



EDUCATION, ECONOMY, AND AI: MULTIDISCIPLINARY PERSPECTIVES FOR A DIGITAL FUTURE

The University of Technology

in Katowice Press

2025



EDUCATION, ECONOMY, AND AI: MULTIDISCIPLINARY PERSPECTIVES FOR A DIGITAL FUTURE

Monograph

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The University of Technology in Katowice Press

2025

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ISBN 978-83-68422-04-7

DOI: 10.54264/M051

Editorial compilation :

The University of Technology in Katowice Press
43 Rolna str., 40-555 Katowice, Silesia Province, Poland
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TABLE OF CONTENTS

Preface.....	6
Chapter 1. Transforming education and development in the digital age.....	8
1.1. Psychology of business decisions: risk, uncertainty, and cognitive biases.....	8
1.2. Psychological readiness as a factor of entrepreneurial activity: essence and structure.....	20
1.3. Purposeful use of ai tools for the development of students' learning ability in higher education.....	38
1.4. The impact of digital technologies on the development of social skills in English language classes.....	49
1.5. Communicative influence and its implementation by the syntactic structure of a sentence in Ukrainian.....	64
1.6. Modern trends in improving the content and methods of professional teacher training in the context of quality management of educational services.....	80
1.7. Peculiarities of career orientation formation among vocational education seekers in the context of the emerging information society.....	95
1.8. Theoretical approaches to defining the essence and psychological content of an individual's professional adaptation in the context of modern production.....	114
1.9. Development of digital competence of teachers of vocational education institutions in the mechanical engineering industry: challenges and prospects of Industry 5.0.....	126
1.10. Artificial intelligence technologies as a tool for personalized learning in digital educational platforms.....	139
1.11. The role of the information society in the psychological recovery of students after the stress caused by military operations.....	152
1.12. On the problem of motivational and semantic attitudes formed under the influence of digital technologies.....	167
1.13. Resource approach in the formation of digital competencies of education seekers through digitalization.....	184
1.14. The impact of war on social work in the context of green and digital transitions: new challenges and competencies.....	198
1.15. Professional self-realization of a music art teacher in the context of the digital transformation of art education.....	215
1.16. Teaching future specialists of fine and decorative arts in higher educational institutions about the cultural heritage of Ukraine and the world through digitization of museums.....	228

Chapter 2. Navigating digital and spatial shifts in a globalized world.....	245
2.1. Modeling the impact of digitalization on economic growth.....	245
2.2. Challenges of the modern economy.....	262
2.3. The impact of the full-scale war on restructuring national economy and trading enterprises'.....	284
2.4. Strategies for the development of territorial communities during wartime and the post-war period: the role of investment in recovery.....	293
2.5. Design thinking as an innovative technology for creating an informational tourism product.....	305
2.6. Digital technologies in the tourism sector.....	317
2.7. Prospects for the use of information and analytical technologies in ensuring housing resources within the European union's migration policy in the context of global challenges.....	329
2.8. Modern approaches in entrepreneurial training of specialists in transport management and logistics in the republic of Poland.....	343
2.9. Management in financial potential of the enterprises in the conditions of digitalization and developments of financially-technical ecological system.....	355
2.10. External and internal risks of real estate market investment projects....	370
2.11. Influence of external and internal factors on the functioning of the management mechanism of renewable energy business structures..	385
2.12. The role and importance of the digital economy for the transformation of society.....	401
2.13. Predictive modeling of the profitability of IT-industry enterprises.....	412
 Chapter 3. Integrating AI, Security, and Recovery into Digital Life.....	 432
3.1. Development of a model and method for detecting inaugural behavior of chat users.....	432
3.2. Modern artificial intelligence technologies in chemistry education.....	446
3.3. Analysis of methods for identification of combat vehicles based on convulsive neural networks taking into account the conduct of battle.....	460
3.4. Sensory integration in pediatrics.....	474
3.5. Use of the noise emission effect for the diagnostics of X-ray non-contrast fragments and the features of multidisciplinary rehabilitation of patients with combat injuries at various stages of recovery.....	487
3.6. Tendency to platform thinking.....	502
3.7. Digitalization of modern energy in the information society.....	513

3.8. Innovative technologies in labor protection: from drones, AI to wearable devices.....	528
3.9. Nuclear informatics: key technologies and modeling.....	540
3.10. Ensuring information security in the process of development and implementation of startup projects.....	552
3.11. Using the PICO model to assess the impact of training periodization on powerlifter performance.....	567
3.12. Use of digital technologies in rehabilitation.....	581
3.13. The role of physical rehabilitation for the training of nurses for rehabilitation.....	598
3.14. Features of the use of artificial intelligence in scientific research.....	608
Annotation.....	621
About the authors.....	635

2.6. Digital technologies in the tourism sector

Modern tourism is undergoing significant changes under the influence of digital technologies. Innovative solutions help automate processes, improve customer experience and increase the efficiency of travel companies.

The introduction of online booking, mobile apps, artificial intelligence (AI), virtual reality (VR) and augmented reality (AR), blockchain and Big Data is transforming the travel industry, making it more accessible, personalised and competitive (Lysiuk, 2024).

Key digital technologies in tourism

1. *Online platforms and mobile apps.* Digital platforms, such as Booking.com, Airbnb, Expedia, provide travellers with the ability to easily book accommodation, transport and travel services in real time. Mobile apps provide users with a more advanced user experience through geolocation, recommendations, social media integration and online payment.

2. *Artificial intelligence (AI) and chatbots.* Artificial intelligence is used to analyse traveller behaviour, personalise offers and automate customer service. Chatbots, such as Expedia Chatbot, Skyscanner Bot, provide instant answers to user queries, helping them find the best travel options.

3. *Virtual (VR) and augmented reality (AR).* VR and AR open up new opportunities for travel marketing. Virtual tours allow potential customers to see hotels, attractions, or museums before they travel. AR, in turn, improves navigation and interaction with the environment – tourists can get information about attractions simply through a smartphone camera.

4. *Blockchain in the travel industry.* Blockchain technologies provide secure and transparent transactions in tourism. They are used to verify tickets, book hotels, protect personal data, and fight fraud. For example, Travala offers travel services based on cryptocurrencies, which simplifies international payments.

5. *Big data analysis.* Big Data helps travel companies analyse demand trends, predict customer behaviour and optimise pricing. Services such as Google Travel Insights use large amounts of data to create personalised recommendations and improve marketing strategies (Table 1).

Digitalisation has become a key factor in the development of the travel industry, providing convenience, accessibility, personalisation and security for tourists. The introduction of innovative solutions allows companies to improve the quality of services, reduce operating costs and adapt to new market requirements (Lysiuk, et al., 2023).

The use of digital technologies in the tourism sector is not just a competitive advantage, but a vital necessity for hotels, travel agencies, airlines, transport operators and other market players. The main aspects that determine the importance of digitalisation include:

Increasing convenience for tourists. Modern travellers expect quick access to information and convenient digital solutions. Online platforms for booking hotels, airline tickets, tours and car rentals simplify the travel planning process. Mobile apps and voice assistants provide users with personalised recommendations, interactive maps and real-time services.

Optimisation of operational activities. Automation technologies reduce staff costs, shorten order processing times and improve the accuracy of operations.

Personalisation of the travel experience. Artificial intelligence (AI) and big data analysis algorithms enable companies to offer customers individualised tours, special promotions and recommendations based on their preferences. This contributes to an increase in tourist satisfaction and brand loyalty.

Expanding marketing opportunities. Digital marketing plays an important role in promoting tourism services. Social media, content marketing, SEO optimisation, and targeted advertising help to attract new customers and keep in touch with regular tourists. Virtual tours and augmented reality (AR) help to attract potential visitors even before they book a trip.

Table 1

Main digital technologies in tourism

Name of technology	Where it is used	Characteristics
Online platforms and mobile apps	Booking systems (Booking.com, Airbnb, Expedia), hotel and airline mobile apps	Allows booking accommodation, transport, excursions; integrated with cards and payments.
Artificial intelligence (AI) and chatbots	Travel companies, hotels, airlines, online services	Used to analyse customer behaviour, personalise offers, and provide automated support.
Virtual (VR) and augmented reality (AR)	Virtual tours, museums, city navigation, travel apps	Allows you to preview tourist attractions and improve navigation with AR.
Blockchain	Payment services, booking, data security	Enables transparent transactions, ticket verification, personal data protection, secure crypto payments.
Big Data analysis	Travel agencies, marketing campaigns, pricing	It is used to forecast demand, analyse tourist behaviour, and personalise offers.
IoT (Internet of Things)	Smart hotels, airports, transport systems	Automated hotel room management, smart locks, personalised services via mobile devices.
Cloud technologies	Travel companies, aviation systems, CRM systems	Provide data storage and processing, integration between platforms, and quick access to information.
Geolocation services	Maps, guides, transport apps	Optimise routes, provide information about places and services in real time.
Robotic assistants and automation	Hotels, airports, cruise ships, restaurants	Used for check-in, room service, food delivery, and answering customer queries.
Electronic travel passports (ePassports)	Airports, border services	Simplify customs clearance and reduce the time for document checks.
Voice assistants (Alexa, Google Assistant, Siri)	Hotels, tourist information centres	Allows you to receive information about routes, hotels, entertainment using voice commands.
Advanced Analytics and Forecasting	Travel companies, hotels, cities	It helps to predict demand, optimise prices, and analyse the flow of tourists.
Electronic SIM cards (eSIM)	Smartphones, roaming, international travel	Allows you to easily change operators without a physical SIM card, reducing communication costs.
Drone technology	Tourist excursions, aerial photography, hotel delivery	Used to create unique videos, deliver goods, and monitor territories.
Personalised recommendation systems	Online tour operators, mobile apps	Offer customised itineraries, activities and hotels based on user behaviour.

Increased security and trust. Blockchain technologies contribute to the transparency of financial transactions and the security of personal data. Biometric identification and e-passports allow for faster security checks at airports and hotels. Smart cameras and artificial intelligence systems increase the security of tourist attractions.

Green tourism and sustainable development. Innovations contribute to the development of eco-tourism. The use of IoT technologies in hotels helps to save resources, control energy consumption and reduce waste. E-tickets and digital guides reduce the use of paper, which helps to preserve the environment (Mikhaylyuk, 2022).

Innovative technologies make it easier to plan trips, improve the quality of customer service, optimise operational processes, and improve the safety and sustainability of travel.

Today's travellers expect convenience, speed and personalised offers, which are made possible by digital technologies. They cover various aspects of travel – from booking tickets and hotels to interactive navigation support and big data analysis to forecast tourist flows.

Digital tools help travel companies create unique products, increase customer loyalty and respond to the challenges of globalisation and changing consumer behaviour. Below, we look at how technology is changing different stages of travel (Bihus, et al., 2020).

1. Travel planning: digitalisation of travel services

Today's travel planning is as convenient as possible thanks to a wide range of digital services:

Online booking platforms (Booking.com, Airbnb, Expedia, Agoda) allow you to compare prices, read reviews and choose the best accommodation options.

Meta-search engines (Skyscanner, Momondo, Google Flights) analyse hundreds of flights and offer the most favourable flight options.

Chatbots and virtual assistants (Google Assistant, Siri, Alexa) help to find the necessary information, send reminders, and recommend places to visit.

Big Data and AI analyse user behaviour, generate personalised offers and create special tours for different categories of tourists.

2. Mobile technologies and flexibility when travelling

Mobile applications and technologies play a key role in ensuring the comfort of travellers:

E-tickets and mobile boarding passes make it easier to check in for flights and use public transport.

Geolocation services and interactive maps (Google Maps, Maps.me, Citymapper) help to navigate a new city, plan routes and find interesting places nearby.

Mobile payment systems (Apple Pay, Google Pay, PayPal) allow you to securely pay for services anywhere in the world without the need for physical cards.

Augmented reality (AR) and virtual tours allow you to view 3D tours of hotels, museums and attractions before booking or visiting.

3. Personalisation of travel services

Tourists increasingly value an individual approach, and digital technologies allow for the personalisation of the travel experience:

Artificial intelligence analyses previous bookings and customer preferences to offer personalised offers.

Social networks and user behaviour analysis (Facebook, Instagram, TikTok) help travel companies create unique advertising campaigns for different audience segments.

Voice assistants allow you to quickly find the necessary information and adapt the route in accordance with changing travel conditions.

4. Innovations in air travel and transport logistics

Digitalisation is also affecting the transport sector:

Automated check-in systems and biometric control significantly reduce the time required to clear security at airports.

Artificial intelligence systems help to optimise flight schedules, avoid delays and manage fleets efficiently.

The development of unmanned transport (robotaxis, delivery drones) may change travel logistics in the near future.

5. Hotel business and digital hospitality solutions

The hotel industry is actively implementing innovations to improve service:

IoT-enabled smart rooms allow guests to control lighting, temperature and multimedia using voice commands or smartphones.

Automation of check-in and check-out processes eliminates the need for queues and contact with staff.

Big Data helps to predict guest requests, reduce service costs and increase the efficiency of the hotel business.

6. Environmental friendliness and sustainable use of resources

Modern technologies also contribute to the development of sustainable tourism:

E-tickets and mobile guides help reduce the use of paper.

IoT solutions in hotels control water and electricity consumption, which contributes to environmental friendliness.

The development of ecotourism through digital platforms allows tourists to choose eco-friendly routes and hotels.

7. Security and protection of personal data

In a world where digital technologies are central, the issue of tourist safety is of particular importance:

Blockchain technologies ensure secure transactions and personal data protection.

Biometric identification and artificial intelligence help prevent fraud and improve traveller safety.

Digital health certificates make travelling easier in a pandemic.

One of the most promising innovations in this direction is blockchain technology. It provides transparency, security, decentralization and significantly improves the efficiency of interaction between travel companies, services and customers.

Blockchain allows you to create immutable, tamper-proof registers of all transactions, which makes it indispensable in areas such as booking, payment, passenger identification and loyalty program management. Due to its characteristics, this technology is transforming the travel industry, making it safer and more convenient for both companies and consumers.

1. Transparency and security of booking

One of the main problems of the travel industry is fraud during booking. Blockchain is able to solve this problem by creating decentralized registers, where all information is stored in encrypted form and cannot be changed without confirmation by all network participants.

Protection against fake bookings: Since all transactions are recorded on the blockchain, users can be sure that their booking is authentic and cannot be tampered with.

No intermediaries: Blockchain eliminates the need for intermediaries, which reduces the risk of fraudulent schemes and hidden fees.

Fast data verification: Users can verify the authenticity of a booking directly through the blockchain network.

2. Revolutionizing payments and financial transactions

Traditional payment methods in tourism are often accompanied by high fees, payment delays and currency conversions. The use of cryptocurrencies and blockchain-based smart contracts makes financial transactions faster, cheaper and safer.

Secure international payments: Blockchain allows transactions to be made without bank fees and delays.

Smart contracts: Automated transactions that are executed only after all conditions are met, prevent fraud and ensure compliance with obligations.

No double debits: transactions in the blockchain are confirmed by independent network participants, which makes double debiting of funds impossible.

3. Improving loyalty programs

Many hotels, airlines and travel services use bonus programs, but their effectiveness is often limited by the complexity of exchanging points between partners and low convenience for customers. Blockchain allows you to create a single loyalty ecosystem where users can accumulate and exchange points quickly and without unnecessary restrictions.

A single system of accounting for bonuses: tourists can accumulate points from different suppliers and use them in different services.

Fraud reduction: thanks to blockchain, bonus points cannot be forged or used twice.

Transparency and ease of exchange: the use of blockchain platforms allows customers to see their balance in real time.

4. *Protecting tourists' personal data*

The issue of protecting personal information is critical for the tourism industry, especially in the face of growing cyberattacks. Blockchain allows tourists to store and control access to their data without the risk of its leakage or misuse.

Decentralized storage of passport and visa data: passengers can share the necessary information only with trusted organizations (Lysiuk, Roiko, Biletskyi, 2022).

Biometric identification: with the help of blockchain, tourists can quickly pass security control at airports and hotels.

No risk of identity theft: Blockchain allows users to store data in encrypted form without centralized servers.

5. Optimization of the work of travel companies and hotels

The hotel business and travel agencies can significantly improve their efficiency by using blockchain technologies.

Transparent accounting of the room stock: hotels can maintain a register of available rooms in real time, which prevents duplicate bookings.

Supply optimization: Thanks to smart contracts, the terms of supply of goods and services are automatically fixed without the risk of non-fulfillment of contracts.

Simplify personnel management: Blockchain helps automate the payment of salaries and control over the performance of work tasks.

6. Using blockchain in transport logistics

Transport companies, including aviation, rail and road transport, can take advantage of blockchain platforms:

Automation of ticket registration and verification processes: this reduces costs and improves the speed of passenger service.

Creation of digital passports for transport: airlines can more effectively monitor the technical condition of aircraft and reduce the number of system failures.

Transparent control of cargo transportation: travel companies can use blockchain to manage the logistics of luggage delivery and tourist equipment.

The Blockchain digital platform opens up new opportunities for the travel industry, making it safer, more transparent and more efficient. Thanks to a decentralized approach and the ability to protect personal data, this technology contributes to the development of secure bookings, instant payments, improved loyalty programs and optimization of business processes (Lysiuk, Royko, Goryaeva, 2024).

In the future, the implementation of blockchain technologies will become an important competitive advantage for companies that seek to ensure a high level of customer trust, reduce costs and improve the quality of service. Travel companies that actively integrate this technology will be able to adapt to modern challenges and ensure the long-term development of the industry.

Currently, Blockchain platforms are relevant in the tourism industry (Table 2).

Table 2

Blockchain platforms

1.	Winding Tree	Winding Tree is a decentralized travel services distribution network built on Blockchain, which is able to increase the efficiency and convenience of interaction between buyers and sellers using smart contracts and other open source tools.
2.	Travelflex	Travelflex is an application that has built-in functionality to solve tourists' problems, such as making payments with low fees and safely storing funds, or providing a convenient way of communication that includes integration with social networks.
3.	MeetnGreetMe	MeetnGreetMe is a system that focuses on increasing the convenience and ease of use of travel services, offering the creation of a global platform where every traveler can receive concierge services personally tailored to their needs and budget.
4.	Cool Cousin	Cool Cousin (CUZ) is a technology that is a mobile application and in its principle of operation is largely reminiscent of thematic forums where tourists share their impressions of visiting a particular country, city, resort. The application is primarily addressed to those who prefer to plan their vacation independently, having laid out the route in advance.
5.	Concierge	Concierge (CGE) is a project based on Blockchain technology, on the decentralized NEO platform, which is a mobile application for users who are going on vacation. With the help of the application, it is possible to book a hotel in any country in the world without a commission.
6.	Crystabaya	Crystabaya is an advanced platform specializing in the field of hotel management and tourism, providing a more complete experience with many additional services. Crystal Bay Group is engaged in international and domestic tourism; management and operation of hotel resorts, development of various types of tourism and investment in tourism real estate ecosystems.
7.	Visit World	Visit World is a service platform for tourists and migrants, which contains all the relevant information about the rules for crossing the border of every country in the world. Qualified assistance is provided free of charge in 7 languages at a time convenient for the client. All information is structured, so a citizen of every country will be able to find information about the rules for crossing the border, as well as legal stay for any purpose in any country in the world.
8.	Smart Trip	Smart Trip is a platform that will allow users to fully plan their trip abroad, including booking plane tickets, a hotel room and any excursion. The creators of Smart Trip also intend to offer their users an interactive phrasebook compiled by native speakers, a voice-activated machine translation service and a system of recommendations that will help avoid problems with the local population or law enforcement officers, as well as find a suitable restaurant or a little-known attraction. In the future, the platform also intends to issue its own debit card with TASH tokens, which can be used to pay for any services while traveling.

The main areas of influence of digital technologies on competitiveness in the tourism industry are presented in Table 3.

Table 3

Areas of influence of digital technologies on competitiveness in the tourism industry

Sphere of influence	Direction of influence	Technology
Creating a travel product	Acceleration of the procedure for creating a new travel product	GDS and other booking systems, Internet.
Promotion of tourist products	The emergence of fundamentally new methods and technologies of promotion in tourism	Internet, webinars, multimedia technologies, GDS.
Marketing	Formation of new marketing channels for the sale of tourist products	Internet, booking systems, e-commerce.
Management	Improvement of tourism enterprise management technologies	Specialized software products for tourism enterprise management.

So, in the modern era of digital evolution, the issue of innovative shifts in the mechanism of customer service and the features of service in the tourism business is acute and relevant. The widespread introduction of digitalization into business activities has become a key factor in economic growth and improving the quality of tourism services. The use of information systems and the dissemination of information in the tourism sector is one of the most pressing problems of our time.

At the present stage, professional, personal life and business development are unimaginable without digital technologies. The sale of a tourism product requires innovative digital technologies that can provide information about tourist accommodation, booking options, transport rental, ticket sales and other services in a short time.

Digital technologies are the driving force behind the development of modern tourism. They not only improve the experience of travelers, but also contribute to increasing the efficiency of tourism companies. The introduction of online services, AI, VR, AR, blockchain and Big Data is transforming the industry, making it more accessible, secure and personalized. Despite the challenges of digitalization,

its potential remains enormous, opening up new opportunities for sustainable development and competitiveness of the tourism business.

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Annotation

Chapter 1. Transforming education and development in the digital age

1.1. Tetiana Gryniv, Zoryana Skybinska. Psychology of business decisions: risk, uncertainty, and cognitive biases. The article explores the relationship between business psychology, uncertainty risk, and cognitive biases. It examines the key areas of business psychology, including management psychology, decision-making psychology, and organizational psychology. The focus is placed on the impact of cognitive biases on the process of managerial decision-making under uncertainty, which is a critical factor for the effective functioning of businesses. The role of psychological mechanisms in shaping corporate strategies is analyzed, and approaches to minimizing the negative effects of biases are proposed. The study is based on contemporary scientific research and practical case studies, allowing for an assessment of the significance of psychological aspects in business operations.

1.2. Tetyana Nestorenko, Iryna Ostopolets. Psychological readiness as a factor of entrepreneurial activity: essence and structure. Entrepreneurial activity is an important factor in economic development, contributing to job creation, innovation and increased competitiveness. The determining factor for the successful implementation of entrepreneurial activity is the psychological readiness of the individual, which includes motivational, cognitive, emotional-volitional and behavioral components. Studies confirm a significant relationship between the level of psychological readiness and entrepreneurial intentions, self-efficacy and social support. Particular attention is paid to psychological readiness for social entrepreneurship, which has its own specific features, such as empathy and social responsibility. Gender aspects also play a role in the formation of entrepreneurial readiness, in particular among women and female students. Psychological readiness is considered not as a static characteristic, but as a dynamic process that is formed under the influence of education, training and mentoring support. Identification and analysis of psychological aspects of entrepreneurship is key to developing effective programs for the development of entrepreneurial activity.

1.3. Gulnar Huseynova. Purposeful use of ai tools for the development of students' learning ability in higher education. In recent years, artificial intelligence (AI) has significantly influenced higher education, and this impact continues to grow. Various AI tools – such as translation software, paraphrasers, and generative AI-based chatbots – have been introduced to enhance students' learning abilities. These technologies can provide substantial support for students in their academic activities.

However, students' perceptions and expectations regarding AI tools remain largely unexplored. The same applies to the knowledge and skills required for the purposeful use of these tools. The aim of this research is to examine the relationship between first-year students' knowledge, skills, and abilities and their use of AI tools in their learning processes.

As part of the study, surveys were conducted among 220 first-year students from Nakhchivan Institute for Teachers and Nakhchivan State University on various aspects of AI tool usage in education. The analysis results revealed that students' attitudes towards AI significantly clarify their purposes for using these tools. Based on the findings, the author emphasizes that integrating AI technologies into the educational process will play a crucial role in developing AI-related competencies among students. Consequently, students' learning abilities will improve, leading to better academic performance.

- 1.4. Tetiana Konovalenko, Liudmyla Zagoruiko. The impact of digital technologies on the development of social skills in English language classes.** This paper examines the connection between digital citizenship and English language education, focusing on features necessary for creating a safe digital learning environment. It identifies the elements of responsible digital interaction: respect for self and others, secure and accountable technology use, and positive online influence. The paper also explores how digital technologies enhance social skills development in English language classrooms through six key mechanisms: interactive collaboration, gamification, emotional intelligence development, intercultural communication, autonomous learning, and reflective digital portfolios. The findings suggest digital tools create authentic learning contexts that prepare students for effective communication and collaboration in modern society.
- 1.5. Olena Kuts. Communicative influence and its implementation by the syntactic structure of a sentence in Ukrainian.** The article deals with the relationship between syntactic categories of a sentence in aspects of the implementation of communicative influence through a sentence-expression. The interaction of the categories of predicate, modality, actual sentence division, dictum and intention in the structure of a sentence is characterized. It is noted that understanding the specifics of communicative influence allows the subject (addressant, speaker) and the addressee to adequately operate with information, that is to organize thoughts primarily in the form of sentences, which can later be combined in the structure of discourse.
- 1.6. Olha Shapovalova, Vita Butenko, Svitlana Parfilova. Modern trends in improving the content and methods of professional teacher training in the context of quality management of educational services.** The article highlights the tendencies of updating the content and methods of professional-pedagogical training of teachers in terms of educational services quality management. The analysis of the requirements for British teachers, laid in professional standards as a mandatory part of the policy of «new professionalism» is made. It is pointed out that professional standards developed by the Training and Development Agency for Schools cover three areas: professional attributes, professional knowledge and understanding and professional skills, formulated separately for teachers with different professional status, namely: award of Qualified Teacher Status – QTS (Q – standard); teachers on the main scale – Core (C); teachers on the upper pay scale – Post Threshold Teachers (P); Excellent Teachers (E) and Advanced Skills Teachers – ASTs (A).

1.7. *Liudmyla Bazyl, Valerii Orlov. Peculiarities of career orientation formation among vocational education seekers in the context of the emerging information society.*

The section of the monograph describes the key features of the formation of career orientations of future specialists in the conditions of the formation of an information society. Considerable attention is paid to highlighting the essential characteristics of the development of ideas about a professional career in students and the mechanisms for developing stable career orientations, and a number of invariants of understanding the content of the concept of "career orientations" are summarized. Emphasis is placed on: the goals and objectives of teachers, psychologists who perform the role of consultants in career guidance and/or career development; contradictions that cause discrepancies between the ideas of future specialists about themselves and their real resource potential. Attention is drawn to the fact that in the conditions of the formation of the information society, numerous websites are being created to provide career counseling and professional orientation services, at the same time, the importance of traditional forms and methods of career counseling, the activities of career centers as structural units of educational institutions is not lost.

1.8. *Nataliya Byelyayeva, Oleksandra Sklyar, Iryna Yemchenko. Theoretical approaches to defining the essence and psychological content of an individual's professional adaptation in the context of modern production.*

Professional adaptation is a critically important process that determines work efficiency, conditions psychological comfort, and facilitates employees' professional development. The article explores the essence and specific features of various scientific approaches to the analysis of professional adaptation, including the psychophysiological, socio-psychological, activity-based, personal-developmental, and organizational-management perspectives. It is emphasized that considering these aspects contributes to a better understanding and support of the professional adaptation process, which is essential for improving labor productivity and reducing the risk of professional burnout.

1.9. *Mykola Pryhodii, Andrii Hurzhii, Liliia Luparenko. Development of digital competence of teachers of vocational education institutions in the mechanical engineering industry: challenges and prospects of Industry 5.0.*

Preparing teachers for Industry 5.0 is critical to ensure high quality education and compliance with modern technological development requirements. Mastering innovative digital tools allows teachers not only to effectively train future professionals but also to ensure their competitiveness in the labor market. The digital competence of teachers of vocational education institutions in the mechanical engineering industry is subject to transformation in the context of the transition to Industry 5.0. An expert group consisting of representatives of the scientific community, educators, and employers identified the main components of digital competence. They cover technical, pedagogical, socio-emotional, and organizational aspects of a teacher's activity. The survey allowed us to establish the real level of proficiency in modern digital technologies by teachers and identify prospects for their improvement.

1.10. *Mykola Pryhodii, Oleksandr Radkevych. Artificial intelligence technologies as a tool for personalized learning in digital educational platforms.*

Personalised learning in vocational education contributes to improving the quality of training through the use of digital educational platforms and artificial intelligence technologies. They

allow us to adapt the content of training programmes to meet the individual needs of students and the requirements of the modern labour market. Machine learning algorithms and adaptive learning paths ensure effective analysis of educational data, personalisation of the educational process and automation of assessment. The introduction of these technologies contributes to the development of professional competences, increased motivation and competitiveness of graduates of vocational education institutions.

- 1.11. Dmytro Prykhodko, Vitalii Kyslyi, Marharyta Mykhalenko. The role of the information society in the psychological recovery of students after the stress caused by military operations.** The article examines the role of the information society in the psychological recovery of students who have experienced stress caused by military actions. It analyzes both the positive aspects of digital technologies, such as access to psychological support, educational resources, and online communities, as well as the risks associated with information overload and misinformation. Special attention is given to students' adaptation mechanisms and strategies for effectively using the information environment to support their mental well-being.
- 1.12. Natalia Prorok, Oksana Chekstere, Vitaliya Polyakova. On the problem of motivational and semantic attitudes formed under the influence of digital technologies.** The article describes the results of research conducted in Ukraine on the psychological characteristics of the formation of motivational and value structures influenced by the digital society and martial law. The negative consequences (for personal development) of the majority of motivational and semantic attitudes formed under the influence of virtual reality are characterised. It is shown that excessive spending in virtual space leads to a decrease in the child's activity in the real world, inhibits social development, exacerbates communication difficulties, and reduces academic performance. There is a decrease in the influence of real society (with its rules, norms, traditions) on the child: he or she loses interest in what is happening in the social environment; the importance of classmates, family members, and teachers decreases.
- 1.13. Mykola Sadovyi, Olena Tryfonova, Dmytro Somenko. Resource approach in the formation of digital competencies of education seekers through digitalization.** The article is devoted to the problem of realization of potential opportunities, which are inherent in the concept of digitization and transformation of digitalization in the educational process of educational institutions. The research of scientists shows an increase in the conceptual base of the content of the specified concepts, new problems arise in connection with the digitalization of education. This concept is considered as a more effective than digital technologies means of forming in education seekers an innovative understanding of the principles, tools and methods of digital transformation of the entire spectrum of the educational process, and accordingly, traditional resources are expanding and new potential resources are emerging. Analysis of the research of scientists allows us to outline the main aspects for clarifying the potential resources of digitalization of the educational process. The proposed approach makes it possible to carry out a meaningful comparison of the concepts of digitalization of the educational process and digital technologies in education and to highlight specific differences between them.

1.14. *Kateryna Petrovska. The impact of war on social work in the context of green and digital transitions: new challenges and competencies.* The article examines the impact of war on social work in the context of green and digital transition. It explores new challenges faced by social workers, including the need to master digital technologies, adapt to environmental changes, and provide social support to vulnerable groups. The importance of developing new competencies for effective crisis response, digitalization of social services, and implementation of environmentally sustainable approaches is emphasized. The article presents an analytical review of current trends in social work and the possibilities of integrating international experience.

1.15. *Anna Zarytska. Professional self-realization of a music art teacher in the context of the digital transformation of art education.* The article addresses the issue of professional self-realization of future music teachers in the context of education digitalization. Various approaches to understanding the essence of professional self-realization in philosophy, psychology, and pedagogy are analyzed. Special attention is paid to the professional self-realization of music teachers as an integrative characteristic that activates internal potentials and contributes to the spiritual and creative development of the individual. It is proven that the professional self-realization of future music teachers in the context of digitalization is an important factor in ensuring high-quality art education and the development of students' creative potential.

1.16. *Iryna Shymkova, Svitlana Tsvilyk, Vitalii Hlukhaniuk. Teaching future specialists of fine and decorative arts in higher educational institutions about the cultural heritage of Ukraine and the world through digitization of museums.* The article examines theoretical and practical aspects of studying Ukrainian and world cultural heritage through museum digitalization. The evolution of the cultural heritage concept, encompassing both tangible and intangible components, is analyzed. The research investigates the potential of virtual museums, online exhibitions, and digital archives in facilitating comprehensive access to cultural values. International standards for museum digitalization are explored, with particular focus on UNESCO and European Union initiatives.

The study identifies key methods for digital documentation of cultural artifacts and proposes a model for implementing museum digitalization in teaching the "Cultural Heritage of Ukraine and the World" discipline. This approach aims to prepare specialists capable of representing Ukrainian culture globally, engaging in cultural diplomacy, and countering information threats.

Chapter 2. Navigating digital and spatial shifts in a globalized world

2.1. Lidiya Guryanova, Anastasiya Orlova, Oksana Panasenکو. Modeling the impact of digitalization on economic growth. The purpose of the work is to develop a complex of models that allow classifying the country by the level of economic development under the influence of digital transformation, as well as to determine the dynamics of the IT market in Ukraine, which should be taken into account in retraining programs, and to identify those areas in which the offer of educational programs should be increased. The obtained results can be considered as a decision-making support tool regarding the adaptation of the imbalance prevention system in various areas of activity in the IT market in connection with its slow recovery and the adaptation of educational programs to reduce the duration of structural unemployment.

2.2. Guljan Mammadova. Challenges of the modern economy. The accelerating growth of the digital economy revolutionized worldwide systems while creating new extensive systematic risks. This paper is a review of core challenges of tech such as data commodification in case of Meta's GDPR fine and TikTok's data cases in other jurisdictions, cybersecurity threats – ranging from ransomware attacks to AI driven deepfake frauds, labor precarity in gig economies and automation driven job losses, monopolistic dominance by tech giants that challenges competition, environmental strain due to the energy consumption of cryptocurrencies and e-waste, and the digital divide excluding marginalized communities. Suggestions aim at reaching the international regulatory convergence that seeks to stop companies from exploiting taxation system's gaps along with data privacy, stopping unfair tax advantages, constructing infrastructure with built-in security features to fight cyber threats while implementing digitally accessible initiatives and conducting green technology transitions for ecological reduction. The study demonstrates why the digital economy needs equitable service for humanity by establishing ethical governance and adaptive policies along with multilateral cooperation.

2.3. Leonid Melnyk, Kateryna Zubaliy, Liudmyla Kalinichenko. The impact of the full-scale war on restructuring national economy and trading enterprises'. The start of a full-scale war in Ukraine has put on hold or destroyed the business activities of, perhaps, almost every Ukrainian company; of course, it also made international trade impossible for at least the first 2-3 months of the war. It is also worth noting that before the start of Russia's full-scale invasion of Ukraine, Russia was one of the key foreign trade partners for domestic companies, but after February 24, 2022, trade with Russia was reduced to only a statistical error and the black market. Since April 2022, the import of goods from the Russian Federation has been completely prohibited, and since September 2022, the export of goods from Ukraine to the Russian Federation has been completely prohibited.

2.4. Olha Rudachenko, Olena Uhodnikova, Vladyslava Troian. Strategies for the development of territorial communities during wartime and the post-war period: the role of investment in recovery. This section highlights the importance of developing strategies for the growth of territorial communities during wartime and the post-war period to ensure stability and sustainable development at the local level.

It outlines approaches to strategy development that incorporate an investment component, which facilitates attracting domestic and foreign investments, the creation of new jobs, and the restoration of infrastructure. Key international methods and models are presented, which communities can consider when formulating their strategic and operational objectives. Particular attention is given to assessing a community's investment attractiveness as one of the key factors in promoting local economic development.

2.5. Oksana Kikinezhdi, Yaroslava Vasylykevych, Mykola Ryk. Design thinking as an innovative technology for creating an informational tourism product.

The article presents a theoretical analysis and specifics of using design thinking as an innovative technology in the field of business tourism in the context of digitalization. The results of testing effective resources for using design thinking tools to create information tourism products and to activate geoinformational service-technologies oriented towards service consumers in competitive conditions are described. The study results demonstrated the effectiveness of the design method in forming an ecomentum environment as a system-forming component of the humanization of the educational space and as a strategic direction for improving the digital innovative infrastructure of tourism in Ukraine.

2.6. Tetiana Lysiuk, Yurii Biletskyi, Larysa Royko. Digital technologies in the tourism sector.

The role of digital technologies in the development of the tourism industry and their impact on the transformation of consumer experience are explored. The main digital tools used in the tourism sector, including online booking platforms, mobile applications, artificial intelligence, virtual and augmented reality, blockchain and Big Data, are analysed.

The benefits and challenges of digitalisation for travel companies, hotels and tourists are outlined. Particular attention is paid to the prospects for the development of digital technologies in the context of increasing the competitiveness of tourism enterprises, personalisation of services and ensuring sustainable development.

2.7. Ihor Mamontov. Prospects for the use of information and analytical technologies in ensuring housing resources within the European union's migration policy in the context of global challenges.

The article examines the state of international legal regulation and scientific approaches to the use of information and analytical technologies in ensuring housing resources within the framework of migration policy in the European Union as a whole and in its individual member states. Based on the analysis of international legal instruments and scholarly research, the necessity of developing and implementing a unified EU information and analytical system is substantiated. This system will comprise databases of optimized housing stocks available for migrants and displaced persons. The article demonstrates the socio-humanitarian, economic, and managerial benefits of introducing a unified information and analytical system for EU housing resources.

2.8. Denys Zhezherun. Modern approaches in entrepreneurial training of specialists in transport management and logistics in the republic of Poland.

The development of the European educational space is determined by the influence of political, economic, socio-demographic and technological factors that allow for early identification of potential challenges (in particular, a decrease in demand for specialists in certain

professions, changes in the direction of education development in the EU, and a decrease in the attractiveness of vocational education) and forecasting opportunities for structural and content changes in the training of transport management and logistics specialists. This includes improving the models of educational systems, growing demand for competent specialists with developed soft skills, including entrepreneurship, increasing public demand for continuous professional education, introducing flexible qualification paths, updating the content of training and actively introducing innovative educational technologies.

The key aspect is the entrepreneurship of future specialists in the field of transport management and logistics, which we consider to be an integrative quality. It combines professional knowledge, practical skills, experience in applying theoretical concepts, leadership qualities, and the ability to generate and implement innovative ideas in the industry.

2.9. Oksana Blyzniuk. Management in financial potential of the enterprises in the conditions of digitalization and developments of financially-technical ecological system. Article purpose is substantiations and development of theoretical positions, improvement of methodical toolkit, working out of recommendations about management in financial potential of the enterprise in the conditions of development of modern financially-technical ecological system and digitalization business processes with use modern digital-technologies which will promote as a result to increase of efficiency of activity of the enterprises and validity of acceptance of administrative decisions. Reserves of increase of financial potential of the enterprises in the conditions of development of modern financial ecological system of Ukraine taking into account competitive conditions of managing, cyclic development of economy, instability of internal and external environments are revealed. Prospects of innovative development of financially-technical ecological system of Ukraine on a basis digitalization financial technologies, adaptation of digital Internet technologies and platforms, possibilities in post-war restoration of a national economy on the basis of integration into the European and world financial space are defined.

2.10. Roman Mashchenko. External and internal risks of real estate market investment projects. In the current conditions of economic uncertainty and the dynamic development of the real estate market, managing investment risks has become a critically important task for developers, investors, and financial institutions. This study aims to analyze external and internal risks of investment projects in the real estate sector, classify them, and assess their impact on project implementation efficiency.

External risks include macroeconomic factors, political instability, exchange rate fluctuations, changes in the legislative framework, natural and climatic conditions, and market competition. Internal risks cover managerial errors, financial instability of the company, miscalculations in location selection, technological risks, inefficient resource utilization, and personnel-related issues.

A methodological approach to risk management is proposed, which includes risk factor analysis, forecasting possible scenarios, developing strategies for their minimization, and adapting risk management methods according to the specifics of the investment project. The practical significance of this study lies in developing recommendations for investors and developers to enhance the reliability and efficiency of real estate investments.

2.11. Oleksii Petrukhnov. Influence of external and internal factors on the functioning of the management mechanism of renewable energy business structures. The article examines the internal and external factors influencing the functioning of the management mechanism of entrepreneurial structures in the renewable energy sector. Key external challenges are identified, including legislative instability, fluctuations in government support, high competition, and dependence on foreign technologies. The analysis of internal factors includes an assessment of management efficiency, financial stability, innovation potential, and resource utilization effectiveness. Special attention is given to the need for optimizing management mechanisms to enhance the competitiveness and resilience of enterprises to crisis phenomena. Practical recommendations are proposed for improving management approaches, considering modern challenges and market trends. The research findings can be used to develop an effective strategy for the growth of entrepreneurial structures in renewable energy, improve public policy, and attract investments.

2.12. Alexander Sklyarenko. Роль та значення цифрової економіки для трансформації суспільства. The article substantiates that the latest technologies penetrate into all spheres of society, thereby affecting the economy, its essence and forming structural innovative changes in it. It is emphasized that digitalization processes are important for further innovative development of the national economy, increasing the level of competitiveness of the country, and ensuring the transition from material to information resources. Digital platforms and projects aimed at digitalizing the Ukrainian economy are characterized. The importance of further development of the digital economy is determined. The theoretical foundations and aspects of the development of the digital economy and further informatization in general, its features, problems and development trends in Ukraine are investigated.

2.13. Svitlana Shcherbinina, Olena Shevchenko. Predictive modeling of the profitability of IT-industry enterprises The study is devoted to the analysis and forecasting of profitability of Ukrainian IT companies. It analyses the financial performance of three leading IT-companies: Intellias, GlobalLogic and SoftServe, which are included in the authoritative Forbes Ukraine rankings. The efficiency of fixed assets use, profitability and liquidity was assessed. To forecast profitability, the article uses the adaptive Holt and Holt-Muir methods, which ensure high accuracy of the results. It is found that Intellias demonstrates the most stable profitability, while SoftServe is characterised by significant fluctuations in financial indicators. The results obtained can be used for strategic financial planning of IT-sector enterprises and further economic research.

Chapter 3. Integrating AI, security, and recovery into digital life

- 3.1. Mariia Nazarkevych, Victoria Vysotska, Nazar Nakonechnyi. Development of a model and method for detecting inaugural behavior of chat users.** With the development and spread of Internet technologies, the transfer of information has become much simpler and more efficient. At the same time, in addition to the positive aspects, this has contributed to the mass spread of fake news, which can have serious negative consequences for society, states and individuals. In view of this, an active fight against disinformation is being conducted. In particular, this problem has become even more relevant with the emergence of generative text models capable of quickly and in large quantities creating false content.
- 3.2. Tetiana Diuzhykova, Tetiana Chetvertak, Iryna Kulyk. Modern artificial intelligence technologies in chemistry education.** The introduction of artificial intelligence technologies into chemistry education enhances the effectiveness of student learning. By automating learning and assessment, planning, and administrative teaching work in chemistry education, artificial intelligence systems can free up teachers' time and energy for working with students. The paper considers tools based on artificial intelligence technologies: Chemistry Assistant (Easy-Peasy.AI), StudyMonkey, Chem AI: Chemistry Solver, Chemistry X10, OddityAI, Chemistry AI Homework Solver, HyperWrite Chemistry Assistant, Sizzle AI, Mathway, UPDF AI Assistant, Smodin. Solutions offered by artificial intelligence technologies allow accelerating innovations in chemistry education.
- 3.3. Mariia Nazarkevych, Vasyl Lytvyn, Andrii Nazarkevych. Analysis of methods for identification of combat vehicles based on convulsive neural networks taking into account the conduct of battle.** We present an intelligent visual surveillance system with real-time motion detection, classification and tracking capabilities. The system operates on color and grayscale video images from a stationary camera. In the proposed system, moving object detection is carried out using an adaptive background subtraction scheme, which we propose to use in combat. The combat scheme is described. It is shown how to identify moving objects. We present object detection schemes, time difference models and adaptive background mixture models to compare the efficiency and quality of detection.
- 3.4. Yevhenii Vlasov, Igor Holovchenko, Svitlana Danylchenko. Sensory integration in pediatrics.** The purpose of the study was to understand and improve the practical aspects of sensory integration in pediatrics in order to ensure optimal child development. Sensory integration disorders are complex conditions that affect the way the body perceives and processes sensory information. These disorders can have a significant impact on a person's development, behavior, and daily functioning. They can be caused by a variety of factors, including genetic, neurological, environmental, and sociocultural aspects. Understanding these causes and risk factors is important for developing effective methods for diagnosing, treating, and supporting individuals with sensory integration disorders.

3.5. Lidiia Butska, Viktor Cherniak, Oksana Drevitska. Use of the noise emission effect for the diagnostics of X-ray non-contrast fragments and the features of multidisciplinary rehabilitation of patients with combat injuries at various stages of recovery. This article explores the effectiveness of the acoustic emission method for diagnosing radiopaque fragments and a multidisciplinary approach to the rehabilitation of patients with combat-related injuries at various stages of recovery. The first part of the study is dedicated to the use of acoustic signals to detect radiopaque fragments, which significantly reduces the risks associated with ionizing radiation and improves diagnostic accuracy. The application of the acoustic emission method demonstrated high sensitivity and the ability to detect even microscopic fragments, a critical aspect for patients with combat trauma. The study compares the results of this method with traditional imaging techniques such as radiography and computed tomography (CT), revealing that the acoustic emission method can serve as a reliable adjunct in diagnosing fragments that are difficult to detect by conventional means.

The second part of the article presents an analysis of a multidisciplinary rehabilitation program, which includes a combination of physiotherapy, psychological support, and social adaptation. This approach emphasizes the need for personalized rehabilitation, addressing the physical, psychological, and social aspects of recovery. The rehabilitation program was tailored to the individual needs of patients and was implemented at different stages of recovery: acute post-operative phase, subacute phase, and long-term recovery. The results of the study indicate that the multidisciplinary approach significantly enhances the functional, psychological, and social outcomes of rehabilitation, leading to better patient recovery and reintegration into society.

Furthermore, the article discusses the clinical outcomes of integrating these two methods – acoustic emission diagnostics and multidisciplinary rehabilitation – into the medical care of soldiers. The findings suggest that this combined approach improves diagnostic precision and rehabilitation outcomes, offering a holistic solution for treating combat-related injuries. The study also highlights the need for further research to refine these methods and explore their broader applications in military medicine, especially in the context of evolving medical technologies and the complex needs of war veterans.

This research provides valuable insights into the future of diagnostic and rehabilitative practices in military healthcare, suggesting avenues for further development and implementation in combat casualty care.

3.6. Oleksandr Lefterov, Oleksandr Fedosieiev, Olga Lefterova. Tendency to platform thinking. With the advent of the information age, there was a need for a new revision of the model of the world picture. The authors of the article advocate its modification, which is based on another mental model – platform thinking, which begins to take shape with the growth of the number of digital platforms we use. A person who has mastered the skills of platform thinking gets the opportunity to organically perceive and maintain the symbiosis of innovative technologies and social processes at the level of conscious interaction with the modern information space, which can contain not only subjects, but also technical objects, for example, those belonging to the class of the Internet of Things, at the same level of communication. The article identifies the main features of the approach to considering digital platforms, which is based on platform thinking.

3.7. Vasyl Gorbachuk, Tamara Bardadym, Maksym Dunaievskyi. Digitalization of modern energy in the information society. Based on big diverse data from the nuclear energy industry and cloud computing, a digital platform is being created that allows for a comprehensive analysis of nuclear reactor design, nuclear safety assessment, and data-based forecasting. The technology risk is quantified by the NPP safety index. The index includes the nuclear reactor, the external environment, and society. Technologies of big data processing, data mining, artificial intelligence are used. Interdisciplinary data from the fields of nuclear energy, meteorology, seismology, geology and hydrogeology, economics, sociology, ecology, as well as public opinion on nuclear energy are analyzed. The social risks are assessed based on big data of the nuclear energy industry.

3.8. Svitlana Nazarko, Svitlana Suvorova. Innovative technologies in labor protection: from drones, AI to wearable devices. The article presents innovative technologies that are used in the field of labor protection, gives examples of successful implementation of these technologies in various industries, and also substantiates some challenges and ethical means associated with their use. Their role in increasing the safety of workers, the effectiveness of monitoring dangerous conditions and preventing accidents is analyzed. Significant benefits of implementing these technologies, such as speed of emergency response, process automation and improved data collection and analysis. Particular attention is paid to the effectiveness of the occupational health and safety training process, related to the development of innovative methods and technologies that allow for interactive and improved training. The article emphasizes the importance of integrating these technologies into everyday practice, building a modern workplace safety culture and creating a productive work environment.

3.9. Dmytro Rybachok, Viktor Hodliuk, Oleksandr Kushnir. Nuclear informatics: key technologies and modeling. The article examines the concept of nuclear informatics and its application in the field of nuclear energy. Special attention is given to modeling methods and software tools used for solving problems in nuclear energy. Particular focus is placed on nuclear process modeling, as well as the integration of computer technologies in the study and prediction of nuclear reactions. The article also includes examples of the application of modern technologies for optimizing processes in nuclear industry.

3.10. Olena Serhiienko, Ihor Sosnov, Yevhenii Ippolitov. Ensuring information security in the process of development and implementation of startup projects. The study focuses on ensuring information security by protecting the intellectual property and confidential data of startups, particularly through encryption methods, the use of legal mechanisms, and secure data storage. Practical aspects of information security are examined, including the implementation of cybersecurity policies, technological solutions for data protection, and improving cyber hygiene among personnel. The study provides a detailed analysis of information security challenges during the scaling phase of a startup, covering IT infrastructure protection, security audits, and incident response planning. Recommendations are proposed to enhance the level of information security in startups.

3.11. *Victoriia Horoshko, Valerii Zhamardii, Evelina Zhygulova. Using the PICO model to assess the impact of training periodization on powerlifter performance.*

In modern society, informatization covers all aspects of life, including physical culture, sports and physical rehabilitation. There are conflicting results regarding the effectiveness of different periodization models, which emphasizes the need for additional research in this area. Using the PICO model to assess the effectiveness of periodization methods can contribute to the development of more individualized training programs that take into account the physiological characteristics of women and allow achieving maximum results in powerlifting. The aim of the study was to assess the impact of different training periodization methods on powerlifters' strength and endurance using the PICO model, identifying the most effective approaches to improving sports results. Materials and methods of the study: 1. Analysis of literary sources included the study of scientific works, articles and methodological recommendations related to the periodization of training in powerlifting. 2. Pedagogical experiment. 3. Control tests. 4. Methods of mathematical statistics. Results: After 12 weeks of training, improvements in strength and endurance were recorded in all three groups. However, the group using block periodization showed the greatest increase in all tested exercises, which indicates the high effectiveness of this approach for improving strength and endurance in powerlifters. Conclusions: 1. Based on the results obtained, it can be concluded that block periodization is the most effective method for improving strength and endurance in powerlifters. 2. Nonlinear periodization also showed high effectiveness, especially for maintaining constant progress in strength development and avoiding plateaus. 3. Linear periodization, although it contributes to improving strength, is less effective compared to other methods, especially for athletes with a high level of training. 4. The use of the PICO model allowed us to systematically evaluate the effectiveness of various periodization methods and develop scientifically based recommendations for optimizing the training process in powerlifting.

3.12. *Natalia Kuksa, Yulia Maliarova. Use of digital technologies in rehabilitation.*

The article is devoted to the actual problem of using digital technologies in rehabilitation. The modern digital technologies used in the rehabilitation practice of people different categories and nosologies are described. The advantages and obstacles to implementation of various digital technologies in rehabilitation are identified. The trends and prospects for further implementation of digital technologies in the rehabilitation practice of people different categories and nosologies are noted.

3.13. *Oksana Polianska, Igor Polianskyi, Olha Hulaha, Inna Moskaliuk. The role of physical rehabilitation for the training of nurses for rehabilitation.*

The functions of a rehabilitation nurse include the work of a physical therapist assistant and an occupational therapist assistant, the role of a patient case manager with the provision of communication functions with external consultants. This model, with expanded functions and a changed role of a nurse, requires additional training for this profession in the field of organizing the rehabilitation process and practical use of medical rehabilitation tools and methods. A rehabilitation nurse should perform physical exercises aimed at restoring the activity of the cardiovascular system, musculoskeletal system, nervous system, motor-evacuation function of the gastrointestinal tract, prevention of postoperative pneumonia, and restoration of external breathing (respiratory gymnastics, vibromassage of the chest).

3.14. *Yurii Lotiuk, Valentyna Yuskovych-Zhukovska, Oleg Bogut.* Features of the use of artificial intelligence in scientific research. The article explores the possibilities and prospects of applying artificial intelligence for scientific research. It is studied that the application of artificial intelligence allows to increase the efficiency of scientific research from the generation of ideas and formulation of hypotheses to data analysis, writing scientific texts and generalization of results. Separately, the observance of copyrights related to the use of artificial intelligence in science is highlighted. It is studied that artificial intelligence not only transforms traditional approaches to conducting research, but also opens up new prospects for academic science.

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Chapter 1. Psychological, social and legal dimensions of quality of life in times of change

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978-83-68422-04-7

