Trends in logistics development in today's environment

Digitalization and Automation

Digitalization is essential for improving business competitiveness, even in wartime. Technology is being integrated into logistics processes, ensuring efficient supply chain management and order processing. Warehouse automation and the use of artificial intelligence for route planning and freight flow analysis help to reduce costs and supply disruptions.

TMS and WMS systems are being actively implemented in Ukraine, allowing logistics to adapt to limited infrastructure and market changes. Digital solutions ensure logistics stability and maintain a high level of customer service during wartime.

«*Impact of War on Logistics Digitalization and Automation*»

Year	Digitalization Trends	Automation Trends	Impact of War / Comments
2022	Initial active implementation of TMS and WMS; digital communication platforms	Limited warehouse automation; basic tracking systems	Limited infrastructure and security risks prompted a shift to remote management
2023	Integration of Big Data for freight flow analysis; digital route maps	Use of robotic systems for sorting and packaging	Multimodal routes became necessary due to damaged roads and port blockages
2024	Implementation of AI for route planning and demand forecasting	Inventory management automation; ERP system integration	Rapid adaptation to new supply chains required; logistics flexibility increased
2025	Extensive use of digital platforms for monitoring and analytics; e-commerce development	Expansion of automated warehouses; drones for internal delivery	Digitalization became critical for logistics resilience and adaptation to new conditions

Green logistics.

Environmental care is becoming a key component of logistics development. The use of electric vehicles, route optimization to reduce carbon emissions, and the use of renewable energy sources in warehouses and transport infrastructure are the basis of green logistics.

In the context of war, this area is of particular importance for Ukraine. On the one hand, companies are faced with limited fuel resources and damaged infrastructure, which encourages the introduction of energy-saving technologies. On the other hand, environmental solutions help to reduce operating costs while ensuring compliance with international standards, which is essential for integration into global markets.

Ukrainian Companies Implementing Green Logistics During Wartime

Nova Poshta. A leading delivery company investing in eco-friendly initiatives, including the use of electric vehicles and route optimization to reduce CO_2 emissions.

Ukrzaliznytsia (Ukrainian Railways).The state railway operator working on infrastructure modernization and implementing energy-efficient technologies in its operations.

Metinvest. An industrial leader reducing the environmental footprint of its logistics, optimizing transportation, and using more eco-friendly modes of transport.

Ukrposhta. The national postal operator developing infrastructure for electric vehicles and implementing digital solutions to reduce paper usage.

ZAMMLER. An international logistics company that actively implements practices of stable development, in particular the use of alternative energy sources and electric transport.

Development of E-commerce

E-commerce is one of the main things driving the logistics sector.

According to the Ukrainian E-Commerce Association, the e-commerce market in Ukraine will grow by 15–20% each year until 2027.

According to forecasts by the Ukrainian E-Commerce Association, in 2027, the e-commerce market in Ukraine will grow at an annual rate of 15–20%. This increases the demand for fast, safe, and secure delivery, expansion of the network of post terminals, automation of order processing and optimization of **last-mile logistics.**

Ukrainian E-commerce Companies and Logistics Innovations During Wartime

Company	Business Model	Logistics and Delivery Innovations
Rozetka	Online retail, adjusting operations for wartime	Route optimization, fast delivery even in risky areas
Nova Poshta	Logistics and delivery supporting e-commerce	Electric vehicles, drones for internal deliveries
Fozzy Group / Silpo	Online grocery and retail	Home delivery solutions, innovative delivery strategies
Allo	Online electronics retail	Fast order processing and delivery solutions
Prom.ua	E-commerce marketplace for SMEs	Optimized logistics for SMEs, real-time tracking of shipments

Geopolitical Challenges and New Supply Chains

Russian aggression in Ukraine has greatly affected the country's logistics infrastructure, broken traditional supply routes and creating significant risks for businesses.

Many companies are forced to quickly reorient their supply chains, find new suppliers, and establish alternative transportation routes to ensure the smooth operation of production and distribution networks.

In response, Ukrainian companies are actively using ***multimodal transport***, combining different modes of transport - road, rail, sea and air. This approach not only minimizes supply chain but also optimizes costs and improves logistics efficiency. In addition, digital monitoring and route planning systems allow for quick adaptation to changing conditions and ensure the flexibility of supply chains even in wartime.

Wartime Infrastructure Development and Logistics Efficiency

Project / Company	*Description*	*Impact on Logistics*
Modernization of Railways	Construction of 22 km standard- track railway (1435 mm) from Chop to Uzhhorod.	Facilitates integration with European transport network and improves cargo transport efficiency.
Restoration of Bridges and Roads	UNOPS (United Nations Office for Project Services) and World Bank-supported project restoring critical bridges and roads.	Restores logistics routes and ensures humanitarian aid delivery.
Ahlers Logistics	Adapts operations to wartime conditions, working around damaged infrastructure and keeping cargo safe.	Maintains supply chains and ensures delivery using alternative routes.
BIONIC Hill Innovation Park	Development of Ukraine's first innovation park (live, work, study, play).	Promotes technological solutions in logistics and attracts post-war investments.
Logistics Infrastructure Strategy	Integrated plan for transport and logistics restoration, including institutional reforms.	Provides stable economic growth and efficient logistics activities.

Cybersecurity

In today's world of digital logistics, the risk of cyberattacks on enterprise information systems is increasing. Disruptions in transport, warehousing or order management systems can lead to significant financial losses, delivery delays, and supply chain disruptions, which are particularly sensitive in wartime.

In wartime, cybersecurity becomes not only a security tool, but also a critical requirement for the stability of Ukraine's logistics system, ensuring the supply chain's safety and protecting private data from outside threats.

Top cyber attacks in Ukraine

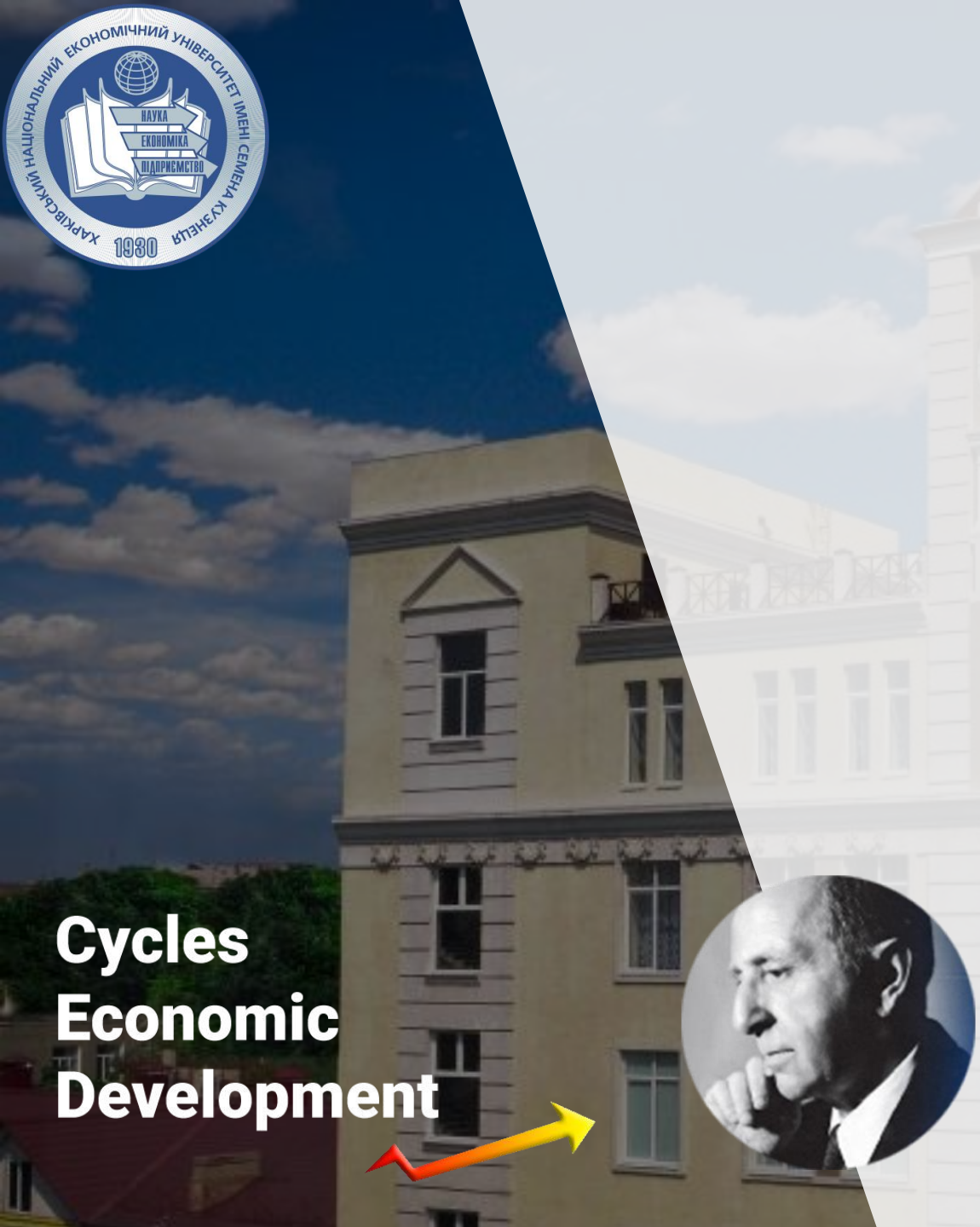
1. ***NotPetya (2017).*** A massive cyberattack initially targeting Ukrainian companies, later spreading globally. (Significant losses for businesses and government institutions, including banks, energy companies, and government agencies.)

2. Attacks on Energy Infrastructure (2015–2022). Several large-scale attacks on energy companies, including disruption of energy consumption management systems.

3. Attacks on Banks and Financial Institutions (2022–2023). Large-scale DDoS attacks and targeted phishing companies against Ukrainian banks.

4. Attacks on Government Portals and Agencies (2022–2023). Large-scale cyberattacks on government websites, the Ministry of Defense, and other state agencies.

5. Attacks on Critical IT Infrastructure (2022). Targeted cyberattacks on logistics, energy and transport companies



Thank you for you attention!