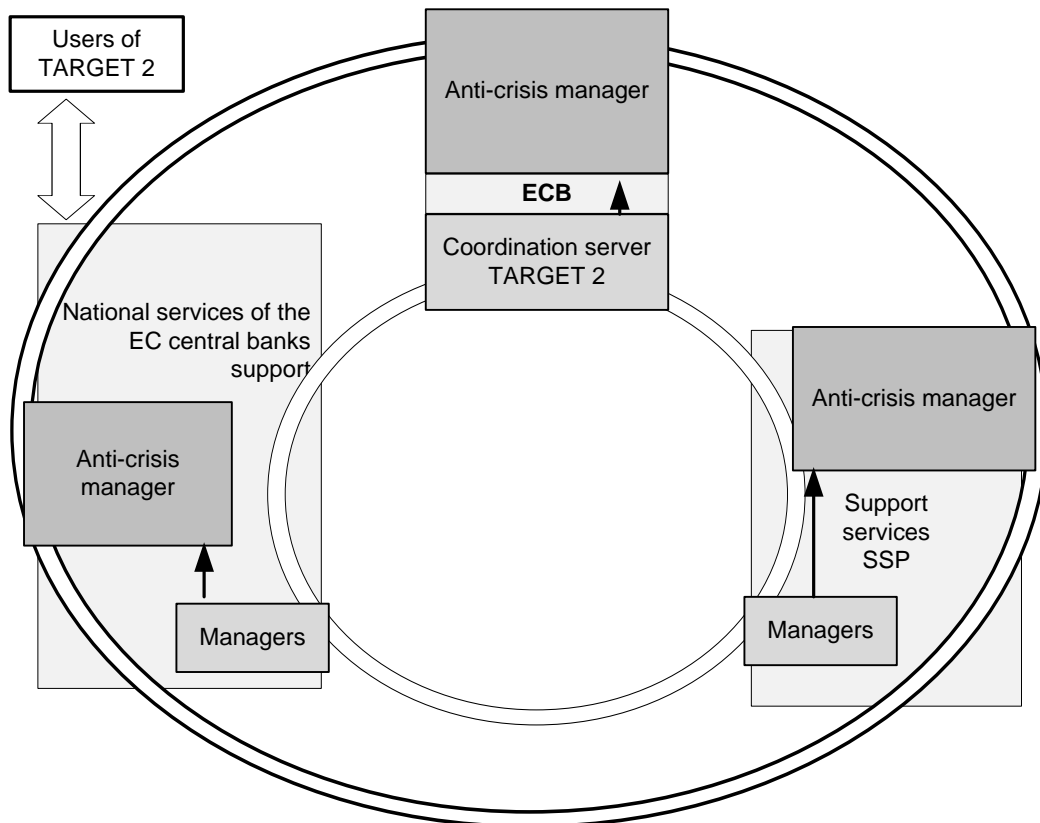


Fig. 6. Organizational structure of TARGET 2

Conducted researches certify about the high level of information technologies development in the banking system of the EU countries-members, that allowed fully avoid routine standard operations that are made now in the default mode; increased rapidness and quality of the data processing; strengthened control of money circulation; decreased number of faulty decisions; allowed to identify automatically potential or existing dangers of breaking normal operating of the banking activity; strengthened safety of the clients and the staff; integrated national bank systems of the EU; solved the problem of constantly growing amount of the information to be processed; created conditions for remote servicing the clients and work of the staff.

Given above advantages of the banking system of the European Union at the present moment have to be considered as priority directions of modification of the banking information technologies in Ukraine.

Efficiency increasing of the banking system operating in our state is possible on condition of introducing and establishing continuous work of single system of automatization, somewhat as TARGET 2 in the EU, obligatory for use by all relevant establishments of the country. By this, new software should include modules for execution on the default mode of all standard operations and have single set of

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system means, in other words, the program should be large scale and have limitations concerning the access to control the outflow of important financial information. Introducing such system needs of legislative regulating. Implementation of this idea will allow to accelerate and improve information processing, to make automatic control on operations, to establish interrelation between all banks and other members of the process, predict and timely solve crisis situations both on the level of individual banks, and in the system on whole.

An important direction of reforming the bank information system can become development of remote servicing the clients of the bank products and services. As of 2015 the users of the Internet network in Ukraine are 43,4% of the population. This is the lowest index among the European countries [10].

Inaccessibility for majority of people the global network reasons the low level of using the Internet-banking, especially in the countryside in comparison with the EU countries-members. It can be observed in Ukraine positive dynamics of the number of performed operations using payment cards through the Internet network (Fig. 7) [7], and that phenomenon must be supported and developed conducting educational trainings among the population, increasing the level of trust to the system by appropriate protection and guarantees.

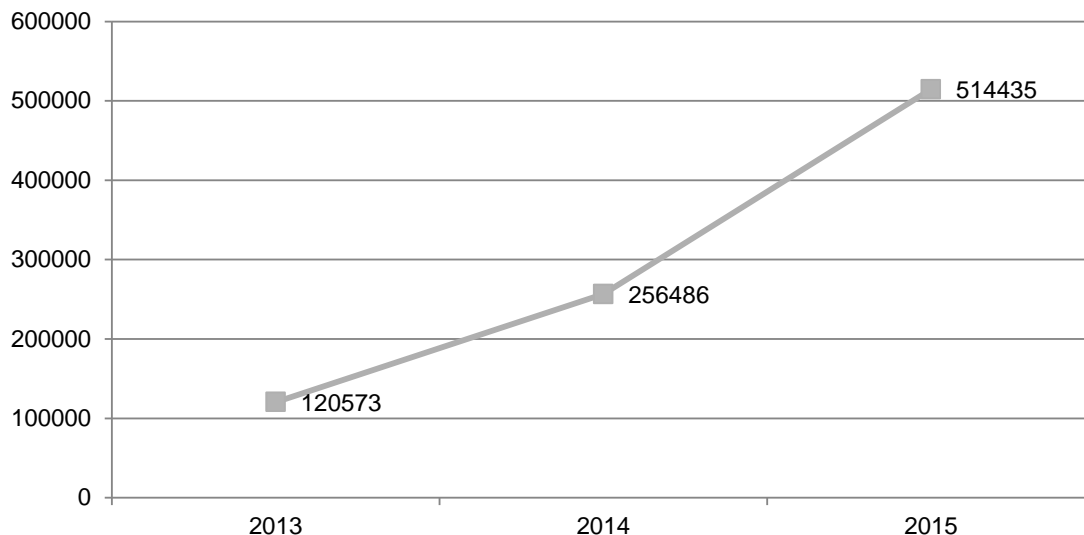


Fig. 7. Dynamics of the operations number using payment cards through the Internet

The statistic data of the World Bank state high development of cash point machines network in Ukraine, the number of which per 100 000 users increases not only world average, but as well average number in the EU (Fig. 8) [10]. However, in 2015 their number was 8,9% decreased comparing with 2014, negative dynamics could be followed in all regions of Ukraine (the biggest amount in Donets, Lugansk and Odessa regions) [7].

Besides, in 2015 decreasing of trading terminals on the territory of Ukraine in 2,6%. Tendency to decreasing the number was mostly observed in Ternopil, Kherson, Chernivtsi regions; tendency to increasing the number – in Kyiv, Lviv, Odessa and Mykolaiv regions [21].

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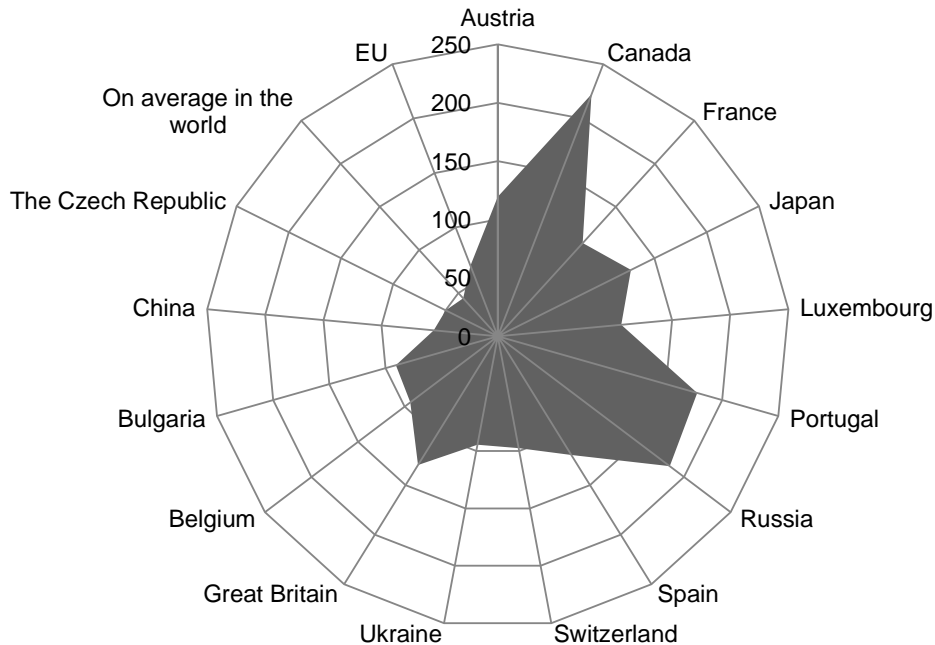


Fig. 8. Cashpoint machines number per 100 000 people in some countries of the world

Conclusion. Current banking information system of Ukraine is characterized by outdated regulatory framework; software mismatch that limits the possibilities to exchange information; access conditions to get the right for using information complexes.

Conducted researches state about necessity to modernize the banking information system of our state. In process of work essence of the definition “automatic banking system” was studied; retrospective of the information technologies in the banking activity of Ukraine was researched; current state of this sphere automatization in our state and the EU countries-members was diagnosed, that allowed to track the main drawbacks and define the priority directions of reforming the domestic information banking system.

Implementing the suggested ideas (introducing single complex software, system accessibility, legislative implementing of the operative service of crisis situations solving, security increase and data controlling, internet-banking and other remote services, etc. development) shall allow to create efficient and immediate management system, unify and standardize the information technologies in the banking establishments, to provide productive work of the virtual banking environment, to satisfy in maximal extent demand of the clients in banking products and services on account of possibility to use wide spectrum of modern technic devices, to increase the system mobility and minimize the risks of the financial information outflow.

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Received for publication 27.02.2017

Бібліографічний опис для цитування :

Sadchykova, I. V. Structure and concept of the automatic banking systems operating: domestic and foreign experience / I. V. Sadchykova, Y. V. Krasnyanska // Науковий вісник Полісся. – 2017. – № 2 (10). Ч. 2. – С. 94-103.