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DIGITALIZATION IN ENSURING THE RESIELENCE OF TRADE ENTERPRISES

The full-scale invasion of the russian federation into Ukrainian territory has significantly changed the operating conditions for trade enterprises, forcing them to adapt their business processes to new challenges. Traditional management methods used before the crisis proved inadequate for ensuring stable operations. This has created the need for the implementation of new approaches focused on digital transformation. The hypothesis of the research is that the implementation of digital technologies, such as CRM and ERP systems, cloud services, analytical platforms, and artificial intelligence, positively impacts the stability of trade enterprises under martial law and helps maintain their competitiveness in crisis conditions. The research applies methods of generalization, analysis, synthesis, systematization, comparison, and scientific abstraction. It examines how digital technologies contribute to improving management efficiency, minimizing risks, and maintaining the competitiveness of enterprises. The results of the research indicate

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ЦИФРОВІЗАЦІЯ У ЗАБЕЗПЕЧЕННІ СТІЙКОСТІ ТОРГОВЕЛЬНИХ ПІДПРИЄМСТВ

Повномасштабне вторгнення російської федерації на територію України значно змінило умови функціонування торговельних підприємств, змушуючи їх адаптувати бізнес-процеси до нових викликів. Традиційні методи управління, що застосовувалися до кризи, виявилися недостатніми для забезпечення стабільної діяльності підприємств. Це створило необхідність впровадження нових підходів, орієнтованих на цифрову трансформацію. Висунуто гіпотезу, що впровадження таких цифрових технологій, як CRM- та ERP-системи, хмарні сервіси, аналітичні платформи та штучний інтелект, позитивно впливає на стійкість торговельних підприємств в умовах воєнного стану та допомагає зберігати їх конкурентоспроможність у кризових умовах. Застосовано методи узагальнення, аналізу, синтезу, систематизації, порівняння та наукового абстрагування. Досліджено, що цифрові технології сприяють підвищенню ефективності управління, мінімізації ризиків і збереженню конкурентоспроможності підприємств.

that digitalization is one of the key factors in business stability during crises. The implementtation of digital technologies allows trade enterprises not only to adapt to unstable conditions but also to lay the foundation for long-term development. The main challenges related to digital transformation have been identified, and recommendations for overcoming them have been proposed.

Keywords: digitalization, business resilience, trade enterprises, digital technologies, martial law, digital transformation.

Результати дослідження свідчать, що цифровізація є одним з ключових факторів стабільності бізнесу в умовах кризових явищ. Впровадження цифрових технологій дозволяє торговельним підприємствам не лише адаптуватися до нестабільних умов, а й закладати основу для довгострокового розвитку. Визначено основні труднощі, пов'язані з цифровою трансформацією, та запропоновано рекомендації щодо їх подолання.

Ключові слова: цифровізація, стійкість бізнесу, торговельні підприємства, цифрові технології, воєнний стан, цифрова трансформація.

JEL Classification: D21, J32, L23.

Introduction

In the context of global economic instability, exacerbated by the full-scale war in Ukraine, the digital transformation of business has transformed from an innovative trend into a necessary condition for the survival and sustainability of enterprises. These challenges are especially acute in the field of trade, where the destruction of logistics chains, changes in consumer behavior, infrastructure disruptions, and reduced demand require a radical revision of management models.

The problem addressed by this research is the need to ensure the sustainability of trade enterprises in conditions of exogenous shock, in particular armed conflict, by implementing digital tools that will allow maintaining operational efficiency, optimizing processes, and minimizing risks.

The issue of digitalization of the national economy is currently being actively studied by scientists. The scientists who conducted research on current trends in the development of the digital economy in Ukraine include: I. Aksyonova, V. Apalkova, K. Buzhymska, O. Dannikov, M. Kyzym, G. Kopteva, N. Kraus, N. Levitska, I. Odotyuk, O. Pizhuk, O. Raevneva, O. Reshetnyak, A. Semenog, I. Strutynska, V. Haustova, K. Shaposhnikov, S. Scarlett, H. Yarovenko and others.

In particular, the work of Zaman et al. (2024) investigated the impact of management on the effectiveness of digitalization processes in enterprises. The need to apply personalized approaches to digitalization depending on the company's position in the market and the specifics of its activities was noted by scientists Parviainen et al. (2022).

One of the works by scientists Bai and Kalinichenko (2023) emphasized the importance of digitalization of society in general, in particular educational processes and personnel training to increase the innovative potential of enterprises.

For their part, Fedulova and Dzhulay (2020) study best practices aimed at supporting the internal and external brands of companies in various areas of activity in crisis conditions.

However, the practical aspects of using digital solutions in trade during the war by companies such as Rozetka, Silpo, and Epicenter remain insufficiently covered. Therefore, this scientific gap became the subject of the research.

The aim of the research is to determine the role of digital technologies in ensuring the stability of trade enterprises in martial law, to analyze the effectiveness of the use of specific IT solutions (CRM, ERP, clouds, analytics), and to formulate recommendations for the implementation of digital tools in a crisis environment.

To achieve the aim, it is necessary:

- to summarize theoretical approaches to the concept of digital transformation in business;
- to investigate modern digital practices of Ukrainian retailers;
- to assess the effectiveness of implemented solutions using quantitative indicators;
- to identify barriers to digitalization and provide recommendations for overcoming them.

The hypothesis of the research is the assumption that the implementation of digital tools allows significantly increase the resilience of retail enterprises to external shocks, in particular to the consequences of armed conflict.

To test the hypothesis, a combined methodological approach was used: comparative analysis before/after the implementation of digitalization (using the examples of the companies Epicenter, Silpo, Rozetka); case method in-depth study of Bitrix24, Power BI, Google Cloud application models; elements of statistical analysis – assessment of performance indicators; content analysis of public reports, regulatory legal acts and expert interviews.

Information base is official company reports, Opendatabot data, Microsoft Ukraine publications, Kyivstar Business Hub, documents on the use of CRM/ERP in the retail sector.

Structurally, the article has three main sections. The first section examines the theoretical aspects of digitalization, in particular the concept, meaning and main directions of digital transformation. The second section is devoted to the analysis of the impact of digitalization on the sustainability of retail enterprises, in particular its role in improving operational activities, increasing competitiveness and minimizing risks. It also highlights the key digital tools and technologies used by enterprises, in particular CRM and ERP systems, cloud platforms, analytical systems and artificial intelligence. The third section characterizes the challenges and risks of digital transformation, issues of cybersecurity, financial constraints and the need to develop digital literacy of personnel. The conclusions summarize the results of the research and formulate practical recommendations for the effective implementation of digital technologies in the retail sector.

1. Theoretical aspects and concepts of digitalization

1.1. The concept and meaning of digitalization

Digitalization is the process of introducing digital technologies into all areas of an enterprise's functioning, which involves transforming business models, automating processes, integrating analytics and digital platforms to increase the efficiency and adaptability of the organization. Unlike computerization, which focuses on automating individual tasks, digitalization encompasses changing organizational logic and creating new forms of value for customers (Parviainen et al., 2017).

The European Commission defines digital transformation as the use of digital technologies to significantly improve productivity, competitiveness of enterprises and interaction with customers (European Commission, 2020). According to Schwab's study (2017), digitalization is the foundation of the Fourth Industrial Revolution, which is shaping new economic paradigms.

In the context of martial law in Ukraine, the importance of digital technologies has grown rapidly. Retail companies are forced to restructure their operating models, switch to remote service formats, and automate logistics and financial processes. According to Opendatabot data (2023, October 23), over 60% of enterprises in the retail sector in Ukraine have implemented new digital solutions, including CRM, ERP, cloud services, and analytical platforms, in the past two years.

1.2. The main directions of digital transformation of trade enterprises

Business process automation. The implementation of digital platforms (ERP, SCM, BPM systems) allows enterprises to automate routine operations: order processing, inventory management, logistics, accounting. This reduces the impact of the human factor, increases the accuracy and speed of operations (Davenport & Harris, 2007).

Cloud technologies. The transition to cloud services (Google Cloud, AWS, Microsoft Azure) provides continuous access to data, flexibility of scaling, and reduced costs for IT infrastructure. In wartime, clouds become critically important for data storage and ensuring work during relocation (Bhandari et al., 2025).

Development of e-commerce. Digital trading platforms allow enterprises to sell online, reducing dependence on physical infrastructure. Marketplaces, mobile applications, integration with payment systems allow you to expand markets and maintain a customer base (Natorina, 2021).

Big Data Analytics. Using analytics platforms (Power BI, Tableau, Qlik) helps businesses analyze customer behavior, forecast demand, optimize

inventory, and evaluate the effectiveness of marketing campaigns in real time.

Artificial intelligence and machine learning. The use of AI for chatbots, recommendation systems, and query recognition allows for personalized service and reduced customer support costs.

Cybersecurity. The increase in the volume of digital transactions requires new approaches to data protection. The implementation of multi-factor authentication, backups, and intrusion detection systems (IDS) are critically needed, especially given the increase in the number of cyberattack attempts. From the beginning of January to February 20, 2025, cyberattacks were carried out on at least 25 Ukrainian enterprises engaged in the development of automated process control systems and related to electrical installation work, and on four more enterprises specializing in the design and production of equipment for drying, transporting, and storing grain (State Service for Special Communications and Information Protection of Ukraine, 2025, March 20).

Electronic interaction with government agencies. Electronic document management (Vchazno, 2021), reporting through digital channels, and digital signatures reduce time, costs, and bureaucratic barriers.

Thus, the main directions of digital transformation of commercial enterprises cover a wide range of technologies from the automation of internal processes to the use of cloud services, analytics, artificial intelligence and digital channels of interaction with the state. Each of these directions not only increases operational efficiency, but also ensures the adaptability and stability of business in martial law conditions. Therefore, digitalization becomes not just a tool for optimization, but a key factor in the survival and development of enterprises in conditions of high uncertainty and risks.

1.3. The impact of digitalization on the resilience of trade enterprises

In modern business conditions, especially during martial law, ensuring the sustainability of commercial enterprises is becoming one of the key management tasks. Business sustainability is understood as its ability to function effectively in conditions of uncertainty, maintain competitive positions, ensure financial stability and adapt to changes in the external environment. The introduction of digital technologies is a powerful tool that allows you to achieve these goals by increasing the level of automation, accelerating decision-making processes and reducing operating costs.

One of the key factors that determines the need for digital transformation of commercial enterprises is the growing volatility of the market and the uncertainty of the economic situation. Changes in consumer

behavior, disruptions in supply chains, fluctuations in demand and the need to quickly respond to new challenges require businesses to increase flexibility and adaptability. In this context, digitalization allows you to create effective business process management mechanisms that provide operational control over key aspects of the enterprise's activities, such as logistics, finance, marketing and personnel management.

Digital technologies are significantly changing the mechanisms of interaction between enterprises and their customers. The implementation of CRM systems, chatbots, personalized electronic services and mobile applications contributes to the formation of a better customer experience, which in turn increases the level of consumer loyalty and ensures the stability of sales. The use of analytical platforms allows enterprises to receive timely information about the market, analyze consumer behavior and predict trends, which allows them to make more informed strategic decisions.

No less important is the impact of digital technologies on cost optimization. Automation of business processes helps to increase labor productivity and reduce the need for human resources to perform routine operations, which reduces the operating costs of enterprises. The use of cloud technologies allows you to reduce costs for supporting IT infrastructure, and the introduction of digital payment systems simplifies financial management processes and helps increase the transparency of financial flows.

Digitalization is a powerful factor in increasing the resilience of commercial enterprises, allowing them to quickly adapt to changes, ensure operational continuity, minimize risks and open up new opportunities for development. In conditions of martial law, this process becomes even more relevant, as digital technologies help enterprises continue their activities even in conditions of limited physical access to resources, logistical problems and instability of the economic environment (Blakyta et al., 2025).

2. Digital tools and technologies

2.1. Types of digital technologies

Digitalization has become one of the key transformation areas of commercial enterprises in the 21st century. It has become particularly relevant in wartime, when traditional business processes have undergone significant changes due to logistical difficulties, risks to personnel and infrastructure, and the need for rapid adaptation to an unstable environment. Digital tools make it possible to ensure the stability of enterprises, the efficiency of management decisions, the preservation of the client base, and adaptation to new realities (*Table 1*).

Table 1

Functions and benefits of key digital tools

Category	Functions	Benefits
CRM-systems	Customer database management; automatic generation of offers; integration with call center and social networks; automated sales funnels	Increase conversion; reduce churn; fast service; customer satisfaction
ERP-systems	Inventory control; supply management; financial accounting and reporting; personnel management	Synchronization of departments; minimize errors; reduce costs; efficiency
BI-systems	Sales analysis; demand forecasting; comparison of planned and actual indicators; identify trends	Data-driven solutions; performance monitoring; shortage forecasting; assortment optimization
Power BI	Integration with Excel, SQL, CRM, ERP; publishing reports online; auto-update data; adaptive dashboards	Operational procurement management; control of logistics costs; tracking consumer behavior
Electronic document management systems	Creation and signing of electronic documents; electronic signature; integration with accounting	Time reduction; avoidance of document losses; continuity of document flow
Cloud services	Collaboration; backup; remote access; data protection	Business continuity; data protection; team collaboration
SCM systems	Supply planning; inventory management; logistics optimization	Reducing warehousing costs; fast delivery; coordination with suppliers
E-commerce platforms	Catalog management; integration with CRM, ERP, payment systems; logistics automation; sales analytics	Reducing costs; access to new markets; flexible pricing
Marketing platforms	Customer segmentation; launching newsletters; multi-channel campaigns; click-through rate analytics	Increasing engagement; repeat sales; saving marketers' time
Chat bots and omnichannel platforms	Autoresponders; ordering in messenger; forwarding to the operator	24/7 availability; reducing load; quick response
Project management systems	Creating tasks; controlling deadlines; productivity analytics	Transparency of work; timely execution; responsibility in the team
HRM/HCM systems	Electronic personnel files; vacation schedules; time tracking; staff turnover analytics	Less paperwork; convenience for HR and accounting; quick processing of changes

Source: compiled by the authors.

CRM systems (Customer Relationship Management) are an integral part of modern customer relationship management. In the field of trade, they allow not only to keep a complete history of interactions with each buyer, but also to segment the audience, analyze behavioral patterns, and automate marketing and sales processes.

ERP systems allow you to centrally manage all key processes of the enterprise: from accounting for goods to logistics, procurement, finance, and personnel management. This is especially important in times of crisis, when the efficiency and accuracy of data are crucial.

BI platforms provide analytical support for decision-making. They collect large amounts of data from various sources and provide tools for their visualization and in-depth analysis.

Cloud services provide access to enterprise resources from anywhere in the world. This is especially important when part of the staff is located in another region or country, or when offices and warehouses are physically inaccessible.

Supply chain management (SCM) systems allow you to forecast needs, manage supplies, and reduce the risks associated with shortages or excesses of goods, which is especially critical in conditions of wartime resource shortages.

Digital platforms for e-commerce allow you to organize online sales – both through your own website and through marketplaces. In conditions of physical restrictions, destruction of trade infrastructure or the impossibility of conducting offline trade, these platforms have become the only channel of interaction with the consumer for many enterprises.

Marketing platforms and automators (Marketing Automation Platforms). In the context of the digital transformation of trade, it is important not only to establish operational activities, but also to maintain communication with customers. Marketing automation systems allow you to create personalized e-mail, SMS, Viber or push campaigns, track the effectiveness of advertising activities and conduct A/B testing.

Chatbots and omnichannel service platforms. Automated service has become not only a trend, but also a necessity during wartime, when physical contact is limited and the load on contact centers is maximum. Chatbots allow you to process thousands of requests without human intervention, and omnichannel support platforms combine all communication channels in a single window.

Project and task management systems (Project Management Systems). Effective team management is especially important in conditions of remote work, changing schedules and geographical dispersion of employees. Task management systems help maintain clarity in the implementation of plans, delegation and reporting (Ministry of Digital Transformation of Ukraine, 2023).

HRM/HCM systems (Human Capital Management). In crisis conditions, when teams change frequently or are under stress, automation of HR processes allows you to maintain order and control over personnel processes. This is also critical for ensuring legal compliance and labor accounting.

These tools form a digital infrastructure that supports the vital activities of the enterprise in extraordinary circumstances. Their systemic integration and strategic use are the basis of resilience, productivity and flexibility of modern trade.

2.2. The use of digital technologies in Ukraine

In the context of a full-scale war, Ukraine has become an example not only of resilience, but also of the dynamic implementation of digital innovations in the field of trade. A significant number of enterprises, in particular national retailers, have adapted their business models through digital transformation, which allowed them to maintain competitiveness and ensure operational sustainability. One of the most illustrative cases is the Epicenter. The company invested in IT infrastructure even before the start of hostilities, but it was the hostilities that became the impetus for accelerating digital transformation. Due to the disruption of logistics chains and the loss of warehouses, a significant part of operations was transferred to the digital environment. In particular, in July 2020. Epicenter switched to electronic document management using the Vchasno platform: up to 95% of contracts and acts are executed electronically, up to 100 documents are signed daily, and on peak days, about 300 contracts are signed monthly, and the transition itself, along with employee training, took only 15 minutes. In addition, the SAPS/4HANA system was implemented to automate accounting, logistics, finance, and procurement, as well as a CRM module to personalize interaction with customers. The use of cloud solutions ensured continuous access to data even in the event of physical damage to the center servers. The result was a reduction in the time it takes to complete online orders, a decrease in the share of delivery errors, and a significant increase in the share of online sales in the overall revenue structure (Bezruk, 2023; Vchasno, 2021).

Retailer Rozetka consistently integrates advanced digital solutions to improve operational efficiency and customer service quality. By implementing the Google Analytics 360 platform in combination with BigQuery cloud storage and integrating data from the ERP system, the company was able to process huge amounts of data in real time and generate high-quality recommendations for consumers (Google, 2016). This allowed it to increase revenues from direct SMS mailings by 18%, and the average check by 9%. The new architecture allows sending personalized e-mail mailings taking into account ERP data, inventory and customer behavioral patterns.

In parallel, to optimize customer support, Rozetka implemented an omnichannel service based on Zendesk in partnership with the integrator Cloudfresh. The implementation of basic Zendesk modules, in particular HelpCenter, allowed the retailer to increase the productivity of the support service by 1.5 times and reduce the time to first response by 65% without the

need to expand the staff. These activities have shown that a well-thought-out digital architecture not only enhances the customer experience, but also improves the resource efficiency of business processes. The strategic use of data and digital platforms allows Rozetka not only to optimize internal operations, but also to increase the return on marketing campaigns, while strengthening its competitive advantages in the e-commerce market (Cloudfresh, 2019).

The Silpo chain confirms its strategic course for digital transformation aimed at optimizing services and improving customer experience. In July 2020, the chain introduced the Scan & Go system ("Free Checkout") – a technology for self-scanning goods via a mobile application and self-service checkouts ("Self-checkouts"). As part of the pilot launch, more than 75,000 participants of the "Own Account" program used this service; Scan & Go is currently available in 59 supermarkets, which significantly reduced time at the checkout, minimized queues, and increased service speed in conditions of mass customer presence in shopping centers. In addition, back in December 2018, Masterpass QR was integrated into the Silpo application, thanks to which buyers can make payments in one scan in more than 230 stores. This supports a wide range of customers – even those whose devices do not support Apple Pay or Google Pay – and indicates universality, inclusiveness, and high-tech use. The Silpo chain is actively modernizing both the front office through innovative customer interactions and the back office through digital systems. Currently, the Silpo chain has established itself as one of the leaders of innovative retail in Ukraine, ensuring operational stability, reducing the load on cash registers, and significantly improving customer convenience (Silpo, 2018, December 22).

Kasta also demonstrates high adaptability. In particular, the use of the Similarweb platform has expanded its capabilities for analyzing the competitive environment and optimizing marketing costs. Using the IT tool, Kasta tracks competitors' investments, analyzes changes in advertising strategies, and identifies new product categories, which resulted in a 2.5-fold increase in sales in the second half of 2024. The digital direction also accompanied the optimization of sales channels and the adaptation of marketing strategies in real time, which helped Kasta maintain flexibility in the face of crisis changes in the market (Similarweb, 2024).

This experience illustrates the importance of a multi-level digital strategy: competitive analysis tools, big data analytics, and cloud solutions help not only optimize current operations, but also quickly respond to market changes, increase profitability, and strengthen positions in the Ukrainian e-commerce arena.

Comparative characteristics of the digital tools used and the achieved results are presented in *Table 2*.

Table 2

Digital tools and prospects for the development of trade enterprises

Chain	Digital tools	Achievements	Prospects for the development
Silpo	Scan & Go via mobile application ("Vilnokasa") QR payment Masterpass	Over 75,000 users of the "Vlasny Rahunok" program Deployed in 59 stores Payment with one scan in over 230 points	Expansion of self-service checkouts CRM integration for personalization Implementation of AI analysis of user behavior
Rozetka	Google Analytics360 + BigQuery Zendesk for omnichannel support	Increased marketing revenue, customer support productivity, response speed	AI personalized recommendations Chatbot and bot support expansion Deep CRM + BI integration
Kasta	Competent analysis via Similarweb	Analytics gave 2.5 times sales growth in 2024	AI variable pricing Realtime BI dashboards Internal BI infrastructure for marketing and logistics
Epicenter	SAPS/4HANA ERP CRM module Cloud solutions for data availability	Cloud solutions for data availability Transferring business operations to the cloud Continuous access to data in case of loss of physical infrastructure Reduction of online order time, delivery errors, growth of online sales	Integration of AI logistics and analytics Deep CRM communication Development of mobile channels for customers

Source: compiled by the authors based on (Cloudfresh, 2019; Fozzy Group, 2020, July 2; Silpo, 2018, December 22; Similarweb, 2024).

Therefore, *Table 2* shows the formation of a new paradigm in the management of trade enterprises where digitalization is not only a tool for increasing efficiency, but also a means of ensuring flexibility, stability, and strategic advantage in an unstable environment.

3. Risks and challenges of digitalization

Despite the numerous advantages of digital transformation, its implementation is accompanied by a number of complex risks that can significantly affect the effectiveness of the implementation of digital solutions in commercial enterprises. One of the most acute of them is the growth of cyber threats, which has become especially relevant in war conditions. The intensification of hacker attacks, the spread of malicious software, phishing campaigns, and the increase in the use of ransomware create serious threats to the continuity of business processes. System vulnerability is often exacerbated by the lack of multi-layered protection, outdated software, or a low level of staff awareness of the basics of cyber hygiene (Bezhan & Rozhko, 2023).

Another significant barrier to digital transformation is the high financial cost of implementing technologies. Small and medium-sized enterprises often do not have the opportunity to invest in the purchase of licensed software, hardware upgrades, payment for IT consulting, or provision of continuous technical support. In addition to initial costs, digitalization requires sustained investments in infrastructure support, system upgrades, cybersecurity, and staff training, which places additional strain on enterprise budgets (Omowole et al., 2024).

There is also a low level of digital literacy among staff. Employees who are not prepared to work with new digital platforms may make mistakes, which reduces the effectiveness of automation. Insufficient understanding of the principles of CRM, ERP and BI systems leads to an increase in the workload of technical departments and slows down the company's adaptation to new digital formats. The formation of an internal culture of digital competence requires time, resources and additional organizational efforts (Sytnyk & Tarkanii, 2024).

The instability of telecommunications infrastructure, which arises as a result of military operations, power outages or cyberattacks on critical facilities, creates additional risks. In the event of loss of communication or access to cloud services, companies may lose control over supply chains, electronic document management, warehouse accounting or interaction with customers. The reliability of digital systems in such conditions requires not only high technical stability, but also the availability of backup scenarios and autonomous recovery tools.

In addition to technical and organizational barriers, enterprises face regulatory restrictions and legal uncertainty. The implementation of international standards for the protection of personal data, such as GDPR, or national requirements for electronic document management requires companies to make changes to the internal regulatory framework, which is often accompanied by additional costs for legal support and auditing.

Separately, it is necessary to dwell on the factors of resistance to change from the side of personnel and management. Digital transformation, like any strategic change, is inevitably accompanied by psychological discomfort, doubts about the feasibility of innovations, fears of losing a job or excessive control. The lack of proper communication of the benefits of digitalization leads to passive or even active resistance from employees. To overcome this challenge, it is necessary to implement motivation programs, internal training and employee involvement in the transformation process at the early stages (Ministry of Digital Transformation of Ukraine, 2023).

In the context of a full-scale war, the role of cyber threats is especially growing. With the beginning of a full-scale war, Ukraine has become a target for numerous cyber-attacks aimed at destabilizing critical infrastructure, financial institutions, and government agencies. According to research, in 2023, Ukraine suffered more than 600 cyber-attacks, which is a fifth of all

cyber-attacks in the world (Center for Democracy and the Rule of Law, 2024, September 4; Olteanu, 2024). Such attacks are diverse in execution and can lead to reputational or financial losses and disruption of business operations:

data leakage – unauthorized movement or theft of confidential information can cause financial and reputational losses;

social engineering – attacks that use psychological manipulation to gain access to company systems;

phishing – fraudulent emails or messages aimed at obtaining confidential information;

DDoS attacks – overloading a system with requests with the aim of disabling it.

To effectively counter malicious intrusion, it is advisable for enterprises to follow a number of recommendations:

- Implementing multi-layered protection: using modern solutions to protect the network and devices, such as FortiGuard, FortiMail, and FortiAI.
- Staff training: increasing employee awareness of cyber threats and methods for avoiding them.
- Regular cyber diagnostics: conducting penetration tests and assessing the vulnerabilities of the information environment.
- Data backup: creating backup copies of important information for recovery in the event of an attack.
- Collaboration with specialists: involving cybersecurity experts to develop and implement effective protection strategies (Yilmaz et al., 2023).

Despite the obvious advantages of digital transformation, its implementation is accompanied by a number of serious challenges, both technical and organizational and psychological in nature. The most threatening are the growing cyber risks, which in wartime conditions have acquired a systemic scale, creating a potential danger to the continuity of business processes and the preservation of critical data. Additional barriers remain high costs of digitalization, low digital literacy of personnel, infrastructural instability, legal uncertainty and resistance to change from the side of employees. To overcome these difficulties, commercial enterprises need to implement comprehensive approaches to cyber protection, systematically invest in personnel training, modernization of IT infrastructure and the formation of a digital culture in the organization.

Conclusions

The research analyzed key digital tools implemented by Ukrainian retail enterprises under martial law, including CRM and ERP systems, cloud services, analytical platforms, electronic document management, and solutions based on artificial intelligence. Based on the analysis of practical cases of the companies Epicenter, Rozetka, Silpo, and Kasta, it was proven that digitalization significantly increases adaptability, operational efficiency,

and business resilience to crisis conditions. The hypothesis about the positive impact of digitalization on the viability of retail enterprises under war conditions was confirmed by both quantitative and qualitative indicators, in particular, in reducing order processing time, increasing NPS, reducing logistics costs, and increasing document flow efficiency.

The scientific novelty of the research lies in the integrated approach to studying the impact of digitalization on the resilience of retail enterprises under armed conflict. Unlike previous developments, the research analyzes in detail the military challenges of digital transformation in Ukraine: cyberattacks, infrastructure instability, and resource limitations.

The implementation of digital tools covers several key areas: business process automation, the use of cloud services, resource management systems (ERP), customer databases (CRM), analytics tools (BI) and electronic document management platforms. CRM systems contribute to increased personalization of service, customer retention and increased sales. ERP platforms integrate finance, logistics, inventory and human resources into a single management system, which allows for better coordination and transparency. BI tools play a critical role in data-based decision-making, and cloud technologies guarantee business availability regardless of geographical location and physical infrastructure security.

At the same time, digitalization is accompanied by a number of risks, the most important of which is the growth of cyber threats. This is all the more relevant now that cyber-attacks from the aggressor state, data leaks, phishing and social engineering are becoming regular threats to Ukrainian business. Low levels of digital literacy among employees, high initial investments, unstable internet connections, legal uncertainty, and resistance to change form a multifactorial barrier to effective transformation.

However, the existing threats do not negate the potential of digitalization; on the contrary, enterprises that integrate digital tools systematically and strategically demonstrate a higher level of adaptability, scalability, and readiness for future challenges. Retail chains that previously automated key processes turned out to be better prepared for war, retained customers and assets, and also entered new sales channels. Thus, digitalization is not just a tool for modernization, but a condition for survival and sustainable development of business in conditions of uncertainty.

To ensure effective digital transformation, it is necessary to apply a comprehensive approach that includes investments in technology, formation of digital skills of personnel, strengthening cyber defense, adaptation of regulatory processes, and change of organizational culture. Only under such conditions will retail enterprises be able not only to overcome modern crises, but also to gain long-term competitive advantages in the digital economy.

Future scientific research should focus on several areas. First, it is modeling the economic efficiency of digital investments in crisis conditions, taking into account industry specifics and business scale. Second,

it is promising to study the social and psychological factors of digital transformation, in particular, resistance to change, the level of digital culture, and staff motivation. Third, it is necessary to conduct a deeper analysis of the relationship between the level of cyber protection and customer trust in trading platforms in conditions of military and post-war instability. It is also relevant to study the impact of state regulatory policy on the intensity of digitalization of small and medium-sized businesses. Special attention should be paid to the development of artificial intelligence in the management of trading enterprises, in particular in the field of demand forecasting, assortment formation, and service personalization.

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