

The integration and clustering processes in digital innovative development of payment market

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Abstract—In order to expand the influence of payment systems on the innovative development of the economy, we believe it is necessary to integrate payment systems with FinTech companies, IT companies and to create clusters according to territorial and operational principles. Integration and clustering can accelerate the process of transfer and distribution of digital innovations to subjects and users of the payment market. We propose to consider two interaction directions of the payment market participants, using which acceleration of digital payment innovations can be carried out as well as their transfer to market subjects, namely: integration and clustering.

The integration of payment systems should be carried out step-by-step by institutions (with creation of joint management bodies, with creation or adaptation of common payment networks, clearing networks, with formation of joint data processing centers); by methods of regulation, standardization, supervision and control of the payment market; by processes of multi-level cooperation and market coordination; by integration products in the form of operational standards, standards for information protection and crime prevention, universal digital competences in scientific research, educational environment, special (financial) and general (nano-, bio-, information and cognitive) technologies.

We propose to create clusters of payment systems and subjects of payment markets through their consolidation and merging, which will ensure a symbiosis of financial and non-financial technologies. Clustering can occur on the operational grounds, as well as territorial clusters can also be formed within operational clusters, that carry out local digital technology transfer. As a result, one achieves intensive introduction (or acceleration of extensive development) of the new digital technological structure, competition based on progressive market positions, complementarity of the payment markets, expansion of the capacity of national and private payment systems, global scale of the resource and customer base, acceleration of money turnover and other private economic, political and social effects.

Keywords—integration, clustering, payment markets, payment systems, payment services, digital economy, digital innovations

I. INTRODUCTION

In recent years, the world has seen trends to accelerate the diffusion of innovations produced by the information

and communication sector into high-tech sectors of the economy. The payment market shows the most susceptibility. It does not only approve such innovations as blockchain technologies, API, Big Data, biometric identification, robotization, machine learning, neural networks, etc., but also contributes to their accelerated penetration into non-financial sectors of the economy. Payment systems, as the main system-forming participants in the payment market, are the first to respond to the challenges of time, prove efficiency and competitiveness in servicing individual financial and social needs of the economy and society.

It is known that operational and/or territorial localization is a limiting factor for the stable progressive growth not only of quantitative indicators, but also of the quality of provided services by both individual subjects and the payment market. In order to expand the activities of payment systems on an innovative basis, we believe it is necessary to integrate payment systems with FinTech companies, IT companies and create clusters according to territorial and operational principles. Integration and clustering can accelerate the process of transfer and distribution of digital innovations to subjects and users of the payment market. Unlike horizontal transfer of innovations, that is, between participants in the payment market, which is not directly controlled by the market, driven largely by market forces, the vertical transfer of innovations can and should be centrally managed by the authorities of digital development and be consistent with the geopolitical strategy of breakthrough evolution and protection of sovereign interests [1], [2]. These circumstances determine the importance of developing integration and clustering mechanisms in the payment market, ensuring an increase in the overall socio-economic effect of introducing digital innovations and speeding up the transition to a new technological structure.

II. METHODS

Geo-economic and political challenges that orient sovereign payment markets to protectionism of national economic entities and ensuring information and financial security have intensified applied scientific research. However, the holistic theory of payment systems has not been developed yet, the discussions are revolved around the organizational and functional improvement of the elements

of the financial mechanism of payment systems and other participants of the payment market, around the fundamental issues of digital innovation and its mechanisms in the payment sphere [3].

Problems of innovation of the banking system were considered in the works of I.D. Anikina, A.V. Gukova, A.A. Golodova, A.A. Chekalkina [4], Yu.I. Korobov [5], O.G. Semenyuta, N.O. Panchenko [6], et al. The theory and methodology of the payment market was addressed by Russian and foreign experts: Baydukova N.V., Vasilyev S.A., Chepakov D.A. [7], Bech M.L., Preisig C., Soramaki K. [8], Korobov Yu.I., Orlova A.N. [9], Leinonen H., Soramaki K. [10], Stiglitz J. E., Bhattacharya A. [11], Travkina E.V., Kovalenko S.B. [12] et al.

Certain aspects of the digitalization of the economy were developed by Kozenko Yu.A. [13], Levine R., Loayza N., Beck T. [14], Nelson R., Phelps E. [15], Tokareva E.V., Yagupova E.V. [16], Zavivaev N.S. Shamin E. A. [17] et al.

However, the existing specialized literature doesn't present unified approaches to integration and clustering, which are considered as mechanisms for acceleration and subsequent transfer of digital innovations from payment systems to their users for distribution to the non-financial sector.

This study is based on general methodological scientific principles (unity of theory and practice, objectivity, complexity of a specific historical approach), as well as a system approach to integration and clustering as mechanisms for the innovative development of payment market entities and transfer of innovative impulses to payment service users.

III. RESULTS

We propose to distinguish two areas of interaction between the main operational participants of the payment market - payment systems, using which acceleration of digital payment innovations can be carried out as well as their transfer to the subjects of the payment market: integration and clustering.

A. *Integration of the payment systems*

To achieve a synergistic effect of innovatization the payment market and accelerating the payment innovations, it is advisable to integrate payment systems by institutions, methods, processes, and products.

3.1.1. Integration by institutions with the creation of joint governing bodies, the creation or adaptation of common payment networks (based on the existing SWIFT system and/or the created alternative to the SWIFT system of the European Union group jurisdiction and/or the improvement of sovereign networks and/or the formation of new networks based on blockchain technologies), clearing networks, the formation of common data centers while preserving their sovereignty in the protection of national security information, which together form the institutional environment of accelerative transfer of payment innovations.

Here the major problem is the creation or adaptation of payment networks for cross-border operations. Recently, the Russian Federation has repeatedly faced with emergency of disconnection from the international payments system SWIFT, the answer to which could be the development of alternative methods of transferring payment information. For

example, the most likely alternative analogue is a payment network created by the EU countries - Blockchain World Wire. This is a global payment blockchain system based on the Stellar protocol, using which banks can make international payments using clearing. Transactions within the system can be carried out with both traditional fiat money and with cryptocurrencies, as well as between them, which creates opportunities for issuing national or supranational cryptocurrencies.

3.1.2. Integration by methods of regulation, standardization, supervision and control of the payment market.

When integrating payment systems for transferring digital innovations, it is advisable to build an external impact policy, including regulation and incentives. When organizing such an impact at the stages of the formation and functioning of an integrated system, an individual approach is required to the subjects of the selected groups, regardless of the degree of centralized certainty and conditionality of the elements and their co-ordination from the central element.

The policy of external influence takes into account the nature of integration and centralization. The following regularity seems to be fair: the higher is the degree of centralization of the system and the dominance of centralized elements in it, the stronger the direct coordination and regulation by national regulators is [18]. Consequently, in a decentralized system, integrated on free market principles, along with indirect measures of external influence, it is advisable to practice self-regulation (for example, following the pattern of the association of commercial banks in the banking system). But the ratio of external regulation and self-regulation should be different at different stages of formation and institutional formation of the system under consideration: the predominance of direct external regulation at the initial stages with its gradual transformation into indirect forms, or replacement with self-regulation mechanisms at the later stages of integration.

Different forms of regulation should be applied to different sectors and segments of the payment market [19]. Thus, the sector of financial commercial services and the sector of payment services in electronic communications are the most commercially attractive, dynamically growing, and therefore for them the predominance of self-regulation forms is logical. For the social sectors, where the share of state capital and state and municipal organizations is high [20], strict standardization, more detailed control and a shift in the balance towards external regulation are assumed.

Regulation and self-regulation assumes a high level of standardization of payment system operations, aimed at increasing the degree of compliance of products and technological processes with their functional purpose, elimination of artificial technical barriers for entering new participants [21].

When implementing the task of digital innovations' transfer, it is important to introduce standardization procedures for the following key parameters of the innovations' transfer:

- Ensuring the security of processing, transmission and storage of data;

- Conducting settlement procedures between the participants of the system and separate payment systems;
- Adherence to time schedules and speed of processing of various types of transactions in payment systems;
- Basic requirements for the functionality of payment instruments;
- The main identification parameters of various categories of users [22] and others.

3.1.3. Integration by processes of multi-level cooperation and market coordination.

3.1.4. Integration by vertical integration products in the form of operational standards, standards of information protection and crime prevention [23], [24], universal digital competences in research, educational environment, special (financial) and general (nano-, bio-, informational and cognitive) technologies.

B. Clustering of the payment systems and subjects of the payment market.

As a result of vertical integration, clustering of payment systems and subjects of payment markets should take place, which involves consolidation and merging of payment systems with the formation of new organizational structures - payment clusters, as well as the symbiosis of financial and non-financial technologies. Clustering can occur on an operational basis, but territorial clusters can also be formed within operational clusters that carry out local digital transfer (for example, to non-financial sectors [25]).

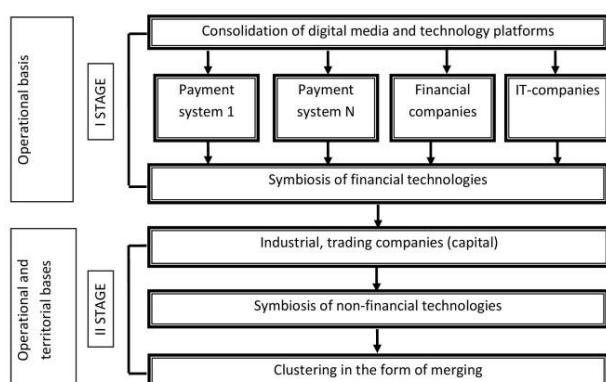


Fig. 1 - Stages of the cluster transfer of digital payment innovations
(source - author)

The Fig.1 shows the stages of transfer of payment innovations in clusters.

To form cluster groups, the following economic and regulatory prerequisites must be created:

- Ensuring the unity of the legislative regulatory and control field, manifested in the creation of a successive vertical of laws, regulations, guidance documentation;
- Protectionism of payment systems of national origin;
- Creation of transparent conditions for entry and mechanisms for the functioning of associations, which consist in: unifying the rules of participation, requirements for participants; unambiguous understanding of the rights, duties and responsibilities of participants; formalization of relations between the participants and so on;
- Ensuring the technical attractiveness or at least the

acceptability of the technical and technological aspects of integration into the group, meaning the competitive preference of various forms of cooperation in the payment cluster with the availability and ease of adaptation of the technical support for the functioning of the subject as an independent unit and as an element of the cluster;

- Development of a common infrastructure for the territorial expansion of payment systems with the alignment of regional levels of high-tech and high-performance information transfer. If various software and hardware and technology platforms are used, then there will be no guarantees of the implementation of transactions by different subjects of payment systems;

- Providing general economic incentives to the entering participants, including:

a) Tax preferences of the initial stage of the functioning of the cluster element in the form of investment tax credits, etc;

b) General subsidiary funding, which replaces individual funding of monetary items in cash flow, in accounts in national structures, allowing individual participants to achieve savings in funding sources and their redistribution to operational activities;

c) The general subsidiary mandatory and voluntary reservation of liabilities by the payment system, replacing the individual reservation by participants;

d) Creation of self-insurance funds to minimize the risks that are actualized in connection with the integration and innovation of the payment market;

e) Preferential domestic lending for temporary gaps in the participant's payment turnover within the cluster with reduced requirements for the provision and opening of credit lines, which will contribute to the rational flow of capital that regulates current cash flows;

f) Cluster pricing mechanisms, which consist in the possibility of differentiating the cost of services for cluster members, the establishment of preferential domestic tariffs. However, this incentive can be applied in the areas of payment systems where there are no violations of antitrust laws, that is, mainly in systems that are united by an operational basis (where competition is high enough) and not by a territorial basis (in the case of geographic isolation and lack of alternative services).

- informational and educational work and educational activities of the state and economic entities to improve the financial and communication literacy of payment system users, individually focused on different age groups of the population, separate groups of legal entities, namely users of payment systems. Activities should focus on advertising the benefits of innovative payment services, on learning technologies and practice of using payment instruments and payment equipment, on mastering ways to protect one's own information, personal data and money, and so on.

IV. CONCLUSION

The subjects of the payment market are able to support the trend of accelerating the diffusion of innovations produced by the information and communication sector into high-tech sectors of the economy. In order to expand the influence of payment systems on innovative development, we believe it is necessary to integrate payment systems with

FinTech companies, IT companies and create clusters according to territorial and operational principles. Integration and clustering can accelerate the process of transfer and distribution of digital innovations to subjects and users of the payment market.

We propose to consider two areas of interaction of the main operational participants of the payment market - payment systems, using which acceleration of digital payment innovations can be carried out and their transfer to the subjects of the payment market: integration and clustering.

It is advisable to gradually integrate payment systems by institutions (with the creation of joint governing bodies, with the creation or adaptation of common payment networks, clearing networks, with the formation of joint data processing centers); by methods of regulation, standardization, supervision and control of the payment market; by processes of multi-level cooperation and market coordination; by integration products in the form of operational standards, standards of information protection and crime prevention, universal digital competences in scientific research, educational environment, special (financial) and general (nano-, bio-, information and cognitive) technologies.

We propose the creation of payment system clusters and subjects of payment markets through their consolidation and merging, which will ensure a symbiosis of financial and non-financial technologies. Clustering can occur on an operational basis, but also territorial clusters can be formed within the operational clusters that carry out local digital technology transfer. As a result, intensive introduction (or acceleration of extensive development) of the new digital technological structure, competition based on progressive market positions, complementarity of the payment markets, expansion of the capacity of national and private payment systems, global scale of the resource and customer base, acceleration of money turnover and other private economic, political and social effects, which together form the institutional environment for the accelerated transfer of payment innovations.

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