

THE CONCEPT OF DIGITALIZATION AND USAGE IT SOLUTIONS IN FINANCIAL SECTOR

КОНЦЕПЦІЯ ДИДЖИТАЛІЗАЦІЇ ТА ВИКОРИСТАННЯ ІТ-РІШЕНЬ У ФІНАНСОВОМУ СЕКТОРІ

The era of Industry 4.0 has a great impact on the nature of finance and interaction between market participants. Industry 4.0 has already made a global contribution through improving and automating production through various physical and digital technologies. But one of the main questions today remains how companies can effectively use digital technologies in the financial sector. The paper considers the role of digitalization and the process of its implementation on real cases of companies around the world, as well as software used by companies. Based on the data received from Google Scholar and Statista, the demand for electronic document management, which became extremely popular during the Covid-19 pandemic, was confirmed as a solution and facilitation of the work remotely. The essence of the digitalization process study has been substantiated and the possibilities and prospects for the further development of this topic have been put forward. Further technological development and digitalization of financial services will be associated with the use of innovative financing methods and the development of FinTech startups that ensure the use of several online financial services directly to key market participants, excluding the participation of financial intermediaries. This could lead to a personalized system that will be used not only in the financial sector, but also in related sectors such as supply chain management and value chain creation.

Key words: Industry 4.0, digitalization, financial sector, electronic document management, financial software.

Эпоха Индустрии 4.0 оказывает большое влияние на характер ведения финансов и взаимодействия между участниками рынка. Четвертая промышленная революция включает в себя множество физи-

ческих и цифровых технологий. Индустрия 4.0 уже внесла глобальный вклад в улучшение, совершенствование и автоматизацию производства, однако одним из главных вопросов на сегодняшний день остается то, каким образом компаниям эффективно использовать цифровые технологии в финансовом секторе. В статье рассмотрена роль диджитализации и процесс ее реализации на реальных кейсах мировых компаний, действующих также и в Украине, а также программное обеспечение, которое используется компаниями. На основе данных Google Scholar и Statista проанализирован спрос на ведение электронного документооборота, который стал популярным во время пандемии Covid-19, как решение и облегчение работы удаленно. Обоснована сущность исследования процесса цифровизации и выдвинуты возможности и перспективы дальнейшего развития данной темы. Дальнейшее технологическое развитие и цифровизация финансовых услуг будут связаны с использованием инновационных методов финансирования и развитием FinTech стартапов, обеспечивающих использование ряда финансовых онлайн-сервисов непосредственно ключевым участникам рынка, исключая участие финансовых посредников. Это может привести к персонализированной системе, которая будет использоваться не только в финансовом, но и в смежных секторах, таких как отдел закупок и логистика.

Ключевые слова: Индустрия 4.0, диджитализация, финансовый сектор, электронный документооборот, финансовое программное обеспечение.

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Епоха Індустрії 4.0 має великий вплив на характер ведення фінансів та взаємодії між учасниками ринку. Четверта промислова революція включає в себе велику кількість фізичних і цифрових технологій, таких як штучний інтелект, хмарні обчислення, адаптивна робототехніка, доповнена реальність, адитивне виробництво та Інтернет речей (IoT). Незалежно від технологій головною метою такої трансформації є підвищення ефективності використання ресурсів і продуктивності для підвищення конкурентоспроможності компаній. Індустрія 4.0 уже зробила глобальний внесок у поліпшення, вдосконалення та автоматизацію виробництва, проте одним із найголовніших питань на сьогоднішній день залишається те, яким чином компаніям ефективно використовувати цифрові технології у фінансовому секторі. На сьогодні багато наукових діячів уже підіймали тему цифровізації, наприклад, Грег Медкрафт розповів про вплив Індустрії 4.0 на фінансові послуги та ринки. Також Gartner, Inc займається дослідженнями цієї теми. У статті розглядається роль цифровізації та процес її реалізації на реальних кейсах компаній у всьому світі, а також програмне забезпечення, яке використовується компаніями. На основі даних Google Scholar та Statista проаналізовано попит на ведення електронного документообігу, який став популярним під час пандемії Covid-19, як рішення та полегшення роботи віддалено. Обґрунтовано сутність дослідження процесу цифровізації та висунуто можливості та перспективи подальшого розвитку даної теми. Подальший технологічний розвиток та цифровізація фінансових послуг будуть пов'язані з використанням інноваційних методів фінансування та розвитком FinTech стартапів, які забезпечують використання низки фінансових онлайн-сервісів безпосередньо ключовим учасникам ринку, виключаючи участь фінансових посередників. Таким чином, через пандемію, як необхідність пошуку нових рішень для успішного існування на ринку та тим самим прискорюючи усі процеси, світ буде трансформуватися. Це може призвести до персоналізованої системи, яка буде використовуватися не тільки у фінансовому, а також у суміжних секторах, таких як управління ланцюгами постачання та побудова ланцюжку доданої вартості.

Ключові слова: Індустрія 4.0, цифровізація, фінансовий сектор, електронний документообіг, фінансове програмне забезпечення.

Formulation of the problem. Industry 4.0 has already made a global contribution to improving and automating production, but one of the key issues today remains how companies can effectively use digital technology in the financial sector. To clarify this, it is necessary to study digitalization in general and on specific cases of existing companies.

Analysis of recent research and publications. This topic has already aroused interest among scientists. So, for example, Greg Medcraft talked about impact of Industry 4.0 on financial services and markets. Also, Gartner, Inc is engaged in digitalization research. In general, the issue of digitalization focuses on the application of software for the financial sector [3; 5; 7; 8; 14], the study of the nature and impact of Industry 4.0 [1; 2], the identification of practical situations in companies [10; 11; 12; 13].

The purpose of the paper. The aim of the paper is to consider the role of digitalization and its process in real cases of global companies that also operate in Ukraine. We will explore and specify the software used by the companies through the case study method. We also analyze the demand for electronic document management, which became popular during the Covid-19 pandemic. But it is necessary to substantiate and search for opportunities and prospects for further development of this topic.

Main part. The world economy is currently experiencing a period of global turbulence, which is accompanied by irreversible transformations in all its spheres. The current era is characterized by the gradual unfolding of the Fourth Industrial Revolution, which is a way to resolve the socio-economic contradictions caused by the surge in Industry 4.0 technology against the challenges of sustainable development, exacerbated by the 2020 coronavirus pandemic.

The strategic implications of the fourth industrial revolution for international business is a radical restructuring of global markets and industries combined with a wave of disruptive innovation that covers all areas of international companies [14].

The Fourth Industrial Revolution is characterized by such a phenomenon as the Industrial Internet of Things. It is a network of computers integrated with industrial production. The presence of this network allows you to remotely manage production processes and exchange data without direct human involvement. Today, the Fourth Industrial Revolution has affected only half of world production. According to the report of the World Economic Forum, only 25 countries are ready to move to a new level of production and service. These are countries such as: Denmark, the Netherlands, the United States, Great Britain, Canada, Poland, the Czech Republic, Slovenia, Austria, Belgium, China, Germany, Estonia, Finland, France, South Korea, Ireland, Israel, Italy, Malaysia, Japan, Singapore, Sweden, Switzerland, Spain [2].

Thanks to the rapid development of communication and information technologies, today we live in an interconnected digital world characterized by increased mobility and timely access to information. The Industrial Revolution 4.0 faces several global challenges, including improving human health and combating the COVID-19 pandemic, protecting the environment and environmental security, and overcoming poverty. As a result, there are new challenges in the application of digital financial technologies, which will help to solve the outlined tasks. One of the most pressing issues today is how to start using digital technology in the finances of a company different by size.

The main risk is the unpreparedness for digital transformation, as only 15% of companies have carried out a digital revolution in the financial sector. Only 13% of organizations have implemented digital financial technologies. Although this experience is small, and it is quite positive. In order for a company's finances to become "flexible", it is necessary to centrally process and analyze data in so-called centers of excellence, i.e. teams that accumulate best practices, conduct research, and provide support and training. Undoubtedly, such a center will be too expensive for small companies, but for large companies it can become a real center of corporate thought and expertise. Other important priorities in the digital transformation of finance – the restructuring of financial processes, deepening the partnership between financial and business processes, the use of automation in the preparation of corporate and tax reports [3].

Thus, with the development of modern financial technologies, the new opportunities for a wide range of activities appear. The fourth industrial revolution is transforming business models through digitalization, which leads to the growth of innovation, the creation and development of new niche segments in the environmental, social, and economic spheres. New technologies are hitting the business of modern multinational corporations both on the supply side and on the demand side, which is often much better than having a platform that brings consumers and suppliers together than a core asset.

So, Uber, the world's largest taxi company, does not own vehicles; Facebook, the most popular media owner, does not create informational content; Alibaba, the most valuable retailer, has no goods of its own; and Airbnb, the largest housing provider, has no property rights. Even full-stack corporations, such as Tesla, Warby Parker, BuzzFeed, Nest or Harry's, which invest billions of dollars in innovation and seek to control all production processes from R&D to marketing and from distribution to sales, find it increasingly difficult to build and scale your business [4].

The main trend in modern global business is that corporations are becoming more flexible, mobile, global, and transparent – and this trend will only intensify in the future. Network global structures will gradually displace hierarchical ones, and the management process itself will tend to horizontal connections, because in conditions of turbulence, small teams with a developed horizontal culture based on trust and cooperation are needed to speed up decision-making and minimize errors.

As a result, corporations will increasingly strive for more balanced forms of financial resource management and the use of new mechanisms in the FinTech segment. Let's consider financial services industry. Customer expectations have changed, and people are more empowered than ever. We now live in a world with technology and social media at our fingertips. Individuals have unprecedented access to information (both real and fiction) and, as a result, if businesses are not behaving in the right way, the crowd will let them know, if not the headlines [5]. Of course, we have seen the conduct of financial institutions often adversely highlighted by the media. Responding to these changing community expectations, the Government is increasingly calling for, and looking at ways to foster, business conduct in which customers can have trust and confidence. Obviously, businesses will drive many of the developments that will bring the benefits. They will be the innovators, the strategists and the leaders of this Fourth Industrial Revolution – the digital revolution. Technology offers our financial services industry and capital markets huge opportunities. Intelligent systems can provide greater flexibility at the technical level. For many years, production has been based on static off-line production lines controlled by systems of often impractical operating technologies. Now in the current era of digitization, manufacturers can combine control and information systems to collect and analyze data to the smallest detail. This analysis, together with feedback, can be used to adapt and refine operations during production system operation. In the field of manufacturing operations management, technologies of the fourth industrial revolution are designed to help optimize and automate the main

business processes and improving production planning. Digital tools can contribute significantly to an agile strategic planning process. Companies need to leverage digital tools in various areas of the planning process. Given the abundance of tools available in the market, companies need to consider the context of the planning need to select the appropriate tool [6, p. 137].

Worldwide IT spending is projected to total \$ 4.1 trillion in 2021, an increase of 8.4% from 2020, according to the latest forecast by Gartner, Inc. The source of funds for new digital business initiatives will more frequently come from business departments outside IT and charged as a cost of revenue or cost of goods sold (COGS). All IT spending segments are forecast to have growth through 2022 (see Table 1). The highest growth will come from devices (14%) and enterprise software (10.8%) as organizations shift their focus to providing a more comfortable, innovative, and productive environment for their workforce.

CFOs are squarely focused on digitalization imperatives in 2021 – not just enabling enterprise digital ambitions, but making the digital finance function a reality. A recent Gartner survey showed that 93% of senior finance leaders were aligned on their vision for the finance function in 2025. Those leaders expect to see a function that is leaner (with fewer employees), digital and data-driven [8].

Leading CFOs recognize the importance of organizing finance in line with these opportunities and are updating their functional strategies and organizational design accordingly. Unfortunately, history shows that finance functions rarely transform successfully. Only 39% of finance leaders said that their previous transformation efforts delivered the expected benefits to finance; even fewer (36%) reported tangible benefits to the business. Many organizations continue to run unwieldy finance processes using outdated technology. And less than one-third of CFOs are confident that their technologies are aligned to ensure the future success of the organization. Finance AI is a critical next step toward hyperautomation, which enables automation of process orchestration, not just tasks [8].

Table 1

Worldwide IT Spending Forecast (Millions of U.S. Dollars)

	2020 Spending	2020 Growth (%)	2021 Spending	2021 Growth (%)	2022 Spending	2022 Growth (%)
Data Center System	219,940	2.3	236,806	7.7	247,513	4.5
Enterprise Software	466,647	-2.1	516,872	10.8	571,725	10.6
Devices	553,223	-6.9	755,798	14.0	778,949	3.1
IT Services	1,021,187	-1.8	1,112,626	9.0	1,193,461	7.3
Communications Services	1,386,471	-0.7	1,450,444	4.6	1,504,743	3.7
Overall IT	3,757,468	-2.2	4,072,547	8.4	4,296,391	5.5

Source: Gartner (April 2021) [7]

By using additional technologies to automate complex finance processes, CFOs can focus on identifying new value-adding services, such as automatically forecasting long-term real estate value or predicting pricing based on consumer behavior. Digitalization is how organization exploit all sources of data and technology to create and enhance products and services, boost employee productivity through collaboration and insight from data, enable new or more efficient operations and processes [8].

Digitalization equalizes data domains in enterprise decision making. Finance uses a data lake to augment enterprise data with financial data. Finance leaders stop pursuing “one truth” through centralized control and augmented financial data, instead focusing control on external financial reporting. As a result, finance provides access to a financial data at transitional level in the cloud and self-service “snapshot” views of financial trends. Leaders utilize more financial data to test micro-strategies around profitability. Digitalization demand scalability, reliability, real-time responsiveness, productivity, efficiency, support for rapid innovation and data integrity. Embracing the attributes of digitalization requires a powerful and flexible ERP that can handle huge amounts of data from many sources [9].

Let's look at the example of companies, how digitalization in the field of finance works in practice. IMMER Group has launched a comprehensive digital business transformation project using Microsoft's Dynamics 365 platform. The aim of the project is to accelerate the company's integration into the digital economy, increase the efficiency of internal processes and the quality of interaction with customers, as well as provide competitive advantages to expand the geography of sales and attract new customers through digital financial technologies [10].

Lebara is one of Europe's fastest-growing mobile virtual network operators with a presence in 8 countries. The company offers Pay As You Go mobile SIM cards and other related products and services for international communities. The products make migrants' lives easier – from communications to entertainment, and financial services.

6 years ago, Lebara initiated a digital transformation program, which was designed by a leading consulting agency. At that time, Lebara worked with a number of IT service providers. Following its digital strategy, Lebara decided to migrate its solutions from on-premises to the cloud. N-iX has been leading Lebara's cloud transformation and development of scalable and cost-efficient cloud solutions.

Following the multi-cloud strategy and choosing two cloud vendors allowed Lebara to gain more flexibility and avoid vendor lock-in. Also, cloud transformation enabled Lebara to introduce innovations faster and expand their market reach [11].

To keep up with the pace of industry change, KPMG Germany embarked on a transformative project to shape the future role of finance in the company. Using the Board decision-making platform, the business created a one-touch, standardized planning process covering everything from strategic plans down to detailed costs. The result is greater efficiency, flexibility, and visibility in all financial planning and analysis activities.

In 2016, KPMG's finance team launched the Finance 2020 program to address future requirements and shape the role of finance in the company. The scheme deals with increased process automation, radical process optimization, and a repositioning of the division's role which is shifting towards a skilled, engaged, professional, and objective Finance Business Partner.

KPMG identified the Board decision-making platform, which unifies Business Intelligence, Planning, and Predictive Analytics, as the potential solution to its challenges. In a successful POC (Proof of Concept), Board managed to model all of KPMG's process, design, and planning requirements in a compacted form within 2 days. The moderate project costs meant KPMG could easily predict and justify the project risk. Board had also already been successfully implemented within the KPMG global network in Switzerland and the Netherlands, which made the decision easier [12].

Deloitte. One of the largest banks in the world was going through an ambitious digital transformation across the enterprise, and had been working with Finance to disrupt its operations and bring them into the future. Not only did the bank want to update its operating model, it was transforming its entire technology landscape.

As part of this sweeping change, the bank asked Deloitte to deliver a digital budgeting solution that would improve the accuracy and quality of their non-interest, fee-based income projections.

The bank was facing a few key roadblocks: a wide variance of forecasting, a dependence on human judgment, and a lack of tools that could provide accurate projections. The bank wondered if artificial intelligence and machine learning could

help Finance create better projections and make stronger decisions around this key facet of their business, and maybe even make those projections and decisions faster.

The tool that was delivered uses 5 billion data points drawing from client risk profiles, industry indicators, governmental policies, and much more. The tool was able to improve the accuracy of non-interest income from 12 percent to 2 percent, and it now takes about 5 minutes to create a projection that previously took the bank up to a day to build. Even for the most complex model that depends on billions of data points, the tool takes less than 2 hours. With

this effort, the bank was able to lay the groundwork for a phase 2 project: monthly and quarterly rolling forecast models [13].

The Covid pandemic has been a huge catalyst for transformation projects. Expanding digital services became an imperative when it became impossible to engage with clients in an analog way. So, electronic document management applications began to gain popularity.

Document management (DM) software encompasses a wide range of features and functionalities, many of which are critical to effectively running a business. With all that power, it's no surprise that worldwide revenue projects for DM and enterprise content management (ECM) systems are steadily tracking up, as shown in the chart below from market research firm [14].

This statistic shows (Fig. 1) the size of the enterprise content management (ECM) market worldwide from 2017 to 2027. In 2018, the enterprise content management market was valued at 12.94 billion U.S. dollars worldwide. The market is projected to increase to 32.3 billion U.S. dollars by 2027.

In addition to new efficiency, DM systems can also act as collaboration tools, ones that combine new ways of communicating with equal attention paid to

legitimate regulatory needs. For starters, traditional file storage makes security difficult to manage and maintain. While there are certain capabilities available to set permissions on a file or folder, these permissions can be rapidly degraded or defeated entirely simply by moving files from one folder to another.

Tracking changes to a document stored in a shared folder on a corporate server is nearly impossible for users, as is maintaining and evaluating an audit trail. Even in terms of collaboration, there are significant improvements to be had simply by transitioning away from the traditional corporate file share.

The world popular financial software and applications are ERP SAP, Zoho Docs, Logical Doc, Microsoft SharePoint, M-Files DMS, and in Ukraine Vchasno system. Some companies are investing in the development and improvement of these applications themselves.

It is necessary to say, that 93% of businesses that implement ERP projects consider them a success. And the leader in ERP Software is ERP SAP (fig. 2). SAP bought a lot of competitors like Business Objects, Sybase, Ariba, SuccessFactors, and Concur.

Conclusions from research and prospects. Thus, in the conditions of accelerated development of the "new economy" and the modern stage of the

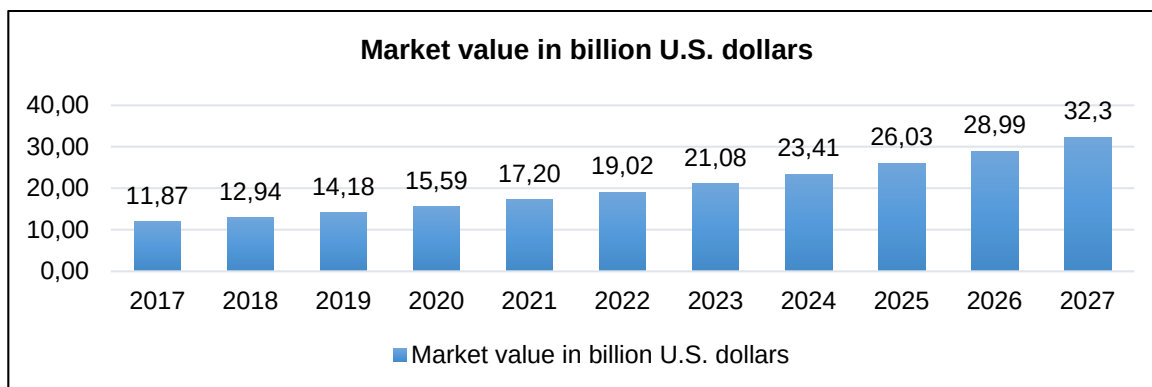


Fig. 1. ECM Worldwide Revenue, 2017–2027 (Billions USD)

Source: Statista [14]

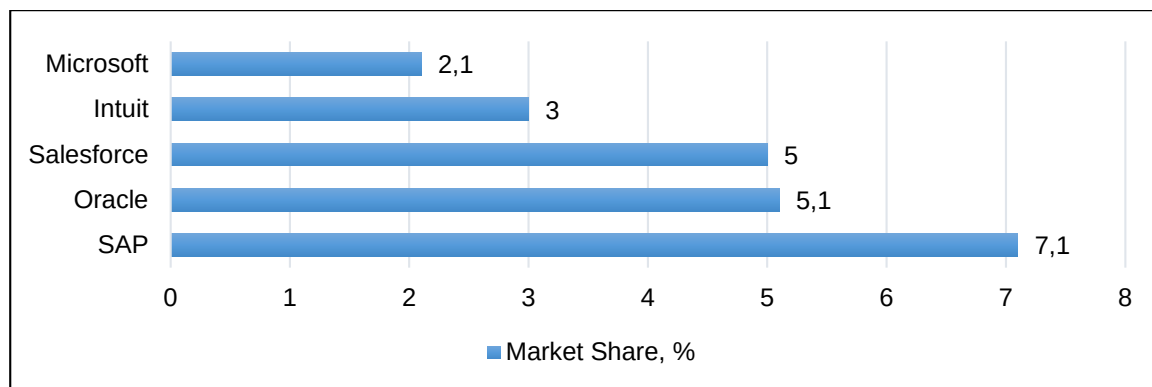


Fig. 2. Leading Enterprise Applications Market Vendors Worldwide in 2020

Source: INUI [15]

information society, one of the keys functionally competitive strategies of companies is the strategy of using the most important intangible asset – innovation. Effective use of the innovation factor is becoming one of the main competitive advantages in the XXI century. But time does not stand still and the coronavirus pandemic may further promote the development of Industry 4.0. Industry 4.0 technology such as Big Data (BD) and Artificial Intelligence (AI) may lead to a personalized system. The final bridge between humans and machines can be the super-smart society that employs AI in manufacturing and logistics.

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