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PROBLEMS OF LEGAL PROVISION OF INNOVATIVE BANKING

The author analyzed the problem of legal provision of innovative banking. In modern conditions unconventional use of technologies in financial services sometimes absorb ways, system, methods of service delivery and some other objects of intellectual property. The author considered several problems in implementing financial innovations and questions on the coordination of technical solutions and the necessity of standardization and interoperability. Also the article investigated the aspect of regulating the use of financial innovation from the point of view of their accessibility for all participants in the financial markets. Finally, conclusions was done concerning innovating in banking. According to the author, the main problem is resolving legal issues regarding the relationship between the mechanisms of patent protection technologies and their mass application, resolving the conflict of public and private interests.

Key words: financial innovation, banking, invention, patent, payment services.

The regulation of innovations and technologies with their elements as components of innovations considered by such scientists as O. Davydiuk, J. Atamanova, K. Efremova, K. Martiakova, O. Shevchenko, D. Pogribnyi (transfer of technologies), B. Paduchak, I. Venediktova (intellectual property), I. Yakubivskiyi (intellectual property rights), Y. Voronin (invention) and others. But in modern conditions unconventional use of technologies in financial services appears, which sometimes absorb ways, system, methods of service delivery and some other objects of intellectual property.

In accordance with the database of State register of patents of Ukraine for inventions, utility models and industrial designs¹ Ukrainian banks protected the rights on appropriate items of intellectual property by obtaining patents. As of April 25, 2016 there were registered 12 (4 of them are annulled) patents for inventions related to banking, 19 (1 of them is annulled) patents for utility models and 41 (26 of them are annulled) patents for industrial designs. Many inventions and utility models provide systems, methods or processes of banking operations, parts of banking operations or performing certain actions related to the following transactions. They can be classified by various criteria. In our opinion, their distribution on the objects of intellectual property in accordance with the International patent classification (IPC)² and their correlation with the classification of banking innovations by certain groups according to scientific sources are the most expedient.

The classification of these inventions reveals that they relate exclusively or concurrently with another encoding to systems or data processing methods specifically adapted for administrative, commercial, financial, managerial, supervisory or prognosticative purposes. Herewith, such methods or criteria for marking patents are used as additional criteria (according to IPC):

- payment structure, schemes or protocols;
- trade, such as purchase, electronic commerce;
- finances; insurance; tax strategy; corporate tax or income tax treatment;
- systems or methods that are specially adapted for administrative, commercial, financial, managerial, supervisory or prognosticative purposes, without significant data processing.

Such systems and methods may be classified directly by the content in the following areas:

1. methods of remote access authentication or identification of bank clients for banking operations;
2. systems for transactions that relate only to bank operations or also to electronic commerce;
3. methods of electronic accounts or bill payments;

¹ *Офіційний веб-портал Державної служби інтелектуальної власності України.* <<http://sips.gov.ua/ua/register.html>> (2016, March, 15).

² *Міжнародна патентна класифікація (Версія 2015).* <<http://base.ukrpatent.org/mpk2009/index.html?level=c>> (2016, March, 15).

4. system of remote receiving information in a relationship "bank-client".

Scientists¹ distinguish the corresponding operations and activities:

- by the subject and the scope: product bank innovations that are connected with traditional bank activities; process bank innovations that are innovations of technological processes, properly process or service innovations;

- by the degree of novelty: innovations in an individual bank or innovations at the national level;

- by the nature of the need satisfaction: innovations that are focused on existing needs or innovations that are focused on the formation of new needs;

- financial innovations are also classified according to the new methods of the provision of services.

In modern conditions technology solutions for banking operations are generally classified by methods, systems access to direct banking services.

However, «innovation» is a broad term that encompasses several themes, including technological change, changes in services offered and changes to banks' business model. The study focuses on a selection of five defined «innovations» in the banking market². Mobile banking provides banking services through mobile, smartphone, tablet channels. Digital wallet is a service that facilitates the storage of payment credentials a payment either online or via a mobile device. Aggregators are a website or computer software that aggregates a type of information from several sources on the Internet. «Big Data» is the set of information, approaches and technologies for banking operations. The focus is on the use of big data in assessing credit-worthiness. «Bank in a Box» provides comprehensive core banking systems by another party to a bank.

1. Mobile banking includes new methods, systems, processes and programs that are the parts of such core services provided by mobile banking applications³:

- account checking services;
- money transfer and payment services;
- ATM location services;
- personalized alert;
- loan and service requests.

C. Mariotto and M. Verdier describe such innovations in mobile banking: stored-value card; personal finance tools apps; mobile technologies; touch ID, NFC, and Bluetooth technologies and cross border transactions; mobile technologies; online platform and others⁴.

2. Digital wallet – is a service that facilitates the storage of payment credentials and enables users to make payments, either online or via a mobile device. It can take a number of forms, encompassing different technologies, channels and providers. Digital wallets are generally split into two broad categories: online digital wallet and mobile digital wallet⁵.

Mobile digital wallets can be based on a number of technologies. These include:

- smartphone-based services that transmit funds directly using a mobile phone number;
- cloud-based services, with payment details stored in the cloud;
- other apps: services such as Apple Pay, which stores payment details;
- use of barcodes and QR codes for the payment through the merchant;
- use of NFC-enabled phones to make contactless payments;
- hardware-based systems;
- payment system.

¹ Єгоричева, С.Б. (2010). *Інноваційна діяльність комерційних банків: стратегічні аспекти*. Полтава: ТОВ «АСМІ», 63, 89.

² The Impact of Innovation in the UK Retail Banking Market. 2015. *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>> (2016, March, 15).

³ The Impact of Innovation in the UK Retail Banking Market. 2015. *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>>.

⁴ Mariotto, C., Verdier, M. (2015). Innovation and Competition in Internet and Mobile Banking: An Industrial Organization Perspective (Verkko-Ja Mobiilipankkitoiminnan Innovaatiot Ja Kilpailu Toimialan Taloustieteen Näkökulmasta). *Bank of Finland Research Discussion Paper No. 23/2015*. <[SSRN:http://ssrn.com/abstract=2695739](http://ssrn.com/abstract=2695739)>.

⁵ The Impact of Innovation in the UK Retail Banking Market. 2015. *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>> (2016, March, 15).

Aggregators are services that enable customers to select and buy products from a range of providers in a single place. Aggregators as a new computer software and a method of using banking services can function as comparison aggregators or account aggregators¹.

First of all, «Big Data» is a database that contains a huge set of information. The term is broadly used to describe data that is especially large in volume that traditional desktop computers and software are no longer capable of processing it. In other words, Big Data is the solution of the problem data storage and processing huge data volumes. For example, there are number of potential uses for big data within the banking sector. These include:

- Using detailed customer data to better differentiate between consumers. This can be used for both customer acquisition and customer retention strategies.
- Making use of data from a wider variety of sources in order to assess potential borrowers and the risks of default associated with loans. This is of particular relevance in the market for SME lending.
- Analyzing patterns in large datasets in order to rapidly identify security breaches and predict future violations.
- Making use of centralized information in order to ensure that regulatory reporting requirements are fulfilled while protecting customer privacy.
- Simulating future events and understanding the state of their business, in order to become more capable of managing risk².

Secondly, the processing large volume of information is only a part of the "iceberg". The most popular definition of three «V» (volume, velocity, variety) is used in the context of the term «Big Data». For example, the operation of checking the balance on the card for cash withdrawals is calculated in milliseconds. These requirements are dictated by the market. On the third hand, the information is varied and unstructured. More and more it is necessary to operate with media content, blog posts, poorly structured documents, etc.

So when we talk about Big Data, we understand that it is associated with three aspects: the large volume of information, its diversity or the need to process data very quickly. On the other hand, this term is often understood quite specific set of approaches and technologies that are designed to solve these problems. The basis of one of these approaches is a system of distributed computing, where processing of large amounts of data requires for not one high-performance machine but a whole group of machines that are united in a cluster.

«Bank in a Box» is typically understood more broadly as a «one-stop shop» service, whereby a new entrant or existing institution can obtain a complete solution for the IT systems it needs to operate a banking business. Bank in a Box broadly include:

- a core banking solution providing a range of banking products;
- support for face to face and digital different delivery channels;
- debit and credit card processing;
- Know Your Customer / Anti Money Laundering services;
- credit processing;
- fraud and risk analytics;
- financial, management and regulatory reporting³.

The majority of similar services that are offered in «Bank in a Box» have been proposed by researchers of modern innovation economy of Ukraine innovations in information technology management for the companies of the financial sector. They are as follows. It is important to expand the bank's operations in different market segments while reducing the cost of information processing and improve customer service. ERP class systems allow raising the requirements for efficiency, integrity and objectivity of information on the bank activities and developing strategic management that is based on the Balanced Scorecard. Customer requirements for the software are also in:

1. functionality, technology and adaptation to standard information technology that are offered by this

¹ The Impact of Innovation in the UK Retail Banking Market. 2015. *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>> (2016, March, 15).

² The Impact of Innovation in the UK Retail Banking Market. 2015. *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>>.

³ The Impact of Innovation in the UK Retail Banking Market. (2015) *A Final Report for the Competition and Markets Authority*. <<https://assets.digital.cabinet-office.gov.uk>> (2016, March, 15).

control system;

2.readiness of software developer to provide the necessary support for project management;

3.achieving the appropriate level of adaptation, which is proposed by specific legislation requirements.

It is necessary to make accent on the development of capabilities for the development and client base analysis in order to take into account the customers' needs and requirements to provide the personalized approach to client and to transform business in the most clear and transparent to them¹.

These researchers also offer information technology to government agencies in finance such as maintaining automated control systems that allows to control the flow of finance, correctness of the transaction amounts balances, etc. These tasks may be effectively solved by using modern information technology. So the project that was accepted for implementation by the State Treasury Agency of the Ministry of Finance of the Republic of Azerbaijan in 2005 had already provided for developed in the first stage of implementation:

1.information procedures for budget management (FI-FM);

2.revenue management systems (PSCD);

3.technology management of budget obligations (MM);

4.methods of forming analytical reports (BW).

ERP – is a system that reduces the collection and processing of information on financial results online. There are also algorithms that increase the accuracy of forecasting².

W. Scott Frame and Lawrence J. White define a financial innovation as something new that reduces costs, risks or provides an improved product / service / instrument that better satisfies financial system participants' demands. Financial innovations can be grouped as new products or services; new production processes; or new organizational forms³.

These inventions and utility models of Ukrainian banks can be attributed to certain types of financial innovation:

- commercial banks provide banking services at home that allow customers to pay bills, transfer funds and view account status using microcomputers;

- financial planning services and investment services in affiliates – financial supermarkets are offered;

- home banking, including Internet banking;

- introduction of banks that are only on the Internet;

- electronic bill presentment and payment⁴.

In many cases, innovations in retail payments represent only incremental improvements to existing and established payment services. However, large leaps can occur, particularly in countries where the payment infrastructure is underdeveloped⁵.

These forms of innovation give an opportunity to include financial and banking innovations in technologies and services that are elements of innovation in accordance with laws of Ukraine «On innovation activity» and «On state regulation of activities in technology transfer».

Furthermore, such technological solutions correspond to fixed concept of invention and utility model. Invention meets the patentability if it is new, involves an inventive step and is industrially applicable according to the law of Ukraine art. 7 p. 1, 2 «On protection of rights to inventions and utility models»⁶. In its turn, utility model meets the patentability if it is new and industrially applicable⁷. It is important to note

¹ Товажнянский, Л.Л. (2010). *Инновационная экономика*. Харьков: ООО «ЭДЭНА».

² Товажнянский, Л.Л. (2010). *Инновационная экономика*. Харьков: ООО «ЭДЭНА».

³ Frame, W. Scott, White, Lawrence J. (2014). Technological Change, Financial Innovation, and Diffusion in Banking. *Working Papers 2*. New York: New York University, Leonard N. Stern School of Business, Department of Economics <http://web-docs.stern.nyu.edu/old_web/economics/docs/workingpapers/2014/White_TechnologicalChange_Jan2014.pdf> (2016, March, 15).

⁴ Finnerty, J.D. (1988). Financial Engineering in Corporate Finance: An Overview. *Financial Management*, 17(4). <<http://www.jstor.org/stable/3665764>>.

⁵ Innovations in retail payments (2012). Report of the Working Group on Innovations in Retail Payments. *Bank for International Settlements*. <<http://www.bis.org/press/p120529.htm>>.

⁶ Закон про охорону прав на винаходи та корисні моделі 1991 (Верховна Рада України). *Офіційний сайт Верховної Ради України*. <<http://zakon3.rada.gov.ua/laws/show/3687-12>> (2016, March, 15).

⁷ Закон про охорону прав на винаходи та корисні моделі 1991 (Верховна Рада України). *Офіційний сайт*

that these financial innovations relate to technology objects according to the law « On state regulation of activities in the field of technology transfer»¹, namely, scientific results, objects of intellectual property rights (including patents, utility models, scientific, technical works, computer programs, trade secrets), know-how, which display a list, timing, order and sequence of operations process production and \ or sale and storage products and services.

It is necessary to consider the legal doctrinal understanding of technology as innovations. O. Davydiuk includes the concept «technology» such components: production methods and processes information about the sequence of individual production operations, the results of research and development work, project documentation mechanism, equipment instruments, devices, tools, etc.²

V. Babayev relates to objects of intellectual property rights in innovation: scientific and technical information, computer programs, compiling a database, and industrial property: inventions, utility models, industrial designs, trade (brand) name, geographical indication of origin, trademarks for goods and services, topographies of integrated circuits, plant varieties, know-how. In our opinion, in financial services and banking objects of intellectual property among the above objects are scientific and technical information, computer programs, compile databases, inventions, utility models.

There are several problems in implementing financial innovations. There are questions on the coordination of technical solutions and the necessity of standardization and interoperability. Some questions exist to determine the policy of central banks – towards the development of international standards, adherence to them, collaboration with stakeholders, the direction, participation and support of national standards.

There are factors that make it difficult for all newcomers to enter the financial market. It is noted that the international financial market for retail banking has regulatory, structural and strategic barriers to entry financial services markets³.

Regulators impose barriers to entry on the market by requiring banks to obtain a license from the relevant authority and to implement risk management procedures. Meanwhile, non-banks, such as Internet Service Providers and platforms or large retailers, have less regulatory barriers. There are also barriers to entry due to the particular structure of costs in the banking industry. Costs functions of banks are characterized by economize of scale and scope between deposit and lending activities. Banks economize on costs by bundling both services because they reduce information asymmetries between depositors and lenders, and thanks to their expertise in managing liquidity risk.

The barriers to entry can be strategically erected by incumbent banks. Competitors can also be deterred from entering the financial market by strategic investment in quality. The level of bank quality investments increases in market size and dominant banks offer higher quality than fringe banks.

Thus, the development of innovation and/or technology in the market of banking services and other financial services markets must be clearly associated with the following tasks:

1. The promotion using new technologies in banking.
2. The development of legal framework for public prioritizing technology development in the financial services markets.
3. The resolving legal issues regarding the relationship between the mechanisms of patent protection technologies and their mass application, resolving the conflict of public and private interests.
4. The definition of common technical rules and standards for banking transactions and other financial services to eliminate conflicts.
5. The elimination of anticompetitive issues of application of innovations in the financial services markets.

Верховної Ради України. <<http://zakon3.rada.gov.ua/laws/show/3687-12>> (2016, March, 15).

¹ *Закон про державне регулювання діяльності у сфері трансферу технологій 2006* (Верховна Рада України). Офіційний сайт Верховної Ради України. <Режим доступу: <http://zakon3.rada.gov.ua/laws/show/143-16>> (2016, March, 15).

² Давидюк, О.М. (2010). *Технологія як об'єкт господарсько-правового регулювання*. Харків: Вид-во «ФІНН», 23.

³ Mariotto, C., Verdier, M. (2015). *Innovation and Competition in Internet and Mobile Banking: An Industrial Organization Perspective* (Verkko-Ja Mobicilipankkitoiminnan Innovaatit Ja Kilpailu Toimialan Taloustieteen Näkökulmasta). *Bank of Finland Research Discussion Paper No 23/2015*. <<http://ssrn.com/abstract=2695739>>.

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