



EUROPEAN CONFERENCE

Conference Proceedings

**XXII International Science Conference
«The impact of modern digital technologies
and developments on the future of education»**

June 01-03, 2026

Krakow, Poland

THE IMPACT OF MODERN DIGITAL TECHNOLOGIES AND DEVELOPMENTS ON THE FUTURE OF EDUCATION

Abstracts of XXII International Scientific and Practical Conference

Krakow, Poland
(June 01-03, 2026)

UDC 01.1

ISBN – 979-8-90214-562-2

The XXII International scientific and practical conference «The impact of modern digital technologies and developments on the future of education», June 01-03, 2026, Krakow, Poland, 449 p.

Text Copyright © 2026 by the European Conference (<https://eu-conf.com/>).

Illustrations © 2026 by the European Conference.

Cover design: European Conference (<https://eu-conf.com/>).

© Cover art: European Conference (<https://eu-conf.com/>).

© All rights reserved.

No part of this publication may be reproduced, distributed, or transmitted, in any form or by any means, or stored in a data base or retrieval system, without the prior written permission of the publisher. The content and reliability of the articles are the responsibility of the authors. When using and borrowing materials reference to the publication is required. Collection of scientific articles published is the scientific and practical publication, which contains scientific articles of students, graduate students, Candidates and Doctors of Sciences, research workers and practitioners from Europe, Ukraine and from neighboring countries and beyond. The articles contain the study, reflecting the processes and changes in the structure of modern science. The collection of scientific articles is for students, postgraduate students, doctoral candidates, teachers, researchers, practitioners and people interested in the trends of modern science development.

The recommended citation for this publication is: Chumak G. Cost management in a wartime economy: problems and areas for optimisation. Abstracts of XXII International Scientific and Practical Conference. Krakow, Poland. Pp. 56-62.

URL: <https://eu-conf.com/en/events/the-impact-of-modern-digital-technologies-and-developments-on-the-future-of-education/>

COMPUTER SCIENCE		
9.	Шумілова К.В. КОНЦЕПЦІЯ ІНТЕГРАЦІЇ ШТУЧНОГО ІНТЕЛЕКТУ ТА ЛЮДСЬКИХ КОГНІТИВНИХ ЗДІБНОСТЕЙ В СУЧАСНУ ОСВІТУ ГАЛУЗІ МОРСЬКОЇ ІНЖЕНЕРІЇ	43
CULTURAL STUDIES AND MUSEOLOGY		
10.	Юшкевич Ю.С. ДИЗАЙН НАЦІОНАЛЬНОГО КУЛЬТУРНОГО ПРОДУКТУ ЯК ІНСТРУМЕНТ КУЛЬТУРНОЇ ДИПЛОМАТІЇ	49
ECONOMICS		
11.	Chumak G. COST MANAGEMENT IN A WARTIME ECONOMY: PROBLEMS AND AREAS FOR OPTIMISATION	56
12.	Diachenko Y.L., Tiurina D.M. ORGANIZATIONAL AND MANAGERIAL MECHANISMS FOR THE RECOVERY OF UKRAINE'S ECONOMY: THE ROLE OF E- COMMERCE IN SUPPORTING SMALL AND MEDIUM-SIZED BUSINESSES	63
13.	Kostyshyn N. MECHANISMS FOR ENHANCING FINANCIAL SUPPORT FOR THE SOCIAL SECTOR THROUGH THE DEVELOPMENT OF CITIZENS' FINANCIAL CULTURE	67
14.	Samoshkina I. DETERMINANTS SUPPORTING SUSTAINABLE DEVELOPMENT OF SOCIAL SECURITY IN UKRAINE	69
15.	Sobolev V. CONTRADICTIONS IN THE FUNCTIONING OF STATE EXECUTIVE BODIES AND LOCAL SELF-GOVERNMENT	74
16.	Stryzhychenko K., Kulinich V. INTEGRATION PROCESSES IN THE DYNAMICS OF BTC AND ETH	78
17.	Stryzhychenko K. THE MAIN CHANNELS OF INTERRELATION IN GLOBAL TRADE	85

COST MANAGEMENT IN A WARTIME ECONOMY: PROBLEMS AND AREAS FOR OPTIMISATION

Chumak Ganna,

Candidate of Economic Sciences, Associate Professor,
Simon Kuznets Kharkiv National University of Economics

Cost management is one of the fundamental instruments for ensuring the economic performance of an enterprise, since costs determine the lower limit of pricing policy, shape the level of marginality, and affect financial stability, investment capacity and the competitiveness of a business entity. Under stable conditions, cost management is generally viewed as a system of planning, standard-setting, accounting, control, analysis and optimisation of resource consumption. However, in a wartime economy, this system acquires a fundamentally different meaning, as costs cease to be merely an economic category of internal efficiency and become an indicator of an enterprise's ability to survive, adapt and maintain business continuity under conditions of extreme uncertainty.

A wartime economy is characterised by a high level of turbulence in the external environment, the destruction of production and logistics infrastructure, disruption of supply chains, growing energy risks, labour shortages, inflationary pressure, more limited access to financial resources, declining effective demand and an increase in the cost of operational security. According to the World Bank, the Government of Ukraine, the European Commission and the United Nations, as of the end of 2024, Ukraine's direct war-related damage was estimated at almost USD 176 billion, while recovery and reconstruction needs for the following decade amounted to USD 524 billion [1]. The updated 2026 assessment indicated a further increase in the scale of destruction: direct damage exceeded USD 195 billion, while recovery needs approached USD 588 billion [2]. This means that Ukrainian enterprises are operating not merely in the conditions of a crisis cycle, but in an environment of prolonged systemic shock that is changing the very logic of resource management.

The problem of cost management is particularly acute for micro, small and medium-sized enterprises, which have limited financial resilience while at the same time accounting for a substantial share of employment and value added. According to OECD estimates, small and medium-sized enterprises account for 99.9% of all enterprises in Ukraine, provide 81.6% of employment in the business sector and generate 70.2% of value added [3]. At the same time, the war has caused a significant proportion of SMEs to suspend or cease operations, disrupted supply chains, intensified electricity shortages, reduced labour productivity and increased operating costs [3]. Under such conditions, the traditional understanding of cost optimisation as mechanical cost reduction is methodologically limited, as it does not take into account the critical importance of certain expenditures for enterprise survival.

The relevance of this topic is determined by the need to rethink cost management not only in terms of saving resources, but also in terms of ensuring operational

resilience. Whereas in the pre-war period an enterprise could focus on improving efficiency through standardisation, inventory optimisation, minimisation of unit costs and reduction of non-productive expenditure, in wartime excessive saving may generate additional risks. For example, reducing expenditure on back-up power supply may lead to production downtime; minimising inventories may result in supply failures; reducing personnel costs may lead to the loss of key competences; and refusing to invest in digitalisation may reduce cost transparency and make it impossible to respond promptly to changing conditions. Thus, the problem lies in developing a cost management system that makes it possible not only to reduce excessive and non-productive costs, but also to invest rationally in resilience, security, flexibility, technological capacity and the enterprise's ability to recover.

Contemporary studies of Ukraine's wartime economy increasingly focus on issues of business resilience, infrastructure recovery, digital transformation, access to finance and enterprise adaptation to prolonged uncertainty. The report OECD Economic Surveys: Ukraine 2025 states that Ukraine's economic activity remains resilient owing to policy decisions and international support; however, labour shortages, attacks on energy infrastructure, logistics constraints and damage to business assets are slowing economic growth and intensifying inflationary pressure [4]. The OECD study on business digital transformation emphasises that digital technologies can enhance productivity, economic resilience and the recovery capacity of SMEs, although their diffusion is constrained by financial limitations, shortages of skilled labour and sector-specific factors [3].

The analytical materials of the National Bank of Ukraine are also of considerable value, as they record inflation dynamics, business expectations, and the impact of energy risks, labour costs and logistics difficulties on enterprise activity. The NBU Inflation Report of April 2025 identified limited production capacity, rising energy prices, labour shortages, and higher prices for raw materials and inputs among the key drivers of core inflation [5]. The July 2025 report forecast a gradual decline in inflation to 9.7% in 2025, 6.6% in 2026 and a return to the 5% target in 2027, while also emphasising the continued impact of exchange-rate, production and market factors [6]. The NBU enterprise survey conducted in February 2026 showed that businesses continued to expect an increase in output prices due to rising purchase prices, while the services sector remained under pressure from logistics difficulties and growing expenditure on wages, heating and electricity [7].

At the same time, empirical data from Ukrainian business surveys indicate that the cost problem is not only financial, but also organisational and managerial in nature. According to the survey of the state and needs of business in Ukraine conducted in December 2024, the Ukrainian Business Index stood at 36.9 out of 100, thus remaining in the zone of negative expectations; 46.6% of respondents reported a decline in business activity, 74.4% increased wages to motivate and retain employees, and the main challenges included the unpredictability of the situation in the country, the low purchasing power of the population and the shortage of qualified personnel [8]. This suggests that cost management cannot be limited to accounting control, but should encompass strategic management of risks, personnel, supply, energy and digital

infrastructure.

In traditional economic logic, enterprise costs are understood as the monetary expression of consumed resources required for the production of goods, performance of work or provision of services. Their structure is shaped by production technology, scale of activity, labour organisation, resource prices, inventory management efficiency and productivity levels. In a wartime economy, costs acquire additional characteristics: they become more volatile, less predictable, dependent on external threats and, to a significant extent, associated with the need to compensate for disruptions in the normal functioning of the market.

A wartime economy changes the relationship between fixed and variable costs. Some costs that in peacetime could be variable or optional effectively become mandatory under wartime conditions. For example, expenditure on generators, battery systems, fuel for back-up power supply, alternative communication channels, physical security, cargo insurance and supplier duplication becomes a prerequisite for business continuity. At the same time, some fixed costs lose their economic justification due to business relocation, declining demand or the transition to hybrid working formats.

Within the framework of this study, it is appropriate to propose the following classification of enterprise costs in a wartime economy.

Basic operating costs include expenditure on raw materials, inputs, wages, rent, utilities, depreciation, logistics, sales and administrative support. They remain the basis for cost formation; however, during wartime their relative share and dynamics change significantly.

Wartime adaptation costs are associated with the relocation of production facilities, changes in suppliers, restructuring of logistics routes, organisation of safe working conditions, acquisition of alternative energy sources, preparation of shelters, cybersecurity provision and transition to remote or hybrid working formats.

Operational resilience costs are aimed at maintaining business continuity. These include the costs of stockpiling inventories, creating safety stocks of raw materials, concluding contracts with several suppliers, maintaining reserve sales channels, diversifying the customer base and forming anti-crisis financial reserves.

Strategic recovery costs are investment-oriented and relate to equipment modernisation, process digitalisation, automation of management accounting, implementation of ERP, CRM, BI and BPM systems, development of e-commerce, improvement of energy efficiency and formation of new business models.

Risk-compensation costs arise as a response to increased uncertainty and include insurance payments, legal support costs, additional financial guarantees, losses from downtime, penalties for failure to meet delivery deadlines, and costs related to restoring assets after shelling or emergency power outages.

Such a classification makes it possible to consider costs not only as an object of reduction, but also as an instrument for maintaining enterprise viability. Therefore, in a wartime economy, cost management should be based on the principle of selective optimisation: non-productive, duplicative, low-impact and administratively excessive costs should primarily be reduced, whereas costs that ensure resilience, security, flexibility and technological modernisation should be regarded as strategically

necessary.

Cost pressure on Ukrainian enterprises during the war is formed under the influence of a set of interrelated factors. These can be grouped into several areas: resource-related, energy-related, logistics-related, labour-related, financial, security-related and market-related factors.

The resource-related factor is manifested in rising prices for raw materials, inputs, components and imported resources. Owing to the disruption of production chains, enterprises are often forced to purchase resources from more expensive suppliers, make advance payments, increase inventories or use alternative materials. This raises the material intensity of products and complicates cost forecasting.

The energy-related factor has become one of the most critical following systematic attacks on energy infrastructure. The OECD notes that attacks on energy supply, logistics and business assets are slowing economic activity and increasing inflationary pressure [4]. For enterprises, this means higher expenditure on electricity, fuel, generators, batteries, maintenance of back-up equipment, as well as losses caused by downtime. The NBU survey conducted in February 2026 also confirms that businesses remain under pressure from logistics barriers and rising expenditure on labour, heating and electricity [7].

The logistics-related factor is associated with the destruction or limited use of transport infrastructure, the blocking of certain routes, rising transportation costs, longer delivery times and increased cargo insurance costs. As a result, enterprises are forced to create additional inventories, change logistics operators, use longer routes or locate warehouses closer to sales markets.

The labour-related factor is manifested in shortages of qualified workers, mobilisation, migration, psychological exhaustion of personnel and the need to increase wages in order to retain key specialists. According to the survey on the state and needs of business in Ukraine, in December 2024, 74.4% of surveyed enterprises increased wages to motivate and retain employees, which directly affects the cost structure [8].

The financial factor is associated with the high cost of credit resources, limited access to long-term financing, devaluation risks and a growing need for working capital. Under conditions of instability, enterprises are forced to maintain a higher level of liquidity, which reduces opportunities for investment development.

The security-related factor forms a new group of costs that in peacetime were either insignificant or absent. These include expenditure on shelters, security, evacuation measures, protection of property, data backup, cybersecurity, legal support for force majeure circumstances, asset insurance and personnel safety.

The market-related factor is associated with the declining purchasing power of the population, changes in the structure of demand, reduced investment activity among customers and heightened price sensitivity. Under such conditions, enterprises cannot always fully pass cost increases on to product prices, which reduces marginality and creates a risk of financial instability.

An important prerequisite for effective cost management in a wartime economy is the transition from reactive decision-making to proactive cost governance. Enterprises

should not respond to cost increases only after they have already affected profitability; instead, they should establish mechanisms for early identification of cost risks, continuous monitoring of critical cost items and timely adjustment of operational plans. This requires closer integration between financial management, risk management, procurement, logistics, human resource management and digital analytics. Such an integrated approach enables enterprises to distinguish between costs that should be reduced, costs that must be controlled and costs that should be deliberately maintained or increased in order to ensure business continuity, resilience and future recovery. Therefore, cost management under wartime conditions should be regarded not as a separate accounting function, but as an element of strategic enterprise governance.

To improve the effectiveness of cost management in a wartime economy, it is advisable to use the concept of wartime-adaptive cost controlling. Its essence lies in combining the instruments of management accounting, budgeting, variance analysis, risk management, scenario planning and digital analytics.

Unlike traditional controlling, which is mainly focused on achieving planned financial indicators, wartime-adaptive controlling should take into account uncertainty in the external environment, resource criticality, security risks and the need for prompt adjustment of managerial decisions.

The main principles of wartime-adaptive cost controlling are as follows:

the principle of relevance, according to which costs are assessed in terms of their impact on operational resilience and value creation;

the principle of scenario-based planning, which involves developing several budget scenarios depending on the intensity of risks;

the principle of flexibility, which provides for the possibility of rapidly revising budgets, standards, routes, suppliers and resource plans;

the principle of digital transparency, which orients the enterprise towards the use of digital tools for cost monitoring in a mode as close to real time as possible;

the principle of risk orientation, according to which costs are analysed not only after they have been incurred, but also in terms of their ability to reduce the probability of future losses;

the principle of strategic feasibility, which requires cost-related decisions to be aligned with the long-term goals of the enterprise.

Cost optimisation in a wartime economy should be comprehensive and cover the financial, operational, technological, logistics, organisational and personnel aspects of enterprise activity.

The first area is the digitalisation of cost management. The use of ERP, CRM, BI and BPM systems, electronic document management and analytical dashboards makes it possible to increase cost transparency, reduce the time required to prepare management information, identify non-productive costs and promptly control deviations. The OECD emphasises that digitalisation is an important factor in the productivity and resilience of Ukrainian SMEs during the war and in the period of post-war recovery [4].

The second area is energy optimisation, which involves auditing energy consumption, introducing energy-efficient equipment, using alternative energy

ECONOMICS
THE IMPACT OF MODERN DIGITAL TECHNOLOGIES AND DEVELOPMENTS ON THE
FUTURE OF EDUCATION

sources, automating energy accounting and assessing the feasibility of back-up power systems. Its importance lies not only in reducing energy costs, but also in lowering the risk of downtime.

The third area is logistics optimisation, which includes revising routes, consolidating deliveries, involving local suppliers, creating regional warehouses, digitally tracking cargo and determining the optimal level of safety stocks with due regard to the risk of disruptions.

The fourth area is the optimisation of personnel costs without losing human resource potential. Under conditions of skilled labour shortages, direct staff reductions are less appropriate than redesigning functions, providing internal training, introducing flexible schedules, combining positions, automating routine operations and motivating key employees.

The fifth area is the revision of the product and customer structure. An enterprise should analyse the marginality of individual products, customers, sales channels and orders, abandoning low-margin areas that consume significant resources without generating an adequate return. For this purpose, it is advisable to apply ABC and XYZ analysis, activity-based costing, break-even analysis and the marginal approach.

The sixth area is the optimisation of administrative costs through electronic document management, remote approval of decisions, reduction of paper-based procedures, revision of rented premises, centralisation of procurement, and automation of accounting and HR processes. At the same time, such savings should not reduce the quality of management, control and communication.

The seventh area is financial optimisation, which includes working capital management, acceleration of accounts receivable collection, revision of payment terms with suppliers, attraction of grant programmes, state support, concessional lending and partner financing. Under wartime conditions, liquidity management becomes no less important than profitability management.

In addition, cost management in wartime conditions should take into account the social dimension of enterprise resilience. Excessive reduction of personnel-related, safety-related or recovery-oriented expenditures may produce short-term financial savings, but it can also weaken organisational stability, reduce employee motivation and limit the enterprise's capacity to restore operations after disruptions. Therefore, optimisation should be based on a balance between economic efficiency and the preservation of critical resources that support long-term business continuity.

Thus, in a wartime economy, cost management acquires a new meaning, as it cannot be reduced merely to lowering production costs or cutting individual cost items. Under conditions of energy threats, logistics constraints, labour shortages and inflationary pressure, costs become not only a financial indicator, but also an instrument for ensuring enterprise viability. Enterprises are forced to balance the need to save resources with the need to finance areas that ensure business resilience. Expenditure on digitalisation, energy autonomy, logistics diversification, security, retention of key employees and financial flexibility is of strategic importance, as it forms the basis for adaptation to a crisis environment. At the same time, non-productive, duplicative and administratively excessive costs should be subject to

systematic review and reduction. Therefore, effective cost management in a wartime economy requires a transition from short-term saving to strategically justified optimisation. Such an approach makes it possible not only to minimise losses under wartime conditions, but also to strengthen the operational resilience, adaptability and competitiveness of enterprises during post-war recovery.

References

1. *Ukraine Fourth Rapid Damage and Needs Assessment: February 2022 – December 2024*. World Bank, Government of Ukraine, European Union, United Nations. Washington, DC: World Bank, 2025. 172 p.
2. *Updated Ukraine Recovery and Reconstruction Needs Assessment Released*. World Bank. 2026. URL: <https://www.worldbank.org/en/news/press-release/2026/02/23/updated-ukraine-recovery-and-reconstruction-needs-assessment-released>
3. OECD. *Enhancing Resilience by Boosting Digital Business Transformation in Ukraine*. Paris: OECD Publishing, 2024. URL: https://www.oecd.org/en/publications/2024/05/enhancing-resilience-by-boosting-digital-business-transformation-in-ukraine_c2e06e50.html
4. OECD. *OECD Economic Surveys: Ukraine 2025*. Paris: OECD Publishing, 2025. URL: https://www.oecd.org/en/publications/oecd-economic-surveys-ukraine-2025_940cee85-en.html
5. National Bank of Ukraine. *Inflation Report. April 2025*. Kyiv: NBU, 2025.
6. National Bank of Ukraine. *Inflation Report. July 2025*. Kyiv: NBU, 2025.
7. National Bank of Ukraine. *Businesses Improve Their Still Guarded Expectations for Their Performance – Results of Enterprises Survey in February 2026*. 2026. URL: <https://bank.gov.ua/en/news/all/biznes-polipshiv-strimani-otsinki-rezultativ-svoyeyi-diyalnosti--pidsumki-opituvannya-pidpriyemstv-u-lyutomu>
8. *State and Needs of Business in Ukraine: Results of the Survey in December 2024*. Center for Innovations Development, Office for Entrepreneurship and Export Development, Diia.Business. 2025. URL: <https://cid.center/en/analytics/stan-ta-potreby-biznesu-v-ukrayini-rezultaty-doslidzhennya-u-grudni-2024-roku-en-translation/>

Scientific publications

MATERIALS

The XXII International Scientific and Practical Conference
«The impact of modern digital technologies and developments on the future of
education»

Krakow, Poland
(June 01-03, 2026)