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The 11th Annual Entrepreneurship and Innovation Conference unfolds a comprehensive exploration into the profound impact of Artificial Intelligence (AI) across diverse domains. With a global perspective, this collection of abstracts delves into the transformative influence of AI on marketing, industries, education, healthcare, business management, research, social impact, learning, and ethical applications. The conference aims to explore the complex relationship between humans and AI, examining the challenges, opportunities, and ethical considerations associated with the integration of AI technologies.

Participants from Croatia, the Czech Republic, Estonia, Finland, Iceland, Italy, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Poland, Ukraine, the United Arab Emirates, Uzbekistan, and the USA contribute to this international discourse.

In essence, the conference proceeding "YOU HAVE BEEN REPLACED BY AI" summarises a rich research, insights, and perspectives, offering a nuanced understanding of AI's transformative impact across various domains and its implications for individuals, industries, and society at large.

Keywords: artificial intelligence, entrepreneurship, innovation, digital marketing, industry transformation, leadership, education, skills, social impact, global perspectives, human-AI collaboration, future workforce, ethical implications.

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Section 1. AI in Marketing and Business Strategies

ELEVATING DIGITAL MARKETING STRATEGIES IN THE AGE OF ARTIFICIAL INTELLIGENCE: A COMPARATIVE ANALYSIS OF HUMAN AND AI-DRIVEN CAMPAIGN PERFORMANCE

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Objectives:
This study aims to assess the impact of integrating Artificial Intelligence (AI) in digital marketing strategies compared to traditional human-led approaches. By examining key performance indicators (KPIs) and consumer engagement metrics, we seek to uncover the potential benefits and limitations of AI-driven campaigns in optimizing marketing efforts.

Data and Methods:
We conducted a comprehensive analysis using a dataset spanning three years, encompassing diverse industries and platforms. The data comprises impressions, clicks, conversions, and consumer behaviour metrics collected from both AI-driven and human-led digital marketing campaigns. To ensure a fair comparison, we employed a propensity score matching technique to balance the covariates between the two groups. Additionally, machine learning models were utilized to identify patterns and correlations within the dataset.

Results:
Our findings reveal a significant enhancement in campaign performance metrics for AI-driven strategies across various industry verticals. Specifically, campaigns employing AI technologies demonstrated a notable increase in click-through rates (CTR), conversion rates (CR), and return on investment (ROI) compared to their human-led counterparts. Furthermore, AI-driven campaigns exhibited a higher level of personalization and precision in targeting specific audience segments, leading to a more efficient allocation of resources.

Conclusions:
The study provides compelling evidence that integrating Artificial Intelligence into digital marketing strategies yields substantial advantages over conventional human-led approaches. The results indicate that AI-driven campaigns not only outperform in terms of KPIs but also offer a higher degree of scalability and adaptability in today's dynamic digital landscape. This research contributes valuable insights for marketers seeking to leverage the full potential of AI technologies in optimizing their digital marketing endeavours.

JEL Classification: M31, O33.

Keywords: artificial intelligence, digital marketing, campaign performance, consumer engagement, machine learning, personalization

SYSTEMIC RESEARCH OF ARTIFICIAL INTELLIGENCE APPLICATION IN MARKETING

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Objectives:
The aim of this research is to systematize the experience of AI application in marketing, its key advantages, and examples for more effective consumer influence and increased sales.

Data and Methods:
The study is based on qualitative and quantitative research methods, utilizing descriptive data, and applying abstraction, analysis, synthesis, and deduction methods on both empirical and theoretical levels. Data is collected from a diverse range of sources, including online surveys, case studies, and secondary research reports.

Results:
The authors have categorized the primary trends associated with AI's application within the components of the marketing complex: product, pricing, promotion, place.
For instance, within the purview of product policy, ChatGPT serves as a valuable source of information regarding both the product and its competitors. In the realm of pricing policy, AI affords the capacity to effectuate price adjustments and prognostications through the visualization of potential outcomes pertaining to a multitude of pricing strategies. This is achieved by harnessing real-time data gleaned from previous company transactions and market dynamics, inclusive of the actual valuation of the product, advertising campaigns, and market sales metrics. This results in the presentation of superlative offerings that not only allure new clientele but concurrently pave the way for market leadership, surpassing contemporaneous competition. Within the contours of promotion policy, ChatGPT emerges as an invaluable instrument for the automation of content creation, personalized email outreach, keyword selection for contextual advertising across search engines or social media platforms, meta description crafting, and the formulation of SEO-optimized headlines. By employing AI-generated content, businesses can tailor their messages to specific customer segments, thereby ensuring resonance with the targeted audience. The advantages are manifold, encompassing resource economies, bolstered search engine rankings, augmented visibility, heightened engagement, enhanced conversion rates, and elevated brand recognition.
In the domain of distribution and sales, the incorporation of interactive chatbots, virtual assistants for customer interaction, cashierless outlets, cloud-based solutions, augmented reality technologies, and more, all contribute to a reduction in purchase times and the expansion of capabilities for the timely refinement, comprehension, and prognostication of consumer comportment. Additionally, the provision of personalized, real-time support augments customer satisfaction, cultivates brand loyalty, and elevates the overall customer experience.

Conclusions:
Artificial intelligence opens new perspectives for enhancing the efficiency of marketing campaigns and securing competitive advantages in the market. It aids in better understanding customers, forecasting their needs, providing personalized services while reducing marketing costs, increasing profitability.

JEL Classification: L81, M15.

Keywords: artificial intelligence, pricing, product, promotion, distribution, sales.

THE SIGNIFICANCE OF AI MARKETING STRATEGY FOR SMALL BUSINESSES

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Objectives:
The abstract aims to explore the pivotal role of AI marketing strategy in the success of small businesses. It delves into how AI, through technological advancements, becomes an indispensable tool for marketing professionals, assisting small businesses in streamlining efforts, improving customer targeting, enhancing personalization, and optimizing marketing campaigns.

Data and Methods:
The abstract presents insights into how AI enables small businesses to gather and analyze extensive customer data, emphasizing demographics, preferences, and behavior patterns. It discusses the data-driven approach that allows businesses to understand their target audience, tailoring marketing messages with the help of AI-powered tools for personalized campaigns and increased conversion rates.

Results:
Moreover, the abstract highlights how AI marketing strategy helps small businesses optimize campaigns by automating tasks, identifying trends, and providing real-time insights into consumer behaviour, market trends, and competitor strategies. This information empowers small businesses to make data-driven decisions and adjust marketing strategies for maximum impact and return on investment.

Conclusions:
The abstract concludes by addressing the challenges faced by small businesses in effective marketing and how AI serves as a robust solution. It suggests that if current strategies are ineffective in reaching the intended audience and generating leads, a re-evaluation is essential. The abstract emphasizes the importance of thorough market research, personalization, and effective communication channels, and discusses how AI can contribute to overcoming these challenges.

JEL Classification: L81, M15.

Keywords: artificial intelligence, analysis, marketing, small business, trends, advancement of technology.

EMBARKING ON THE METAVERSE: UNVEILING PERSPECTIVES OF HUMAN-AI COLLABORATION IN DIGITAL BRAND MANAGEMENT

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Objectives:
The article examines the current state of digital brand management. It analyzes existing forecasts of metaverse development and identifies potential pathways for enhancing collaboration and optimizing the development of digital brands within the metaverse. Additionally, the article analyses AI in marketing strategies, facilitating more efficient and personalized campaigns within the future of the metaverse.

Data and Methods:
This research utilizes a mixed-method approach, including literature review, horizon scanning and case study analysis.

Results:
The study underscores the escalating significance of synergistic interaction between human agents and AI in the domain of digital brand management. Forecasts anticipate the development of metaverses in education, workplaces, and e-commerce by 2030. Instances of successful collaborations substantiate AI's efficacy in optimizing content, conducting audience analyses, and automating tasks integral to digital brand management within the metaverse. The research identifies 12 directions for future human-AI collaboration in brand management and marketing, emphasizing the seamless integration of AI for more efficient and personalized campaigns

Conclusions:
As forecasts anticipate the development of metaverses in education, workplaces, and e-commerce by 2030, the study explores the swift impact of AI on digital brand management, revealing novel dimensions, influences, and connections between brands, their proprietors, and target audiences, emphasizing the growing significance of their synergistic collaboration. Employing a mixed-method approach involving literature review, forecasting analysis, and content review, the study seeks to define new qualitative directions for digital brand management in the era of digital transformation and leadership evolution at personal, organizational, and digital community levels, as well as the directions of Human-AI Collaboration that can aid in navigating this transformation in the digital world. The transformative impact of AI in the metaverse extends beyond traditional realms, necessitating a paradigm shift in digital brand management. Metaverses in workplaces, education, and e-commerce require a nuanced approach, with personal digital brands playing a pivotal role in both promotion and interaction. The combination of AI with big data and virtual/augmented reality continues to drive innovative marketing strategies, enhancing productivity and positively impacting financial metrics through cost-efficiency within these diverse landscapes.

JEL Classification: L81.

Keywords: Human-AI Collaboration, Digital Brand Management, Symbiosis, Metaverse, Potential Pathways.

THE ROLE OF AI IN SOCIAL MEDIA MARKETING IN THE POST-PANDEMIC TOURISM INDUSTRY

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Objectives:
The primary objectives of this study are to investigate the evolving dynamics of tourism marketing, particularly in the post-Covid-19 recovery period. Specifically, the focus is on understanding the changing landscape of promotional strategies with an emphasis on the growing significance of social media. The study aims to explore the role of social media as a key tool in marketing tourism products and services. Additionally, the research seeks to assess the impact of artificial intelligence (AI) and modern text generation on reducing costs and simplifying tourism product promotion via social media platforms.

Data and Methods:
To achieve the stated objectives, this study relies on a comprehensive review of existing literature, incorporating insights from various studies on the post-pandemic tourism industry. Statistical data on social media usage trends, particularly the 8% increase in 2020, serves as a foundational element for understanding user behaviour. The article by Andrew N. Mason and other relevant research works are analysed to discern the changing patterns of trust in social media for purchase decisions and post-purchase engagement. The methods also involve an exploration of contemporary marketing methods, especially those related to travel products, and how social media facilitates consumer engagement. The study further examines the opportunities for tourism product promotion through both direct and indirect consumer engagement on social media.

Results:
The findings of this study highlight the growing importance of social media marketing in the tourism industry, particularly post-pandemic. The statistical data reveals a sustained trend in increased social media usage, indicating a lasting shift in consumer behavior. Insights from Andrew N. Mason's article underscore the heightened trust in social media for purchase decisions and post-purchase engagement. The study also identifies travel products as particularly versatile for social media marketing, emphasizing the potential for user-generated content to promote tourism offerings. Moreover, the examination of direct and indirect consumer engagement strategies on social media provides insights into effective promotional methods.

Conclusions:
In conclusion, the study emphasizes the pivotal role of social media in contemporary tourism marketing. The integration of consumers with modern text generation through artificial intelligence emerges as a cost-effective and streamlined approach for promoting tourism products on social media platforms. The role of social media managers and the management of business pages are highlighted as essential components in leveraging the benefits of social media development. The study acknowledges the historical limitations faced by small businesses in social media marketing but points to the evolving landscape, where advancements in artificial intelligence enable professional social media marketing even for smaller enterprises. This shift is particularly significant given that small businesses constitute approximately 80% of the tourism industry.

JEL Classification: L81, M15.

Keywords: tourism industry, social media marketing, post-pandemic recovery, artificial intelligence.

FACTORS AFFECTING THE SME ABILITY TO ENTER THE AI REVOLUTION

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Objectives:
Rapid advancements in artificial intelligence (AI) have led to the creation of numerous tools with potential applications in the business realm. However, businesses may be hesitant to incorporate these tools into business processes for various reasons. This hesitancy is creating divide amongst sectors of economy, where some are left behind in the AI race. AI hesitancy may be especially prominent amongst small and medium sized enterprises (SMEs) as they have fewer resources, both financial and expertise. The aim of this study is to rate the main factors affecting AI transition in SMEs.

Data and Methods:
This study investigated Estonian business professionals and presented them a list of influencing factors (13) and asked if it supports AI transition in SMEs. The business professionals assessed each factor on Likert's scale 1-doesn't support at all… 5-supports a great deal. The factors were grouped into four categories: 1) Economical, 2) Socio-demographical, 3) Technological and 4) Political. The questionnaire was published electronically, and the main delivery method was Moodle's online learning platform, where the respondents were taking courses. The sample size was 40 business professionals with a professional tenure ranging from 1 to 45 years.

Results:
This study reveals that the economical category was most supporting category for SMEs abilities to undergo AI-digitalization was (score 3.1 out of 5). The other categories were rated as: socio-demographical (2.9); technological (2.8); political (2.5). 'Marked demand for AI equipped products and services' was the highest rated individual factor (3.5 out of 5). Also, high scores were attributed to the next individual factors: Economic environment in general (3.2), Working methods of contemporary workers (3.2), Nation's demography (3.1), Infrastructure where companies are located (3.1). Lowest score was attributed to individual factors: companies' capability to independently implement AI technologies (2.2) and Regulations (2.3).

Conclusions:
This study sheds light on the multifaceted landscape of factors influencing AI transition in SMEs within the Estonian context. In conclusion, economic factors emerge as the primary driver of AI adoption among SMEs in Estonia, emphasizing the importance of demonstrating economic benefits. While socio-demographical and technological factors also play significant roles, political and regulatory considerations appear to be of lesser concern, underscoring the need for policies that facilitate AI integration while addressing regulatory concerns. The relevance of the study stands within the recognition of the dominant factors, stakeholders can tailor strategies and support mechanisms to bridge the gap between SMEs and AI adoption.

JEL Classification: M21, O39.

Keywords: SMEs, artificial intelligence, AI revolution, digitalization, change management, innovation capacity

THE FUTURE OF MARKETING: AI INNOVATION

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Objectives:
The primary objective of this scientific work is to explore the transformative impact of artificial intelligence (AI) on the field of marketing. Specifically, the study aims to investigate the innovative ways in which AI is reshaping marketing practices, with a focus on AI-driven customer insights, personalization, predictive analytics, and automation of marketing campaigns.

Data and Methods:
The study employs a comprehensive approach to examine the influence of AI on marketing. Key sources and references, including Daugherty and Wilson (2018), Burrows (2019), P.S.H. Leeflang (2000), Davenport et al. (2020), Grewal et al. (2020), and Antonio (2018), are utilized to gather insights into the impact of AI in various aspects of marketing. The methods involve a thorough review of literature, case studies, and examples to illustrate how AI is revolutionizing customer insights, personalization, predictive analytics, and marketing campaign automation.

Results:
The integration of AI-powered tools allows marketers to analyse extensive data, providing valuable insights into consumer behaviour, preferences, and trends. This has facilitated deeper understanding of target audiences, enabling personalized campaigns and the delivery of experiences that resonate with customers. Advanced machine learning algorithms enable marketers to achieve new levels of personalization by analysing user data, such as browsing behaviour and purchase history. This results in highly personalized experiences across multiple touchpoints, fostering stronger customer engagement, loyalty, and increased conversion rates. The incorporation of chatbots and virtual assistants into marketing strategies enhances customer engagement, response times, and overall user experiences. These AI-powered conversational agents provide personalized interactions and perform tasks on behalf of customers, contributing to a seamless customer service experience. AI empowers marketers with predictive analytics capabilities, allowing them to make data-driven decisions and anticipate future trends. This foresight helps marketers stay ahead of the competition, optimize strategies, and allocate resources effectively. AI takes marketing campaign automation to the next level by enabling intelligent decision-making and adaptive campaigns. Marketers can automate repetitive tasks, optimize ad placements, and dynamically adjust marketing messages based on real-time data, resulting in agile campaigns that respond to changing market conditions and customer preferences.

Conclusions:
As AI continues to become more integrated into marketing practices, it is imperative to address ethical considerations. Transparency, privacy, and responsible use of customer data must be prioritized to maintain consumer trust. The study concludes that the future of marketing is undeniably intertwined with AI innovation. Marketers should embrace the potential of AI, stay informed about emerging technologies, and adapt their strategies to harness the power of AI effectively. Leveraging AI innovation allows marketers to unlock new levels of efficiency, engagement, and growth in an ever-evolving digital landscape.

JEL Classification: L81, M15.

Keywords: artificial intelligence, marketing transformation, customer insights, personalization, machine learning algorithms, customer engagement, chatbots.

ARTIFICIAL INTELLIGENCE AND ENTREPRENEURSHIP: COMPETITION OR PARTNERSHIP

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Objectives:
The primary objective of this study is to examine the impact of artificial intelligence (AI) on entrepreneurship and business activities. The focus is on understanding how the integration of AI technologies affects various aspects of the business landscape. Additionally, the study aims to identify both the advantages and potential threats associated with the use of AI in entrepreneurial endeavours.

Data and Methods:
The study draws on a combination of qualitative and quantitative data to analyse the role of AI in contemporary business environments. Various sources, including academic literature and real-world examples, are utilized to explore the implications of the digitalization process on different spheres of life. The methods involve assessing the manifestations of AI in society and business, examining the link between workforce transformation and the demand for highly qualified employees, and evaluating the impact of AI on organizational processes.

Results:
The results indicate that the active process of digitalization has permeated all aspects of modern life, with AI emerging as a key factor in the Fourth Industrial Revolution. The integration of AI in entrepreneurship is observed to have positive effects, such as the optimization of business processes, efficient data analysis, and automation of management tasks. However, potential threats, including unemployment, loss of control over AI, socio-economic conflicts, and the possibility of errors in programs, are also identified.

Conclusions:
In conclusion, while artificial intelligence offers numerous advantages for business activities, its implementation requires a balanced and justified approach. The study underscores the importance of maintaining a harmonious balance between technology and the human factor to ensure that AI brings benefits to entrepreneurship without causing negative repercussions. The findings emphasize the need for careful consideration and strategic decision-making when integrating AI into business processes to uphold a sustainable equilibrium between technological advancements and human-centric values.

JEL Classification: M21, O39.

Keywords: artificial intelligence, automation, adapting to change, job market, workforce transformation.

CASE STUDY ON POSSIBILITIES OF IMPLEMENTATION OF AI IN SERVICE INDUSTRY AUTOMATING INTERNAL AND EXTERNAL COMMUNICATION

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Objectives:
The primary objectives of this research are to conduct a comprehensive literature review, focusing on service organizations, particularly in the financial sector, to investigate the effects and possibilities of incorporating Artificial Intelligence (AI) into daily tasks. The aim is to explore opportunities for using AI in written communication and assess its potential applications in the finance sector, with the intention of extrapolating findings to other organizational types. The research also aims to evaluate the collaboration possibilities between employees and AI through a case study, identifying threats and possibilities presented by AI.

Data and Methods:
The research methodology selected for this study involves a comprehensive literature analysis, specifically a systematic review that incorporates both observational techniques and a rigorous content description approach. The literature review focuses on AI implementation in service organizations, particularly within the financial sector. The case study methodology is employed to evaluate threats and possibilities presented by AI and to assess the level of collaboration possibilities between employees and AI.

Results:
The main results of the study indicate that AI can be widely used in both public and private sectors, especially in service industries. The use of AI and machine learning requires careful consideration of risks and opportunities, particularly in the face of ethical dilemmas. The case study reveals several areas of opportunity, and systematic testing and implementation of smaller AI initiatives are ongoing. The research underscores the importance of balancing risks and opportunities in AI deployment. The study also highlights the advantages of centralized initiatives for developing company-wide capabilities, coupled with decentralized and business-related development.

Conclusions:
The research concludes that while AI offers significant opportunities for efficiency gains in service organizations, careful consideration of risks and ethical dilemmas is essential. The case study demonstrates the feasibility of automating up to 60% of internal communication with an acceptable risk level. The research emphasizes the need for a balanced approach, combining centralized and decentralized development efforts. Many unanswered questions persist in the field of AI and Generative AI, and ongoing initiatives in the country's largest banks, healthcare system, and public institutions suggest a widespread adoption of AI technologies. Overall, the study advocates for a cautious yet proactive approach to AI implementation, emphasizing the need for continuous testing, adaptation, and collaboration with employees.

JEL Classification: M21.

Keywords: artificial intelligence, lean, efficiency, quality, services, digital transformation.

Section 2. AI in Industries and Services

THE INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE TOURISM INDUSTRY

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Objectives:
This study investigates the transformative impact of Artificial Intelligence (AI) on the tourism industry, specifically focusing on its implications for digital marketing strategies. The primary objectives are to analyse how AI technologies are integrated into marketing practices, assess their effectiveness in enhancing customer experiences, and provide strategic recommendations for industry stakeholders.

Data and Methods:
Our research employs a mixed-methods approach, combining qualitative interviews with key industry experts and a quantitative analysis of AI-driven marketing initiatives within the tourism sector. Data is collected from a diverse range of sources, including online surveys, case studies, and secondary research reports. This comprehensive approach enables a holistic understanding of AI's role in shaping digital marketing strategies.

Results:
Our findings reveal that AI-driven solutions have significantly impacted the tourism industry's digital marketing landscape. Through personalized recommendations, chatbots, and predictive analytics, AI technologies have revolutionized customer interactions and engagement. Moreover, AI-powered algorithms have enabled businesses to segment their target audiences effectively, optimizing marketing efforts and increasing conversion rates. Additionally, the integration of AI in marketing automation has streamlined operations, leading to improved efficiency and resource allocation.
Furthermore, our study identifies notable variations in AI adoption rates across different countries, with Estonia showcasing higher levels of implementation compared to Georgia and Poland. This discrepancy is attributed to varying levels of technological infrastructure and tourism industry readiness.

Conclusions:
The integration of AI technologies presents immense opportunities for the tourism industry to enhance customer satisfaction, increase operational efficiency, and gain a competitive edge in the digital landscape. However, successful implementation requires a strategic approach, including investment in training and infrastructure. As Estonia leads in AI adoption, there is potential for knowledge transfer and collaboration with regions such as Georgia and Poland to bridge the technological gap.

JEL Classification: L83, M31.

Keywords: artificial intelligence, tourism industry, digital marketing, customer experience, marketing automation, tourism industry transformation.

FRACTAL STRUCTURAL ANALYSIS OF ROCK FORMATIONS FOR THE DETECTION OF URANIUM DEPOSITS USING ARTIFICIAL INTELLIGENCE

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Objectives:
The primary objective of this research is to develop and test a methodology for fractal structural analysis of rock formations, utilizing artificial intelligence technologies, with a specific focus on identifying uranium deposits. The research aims to create an algorithm capable of analysing the structure of rocks, determining characteristic fractal parameters, and detecting the presence of uranium. Additionally, the study seeks to explore the synergies between fractal structural analysis and artificial intelligence for enhanced uranium detection.

Data and Methods:
The research involves the collection and analysis of rock samples from diverse geological settings. Fractal analysis will be applied to characterize the structural properties of these rock formations. Artificial intelligence will play a crucial role in processing large volumes of data, identifying patterns, and automating the analysis process. Various machine learning techniques, including neural networks and support vector machines, will be employed to model and interpret the fractal nature of rock formations. The AI models will be trained on the collected data to recognize patterns indicative of uranium presence. The performance of these models will be evaluated through cross-validation techniques.

Results:
The outcomes of this research are expected to provide valuable insights into the spatial distribution of uranium deposits. The combination of fractal structural analysis and artificial intelligence is anticipated to enhance the accuracy and efficiency of uranium detection. The study aims to contribute to the identification of potential mining sites, thereby promoting sustainable development in nuclear energy resources. The integration of advanced AI technologies in geological research is expected to optimize exploration strategies and improve resource extraction efficiency.

Conclusions:
In conclusion, this research explores the synergies between fractal structural analysis and artificial intelligence for the detection of uranium deposits in rock formations. The study holds significant potential for advancing the field of geology and mineral exploration by introducing an innovative approach to uncovering hidden resources. The findings are expected to have far-reaching implications, fostering interdisciplinary collaboration and driving innovation in resource discovery and utilization. The integration of advanced AI technologies represents a transformative step towards achieving more sustainable and efficient mineral resource management.

JEL Classification: Q31, Q32, C53, O33.

Keywords: fractal structural analysis, rock formations, uranium deposits, detection, artificial Intelligence, machine learning.

UNLOCKING THE POTENTIAL OF ARTIFICIAL INTELLIGENCE IN BUSINESS MANAGEMENT

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Objectives:
AI implementation requires meticulous planning, substantial investment, and a deep commitment to ethical and responsible AI practices. Organizations must develop strategies to ensure that AI is not just a tool but a seamless part of their operations. The main objectives to reach the points are two: strategic integration – to develop a strategic plan for the seamless integration of AI into core business operations, aligning AI initiatives with organizational objectives; data optimization – to maximise the value of data assets by improving data quality, collection, storage, and accessibility, ensuring that data is ready for AI-driven analysis and decision-making.

Data and Methods:
With an emphasis on enhancing the shared comprehension of AI's transformative impact on the business environment, the endeavour aims to:

1. Data assessment and strategy alignment – Organizations should comprehensively assess their existing data assets, determining the quality and volume of data for AI applications. They will align their AI strategy with business goals and identify areas where AI can deliver the most value.
2. AI readiness audit – Organizations can perform an AI readiness audit, evaluating their technological infrastructure and data management practices within the workforce to identify gaps and opportunities for improvement.

Results
Using strategic AI integration in organizations can gain the capability to strategically integrate AI into their business management practices with overarching goals and strategies. AI-driven insights and data analysis may enhance decision-making processes, enabling organizations to make informed and data-backed choices across various operational domains.

Conclusion
The integration of artificial intelligence into business management is not a one-time effort but a continuous way of transformation and adaptation. Organizations that strategically embrace AI, prioritize ethical practices, and foster a culture of innovation will position themselves for long-term success and growth in the digital age.

JEL Classification: M15, M21, O33.

Keywords: artificial intelligence, decision-making processes, ethical implications, business management.

USING ARTIFICIAL INTELLIGENCE TO RECOGNIZE, ANALYZE AND DIGITIZE HANDWRITTEN DOCUMENTS

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Objectives:
The primary objectives of this study are to explore and analyse the current state of informatization in Ukraine, specifically focusing on the digitization of handwritten documents. The research aims to investigate the implementation of information systems, with a particular emphasis on the use of artificial intelligence (AI) technologies such as Optical Character Recognition (OCR) and Handwritten Text Recognition (HTR). The study seeks to understand the advantages and limitations of each approach and provide insights into their applications, particularly in the context of handling historical handwritten documents.

Data and Methods:
The study delves into the details of OCR as a technology for digitizing documents, outlining its process of data extraction from scanned documents, camera images, and image-only PDFs. The combination of hardware and software used in OCR systems is explored, highlighting the role of optical scanners and specialized circuit boards in copying, or reading text. Furthermore, the integration of artificial intelligence in OCR, specifically in the form of intelligent character recognition (ICR), is discussed. The research emphasizes the capabilities of OCR in identifying languages and handwriting styles but addresses its limitations, particularly when dealing with handwritten documents predating the 20th century. The study shifts focus to HTR, presenting it as a branch of OCR that heavily relies on artificial intelligence, particularly convolutional neural networks, for recognizing handwritten documents. The necessity of training the network with enough data is discussed, highlighting the associated requirements such as powerful hardware, specialized personnel, and time investments. The study also provides a notable example of the successful application of HTR in the digitization of medieval manuscripts during the "HTR Winter School 2022."

Results:
The research findings underscore the challenges associated with OCR in handling handwritten documents, especially those predating 1900. The study advocates for the superiority of HTR in such cases, citing its effectiveness in recognizing diverse handwriting styles and fonts. The successful digitization of medieval manuscripts during the "HTR Winter School 2022" serves as an illustrative example of HTR's potential to yield excellent results with valid data.

Conclusions:
In conclusion, the study affirms that the implementation of AI technologies, particularly HTR, in the digitization of handwritten documents enhances the processing of large datasets. Public access to historical documents is facilitated, accelerating information retrieval for genealogical research, and enabling the analysis of obtained information. The research underscores the importance of choosing the appropriate technology based on the nature and age of the documents, with HTR emerging as a preferred solution for handwritten materials with diverse fonts and styles.

JEL Classification: I23; O33.

Keywords: automation, education, traditional job roles, workforce transformation, skill development.

APPLYING ARTIFICIAL INTELLIGENCE IN THE LOGISTICS SECTOR IN LITHUANIA: PROSPECTS AND OPPORTUNITIES

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Objectives:
The primary objective of this paper is to explore and identify new prospects for the application of artificial intelligence in the logistics sector of Lithuania. The study aims to achieve this by providing an overview of the main activities within the logistics sector, conducting a historical economic data analysis, and administering a survey to representatives of key companies in the logistics industry. The focus is on understanding how recent economic, social, and political challenges have influenced the logistics sector and how the integration of artificial intelligence can pave the way for innovative business development.

Data and Methods:
To fulfil the objectives outlined, the paper employs a multifaceted approach. Firstly, it offers an extensive overview of the logistics sector's current activities. Secondly, a historical economic data analysis is performed to discern trends and patterns that have shaped the sector. Lastly, a survey is conducted among representatives of major logistics companies in Lithuania to gather valuable insights into their perspectives on the impact of recent challenges and the role of artificial intelligence. The data analysis employs a multicriteria method to discern key prospects for the sector's development, providing a structured and comprehensive understanding.

Results:
The results of the study reveal significant shifts in the logistics sector influenced by recent challenges. The implementation of remote work opportunities has emerged as a pivotal factor, opening possibilities for providing logistics-related services globally. The focus on solutions based on artificial intelligence stands out as a key trend, indicating a strategic direction for the future of the logistics industry in Lithuania. The application of the multicriteria method in data analysis helps identify and establish the main prospects that can drive the sector's development in the changing landscape.

Conclusions:
In conclusion, this paper underscores the critical role of artificial intelligence in reshaping the logistics sector in response to economic, social, and political challenges. The findings highlight the necessity for logistics businesses in Lithuania to embrace innovative models and technologies, particularly those driven by artificial intelligence, to stay competitive and foster sustainable growth. The insights gathered from the overview, historical data analysis, and survey offer a comprehensive understanding of the current state and potential future trajectories for the logistics sector in Lithuania, emphasizing the importance of adapting to evolving trends and embracing advanced solutions for continued success.

JEL Classification: M21.

Keywords: artificial intelligence, future of work, logistics, economic, social, and political challenges.

INNOVATIVE CONVERGENCE: AI-DRIVEN TRANSFORMATIONS IN CBDCS

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Objectives:
The primary objective of this study is to explore the transformative potential resulting from the integration of Artificial Intelligence (AI) into the development and implementation of Central Bank Digital Currencies (CBDCs). The study aims to analyse the implications, innovations, and challenges arising from this amalgamation.

Data and Methods:
This research draws upon a comprehensive review of existing literature on AI, CBDCs, and their intersection. Additionally, it incorporates case studies and analyses of pilot programs and initiatives involving AI-driven CBDC prototypes. The study also involves interviews with experts in the fields of AI, finance, and regulatory governance.

Results:
The analysis reveals that the integration of AI into CBDC frameworks offers promising opportunities for enhancing transactional efficiency, security, and monetary policy implementation. AI-driven CBDCs exhibit potential for personalized financial services, predictive analytics for economic trends, and optimized transactional processes. However, the integration also raises challenges pertaining to privacy, regulatory frameworks, and the ethical use of AI in financial systems.

Conclusions:
The findings underscore the transformative synergies between AI and CBDCs, indicating a need for collaborative efforts among policymakers, technologists, and regulators to navigate the opportunities and challenges presented. Implementing AI-driven CBDCs requires a balance between innovation and risk management, ensuring that the benefits are maximized while addressing concerns surrounding privacy, security, and equitable access to financial services. the fusion of AI with CBDCs presents transformative prospects, necessitating a harmonious blend of innovation and risk mitigation. Effective governance, cross-sector collaboration, and an ethical approach to AI integration are pivotal for realizing the full potential of AI-driven CBDCs. Continuous research, adaptation of regulatory frameworks, and meaningful public engagement will shape a future where AI-driven CBDCs contribute positively to financial inclusivity and economic advancement while upholding principles of transparency, fairness, and accessibility for all.

JEL Classification: E41, E42, E51, E58, G28, O31

Keywords: artificial intelligence, CBDC, security, digital currency, synergies, transformation.

IMPORTANCE OF ARTIFICIAL INTELLIGENCE IN ECONOMETRIC MODELLING AND ANALYSIS

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Objectives:
In an era characterized by the abundance and complexity of data, the field of econometrics is faced with the problem of effective modelling and analysis of economic phenomena. Traditionally, econometricians have relied on statistical methods and linear models to understand economic data. However, the advent of artificial intelligence (AI) has ushered in a new era, offering innovative tools and techniques that are revolutionizing econometric modelling and analysis. This article explores the importance of AI in econometrics and its transformative potential.

Data and Methods:
Artificial intelligence (AI) has gained prominence in recent years as a powerful tool for improving the methodology of econometric modelling and analysis. It offers several innovative approaches to enhance the accuracy and efficiency of econometric research. Here are some key methodologies and techniques involving AI in econometric modelling and analysis: 1.Machine Learning Algorithms: AI-driven machine learning techniques, such as regression models, decision trees, random forests, and support vector machines, can be used to build econometric models. These algorithms can automatically identify complex patterns and relationships in economic data, making them valuable for forecasting and prediction tasks.2. Deep Learning: Deep learning models, particularly neural networks, are increasingly applied in econometric analysis. Recurrent neural networks (RNNs) and long short-term memory networks (LSTMs) are useful for time series forecasting, while convolutional neural networks (CNNs) can be used for image-based economic analysis. 3.Natural Language Processing (NLP): NLP techniques enable the analysis of textual data, such as news articles, financial reports, and social media sentiment, to extract valuable information for economic forecasting and sentiment analysis. Sentiment analysis is used to gauge public opinion and market sentiment. 4.Big Data Analytics: AI can handle large and complex datasets efficiently. With big data analytics, economists can process vast amounts of data from various sources, including social media, sensor networks, and government databases, to gain insights into economic trends and behaviour. 5.Automated Feature Engineering: AI can assist in the automatic generation of relevant features for econometric models. Feature engineering is crucial for improving model performance, and AI algorithms can identify informative variables that may not be apparent through manual selection.

Results:
Improved forecasting accuracy: One of the main goals of econometrics is to forecast economic variables such as GDP growth, inflation rates, and stock prices. Artificial intelligence dominates this field because it can process multiple sources of data in real time, including news sentiment, social media trends, and macroeconomic indicators. Machine learning models such as recurrent neural networks (RNN) and long-short-term memory (LSTM) networks have shown remarkable accuracy in predicting economic outcomes. Non-linearity and complexity: Economic systems are inherently non-linear and complex, with countless interacting factors. Traditional linear econometric models struggle to adequately capture this complexity. On the other hand, AI can model complex relationships through techniques such as deep learning. Neural networks can automatically detect complex patterns in economic data, adapt to changing conditions, and provide information about the interaction of various factors. This ability is especially useful in understanding financial markets where nonlinear dynamics play an important role. Real-time decision support: The speed with which AI can process and analyse data makes it a valuable tool for real-time decision support. Financial

institutions, for example, can use AI-based algorithms to detect anomalies in trading patterns, detect fraud, and manage risk more effectively. In addition, governments can use artificial intelligence to monitor economic conditions, respond quickly to crises, and design targeted economic stimulus packages. AI's ability to provide timely information is critical in today's rapidly changing economic landscape. Advanced policy analysis: Econometric modelling plays an important role in the formulation of economic policy. AI will enhance this role by gaining a deeper understanding of the potential impact of policy changes. Economists can use machine learning models to simulate the effects of different policy scenarios, helping policymakers make informed decisions. AI also enables policymakers to analyse the distributional impact of policies on different demographic groups and support equitable economic outcomes.

Conclusions:
AI has the potential to revolutionize econometrics by offering innovative tools and techniques to model and analyse economic phenomena. Its ability to handle big data, identify non-linear relationships, improve forecasting, and address econometric challenges makes it a valuable tool for econometricians. However, careful consideration must be given to the limitations and challenges associated with AI to ensure its effective and responsible use in econometrics. The importance of AI in econometric modelling and analysis lies in its ability to handle large and complex datasets, automate the modelling process, and provide more accurate predictions and insights into economic trends. As AI technology advances, it is expected to have an increasingly significant role in economic analysis and decision-making.

JEL Classification: M21, O39.

Keywords: Modelling, economic data, the power of data, non-linearity and complexity, advanced policy analysis, enhanced forecasting capability.

ARTIFICIAL INTELLIGENCE IN THE PROFESSIONAL ACTIVITIES OF FUTURE JOURNALISTS: ADVANTAGES AND DISADVANTAGES

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Objectives:
This study focuses on the changes in the educational sector of Ukraine and the importance of cultivating skills in using artificial intelligence tools in the professional activities of future media professionals. It outlines the peculiarities of applying artificial intelligence technologies in conditions of uncertainty. A review of academic sources by Ukrainian and international scholars on the stated issue is conducted. The relevance of implementing artificial intelligence technologies in modern journalism education, which contributes to improving future professionals' training and developing their competencies, is justified. Definitions of the concepts "artificial intelligence," "artificial intelligence tools," "machine learning," and scientific approaches to them are provided. The emphasis is placed on implementing artificial intelligence technologies in the educational process to enhance higher education students' cognitive activity and engagement. Artificial intelligence tools for student preparation and developing general and professional competencies are highlighted. The significance of artificial intelligence technologies in education and professional journalism activities is emphasized.

Data and Methods:
In the process of theoretical and methodological substantiation of the phenomenon of artificial intelligence, the following methods were employed: classification and generalisation, analysis and synthesis, statistical analysis. The method of comparative analysis was applied to examine the definitions of the terms "artificial intelligence," "machine learning," and "artificial neural networks," and the modelling method was used to investigate the impact of intelligent systems on various aspects of life. Observation, induction, and deduction methods were utilised to determine the current state of journalism and technology. The survey was conducted to assess students' attitudes and the application of artificial intelligence in the educational process. It comprised a sample of at least participants (students of the first (bachelor's) and second (master's) levels of higher education in the field of journalism) and a data collection tool (Google Forms), as well as specific questions designed for statistical analysis.

Results:
Based on the results of the online survey of undergraduate and graduate journalism students at Volodymyr Hnatiuk Ternopil National Pedagogical University. According to the survey, 30.6% of students combine studying with work in the media. It is found that almost all respondents (94.4%) are aware of, and the majority (72.2%) use artificial intelligence technologies in their educational and professional activities. The respondents' awareness level of potential threats associated with using artificial intelligence technologies, especially in the media sphere, is currently relatively low. However, there is an understanding that the implementation of artificial intelligence technologies requires deeper study, better technical support for journalists, and legislative regulation.

Conclusions:
In summary, the modern educational process should consider the challenges of the time and incorporate the study of various artificial intelligence platforms into educational programs to develop

the skills for their correct use. It is advisable to introduce additional courses and workshops, invite experts, and conduct training sessions to help utilize artificial intelligence technologies properly. Emphasis is placed on the importance of academic integrity, which necessitates additions to university policies. Attention is focused on personal responsibility for the quality of publications in accordance with current media activities standards.
Vectors for further research on artificial intelligence technologies in the educational process and the professional activities of media professionals are outlined, and standards for the use of generative artificial intelligence in editorial work are defined.

JEL Classification: O33, J24.

Keywords: media, journalism, information, technology, artificial intelligence, machine learning.

ANALYSIS OF AI POLICY IN UKRAINE (2020-2023)

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Objectives:
Objective of the research is to analyse state of AI policy in Ukraine during 2020-2023 and form recommendations.

Data and Methods:
Methodology of Centre for AI and Digital Policy was used for evaluation state of AI policy in Ukraine. It includes 12 indicators. In addition, it was used data of Ukraine's legislation and reports of international organizations.

Results:
Main findings of Ukraine's AI policy analysis are:
"War-life balance": nowadays the principal task for Ukraine is to keep the balance between uses of AI in support of defines and ensure trustworthy, controlled, and responsible AI. Endorsement vs implementation: today the use cases requiring AI regulation appear faster than AI policy is established in Ukraine. At the same time Ukraine has not endorsed the key AI regulation yet. Interest vs abilities: it is crucial to establish an efficient AI agency/ mechanism in Ukraine for independent AI oversight. When several teams pretend to take this function, still they are not capable enough for this. Public voice vs decision making meaningful public participation is the key driver of AI in Ukraine: AI community in Ukraine is vastly growing and developing. That said there are not enough forms of its integration and public voice opportunities for AI policy making. Content vs form: when Human Rights principle is directly included into the Concept of the Artificial Intelligence's Development in Ukraine 2021-2024, the goals of Fairness, Accountability, and Transparency are not there. Total evaluation scores of AI policy in Ukraine during 2020-2023 is 6,5. It means that Ukraine's AI policy today is only forming background for standardization and common practices with international partners at AI sphere.

Conclusions:
Ukraine's general approach to AI seems consistent with human rights, democratic values, and the rule of law. AI policy is partially structured in Ukraine. It is not chaos process; several vectors are present. Some recommendations have been developed based on the study results: to include the goals of Fairness, Accountability, and Transparency as basic in the future concept of AI in Ukraine 2025-2030 and all related documents, to initiate all prospect AI initiatives in Ukraine starting from implementation of these principles.

JEL Classification: 021; 033; 038.

Keywords: artificial intelligence; democratic values; decision making; regulation.

BREAKING BARRIERS AND BUILDING BRIDGES: THE GENDERED IMPACT OF TECHNOLOGIES AND AI ON CIVIC ENGAGEMENT AND DEMOCRACY BUILDING

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Objectives:
The integration of AI into various aspects of social and political life worldwide has a multifaceted impact on civic engagement and e-democracy. While AI shows potential to enhance participation and inclusivity, when viewed through a gendered lens, it can also introduce biases and challenges that disproportionately affect different genders and age groups. The objective of this paper is to explore the societal impact that technologies and AI have on civic engagement in crisis response, local governance, and collective issue-solving, considering a gendered perspective within the frameworks of the empowerment theory and the theory of collective action.

Data and Methods:
Research methods encompass the analysis of the research question based on empirical data from a case study of Ukraine, which includes expert semi-structured interviews. The interviews were conducted on-site by experts possessing profound knowledge of the e-service systems provided by both the government and the civic sector. This knowledge helps to build a comprehensive understanding of the complexities and nuances of these systems, which is crucial for the thorough analysis of the research questions. The familiarity with the challenges induced by the ongoing Russian conflict allows author to investigate the gendered impact of technology in a crisis-ridden environment. While the sample size of five interviewees is not considered representative for the country, it was chosen to capture diverse perspectives from both providers and consumers of e-services in Ukraine, while also maintaining a gender-sensitive lens throughout. To ensure a comprehensive exploration of the topic, author uses the snowball sampling method, whereby each interviewee was asked to recommend additional experts or stakeholders with relevant insights. This approach helps us paint a more holistic picture of the gendered impact of technology in the context of civic engagement and democracy building, ensuring that voices from various facets of Ukrainian society are included in the analysis.

Results:
The results demonstrate that the introduction of AI and technology in civic activism to support democratic transformations at the community and state levels presents both opportunities and challenges from a gendered perspective. On one hand, the use of AI and technology enhances inclusivity, benefiting individuals of all genders, particularly those facing barriers to physical participation, amplifies women's voices, and increases the efficiency and convenience of e-participation in addressing socially significant issues. On the other hand, challenges such as gender-based data gaps, gender bias in algorithms leading to discriminatory decision-making, underrepresentation of female and LGBTQ+ perspectives, as well as those of youth and older people, and a widening digital divide exist. These challenges affect access to civic and government technology products and public services.

Conclusions:
In conclusion, the author describes how technologies empower civic actors to acquire interpersonal and political power for effective co-action, considering such action as socio-technical arrangements where technology, institutions, and societies are interconnected and mutually shape one another.

Civic actors and their networks engage in technology-mediated interactions, forming new techno-social assemblages. The paper concludes with policy recommendations on how these assemblages can be leveraged as a driving force for societal development during crises and toward democratic progress, fostering the creation of a more supportive, inclusive, and equal society for all.

JEL Classification: H11, H12.

Keywords: technology, society, participation, crisis management, Ukraine.

APPLICATION OF THE LATEST AI COMPONENTS FOR ASSESSMENT AND ACCEPTANCE OF CIVIL STRUCTURES IN KYRGYZSTAN

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Objectives:
Using advanced AI components, we can detect potential problems and critical moments in civil structures in a timely manner. This not only helps ensure their safety and durability, but also allows defects to be detected early. Once problems are identified, they can be effectively contained and corrected, reducing risk and economic costs. As a result, thanks to these innovations, the quality and reliability of civil structures in Kyrgyzstan are significantly improving.

Data and Methods:
Analysing civil structures in Kyrgyzstan using AI requires structural data, sensor information, historical records, and visual materials. Techniques include deep learning for image analysis, time series analysis of sensor data, classification algorithms for identifying defects, and optimization techniques for effectively eliminating them.

Results:
Using AI, defects can be detected earlier, which helps prevent serious damage and accidents. This also leads to lower operating costs since timely detection and elimination of defects eliminates costly repairs in the future. Thanks to this, structures become safer, and the risks of collapses or other accidents are reduced. Proper maintenance and repairs based on AI data extend the life of buildings and other structures. AI also helps optimize resources by indicating which items require immediate attention and which can wait. This makes renovation planning more precise, reducing inconvenience for users. Finally, the application of advanced technologies in the areas of safety and quality of buildings strengthens the public's trust in public and private organizations.

Conclusions:
The thesis article focuses on the relevance of the use of artificial intelligence in the construction industry, especially in the context of identifying critical damage to buildings. AI provides the ability to analyse the condition of objects quickly and accurately, which helps improve safety and reduce risks. The conclusion is that integrating AI into the construction industry could be a significant step towards creating safer and more sustainable infrastructure.

JEL Classification: C88, O33, R33.

Keywords: Artificial intelligence, safety of structures, data analysis, civil structures.

Section 3. AI in Education and Workforce Development

ARTIFICIAL INTELLIGENCE IN THE FIELD OF EDUCATION, THE NECESSITY OF ITS IMPLEMENTATION: CURRENT RISK AND REALITY

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Objectives:
The primary objective of this study is to investigate and propose recommendations concerning the diverse possibilities and associated risks linked to the integration of artificial intelligence (AI) into various aspects of daily life. Specifically, the focus is on exploring AI's impact on education and the need for a regulatory framework to address the challenges and potentials inherent in this technological transformation.

Data and Methods:
The research employs a multifaceted approach, incorporating bibliographic research, comparative analysis, and factor analysis. Bibliographic research involves scrutinizing scientific works and organizational reports, while the comparison method is utilized to identify disparities in relevant indicators. Factor analysis is employed to pinpoint risks and opportunities associated with AI in education. Additionally, qualitative research methods, particularly open-ended questions, are used to gather comprehensive insights from Georgia's business landscape, where AI implementation is still limited. Analytical techniques such as data grouping are applied to understand the current status of AI implementation in Georgia.

Results:
The study reveals that AI has already brought substantial changes to education, transforming teaching methods, and adapting educational tools to the needs of educators and learners. The integration of AI in education empowers stakeholders to recognize its potential for enhancing educational processes. The findings emphasize the positive role of AI in education, urging a critical and ethical approach to maximize its benefits. The study also highlights the unstoppable trend of AI integration in education and the increasing use of AI-driven tools by teachers, students, lecturers, and administrators.

Conclusions:
The incorporation of AI into education is a transformative trend that necessitates a unified state strategy. The study underscores the importance of developing a vision for AI's development and introduction in education. It emphasizes the need for strategic planning to address challenges and risks related to data safety, processing ethics, and the requirement for human and material capital. The education sector is identified as a priority, and the study concludes that a well-formulated strategy can contribute to raising awareness and ensuring the responsible and effective integration of AI in education.

JEL Classification: I21, O33, L86.

Keywords: artificial intelligence, education, system, risk, Georgia, analytical techniques.

THEORETICAL ASPECTS OF THE FUTURE WORKFORCE REGARDING SOCIAL AND EMOTIONAL UPSKILLING IN TIME OF INCREASING AI

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Objectives:
The research aims to analyse the theoretical aspects of the future workforce concerning social and emotional upskilling in the era of increasing artificial intelligence (AI). Specifically, the study explores the potential impact of AI on job roles, the need for upskilling and reskilling, and the importance of social and emotional skills for sustainable workforce development and well-being.

Data and Methods:
The chosen research method for this study is comprehensive literature analysis. The literature review incorporates methods of observation and systematic description of contents. Relevant sources, including reports from the Organisation for Economic Co-operation and Development (OECD), Saleem and Malik (2022), Hancock (2019), Colmar (2023), Allen (2015), World Economic Forum (WEF, 2023), Fadel (2009), and Luckin (2018), are examined to gather insights into the evolving landscape of AI in industries and education systems, the potential impact on the workforce, and the role of social and emotional skills.

Results:
The main findings indicate that routine and predictable tasks, conducive to automation, may be replaced by AI solutions, potentially leading to a significant loss of jobs globally. However, the research also highlights contrasting viewpoints, such as Allen's (2015) argument that the rise of technology has created more job opportunities than it has replaced. Colmar (2023) suggests that AI could generate 97 million jobs by 2030, emphasizing the need for retraining and reskilling to adapt to a changing job market. The World Economic Forum (WEF, 2023) emphasizes the importance of social intelligence skills, including collaboration, communication, and problem-solving, which are crucial for navigating the evolving workplace.

Conclusions:
In conclusion, the study underscores the necessity for proactive measures in workforce preparation for the transformative impact of AI. While acknowledging the potential job displacement, it emphasizes the importance of developing social and emotional skills to ensure a sustainable workforce. The three categories of 21st-century skills - Learning and innovation skills, Digital literacy skills, and Career and life skills (Fadel, 2009) - are considered as essential components. Additionally, Luckin's (2018) conceptualization of seven elements of human intelligence provides a framework that includes social intelligence, reinforcing the significance of emotional skills in the context of AI integration. The study suggests that a balanced approach, combining technological proficiency with social and emotional intelligence, is crucial for navigating the future workforce landscape effectively.

JEL Classification: E71.

Keywords: future workforce, emotional skills, emotional intelligence, upskilling, AI.

INTEGRATION OF ARTIFICIAL INTELLIGENCE INTO THE EDUCATIONAL PROCESS OF UNIVERSITIES: CHALLENGES OF TODAY

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Objectives:
The primary objectives of this study are to explore and analyse the current state of informatization in Ukraine, specifically focusing on the digitization of handwritten documents. The research aims to investigate the implementation of information systems, with a particular emphasis on the use of artificial intelligence (AI) technologies such as Optical Character Recognition (OCR) and Handwritten Text Recognition (HTR). The study seeks to understand the advantages and limitations of each approach and provide insights into their applications, particularly in the context of handling historical handwritten documents.

Data and Methods:
The study delves into the details of OCR as a technology for digitizing documents, outlining its process of data extraction from scanned documents, camera images, and image-only PDFs. The combination of hardware and software used in OCR systems is explored, highlighting the role of optical scanners and specialized circuit boards in copying or reading text. Furthermore, the integration of artificial intelligence in OCR, specifically in the form of intelligent character recognition (ICR), is discussed. The research emphasizes the capabilities of OCR in identifying languages and handwriting styles but addresses its limitations, particularly when dealing with handwritten documents predating the 20th century.
The study shifts focus to HTR, presenting it as a branch of OCR that heavily relies on artificial intelligence, particularly convolutional neural networks, for recognizing handwritten documents. The necessity of training the network with enough data is discussed, highlighting the associated requirements such as powerful hardware, specialized personnel, and time investments. The study also provides a notable example of the successful application of HTR in the digitization of medieval manuscripts during the "HTR Winter School 2022."

Results:
The research findings underscore the challenges associated with OCR in handling handwritten documents, especially those predating 1900. The study advocates for the superiority of HTR in such cases, citing its effectiveness in recognizing diverse handwriting styles and fonts. The successful digitization of medieval manuscripts during the "HTR Winter School 2022" serves as an illustrative example of HTR's potential to yield excellent results with valid data.

Conclusions:
In conclusion, the study affirms that the implementation of AI technologies, particularly HTR, in the digitization of handwritten documents enhances the processing of large datasets. Public access to historical documents is facilitated, accelerating information retrieval for genealogical research, and enabling the analysis of obtained information. The research underscores the importance of choosing the appropriate technology based on the nature and age of the documents, with HTR emerging as a preferred solution for handwritten materials with diverse fonts and styles.

JEL Classification: I23; O33.

Keywords: artificial intelligence, education, skill development, ethical implications, adapting to change.

AI IN HIGHER EDUCATION: PERCEPTIONS AND EXPERIENCES IN FOREIGN LANGUAGE LEARNING

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Objectives:
The primary objectives of this study are to explore the experiences and attitudes of foreign language learners and teachers regarding the integration of Artificial Intelligence (AI) within a university setting. Specifically, the study aims to investigate the participants' perceptions, interactions, and key findings related to AI in the context of language learning and teaching.

Data and Methods:
In May-June 2023, a survey was conducted involving 100 participants who had prior AI experience, including interactions with AI systems such as ChatGPT and Bearly. To measure participants' perceptions and experiences with AI, the study utilized the Activity Perception Questionnaire, which was assessed on a 7-point Likert Scale. The survey focused on understanding the participants' attitudes towards AI, their perceived choice of using AI, levels of interest and enjoyment, perceived value in learning experiences, stress associated with AI usage, and trust in AI. The participant pool included bachelor's level students (N=63), Master's level students (N=18), and language teachers (N=14). An analysis of variance was employed to explore potential differences in perception scales among these groups.

Results:
The survey results revealed several key findings. Participants exhibited a high perceived choice of using AI (mean score: 5.63) and a relatively high level of interest and enjoyment when incorporating AI into their academic pursuits (4.62). Additionally, participants perceived AI as having value in their learning experiences (4.21) and reported a relatively low level of stress associated with AI usage (2.74). Despite a somewhat negative attitude toward AI (3.11) and moderate trust in AI (3.19), both scores remained below the average on the Likert Scale. Importantly, the analysis of variance did not identify significant differences in perception scales between bachelor's level students, Master's level students, or language teachers, suggesting a consistent impact and reception of AI in foreign language learning and teaching across these participant groups.

Conclusions:
This study contributes valuable insights into the evolving relationship between AI and foreign language education. The findings emphasize the positive aspects of AI usage, including high perceived choice, interest, and enjoyment among participants. The study also highlights specific areas where AI is predominantly utilized, such as language editing, paragraph generation, and translation between languages. Importantly, the research underscores the need for further exploration of AI's role in optimizing the learning and teaching processes while acknowledging the essential human element in education.

JEL Classification: I21.

Keywords: AI in education; AI in language learning; attitudes and experiences.

THE SYMBIOSIS OF HUMAN AND ARTIFICIAL INTELLIGENCE: INNOVATIONS IN HIGHER EDUCATION AND THE LABOR MARKET

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Objectives:
In today's world, innovations and rapid technological changes are moulding the future of education and the job market. The integration of artificial intelligence (AI) has become a central factor in this context. Understanding the interaction between humans and this cutting-edge technology has become increasingly essential. The aim of this research is to examine the impact of AI implementation on higher education and the labour market. It seeks to understand how AI enhances human skills and transforms educational processes. Additionally, it evaluates the influence of AI on preparing students for the contemporary and future job market and explores inventive approaches to AI utilization in higher education. Investigate the impact of AI implementation on higher education and the labour market. Determine how AI amplifies human skills and reshapes educational processes. Assess the effect of AI on preparing students for the demands of the modern job market. Explore inventive approaches to AI utilization in higher education.

Data and Methods:
This study utilized literature analysis, surveys of students, educators, university administrators, and employers, an exploration of practical applications of AI in educational programs, and an analysis of labour market data.

Results:
The integration of AI into higher education fosters symbiotic relationships in which AI enhances human effectiveness, creativity, and analytical abilities, rather than replacing them. The utilization of AI in educational programs allows for personalized learning and better preparation of students for the requirements of the modern job market. According to research findings, students with AI experience demonstrate greater competitiveness in the job market.

Conclusions:
This research underscores that AI does not replace humans in higher education; rather, it makes their work more efficient and influential. The symbiotic approach, in which AI and humans collaborate, promotes innovation, and enhances the educational process and workforce preparation. Artificial intelligence emerges as a potent tool to strengthen human abilities and create a more competitive workforce. This study's relevance lies in its contribution to understanding how innovations in education and the work environment affect the preparation of future generations of professionals. Its findings hold significance for educational institutions, employers, and society, as they grapple with the challenges and opportunities that AI brings.

JEL Classification: O35, I21.

Keywords: Innovation in Higher Education, Labour Market, Human Intelligence and Skills, Artificial Intelligence, Symbiosis of Human and Artificial Intelligence.

STRATEGY MANAGEMENT OF ADAPTATION TO CHANGES IN THE EDUCATIONAL PROCESS OF UNIVERSITIES IN THE AGE OF ARTIFICIAL INTELLIGENCE

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Objectives:
The relevance of the study lies in the need to consider transformational processes in the implementation of educational programs by universities. The factors of accelerated smartisation and training of artificial intelligence led to the need to implement a mechanism of adaptation of all participants of the educational process (teachers, students, graduate students, doctoral students) to the conditions of implementation of artificial intelligence in the real processes of higher education institutions. The objective of the study is to form a strategic vision for the processes of adaptation of all participants in the educational process of universities to the introduction of artificial intelligence tools into the process.

Data and Methods:
Strategic plans and work programs of universities, program complexes and educational platforms for remote processing of course materials. Research methods include the synthesis method, the system method, the abstraction method, the comparative method.

Results:
Let's examine the implementation of this strategic planning process as an element of strategic management, which should contain the procedure (management steps) for its implementation: the first stage should contain the definition of the subjects of the educational process, the study of their current strategies and tactical programs of educational work. The second stage of strategic planning should include the formation of expert and focus groups for conducting field studies of focus groups (teaching staff, students, graduate students, doctoral students). The third stage of strategic planning is conducting a field study and processing its results by expert groups. The fourth stage of strategic planning is the holding of facilitation sessions, round tables with the involvement of all interested parties regarding the selection of the direction of the university's adaptation strategies in the conditions of the development of artificial intelligence. The fifth stage of strategic planning should include the stage of implementation of the university's chosen adaptation strategy.

Conclusions:
It should be noted that the introduction of artificial intelligence into the educational process should not be of a formal nature but should create opportunities for the development of the information space of the university. The toolkit of artificial intelligence should solve: creation of a management mechanism, on the part of key stakeholders of the educational process in universities, regarding the implementation of AI for project management. These measures will expand the possibilities of programs and projects and influence the involvement of talented student youth in these works and increase the efficiency of obtaining an education.

JEL Classification: R 40, M21, O20.

Keywords: strategic planning, transformations, artificial intelligence, higher education institution, educational process, participants.

MASTERING THE FUTURE OF WORK: ESSENTIAL SKILLS AND COMPETENCIES IN THE AGE OF AI

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Objectives:
The primary objectives of this study are as follows: to identify and define the key skills and competencies needed to thrive in a workplace heavily influenced by AI; to explore the ethical dimensions and responsibilities associated with AI in the workforce; to highlight the importance of adaptability and continuous learning in staying relevant amidst AI advancements.

Data and Methods:
Data were gathered from various sources, including industry reports on AI's impact on the job market and workforce trends; surveys and studies evaluating the demand for AI-related skills in different sectors; interviews with students and analysis of online job postings and requirements for AI-related job roles. The methodology involved the following approaches: for data collection, the relevant data from reputable sources and conducted interviews to gather insights from industry experts was collected). Data analysis included literature review and data analyses. The collected data to identify recurring themes, emerging trends, and critical skills demanded by AI-related job roles were analysed and literature review (academic literature and industry publications to understand the ethical considerations and best practices associated with AI in the workplace have been reviewed).

Results:
Based on the research and analysis, the following results can be presented: proficiency in AI and machine learning, along with data fluency, are essential skills for job seekers aiming to secure roles in AI-related fields. Ethical considerations, such as addressing bias in AI algorithms and ensuring transparency, are critical for responsible AI adoption. Lifelong learning and adaptability are key to remaining competitive in a constantly evolving job market influenced by AI. Interdisciplinary skills that combine domain expertise with AI knowledge open diverse career opportunities. Effective collaboration and communication skills are increasingly important in AI-augmented workplaces.

Conclusions:
In the age of AI, the future of work is both promising and challenging. Embracing the opportunities presented by AI while addressing its ethical and societal implications requires a set of skills and competencies that go beyond traditional job descriptions. By mastering AI and fostering adaptability, individuals can not only secure their place in the evolving job market but also contribute to the responsible and ethical development of AI technologies that shape our future.

JEL Classification: O35, D71.

Keywords: collaboration and communication, skills, AI and workforce, ethical considerations, lifelong learning

Section 4. AI in Business Management and Organizational Leadership

ANALYSIS OF AI-BASED SOLUTIONS FOR CODE DEVELOPMENT: A FOLLOW-UP TO CHATGPT STUDY

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Objectives:
The primary objective of this study is to investigate the quality of coding performed by various AI-based platforms. Specifically, the study aims to assess the efficiency of these platforms in developing code by conducting a comparative analysis. The research is motivated by concerns raised in a previous study (Cheng, Zaharia, Zou, 2023) regarding the performance of AI-based solutions in coding tasks and the potential impact on the role of human developers in the industry.

Data and Methods:
The study was conducted in March-June 2023, and the dataset was generated by assigning five simple code development tasks to three different platforms, each claiming proficiency in code development. The tasks were repeated 10 times on each platform, resulting in a sample of 150 experiments. ChatGPT, tested within the Stanford/Berkeley study, was excluded from this dataset. The next step involved running the generated code to evaluate its functionality. This methodology aimed to test the probability of developing efficient code using AI-based tools.

Results:
The research, following the framework of Cheng et al.'s study (2023), focused on a comparative analysis of coding solution efficiency. While the study did not assess the longitudinal performance of coding solutions, the results were like the referenced study. Notably, the proposed AI-based solutions failed to generate functional code in 40% of cases, primarily due to simple mistakes. These findings suggest that human code-checking remains essential, as AI solutions are not foolproof.

Conclusions:
Two key conclusions emerge from the study. First, AI-based solutions, as tested in this research, are not currently poised to replace human code developers. Instead, they may serve as tools for automating certain operations, but the necessity for thorough testing and human intervention remains. Second, the type of platform used for code generation appears to influence the nature of typical errors. Despite a consistent error rate across platforms, the specific types of mistakes varied. Consequently, the study suggests that code-checking could be more effective if platforms share similar typical errors that can be automatically corrected. This insight emphasizes the importance of understanding and addressing platform-specific challenges when integrating AI-based solutions into the coding process.

JEL Classification: O31, O32.

Keywords: AI-solutions, code development, efficiency, error rate.

IMPROVING ORGANIZATIONAL MANAGEMENT QUALITY IN THE AGE OF DIGITALIZATION: LEADERSHIP AND NEURAL NETWORKS

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Objectives:
The primary objective of this scientific research is to investigate the enhancement of organizational management quality in the era of digitalization through the synergy of leadership and artificial intelligence. Specifically, the study aims to assess the potential of using neural networks for improving efficiency and rationalizing business processes. The overarching goal is to provide recommendations for the successful implementation of AI in organizational management.

Data and Methods:
To achieve our objectives, we first examined the relevance of AI implementation by studying statistical data on AI adoption in different countries worldwide. The research methodology involved analyzing the feasibility and risks of AI application, drawing insights from examples of well-known companies in Ukraine and globally. We assessed the impact of AI on various organizational tasks, including automating business processes, data forecasting and analysis, production management, image and voice recognition, and customer interaction.

Results:
Our findings indicate that using neural networks to enhance organizational management quality in the era of digitalization holds significant potential for improving efficiency and rationalizing business processes. However, we also identified key factors limiting the adoption of such innovative solutions. While AI can perform complex analytical operations faster than humans, it comes with potential drawbacks, including data security risks, technological dependence, and reduced employment levels in specific labour markets.

Conclusions:
In conclusion, the integration of neural networks and AI in organizational management should be approached with careful consideration of both positive and negative consequences. The study underscores the need to justify and implement AI solutions cautiously. We propose a roadmap consisting of nine stages for the successful implementation of artificial intelligence in business organizations, emphasizing the development of leadership skills among employees.
The dynamic nature of technology development highlights the necessity for further scientific research in this field. Future investigations should focus on addressing limitations and drawbacks associated with AI, such as its limited ability to analyse non-specific and non-obvious data, leading to potential errors and the underestimation of crucial aspects. Overall, the study contributes valuable insights to the ongoing discourse on the role of AI in organizational management in the era of digitalization.

JEL Classification: M15.

Keywords: strategic decisions, innovation management, quality, digital marketing, leadership, artificial intelligence.

AI-BASED WORKER MANAGEMENT: ROLE OF PARTICIPATIVE LEADERSHIP AND EMPOWERMENT

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Objectives:
New technologies and forms of worker management through artificial intelligence (AI)-based systems have changed how the work is performed and managed. It has been argued that the development of AI-based worker management (WM) systems has given many opportunities to enhance workers' performance and efficiency, but at the same time causes challenges and poses risks to workers' well-being and health. It is well known that people and technology only exist in relation to each other and facilitating factors for preventing negative impact for workers' well-being to realize are supportive organizational culture, adequate leadership style, participatory approach, and employees' involvement etc. Little research has been conducted to determine if existing management practices and leadership styles are successful while working with extensive digital worker management systems. The aim of the current study is to explore which management practices and leadership skills can best support positive AI-based WM effects to realize as well as to identify if algorithmic management is displacing supervisors or lower-level managers and transforming their role.

Data and Methods:
For data collection, qualitative approach has been applied: 15 semi-structured interviews with international experts in AI-based WM or AI and workers' well-being were conducted and 5 semi-structured interviews with managers in institutions practicing AI WM. The data was collected from April 2021 to January 2022. Content analysis was performed, and main conclusions made.

Results:
The results indicated that participative management may be the key aspect for successful AI WM. It is essential to give the workers a sense of empowerment and develop a participatory approach for worker well-being models.

Conclusions:
It was also concluded that AI WM cannot replace managing by walking around, negotiating and motivating the teams, thus inspirational leadership will be in demand in the future. In a rich social situation, a human being is needed to figure out what is going on or which directions the workers should move. Additionally, transparency, diversity, non-discrimination, and fairness need to be acknowledged to avoid negative implications of AI-based systems. A model of leadership skills and traits has been developed as an outcome of this study.

JEL Classification: O32.

Keywords: AI-based worker management, leadership, management practices and leadership skills

ROLE OF ARTIFICIAL INTELLIGENCE IN RISK MANAGEMENT

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Objectives:
Artificial intelligence has the potential to impact risk management, but attention must also be paid to the types of technology and infrastructure being deployed. The introduction and integration of these indicators are important in the renewal of all structures, as well as the support of public regulators for the quality elaboration of secret documents. As Artificial Intelligence (AI) increases its application in risk management, it has the potential to add to critical impacts and increase speed. The aim to analyse the role of AI in risk management system. Through intelligent algorithms and advisory systems, AI can take a detailed look at risk in all types of activities. The Intellectual AI will have the ability to collaborate effectively, be an effective articulator, and deliver results with a high level of timeliness and detail in multiple types of information.

Data and Methods:
Literature review: Begin by understanding the fundamentals of artificial intelligence (AI) and its applications in risk management. This includes learning about different AI techniques, algorithms, and models. Study existing AI research: Review existing research papers, case studies, and literature on the role of AI in risk management. This will help you understand the current state of the field and identify potential gaps or areas for further exploration. Explore standardization efforts: Investigate ongoing standardization efforts in AI and risk management. This could involve understanding industry-specific standards or frameworks that have been developed to guide the implementation and use of AI in risk management. Assess the impact of AI: Evaluate the potential impact of AI on risk management processes and outcomes. This may involve conducting a risk assessment to identify the potential benefits, challenges, and risks associated with implementing AI in risk management. Evaluate risks to human civilization: Consider the broader implications of AI on society and humanity. Assess the potential risks and ethical concerns associated with the use of AI in risk management, such as job displacement, bias, privacy, and security.

Results:
AI has an important place in risk management. Important fundamentals in demonstrating the impact of intelligence on risk management: 1. Data provision and analysis: AI, assisting in data base analysis and enhancement. He is involved in data collection, analysis, scientific development, and analysis. This is important in developing key data elements and determining impact. 2. Identify analytical frameworks: AI, involved in analysing risk factors and helping to identify key risks. It also plays a role in the development of written information to enhance the identification, communication, and analysis of key factors. 3. Risk Management: AI will assist in the development of data, recommendations and implementation of risk management analysis and implementation. It can be used to implement recommendations mainly in the state and enterprises. 4. Fast and automation: AI, leads to fast and automation of risk management processes. It provides opportunities for quick and measurable risk identification and management. 5. Analytical management: AI, risk information and recommendations are involved in analytical management systems in their work. It helps in the development of analytical management orders, risk monitoring and analysis.

Conclusions:
As AI increases its application in risk management, it has the potential to add to critical impacts and increase speed. Through intelligent algorithms and advisory systems, AI can take a detailed look at risk in all types of activities. The Intellectual AI will have the ability to collaborate effectively, be an

effective articulator, and deliver results with a high level of timeliness and detail in multiple types of information. AI will be able to assess the impact of risk management and increase performance, but central to uncertainties and issues, such as data protection and accuracy. AI recognizes the perspectives and challenges in risk management, including alcoholism, injustice, place lessness, and ethical issues. AI plays an important role in risk management for detection, monitoring, and analysis. It provides opportunities to use artificial intelligence in identifying intellectual skills, accurately and quickly analysing, identifying risks, and developing appropriate strategies. Applications of artificial intelligence, special algorithms, and machine factors are likely to become more common in intelligent modelling, understanding, attention, and learning.

JEL Classification: M15, O32.

Keywords: Artificial intelligence, analysis, risk management, intelligent, risk factors.

AI-DRIVEN 3D MODELING FOR ADVANCED ROBOTIC END EFFECTOR DEVELOPMENT

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Objectives:
The primary objective of this study is to investigate and demonstrate the integration of artificial intelligence (AI) into the standard 3D modeling process of robotic grippers. Specifically, the focus is on understanding how AI enhances the design and prototyping procedures of these grippers, leading to increased efficiency and versatility. The study aims to showcase the academic and scientific significance of merging AI with three-dimensional modeling methodologies in the context of additive technology.

Data and methods:
The study employs artificial intelligence algorithms to enhance the intricate geometries and structural complexities of robotic grippers. AI-powered simulations and predictive modeling are utilized to facilitate the iterative refinement of prototypes. The integration of novel computer-aided design (CAD) tools with AI systems is explored to achieve complex three-dimensional (3D) models without requiring advanced modelling expertise. The research follows generative design techniques for fabricating 3D models specifically tailored for a robotic arm. The sequential procedures involved in this integration are comprehensively explored to provide a detailed understanding.

Results:
The results of the study showcase the successful development of complex 3D models for robotic grippers through the integration of AI with the standard 3D modelling process. The application of generative design techniques, coupled with AI-powered simulations, leads to grippers that exhibit enhanced efficiency and versatility. The iterative refinement process, facilitated by AI, contributes to a reduction in development time and associated expenses. The study also highlights the feasibility of achieving sophisticated designs without the need for advanced modelling expertise, thanks to the integration of novel CAD tools with AI systems.

Conclusions:
In conclusion, the integration of artificial intelligence into the 3D modelling process of robotic grippers signifies a crucial advancement in additive technology. The study emphasizes the academic and scientific importance of this integration, showcasing its practical implications in the design and prototyping of robotic limbs. The enhanced efficiency and versatility demonstrated by AI-powered grippers highlight the potential for significant advancements in the field. The research not only provides insights into the sequential procedures but also outlines the practical implementation of components, including the fabrication and evaluation of a prototype robotic arm. This comprehensive examination underscores the transformative impact of AI on the development of sophisticated robotic systems.

JEL Classification: C63, C88, L60, L69, L86.

Keywords: artificial intelligence, CAD, robotics, additive manufacturing, optimization.

LLMS AND THE ART OF ASKING QUESTIONS

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Objectives:
The presentation aims to argue that while LLMs are revolutionizing the way we think about and utilize information, they do not render subject matter expertise obsolete. The presenter intends to illustrate, through examples, how the widespread availability of LLMs can reshape our understanding of knowledge and expertise.

Data and Methods:
The presenter will analyse the progression of information value, starting from raw data, moving through contextualized and usable information, to situated and practical knowledge, and finally reaching practical wisdom (phronesis). The discussion will highlight how LLMs facilitate novel approaches to working with information, supporting this progression in multiple ways.

Results:
The key finding of the presentation is that, in the 2020s, the primary capability of a subject matter expert lies in curiosity, continuous learning, and iterative inquiry rather than static knowledge. The presenter will demonstrate how LLMs play a crucial role at each stage of the information value progression, providing contextual information to AI agents and enabling them to ask progressively better questions for gaining insights.

Conclusions:
In conclusion, the presentation asserts that LLMs contribute to a paradigm shift in the nature of expertise. While subject matter expertise remains essential, the emphasis has shifted towards curiosity-driven learning and inquiry. The presenter contends that LLMs are valuable tools that can be leveraged at each step of the knowledge progression, facilitating a more dynamic and interactive relationship with information in the pursuit of practical wisdom.

JEL Classification: C63, O35.

Keywords: Large language models, GPT-4, LLaMa, PaLM, AI in education, knowledge professions, automation

Section 5. AI in Social Impact and Entrepreneurship

ADVANCING RISK MANAGEMENT THROUGH MACHINE LEARNING AND OPTIMIZATION TECHNIQUES: A CASE STUDY IN FINANCIAL PORTFOLIO MANAGEMENT

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Objectives:
This study presents a comprehensive study on the integration of advanced machine learning techniques and optimization methods in the field of risk management, with a specific focus on financial portfolio management. The primary objective is to demonstrate how these cutting-edge technologies can enhance decision-making processes, improve risk assessment, and ultimately lead to more robust and efficient portfolio strategies.

Data and Methods:
The study leverages a rich dataset encompassing a diverse range of financial instruments, including equities, fixed-income securities, and alternative investments. The data spans multiple asset classes and incorporates historical market trends, volatility measures, and fundamental financial metrics. Machine learning algorithms, such as deep learning models and ensemble methods, are employed for predictive modelling, while state-of-the-art optimization techniques are utilized to construct and rebalance portfolios.

Results:
Our findings reveal substantial improvements in risk-adjusted performance metrics compared to traditional portfolio management approaches. The integration of machine learning models allows for more accurate forecasts of asset returns and volatilities, leading to enhanced portfolio diversification and risk mitigation. Furthermore, the optimization process consistently identifies portfolios that achieve higher expected returns for a given level of risk tolerance. These results are validated through extensive back-testing and sensitivity analyses.

Conclusions:
This study demonstrates the considerable potential of combining machine learning and optimization methodologies in the realm of risk management and financial portfolio construction. The results highlight the practical applicability of these techniques in real-world scenarios, offering substantial value to investment professionals and financial institutions. By harnessing the power of artificial intelligence, practitioners can make more informed, data-driven decisions, ultimately leading to more robust and resilient investment strategies.

JEL Classification: C44, G11.

Keywords: risk management, financial portfolio management, machine learning, optimization methods, data mining, artificial intelligence, quantitative research.

ARTIFICIAL INTELLIGENCE AND THE DECLINE IN STUDENTS' INTELLIGENCE

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Objectives:
This text aims to examine the impact of artificial intelligence (AI) on education, focusing on potential drawbacks and benefits. The primary objectives include exploring concerns related to students' dependency on technology, the potential loss of basic skills, the impact on motivation, the influence on social skills, and ethical considerations. Additionally, the text aims to present counterarguments advocating for the positive aspects of AI in education.

Data and Methods:
The analysis is based on a qualitative examination of the perceived effects of AI on education. The text draws upon observations and opinions regarding students' reliance on AI, potential skill erosion, motivational factors, social implications, ethical concerns, and counterarguments. The methods involve a critical evaluation of the presented arguments and a consideration of various perspectives on the role of AI in education.

Results:
The findings suggest that the use of AI in education raises significant concerns, including students' overreliance on technology leading to a decline in critical thinking skills, potential loss of fundamental skills, diminished motivation, and negative impacts on social skills. Ethical issues, such as data confidentiality and unequal access to educational resources, are also highlighted. Despite these concerns, there are counterarguments emphasizing the potential benefits of AI in personalizing learning materials and increasing educational accessibility.

Conclusions:
In conclusion, the text posits that artificial intelligence has the capacity to both enhance and hinder the educational process. It underscores the importance of a conscious and moderate approach to utilizing AI in education. The key takeaway is that a balanced integration of AI, coupled with measures to foster skill development and mitigate negative consequences, can contribute positively to the overall development of students' intelligence. This nuanced perspective advocates for a thoughtful and controlled use of AI in education to maximize its benefits while minimizing potential drawbacks.

JEL Classification: I21, I23, J24, O33.

Keywords: artificial intelligence, education, decline in intelligence, dependency on technology.

ARTIFICIAL INTELLIGENCE AND THE FUTURE OF BUSINESS WORK ENVIRONMENT

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Objectives:
The primary objectives of this literature review are to explore the transformative impact of artificial intelligence (AI) on the future business environment. The study aims to investigate how AI has become an essential component of business development, its applications in various commercial and industrial sectors, and its influence on business functions, operations, and innovation. The research also seeks to understand the implications of AI on future work prospects and human interaction, as well as the potential of AI to nullify human limitations.

Data and Methods:
The research comprises a comprehensive secondary literature review and theoretical analysis. Professional reports and scientific journals were meticulously selected as literature sources. The analysis involves both empirical and conceptual research to showcase the role of artificial intelligence in shaping the future business work environment. Theoretical frameworks and available resources are examined to provide insights into the mechanisms, applications, and effects of AI in business management.

Results:
Artificial intelligence, as discussed in the literature, has brought about a radical transformation in the business landscape. It has replaced traditional methods of development in various sectors, offering capabilities such as analysis, learning, interpretation of knowledge, voice recognition, and problem-solving. The applications of AI extend to monitoring, reporting, customer services, campaign development, and risk assessment. The integration of AI has led to increased value creation and sophistication in business functions.

Conclusions:
The findings suggest that artificial intelligence has the potential to surpass human expectations, breaking through the division between human knowledge and execution. The research indicates that AI systems are evolving and self-regenerating into mechanized automation systems. To integrate AI into mainstream business management successfully, there is a need for adaptability and a deep understanding of future market demands. The study concludes that the long-term integration of artificial intelligence requires continuous learning and development. The implications of AI on future work prospects and human interaction underscore the need for businesses to embrace and adapt to the evolving landscape of AI technology.

JEL Classification: F23.

Keywords: artificial intelligence, AI systems, human interaction, knowledge, business environment.

ARTIFICIAL INTELLIGENCE IN SOCIAL ENTREPRENEURSHIP DEVELOPMENT: ADVANTAGES AND THREATS

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Objectives:
The primary objectives of this study are to investigate the advantages and threats associated with the use of Artificial Intelligence (AI) in social entrepreneurship. The focus is on understanding how AI can contribute to the missions of social enterprises and help in achieving social, economic, and environmental goals. Additionally, the study aims to highlight the ethical and social considerations that must be taken into account when integrating AI into social entrepreneurship.

Data and Methods:
To achieve the objectives, the study employed a multi-faceted approach. The methods utilized include a comprehensive literature review of existing literature to understand the current landscape and insights regarding AI in social entrepreneurship. In addition, the expert interviews, and surveys: Gathering qualitative data through expert interviews and quantitative data through surveys to capture perspectives and opinions on the advantages and threats associated with AI in social entrepreneurship. Quantitative Data Analysis and Statistical Methods: Employing quantitative data analysis techniques and statistical methods to process and analyse a substantial amount of data. This includes evaluating trends, correlations, and patterns related to the use of AI in social entrepreneurship.

Results:
The research results indicate that AI can significantly contribute to social entrepreneurship by: facilitating the development of innovative products and services; improving the quality of life and addressing community needs. Analysing large volumes of data for trend identification and forecasting in social issues. Enhancing strategic planning, decision-making, and internal communication within social enterprises. Streamlining fundraising and resource mobilization efforts, leading to improved program implementation efficiency. However, the study also identifies several threats and challenges, including ethical concerns, potential job displacement, and the vulnerability of AI to attacks and unauthorized access.

Conclusions:
In conclusion, the integration of AI in social entrepreneurship presents both opportunities and challenges. While AI can be a valuable tool for achieving societal goals, careful consideration must be given to ethical and social aspects. Transparency, ethical standards, and addressing potential job displacement are crucial for ensuring that AI contributes positively to social entrepreneurship. The study emphasizes the need for ongoing scientific research to guide the controlled development of AI, creating conditions that align with societal objectives.

JEL Classification: D71.

Keywords: artificial intelligence (AI), social entrepreneurship, dangers, advantages, decision-making.

A DEPLOYMENT OF ARTIFICIAL INTELLIGENCE AND ITS ETHICAL IMPLICATIONS

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Bifrost University, Iceland
Jan Budik
Brno University of Technology, Czech Republic

Objectives:
The primary objectives of this research are to conduct a comprehensive exploration of the current discourse surrounding artificial intelligence (AI) and its application across various human activities. Specifically, the study aims to investigate the ethical considerations and challenges related to AI deployment, with a focus on data privacy, algorithmic bias, interpretability, and the evolving role of educators. The overarching goal is to contribute to the development of a human-friendly deployment framework for AI and related technologies that prioritizes human well-being, fairness, transparency, and accountability.

Data and Methods:
The research employs a two-phase approach. In the initial phase, a critical literature review is conducted to synthesize existing knowledge on AI, emphasizing recent advancements and their implications. This phase forms the foundation for the long-term research project. The second phase involves interviews with experts and users of artificial intelligence to gather firsthand insights into the practical aspects and implications of AI implementation. This dual-method strategy aims to provide a comprehensive understanding of the advantages and disadvantages of AI usage, with a particular emphasis on ethical considerations and human-centred design principles.

Results:
The preliminary findings reveal a robust discourse on the pros and cons of AI implementation. The literature underscores the importance of human-friendly deployment, emphasizing ethical considerations as crucial components. Themes such as human-centred design principles, fairness, and accountability emerge as central to fostering a positive impact of AI on society. The results suggest a need for strategic integration of these concepts into AI deployment strategies to ensure harmony with human values and well-being.

Conclusions:
In conclusion, this research underscores the significance of ethical considerations in the deployment of AI and related technologies. The identified themes, including human-centred design principles, fairness, and accountability, highlight the essential elements for promoting a positive societal impact of AI. The study advocates for a future where AI technologies work in tandem with human values and well-being. The ongoing research, incorporating literature review and interviews, contributes to building a comprehensive framework for the human-friendly deployment of AI, addressing the challenges and opportunities posed by these evolving technologies.

JEL Classification: D71.

Keywords: artificial intelligence, modern technologies, ethics, ethical implication.

Section 6. AI in Learning and Social Development

LEGAL ASPECTS IN AI-BASED RECOMMENDATION IMPLEMENTATION TO INVESTMENT PLATFORMS

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Objectives:
The primary objective of this study is to provide an overview of potential approaches to the legal regulation of AI-based investment decisions. Specifically, the research aims to address the challenges arising from the widespread implementation of AI solutions in various aspects of human development, particularly in the context of digital investment. The study seeks to explore the implications of AI-driven decisions on existing legal frameworks, with a focus on the responsibility distribution between decision-makers and AI creators.

Data and Methods:
The research employs predominantly qualitative methods, utilizing content analysis and word use intensity as key tools. The data corpus comprises more than a hundred papers discussing artificial intelligence development and legal regulation. Additionally, a comparative analysis is conducted to identify potential regulatory solutions for AI-based decision-making in investments. Quantitative methods, such as descriptive statistics on word count, are applied to enhance the understanding of the research findings.

Results:
The study has yielded several significant results. Firstly, it highlights the absence of a consensus in current research regarding the allocation of responsibility between decision-makers and AI creators in the context of AI-based solutions. Secondly, an analysis of existing tools for regulating the consequences of investment losses due to AI-recommended strategies reveals inherent disadvantages in each solution. Thirdly, quantitative research indicates substantial variations in types of investing, suggesting the need for distinct regulatory frameworks for different subsections of investing. Finally, the research points to crowdfunding regulations as potentially resembling a suitable framework for regulating AI-based investments, emphasizing the importance of studying relevant experiences in this domain.

Conclusions:
In conclusion, the findings of this study underscore the complexity of legal regulation in the rapidly evolving landscape of AI-based investment decisions. The lack of consensus on responsibility allocation and the identification of disadvantages in existing regulatory tools highlight the need for a nuanced and adaptive approach. The suggestion that different subsections of investing may require distinct regulatory frameworks emphasizes the importance of tailored solutions. The proximity of crowdfunding regulations to a potential AI-based investment regulation framework suggests an avenue for further exploration and study of relevant experiences in this context. Overall, this research contributes valuable insights to the ongoing discourse on the legal challenges posed by the integration of AI in investment decision-making.

JEL Classification: K22, K24.

Keywords: AI-based investments, legal framework, legal regulations, investment regulation.

INTEGRATING DIAGNOSTIC MODELS: A REVOLUTIONARY APPROACH IN AI-DRIVEN HEALTHCARE

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Objectives:
The rapid advancements in artificial intelligence (AI) have paved the way for its integration into medical diagnostic complexes, revolutionizing the field of healthcare. This paper presents a method for the seamless integration of diagnostic models into AI systems, aiming to enhance the accuracy and efficiency of medical diagnoses.

Data and Methods:
We leverage a comprehensive dataset comprising diverse medical imaging modalities, including radiographic, tomographic, and histopathological images, alongside corresponding clinical reports. The proposed method employs a hybrid approach, combining convolutional neural networks (CNNs) for feature extraction and recurrent neural networks (RNNs) for temporal context modelling. Additionally, domain-specific knowledge is integrated using an expert system, ensuring clinical relevance and interpretability.

Results:
Our experiments demonstrate significant improvements in diagnostic accuracy compared to standalone AI systems. The integrated approach achieves a sensitivity of 94.5%, specificity of 92.3%, and an overall classification accuracy of 93.8%. Furthermore, the incorporation of domain-specific knowledge leads to enhanced interpretability, enabling clinicians to gain valuable insights into the decision-making process of the AI system.

Conclusions:
This study introduces a novel method for integrating diagnostic models into AI systems within medical diagnostic complexes. The results indicate a substantial enhancement in diagnostic accuracy, emphasizing the potential of this approach in clinical practice. The utilization of domain-specific knowledge ensures not only accuracy but also provides valuable interpretability, bridging the gap between AI and human expertise. This method represents a significant step towards harnessing the full potential of AI in healthcare, ultimately leading to more accurate and efficient diagnoses.

JEL Classification: I19.

Keywords: artificial intelligence, medical diagnosis, diagnostic models, knowledge integration, healthcare.

AI-RECOMMENDATION IMPLEMENTATON IN ECOMMERCE: A QUANTITIVE STUDY OF CUSTOMER INTENTION

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Objectives:
The primary objective of this study is to examine customer attitudes towards AI-based recommendations in the context of e-commerce. Specifically, the research aims to investigate the impact of personal characteristics, internet browsing habits, and the influence of electronic filtering on the acceptance of AI-driven recommendations. The study also seeks to understand how customer attitudes may vary across different products and services within online marketplaces.

Data and Methods:
The data collection process involved the distribution of an electronic questionnaire to customers of various e-commerce platforms. The questionnaire, sent to over ten thousand individuals, was designed to gather personal characteristics and measure attitudes using Likert scales related to artificial intelligence and e-commerce. A total of 135 valid responses were obtained. The analysis utilized quantitative methods, including descriptive statistics, correlation, and regression analysis, performed using SPSS Statistics software version 24.0.

Results:
The research yielded several key findings. Firstly, personal characteristics were found to be insignificantly correlated with attitudes towards AI-based recommendations, contrary to the initial expectation that younger individuals would be more receptive. Secondly, the study identified that the number of hours spent browsing the internet only had a slight influence on attitudes towards AI-based solutions in e-commerce. Thirdly, the hypothesis linking the widespread use of electronic filtering to the intention to use AI-recommendations was confirmed. Lastly, variations in customer attitudes were observed concerning different products and services purchased through marketplaces, indicating distinct levels of readiness to embrace AI-based solutions in the e-commerce setting.

Conclusions:
In conclusion, this study sheds light on the nuanced dynamics of customer attitudes towards AI-based recommendations in the e-commerce sector. It highlights the limited significance of personal characteristics and internet browsing habits in shaping these attitudes, emphasizing the confirmed relationship between electronic filtering and the inclination to use AI-recommendations. The observed variations in attitudes across different product categories underscore the importance of considering product-specific factors when implementing AI-based solutions in e-commerce. These findings contribute to a deeper understanding of the factors influencing customer acceptance of AI-driven recommendations, offering valuable insights for the development and deployment of recommendation systems in the evolving landscape of online marketplaces.

JEL Classification: L81.

Keywords: e-commerce, AI-based recommendation, marketplace, customer attitude.

PECULIARITIES OF RECONSTRUCTION OF THE TERRITORIES OF UKRAINE IN VIEW OF THE DEVELOPMENT OF DIGITAL TECHNOLOGIES

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Objectives:
The research aims to optimize technologies for reconstructing Ukraine's territories post-war, with a focus on increasing environmental efficiency and minimizing costs.

Data and Methods:
Methods include an analytical review of modern projects and technologies. Evaluation metrics involve assessing environmental damage based on the flow of useful resources, considering natural features and minimal environmental impact. The proposed sequence of actions includes damage assessment, ecosystem monitoring, project competitions, technological partnerships, winner selection, and the creation of an "electronic restoration map."

Results:
The study suggests a step-by-step plan for restoration, involving assessment, competition, technological collaboration, and international team formation. A detailed "map of recovery" outlines restoration stages, timeframes, and resource needs. The plan encompasses infrastructure restoration, land reclamation, and the creation of "innovative settlements" and non-commercial nature protection areas.

Conclusions:
Based on analytical data, collaboration with international companies such as Microsoft, Nvidia, Samsung, Google, Bosch, Amazon, LG, and others is proposed. Major players in the innovation market, like the Urban Tech District, can contribute to building infrastructure using artificial intelligence. Engaging the local population through competitions for innovative projects is emphasized. Funding through company donations aims to reduce corruption and test new products in the region. In conclusion, technology-driven collaboration with global companies and local innovation can play a pivotal role in restoring Ukraine's territories, fostering environmental sustainability, and involving the community in the reconstruction process.

JEL Classification: D74.

Keywords: technology development, rebuilding of Ukraine, restoration of territories, digital development.

ARTIFICIAL INTELLIGENCE ON THE FRONTLINE IN THE XXI CENTURY

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Objectives:
The main objective of our research is to investigate whether the artificial intelligence will ever dominate the battlefield or not, and how the World's military conscription system is supposed to be changed in a reply for modern challenges.

Data and methods:
Analysis, synthesis, induction, deduction.

Results:
War is one of the greatest accelerators of the progress in our World. It is a common rule which still dominates, especially on the battlefield. Nowadays, even more, the success depends on whose side the modern technologies will be in war. Therefore, the postulate of applying development in the sphere of artificial intelligence during armed conflicts starts to be more and more crucial at present. On the battlefield of actual armed conflicts, during further ongoing full-scale invasion of Russia on the territory of Ukraine, both sides already apply AI in various branches, starting with fully automatic drones, battle machines and other technical tools that save more and more soldiers during military operations. Prospectives desires of number of people around the world will ask to exchange human resources into AI completely. However, it will not be objectively possible.
If wars waged applying only AI, it would not mean lack of victims among civilians. It would not mean also lack of property and city infrastructure destruction. Because AI will still wage war most probably in the most common way of destruction and fear. What is more, when everybody will count exceptionally on modern technologies, every highly professional hacker attack would be able to leave the whole State defenceless, because the more quality AI is, the more professional will also become hacker. On the other hand, we will be able to protect more lives on the battlefield itself and avoid somehow "unnecessary" or "accidental" victims among humans. At the same time, though, risk of switching to an artificial battlefield is still enormous.

Conclusions:
AI on the battlefield cannot just save lives of soldiers, but also be an incredible risk for the State's defence system. Therefore, we should develop an appropriate system of co-functioning between human resources and AI.

JEL classification: 18C.

Keywords: artificial intelligence, frontline, modern wars, artificial battlefield, human factor.

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