15. International Quality Conference

BOOK OF ABSTRACTS

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15. International Quality Conference
Quality Festival 2025

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Dear friends,

By providing international platform, 15. International Quality Conference 2025 will gather experts from industry and academia in order to exchange ideas and present results of ongoing research in a range of topics.

This Conference has a motto "QUALITY AND SUSTAINABILITY Road to Business Excellence".

We invite you to participate in this important event.

Sincerely yours,
President of Organization Committee

Prof. dr Miladin Stefanovic

15th IQC QUALITY RESEARCH

CONTENT:

15. International Quality Conference

SCIENTIFIC FOCUS 1

Quality Festival 2025
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Slavko Arsovski [1]
Zora Arsovski
Marija Zahar Djordjevic

Research paper

A NEW ROLE OF SMART QUALITY 4.0, 5.0 AND 6.0 ON INDUSTRY 4.0 / 5.0 / 6.0 AND SOCIETY 6.0

Abstract: *A concept of quality is developed in previos centuries dominantly related to quality of products and then quality of industrial organizations. In this period is defined and used concepts of Industry 1.0, Industry 2.0, Industry 3.0, Industry 4.0, Industry 5.0 and now Industry 6.0. This transformation of industry is fellowed concept of quality from Quality 1.0 to Quality 6.0.*

In the paper is presented this way and challenges of the transformation and especialy now role of smart quality for Industry 4.0/5.0 and Smart and Intelligent Quality for Industry 6.0 and Super Intelligent Society 6.0.

Keywords: *Industry 6.0, Quality 6.0, Super Intelligent Society 6.0.*

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Tadeja Jere Jakulin [1]

Research paper

SYSTEMS THINKING, AI AND CONSCIOUSNESS FOR EDUCATIONAL QUALITY

Abstract: *This paper presents the integration of systems thinking and artificial intelligence (AI) as tools for enhancing quality in education. It is based on theoretical analysis connecting systems dynamics, theories of consciousness, and research on AI in education. Through qualitative modelling, we develop causal loop diagrams illustrating the complex interactions between three types of systems (autopoietic, allopoietic, and evolutionary) in the educational context. The article presents a theoretical method and practical guidelines that create a bridge between traditional linear teaching and the holistic systems approach, only by using AI responsibly. The presented models illustrate the potential of systems thinking for promoting consciousness development and offer a foundation for future development of empirically-based simulation models.*

Keywords: *AI, Systems Thinking, Education Quality, Modelling, Consciousness*

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Milos Jelic [1]

Research paper

THIRTY YEARS OF NATIONAL BUSINESS EXCELLENCE AWARD IN SERBIA

Abstract: *National business excellence award "OSKAR KVALITETA" (up to 2002 named Yugoslav Quality Award) began in 1995. In the course of thirty years of its implementation "OSKAR KVALITETA" underwent five revisions aiming to accommodate to the transition in social and business environment as well as trying to keep pace with globally relevant business excellence competitions. Among several approaches to business excellence from the very beginning "OSKAR KVALITETA" has turned to stakeholders approach setting its goal in balanced satisfaction of key organizational stakeholders. The paper describes modifications made in each business excellence model revision trying to meet the expectation of organizations and society. Despite various temptations during three decades lasting, national business excellence award remained non-governmental and fully professional what have safeguarded the reputation of the Award so far.*

Keywords: *Business Excellence, Quality Awards, Organizational Stakeholders*

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Jasmina Ćurčić[1]
Sandra Milunović Koprivica
Zoran Nešić

Research paper

ANALYSIS OF STANDARDIZATION EFFECTS AND IMPROVEMENT OF BUSINESS QUALITY

Abstract: *The packaging sector has turned to new searches to offer consumers safer, higher-quality food products and to adapt to the markets. Traditional packaging is no longer sufficient. New features of food packaging are influenced by consumers' preferences for higher food safety, desire for information and convenience. New packaging systems that increase the protective power of the packaging, extend the shelf life, monitor the product, provide information about its quality and are used for product sections have emerged. This research aims to determine the perceptions of associate degree students about food packaging and their perspectives on new-generation packaging (Smart Active Packaging). The sample of the research consists of associate degree students of Namık Kemal University Vocational School of Technical Sciences. According to the results of the research, there is a statistically significant relationship between the participants' gender and various packaging preferences. The results show that associate degree students do not have detailed knowledge about innovative packaging, but they are open to training on innovative packaging. Understanding students' perspectives on packaging can help develop appropriate packaging designs for young consumers. In this context, future research can provide students with more information about innovative packaging and increase their awareness by creating personalized training programs with artificial intelligence.*

Keywords: *Quality, Quality in business, Standardization, Effects.*

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Rehabeam K. Shapaka[1]

Research paper

COMPLEX INTERPLAY BETWEEN SERVANT, DEMOCRATIC, TRANSFORMATIONAL LEADERSHIP AND SYSTEMIC CHALLENGES

Abstract: *This study explores complex interplay between servant, democratic, transformational leadership and systemic challenges. Data was collected through interview schedule, field notes and open-ended questionnaire. Criterion purposeful sampling technique was used to select ten educational leaders from ten schools. Data analysis was conducted using thematic analysis, typological analysis and content analysis using Atlas.ti. The findings have established the complex interplay between servant, democratic and transformational leadership and systemic challenges, leadership styles used and the complex interplay between them. Educational leaders need to study and learn the application of leadership styles, apply leadership styles to optimise their success and enhance schools performance which results on student performance. Educational leaders should integrate elements of servant, democratic, and transformational leadership to support teachers, enhance job satisfaction, and promote student success. Leadership styles have complex interplay on schools performance which affects schools, teachers' performance and student performance.*

Keywords: *leadership styles, schools performance, democratic, servant, transformational*

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Aleksa Šepec[1]
Sandra Mladenović
Ognjen Simonović

Research paper

THE IMPACT OF IMPLEMENTING ISO 21001:2018 STANDARD ON THE OPERATIONS OF BELGRADE METROPOLITAN UNIVERSITY

Abstract: *There are a plethora of ISO standards, tailored to different industries and domains. This includes ISO 21001:2018, a standard adapted to educational institutions. This standard represents a set of requirements that can be applied to any educational organisation, regardless of its size, type and location, in order to achieve more efficient and effective operations. By analysing the current operations of educational institutions in our country, it was found that the University of Belgrade is the only educational institution that implemented ISO 21001:2018, on 20 September 2021. However, no private university has done so. Based on this, the idea for the implementation proposal of the aforementioned standard at Belgrade Metropolitan University was created, where the analysis of the current Belgrade Metropolitan University's operations and the current quality management method will be presented, as well as the reasons for ISO 21001:2018 standard implementation.*

Keywords: *ISO 21001:2018, Belgrade Metropolitan University, Quality And Standardisation, Student Satisfaction, General Regulations, Educational Institutions*

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Research paper

THE INFLUENCE OF PEOPLE DEVELOPMENT PROGRAMS ON THE BUSINESS PROCESSES QUALITY IN ORGANIZATIONS WITH THE IMPLEMENTED ISO 10015 STANDARD

Abstract: *This study examines the impact of people development programs (PDPs) on business process quality in organizations implementing the ISO 10015 standard. The research focuses on the relationship between PDPs and the number of failures among employees, distinguishing between production operators and administrative staff. A questionnaire was administered to 1980 employees across 68 Slovak companies certified under ISO 9001 and using ISO 10015. The results indicate a strong negative correlation (r = - 0.78) between PDP participation and failures among production operators, suggesting significant improvements in process quality. However, no significant relationship was found for administrative staff (r = - 0.04). The findings reveal a marked difference between these groups regarding PDP effectiveness. Overall, a moderate negative correlation (r = - 0.51) was observed across all employees, affirming that PDPs enhance business process quality by reducing employee failures. These insights underscore the importance of PDPs in fostering operational efficiency, particularly among production personnel.*

Keywords: *People Development Programs, Business Process Quality, ISO 10015 Standard, Employee Performance, Production Operators, Administrative Staff*

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Research paper

APPLICATION OF BPM AND ECM TECHNOLOGIES IN SUPPORTING QUALITY MANAGEMENT SYSTEMS -- CASE STUDY

Abstract: *Extensive literature and numerous reports from business practice show how important the role of IT/IS is in implementing and maintaining Quality Management Systems (QMS). The entire class of IT systems supporting quality assurance in enterprises is called Quality Management Support Systems (QMSS). The aim of this paper is to show the key role that Business Process Management and Enterprise Content Management technologies can play as QMSS. The article presents a case study of building QMSS based on an integrated BPM/ECM platform. The subject of the analysis will be a large nationwide network of medical laboratories, which has a number of certified ISO quality systems. The analysis will concern a several-year project of defining and implementing quality processes and building a digital repository of quality documents. Models of quality processes and their systemic mapping will be presented. The quality processes are focused on content (content centric processes), therefore, during their digitization, the application of content management technology and building an integrated repository of quality content will also be discussed. The paper will present the concept of using the Unified Content Strategy to create an intelligent quality management system (iQMS). The conclusion of the work will be to show that the combination of BPM and ECM technologies can bring integration and flexibility to building quality processes, provide orchestration of these processes. What is more, the increase in employee participation in creating and supervising quality processes, and providing a modern communication platform for the content of quality management systems will be emphasized.*

Keywords: *Quality Management Systems, Quality Management Support Systems, BPM, ECM, BPMN*

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Krzysztof Mielczarek[1]
Stanisław Borkowski

Research paper

THE IMPORTANCE OF QUALITY IN THE MISSION OF ENTERPRISES

Abstract: *This paper presents the results of a survey conducted among enterprises from various indus-tries. It examines the significance of quality as a key factor in the Toyota House model, spe-cifically its roof. In addition to quality, the roof also encompasses safety, lead time, imple-mentation costs, and team morale. These five factors constitute the E1 area of the BOST method, a fundamental research tool in Toyotarity.*

The study identifies the characteristics of respondents, establishes importance rankings, evaluates the degree of similarity in preferences, assesses the significance of differences in average ratings, and analyzes the impact of respondents' characteristics on factor im-portance. Based on the results and their analysis, the mission of enterprises were formulated.

Keywords: *Toyotarity, Quality, Toyota House Model*

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Research paper

THE QUALITY OF POLISH SCIENTIFIC PUBLICATIONS IN THE FIELD OF ECONOMICS AND MANAGEMENT

Abstract: *The presentation and the publication will be composed of three main parts:*

- *The overview of previous research results concerning bibliometric measures used for expressing the quality of research publications and identification of factors influencing the quality of publications,*
- *identification of factors characterizing Polish scientific publications in the field of economics and management (subject of the publication, number of authors, research experience of the authors, affiliation of the authors, internationalization of an author's team),*
- *construction of a model describing the relationship between publication quality and potential determinants.*

The research will be conducted with the use od data about 35 thousand Polish research publication published in the period 2000 – 2024 and registered in the Scopus database.

Keywords: *Quality, Poland, Economics, Management*

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Joanna M. Dziadkowiec[1]

Research paper

ADAPTING LEAN MANAGEMENT TO SERVICE INDUSTRIES: A SYSTEMATIC REVIEW OF PRACTICES AND CHALLENGES

Abstract: *This study explores the adaptation of Lean Management (LM) principles in service organizations through a systematic review of 58 peer-reviewed articles from 2000–2025. It examines sector-specific implementation patterns, success factors, and challenges across healthcare, IT, and financial services. Findings highlight the need to recontextualize LM tools like Value Stream Mapping and PDCA cycles to address service-specific metrics such as client satisfaction and process flexibility. Key success factors include leadership commitment, employee training, and digital integration for process monitoring. Case studies demonstrate efficiency gains, including a 40% reduction in healthcare diagnostic timelines and 25% waste elimination in shared services. The study proposes a Lean maturity framework for services and hybrid models integrating Agile methodologies. Challenges include balancing standardization with personalization and quantifying intangible outputs. This research offers actionable insights for aligning LM practices with the unique dynamics of service industries.*

Keywords: *Lean Management, Service Industries, Systematic Review, Implementation Challenges, Success Factors, Lean Maturity Framework*

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Marek Jabłoński[1]

Research paper,

TECHNICAL PROGRESS AND THE CHANGE OF WORK CONTENT OF ORGANISATIONAL POSITIONS: CASE OF A MUNICIPAL COMPANY IN POLAND

Abstract: *The paper presents the results of the analysis of change of the work content of jobs of the municipal company in Poland in the period: 2009-2025. The research assumed that the change in the content of the work occurred as a result of technical progress. The study is based on the observations carried out on the general population of the company with the use of the following methods: interview, document analysis, and group discussion. The implemented approach of analysis of changes in work content is content with studies that investigate the influence of technical progress on job design, particularly in sectoral and economic research. However, there is little research showing the application of such an approach in relation to individual enterprises, particularly all positions in the enterprise.*

The findings of a study are as follows; Potential for automation of manual jobs have been limited to the greatest extent in core activities, which may suggest that it is in this area that technical progress in work processes, especially manual jobs, is implemented first and relatively most intensively. Additionally, technological progress in work processes implemented in core and auxiliary activities limits routine manual jobs, but is associated with an increase in routine cognitive jobs. The paper also identifies the different specificity of the impact of technical progress on the content of work in individual areas of the company's activity. In other words, the empirical confirmation of the sequence of automating work within individual areas of the company's activities has been pointed out.

Keywords: *Work Content, Technical Progress, Municipal Company*

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Elżbieta Szczygiel[1]

Research paper

SPECIFICS OF CIRCULAR BEHAVIOUR ON THE EXAMPLE OF POLISH HOUSEHOLDS

Abstract: *Despite the growing popularity of the Circular Economy (CE) concept, only a few studies analyse the role of household members in its implementation. There is still a need to systematise behaviour in terms of inclusion in the CE. It is possible to rank the behaviours adopted by household members in terms of the circularity of their effects. Such an arrangement also makes it possible to group coherent areas of action in order to identify the factors that favour their adoption by household members. The main questions are therefore: 1) Can the Circular Behaviours (CB) undertaken by households be grouped and what is their structure? 2) How are the different groups of such behaviours related to each other? Do analizy wykorzystano dane z losowej reprezentatywnej próby 1200 gospodarstw domowych z Polski, obejmujące 44 zachowania zidentyfikowane na podstawie przeglądu literatury i związane z CE. Do wyodrębnienia struktury wykorzystano eksploracyjną analizę czynnikową (EFA). Na podstawie wyników opracowano model równania strukturalnego (CB-SEM). This resulted in five groups of behaviours (latent variables): Simple CB, Recovering, Repairing, Re-using and Energy. The strongest causal relationship was found between Recovering and Re-using (r=0.708). Simple CB influenced on Repairing (0.670). Interestingly, Repairing things did not have a strong effect on the desire to use used items (0.220). However, the use of renewable energy was associated with the use of second-hand items (0.463). The results of this analysis provide information and guidance on how to shape environmental policy at the micro level (households) and how to implement a circular economy in the area of use and disposal of used products (i.e. at a stage where businesses have no direct influence on their behaviour).*

Keywords: *Circular Behaviours, CB-SEM, Poland, Households*

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Pavle Popović [1]
Dragan Vujović
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Research paper

APPLICATION OF THE INTEGRATED PORT SERVICES MANAGEMENT MODEL IN THE CONTEXT OF QUALITY, SAFETY, AND SECURITY

Abstract: *The primary objective of this research is to apply a new integration model in the management system within maritime practice, utilizing modern scientific methods and approaches. The subject of the research is maritime services, with a particular focus on port services, through the definition of internal and external advantages of introducing integrated management systems.*

The goal is to recommend practical training in real port systems, which commonly operate in maritime practice in the field of integrated management systems, from the perspective of quality, safety, and security of vessels and ports.

Keywords: *Improvement, BSC model, KPI, Business performance management, Key performance indicators, Phase sets, Simulation models*

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Layla Boulkhir[1]
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Souad Taha

Research paper

THE TRANSFORMATIVE IMPACT OF SOCIAL ENTREPRENEURS: THE CASE OF COOPERATIVES IN MARRAKECH-SAFI USING BINARY LOGISTIC REGRESSION ANALYSIS

Abstract: *This article explores the impact of social entrepreneurs in the Marrakech-Safi region of Morocco, highlighting how their personal characteristics contribute to the region's social and sustainable development. Using a quantitative methodology based on binary logistic regression, the study analyzes data from 100 social entrepreneurs active in agricultural cooperatives. These cooperatives focus on various activities such as livestock farming, beekeeping, poultry farming, rabbit farming, and the production and sale of local products like cereals, dried fruits, dairy products, and aromatic and medicinal plants. The results show significant links between the personality traits, motivations, and skills of social entrepreneurs and their impact on territorial economic development. Their performance is significantly impacted by both internal and extrinsic motives, as well as personality factors like conscientiousness, extraversion, agreeableness, emotional stability, and openness to new experiences. The cognitive, relational, and functional skills of social entrepreneurs are also crucial. The article offers practical recommendations to support and strengthen social entrepreneurship in the region, emphasizing the importance of favorable public policies and strategic partnerships. This study provides a deep understanding of the specific dynamics in Marrakech-Safi, offering valuable insights for researchers, policymakers, and practitioners.*

Keywords: *Social entrepreneurship Individual characteristics of social entrepreneurs Generalized linear models Binary logistic regression*

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Research paper

THE ENTREPRENEURIAL JOURNEY: FACTORS CONTRIBUTING TO SUCCESS (CASE: KENITRA CITY)

Abstract: *The study of entrepreneurial success is situated within a complex and dynamic research field. While numerous studies have attempted to decipher the determinants of this success, our understanding of the underlying mechanisms remains partial. In this perspective, our research aimed to explore the factors influencing the sustainability of small and medium-size enterprises in Kenitra. By adopting a qualitative approach based on semi-structured interviews, we sought to understand the experiences and perceptions of entrepreneurs in all their complexity. After an in-depth review of the scientific literature, our empirical study identified three key categories of factors: individual factors, related to the entrepreneur's personal characteristics; contextual factors, related to the economic, social, and institutional environment; and organizational factors, linked to strategic choices and management practices. Our results, while confirming some of the conclusions of the existing literature, also provide important nuances. They highlight in particular the crucial role of social networks in accessing resources and opportunities, as well as the importance of constant adaptation to market changes. This study thus contributes to enriching the theoretical body of knowledge on entrepreneurship and offers avenues for reflection for public policies aimed at promoting the development of the local entrepreneurial ecosystem.*

Keywords: *Entrepreneur, approaches, personal factors, environmental factors, managerial factors*

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Sunday Isdory Mkama[1]

Research paper

MEDIATING ROLE OF PROCESS INNOVATION ON THE RELATIONSHIP BETWEEN ENTREPRENEURIAL TRAINING AND BUSINESS PERFORMANCE OF WOMEN FOOD VENDORS IN ILALA MUNICIPALITY, TANZANIA

Abstract: *This study was aimed to investigate the mediating role of process innovation on the relationship between entrepreneurial training and the business performance of women food vendors in Ilala Municipality, Tanzania. Understanding this relationship is important since entrepreneurship is regarded as a crucial aspect of economic development in general and within informal economies that are mainly performed by women. Informed by Schumpeter's theory of innovation, the study used a quantitative method to analyse data from 349 women food vendors, using partial least squares structural equation modelling (PLS-SEM). The results indicate that entrepreneurial training has a positive impact on process innovation ($\beta = 0.757$, $p < 0.001$), and process innovation has an impact on business performance ($\beta = 0.327$, $p < 0.001$). The mediation analysis demonstrates that training has a statistically significant indirect effect on performance through process innovation ($\beta = 0.247$, $p < 0.001$), suggesting that mediation accounts for 43% of the total effect. These findings suggest that there is a value in developing more targeted training programs related to process innovation projects, as well as support for better business performance. Ultimately, it is critical for decision-makers and trade practitioners involved in development to co-design skills programs pertaining to capacity building and innovation that are geared toward building up informal economy development and sustainability. In this respect, this study recommends the incorporation of entrepreneurial training blended with process innovation to realize measurable business performance. Future research might examine the longer-term effects of such interventions beyond this study and consider the use of digital tools in creating an environment of innovation for women entrepreneurs.*

Keywords: *entrepreneurs, informal sector, Entrepreneurial Training, Process Innovation, Business Performance*

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Research paper

ADOPTION OF HUMAN RESSOURCES INFORMATION SYSTEM BY THE MORROCAN ADMINISTRATION: A QUANTITATIVE STUDY APPLYING DELONE AND MCLEAN MODEL

Abstract: *This study was aimed to investigate the mediating role of process innovation on the relationship between entrepreneurial training and the business performance of women food vendors in Ilala Municipality, Tanzania. Understanding this relationship is important since entrepreneurship is regarded as a crucial aspect of economic development in general and within informal economies that are mainly performed by women. Informed by Schumpeter's theory of innovation, the study used a quantitative method to analyse data from 349 women food vendors, using partial least squares structural equation modelling (PLS-SEM). The results indicate that entrepreneurial training has a positive impact on process innovation ($\beta = 0.757$, $p < 0.001$), and process innovation has an impact on business performance ($\beta = 0.327$, $p < 0.001$). The mediation analysis demonstrates that training has a statistically significant indirect effect on performance through process innovation ($\beta = 0.247$, $p < 0.001$), suggesting that mediation accounts for 43% of the total effect. These findings suggest that there is a value in developing more targeted training programs related to process innovation projects, as well as support for better business performance. Ultimately, it is critical for decision-makers and trade practitioners involved in development to co-design skills programs pertaining to capacity building and innovation that are geared toward building up informal economy development and sustainability. In this respect, this study recommends the incorporation of entrepreneurial training blended with process innovation to realize measurable business performance. Future research might examine the longer-term effects of such interventions beyond this study and consider the use of digital tools in creating an environment of innovation for women entrepreneurs.*

Keywords: *Adoption; Information Quality; HRIS; Human Resources; Public Administration;Service Quality; System Quality*

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Research paper

LEGAL COMPLIANCE OF HUMAN RESOURCE MANAGEMENT PRACTICES AND LABOR CONFLICTS

Abstract: *This study aims to assess the proportion of causes of labor conflicts that are linked to the legal non-compliance of Human Resource Management (HRM) practices in conflicts recorded within Moroccan companies. The primary objective of this research is to quantify the percentage of conflict causes associated with the legal non-compliance of HRM practices within these organizations. Quantitative results reveal a significant contribution of conflict causes linked to legal non-compliance, representing 48% of all observed cases of labor conflicts. These conclusions highlight an important avenue to consider in the development of proactive strategies for preventing labor conflicts within Moroccan enterprises. They also underscore the importance of promoting HRM practices that adhere to legal standards, emphasizing their crucial role in human resource management and the promotion of social stability within Moroccan businesses. These findings reinforce the necessity of developing strategic approaches centered on legal compliance to foster a harmonious and sustainable work environment.*

Keywords: *Human Resource Management; Legal Compliance; Labor Conflicts; Social Peace; Labor Law; Causes of Conflicts; Professional Relations; Morocco.*

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Marek Jabłoński[1]
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Research paper

REMOTE WORK AND THE QUALITY OF PERSONNEL MANAGEMENT – CHALLENGES AND EXPERIENCES FROM A MUNICIPAL ENTERPRISE

Abstract: *The aim of this study is to analyze the relationship between the implementation of remote work and the assessment of personnel management quality in a municipal sector enterprise. The analysis focuses on identifying specific managerial challenges related to the organization of hybrid work and the impact of these challenges on assessments of cooperation quality, communication effectiveness, and supervisor support. The primary research questions are: (1) How does the assessment of personnel management quality (including satisfaction with supervisor collaboration, perceived support, and communication effectiveness) differ between employees working remotely and those working exclusively onsite? (2) What specific managerial barriers emerged during the implementation of remote work in a municipal enterprise, and how have they influenced perceptions of personnel management quality?*

The empirical analysis is based on survey results conducted among operational employees and managerial staff at Wodociągi Miasta Krakowa S.A. Surveys were conducted twice, in 2023 and 2025, allowing for a comparative analysis of respondents' opinions and capturing the dynamics of changes in the perception of remote work and management quality. The obtained results will highlight specific managerial challenges associated with hybrid work in the municipal sector and enable the formulation of practical recommendations for further improvements in personnel management processes in such organizations.

Keywords: *Remote Work, Personnel Management, Municipal Enterprise*

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Review paper

EXPLORING HOW PRODUCTION FACTORIES ALIGN OPERATIONAL EFFICIENCY WITH MARKET DEMAND: A SYSTEMATIC LITERATURE REVIEW

Abstract: *This literature systematic review considers the way that manufacturing plants reconcile operational efficiency with demand within the marketplace, a key factor influencing long-term competitiveness. Based on 32 peer-reviewed papers (2020-2024), the study finds key strategies such as Industry 4.0 technologies, supply chain integration, and sustainability-focused strategies. Methodologically, a systematic search in multiple databases was conducted to guarantee exhaustive inclusion criteria. The findings highlight the significance of digital transformation, automation, and organizational capabilities in reconciling alignment. However, sustainability integration and industry-specific implementation are still research-underdeveloped. The adoption of artificial intelligence, real-time analytics, and sustainable manufacturing frameworks is suggested by the study to enhance responsiveness and resource utilization. Managers need to ensure digital literacy and workforce skills development, and policymakers need to drive industrial modernization through policy incentives in bills. Future studies need to examine AI optimization, the impact of sustainability on efficiency, and technology-workforce engagement across industries to further develop mechanisms of operational alignment.*

Keywords: *Operational Efficiency, Market Demand, Production Factories, Sustainability, Industry Supply Chain Integration, and Systematic Literature Review*

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Review paper

SYSTEMATIC ARTICLE REVIEW ON EXPLORING THE EFFECTIVENESS OF GUERRILLA MARKETING STRATEGIES IN EMERGING MARKETS: A CASE STUDY OF SME

Abstract: *This systematic review investigates the efficacy of guerrilla marketing for SMEs in developing nations. Adopting a qualitative approach, the study synthesizes findings from 25 shortlisted studies. Articles published between 2015 and 2025 were hunted from highly reputed journals and databases, and articles were collected from around the world to ensure validity and avoid bias. Evidence proves guerrilla marketing to be highly effective when campaigns are culturally compatible and utilize digital media. However, ethical concerns and the lack of systematic evaluation models are challenges. The study recommends the utilization of digital media tools, cultural compatibility of campaigns, and the embracement of ethical practices to optimize the long-term efficacy of guerrilla marketing.*

Keywords: *Guerrilla Marketing, SMEs, Emerging Markets, Digital Marketing, Ethical Concerns, Consumer Engagement*

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Bindhiya Rai
Tshering Drolkar Bhutia
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Smita Kumari

Revierw paper

SUSTAINABLE DEVELOPMENT AND BHUTAN'S GROSS NATIONAL HAPPINESS: AN ALTERNATIVE TOWARDS A HOLISTIC GOAL

Abstract: *The Sustainable growth or the Sustainable Development, were introduced on a report called "Our Common Future" by World Commission on Environment and Development in 1987. It incorporates economic, environmental, and social contemplations, aiming for balanced and long-term progress. The major aspects of sustainable growths are economic viability, environmental responsibility, social equity, long-term perspective, resource efficiency, adaptability and resilience.*

In the wake of attaining objectives goals every nation has committed to implement the policy which can foster the sustainable growth. Bhutan, nestled in Himalaya with about 7,50,000 population has since the 1980s adopted a innovative, holistic approach to development governance commonly referred to as 'Gross National Happiness' (GNH), which aims at achieving equitable socio-economic progress along with environmental preservation, good governance, and protection of the local cultural identity inspired by purely Buddhism Philosophy.

Keywords: *sustainable growth, Gross National Happiness (GNH).*

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Maroua Barha[1]
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Research paper

ANALYSIS OF THE INFLUENCE OF ERP ON THE PERFORMANCE OF MOROCCAN COMPANIES: VALIDITY OF THE MEASUREMENT MODEL

Abstract: *This paper focuses on the study of ERP (Enterprise Resource Planning) impact on the performance of Moroccan companies, while highlighting the causal relationships between the contributions of ERP and the measurement criteria of various aspects of performance, including economic, organizational, and human aspects.*

Our primary objective is to test the reliability and validity of the measurement model for the impact of ERP on the performance of Moroccan companies.

To achieve this, we conducted a quantitative study using a questionnaire administered to Moroccan companies that use ERP systems. The collected data were then subjected to confirmatory factor analysis through structural equation modeling, particularly using the PLS (Partial Least Squares) approach.

The results of this study demonstrated that the assessment of the impact of ERP systems on the performance of Moroccan companies can be conducted using a questionnaire tailored to professionals.

Keywords: *ERP; Impact; Economic Performance; Organizational Performance; Human Performance; Moroccan Companies.*

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Maroua Barha[1]
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Research paper

THE IMPACT OF ERP SYSTEMS ON THE PERFORMANCE OF MOROCCAN COMPANIES: AN ASSESSMENT OF THE STRUCTURAL MODEL

Abstract: *Enterprise Resource Planning (ERP) systems represent a major opportunity to enhance business efficiency. This study seeks to assess the impact of ERP implementation on the performance of Moroccan companies, focusing on three key dimensions: economic, organizational, and human performance.*

Data were collected through a questionnaire distributed to executives of Moroccan companies and analyzed using SmartPLS4 software.

The findings confirm that ERP adoption has significantly improved the economic, organizational, and human performance of Moroccan businesses.

Notably, the implementation of a unified database has greatly enhanced the reliability of information exchange. This improvement has, in turn, strengthened communication and coordination across the various departments within the company.

Keywords: *ERP; Economic Performance; Organizational Performance; Human Performance; Moroccan Companies.*

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Research paper

INTERNATIONAL TRADE IN SERVICES AS A CATALYST FOR GROWTH: A COMPREHENSIVE ANALYSIS OF MOROCCO

Abstract: *This research examines the influence of international trade in services on economic value generation, utilizing Morocco as a case study. The global landscape has transitioned to a service-oriented economy, propelled by technological breakthroughs and liberalization policies. This research used a multiple linear regression (MLR) model to examine data from 2001 to 2022, investigating the correlations between GDP and several service-related variables, such as transportation, travel services, and foreign direct investment (FDI). The findings indicate that service exports substantially enhance GDP growth, but imports generally detract from economic value. Foreign Direct Investment (FDI) is emphasized as a driver for growth, affirming its impact on technology transfer and capacity enhancement. These findings highlight the necessity of strategic strategies to foster service sector exports and attract foreign direct investment, enabling Morocco and other emerging countries to augment their involvement in global value chains. The paper closes by advocating for policies that promote service innovation and enhance infrastructure, recognizing the constraints associated with educational and technical factors, and proposing directions for further research.*

Keywords: *Adoption; Information Quality; HRIS; Human Resources; Public Administration; Service Quality; System Quality*

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Marek Krynke[1]
Dorota Klimecka-Tatar

Research paper

A SIMULATION-BASED APPROACH TO QUALITY MANAGEMENT IN MANUFACTURING THROUGH BALANCING PROCESS SPEED AND COST MINIMIZATION

Abstract: *This paper presents a simulation-based approach to quality management in manufacturing processes, focusing on balancing production speed and cost minimization. A simulation model developed in the FlexSim environment is utilized to replicate the quality control process and analyze the impact of production speed on product defect rates. The model incorporates the relationship between machine processing time and the percentage of defective products, described by a power function. System optimization is conducted to minimize production costs while maintaining an adequate level of quality. The research findings identify optimal process parameters that enable cost reduction and enhance the efficiency of quality control.*

Keywords: *Quality Management, Simulation Modeling, Process Speed Balancing, Cost Minimization, Flexsim*

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Evgenia Vygodskaya[1]
Elena Lipniagova

Research paper

FOREIGN ECONOMIC ACTIVITY IN LOGISTICS: A BIBLIOMETRIC ANALYSIS AND SCOPING REVIEW

Abstract: *In the context of globalization and accelerated technological change, the influence of foreign economic activity on logistics is becoming increasingly significant. This study presents a comprehensive bibliometric and scoping review of 78 peer-reviewed articles from the Scopus database (2020–2024), structured using the PRISMA-ScR and PICO frameworks. The analysis identifies five key research themes: sustainability and green logistics, disruptive technologies (AI, blockchain), risk management, procurement performance, and the development of air cargo and reverse logistics. Using Python-based modeling and bibliometric indicators such as the H-index, Impact Factor, and Collaboration Index, the study maps the intellectual landscape of the field. Findings show that external economic factors—such as policy shifts, trade agreements, digitalization, and environmental regulations—significantly reshape logistics strategies and performance. The review underscores the need for businesses to integrate technological innovation and sustainability practices to enhance operational efficiency and resilience. It also highlights research gaps related to emerging markets and reverse logistics, offering directions for future inquiry and practical improvements in global supply chain management.*

Keywords: *Foreign Economic Activity, Logistics, Supply Chain, Digitalization, Sustainability, Risk Management*

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Paweł Dziekański
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Joanna Wyrobek

Research paper

ANALYSING AND EVALUATING MUNICIPAL AND ENVIRONMENTAL EXPENDITURE IN POLAND'S VOIVODSHIPS USING SPATIAL AUTOCORRELATION

Abstract: *Purpose: Ecological and spatial development includes appropriate creation of spatial order and development of environmental values. The main purpose of the article is to present how to use a measure of spatial autocorrelation to determine the degree of polarization of the relationship between environmental spending, municipal management and ecological activities in Poland (at the level of provinces).*

Design/methodology/approach: The study was carried out in two stages.In the first, an analysis of the literature on the subject, descriptive statistics, synthetic measure (according to the CRITIC-TOPSIS method) was carried out. In the second stage, a spatial (local and global) Moran's I analysis was performed. Empirical data, selected substantively and statistically, were obtained at the level of provinces in Poland, available for 2010-2012 and 2020-2022 in Statistics Poland.

Findings: The results of research at the level of provinces in Poland show that the relationships between expenditures on municipal management and environmental protection and environmental activities at the level of provinces, have their justification, while, no statistically significant regularities were found in this regard.However, the recorded trend of growth of these relationships (between expenditures on municipal management and environmental protection and environmental activities) is slightly increasing.

Research limitations/implications: The research was conducted at the provincial level in Poland. A limitation of the study was the insufficient availability of data on spending on environmental protection, municipal management and ecological activities in Poland (at the provincial level).

Practical implications: The results can be the basis for further research on a wider range of variables, a larger time period or other methods (including structural models), analysis of the relationship of subindices, or the study of relationships at the municipal level. Empirical research is needed on the relationship of the study area to the circular economy,

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demographic and financial conditions, which is related to the availability of diagnostic variables in Staistical Poland. The results serve as a source of information for national and local authorities on the difference between provinces. Applying this knowledge can help authorities assess how well the instruments and tools that have been used to implement environmental or regional policies are working.

Originality/value: The research indicates the essence of sustainable development in terms of the relationship between environmental protection and pro-ecological activities, with rational design of expenditures by individual local government units. The value of the article is the combined treatment of pro-ecolofgic expenditures and the state of ecology in Poland (provinces) in 2010-2012 and 2020-2022.This is an important inspiration for conducting and publishing further research, aimed at how to increase the effectiveness of the implementation of sustainable development in the conditions of a particular territorial unit.

Keywords: *Pro-Environmental Spending, Environment, Province, Synthetic Measure, Spatial Autocorrelation*

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Research paper

EVALUATION OF THE RELATION OF EXPENDITURES ON MUNICIPAL MANAGEMENT AND ENVIRONMENTAL PROTECTION AND PRO-ENVIRONMENTAL ACTIVITIES AT THE LEVEL OF VOIVODESHIPS IN POLAND BASED ON THE MEASURE OF SPATIAL AUTOCORRELATION

Abstract: *This study examines the environmental and health challenges at Pasar Siti Khadijah, Kelantan, using the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) framework. The purpose is to systematically identify hazards, assess risks, and propose effective control measures tailored to the market's socio-cultural context. The study utilizes a mixed-methods approach, including observational surveys, structured questionnaires, and semi-structured interviews with a stratified random sample of 217 market vendors. Results reveal significant issues, such as inadequate waste management, poor ergonomic workspace design, and unsanitary conditions, which worsen foodborne illnesses, respiratory conditions, and pest infestations. These findings underline the importance of environmental ergonomics in optimizing market layouts and waste systems to reduce these risks. The findings highlight the urgent need for targeted interventions, including improved waste management systems, gender-sensitive hygiene training, and community-driven awareness campaigns. This research concludes that integrating HIRARC with environmental ergonomics, alongside cultural and demographic considerations, provides actionable strategies to enhance market sustainability, public health, and human-environment interaction. These results offer a replicable framework for managing similar risks in traditional markets across Malaysia and beyond.*

Keywords: *Environmental Ergonomic, Risk Assessment, Sustainability, Safety & Health*

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Research paper

ENVIRONMENTAL ERGONOMICS AND SUSTAINABLE RISK MANAGEMENT: ENHANCING HEALTH AND SAFETY IN MALAYSIAN WET MARKETS

Abstract: *This study examines the environmental and health challenges at Pasar Siti Khadijah, Kelantan, using the Hazard Identification, Risk Assessment, and Risk Control (HIRARC) framework. The purpose is to systematically identify hazards, assess risks, and propose effective control measures tailored to the market's socio-cultural context. The study utilizes a mixed-methods approach, including observational surveys, structured questionnaires, and semi-structured interviews with a stratified random sample of 217 market vendors. Results reveal significant issues, such as inadequate waste management, poor ergonomic workspace design, and unsanitary conditions, which worsen foodborne illnesses, respiratory conditions, and pest infestations. These findings underline the importance of environmental ergonomics in optimizing market layouts and waste systems to reduce these risks. The findings highlight the urgent need for targeted interventions, including improved waste management systems, gender-sensitive hygiene training, and community-driven awareness campaigns. This research concludes that integrating HIRARC with environmental ergonomics, alongside cultural and demographic considerations, provides actionable strategies to enhance market sustainability, public health, and human-environment interaction. These results offer a replicable framework for managing similar risks in traditional markets across Malaysia and beyond.*

Keywords: *Environmental Ergonomic, Risk Assessment, Sustainability, Safety & Health*

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Research paper

CONSIDERATION OF THE POTENTIAL DANGER OF VIOLATIONS IN ASSESSING THE EXPECTED PREVENTED DAMAGE AT OIL AND GAS INDUSTRY FACILITIES

Abstract: *In modern conditions of increasing scale and complexity of production systems, proactive methods of ensuring safety through the use of a risk-based approach are of particular importance. Within the framework of these methods, the main efforts are aimed at early identification of violations and deviations in the operation or maintenance of the facility and their elimination before violations and deviations become prerequisites for events with negative consequences (accidents, incidents, etc.).*

Evaluation of the effectiveness of inspection control activities as one of the areas of application of proactive safety methods can be carried out using the indicator of expected prevented damage, taking into account direct and indirect components. The calculation of this indicator is carried out using a modified pyramid of incidents, supplemented by the level of detected violations and deviations, taking into account a number of assumptions.

The use of statistical data on incidents of different scales of consequences allows to predict the number of events prevented, which depends on the number of violations detected and eliminated. However, from the point of view of occurrence and development of incidents, different groups of violations have different levels of potential danger. Using the hierarchy analysis method, an assessment of the potential danger of violations in the field of industrial safety of oil and gas facilities was carried out according to the degree of their influence on the occurrence of prerequisites for incidents, incidents and accidents. Based on the classifier of violations in the field of industrial safety, a three-level hierarchy was compiled, matrices for interviewing experts were developed and a survey was conducted. The expert assessment was performed for three levels: the level of incidents, the level of groups of violations, and the level within groups of violations. The analysis of the results made it possible to obtain estimates of the potential danger of various groups of violations and to increase the validity of the assessment of the expected prevented damage and the effectiveness of inspection control activities

Keywords: *Risk-Based Approach, Prevented Damage, Pyramid Of Incidents, Inspection Control Activities, Potential Danger, Violation*

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Research paper

ENVIRONMENTAL PERFORMANCE AND DIGITIZATION: THE ROLE OF INDUSTRY 4.0 IN THE ECOLOGICAL TRANSITION OF COMPANIES

Abstract: *This study explores the intersection of digitization and sustainability, focusing on how Industry 4.0 technologies can enhance companies' environmental performance during their ecological transition. By leveraging advanced tools such as the Internet of Things, Artificial Intelligence, Big Data, and Blockchain, Industry 4.0 offers innovative solutions to reduce carbon emissions, optimize resource use, and promote supply chain transparency. This paper analyzes the transformative potential of these technologies while acknowledging the associated challenges, including high implementation costs, skill shortages, and e-waste management. Through a review of contemporary research and case studies, the findings highlight both opportunities and constraints, providing actionable recommendations for maximizing the environmental benefits of digitalization. This integrated perspective aims to support decision-makers in rethinking industrial processes and supply chains, aligning them with sustainable economic models. The results underscore the critical role of Industry 4.0 in addressing environmental challenges and advancing corporate ecological responsibility.*

Keywords: *Industry 4.0; Environmental Performance; Digital Transformation; Ecological Transition; Advanced Technologies*

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Research paper

RETURNS AND BUSINESS VALUE OF ECOLOGICAL POLICIES: AN ANALYSIS OF THE ICO2 INDEX

Abstract: *Global warming and climate change, intensified since the Industrial Revolution, are primarily driven by the burning of fossil fuels, which has increased greenhouse gas (GHG) emissions and raised global temperatures by more than 1°C (Budoia Filho; Humberto, 2016). In response, sustainable initiatives have gained prominence, such as the creation of stock market indices evaluating the performance of companies committed to sustainable practices. In Brazil, B3, the Brazilian stock exchange, launched the Carbon Efficient Index (ICO2), a theoretical portfolio designed to foster discussions and investments based on environmental conduct regarding GHG emissions, and to encourage the adoption of environmental practices and greater transparency (B3, 2024).This study employs traditional time series models like ARMA and GARCH, as well as machine learning techniques based on neural networks, to model and forecast the index's volatility. The results show these models successfully capture the daily variation behavior of the series, identifying periods of high volatility linked to political uncertainties, COVID-19 measures, and increases in Brazil's benchmark interest rate. The ARMA(29,0)-GARCH(1,1) model revealed that 89.2% of the previous day's volatility persists into the next day. During the analyzed period, companies in the financial products sector represented between 35% and 54% of the total portfolio, standing out for their commitment to reducing GHG emissions. Finally, no evidence was found regarding the returns of companies that invested in ecological policies. It is recommended that future studies conduct analysis of these returns.*

Keywords: *Volatility, Sustainable, Time Series, GHG Emissions*

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Research paper

ENHANCING SAFETY AND ENVIRONMENTAL RESILIENCE IN MARINE TOURISM: RISK MANAGEMENT STRATEGIES FOR MALAYSIAN JETTIES

Abstract: *Marine tourism in Malaysia is a key economic sector and play a critical role in coastal and island transportation. However, the growth in tourism has introduced challenges, particularly in occupational safety, environmental sustainability, and operational risks. The paper aims to analyse safety awareness and improving risk assessments among boat operators and stakeholders. The research employs a mixed-method approach, including qualitative interviews, focus group discussions, and quantitative risk assessments using Hazard Identification and Risk Assessment (HIRA) methodologies. A total of 10 most prominent tourism jetties in Malaysia were involved in this study. The findings reveal that overcrowding and inconsistent safety practices significantly affect both safety performance and environmental quality. Operators perceived that insufficient risk management measures during peak tourism periods compromise both their occupational safety and environmental sustainability. The study highlights the urgent need for targeted strategies to enhance safety awareness, improve quality of life, and ensure environmental resilience in marine tourism hubs.*

Keywords: *Marine Tourism, Occupational Safety, Risk Assessment, Environmental Sustainability, Quality of Life*

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Research paper

RESORTS AND RISKS: ENHANCING WORKER SAFETY AND HEALTH FOR HIGH-TOURISM AREAS IN PAHANG, MALAYSIA

Abstract: *A few nations including Malaysia contribute in safety measures, such as Occupational Safety and Health Administration (OSHA) to extend the safety performance in their nation. The department too mindful for the administration and authorization of legislations related to occupational safety and health of the nation such as Occupational Safety and Health Act 1994, Factories and Machinery Act 1967 and Part of Petroleum Act 1984 (Safety Measures). It moreover leads the country in creating a safe and healthy work culture that contributes towards upgrading the quality of working life. The problem statement in this study is the level of assessment of the safety and health in the area at Pantai Teluk Cempedak and Pantai Cherating. The objective in this study, first is to determine the level of safety and health of workers in the resort area at Pantai Teluk Cempedak and Pantai Cherating and secondly is to identify the risk and control measure according to the safety of workers. So, the finding in this study the probability of an accident in the workplace is high. Hotels with pools where there is no life guard duty to watch out the pool will risk the accident to happen, then the probability of accidental occurrence in the pool area is high for visitors, or for workers and the probability of crash severity is high as an example of a life-threatening accident. Therefore, finding in this study is about safety and health at work place. All workers need to take this course and understand it better to avoid any incidents at work place.*

Keywords: *Safety & Health; Resort Area; Hazard Identification, Risk Assessment & Risk Control*

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Research paper

FOOD SAFETY ECONOMICS - THE INFUENCE OF THE LACK OF FOOD SAFETY

Abstract: *The food safety economics (FSE) will be described.FSE is a quite new term, not widely discribed in the literature. It shows the cost of the lack of food safety. Food safety is very important because the lack of it has a direct, negative impact on our health or life. FSE delas with the identification of the costs of the lack of food safety and their impact on various areas, for example: the economy, society, industry. It also deals with the costs that are complicated to be assessed as trust, image, quality of life. The identification of costs will be characterized as well as the possibilities to assess them.*

Keywords: *Food Safety, Economics, Costs Of Lack Of Food Safety*

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Research paper

CONSUMER ATTITUDES AND BEHAVIORS TOWARDS THE PROBLEM OF FOOD WASTE

Abstract: *With the development of civilisation, the world has recorded an increase in the production, processing, and consumption of food. An excessive supply of a variety of food products leads to irrational purchases and, consequently, to the waste of food products and raw materials. This has negative social, economic and environmental consequences. Because the phenomenon of food waste occurs in households on the largest scale, compared to other stages of the food chain, a study of consumer attitudes and behaviour towards the problem of food waste was undertaken. The study was conducted in 2024 on a sample of 306 consumers using an online survey. Consumer attitudes were examined along cognitive, emotional, and behavioural dimensions. The thematic scope of the analysis included issues such as consumer perceptions of food waste, individual behaviour, and habits of consumers, the most commonly wasted food products, and opportunities to reduce this phenomenon by promoting sustainable consumer practices. Food waste occurs mainly because it exceeds the expiration date, excessive purchases, or improper food storage. Ninety % of the respondents admitted that they throw away food, including one in three, several times per month. The most commonly discarded food products are leftovers of meals, bread, fruits, and vegetables. The vast majority of respondents (98%) were aware of the problem of food waste and tried to reduce it by using various practices, such as checking before going shopping what products are in the house, using products from the previous day, or freezing excess food.*

Keywords: *Food Weste, Consumer Behavior, Sustainable Development*

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Research paper

MIXTURES OF ENDOCRINE DISRUPTORS IN THE WORKPLACE: TOWARDS A BETTER EVALUATION OF THE EXHIBITION

Abstract: *Endocrine disruptors (EDs) are the target of many debates and research on their potential effects on public health. However, while workers are daily exposed to multiple EDs, most often found in complex mixtures and at varying concentrations, few studies and projects in the workplace have been carried out. Consequently, this lack of information and studies complicates the identification and consequently the exposure assessment to these mixtures. However, many tools for the assessment of chemical risks such as regulations, strategies and programs, technical tools, and preventive measures are available. In order to assess worker exposure and the potential risks of these substances. Thus, an action plan dedicated to EDs mixtures based on the precautionary principle and using existing tools is proposed to industries exposing their workers to these mixtures, with the aim of enabling employers to detect at most early, to assess and prevent their employees' exposure to EDs cocktails as much as possible.*

Keywords: *Endocrine Disruptors, Mixtures, Exposure Assessment, Precautionary Principle, Preventive Measures*

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Research paper

THE IMPACT OF PHYSICAL FATIGUE ON THE PERFORMANCE OF EMPLOYEES IN PUBLIC UTILITY COMPANIES IN THE REPUBLIC OF SERBIA

Abstract: *This study examines the impact of physical exhaustion as a dimension of burnout on employee performance in public utility enterprises in Serbia. Physical exhaustion, characterized by a decrease in physical energy and the ability to perform work tasks, has become an increasingly significant factor affecting workforce productivity and overall health. Utilizing a structured questionnaire distributed to 101 employees across six public utility companies, the research identified a statistically significant negative correlation between physical exhaustion and job performance at a confidence level of 0.01. Findings reveal that high levels of physical exhaustion result from excessive workload, inadequate workplace conditions, and insufficient recovery time, leading to decreased efficiency and productivity. This research underscores the urgent need for interventions to mitigate physical exhaustion among employees, thus enhancing their work performance and the quality of services provided to the community.*

Keywords: *Ob Burnout, Physical Exhaustion, Employee Performance, Public Utility Enterprises, Republic Of Serbia.*

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Matej Stoprd[1]
Ivan Grgačić

Research paper

COMBATING FOREST FIRES IN REMOTE AREAS: PREVENTION, TECHNOLOGY, AND COMMUNITY COLLABORATION

Abstract: *Forest fires in inaccessible areas are a serious problem all around the world and often lead to catastrophic consequences not only for the areas affected by the fire but also for nearby agricultural and even residential areas. In addition, forest fires also pose a potential threat to tourism, which is one of the most important economic sector in developed countries, as large forest fires instill insecurity and fear among visitors. This paper examines the challenges and measures for protecting against forest fires in inaccessible areas, which are at high risk of fire due to global warming and adverse climate conditions. The number of forest fires is expected to increase by 50% by 2050, which requires improved safety measures and equipment. The consequences of fires include ecological, economic and social damage, while most fires are caused by human activities. The paper focuses on key factors that influence forest fires, such as meteorological conditions, vegetation types and accessibility of forest areas, and emphasizes the importance of preventive measures such as forest thinning, construction of access roads and vegetation planning that can slow down the spread of fires. Innovative methods such as 24-hour video and meteorological surveillance, drones with thermal cameras and fire spread simulators help in prevention and rapid intervention. The paper also highlights the importance of cooperation between local communities and farmers in fire prevention activities, and how these measures contribute to the development of tourism, agriculture and sustainable management of natural resources. The application of these systems of some area's has proven effective in reducing risks and damages, while the implementation of technologies such as video surveillance and simulations can further improve fire responses. The developed systems contribute to economic profitability and environmental protection, and provide many benefits for local communities.*

Keywords: *Fire Prevention, Forest Fires, Holistic Fire Protection*

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Research paper

OVERVIEW OF RISK MANAGEMENT TOOLS USING THE PDCA CYCLE

Abstract: *Continuous improvement of processes, products, and services is the goal of every organization to ensure business sustainability through careful planning and implementation. Risk assessment implementation involves aseries of requirements that must be met, as defined and conditioned by the ISO 31010:2019 standard. Risk assessment within this standard is based on the PDCA(Plan-Do-Check-Act) cycle, which enables a systematic and continuous approach to risk identification, analysis, and management. A wide range of tools and methods for risk assessment, as outlined in ISO 31010:2019, can be integrated within the PDCA cycle, ensuring effective risk management and process optimization within the organization. In the planning phase (Plan – P), risk identification is conducted using methods such as FMEA, SWOT analysis, scenario analysis, and the Delphi method. During the implementation phase (Do – D), quantitative and qualitative risk analysis methods are applied, including Monte Carlo simulations, the risk consequence and probability matrix, and Fault Tree Analysis (FTA). In the verification phase (Check – C), the results of the implemented methods are analyzed through statistical analysis, mathematical calculations, data audits, and comparison with reference values. Finally, in the action phase (Act – A), corrective measures and improvements are introduced based on the obtained results. In conclusion, the PDCA cycle, besides ensuring a systematic, repeatable, and adaptable risk assessment process, allows for continuous monitoring and adjustment of measures, ultimately minimizing risks to the lowest possible level.*

Keywords: *PDCA cycle, Deming cycle, ISO 31010:2018, FMEA method, risk assessment*

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SCIENTIFIC FOCUS 4

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Short research paper

DIGITAL TWINS IN SMART MANUFACTURING: ADOPTION, CHALLENGES, AND FUTURE PROSPECTS

Abstract: *With the ability to provide real-time visualization of machines, processes, and systems, Digital Twins (DTs) have rapidly emerged as a vital component of smart manufacturing. This study explores the use of DTs across various industries, highlighting key challenges such as data integration, scalability, and cybersecurity, while outlining future opportunities driven by advances in AI, IoT, and edge computing. DTs have transformative potential to enhance operational efficiency, enable predictive maintenance, and support data-driven decision-making, even as they face technical and ethical obstacles. Through case studies and literature review, this paper presents a comprehensive understanding of the current landscape and the future direction of DTs in smart manufacturing.*

Keywords: *Industry 4.0, Artificial Intelligence, Cybersecurity, Data Integration, Scalability, Smart Manufacturing, Digital Twins.*

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Research paper

INDUSTRY 4.0 – INNOVATIVE ROBOTIC STATION FOR FRUIT & VEGETABLE PROCESSING

Abstract: *This paper aim is to present idea and results of work on research, development and construction of innovative robotic station which should help in automation of fruit and vegetable primary processing tasks. Basic idea is related to introduction of Industry 4.0 tools and methods in order to achieve increasing efficiency, productivity, quality and flexibility for small and medium-sized producers in food industry.*

Keywords: *Industrial Robot, Machine Vision, AI, Industry 4.0*

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Research paper

SYNERGY BETWEEN INDUSTRY 4.0 AND PERSONAL DATA PROTECTION: LEGAL CHALLENGES AND COMPLIANCE STRATEGIES

Abstract: *The rise of digital technologies is driving a profound transformation in our society, affecting not only the way we communicate but also our lifestyles, work habits, and social interactions. Industry 4.0, which integrates smart technologies into production processes, represents the current industrial revolution, characterized by the digital interconnection of machines. However, this evolution raises significant challenges in terms of personal data protection, which lies at the heart of this digital transformation. The global flow of data, facilitated by the Internet and cyberspace, challenges traditional legal boundaries of protection. This article aims to examine the synergy between Industry 4.0 and personal data protection by analyzing the legal issues and international compliance strategies needed for better optimization of privacy in the digital age.*

Keywords: *Personal data - Data protection - Industry 4.0 - Compliance strategies - International standards - Industrial revolution - Information and communication technologies (ICT) - Digital boundaries*

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Research paper

DETERMINANTS OF THE INTENTION TO ADOPT INDUSTRY 4.0 TECHNOLOGIES: AN EMPIRICAL ANALYSIS BASED ON TAM AND UTAUT IN A MULTI-SECTOR CONTEXT

Abstract: *The adoption of Industry 4.0 technologies, including the Internet of Things (IoT), artificial intelligence (AI), and Big Data, represents a pivotal strategic challenge for industrial enterprises. This study examines the behavioral and organizational factors influencing employee acceptance of these technologies within a multi-sectoral context. Grounded in the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), a questionnaire survey was conducted with 150 employees from diverse industrial sectors. The primary objective was to evaluate the effects of perceived usefulness, ease of use, social influence, and facilitating conditions on employees' intentions to adopt these technologies.*

The findings demonstrate that perceived usefulness and ease of use are significant determinants of adoption intention, while social influence, although less pronounced, still exerts a notable effect. Moreover, facilitating conditions were identified as a moderating variable, amplifying the relationship between perceived usefulness and adoption intention. These results provide valuable theoretical contributions and practical recommendations for enhancing the effective integration of Industry 4.0 technologies in industrial enterprises.

Keywords: *Industry 4.0; Technology Acceptance; Technology Acceptance Model (TAM); Unified Theory of Acceptance and Use of Technology (UTAUT); Perceived Usefulness; Ease of Use; Social Influence; Facilitating Conditions*

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Research paper

INCORPORATING AUGMENTED REALITY (AR) IN QUALITY INSPECTION FOR MANUFACTURING PRACTICE

Abstract: *Quality inspection in industry, especially automotive industry, had evolved over the time from measuring manually up to use of advanced technology in process. High production volume of automotive requires measurement of product to be made as accurate as possible even while using conventional inspection jigs. A new approach to integrating augmented reality into product inspection was proposed and tested in actual industrial practice. A concept was developed and experimentally evaluated on effectiveness in measurement of datum point. The difference in process time taken was analyzed. Practical evaluation in industrial practice was created in evaluating augmented reality contribution during quality inspection of a ½-14 NPT connector. Process time taken for both evaluation considering controlled condition of inspection with and without AR was compared and analyzed statistically using independent t-test. The final p-values were compared with a confidence level of 0.95 and expected to be less than 0.05. The analysis showed that there is a significant difference between AR aided inspection inducing reduction of process time.*

Keywords: *Augmented reality, Process time, Quality, Inspection, Independent t-test*

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Review paper

DIGITAL MANUFACTURING: MODERN TECHNOLOGIES AND APPLICATIONS IN LOGISTICS

Abstract: *Under the influence of digital technologies, modern industrial systems are undergoing profound transformation, leading to the creation of new production models and management of logistics processes. Concepts such as Industry 4.0 and the increasingly prevalent Industry 5.0 introduce advanced solutions such as the Internet of Things (IoT), Artificial Intelligence (AI), digital twins, and smart factories, enabling greater flexibility, efficiency, and adaptability in production processes.*

In such an environment, logistics plays a key role in ensuring the continuous flow of materials, information, and energy throughout all phases of production and distribution. The integration of digital technologies into logistics processes enables better planning, real-time tracking, and resource optimization, which directly impacts the overall competitiveness of production systems.

This paper demonstrates how modern technologies affect logistics processes, with an emphasis on challenges, and development prospects. Special attention is given to the possibilities for improving logistics through the application of digital tools.

Keywords: *digital technologies, logistic, digital manufacturing.*

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Research paper

OPC UA IN INDUSTRIAL AUTOMATION: INTEGRATION WITH CNC SYSTEMS AND COMPARATIVE ANALYSIS WITH DNC

Abstract: *OPC UA (Open Platform Communications Unified Architecture) is a modern industrial communication standard designed for secure, reliable, and interoperable data exchange between different devices, applications, and systems within Industry 4.0. Compared to traditional protocols, OPC UA offers several significant advantages, with its main benefit being platform independence, enabling communication between devices from different manufacturers without requiring specific hardware interfaces or custom drivers. OPC UA provides bidirectional communication, allowing not only the transmission of NC programs but also real-time monitoring of machine status and process data. Additionally, OPC UA is scalable, meaning it can be used not only for connecting CNC machines but also for integrating entire manufacturing systems, including SCADA, MES, and ERP solutions.*

The advantages of OPC UA over DNC and older protocols make it an ideal choice for industrial environments that require flexibility, security, and integration with modern technologies. Its capability to operate in distributed systems, compatibility with cloud and IoT (Internet of Things) technologies, and ability to automatically adapt to complex network infrastructures make it a key element of future industrial systems.

Keywords: *OPC UA, DNC, Industrial Automation, CNC Communication, Industry 4.0, IIoT, SCADA, Data Security*

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Research paper

SECURING INDUSTRIAL DATA: THE ROLE OF BLOCKCHAIN TECHNOLOGY IN INDUSTRIAL AUTOMATION

Abstract: *The ubiquitous and accelerated digitization and integration of information and operational technologies have become a key aspect of modern industrial environments. Through the interconnection and interaction of these technologies, a considerable amount of data is generated, making their protection one of the dominant challenges. This paper aims to explore blockchain technology's role in protecting industrial data in modern industrial environments through a comparison with traditional security systems. The paper focuses on identifying critical processes of industrial automation and exploring how the basic principles of blockchain technology, such as decentralization, immutability and transparency, can contribute to the improvement of industrial data security. A good example of the practical application of blockchain technology can be seen in the case study of the implementation of the IBM Food Trust platform in Walmart's supply chain management, illustrating the benefits, including reduced product tracking time and increased transparency. The qualitative results of this research indicate that blockchain technology can significantly improve industrial data security, but also that there are challenges related to scalability, integration with existing systems and regulatory frameworks.*

Keywords: *Blockchain Technology, Industrial Data Security, Decentralization, Transparency, IBM Food Trust,*

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Research paper

INNOVATIVE STRATEGIES IN INDUSTRIAL MACHINERY MAINTENANCE AND REPAIR

Abstract: *Machinery and equipment are the foundations of industrial productivity. However, mechanical failures such as wear, fatigue and corrosion can lead to serious losses. Improving the maintenance and repair processes of machines and their parts has become a critical necessity for businesses in terms of minimizing machine downtime, extending equipment life and reducing costs. Predictive maintenance reduces unplanned downtime and increases operational efficiency by detecting problems before they turn into major failures. While predictive maintenance tools such as vibration and infrared analysis provide early diagnosis, many businesses still struggle with unexpected failures and high repair costs. While modern technologies increase equipment reliability and extend its life, they are not sufficiently integrated into traditional maintenance approaches. Innovative tools, especially Augmented Reality, have the potential to make maintenance and repair processes more efficient and accurate. In this context, it is of great importance to create a comprehensive framework covering sustainability, innovation and failure prevention, and to research innovative strategies to improve machine performance and extend equipment life.*

Keywords: *Wear mechanisms, Repair, Maintenance, Augmented reality, Soldering, Welding, Part replacement*

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Research paper

ANALYSIS OF SAVINGS POTENTIAL THROUGH THE APPLICATION OF WELDING REPAIR FOR THE REVITALIZATION OF PARTS IN CONSTRUCTION MACHINERY

Abstract: *In modern industrial production, due to rigorous working conditions, machine parts frequently fail or wear out, leading to production downtime and financial losses. When a machine part becomes damaged, there are two options: replace the worn part with a new one or repair the damaged part through welding. Although purchasing a new part initially seems like a simpler and more reliable solution, many large industrial systems today opt for the regeneration of damaged components.*

This choice is driven by the multiple advantages that welding offers, not only from a technical perspective but also from an economic standpoint. This paper presents a procedure for determining the optimal technology for repairing various technical systems and provides an overview of potential monetary and time savings achievable through this technology. Costs and savings will be analyzed using the cost-effectiveness (profitability) method for different complex machine parts.

All analyzed components were revitalized through welding. Along with restoring the operational capacity of machine parts, significant savings in both money and time were achieved. The welding technology quality was evaluated and verified through experimental research and monitoring the performance of repaired parts during operation. The savings achieved were calculated using the cost-effectiveness method and expressed in specific monetary values for each analyzed part compared to the costs of purchasing a new one.

Overall, this paper represents a comprehensive techno-economic analysis of welding in the repair of various machine systems.

Keywords: *Welding Repair, Costs, Savings, Profitability*

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Research paper

LIFE CYCLE ASSESSMENT OF BONE GRAFT MANUFACTURING

Abstract: *In this paper, an assessment of the negative environmental impact of the manufacturing of bone grafts was carried out under various environmental aspects. The environmental impact assessment was carried out using the standardised life cycle assessment method . The aim of the study is to quantify and identify the main challenges related to the negative environmental impact of the bone graft production phase. Various aspects were analyzed, including material consumption, energy consumption, emissions, waste and others. The results indicate that the greatest environmental impact is due to energy inputs and material consumption, which highlights opportunities to reduce the impact through material selection, improved energy efficiency and optimization of the manufacturing process.*

Keywords: *Life cycle assessment, Bone graft, Manufacturing*

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Review paper

TRENDS IN ENSEMBLE LEARNING AND MODEL OPTIMIZATION

Abstract: *Ensemble learning has become an adaptive machine learning method, that enhances prediction accuracy, stability, and generalization by averaging several models. This review explains recent developments in ensemble techniques with focus on evolution of traditional techniques such as bagging, boosting, and stacking into adaptive and efficient ones. Contemporary ensemble techniques now comprise deep learning models, hybrid models, and adaptive choice mechanisms to handle challenges such as big data, class imbalance, and computational complexity. Model optimization methods such as parameter tuning, overfitting avoidance, neural architecture search, and trial-and-error are now being incorporated into ensemble systems. All these advancements have given rise to auto-ML platforms which provide scalable and intelligent systems in all domains. Real-world deployment has also been considered by this paper, and emphasis has been placed on problems like model interpretability, runtime efficiency, and suitability for deployment in real-time. Overall, it provides insight into how ensemble learning is transforming data-driven solutions.*

Keywords: *Ensemble Learning, Model Optimization, Auto-ML, Deep Learning, Prediction Accuracy, Real-world Deployment.*

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Research paper

MITIGATION OF CONGESTION USING TCPAR FACTS CONTROLLER

Abstract: *Modern society is heavily dependent on electricity. Consistent efforts are being made to continuously upgrade the power system to meet the ever increasing demand of electrical power. However, installation of generating plants, transmission and distribution systems is a costly affair. With the increasing demand of power, transmission lines are overloaded or congested. Also due to the line outages, other healthy lines become congested. Many FACTS Controllers are available, which can be applied for mitigation of the congestion in the lines. In this research paper, authors have used Thyristor Controlled Phase Angle Regulator (TCPAR) FACTS Controller to mitigate congestion. The authors have mathematically analyzed the efficacy of the TCPAR FACTS controller. TCPAR FACTS Controller is implemented on two different power systems i.e. IEEE 5-Bus Test system and IEEE 9-Bus Test system and results are obtained.*

Keywords: *Congestion Management, TCPAR FACTS controller, IEEE 5-Bus Test system, IEEE 9-Bus Test system*

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Research paper

MECHANICAL AND CORROSION PROPERTIES OF 2507 DUPLEX STAINLESS STEEL: LASER POWDER BED FUSION (LPBF) ANALYSIS

Abstract: *This study examines the mechanical and corrosion properties of 2507 Duplex Stainless Steel (DSS) fabricated using Laser Powder Bed Fusion (LPBF). The influence of laser power and scanning speed on the material's microstructure, mechanical performance, and corrosion resistance was systematically evaluated. Optimized LPBF parameters (350 W laser power, 800 mm/s scanning speed) resulted in a well-balanced austenite-ferrite microstructure (50:50 ratio), minimal porosity, and the absence of detrimental sigma or chi phases after post-processing. These optimized samples exhibited superior mechanical properties, including a yield strength of 735 MPa, ultimate tensile strength of 915 MPa, elongation of 16.5%, and impact toughness of 60 J. Corrosion testing in a 3.5% NaCl solution demonstrated excellent pitting corrosion resistance, with a corrosion current density of 0.35 μA/cm² and a pitting potential of +0.90 V. In contrast, samples fabricated at lower laser power (200 W) showed decreased mechanical strength and corrosion resistance due to higher porosity and sigma phase formation. These findings highlight the potential of LPBF to manufacture high-performance 2507 DSS components for demanding applications. Future research should focus on further optimization of LPBF parameters and the long-term durability of components in aggressive environments.*

Keywords: *Duplex Stainless Steel, Laser Powder Bed Fusion, Mechanical Properties, Corrosion Resistance, Microstructure, Process Optimization, Additive Manufacturing*

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Umeshkumar Chavan[1]
Vishal Sulakhe
Kiran Kaware

Research paper

EXPERIMENTAL STUDY ON LASER MACHINING OF SS 304: MINIMIZING TAPER, ROUGHNESS, AND DROSS

Abstract: *Laser Beam Machining commonly known as LBM is an impeccable industrial tool that enable precise cutting over different materials. This study aims to investigate the best LBM process parameters for SS 304 stainless steel material which will help overcome kerf taper and control surface roughness and dross. Attributes like laser power, cutting speed and assist gas pressure were chosen as factors to determine the performance of this process. RSM along with ANOVA test was used for studying the effect of these parameters. The optimal conditions determined were: 400; for reducing kerf taper, a cutting speed of 5500 mm/min and laser power of 3000 W with gas pressure of 8 bar and for minimizing dross formation, the cutting speed of 4500 mm/min and laser power of 2500 W with gas pressure of 9 bar. The experiments proved a good accuracy between ex-predicted and experimental values. This work offers significant recommendations to address significant issues in enhancing LBM processes for machining stainless steel.*

Keywords: *CO2 Laser cutting, Laser Beam Machining (LBM), SS 304 stainless steel Kerf taper, Surface roughness, Dross formation, Analysis of Variance (ANOVA).*

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Research paper

DESIGN, INSTALLATION AND EVALUATION OF A CONTROL SYSTEM UTILIZING A PRESSURE TRANSMITTER-BASED VARIABLE FREQUENCY DRIVE (VFD) IN AN URBAN WATER PUMP FACILITY IN THE PHILIPPINES

Abstract: *This study addresses the critical issue of energy consumption at the pump facility of a water service provider in Cagayan de Oro City, Northern Mindanao, Philippines. The existing constant-speed pumps which operated at constant speed led to energy inefficiency and increased equipment wear. The present study involves designing and installing a control system using pressure transmitter-based Variable Frequency Drives (VFDs) to regulate pump motor speeds based on real-time demand. By integrating pressure transmitter-based VFDs, the control system dynamically adjusts motor speeds to match the system's actual demand, leading to substantial energy savings. The results demonstrated the effectiveness of the control system in significantly reducing energy consumption, improving equipment performance, and lowering operational costs. It highlights the potential of modern control technologies to optimize energy use in water pump facilities. Moreover, this endeavour serves as a model for improving energy efficiency and enhancing operational efficiency in water distribution systems, benefiting both the utility and the broader community.*

Keywords: *Variable Frequency Drives (VFD), Water Pump Facility, Energy Consumption, COWD*

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Boris Agarski

Research paper

LIFE CYCLE ASSESSMENT OF PACKAGING MATERIALS FOR DRINKING WATER

Abstract: *Packaging materials play a key role in sustainability, as their production and disposal affect the environment. This research examines the environmental impact of different materials used in the production of drinking water packaging: polyethylene terephthalate, white packaging glass, and green packaging glass. The assessment was carried out by applying two levels of environmental impact mechanism: midpoint and endpoint: ReCiPe Midpoint 2016 (H), and ReCiPe Endpoint 2016 (H). The results indicate that polyethylene terephthalate exhibits the lowest environmental impact across most categories, except for the "stratospheric ozone depletion" category. In contrast, white packaging glass demonstrates the highest overall impact.*

Keywords: *Life cycle assessment, Polyethylene terephthalate, Packaging glass*

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Hamid Abdullayev[1]
Elnur Huseynzade

Review paper

OVERVIEW AND PROSPECTS OF MAINTENANCE AND REPAIR METHODS FOR MACHINE PARTS

Abstract: *Since machinery and equipment are the foundation of industrial productivity, breakdowns caused by mechanical failures such as wear, fatigue, and corrosion can cause significant losses. The importance of improving maintenance and repair for machinery and its various parts is explained by the growing need in the industry to minimize machine downtime, increase equipment longevity, and reduce operating costs. By identifying problems before they lead to major failures, predictive maintenance reduces unplanned downtime and ultimately increases operational efficiency. While predictive maintenance tools such as vibration and infrared analysis offer early detections, many enterprises continue to face significant challenges related to unplanned downtime and excessive repair costs. Modern tools that increase reliability and extend the life of equipment are often not integrated into traditional maintenance approaches. New tools such as Augmented reality can completely transform the way maintenance and repair are performed, making them easier and more accurate. The challenge to be explored covers all of these approaches – sustainability, innovation, the exploration of innovative strategies to reduce failures, improve machine performance, and ultimately create a comprehensive framework for longevity.*

Keywords: *Wear mechanisms, Maintenance, Repair, Augmented reality, Welding, Soldering, Part replacement*

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Romeo Jousef Laxamana[1]
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Research paper

OPTIMIZATION AND PERFORMANCE ASSESSMENT OF A SEMI-AUTOMATED TILE-MAKING MACHINE: AN ECONOMICAL APPROACH TOWARDS RECYCLING OF PCB E-WASTES

Abstract: *This study examines the optimization and performance evaluation of a semi-automated tile-making machine designed to recycle printed circuit board (PCB) e-waste. Addressing the e-waste issue in Batangas City, this study explored a sustainable method of converting PCB waste into unglazed decorative wall tiles of varying sizes. The tile composition includes pulverized PCB waste, Portland cement, colored cement, an anti-toxic solution, and water. Using Atomic Absorption Spectrophotometry, the research evaluates the crushing efficiency (69%) and pulverization rate (71%), along with material toxicity, water absorption, compressive strength, flexural strength, and heavy metal leaching. The study also presents a 3D model and animation of the machine, which integrates an Arduino and a PID controller. The optimization process involves crushing, pulverizing, mixing, molding, and dry heating. Lastly, an economic feasibility analysis based on a return-on-investment scheme highlights the viability of this eco-friendly recycling approach, expecting an average output of 69,120 pieces of unglazed tile and a return on investment in 1.449 years.*

Keywords: *Unglazed Tiles, e-Waste, Printed Circuit Board, Tile Maker, Semi-Automated Tile Maker Machine, Sustainable Tiles*

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Ksenia Kaisheva
Pavel Shikov

Review paper

CRITICAL REVIEW OF DIGITAL TRANSFORMATION MODELS AND APPLICATIONS IN THE GARMENT INDUSTRY

Abstract: *This study takes a closer look at modern approaches and models of digital transformation in the fashion industry, particularly in garment manufacturing. Based on a detailed examination of 36 real-world business cases from the Scopus database, the research sheds light on key digitalization trends while also exposing the roadblocks that slow down the adoption of new technologies. These obstacles range from the struggle to integrate digital tools with outdated management systems to a shortage of skilled professionals who can navigate the shift to digital workflows. Additionally, the high financial investment required for modernization remains a major barrier for many enterprises. Beyond mapping out these challenges, the study also identifies promising areas for future research. A deeper dive into digital maturity models, their practical validation in real business environments, and the development of industry-specific assessment frameworks could provide valuable insights for both researchers and industry professionals. The goal is not just to understand digital transformation on a theoretical level but to offer concrete tools and strategies that align with the unique realities of the fashion and garment sector. By addressing these gaps, this research hopes to contribute to a more structured, efficient, and ultimately more accessible path toward digitalization in the industry.*

Keywords: *Digital Transformation, Fashion Industry, Garment Manufacturing, Industry 4.0, Critical Review*

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Ksenia Kajsheva[1]
Elizaveta Kraikina

Review paper

QUALITY IN THE TEXTILE AND CLOTHING INDUSTRY: A BIBLIOMETRIC ANALYSIS AND SCOPING REVIEW

Abstract: *In the context of global competition, rapid technological advancements, and evolving consumer demands, quality management has become a critical focus in the textile and apparel industry. This article presents a comprehensive bibliometric analysis and scoping review of scholarly literature addressing quality-related practices and methods in textile and clothing manufacturing. An initial search in the Scopus database retrieved 1,411 publications. After a structured screening process 86 peer-reviewed articles published between 2020 and 2025 were selected for detailed analysis, following the PRISMA-ScR methodology. The review employs thematic modeling and bibliometric analysis, with all data processing conducted in Google Colaboratory (Colab) using Python and relevant open-source libraries. Key research themes were identified, including quality control systems, assurance strategies, sustainability practices, digital traceability, and customer satisfaction metrics. Particular attention is given to established quality methods such as Six Sigma, Total Quality Management (TQM), and ISO standards, with a focus on their application across the textile value chain. The results demonstrate increasing academic engagement with smart technologies and sustainable quality frameworks. The study reviews existing knowledge, identifies persistent research gaps, and offers evidence-based insights to guide future investigations and industry practices.*

Keywords: *Quality Management, Quality Model, Textile, Clothing, Apparel, Garment*

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Anna Prusak [1]

Research paper

THE APPLICATION OF MULTICRITERIA ANALYSIS IN ASSESSMENT OF THE QUALITY OF CULTURAL HERITAGE ASSETS

Abstract: *Since the late twentieth century, cultural heritage has been increasingly understood as a dynamic, socially constructed phenomenon that shapes both individual and collective identities. Valuation plays a critical role in heritage management, determining the recognition, protection, and prioritization of cultural assets. While earlier heritage valuation was relatively straightforward, contemporary approaches must address the growing diversity and subjectivity of values attributed to heritage. This paper develops and tests a new multicriteria framework for evaluating the "cultural quality" of tangible heritage assets, using the Analytic Hierarchy Process (AHP). Drawing on a comprehensive review of Polish and international literature, the model integrates historical, artistic, scientific, socio-cultural, symbolic, spiritual, and economic dimensions of heritage value. Expert assessments collected from heritage professionals in Kraków were analyzed using AHP to assign weights to evaluation criteria and sub-criteria. The results reveal that socio-cultural and spiritual potentials are the most critical factors in assessing heritage quality, while economic and purely aesthetic dimensions play a secondary role. The study demonstrates the applicability of structured, transparent, and consistent multicriteria methods in heritage valuation, offering a decision-support tool that can aid conservation, management, and funding prioritization efforts. This approach underscores the necessity of holistic heritage assessments that reflect the interconnected and multifaceted nature of cultural value.*

Keywords: *Cultural heritage; Heritage valuation; Analytic Hierarchy Process (AHP); Cultural quality*

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Marta Woźniak [1]

Research paper

THE ROLE OF READABILITY FACTOR IN QUALITY ASSESSMENT OF MEDIA PRODUCTS: THE USE OF ZIPFIAN DISTRIBUTION IN THE ANALYSIS OF PRESS INFORMATION QUALITY

Abstract: *This paper explores the role of understandability as a component in the quality assessment of media content, focusing on the application of Zipf's law and the Gunning Fog Index (FOG) to a diachronic corpus of Polish press materials. In an era of information overload and rapidly evolving content marketing, the ability to objectively and systematically evaluate the quality of written content is of growing importance. Traditional readability metrics often require language-specific calibration, while Zipf's law offers a more universal, language-independent approach to analyzing textual accessibility. The study involves the analysis of 250 historical and contemporary articles centered on a single topic. The results show a weak but statistically significant negative correlation between FOG scores and expert quality ratings, suggesting that increased readability modestly improves perceived quality. Additionally, trend lines and Zipfian distributions point to a more complex relationship, possibly involving a threshold of understandability beyond which quality no longer improves linearly. The study highlights the potential of integrating automated metrics into broader quality assessment frameworks, with implications for journalism, content marketing, and information management.*

Keywords: *Zipf's law, Understandability, Media quality, FOG intex, Press*

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Research paper

SELECTION OF SOLAR PANELS USING MCDM TECHNIQUES

Abstract: *Solar panels play a pivotal role in residential electricity supply, contributing to reduced energy costs and environmental preservation. The current market presents a wide array of solar panel options, differentiated by criteria such as power output, efficiency, warranty duration, and price, among others. This diversity poses a challenge for consumers seeking the most suitable product. This study aims to identify the optimal choice from twelve prevalent solar panel models available in the Vietnamese market. Each model is characterized by seven attributes: power output, efficiency, three dimensional parameters (length, width, height), warranty period, and cost. Three Multi-Criteria Decision Making (MCDM) methods, namely SAW (Simple Additive Weighting), TOPSIS (Technique for Order of Preference by Similarity to Ideal Solution), and RAM (Root Assessment Method), were employed to rank the twelve solar panels. The rankings derived from these different MCDM approaches exhibit a high degree of correlation. The correlation coefficient between SAW and PIV is 0.972, between SAW and RAM is 0.993, and between PIV and RAM is 0.979. Notably, all three methods converged in identifying the same model as the top-performing option among the twelve evaluated. Future research directions are also discussed towards the end of this paper.*

Keywords: *Solar panel, MCDM, SAW method, PIV method, RAM method*

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Myriam Bouzekraoui [1]
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Research paper

OPTIMIZATION OF SOLAR PUMPING SYSTEMS IN THE ORIENTAL REGION OF MOROCCO: TECHNICAL, ECONOMIC, AND ENVIRONMENTAL PERFORMANCE

Abstract: *The adoption of photovoltaic (PV) solar pumping systems offers a sustainable, efficient solution for agriculture, particularly in regions with high solar potential like Morocco's Oriental region. This study presents an innovative approach to optimizing the technical, economic, and environmental performance of solar pumping systems adapted to local farms. By integrating field surveys, climatic data, and mathematical modeling, an optimization model was developed, considering key factors like water flow rate, total dynamic head (TDH), and pump efficiency.*

Results show that well-designed solar pumping systems can reduce energy costs by up to 75%, with a payback period of 2 to 8 years, depending on the replaced energy source (diesel or electricity). Environmental analysis reveals annual CO_2 *emission reductions of 480 to 720 tons for the 60 farms studied. Recommendations include energy surplus valorization, smart pump adoption, and climate forecasting integration, promoting large-scale PV adoption and reducing reliance on fossil fuels.*

Keywords: *Photovoltaic Solar, Water Pumping, Sustainable Agriculture, Optimization, Economic Analysis, Environmental Impact*

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Research paper

ENERGY TRANSITION IN ACTION: THE IMPACT OF SOLAR SYSTEMS IN MOROCCAN PROCESSING UNITS

Abstract: *This study assesses the feasibility of integrating photovoltaic (PV) systems into agricultural processing units in Drâa-Tafilalet, a region with high solar potential. Faced with rising energy costs, PV systems offer a sustainable alternative for units like Difat Ziz and Zrigat, specialized in date storage and packaging.*

The study evaluates energy consumption, PV system sizing, and a 15-year economic analysis. Simulations reveal that PV systems can cover up to 75% of energy needs. For Difat Ziz, a 65-kWc system achieves 51% self-consumption, with a 6.89-year payback (5.4 years with energy compensation). For Zrigat, a 9-kWc system covers 78% of needs, with a 5.7-year payback (4.3 years with compensation).

Economic performance relies on self-consumption optimization, equipment quality, and installation cost control. The findings highlight PV integration as a cost-effective, sustainable solution, with recommendations for training, subsidies, and supportive policies.

Keywords: *Solar Energy; Photovoltaic; Processing Units, Economic Feasibility; Profitability; Sustainability*

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Research paper

MODELING THE YIELD CURVE: A CASE STUDY OF MOROCCO

Abstract: *The yield curve reflects the relationship between interest rates and debt maturities, serving as a key economic indicator. Understanding its dynamics is vital for policy and risk management. This study evaluates advanced yield curve modeling, focusing on the Dynamic Nelson-Siegel (DNS) model and its superiority over traditional methods. By integrating Industry 4.0 technologies like machine learning and data analytics, the DNS model enhances forecasting, particularly for Moroccan Treasury yields.*

The DNS model effectively captures yield curve movements, outperforming static mod- els with lower Root Mean Square Errors (RMSE) and robust statistical validation via tests like Diebold-Mariano and Hansen-Lunde-Nielsen. Advanced tools, including Kalman filtering and the Expectation-Maximization algorithm, further refine forecasts with real-time adjustments.

This research highlights the DNS model's potential for improved economic policy and risk management, emphasizing its adaptability and the role of modern analytics in ad-dressing evolving financial dynamics.

Keywords: *Moroccan Treasury Yield Curve, Forecasting Models, Kalman Filter, Industry 4.0, Financial Economics*

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Noumich Farouk [1]
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Research paper

A FAULT DETECTION MODEL FOR PREDICTIVE MAINTENANCE OF WIND TURBINES BASED ON A HYBRID DEEP LEARNING APPROACH

Abstract: *In the context of Industry 4.0, predictive maintenance of wind turbines is a crucial issue for optimizing their performance. This article proposes a new hybrid deep learning approach, aligned with the principles of Industry 4.0, to improve the predictive detection of failures in wind turbines. By combining long short-term recurrent neural networks (LSTM), artificial neural networks (ANN), and genetic algorithms (GA), our model (GA-LSTM-ANN) effectively captures the temporal and nonlinear complexities of sensor data. Genetic algorithms automatically optimize the model configuration. This innovative approach offers a unique solution for predictive fault detection. Applied to a real dataset, our model has significantly outperformed traditional methods, achieving 96.32% precision, 95.91% accuracy, 96.45% F1-score and 96.41% recall for wind turbine fault detection. These promising results open up new perspectives for optimizing the management of wind farms and contributing to the energy transition.*

Keywords: *Industry 4.0, Predictive Maintenance; Wind Turbine; Fault Detection*

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Research paper

OPTIMIZING EFFICIENCY AND SUSTAINABILITY IN ELECTRICAL POWER GENERATION AND DISTRIBUTION: A COMPARATIVE STUDY OF EMERGING TECHNOLOGIES

Abstract: *The global energy generation and distribution landscape is rapidly evolving to optimize efficiency and sustainability in electrical power. This study provides a comprehensive assessment of emerging technologies within Iraq's energy sector. The primary aim of this research is to compare emerging technologies related to the sustainability of electric power. Energy sustainability in Iraq's power grids can be improved through several key strategies such as renewable energy integration, grid modernization, and energy efficiency measures. These emerging technologies are proving to be more effective than conventional energy methods. The results of this study offer a comparative analysis of various emerging advancements in electrical power generation and distribution. It provides insights into efficiency, environmental impact, scalability, economic feasibility, and technological innovation in the evolving electrical energy sector, the findings of this research indicate that renewable energy sources are a significant focus in the study of evolving dynamics in the field. This study conducts a comparative analysis of emerging technologies, examining their efficiency and sustainability. The comparison between sustainable energy sources and conventional energy sources highlights a pathway to modernize power technologies, positively impacting Iraq's overall power efficiency and economic growth.*

Keywords: *Energy, Power Grid, Efficiency, Sustainability, Emerging Technologies, Generation*

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Research paper

HYBRID ENERGY STORAGE SYSTEMS: INTEGRATING BATTERIES AND SUPERCAPACITORS FOR GRID-SCALE APPLICATIONS

Abstract: *The integration of renewable energy sources in the power grid has accelerated the need for advanced energy storage solutions to stop and secure grid stability. The hybrid energy storage system (HES), which combines the high energy density of battery and supercapacitors, provides a strong solution for grid-scale applications. This study examines the design, modeling, and control of the HES, focusing on the co-integration of the battery and supercapacitor to adapt energy and power control.*

The battery provides continuous energy storage, which makes them ideal for long-term applications, while supercapacitors provide fast efficiency reactions, excellent in handling short-term fluctuations. By integrating these technologies, HES networks can effectively balance the requirements for energy and electricity, which increases reliability and efficiency. A control strategy is proposed to assign power dynamically between the battery and the supercapacitor, which ensures optimal operation under separate load conditions. The battery handles a stable condition load, while the supercapacitor addresses transient tops, reduces the load on the battery, and increases the service life.

The simulation study shows the efficiency of HES in managing challenges with grid-scale such as top shave, load level, and integration of renewable energy. The results highlight the system's ability to improve grid stability, reduce operating costs, and support permanent energy infrastructure. This research emphasizes the ability to hoarse in modern power systems provides a framework for implementation in grid scale applications and provides valuable insights to engineers and policy makers.

Keywords: *Hybrid Energy Storage Systems (HESS), Batteries, Supercapacitors, Grid-Scale Applications, Renewable Energy Integration, Power Management, Grid Stability, Sustainable Energy*

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Research paper

ON THE SYSTEM OF PERFORMANCE INDICATORS AND EFFICIENCY OF CONSTRUCTION CONTROL OF OIL AND GAS FACILITIES

Abstract: *Hazardous industrial facilities of the oil and gas complex go through all stages of their life cycle: design, manufacture and supply of equipment, construction, operation, major repairs, decommissioning. To ensure the quality, reliability and comprehensive safety of facilities, personnel and the environment, it is necessary to carry out various types of supervision and control at all stages of the life cycle. In addition to government control, large companies usually establish corporate control organizations that include a range of inspections. For example, Gazprom has the following inspections: technical, energy, environmental, construction, and corporate acceptance of material and technical resources.*

The construction inspection is one of the key corporate control structures, since violations and inconsistencies are possible at the construction or capital repair stage, which may manifest themselves during the operation of a hazardous facility and lead to accidents of various magnitude. The main tasks of the Gazprom construction inspection are: carrying out control measures for the organization and implementation of the functions of construction control of the customer, supervision of the author; evaluation of the effectiveness of contractors who carry out construction control at the facilities of Gazprom.

The quality of construction control work can be assessed by a number of performance and efficiency indicators. Performance indicators are directly related to the quality of the performance of basic functions, and efficiency is determined by the quality of the use of resources (labor, material, temporary, financial). Performance indicators include indicators of the main (organization and conduct of inspections, preparation of reports, technical audit, participation in tests, etc.) and auxiliary (development of normative methodological documentation, participation in working commissions, participation in meetings, etc.) activities.

It is also possible to evaluate the integral performance indicator based on a linear convolution of weighted partial indicators of the main and auxiliary activities. Performance indicators can also include the number of identified and eliminated violations, including taking into account their potential danger. Another

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integral indicator of effectiveness may be the amount of expected prevented damage, which can be used to assess the economic effectiveness of construction control (the ratio of expected prevented damage to the cost of construction inspection).

All these indicators form the information basis of monitoring for making effective management decisions aimed at improving the quality of construction control in Gazprom.

Keywords: *Hazardous Industrial Facilities , Construction, Supervising, Efficiency, Monitoring*

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Research paper

IMPACT OF PART QUALITY ON INTRALOGISTICS EFFICIENCY IN AUTOMOTIVE MANUFACTURING: KPI-BASED OPTIMIZATION

Abstract: *This paper examines the role of performance metrics in logistics systems, focusing on production logistics in the automotive industry. Key performance indicators (KPIs) such as Scheduled Sequence Achievement Ratio (SSAR), Scheduled Time Achievement Ratio (STAR), and Standard Production Lead Times Ratio (SPLTR) are analyzed to evaluate efficiency and reliability. The study highlights the negative impact of poor-quality parts on intralogistics,. The findings emphasize the importance of high-quality production processes and rigorous quality control to optimize logistics operations and customer satisfaction.*

Keywords: *Logistics performance, KPIs, SSAR, STAR, Automotive industry, Quality management*

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Research paper

IMPACTS OF TRAFFIC ACCIDENT AND CRASH COSTS IN SEVERITY LEVEL ANALYSIS

Abstract: *The severity level of a road interacts with factors that determine the occurrences of traffic crashes, accidents, and their crash costs. Analyzing traffic crashes, accidents, and crash costs is not sufficient to define the severity level of the road unless the combined effects are explored. The objective of this study is defining an alternative severity level based on a combined parameter approach using traffic crash, accident, and crash cost relative percentage share. The study used five years of traffic crash data from Budapest. In the study area, on average, around 45 people die annually due to traffic crashes. Based on a newly alternative severity indexing approach, the severity level of route 1 > route 2 > route 3. Route 1 was a severe segment where greater than 60% of traffic crashes were registered in the study area. In contrast, the existing severity indexing approach 2 showed that route 2 was a severe road segment of the study area. This acknowledges that having a maximum number of traffic crashes, traffic accidents, and crash costs doesn't designate the higher severity level and vice versa. In all, an alternative approach showed that the severity level route 2 was reduced while compared to the existing approach. Utilizing the relative percentage share of road traffic crashes, accidents, and crash costs, the combined effects had a significant impact in defining severity level. Based on the stated severity indexing approach, this study identified that having a higher percentage share of road traffic crashes, accidents, and crash costs designates the severity level. At the end, the study recommends that using the stated alternative severity indexing approach was potentially more comprehensive*

Keywords: *Combined Parameter Approach; Determinant Factors; Traffic Crash Cost; Relative Percentage Share; Severity Level Indicators*

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Research paper

ADAPTIVE ENERGY MANAGEMENT SYSTEM FOR ELECTRIC VEHICLE FUTURE: A MACHINE LEARNING PERSPECTIVE

Abstract: *Electric vehicles (EVs) are progressively viewed as a basic answer for lessening reliance on non-renewable energy sources and moderating discharges, adding to battling environmental change. In India, the reception of electric vehicles (EVs) is picking up speed to handle air contamination and energy shortcomings, especially in metropolitan communities. Notwithstanding, their huge scope reception could strain the public network because of high energy interest for charging. On the other hand, EVs could be utilized as energy stockpiling frameworks, upgrading the use of environmentally friendly power sources like sun oriented and wind. This paper reviews AI (ML)- based energy the board techniques, zeroing in on their job in streamlining EV charging and releasing, limiting expenses, decreasing lattice over-burdens, and guaranteeing savvy activity in the Indian setting..*

Keywords: *Electric vehicles (EVs), energy inefficiencies, Machine Learning (ML), optimizing EV charging*

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Research paper

DESIGN, ANALYSIS, AND FABRICATION OF BRAKE SYSTEM FOR ALL TERRAIN VEHICLE

Abstract: *All Terrain Vehicles (ATV) is a vehicle that can move on almost all types of terrain and travels on low-pressure tires. As the safety of the driver is paramount and depends on breaking there is a need to design and fabricate a safe and reliable braking system. This work aims to use various braking components in the system and design an effective braking system considering various scenarios of the environment and CAE analysis of the brake disc rotor. This study made recommendations for the development of ATV after analyzing developed disc brake rotors. For each design, structural analysis and steady-state thermal analysis are included in the brake rotor study. The designed braking system is effective, reliable, and has minimum weight without any compromise in its safety standards and performance. Moreover, by analyzing the brake rotor it was established that the maximum temperature obtained at the brake pad contact surface is 78.408 °C which is concluded as very much safe.*

Keywords: *All-Terrain Vehicle (ATV), Brake system, Disc rotor Condition*

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Research paper

ORGANISING FOCUS GROUPS IN A SPECIFIC ENVIRONMENT - LOOKING FOR SOURCES OF ERRORS IN MEDICAL RECORDS

Abstract: *The transition from paper to electronic documentation in medical care presents organisational and systemic challenges. One of the key elements of this transition is the identification of the causes of documentation errors. The aim of a study conducted in a hospital in Poland was to analyse the mechanisms of error generation and their organisational determinants. A triangulation of research methods was used: qualitative identification of errors, quantitative assessment of their incidence and exploration of etiological factors. The results indicate that the organisational context of the entire unit plays a crucial role in shaping documentation processes, influencing both the type and frequency of errors. Group discussions encountered barriers due to staff not identifying with the problems of other units, which necessitated an adaptation of the research strategy. Time constraints - overworked staff, lack of full standardisation and insufficient staff training - appeared to be key drivers of error. The study developed a dedicated methodology for conducting focus groups with in-depth interviews, adapted to the specificities of the medical environment. It takes into account the hierarchical structure of healthcare facilities, specific communication barriers and the need to personalise the issues for individual professional groups. The study emphasises the importance of adapting the methodology to institutional specificities and points to the need to actively involve different professional groups in the error diagnosis process. The methodology presented provides a model scheme for use in future research on the quality of medical records.*

Keywords: *Qualitative Mixed Methods, Medical Records, Focus Groups, Sources Of Error In Medical Records*

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Research paper

AI-POWERED FINANCIAL ALGORITHMS: REVOLUTIONIZING THE WEALTH MANAGEMENT

Abstract: *Artificial Intelligence (AI) has revolutionized various industries, including financial management, product management, and database management. AI technologies are increasingly being adopted by financial institutions to enhance decision-making, improve customer service, and streamline operations. This paper explores the impact of AI on financial management, focusing on its benefits, challenges, and future implications. It argues that AI has significantly transformed fund management, finance, and wealth management, and its continued integration will shape the future of these industries.*

By automating tasks such as data entry, recognition, reconciliation, and reporting, AI helps financial managers save time and resources while improving operational efficiency. AI algorithms can analyze market trends, predict future outcomes, and support data-driven investment decisions. The integration of AI and machine learning (ML) allows financial institutions to process vast amounts of data quickly and accurately, leading to more informed and efficient decision-making. Moreover, AI enhances the accuracy of financial forecasts and predictions, ultimately improving overall financial management practices.

Despite its advantages, the adoption of AI in financial management comes with challenges, including ethical concerns, regulatory constraints, and the need for skilled professionals to develop and implement AI-driven solutions effectively. However, as technology continues to advance, AI's role in financial management is expected to expand further, offering innovative solutions for risk management, fraud detection, and strategic planning. The ongoing development of AI-driven financial tools will continue to reshape the industry, ensuring greater accuracy, efficiency, and intelligence in financial decision-making.

Keywords: *Artificial Intelligence (AI), Wealth Management, Financial Algorithms, Risk Assessment, Portfolio Optimization*

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Research paper

POTENTIAL APPLICATIONS OF BLOCKCHAIN TECHNOLOGY IN ENHANCING OCCUPATIONAL HEALTH AND SAFETY SYSTEMS

Abstract: *Occupational health and safety are of fundamental importance, with a particular emphasis on high-risk industries. The growing responsibility toward employees, along with increasingly stringent legislative frameworks, necessitates effective solutions for monitoring safety procedures. Traditional occupational health and safety systems face challenges such as a lack of transparency and data integrity, as well as inefficient auditing and compliance processes, which could potentially be addressed through the application of blockchain technology. This paper aims to explore possible applications of blockchain technology to enhance occupational health and safety systems, including secure and transparent incident reporting, improved management of training records and certifications, real-time monitoring of workplace conditions, and the establishment of secure mechanisms for data access. The application of blockchain technology in occupational health and safety systems is still in its early stages, and there are certainly challenges to be overcome. A case study of the potential application of the Provenance blockchain platform to improve safety in the world's leading construction company, Skanska, highlights the growing potential of this technology.*

Keywords: *Occupational Health And Safety, Blockchain Technology, Safety Procedures*

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Research paper

PERCEIVED ARTIFICIAL INTELLIGENCE LITERACY, TRUST AND AI USE IN SPORTS CARDIOLOGY

Abstract: *This research paper considers the correlation among perceived artificial intelligence literacy, trust, and AI use motives within the cardiology domain. Purposive sampling is used to recruit 260 health workers and sports persons from Pakistan's healthcare institutions, including participants from different provinces. The consent letter from the head of the medical institution is taken, and written informed consent will be taken from health workers specialising in cardiology. Ethical consent from the Punjab Sports Board, Pakistan, was also obtained for the sample data of pentathletes. There is the commonality of research sample as Serbia is a member country of Union Internationale Moderne Pentathlon from Europe and Pakistan is a member country from the same federation. Hence, investigating sports cardiology for pentathletes is an interesting area to explore. The descriptive and inferential statistics are used through IBM SPSSv.25. Instruments of Perceived Artificial Intelligence Literacy Questionnaire [Grassini, 2024], Trust in AI[Scharowski et al., 2024], and AI Use Motives [Yurt &Kasarci, 2024] are administered. The aim is to explore AI's acceptability and acceptance in diagnosing and treating hypertension in developing countries, as of case of Pakistan. The paper consists of normality tests, correlation statistics, linear regression and parametric independent sample t-tests.*

Keywords: *Artificial Intelligence,Health,Sports,Ethics*

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Research paper

QUALITY-DRIVEN MACHINE LEARNING FOR NEONATAL CARE: PREDICTING NECROTIZING ENTEROCOLITIS

Abstract: *Ensuring the quality and reliability of predictive models in neonatal healthcare is crucial for improving early disease detection and clinical decision-making. This study investigates the application of machine learning (ML) algorithms for predicting necrotizing enterocolitis (NEC) in neonatal populations, focusing on model selection, performance evaluation, and quality assessment. A dataset of 207 neonates, including 143 preterm and 64 term infants, was analyzed using six ML classification models: Logistic Regression (LR), Linear Discriminant Analysis (LDA), K-Nearest Neighbors (KNN), Classification and Regression Trees (CART), Naïve Bayes (NB), and Support Vector Machine (SVM). Model performance was assessed using accuracy, precision, recall, F1-score, and area under the receiver operating characteristic curve (AUROC). This study underscores the potential of machine learning in neonatal care and suggests that a hybrid approach combining high-recall and high-precision models could optimize NEC detection. Future research should focus on ensemble learning techniques and clinical validation to further enhance predictive performance and practical implementation in neonatal intensive care units.*

Keywords: *Machine Learning, Data-Driven Analyses, Predictive Modeling, Quality Assessment, Reliability, Healthcare Analytics, Neonatal Care, Necrotizing Enterocolitis*

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Research paper

REVOLUTIONIZING EARLY LUNG CANCER DETECTION WITH MACHINE LEARNING: INSIGHTS FROM FEDERATED AND ENSEMBLE LEARNING

Abstract: *Timely detection of lung cancer leads to better patient results and helps doctors treat the condition more quickly. This research study combines Machine Learning, Federated Learning, and Ensemble Learning to create an improved way to identify lung cancer in its initial stages. Using machine learning for pattern detection, federated learning to protect data privacy, and explainable learning to improve diagnosis, this model brings a strong and flexible solution to healthcare. The proposed ensemble model combines multiple algorithms to improve prediction reliability and robustness against noisy and imbalanced datasets. Federated Learning ensures secure, decentralized data processing across institutions, maintaining patient confidentiality while enabling collaborative insights. Advanced preprocessing techniques and feature engineering optimize the dataset for meaningful analysis, while the ensemble voting mechanism ensures consistent and accurate predictions. Early detection and catching all cases through this approach has improved both how accurately doctors find cancer and how many cases they can identify. Our next research steps include adding more information sources alongside better prediction understanding features before implementing these tools in real hospital operations. By addressing both technical and ethical concerns, this research offers a solid basis for the creation of expandable AI-powered diagnostic instruments for lung cancer treatment.*

Keywords: *Ensemble Learning, Machine Learning, Federated Learning*

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Jayendra Jadhav[1]
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Research paper

A ROBUST BLOCKCHAIN-BASED FRAMEWORK FOR MANAGING UNKNOWN VIRAL DISEASES IN HEALTHCARE SUPPLY CHAINS USING MACHINE LEARNING

Abstract: *Objective of the Study: Frequent viral outbreaks demand a secure, scalable system for early disease detection and healthcare supply chain management. This study proposes a Blockchain-integrated Machine Learning framework to enhance disease surveillance, ensure secure data exchange, and optimize healthcare logistics.*

Methodology/Approach: A multi-layered architecture integrates Blockchain for decentralized data management and Machine Learning for symptom clustering, anomaly detection, and predictive analytics. Smart contracts validate data, while cryptographic techniques ensure privacy. Geospatial analysis maps real-time symptom trends and medicine demand fluctuations.

Originality/Relevance: Unlike centralized systems prone to inefficiencies and data breaches, this framework offers a transparent and decentralized solution. By combining predictive analytics with Blockchain, it strengthens disease tracking, outbreak preparedness, and resource allocation.

Main Results: The system improves disease detection accuracy, enhances supply chain transparency, and ensures secure data exchange. Machine Learning models accurately identify emerging disease patterns, while Blockchain guarantees data immutability. Geospatial analytics predict medicine shortages and outbreak hotspots.

Theoretical/Methodological Contributions: This research enhances Blockchain-based healthcare models with privacy-preserving cryptographic mechanisms and federated Machine Learning. It ensures interoperability among healthcare providers and regulatory bodies while promoting secure data sharing.

Social/Management Contributions: By improving pandemic preparedness and healthcare supply chain resilience, this framework ensures equitable medical resource distribution, faster containment, and better public health security. Its transparency builds trust, aiding data-driven policy decisions and minimizing medicine shortages.

Keywords: *Blockchain Technology, Machine Learning, Early Disease Detection, Viral Disease*

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Dheeraj Kumar Prasad
Rahul Shah

Review paper

COMPREHENSIVE REVIEW OF CONVOLUTIONAL NEURAL NETWORK (CNN) MODELS FOR DRUG DETECTION USING IMAGE PROCESSING

Abstract: *AI and image processing have revolutionized the way that differentiating drugs occur in the health and pharmaceutical sectors. This review paper focuses on the use of AI, particularly deep learning technology, in the identification of drugs from images using a Convolutional Neural Network. these models can also identify pills, blister packs, and even chemical structures according to their forms, colors, and some other characteristics. We suggest how researchers and experts have applied AI to construct some systems that assist in fulfilling duties ranging from identifying falsified drugs, reading drug labels, estimating drug interactions, as well as arranging pharmacy stocks and shelves. Others include integrating the CNNs with conventional methods or approaches like SVM and the k-NN to boost the performance. The research examines different challenges related to medical imaging AI, including unclear drug appearances, together with small training data, and a requirement for transparency when AI systems operate. The paper discusses potential future applications, including developing quick mobile models and utilizing artificial intelligence with different forms of data for drug safety improvements. The review provides students, researchers, and developers understanding of contemporary drug identification methods using artificial intelligence in combination with image processing and upcoming advancements.*

Keywords: *Drug Detection, Image Processing, Artificial Intelligence (AI), Deep Learning, Convolutional Neural Networks (CNNs), Image Recognition*

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Research paper,

USE OF AN BGFT-DBI-LSTM AND PRFFC APPROACHES FOR ENHANCEMENT OF ONLINE DRUG RECOMMENDATION SYSTEM

Abstract: *For drug recommendations for all types of health issues, majority of the people have utilized online consultations in recent times. However, drugs' side effects differ from person to person. In existing research works, online drug recommendation systems according to people are not concentrated. Thus, this paper presents the Bayes Functional with Gaussian Tanh-based Deep Bidirectional Long Short-Term Memory (BFGT-DBi-LSTM)-based drug recommendation system. Initially, the tweets are gathered; by using Palma Ratio Farthest First Clustering (PRFFC), users are grouped according to their age. Next, from the user comment, the audio, video, and text are extracted. Primarily, the text data are pre-processed. By utilizing the WordNet effect and Sandiford Net, the emotion and score are labelled from the pre-processed data. Moreover, pre-processed data are inputted to the Bidirectional Encoder Representations from Transformers (BERT) word embedding. In the meantime, the features are extracted from the pre-processed data; by utilizing Congruence Coefficient-based AnasPlatyrhynchos Optimization (CC-APO), important features are chosen. Next, to predict drug safety, all the output is given as input to BFGT-DBi-LSTM. Subsequently, according to the output, the drug is recommended for the user. Conversely, the noise is removed from the audio data using Correlated Kalman Filter (CKF). After that, the audio is transformed into text and given for pre-processing. In addition, the audio is separated from the video and given as input to the noise-removal process of audio. Lastly, in experimental analysis, the proposed technique achieves superior outcomes.*

Keywords: *Online drug recommendation system; Congruence Coefficient based AnasPlatyrhynchos Optimization (CC-APO); Bidirectional Encoder Representations from Transformers (BERT;, Correlated Kalman Filter (CKF); Palma Ratio Farthest First Clustering (PRFFC); Natural*

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Research paper

SURFACE QUALITY ANALYSIS OF BIOMEDICAL IMPLANT MATERIAL SUPER-FINISHING BY MAGNETORHEOLOGICAL FINISHING PROCESSES

Abstract: *Surface quality (SQ) is among the most essential characteristics of precision machining. The inadequate surface quality of engineering products causes various operational issues, including malfunction, premature wear, geometric error, etc. The use of magnetic media for machine finishing has come a long way in the previous decade. The most up-to-date method established during this period is magnetorheological finishing (MRF). In MRF, a magnetic field hardens a fluid suspension against a workpiece. the workpiece on the revolving spindle which is attached to the CNC milling machine. Cobalt-chromium alloys, including Co-Cr-Mo, were utilized in this study because of their high durability and resistance to wear in orthopedic implant-like joint replacement. Because of their superior mechanical qualities and biocompatibility, Cr-Co alloys have gained widespread use in implant qualities and biomedical engineering. Magnetorheological finishing (MRF) is being studied to improve the surface quality of cobalt-chromium alloy for use as implant material. This research has led to the creation of a novel Logistic Regression Gradient Grey Fuzzy algorithm (LR-GGFA) for predicting, optimizing, and identifying critical factors influencing material removal rate and SQ in magnetic finishing employing a non-natural carrier fluid combined with diamond abrasive particle, carbonyl iron particles (CIPs). The study results of the LR-GGFA algorithm show that the accuracy of predicting the quality of the prediction surface is 99.66%. They also show that precision (97.52%), recall (96.8%), and computation time (82.89%) can be anticipated, which leads to better performance and improving surface finishing by Ra = 11nm from a starting value of Ra = 720 nm yields an optimal change in roughness of 98.47%. This study also provides valuable reference values for predicting, optimizing, and identifying the primary factors that influence SQ and Substance removal rates in a refining model for complex and costly materials, progressing from inexpensive and ecologically friendly materials.*

Keywords: *Magnetorheological finishing (MRF), Surface quality implant material, machine control, Cobalt-chromium-alloys (Co-Cr-Mo), and fuzzy algorithm.*

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Research paper

DEVELOPMENT OF NATIONAL DIAGNOSTIC REFERENCE LEVELS FOR HEAD CT EXAMINATIONS IN MOROCCO: A CLINICAL INDICATION-BASED APPROACH TO OPTIMIZE RADIATION DOSE AND ENHANCE PATIENT SAFETY

Abstract: *This study investigates dosimetric data and technical parameters from 1,299 head CT examinations conducted across 20 hospitals, including 5 university, 8 provincial, and 7 private hospitals, using CT scanners from manufacturers such as Canon, General Electric, Siemens, and Hitachi. Various CT scanner configurations were employed, with technical parameters including kVp values ranging from 80 to 140, mAs between 100 and 300, and scan lengths varying from 6 cm to 28 cm. The dosimetric analysis revealed significant differences in radiation doses across clinical protocols. For stroke evaluation (364 patients) underwent non-contrast scans yielding a mean CTDIvol of 58.71 ± 3.20 mGy and a median effective dose of 12.33 ± 0.99 mSv. Acute brain protocols (272 patients) using similar scan parameters showed a mean CTDIvol of 55.66 ± 4.00 mGy and an effective dose of 11.69 ± 1.19 mSv. Post-contrast non-vascular brain scans (156 patients) resulted in a CTDIvol of 61.48 ± 4.50 mGy and an effective dose of 12.91 ± 1.33 mSv. Contrast-enhanced angiographic imaging (156 patients) with double-phase protocols recorded a mean CTDIvol of 57.60 ± 4.00 mGy and an effective dose of 12.09 ± 1.19 mSv. Oncology simulation scans (117 patients) required the highest doses, with a CTDIvol of 74.74 ± 15.69 mGy and an effective dose of 25.13 ± 1.80 mSv. In contrast,sinus protocols (130 patients) showed a lower mean CTDIvol of 50.08 ± 3.00 mGy and an effective dose of 9.82 ± 0.64 mSv, reflecting the reduced scan range. Temporal bone imaging (104 patients) employed a limited scan length, resulting in a lower CTDIvol of 49.71± 2.80 mGy and an effective dose of 5.57 ± 0.28 mSv. The study revealed significant variations in DRLs driven by clinical requirements and regional disparities in healthcare infrastructure.These findings highlight the balance between diagnostic accuracy and radiation dose optimization across different clinical indications, contributing to improved patient safety while maintaining clinical efficacy.*

Keywords: *Clinical indication, DRLs, Head, Computed Tomography, Morocco*

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Research paper

BEYOND BIRTH: UNDERSTANDING THE SOCIO-ECONOMIC FACTORS INFLUENCING CESAREAN SECTION RATES IN MOROCCO

Abstract: *In Morocco, recent shifts in healthcare access and cultural modernization impact women's well-being and family planning. This study investigates the socio-economic and psychological influences on childbirth methods, particularly the rising demand for elective cesarean sections.*

Analyzing 200 cases over four months, our research reveals noteworthy insights. Key Findings concerning financial implications show that costs for transportation, food, and discharge prescriptions are notably higher for elective cesarean deliveries. While 61.5% prefer cesarean sections, financial considerations significantly affect decision-making. As for psychological and sociocultural factors, fear of complications, pain, and societal perceptions strongly influence choices. Concerns about postpartum conditions, aesthetics, and impact on sexuality shape preferences. Economic Analysis shows that cesarean sections incur higher expenses, with transport and food costs significantly elevated. The Incremental Cost-Effectiveness Ratio (ICER) demonstrates the economic burden of elective cesareans. The study calls for a reassessment of fee exemption policies, considering the incomplete coverage of additional costs. Health education and counseling, focusing on psychological aspects during antenatal care, are crucial for informed decision-making. This research underscores the complex interplay of financial, psychological, and sociocultural factors in childbirth choices. As Morocco navigates evolving healthcare policies, addressing these multifaceted influences is vital for promoting informed decision-making and improving maternal well-being.

Keywords: *Public Health, Health economy, child delivery methods, Elective cesarean sections, obstetrics, gynecology, Psychological influence, Sociocultural aspect*

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Research paper

POSITRON EMISSION TOMOGRAPHY AND PATIENTS' QUALITY OF LIFE

Abstract: *The design of new medical devices has the potential to improve the outcome of many diseases by changing the way they are diagnosed and monitored. Positron emission tomography (PET) provides insight into the body's metabolic processes, allowing for precise visualization and quantification of tissue activity. Available evidence shows a strong impact of this imaging modality in various diseases. PET can play a key role in personalizing therapy based on molecular characteristics, which contributes to reducing adverse effects, improving treatment outcomes, but also improving the quality of life of patients. Assessing the quality of life and mental state of patients is of vital importance for clinicians as well as for the patients themselves.*

The aim of the paper was to highlight and further improve the understanding of progress in the development of the medical device design process, with a focus on current progress and future opportunities in PET design and its impact on the quality of life of patients.

Keywords: *Design, Medical Devices, Positron Emission Tomography, Quality Of Life*

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Research paper

PREVALENCE OF REFRACTIVE ERRORS AND QUALITY OF LIFE AMONG MOROCCO ADULTS WEARING GLASSES IN THE BENI MELLAL-KHÉNIFRA REGION: RETROSPECTIVE

Abstract: *Refractive errors profoundly impact adults' quality of life, limiting independence and productivity. This study investigates their prevalence and examines their correlations with various factors*

Methods: A cross-sectional retrospective study analyzed the optometric records of 6942 spectacle wearers aged 40 and older who visited optical offices in the Béni Mellal-Khénifra region between 2018 and 2022. Refractive errors were classified by spherical equivalent: myopia (≤ -0.50 D) and hyperopia (≥ +0.50 D)

Results: In the studied population, predominantly female (54.5%) with a mean age of 55.4 years, the prevalence of myopia was 35.2%, while hyperopia accounted for 44.8%. Myopia was more common among women, whereas hyperopia increased in peri-urban areas and with advancing age. Additionally, 13.2% of participants had anisometropia.

Conclusion: The findings indicate the importance of tailored screening and management strategies that address demographic and geographic variations in refractive errors to improve vision care and quality of life in this population.

Keywords: *Prevalence; Refractiv error; Hyperopia; Myopia; Astigmatism*

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Research paper

PREVALENCE OF MYOPIA, ASSOCIATED RISK FACTORS AND ITS IMPACT ON QUALITY OF LIFE AMONG MOROCCAN SCHOOLCHILDREN IN THE MARRAKECH-SAFI REGION

Abstract: *Myopia has become a major global public health issue, influenced by genetic and environmental factors that contribute to its onset and progression. This study aims to evaluate the prevalence of myopia and identify associated risk factors among schoolchildren in the Marrakech Al Haouz region. It also explores its impact on the quality of life of affected students, particularly on their academic performance and daily activities*

Methods: A cross-sectional survey was conducted from January to June 2024, involving 10,850 randomly selected students. Participants underwent measurements of uncorrected visual acuity and objective non-cycloplegic autorefraction. Additionally, a sample of 514 parent-child pairs participated in a questionnaire to identify myopia-associated risk factors.

Results: The results revealed an overall myopia prevalence of 25.4%, with significantly higher rates among girls (P<0.01) and in urban areas (P<0.01). Multivariate analysis indicated that advanced age, educational level, a family history of myopia, and frequent screen use were significant risk factors, whereas outdoor time served as a protective factor against myopia development.

Conclusion: This study provides key data on the prevalence of myopia and its risk factors among students in Marrakech Al Haouz, serving as a foundation for targeted preventive interventions, particularly promoting outdoor activities. These findings can guide visual health programs and prevention strategies tailored to Moroccan youth.

Keywords: *Quality of life; Prevalence of Myopia; Schoolchildren, Risk Factors, Marrakech Al Haouz*

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Research paper

PERIPHERAL ASTIGMATISM ABERRATION OF PROGRESSIVE LENSES AND QUALITY OF LIFE OF PRESBYOPIA

Abstract: *Purpose: Progressive power lenses represent the most adopted solution for presbyopia. However, their power of variation induces astigmatism aberrations in peripheral areas, thus inducing distortion and producing visual discomfort which can create difficulties in carrying out daily activities. The objective of the present study is to estimate the astigmatism aberration and its direction in the peripheral zone in four progressive lenses pairs of different designs.*

Methods: The dioptric powers of the spheres and cylinders were measured with an automatic FRONTO FOCOMETER in 12 points in the Distant zone and 10 in the near zone on the NASAL and TEMPORAL sides on the horizontal passing through the centers of the zones. Customization parameters were Pantoscopic angle, vertex distance, curvature angle, In-set and progression heights.

Results: In all lenses analyzed, the results revealed the presence of peripheral astigmatism in both the right and left lenses. The cylinder values are greater on the nasal side than on the temporal side. For areas used simultaneously in binocular vision, the axes of astigmatic aberration are similar on average. In the center of near zones, astigmatism varied between [0.166; 0.27] D.

Conclusion: This investigation showed the presence of peripheral astigmatism in the PPL, both in areas (DV) and (NV). This is more important on the nasal side than on the temporal ones, in order to minimize the penalization of the temporal visual field which is more stressed. In the lenses areas used simultaneously, the distortions of horizontal and vertical lines caused by peripheral astigmatism are almost in the same directions, allowing thus visual consistency. These criteria could facilitate the adaptation process and improve the quality of life of patients.

The choice of PPL depending on the activities of the lens wearer, this will encourages vision health professionals to consider adaptation needs and promote research and development of PPL models.

Keywords: *Peripheral. Astigmatism Aberration. Progressive Lenses, Quality Of Life, Presbyopia*

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Research paper

REFRACTIVE ERRORS AMONG SCHOOL CHILDREN: INSIGHTS FROM MOROCCO

Abstract: *This study aimed to determine the prevalence of refractive errors (RE) among schoolchildren in Morocco, a condition that impacts daily life, academic performance, and overall development. Conducted retrospectively between September 2023 and March 2024 in a Moroccan provincial hospital, the study analyzed 522 children (average age 8.67 years). Among them, 58.6% were female, 52.7% were from urban areas, and 47.3% from rural ones. Myopia emerged as the most prevalent condition, affecting 32.2% of participants, with an average spherical equivalence (SE) of -1.66 ± 1.35. Other REs included hyperopia (6.7%), high myopia (5.7%), mixed astigmatism (4.8%), and high hyperopia (1%). Anisometropia was noted in 21.8% of cases. These findings highlight a higher-than-expected prevalence of myopia in schoolchildren, emphasizing the need for regular screening and further studies to address and manage refractive errors effectively in this population.*

Keywords: *Prevalence;Refractiv error;Hyperopia; Myopia; Astigmatism*

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Research paper

EDUCATION AND TRUST IN NUMBERS: HOW LEARNING SHAPES THE PERCEPTION OF OFFICIAL STATISTICS

Abstract: *In an era of growing misinformation and institutional skepticism, public trust in statistical information is more vital than ever. Official statistics play a key role in shaping informed public discourse and effective policy-making, making it essential to understand the factors that drive trust and credibility.*

This study examines how education influences trust in statistics and perceptions of the impartiality of official sources. Specifically, it tests whether higher education levels correlate with greater trust in data-supported information and whether such trust is associated with viewing Eurostat as an impartial institution. Using data from the Flash Eurobarometer 536 survey in the EU, the analysis applies statistical techniques to explore these relationships and offer insights into how public confidence in statistics can be strengthened.

Keywords: *EUROSTAT, Education, Satisfaction*

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Gligorije Mirkov[1]
Miladin Stefanović

Research paper

APPLICATION OF AGENTS IN FMS: AN EDUCATIONAL APPROACH

Abstract: *This paper explores the application of multi-agent systems (MAS) in an educational environment through the modeling and simulation of a flexible manufacturing system (FMS). The focus is on developing models and programming agents for managing CNC machines, a robot with a peripheral axis, and part manipulation. Students are guided through recommended exercises aimed at optimizing operations and handling parts. Using the Python programming language, students develop code that enables both simulation and real-world application in laboratory conditions. Additionally, through RFID part identification and API communication, the system allows for automation and intelligent control of manufacturing processes. This approach fosters the development of Industry 4.0 concepts in education and enhances students' practical skills in the domain of digital manufacturing.*

Keywords: *Multi-Agent Systems, FMS, CNC, Robotics, DNC, OPC UA, RFID, Education, Industry 4.0*

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Aysel İçöz[1]
Bülent Eker

Research paper

VOCATIONAL COLLEGE OF TECHNICAL SCIENCES, TEKIRDAĞ NAMIK KEMAL UNIVERSITY

Abstract: *The packaging sector has turned to new searches to offer consumers safer, higher-quality food products and to adapt to the markets. Traditional packaging is no longer sufficient. New features of food packaging are influenced by consumers' preferences for higher food safety, desire for information and convenience. New packaging systems that increase the protective power of the packaging, extend the shelf life, monitor the product, provide information about its quality and are used for product sections have emerged. This research aims to determine the perceptions of associate degree students about food packaging and their perspectives on new-generation packaging (Smart Active Packaging). The sample of the research consists of associate degree students of Namık Kemal University Vocational School of Technical Sciences. According to the results of the research, there is a statistically significant relationship between the participants' gender and various packaging preferences. The results show that associate degree students do not have detailed knowledge about innovative packaging, but they are open to training on innovative packaging. Understanding students' perspectives on packaging can help develop appropriate packaging designs for young consumers. In this context, future research can provide students with more information about innovative packaging and increase their awareness by creating personalized training programs with artificial intelligence.*

Keywords: *Gender, Active-Smart Packaging, Students*

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Salah Eddine El Kartouti
Sarah Juidette

Research paper

THE IMPORTANCE OF DISTANCE LEARNING FOR IMPROVING AND DIGITALIZING SCHOOL EDUCATION IN MOROCCO

Abstract: *The emergency program of the ministry of education states, that school education is compulsory up to the age of 15, ensuring this entitlement is the obligation of all stakeholders. Likewise, in a world characterized by the multiplication of mutations and crises, improving education and providing quality teaching is becoming more and more of a difficult task, which makes the transition to hybrid education that mixes face-to-face and distance learning crucial. The evolution of technology, especially the Internet, has affected many fields, among them education. In this sense, faced with these changes, the development of the education system and the integration of distance learning to improve school education has given rise to a number of research works. Thus, this article's goal is to examine the importance of distance learning for the improvement of school education in Morocco. Thus, this study founded on a precise process, expressed through a questionnaire given to school directors and statistical analysis performed with specialized software. The outcomes have shown the importance that distance learning can play in ensuring an improvement in school education, as indicated by several factors, particularly in terms of the development of pedagogical practice, the continuity of education in crisis situations, the improvement of student learning and the introduction of new innovative practices. Nonetheless, distance learning still presents a number of challenges, requiring the multiplication of efforts and promoting a range of measures to guarantee a genuine shift towards digital distance learning, which ensures continuous improvement in teaching and learning, and thus in the well-being of the student.*

Keywords: *Distance learning; digitalization; schools; importance; improvement; ICTE; education; learning; Morocco.*

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Rehabeam Shapaka[1]

Research paper

IMPLEMENTATION OF THE REVISED CURRICULUM FOR ENGLISH AS SECOND LANGUAGE

Abstract: *The aim of the study was to explore the effect of the advisory teachers' instructional strategies on implementation of the revised curriculum for English as a second language. Data was collected through interview schedule, field notes and the open-ended questionnaire. Criterion purposeful sampling technique was used to select five advisory teachers from advisory service in Oshana Region. Data analysis was conducted using typological analysis, content analysis and Atlas.ti. The findings established effect of advisory teachers' instructional strategies on implementation of the revised curriculum for English as a second language, the prevailing instructional strategies used and the association between instructional strategies and existing implementation of revised curriculum at schools. Advisory teachers need to study and learn the application of instructional strategies, apply strategies to optimise their success and enhance implementation of the revised curriculum which may result on students academic outcomes. Advisory teachers' instructional strategies have an effect on implementation of revised curriculum that affects schools, teachers' performance which could results in positive and negative student academic performance.*

Keywords: *English second language, instructional strategies, revised curriculum*

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Mohammed Lazrak[1]

Research paper

STRATEGIES FOR CRITICAL READING IN ADVANCED ENGLISH CLASSES: THE CASE OF MOROCCAN STUDENTS AT THE SCHOOL OF EDUCATION

Abstract: *This paper's objectives are to update teachers on the most recent research on critical reading strategies based on a thorough literature review, determine how frequently advanced EFL students use critical reading strategies, and describe a process by which students can move from understanding a text to critically analyzing it. Based on the most recent research on critical reading, this study identifies the most crucial critical reading techniques for advanced EFL tertiary courses. It specifically suggests reading techniques for real non-fiction passages, such as techniques tailored to academic and ungraded online media texts for EFL students. Although there is a lot of legitimate content available for reading materials for advanced EFL courses, there are issues with quality and complexity. By using critical reading techniques, students may analyze real texts to determine the author's argument, bias, and goal so they can read and react intelligently. The study also presents survey results about advanced EFL college students' usage of comprehension-based and critical reading practices. According to the survey, participants employed comprehension-based reading strategies more frequently than critical reading strategies, although they also independently employed several critical reading strategies, such as differentiating between topic and supporting ideas and drawing pertinent conclusions. Based on the survey results, this study outlines recommended practices for teaching some critical reading methods that require more focus in the classroom, such as recognizing rhetorical devices.*

Keywords: *Critical reading strategies, advanced EFL English, authentic texts, Moroccan EFL Students*

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Yassine Akhmouch[1]

Review paper

TERMS OF ADDRESS AND INTERPERSONAL RELATIONSHIPS IN THE LANGUAGE PRACTICES OF MOROCCAN SPEAKERS

Abstract: *In this article, we analyze the use of terms of address in the language practices of Moroccan speakers. These expressions, fulfilling the function of address, appear in different morphologies ranging from the pronominal form to the nominal syntagm; thus, they show multiple semantic facets both in their production and in their perception while referring to social constraints. Linguist Catherine Kerbrat-Orecchioni was one of the first to take a pragmatic approach to this subject, arguing that, in addition to their deictic value in referring to the other person, terms of address evoke a relational value that serves to establish socio-affective links between speaking subjects. This research is based on an oral corpus of Moroccan Arabic collected during a field survey at the end of our doctoral research on the language practices of Moroccans. It concerns authentic situations emanating from daily life activities taking place in two regions of Morocco, namely the Fes-Meknes region and the Rabat-Sale-Kenitra region. In addition, a questionnaire was drawn up with the aim of gaining a better understanding of how these terms of address are used. Given the diversity of Morocco's sociolinguistic fabric, the analysis of terms of address is rich in connotations. In terms of production, the choice of the term of address is not only determined by the speaker's intention, which is generally to address the second person, whether neutrally, metaphorically, or fictitiously, in order to initiate a conversation, but also by the characteristics of the interlocutor, notably identity, social appearance, and gender. At the level of perception, this use can produce various interpersonal effects: valorization, stigmatization, respect, humiliation, embarrassment, and misunderstanding. In addition, it will be perceived as appropriate or inappropriate, depending on the parameters of the socio-cultural context in which the interaction takes place.*

Keywords: *Terms of address; Interpersonal relationships; Language practices; Moroccan Arabic language; Verbal interaction; Sociolinguistic*

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Anna Mokrousova[1]
Ksenia Kaisheva
Julia Yundunova

Research paper

IMPROVING THE QUALITY OF EFL SKILL DEVELOPMENT THROUGH STATISTICAL METHODS

Abstract: *In the context of growing emphasis on quality assurance in higher education, this study explores how statistical analysis can inform and enhance the teaching of English as a Foreign Language (EFL) to university-level students. Based on diagnostic test data from over 600 learners, a comprehensive statistical approach was employed to identify key patterns in student performance and provide actionable insights for instructors. Descriptive statistics, group comparisons (ANOVA, Kruskal–Wallis), and correlation analyses (Pearson, Spearman) revealed significant differences across academic groups and institutions, as well as a weak but meaningful link between test duration and performance. Advanced methods, including linear and logistic regression, k-means clustering, item difficulty indexing, and normality testing, offered deeper insights into learner segmentation and performance predictors. The results of cluster analysis helped define distinct learner profiles, while item-level diagnostics highlighted the most informative tasks. The study offers practical recommendations for ESL instructors, including strategies for adapting instruction to student needs, optimizing test design, and targeting pedagogical interventions more effectively. By integrating statistical diagnostics into language education, this work contributes to bridging the gap between test results and meaningful improvements in teaching quality.*

Keywords: *Quality, Statistical Analysis, EFL, Evidence-Based Pedagogy, University Students*

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Research paper

ADVANCED MACHINE LEARNING FOR SMART PEDAGOGY AND OUTCOME-BASED ASSESSMENT IN HIGHER EDUCATION

Abstract: *Technology is rapidly transforming higher education, making it essential to adopt new teaching and assessment methods. Traditional teaching approaches often struggle to meet students' diverse learning needs and ensure effective learning outcomes. Machine learning (ML) offers a promising solution by enabling adaptive, personalized, and data-driven learning experiences.*

ML-powered educational systems analyzed large amounts of student data to identify learning patterns, predict performance, and provide tailored support. This helps educators create customized learning paths, improving student engagement and academic success. Outcome-based assessment (OBA), which evaluates students based on predefined learning goals, benefits from ML by automating grading, offering real-time feedback, and detecting knowledge gaps. However, implementing ML in education comes with challenges, including data privacy concerns, bias in algorithms, and the need for proper faculty training. Despite these issues, ML has the potential to revolutionize higher education by making learning more personalized, efficient, and fair.

This research explores how advanced ML techniques such as deep learning, natural language processing (NLP), and predictive analytics can enhance teaching and assessment. It also examines best practices for integrating ML into education while addressing ethical concerns. By proposing a scalable and transparent ML framework, this study aims to support a more effective and student focused approach to higher education.

Keywords: *Machine Learning, Smart Pedagogy, Outcome-Based Assessment, Higher Education, Personalized Learning, AI in Education*

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Aysel İçöz[1]
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Research paper,

PRE-DEGREE STUDENTS' PERCEPTIONS OF FOOD PACKAGING AND PERSPECTIVE ON NEW-GENERATION PACKAGING (ACTIVE-SMART PACKAGING)

Abstract: *The packaging sector has turned to new searches to offer consumers safer, higher-quality food products and to adapt to the markets. Traditional packaging is no longer sufficient. New features of food packaging are influenced by consumers' preferences for higher food safety, desire for information, and convenience. New packaging systems that increase the protective power of the packaging, extend the shelf life, monitor the product, provide information about its quality, and are used for product sections have emerged.*

This research aims to determine the perceptions of associate degree students about food packaging and their perspectives on new-generation packaging (Smart Active Packaging). The sample of the research consists of associate degree students of Namık Kemal University Vocational School of Technical Sciences.

According to the results of the research, there is a statistically significant relationship between the participants' gender and various packaging preferences. The results show that associate degree students do not have detailed knowledge about innovative packaging, but they are open to training on innovative packaging. Understanding students' perspectives on packaging can help develop appropriate packaging designs for young consumers.

In this context, future research can provide students with more information about innovative packaging and increase their awareness by creating personalized training programs with artificial intelligence.

Keywords: *Gender, Active-Smart Packaging, Students,*

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Research paper

INVESTIGATING READING SLOWNESS IN ARABIC: INSIGHTS FROM THE VISUAL SPAN HYPOTHESIS

Abstract: *The visual span refers to the number of letters readers can identify in a single fixation without using linguistic skills. Proponents of the visual span hypothesis postulate an influence of early visual processing on reading speed. Given the slowness of reading Arabic texts, the present work aims to study the development of the visual span and its effects on reading speed in the Arabic- speaking context. Thirty-four subjects participated in the study. The trigram task and the rapid serial visual presentation (RSVP) paradigm were used to estimate visual span size and reading speed. In line with our initial assumptions, the results showed a significant effect of grade level on reading speed ($F(2,31) = 30.93$, $p<0.001$) and visual span size ($F(2,31) = 20.57$, $p<0.001$). In good alignment with previous work, our results show that visual span size could explain around 39% of the reading speed variability. Furthermore, our results show that Arabic readers exhibit slower reading speeds in the RSVP task, which supports the observed slowness in reading Arabic texts. In short, the present findings suggest that a narrowing of the visual span could be a potential factor of this slowness.*

Keywords: *Visual Span; Reading Speed; Arabic; Readers*

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Review paper

ETHICAL CONCERNS AND LEGAL IMPLICATIONS OF GENERATIVE AI IN CONTENT CREATION

Abstract: *The emergence of Generative Artificial Intelligence (AI) as a new content paradigm is reshaping a variety of fields such as journalism, education, entertainment and digital communications. GPT-4, DALL·E, Deepfake and Generative Adversarial Networks (GANs) produced incredibly complex text, imagery, music and video — generally so good they were indistinguishable from human Content Creators. The moral and legal dimensions of these technologies are immense potential for creation however they also pose important challenges.*

This review specially focuses on the importance of generative AI and how it changes our understanding of the creativity, responsibility & human agency through different examples. It also highlights gaps in existing regulatory frameworks and the necessity for ethical guidelines and interdisciplinary work as well as forward looking policy making. Using these issues in a societal and cultural framework the review seeks to aid more responsible and human centred embedding of AI technologies throughout creative practices.

Keywords: *generative artificial intelligence, ethical guidelines, content creation, deepfake, generative adversarial networks.*

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Mustafa Cem Aldag[1]
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Research paper

THE REALITY OF ARTIFICIAL INTELLIGENCE IN MANUFACTURING

Abstract: *The widespread presence of artificial intelligence applications in modern society has a profound impact on all aspects of manufacturing. The application of artificial intelligence in the manufacturing industry has evolved from a possibility to a necessity for survival in competition. The application of artificial intelligence (AI) is required by organizations intending to improve manufacturing processes. The artificial intelligence (AI) application has been shown to increase the effectiveness of quality processes, render them more stable, and reduce the rate of human error. The machinery manufacturing industry in 2024 is witnessing considerable growth and evolution, fueled by technological innovation, shifting consumer attitudes, and global market trends. It is necessary for companies to find out about the shifting trends in this industry to remain competitive and use new possibilities appropriately. This in-depth paper presents a detailed examination of the most significant trends that shape the machinery manufacturing industry in 2024. It gives stakeholders data and expert insights to assist in navigating this evolving environment effectively.*

Keywords: *Artificial Intelligence, Quality 4.0, Industrial IoT*

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Tural Muzafarov[1]

Research paper

THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE (AI) IN MODERN SOFTWARE ECOSYSTEMS

Abstract: *The implementation of Artificial Intelligence (AI) in modern software ecosystems goes beyond model accuracy, requiring the development and coordination of strong, scalable backend infrastructures for smooth integration and deployment. This article outlines the fundamental architectural structures sup-porting AI-enabled systems, highlighting the crucial function of backend engineering in facilitating the interface between machine learning components and production environments. It rigorously analyses prominent technical difficulties, such as the management of model versioning and deployment lifecycles, reduction of inference latency at scale, and maintenance of data integrity throughout dynamic processing pipelines. In anticipating future advancements, the discussion converges on the paradigm of edge computing as a strategic enabler for decentralised, low-latency AI inference, highlighting its potential to reshape backend infrastructure in distributed intel ligent systems.*

Keywords: *Model Versioning And Deployment, Inference Latency, Pipeline Reliability, Edge Computing*

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Vikas Mahandule

Research paper

PRECISION AGRICULTURE: AI-DRIVEN METHODS FOR CROP MANAGEMENT

Abstract: *Precision agriculture utilizes technological innovations to enhance field-level management related to crop cultivation. This research investigates AI-based solutions that aid precision agriculture, highlighting their importance in optimizing crop management, enhancing crop productivity, and fostering sustainability. This study emphasizes the transformative effect of AI on agricultural methodologies and future advancements in the sector by analyzing data analytics, machine learning, and IoT applications.*

Keywords: *Precision Agriculture, Artificial Intelligence in Farming, Crop Management, Smart Irrigation, Machine Learning in Agriculture, IoT in Precision Farming, Agricultural Data Analytics, Sustainable Agriculture, Crop Yield Prediction, Pest and Disease Detectio*

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Research paper

AI-POWERED QUALITY OF WORKING LIFE: THE EVOLUTION THROUGH INTELLIGENT SYSTEMS

Abstract: *Technology has continuously reshaped the way organizations function and how employees perceive their roles in the ever-changing and diverse landscape of contemporary workplaces. One of the most significant advancements of the twenty-first century is artificial intelligence (AL), which has evolved from its initial focus on operational efficiency and mechanization to significantly impact the complex aspects of quality of work life (QWL). The research utilizes a systematic literature review methodology, analyzing 81 articles indexed in the scopus database, selected using the prisma approach. To gain a deeper understanding, thematic analyses in bibliometric analysis was conducted, followed by conceptual analyses. The findings revealed trending topics like robots, innovative work behavior, green hrm (green training, involvement and development, green performance and compensation) using algorithms and machine learning for predicting employee engagement, attrition, future skills needs, family related benefits and well-being expressions and career sustainability. These components are thoroughly examined to uncover their intricate connections, offering a comprehensive understanding of their interdependencies and potential future developments. The objective of this study is to provide managers, policymakers, and owners with a comprehensive understanding of how artificial intelligence (ai) is shaping the future of work and its impact on workers' well-being and work-life quality. This will assist them in gaining a deeper understanding of ai adoptions.*

Keywords: *Artificial intelligence, Quality of work-life, Intelligent Systems*

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Vikas Mahandule

Research paper

AI- POWERED SOLUTIONS FOR LOAD AND ROUTE OPTIMIZATION IN SUPPLY CHAIN MANAGEMENT INCORPORATING THE TRAVELLING SALESMAN PROBLEM

Abstract: *The rising advancements of supply chain complexities and the demand for cost-effective, time-saving, and environmentally friendly logistics has driven innovative solutions. As logistics systems become more and more complex in their operations, and the utilization of traditional means is challenged to provide solutions for efficient routing. The study aims to examine the use of artificial intelligence methods in supply chain incorporating with TSP problem. A comparative worldview will be briefly addressed in-order to display the strength of applicability. There is a comparative analysis of the methods, explicating the differences among them, and discussing the circumstances where one method may be more appropriate than another in a certain logistics case. The required data for conducting each AI method is laid out, along with what the possible impact of the data quality could be on the selected performance measure. Future work directed at hybrid methods, utilizing real-time data systems, and introductions of scalability of the methods across the supply chain will be articulated. The takeaway findings are that AI can fundamentally alter complex routing issues and can move the performance and more importantly the agility and responsiveness of the supply chain into a new distributive sonic layer. We hope this work illuminates future investigations into the body of work that exists on AI in logistics, and serves as a meaningful review of practical implications for the practitioner audience. The focus of this research shows the capability of AI to enhance operational efficiency, travel cost, and aid in intelligent decision-making for uncertain conditions inherent and dynamic in supply chain.*

Keywords: *Artificial intelligence, TSP, Supply chain, Route and Load optimization, load optimization, ACO, Reinforcement learning, Swarm Intelligence*

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Dariusz Raś [1]

Research paper

ARE THE QUALITY-ASSESSMENT CRITERIA INTERDEPENDENT? THE APPLICATION OF DEMATEL METHOD TO EVALUATE RELATIONS WITHIN THE TULIP MODEL

Abstract: *The objective of the current research is to apply DEMATEL (a multicriteria decision support method) to identify cause-and-effect relationships among the sixteen criteria of the TULIP model (Test on Usability, Linguistic, Information and Publicity), a multidimensional framework for evaluating the quality of media messages and internet content. This analysis was intended to support the reduction of redundancy, prioritization of the most impactful elements, and simplification of the model without compromising its explanatory power. The motivation for this study emerged from earlier empirical findings, which revealed strong interdependencies among several criteria, indicating potential conceptual overlap. Using expert-based pairwise comparisons and statistical modeling, the DEMATEL analysis identified completeness (A7) and impartiality (C1) as the most influential and globally significant factors within the model. These findings suggest that these two criteria play a central role in shaping media quality perceptions and should be prioritized in practical assessment applications. The study contributes to media research by demonstrating how multi-criteria decision-making tools can enhance the coherence, interpretability, and efficiency of media products.*

Keywords: *DEMATEL; TULIP; quality assessment criteria; media quality*

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Samikshya Madhukullya
Anwesha Hazarika

Research paper

LOGISTICS AND SUPPLY CHAIN MANAGEMENT USING AI BETWEEN INDIA AND RUSSIA FOR A SUSTAINABLE FUTURE

Abstract: *Artificial Intelligence (AI) has the potential to greatly improve sustainability and efficiency in supply chain management and logistics between India and Russia. With an emphasis on crucial areas including demand forecasting, inventory management, route optimization, and real-time tracking, this study investigates how AI may improve the logistics and supply chain industries in both nations in order to create a sustainable future. In order to comprehend the opportunities and difficulties in putting AI solutions into practice, the study uses a qualitative methodology and conducts in-depth interviews with supply chain managers, industry experts, and AI specialists. Thematic analysis and qualitative coding are two data gathering approaches that aid in finding trends and insights about AI applications in logistics. Additionally, the study assesses the prospective effects of AI technologies like machine learning, neural networks, and predictive analytics on enhancing operational performance, lowering carbon emissions, and promoting sustainable business practices. The partnership between Russia and India, two countries with different but complementary logistical requirements, presents a special chance to use AI to expedite international supply chains. By emphasizing sustainability, the study also looks at how AI may help logistics operations minimize their environmental impact, optimize resource utilization, and reduce waste.*

This study adds to the expanding corpus of research on artificial intelligence (AI) in supply chain management and offers useful suggestions for industry participants wishing to use AI to improve sustainability.

Keywords: *Supply chain management, Logistics, Artificial intelligence, Sustainability, India-Russia*

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Research paper

A NOVEL MONITORING APPROACH USING SUPPORT VECTOR REGRESSION METHOD FOR OPTIMIZING A TRIPLE-CONCEPT MODEL WITH AUTOCORRELATED DATA

Abstract: *Integrating production, maintenance, and quality concepts has yielded positive results for imperfect processes that degrade over time due to various specific causes. In practice, identified correlations within monitored data over time challenges the traditional assumption of independence. To address this, the Autoregressive Moving Average (ARMA) control chart has been utilized in integrated models. This study proposes a novel control chart based on the support vector regression (SVR) method to apply within integrated models. In an integrated model, the performance of both monitoring techniques are assessed. A solution procedure based on particle swarm optimization (PSO) algorithm is employed. An industrial case study and comparative analyses are presented for further examination. Under smaller shifts, SVR performs better, whereas monitoring with the ARMA chart yields infeasible solutions in six scenarios. However, due to the time-consuming procedure of the SVR, the ARMA chart becomes a more desirable option for larger shifts.*

Keywords: *Autocorrelation, ARMA chart, Support vector regression, Production, Maintenance*

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Research paper

IMPROVING QUALITY MAINTENANCE THROUGH NEURAL NETWORK-BASED MACHINE FAILURE PREDICTION

Abstract: *This paper explores a neural network-based approach to machine failure prediction, leveraging deep learning techniques to analyze data. Different neural network architectures with five input features, consisting of one, two, and three hidden layers with 50, 100, and 150 neurons per layer, are tested on a synthetic dataset to identify the most effective model for detecting failure patterns. All procedures are conducted using Python, employing an Multi-layer Perceptron (MLP) classifier. Key performance metrics, including precision, recall, accuracy, and F1-score, are calculated and compared across eight architectures. Additionally, AUC-ROC, Log Loss, and training time are evaluated to determine the optimal model. The results are further analyzed based on class-wise performance for the positive (class 1) and negative (class 0) classes. The best performance is achieved with three hidden layers, each containing 50 neurons, exhibiting a high F1-score, strong recall, and balanced class-wise performance*

Keywords: *Quality maintenance, MLP classifier, Neural network architecture, Performance metrics, Evaluation*

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Research paper

PREDICTION THE MAXIMUM HEIGHT OF ROUGHNESS PROFILE AS A FUNCTION OF TOOL WEAR USING ARTIFICIAL NEURAL NETWORKS

Abstract: *By training artificial neural networks based on data obtained through experiment conducted using the Taguchi design in drilling process, this study developed models for predicting the maximum height of roughness profile as a function of tool wear. The development of models with multiple inputs and a single output was performed using Backpropagation artificial neural networks with one and two hidden layers, employing sigmoid transfer functions in the hidden layers and a linear transfer function in the output layer. During the model development, the input parameters of the drilling process and the tool wear values before tool blunting were used as network inputs, while the maximum height of roughness profile was used as the network output. A comparative analysis of model errors, calculated based on experimental values and predicted maximum height of roughness profile values for given input parameters and wear at the moment of tool blunting, led to the conclusion that the best results were obtained using the artificial neural network model with two hidden layers, employing sigmoid transfer functions in the hidden layers and a linear transfer function in the output layer.*

Keywords: *Prediction, Roughness, Tool Wear, Artificial Neural Networks*

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Research paper

NEURAL NETWORKS FOR IMPROVING INDUSTRIAL OPERATIONS: SMART LOGISTICS APPROACH

Abstract: *The article "Machine Learning Applied to Local Economic Development" explores the use of machine learning techniques to drive economic development at the local level. It highlights how these methods can offer innovative solutions to improve economic planning, optimize resources, and support local businesses. The article begins with an overview of the fundamentals of machine learning and its potential to transform local economic processes. It explains how machine learning algorithms can analyze large amounts of economic data, such as market trends, consumer behaviors, and business performance, to provide valuable insights that support strategic decision-making. Concrete examples of local applications in the Fez-Meknes region are presented, including the use of machine learning techniques to identify growing economic sectors, predict infrastructure needs, and improve business support policies. The article also examines how these technologies can help personalize local services, such as vocational training programs tailored to the skills demanded by the labor market. In addition, the article discusses the challenges associated with implementing machine learning in local economic development, such as data quality, model complexity, and ethical issues related to data use. It also highlights the importance of collaboration between academic institutions, local governments, and businesses to maximize the benefits of machine learning-based solutions. The article argues that, although obstacles remain, the application of machine learning offers significant opportunities to improve local economic development. The insights generated by these technologies can contribute to more effective planning, better resource allocation, and more targeted support for local businesses, thereby strengthening the economic resilience and competitiveness of local communities.*

Keywords: *Machine learning, Local economic development, Supply chain optimization, Data analysis, Cultural tourism, Demand forecasting, Smart urban services, Waste management, Regional innovation*

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Research paper

EXPLORING THE KEY DRIVERS OF BLOCKCHAIN SMART CONTRACTS FOR IMPROVING LOGISTICS SERVICE

Abstract: *Blockchain smart contracts have gained significant importance in the logistics industry due to their ability to provide monitoring of logistics operations and increase on-time delivery, decision-making, and real-time information sharing. The study aims to explore the key drivers of blockchain-based smart contracts for improving logistics service quality. This paper identifies the key factors facilitating the adoption of blockchain-based smart contracts in solving payment issues in the logistics industry. Blockchain smart contracts offer advanced payment systems, not only enabling automated, secure, timely transactions but also decreasing payment delays and the risk of fraud. Effective logistics planning and decision-making depend on the secure and transparent exchange of trade documents across various stakeholders. The qualitative research method is used through in-depth interviews with logistics professionals and blockchain experts. The key finding of the paper is that blockchain and smart contract-powered solutions can significantly mitigate payment issues, reduce costs, enhance speedy logistics service, and respond to stakeholders' requirements in the logistics industry. Moreover, it highlights how these smart contracts enhance logistics service quality by boosting operational efficiency, flexibility, and transparency. The research presents a practical roadmap to logistics managers for integrating blockchain smart contracts offering a comprehensive framework to improve logistics service quality.*

Keywords: *Blockchain, Smart Contract, Logistics Service Quality, Quality*

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Review paper

THE COMPETITIVE ADVANTAGES IN UTILIZING CLOUD COMPUTING SERVICES (CCS): A BIBLIOMETRIC-SYSTEMATIC LITERATURE REVIEW (B-SLR) METHOD

Abstract: *This study investigates the factors and trends that allow organisations to achieve competitive advantages via Cloud Computing Services (CCS). Since 2017, the extensive implementation of CCS has enabled businesses to provide enhanced products and services at competitive prices, while maintaining accessibility and countering competitors' offerings. Nonetheless, insufficient skilled personnel could hinder the optimal implementation of CCS, placing organisations at a competitive disadvantage. This study employs a multi-method approach, integrating a Systematic Literature Review (SLR) and Bibliometric Analysis (B-SLR) to investigate the potential of CCS in improving competitive positioning. Research indicates that organisations should invest in strengthening their Information Systems (IS) processes to optimise the benefits of CCS, ensuring coherence with strategic objectives and operational requirements. This study enhances the comprehension of the strategic role of CCS in business and offers insights for organizations to refine their strategies, optimize CCS usage, and improve market competitiveness.*

Keywords: *Competitive advantages, information system processes, cloud computing services, systematic literature review, bibliometric analysis, bibliometric-systematic literature review*

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Review paper

A REVIEW OF IMAGE SEGMENTATION TECHNIQUES AND APPLICATIONS

Abstract: *Image segmentation is a process of separating an image into different parts or areas to make it more meaningful and easier to understand usually depending on the objects or textures. This helps to simplify image analysis by dividing the image into meaningful classes, which can be used for further process. Image division is used in many practical areas such as medical imaging, autonomous driving, agriculture and remote sensing.*

In today's world, machine learning and deep learning have become popular for image division due to their ability to learn patterns from large datasets. Convolutional Neural Network (CNNS), U-NET, Mask R-CNN, and transformer-based models have shown great success in accurately identifying and separating objects in images.

This review paper offers a summary of various image division technique, from traditional methods to modern deep teaching approaches. Traditional techniques include thresholding, growing area, clustering (such as-support) and edge detection.

Keywords: *images segmentation, machine learning, deep learning, computer vision, medical image, autonomous driving, thresholding*

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Research paper

APPLICATION OF MCDM IN A SMALL SERBIAN PRINTING COMPANY

Abstract: *This paper presents the application of multi-criteria decision-making (MCDM) methods to support the selection of a printing machine in a small Serbian printing company. The study aims to select the most suitable machine among the three alternatives preselected by the company owner. In the decision-making process, seven limiting factors, i.e., criteria, were taken into consideration. The selected criteria were ranked using the AHP method, while the alternatives were evaluated and ranked using the VIKOR method. The theoretical foundations of the chosen methods are described in detail. To evaluate the most favorable alternative considering the selected criteria, the relative importance of each criterion was first determined using the mathematical formulas of the AHP method. Subsequently, taking into account the criteria weights, the requirements of each criterion, and the corresponding mathematical formulas of the VIKOR method, the alternatives were ranked and an assessment of the most favorable machine was provided.*

Keywords: *Multi-Criteria Decision-Making, AHP, VIKOR, Graphic Industry, Printing Company, Printing Machine*

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Review paper

A COMPREHENSIVE ANALYSIS OF EMERGING CYBER THREATS AND MITIGATION STRATEGIES IN THE DIGITAL ERA

Abstract: *The proliferation of digital technologies has led to a corresponding rise in sophisticated cyber threats, impacting individuals, businesses, and national infrastructure. This study presents a comprehensive review of prominent emerging cyber threats, including ransomware, phishing, IoT vulnerabilities, and advanced persistent threats (APTs). It also proposes mitigation techniques and discusses future implications. By analyzing real-world cases and examining current prevention mechanisms, this research contributes to the understanding of evolving cybersecurity landscapes. The findings emphasize the need for adaptive defense systems, cybersecurity awareness, and global cooperation.*

Keywords: *Cybersecurity, Ransomware, Phishing, IoT Security, APTs, DNS Tunneling, Cyber Warfare*

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Research paper

RESEARCH INTO THE IMPACT OF CULTURAL CONDITIONS ON THE QUALITY OF WORK

Abstract: *The article deals with the problem of the influence of cultural conditions on the quality of work. The quality of an employee's performance of a given job can be affected by many factors, such as personality, temperament, professed values or religion, education, age, as well as country of origin. This paper presents the results of a survey conducted at an enterprise belonging to a multinational corporation, representing the energy, electrical engineering and telecommunications industries. In the survey study, the respondents were employees, representing 9 nationalities. The obtained results of the research, their analysis and synthesis can contribute to the awareness of the entrepreneur of the opportunities and at the same time the potential resulting from the country of origin of a given employee.*

Keywords: *quality, quality of work, cultural determinants, multinational enterprise, teamwork*

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Research paper

INTEGRATING IOT DEVICES TO ENHANCE WORK RELATED QUALITY OF LIFE BY REDUCING OCCUPATIONAL HAZARDS OF UNIVERSITY FACULTIES

Abstract: *This paper concentrates on the application of The Internet of Things (IoT) which has completely changed how businesses run and has brought about new methods for data collection and analysis. Human Resource (HR) Management is one area where IoT data can be specifically helpful because it can be utilized to guide strategic planning and decision-making. Therefore, to fully understand the probability of IoT in enhancing work-related quality of work life, this paper discusses the role of IoT technologies that are being currently used to ascertain and collect the data of the potential occupational hazards. Also this paper will highlight how some more IOT technologies and wearable devices will help collect advanced-level data to ascertain issues like emotional exhaustion state/stress, /musculoskeletal disorders which are one of the main indicators of occupational hazards, especially for the university faculties, which has a direct impact on their work-related quality of life.*

Keywords: *Internet Of Things, Wearable Devices, Work-Related Quality Of Life, Occupational Hazards*

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Research paper

QUALITY OF LIFE MODEL WITH SUPER DIMENSIONS

Abstract: *This paper introduces a novel quality of life (QoL) model integrating an over-dimension (mind field network) and super dimensions (macro and micro world influences) with traditional dimensions (economy, society, environment). The human mind, part of a universal mind field, interacts with physical fields (e.g., Earth's magnetic field, solar radiation) and micro-level particles (e.g., photons, quarks), shaping health, behavior, and happiness. This interdisciplinary model, bridging physics, consciousness studies, and social sciences, redefines QoL and calls for innovative research into mind-matter and cosmic interactions.*

Keywords: *Quality Of Life, Mind Field, Macro World, Micro World, Magnetic Fields, Cosmic Radiation, Schumann Resonance, Spirituality, Happiness*

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Research paper

A NEW APROACH TO QUALITY OF CULTURE

Abstract: *Culture started with civilization development and now is one of key civilization carracteristic. On the other side quality is developed paralel with culture as separate process. The question is how integrate both processes.*

During quality development was defined concept of culture of quality in last century, but aspect of quality of culture is less analyzed. The goal of the article is to analyze both concepts and to define relationship between both concepts. For it is defined base model of integration with key entities and relationships, at the end is assessed value of sinergy from both concept based on research in Serbian circumstances.

Keywords: *Culture, Culture Of Quality, Quality, Quality Of Culture, Synergy Through Integration*

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Research paper

A QUALITY OF CIVILIZATIONS

Abstract: *Based on G.G. Hegel's idea about a „World Spirit“ and A. Toynbee's definition of civilization as a group of nation-states whose ideas and ways of doing things come to dominate „the known world“ and quality science autors were encourage to develop thema „quality of civilizations“.*

In the paper are in first part defined basic views related to civilization, as definitions, impact on human development structure, types of civilizations, future etc., but without relation to quality. The last evidence is motive for our research which first results is presented in the paper. In second part of the paper is presented our reflection on civilization, esspeciali past and present civilizations and their futures. In the third part of the paper is presented base model of quality of civilization based on quality science and civilization dimensions and civilization carracteristics.

Keywords: *Civilization, Quality, Model, Quality Of Civilizatopns*

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Review paper

REAL-TIME APPLICATIONS OF MACHINE LEARNING IN SMART CITIES: A REVIEW

Abstract: *With the rate of urbanization, cities worldwide are seeking innovative solutions to enhance their lives to be more efficient, sustainable, and livable. One of the most groundbreaking technologies that enable this change is machine learning (ML), an artificial intelligence subfield that enables systems to learn from data and make smart decisions without being specifically coded. This review discusses the critical role of real-time machine learning in the development of smart cities, whose applications cut across diverse sectors such as transportation, energy, public safety, environmental monitoring, and health. While these innovations promise to make urban processes more efficient, they come with challenges. Concerns related to data privacy, infrastructural constraints, algorithmic bias, and policy deficits persist in keeping ML's full potential in real-time urban contexts from being realized. This paper discusses these challenges and sets out the future directions for the integration of intelligent systems in contemporary urban governance.*

Keywords: *machine learning, artificial intelligence, smart cities, sustainable, integration, intelligent system*

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Midhun Chakkaravarthy

Review paper

A DATA-DRIVEN MAPPING OF ORGANIZATIONAL CITIZENSHIP PRESSURE: A BIBLIOMETRIC AND NETWORK ANALYSIS APPROACH

Abstract: *Organizational Citizenship Pressure (OCP) refers to the pressure employees feel to go beyond their formal job roles. This study maps how research on OCP has evolved by analyzing 70 articles from Scopus and Web of Science using bibliometric tools and the PRISMA method. Our findings show that most studies focus on four main areas: behavior, performance, stress, and causes of OCP. The research field is tightly connected but still limited in variety. We propose two new models: the Adaptive OCP (AOCP) Model, which explains how workplace conditions can make OCP either helpful or harmful, and the Dual-Path Framework, which shows that moderate pressure can boost performance but too much pressure can lead to burnout. These insights offer practical ideas for leaders and HR teams to encourage healthy extra-role behavior. Moreover, the proposed models can support predictive modeling, helping organizations forecast employee outcomes and design more effective workplace strategies.*

Keywords: *Organizational Citizenship Pressure; Extra-role Pressure; Bibliometric Analysis; Thematic Mapping; Well-being; Performance*

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Review paper

COMPREHENSIVE STUDY ON EMPOWERING WOMEN IN THE WORKFORCE: STRATEGIES FOR ADDRESSING CAREER CHALLENGES AND ENHANCING PROFESSIONAL DEVELOPMENT

Abstract: *This comprehensive review investigates the multifaceted challenges and advancements related to women's career development across diverse cultural and organizational contexts. The analysis integrates findings from various studies, including those focused on Bangladesh, Italy, India, Spain, Brazil, and global surveys. The study considers the review from both the developed and underdeveloped countries. Key themes include the persistent impact of work-life balance, gender stereotypes, and barriers to leadership roles. Evidence from these studies highlights that while progress has been made in increasing women's representation in leadership and improving diversity and inclusion practices, significant barriers remain. These include gender biases, inadequate support for women re-entering the workforce, and the need for flexible work arrangements. Specific issues such as career advancement challenges and the influence of personal resilience are also examined. The review underscores the challenges faced by women globally and critical need for attention to be given to continued efforts in policy reform, organizational support, and educational advancements to address these challenges and foster an environment. Hence the study explains the needs of the women to achieve work life balance and equitable career progression from the reviews obtained from various studies.*

Keywords: *Gender Equality, Career Development, Work-Life Balance, Diversity and Inclusion, Professional Development, Global Workforce, Cultural Barriers, Policy Reform*

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Review paper

WHAT IS "ABOVE" THE MIND? – BASIC ENTITY OF EXISTENCE

Abstract: *In order to conduct a thought experiment on the research question: What is "above" the mind, it is necessary to consider the question of the mind itself. The basic paradigm of modern Western science starts from the concept of matter and the theory of evolution, so the source of mind is matter from which it emerges through the process of evolution. He also believes that the mind is exclusively a property of living matter, primarily humans and some animals that are high on the evolutionary ladder of living beings (primates, for example). Is this even true and isn't mind a property of all entities that exist in the visible/cognizable world? These two opposing viewpoints define a completely different understanding of the world and its essence. In the first case, the world was created out of chaos by evolution and from nothing (singularity), and in the second, the world is generated by the mind according to strict principles and is always constant. So, the research problem: what is "above" the mind? is possible only if the entire world is imbued with intelligence. Starting from the assumption that there is nothing finite in the structure of the world and reality and that an unlimited number of different creations are possible, then it is logical that the mind is not a limiting feature of the expression of the world and its reality. Just as we have (through the limited senses) the understanding of matter, energy and time, as well as the origin and disappearance of entities in time, and based on this "absolutely true" (through science and mathematics) proof of objective reality and "fundamental" laws, so we also have the much more logical and deeper truth that the world is organized by the mind and that its essence is the existence of information (ideas and creations) which in a timeless state ("bright emptiness") creates countless worlds and a temporal dimension (not from singularity) in order to express the creations themselves. If the mind is all-pervading then what is it that generates it, what is it that is "above" mind and information? What kind of natural phenomenon is it? This work is an attempt to initiate research into this phenomenon, with the fact that the essence of the mind itself and its role in the existence and being of the world must first be resolved.*

Keywords: *Mind, field of mind, what is "above" the mind?, "bright emptiness", understanding the essence of the world, information, creation, basic entity of existence.*

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Evgenia Vygodskaya

Review paper

PHOTOGRAPHY AS A BUSINESS: A BIBLIOMETRIC ANALYSIS AND SCOPING REVIEW

Abstract: *The photography industry has experienced significant transformation due to rapid digitalization, evolving consumer behavior, and the expansion of social media platforms. This study provides a comprehensive bibliometric analysis and scoping review of scholarly literature on photography as a business, aiming to map key research trends, identify knowledge gaps, and explore emerging strategies in the field. Based on 386 publications retrieved from the Scopus database (1994–2024), and following the PRISMA-ScR protocol, 20 studies were selected for in-depth analysis. Using tools such as Python and VOSviewer, thematic modeling and network visualization revealed two major clusters: economic and organizational aspects (e.g., business models, entrepreneurship, technological innovation) and cultural dimensions (e.g., identity, representation, visual culture). The study identifies core themes including branding, client management, market adaptation, and the integration of artificial intelligence in photography workflows. In addition to offering a systematic synthesis of existing scholarly research, this review contributes to the development of practical frameworks for photographers and creative entrepreneurs, supporting more informed decision-making and sustainable business practices in an increasingly digitized and competitive landscape.*

Keywords: *Photography, Creative Business, Entrepreneurship, Digital Transformation*

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Research paper

FIRE PROTECTION OF INACCESSIBLE AREAS WITH A FOCUS ON PREVENTION

Abstract: *Forest fires in inaccessible areas are a serious problem all around the world and often lead to catastrophic consequences not only for the areas affected by the fire but also for nearby agricultural and even residential areas. In addition, forest fires also pose a potential threat to tourism, which is one of the most important economic sector in developed countries, as large forest fires instill insecurity and fear among visitors. This paper examines the challenges and measures for protecting against forest fires in inaccessible areas, which are at high risk of fire due to global warming and adverse climate conditions. The number of forest fires is expected to increase by 50% by 2050, which requires improved safety measures and equipment. The consequences of fires include ecological, economic and social damage, while most fires are caused by human activities. The paper focuses on key factors that influence forest fires, such as meteorological conditions, vegetation types and accessibility of forest areas, and emphasizes the importance of preventive measures such as forest thinning, construction of access roads and vegetation planning that can slow down the spread of fires. Innovative methods such as 24-hour video and meteorological surveillance, drones with thermal cameras and fire spread simulators help in prevention and rapid intervention. The paper also highlights the importance of cooperation between local communities and farmers in fire prevention activities, and how these measures contribute to the development of tourism, agriculture and sustainable management of natural resources. The application of these systems of some area's has proven effective in reducing risks and damages, while the implementation of technologies such as video surveillance and simulations can further improve fire responses. The developed systems contribute to economic profitability and environmental protection, and provide many benefits for local communities.*

Keywords: *Fire Prevention, Forest Fires, Holistic Fire Protection*

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