2. Stepanenko D. M. Classification of innovations and its standardization in the Republic of Belarus.SCIENCE AND TECHNOLOGY. 2005;(5):71-75.

3. A. A. Azizov, N. G. Akinshina EDUCATION FOR SUSTAINABLE DEVELOPMENT Educational and methodological manual, Tashkent-2009

4. K. A. Barmuta Main stages of implementation of innovative projects. Bulletin of DSTU, 2017. No. 2

5. PALEY T. F. Innovation management. 2nd edition, revised edition-Kazan: Publishing house "Foliant", 2011. - 162 p.

DIGITAL TRANSFORMATION OF FINANCIAL INFRASTRUCTURE OF TAJIKISTAN

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The issues of digital transformation of society today completely permeate our daily life, further exacerbate the relevance of information security issues due to the use of huge amounts of information, the need for high-quality infrastructure, the interaction of all participants in the digitalization process from the standpoint of efficiency and increasing the level of digital literacy of the population, training appropriate personnel capable of working in the digital environment. The developing digital economy has the potential to generate new research and breakthroughs, fueling jobs and economic growth.

The digital economy involves a worldwide network of financial and social interactions that are implemented through reference-computer technological processes, which make it possible to determine direct relationships among firms, banks, authorities and society. The main components of the digital economy include e-commerce, electronic banking, electronic payments, Internet advertising, Internet content and etc. (Figure 1)

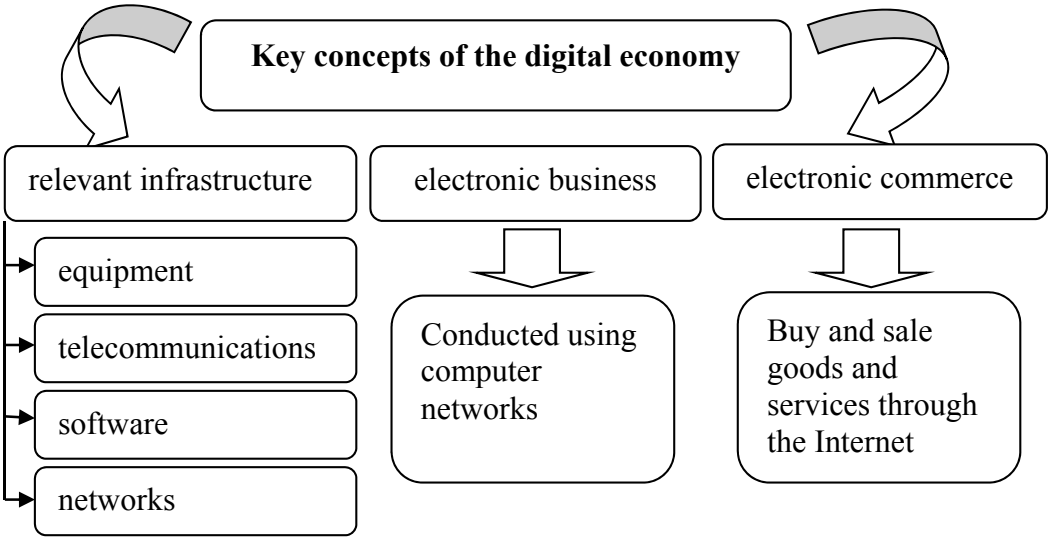

Fig.1. The key concepts of the digital economy

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The digital economy has recently been a relatively new concept that includes many aspects that have not been well studied, especially in terms of building its financial infrastructure. Most developed countries like Japan, the USA, Canada, Great Britain, Germany and Sweden view the development of the digital economy in their society as a strategic goal for the next few decades, focusing on its financial component. This makes it relevant to identify key components of the financial infrastructure of the digital economy in the Republic of Tajikistan.

The issues of developing elements of the financial infrastructure of the digital economy are especially relevant in the context of exacerbating recessionary trends in the global financial system. Issues related to the financial infrastructure of the digital economy have been investigated in the works of such scientists as Mavlutova I. and Volkova T. (2019), I. Lee, and Y. J. Shin(2018), Kotarba M. (2016), Arefjevs I., Spilbergs A. and others(2020), Kolodei YuS & Korshunova OS (2017), Dashchenko Y. (2018) and many others.

In recent years, another wave of transformation of business and social activity models has been unfolding, caused by the emergence of new generation digital technologies, which, due to the scale and depth of influence, have been called - artificial intelligence, big data, robotics, the Internet of things, wireless communication technologies and several others. In accordance with the data of WEF, their implementation is estimated to increase company productivity by more than 40%. In the near future, it is the effective use of new digital technologies that will determine the international competitiveness of both individual companies and entire countries that form the infrastructure and legal environment for digitalization.

Fintech is undergoing radical changes that affect infrastructure (associated with increased levels of automation), openness and customer focus. The development of technologies such as big data, cloud services, artificial intelligence, new analytical tools, etc., contribute to the transition of the quality of customer service to a higher level.

The engine for the development of society and the national economy is the country's effective financial infrastructure. Nowadays technological change is one of the most important components of the economic growth model. Consequently, the trend of accelerating technological change has led to the emergence of a new business philosophy and the development of new strategies in companies. The world's leading countries are allocating huge funds for the development of digital technologies, which are the core of the provision of financial services (Table 1).

While in the classic model, banking and financial institutions were the main elements of financial infrastructure, in the digital era, virtual banks, international electronic money systems, financial and technical companies and etc. are considered it's new forms and models.

Currently, the rapid development of information and communications is causing changes in the business models of banks, which are based on the emergence of new forms of cooperation with market entities that provide various types of services. Fintech is putting competitive pressure on traditional financial institutions' business models by

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eliminating the need for additional intermediaries and encouraging new ways of providing financial services. To date, the volume of services provided using Fintech in the world and especially in Tajikistan is still much less than the volume of traditional financial transactions, but the growth rate of Fintech is incomparably greater.

Table 1. Fintech penetration rates by country

№	Country	Penetration rate indicator	
		2017	2019
1	China	69	87
2	India	52	87
3	Russia	43	82
4	South Africa	35	82
5	Netherlands	27	73
6	Mexico	36	72
7	Ireland	26	71
8	UK	42	71
9	Singapore	23	67
10	South Korea	32	67
11	Brazil	40	64
12	Germany	35	64
13	Sweden	-	64
14	Switzerland	30	64
15	Australia	37	58
16	Spain	37	56
17	Italy	-	51
18	Canada	18	50
19	USA	33	46
20	Bel&Lux	13	42
21	France	27	35
22	Japan	14	34

Source: https://www.ey.com/en_gl/ey-global-fintech-adoption-index

The main consumers of fintech (as well as the main carriers of big data) in the domestic market are organizations of the banking sector, telecommunications and trade, for which big data analysis (solvency analysis, consumer behavior and market conditions, etc.) is a key tool for maintaining competitive advantages.

It should be noted, that in the global space creating a well-structured and well-regulated financial sector is a key factor for the development of the digital economy.

The key components of the financial infrastructure are clearing organizations, central counterparties, commercial banks, investment funds, insurance organizations, central depositories, repositories, money payment and transfer systems, and surety and collateralized lending.

The level of development of financial infrastructure is closely related to the strength and stability of the government financial system. Financial stability achieves by improving the safety and effectiveness of protecting the interests of investors, as well as the rights of borrowers.

The financial infrastructure provides the legal framework for the growth of the financial system and is a key element for increasing the availability of finance. One of the

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ways to improve the efficiency of the financial system is to reduce the cost of banking operations, which will make lending services more affordable.

The level of development of the financial infrastructure is assessed according to four criteria, which together determine its development index (FI-index). Thus, the first criterion is related to the effectiveness of the legal system in resolving trade disputes. The second indicator is related to the availability of credit, as well as to the legislation in the field of protecting the rights of borrowers. The third component is responsible for protecting the rights of investors. In particular, it determines the possibility of disclosing information and the investor's right to challenge the transaction. The fourth indicator reflects the amount of financial and time costs in bankruptcy proceedings.

Increasing access to finance is primarily related to the task of involving the population in the official financial system of the country. The key features of digital finance are the ability to use mobile devices, fast identity authentication, and real-time payment services. Their scalability means they can be applied to hundreds of millions of clients, even for low-value transactions.

According to the World Bank data, between 2011 and 2017years, 1.2 billion adults gained access to accounts for transactions. Much of this progress is a direct consequence of new digital technologies. In accordance with the data of the National Bank of Tajikistan, access to bank accounts in Tajikistan has expanded from 5 percent of the population in 2008 to over 34,3 percent in 2020(Table 2). It was noted earlier that the share of the banking sector predominates in the domestic financial market. As of the beginning of 2021year, 69 credit institutions are operating in Tajikistan (19 commercial banks, 50 microfinance organizations; total number of branches and banking service centers - 1935).

Despite the fact that the total number of payments tends to increase, which amounts to 170,202 transactions through credit institutions in 2020, but the share of payments via the Internet and by devices mobile communication is only 7% in 2020.

According to the statistics agency, there is one POS-terminals for 2493 residents and one ATM's for 7419 residents. Even if we take into account that the majority of the working-age population are in the Russian Federation, these indicators are still low compared to other developed countries.

When COVID-19 demanded social distancing and self-isolation measures, digital payments became a lifesaver for many people. Small businesses were able to continue accepting payments, and people could send money to their loved ones quickly and cheaply. While access to digital payments and financial services has not become universal, technological solutions are helping to close the gaps.

Digital technologies are transforming the financial sphere by changing the methods of providing payment services, savings, credit and investment services, as well as who provides these services. Financial technology companies and major technology companies currently compete with banks and other market participants in a range of activities. Thanks to technology, in ten years it has been possible to achieve what, within the framework of traditional growth processes, could take half a century.

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Table 2. The main indicators of the banking system of Republic of Tajikistan

	Description	2013	2014	2015	2016	2017	2018	2019	2020
1	Quantity of payments (thousand unit)	31 789	50 870	60 850	60 623	84 879	125 331	126 151	170202
	Payment order	-	-	7 663	10 040	9 345	4 809	4 220	14267
	in the form of electronic payment instruments, including:	-	-	5 041	8 143	7 197	3 975	3 902	5229
	-through the Internet	-	-	240	284	391	494	484	983
	-by devices mobile communication	-	-	726	653	46	79	637	10913
	Memorial order	-	-	52 806	50 184	75 197	120 328	121 741	155772
	Check	-	-	381	399	338	194	190	162
2	Volume of payments (mln.somoni)	459 438	675 270	530 745	412 272	681 578	706 415	870 793	1225511
	Payment order	-	-	138 612	139 184	293 467	261 764	381 391	445298
	in the form of electronic payment instruments, including:	-	-	114 127	107 609	219 827	217 008	356 210	409094
	-through the Internet	-	-	8 100	8 060	7 289	10 222	15 527	34497
	-by devices mobile communication	-	-	95	94	71	92	150	1662
	Memorial order	-	-	376 918	252 242	369 203	430 597	474 210	765316
	Check	-	-	15 215	20 846	18 908	14 054	15192	14896
3	Total number of accounts(unit)	1558394	2266500	2904511	3163334	3229363	3517260	4057782	5006082
	-accounts which are provided remote access, including:	-	-	1 570440	1766988	1882236	2125138	2524059	3195217
	-through the Internet	-	-	37110	59748	67755	94415	124939	231207
	-by devices mobile communication	-	-	37215	48742	63280	78390	175603	516147
4	Total number of payments cards (unit)	761 260	1107 079	1446 138	1620 334	1 694157	1817 458	2483861	3247851
5	Number of payments cards holders (person)	745 559	1070 695	1427 221	1605 236	1672 434	1791 655	2420658	3016946
6	Number of POS-terminals (unit)	343	432	650	700	1944	3014	3535	3811
7	Number of ATM’s (unit)	548	704	762	799	685	678	878	1281

Source: Banking Statistics Bulletin of the National Bank of Tajikistan, 12 (305) – 2020 https://nbt.tj/upload/iblock/8cf/27.04.2021%20bull_2020.pdf

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There are certain gaps in areas such as financial infrastructure development, digital literacy and technological competitiveness that limit the possibilities for realizing their digital potential.

1. National policies and regulatory frameworks have been developed in the pre-digital era and should be updated to reflect the reality of the digital economy. The main objectives of legislative reforms should be improving the well-being of citizens and protect their constitutional rights.

2. The government of the country should actively promote digital culture among citizens, in particular, through the transition to digital payments between state, municipal authorities and citizens. Such measures on the part of the government will increase confidence in digital banking services and the transparency of the financial sector. Digital technologies enhance the stability of the banking sector. Commercial banks can assess their client risks faster and more accurately using innovative technologies and big data. Increasing the transparency of the banking system will have a positive impact on the investment attractiveness of the country and will significantly expand funding opportunities.

3.It is very important for the Government of the Republic of Tajikistan to pursue a thoughtful and well-founded policy on development of the digital economy, identify perspective areas and directions for its implementation and support. The most advanced areas for the implementation of the digital economy are the development of artificial intelligence and robotics.

In point of fact all listed activities as improving the legal and institutional framework, investment in skills development work with digital technology and the improvement of the financial infrastructure will contribute to the development of the domestic economy.

References:

1. BIS Papers No 117. Fintech and the digital transformation of financial services: implications for market structure and public policy. Erik Feyen, Jon Frost and others. July 2021, 64 pp. https://www.bis.org/publ/bppdf/bispap117.pdf

2. Mavlutova, I., & Volkova, T. (2019, October). Digital Transformation of Financial Sector and Challengies for Competencies Development. In 2019 7th International Conference on Modeling, Development and Strategic Management of Economic System (MDSMES 2019). Atlantis Press.

3. I. Lee, and Y. J. Shin. Fintech: Ecosystem, business models, investment decisions, and challenges, Business Horizons, 61(1), 2018, pp. 35-46.

4. M. Kotarba. (2016). New factors inducing changes in the retail banking customer relationship management (CRM) and their exploration by the FinTech industry. Foundations of management, 8(1), 69–78.

5. I. Arefjevs, A. Spilbergs & others(2020). Financial sector evolution and competencies development in the context of information and communication technologies. Research for rural development 2020, Volume 35, pp. 260-267.

6. Kolodei YuS & Korshunova OS (2017).The digital economy as one of the promising areas for Russia's economic development. Professional accountant's bulletin 4-6, 50–56.

7. Dashchenko Y. (2018).The digital economy as the economy of the future. Trends in the development of science and education 35-1, 18–19.

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