IMPLEMENTATION OF FINANCE 4.0 IN THE DIGITALIZATION OF THE FINANCIAL SYSTEM

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Abstract: *The accelerating development of modern digital technologies dictates the redefinition of the nature of money, dictating the modernization of the financial services industry in step with changes in information technologies. The definition of financial services was unambiguous in each century: financial firms were to serve as third-party intermediates in transactions, assuring the security of value exchange by acting as an implied trust.*
Financial services have historically leveraged existing technologies to save operating costs, but more recently, they have been used to introduce new digital services and put new digital strategies into place. Technology has advanced to the point where it has the power to radically alter both the function of financial intermediaries and the foundational ideas of trust in value exchange. But in contrast to earlier technology deployments, the current set of digital technologies can drastically cut down on the necessity for middlemen, which has historically been the main role of financial institutions.

Keywords: *finance 4.0, digitalization, Financial Technologies (FinTech), financial innovation, digital financial services, digital transformation.*

JEL Classification: *G20, O33, O38.*

INTRODUCTION

The development of the Internet and the emergence of new technological solutions using it have served as the starting point for the digital transformation of the financial industry. This process varies across countries and regions, as well as in the interaction models between financial service providers, attracting the attention of regulators, financial institutions and analytics firms.

Financial services are mechanisms for obtaining financial-type services, in particular transactions with financial assets, which are carried out in the interest of the consumer, regulated by law and aimed at generating profit or preserving the real value of assets. According to contemporary research, banks and investment companies offer not only cards and savings accounts, but a wide range of financial products such as mortgages, insurance, investments, car loans and others [6].

But it wasn't always like this. Until the 1970s, each sector of the financial services industry was more or less limited to its own specialisation. Banks offered checking and savings accounts. Credit unions offered mortgages and personal loans. Brokerage firms allowed consumers to invest in stocks, bonds and mutual funds. Meanwhile, credit card companies such as Visa and Mastercard offered only credit and debit cards.

The 1990s saw the boundaries between financial services sectors become even more blurred. Not only were companies offering products outside their original range, but they were also merging to form large financial conglomerates. It was believed that this would allow them to profit more and offer even more financial services [14].

MATERIAL AND METHOD

The financial services industry continues to grow and evolve, largely due to the rapid development of digital technologies. Some financial products are becoming increasingly accessible to a wider audience thanks to the internet. There are even banks and financial companies that operate entirely online. Technology has opened up new opportunities for both the financial services industry and its consumers. The financial industry is actively transforming itself [6; 12].

In the digital transformation of the financial industry, two components can be distinguished: the first is associated with the entry of technology companies into the financial services market, and the second with the digitization of traditional financial companies, their mastery of innovative digital technologies to increase the efficiency of their activities. Taken together, these two components have produced a synergetic effect that has made it possible to introduce innovative models of organizing finance in the current context (figure 1).

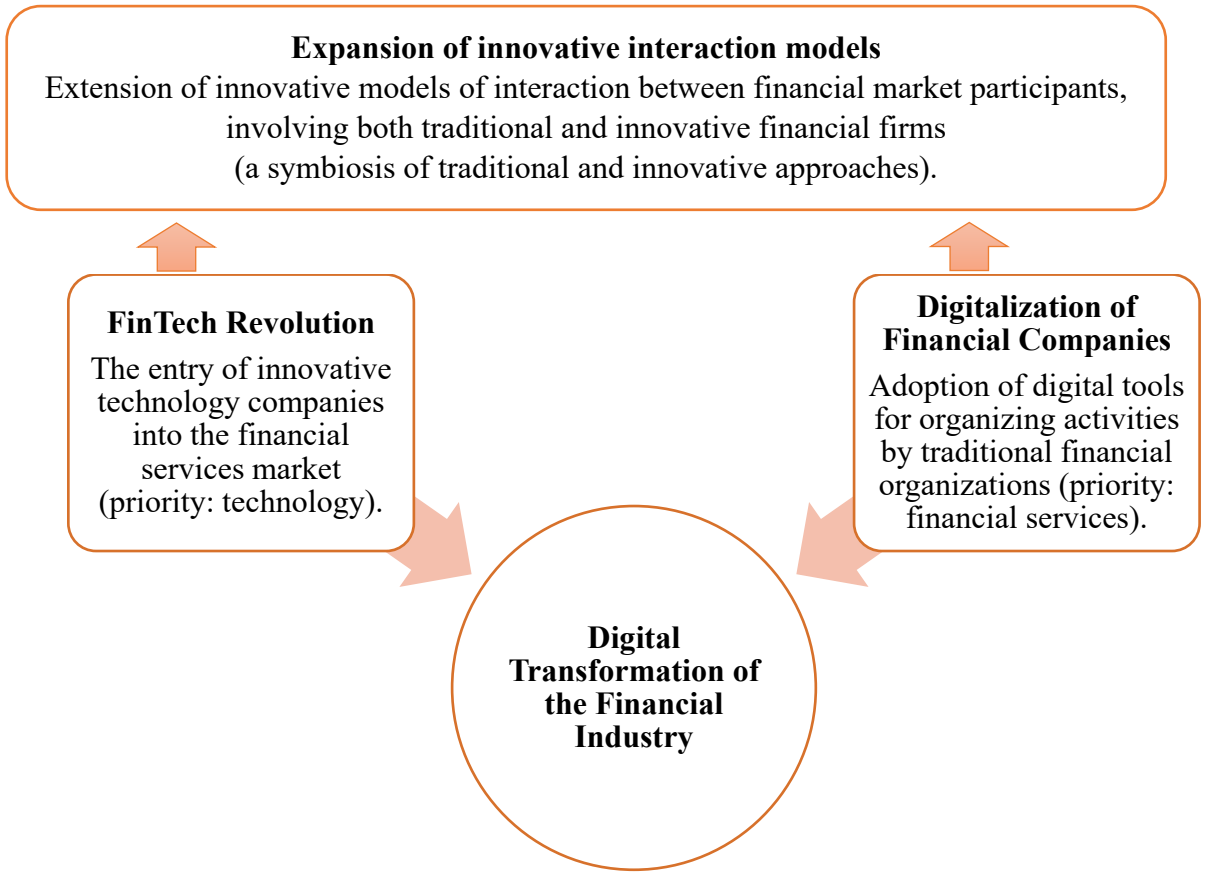

Figure 1. Framework for the Digital Transformation of the Financial Sector
Source: developed by the author

In recent years, the term "digital transformation" has become very popular, as evidenced by the number of publications in academic and practitioner journals, conferences, seminars, professional programs and university courses dedicated to this topic [1;3;9;15;16]. In addition, digital transformation has become an important topic for business practice, start-ups and political discussions. Digital transformation can be defined as an activity focused on the application of digital methods of system interaction, leading to changes in traditional value chains, the transformation of conventional products and services into digital ones, and the adoption of new business models.

A distinctive feature of digital transformation is the integration of different segments of the financial market and the need for alignment with business strategy, taking into account operational and functional specificities. It acts as a connecting element between different strategic levels within firms [1; 8; 13].

In the digital transformation process of the financial sector, existing business models are being rethought on the basis of new structures - digital ecosystems - that reflect the convergence of technologies used in practice and in the market, with the aim of increasing profitability and customer value. Digital transformation is emerging as a result of the impact of new digital technologies such as mobile, analytics, cloud and the Internet of Things [17]. The adoption and proliferation of these digital technologies, together with the expansion of the internet, have moved businesses from an analogue environment to a digital one.

A key aspect of digital transformation is therefore the integration of digital technologies into business processes. Digital transformation is not only a design process, it also plays a decisive role in building new business models and scenarios, even if transforming companies is not easy and requires further evaluation to determine compatibility with digital environment, As a result, the use of digital technologies enables the integration of goods and services across organizational, functional and geographical boundaries [17]. Consequently, these digital technologies accelerate change and drive major transformations in most economic sectors as well as technological changes in industry [4;10]. With the implementation of Industry 4.0, digital technologies have become a catalyst for a new industrial revolution. The development of digital platforms has provided companies with a new way of interacting - digital ecosystems.

A. Goldfarb, S.M. Greenstein and C. Tucker mentioned that the emerging research area of the economics of digitization improves our understanding of whether and how digital technology changes markets. Digitization enables outcomes that were not possible a few decades earlier. It not only reduces existing costs, but has also enabled the development of new services and processes that did not exist before because they were just too costly or merely technologically infeasible. The opportunities generated by digitization have also generated dramatic resource reallocation and restructuring of routines, market relationships, and patterns of the flow of goods and services. This in turn has led to a new set of policy questions and made several existing policy questions more vexing [5].

The Digital Ecosystem is a well-structured network of lasting connections between companies, suppliers, partners and customers, aiming at an efficient distribution of value among all participants in order to build trust.

The digital economy consists of elements such as structure, process, pattern, model, scenario and rules, and from the comparison with the biological world, where an ecosystem is defined as a community of organisms interacting with each other and with their physical environment, it follows that the digital economy is also part of an ecosystem. Today, digital technologies are transforming the economy and society, bringing about changes not only in the way modern society is understood, but also in the correct approach to the role of digital technologies. For example, in Japan, since the beginning of the 20th century, technology has been regarded as a means of achieving the most efficient production performance, stable economic development and solving numerous social problems. As a result, the next stage of societal development after the information age is emerging, with ideas for optimizing the use of resources by each individual and society as a whole, under the concept of Society 5.0.

As a result, digital technologies are influencing all aspects of the economy, organizing this system, setting a general direction of development and an ultimate goal, as shown in figure 2.

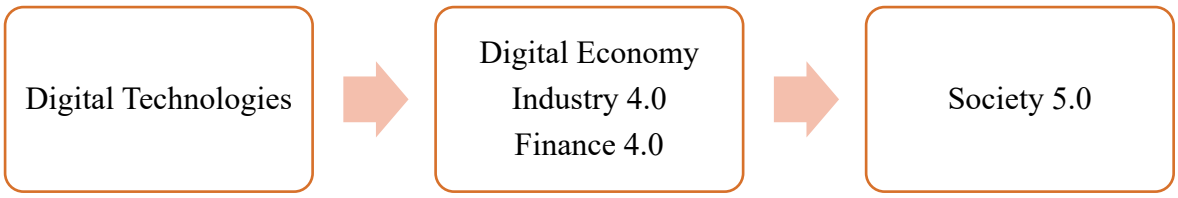

Figure 2. The Interdependence of Concepts within Digital Transformation
Source: developed by the author

Modern society, the economy and production are constantly evolving, developing and absorbing trends from the surrounding environment. One industry that is clearly and continuously changing is the industrial sector, whose development can be clearly and continuously observed in a historical context.

The concept of the Fourth Industrial Revolution in European countries is associated with the term 'Industry 4.0'. In September 2015, the European Parliament provided the following definition: "Industry 4.0 is a term applied to a series of rapid changes in the design, manufacture, operation and maintenance of industrial systems and products. The 4.0 designation signifies that this is the world's fourth industrial revolution, the successor to three earlier industrial revolutions that caused quantum leaps in productivity and changed the lives of people throughout the world." [2].

The transition from "centralized" to "decentralized" manufacturing, enabled by technological advancements, is known as Industry 4.0. It denotes the subsequent phase of organizing and managing the complete value chain throughout a product's life cycle. This cycle will become increasingly tailored and customer-focused.

RESULTS AND DISCUSSION

The development of the financial sphere has evolved alongside the industrial revolutions and is linked to the history of the development of trade and geopolitical processes resulting from the struggle for resources, which inevitably led to armed conflicts. The main stages of financial development can be outlined as follows

1. Finance 1.0 emerged in the 17th century, linked to the creation of the first central banks (in Sweden and England), which were responsible for financing trade activities and supporting wars.
2. Industrialisation and the emergence of new industrial technologies in the 18th and 19th centuries began to have a significant impact on the economy, leading to the development of Finance 2.0 and the expansion of credit and capital markets across Europe. At the same time, the process of colonisation contributed to the rise of global banks, global capital markets and foreign exchange and bond markets.
3. The next phase in the evolution of the financial sector was associated with the development of computers and the Internet in the 1980s, which accelerated the transmission of information and changed the way it was stored. As a result, finance and industry leapt into the information technology era, giving rise to Finance 3.0, which was also marked by the development of financial derivatives. Complex and highly leveraged derivatives became opaque, leading to a stagnation in the global economy in 2007, with Finance 3.0 being a driving factor in a series of global financial crises in many countries.

Former Bank of England Governor Mervyn King explained the essence of Finance 3.0 in his book The End of Alchemy, noting that "the causes of the current imbalance in the global economy are radical uncertainty and the trust dilemma. A lack of trust weakens the stability of the financial system and increases the risk of collapse. Investor and customer confidence in financial institutions is determined by their authority and professionalism. Ongoing changes have led to fundamental shifts in the way financial institutions operate [11].

First, the disruptive impact of financial technologies will put enormous pressure on transforming financial institutions. Second, the new economy (high-tech industries) will dominate for much longer than expected. Third, low interest rates and slow economic growth suggest a prolonged period of deflationary pressure. Fourth, capital investment in new technologies will increase in order to solve practical problems in the financial sector.

In other words, the near future will bring both institutional changes and shifts in people's trust in the financial environment. Since the late 2000s, digitalisation has had a significant impact on the economy and production, leading to a reassessment of business models and architecture. Information technology has evolved from a support area to a key factor, enabling companies to be more flexible and scalable. The general trends of digitisation, lack of customer trust and changes driven by the Industry 4.0 concept have catalysed changes in the financial sector, effectively creating a new phenomenon - Finance 4.0.

Finance 4.0 is a conceptual idea that focuses on applying innovative business models and digitally transforming existing ones to create more efficient value chains and increase customer trust. Finance 4.0 increases the pressure of digital transformation on financial institutions, delivering financial services and products through digital channels and digital business models.

Finance 4.0 defines the following five requirements for financial institutions, financial services and their underlying models:

1. Financial services must meet all financial needs across the life cycle;
2. Ensure a return on equity that is proportional to the growth rates of the real economy;
3. Clearly communicate the risks and benefits to the customer;
4. Continuously apply technologies for transformation, reform and innovation;
5. Trust becomes the glue that binds the financial ecosystem and customers [16].

Finance 4.0 envisions how firms should work towards creating customer-centric business models where the role of trust and contract integrity is critical throughout the life of the relationship. Thus, the main criteria for Finance 4.0 are the creation of ecosystems and FinTech companies, transforming the role of regulators from one of oversight to one of oversight-innovation, where the state and regulators can bring new trends to the financial sector. Digital channels will become the primary mode of communication, with a decline in physical channels for customer interaction; cyber-physical interactions through ATMs, terminals, etc. will also continue to develop. As a result, products and services will become increasingly digital and physical counterparts will be phased out.

The difference between Finance 4.0 and its predecessor lies in the integration of innovation into business models and financial services, driven by the unique relationships between people and their surrounding digital environment. Finance 4.0 aims to create a comfortable environment for individuals, offering them the best possible options and a wider range of products and tools digitally, within a contractual framework.

A notable phenomenon within Finance 4.0 is the rise of FinTech, interdisciplinary organisations that combine knowledge of finance, technology and application methods, with a focus on innovative management. Fintech describes the impact of new technologies on the financial services industry, encompassing various products, applications, processes and business models that have changed the traditional delivery of banking and financial services.

"Although technological innovation in finance is not new, investment in new technologies has increased significantly in recent years, with the pace of innovation accelerating exponentially. These technologies can benefit both consumers and businesses by providing broader access to financial services, a wider range of options and greater operational efficiency."

This activity aims to create a digital interaction environment between individuals and financial institutions, where digital financial services become the primary tool for communication and digital interaction. The role of FinTech can be defined as transforming, creating and implementing innovative approaches to transform business models and value chains into digital models.

Fintech is a relatively new phenomenon, with most of these companies acting as incubators or platforms for developing competitive innovations, sponsored by major financial market players or leading IT companies. With adequate funding, the quality and quantity of solutions created remains high.

According to experts, the influence of FinTech on the financial sector will continue to grow, and it is safe to say that the financial services market will increasingly shift towards these companies, gradually reducing the importance of traditional banks and finance companies. Thus, FinTech, developed with resources from non-digital companies, will occupy a significant share of the financial market [7].

CONCLUSION

In conclusion to what we have analyzed so far, we observe that the digital transformation of the financial sector represents a particular case of the digital transformation of the global economy in the context of changes dictated by technological innovations. The changes brought about by the digitization process in general are also identified also in the financial industry as a part of the national economy, as the reconceptualization of digital technologies invokes interaction among all decision-makers with major impacts. Specifically, the phenomenon of flexible finance reflects the need for more flexibility characteristic of the interaction of economic organizations. The phenomenon, known as Finance 4.0, has emerged as a result of ongoing developments in the financial industry, the global financial crisis at the beginning of the 21st century and the technological advances that have occurred due to the amplification of trade relations between countries and the emergence of new technologies generated in particular by Covid 19.

In Finance 4.0, the pressure of digital transformation on traditional financial institutions is intensifying, with new financial services and products being offered through digital channels and based on digital business models.

Beyond offering specific products and solutions, financial companies can now implement integrated financial services - ecosystems.

Moreover, it is important to understand that the processes of forming the digital infrastructure of finance are primarily aimed at increasing the efficiency of the business and should not be carried out only for the digitization process itself.

The level of digitization of the financial sector is the result of a complex development of macroeconomic, social and technological conditions on an international level under conditions of massive movement of knowledge, technologies and of course financial resources. The uncertain future, influenced by the weak regulation of digital technologies in the financial sector creates the opportunity for the activation of hackers and the heightening of the risks of cyber attacks.

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