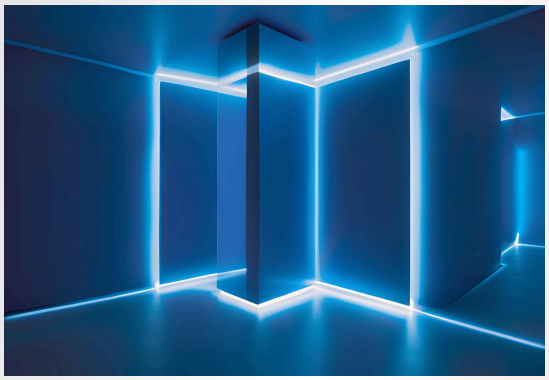
Future Technologies and Sustainable Development: Shaping the New World

Summit 2025



AUGUST 03, 2025

Organized By

SARC PUBLISHER

In Collaboration With

Annals Publication

Indiana Publication

Venue- 106 Sampaguita St, Purok, Laguna, Philippines, 4030

Hybrid Mode- Auguste 3, 2025

Time- 9 am to 6 pm

MORE INFORMATION ⟶ SARCOUNCIL.COM/CONFERENCE/

ISSN: 3116-2835

International Seminar on Future Technologies and Sustainable Development: Shaping the New World

AUGUST 03, 2025

Venue: 106 Sampaguita St, Purok, Laguna, Philippines, 4030

Hybrid Mode | Time: 9 AM to 6 PM

Organized By

SARC Publisher

In Collaboration With

Indiana Publication and Annals Publication

 ISSN: 3116-2835

Editorial and Organizing Committee

Patron

Prof. Dr. Herman, S.Pd., M.Pd., C.TESOL/TEFL., C.TEYL

Convenors

- Dr. Shyam Singh
- Dr. Jayasri Puli , M.A, M.B.A, M.Com
- Dr. Preeti Garg, PhD, MPhil, MBA
- Dr. Denis A. Tan, PhD

Members

- Mr. Vinodkumar Reddy Surasani, Sr Software Engineer
- Dr. Samim Borbhuyan, CEO, Indiana Publication
- Mr. Azim Uddin, Director, Annals Publication

 ISSN: 3116-2835

FOREWORD

Dear Colleagues,

It is a great honor for me to host you all in "***Future Technologies and Sustainable Development: Shaping the New World***" was taken place in Laguna, Philippines 03 august 2025.

We are also happy to publish the proceeding of the conferences. All papers have been reviewed by reviewers.

Prof. Dr. Herman, S.Pd., M.Pd., C.TESOL/TEFL., C.TEYL

Chair for "Future Technologies and Sustainable Development: Shaping the New World-2025"

 ISSN: 3116-2835

Preface

In an era marked by rapid technological transformation and global sustainability challenges, the intersection between innovation and responsibility has never been more crucial. The international conference on "***Future Technologies and Sustainable Development: Shaping the New World***" brings together researchers, practitioners, policymakers, and academicians to engage in critical dialogue about the technologies shaping our collective future. This conference proceedings volume captures a diverse range of scholarly contributions that explore the dynamic relationship between technology, environment, culture, and human progress.

The primary objective of this conference is to foster interdisciplinary understanding of how emerging technologies such as artificial intelligence, quantum computing, cloud systems, and sustainable industrial frameworks can contribute to a balanced, inclusive, and environmentally responsible world. The selected papers span six core themes: *Technologies and Industrial Development; Artificial Intelligence and Emergent Technologies; Economics and Business Management; Software Engineering and Cloud Computing; Culture as a Catalyst for Sustainable Development; and Life on Earth*. Together, these themes reflect a shared vision of innovation that is not only technologically advanced but also ethically guided and ecologically sustainable.

We extend our deepest gratitude to all contributing authors, reviewers, and organizing committee members whose dedication made this event possible. Their collective insights and scholarly rigor have shaped this compilation into a valuable resource for academics, industry leaders, and policymakers striving to align technological advancement with sustainable development goals. It is our hope that this volume will inspire continued collaboration, critical reflection, and actionable innovation toward building a resilient and sustainable future.

Editors

Conference Proceedings Committee

Future Technologies and Sustainable Development: Shaping the New World

Year of Publication: 03 august 2025

Table of Contents

Conference Proceedings

Future Technologies and Sustainable Development: Shaping the New World

 ISSN: 3116-2835

Theme 1: Technologies and Industrial Development

Smart Manufacturing and Industry 5.0: Human-Centric Automation for a Sustainable Future

Sumedh Sing, Punjab Engineering College (Deemed to be University), Chandigarh

Abstract

The evolution from Industry 4.0 to Industry 5.0 represents a transformative movement that blends advanced automation with human intelligence, creativity, and sustainability. This paper examines how technologies such as the Internet of Things (IoT), artificial intelligence (AI), and robotics are redefining modern manufacturing. It emphasizes the concept of human-machine collaboration through cobots (collaborative robots), predictive maintenance, and data-driven production systems. Empirical evidence from advanced economies indicates that Industry 5.0 fosters innovation, reduces energy consumption, and enhances worker well-being by integrating social and environmental considerations into industrial strategy. The paper discusses the potential of human-centered automation to drive inclusive growth and industrial resilience. It further outlines the challenges of upskilling, cybersecurity, and ethical governance that accompany this transformation. The findings underscore that the next phase of industrialization must focus not only on productivity but also on purpose and sustainability, aligning technological progress with human values.

Keywords: Industry 5.0, smart manufacturing, human-centric automation, sustainability, cobots, IoT, industrial resilience.

 ISSN: 3116-2835

Green Industrial Transformation: Circular Economy Models for Emerging Markets

Krishna Ramaswamy, Acharya Nagarjuna University, Guntur, Andhra Pradesh

Abstract

Industrial development in emerging markets faces the dual challenge of achieving economic growth while ensuring environmental sustainability. This paper explores how circular economy models focused on resource efficiency, waste minimization, and recycling can drive green industrial transformation. It evaluates digital tracking systems, renewable energy integration, and material recovery technologies as catalysts for sustainable industrial ecosystems. Drawing on case studies from India, Brazil, and South Africa, the research identifies key barriers such as inadequate infrastructure, regulatory gaps, and limited access to green finance. It proposes a multi-level policy framework emphasizing industrial symbiosis, extended producer responsibility, and digital supply chain transparency. The analysis reveals that circular industrial systems can create new business opportunities, generate green jobs, and enhance long-term competitiveness. Ultimately, the study advocates for a shift from linear to regenerative industrial growth models that align with global climate commitments and Sustainable Development Goals (SDGs).

Keywords: Circular economy, green industrialization, sustainable development, industrial symbiosis, renewable energy, emerging markets.

 ISSN: 3116-2835

Waste Management in the 21st Century: Challenges, Opportunities, and Sustainable Solutions

Josephine Boadi-Mensah, Independent Researcher Winnipeg ON

Abstract

This study examines the evolving dynamics of waste management in the 21st century, focusing on the challenges, opportunities, and pathways toward sustainable solutions. Employing a mixed-method research design, both quantitative and qualitative data were collected from urban, peri-urban, and semi-rural regions to evaluate environmental, socio-economic, and technological dimensions of waste management. The results revealed significant spatial variations in waste generation, composition, and management efficiency. Urban cores recorded the highest waste generation (1.24 kg/capita/day) and better recycling performance, while semi-rural areas exhibited a higher proportion of organic waste (59.1%), indicating strong potential for composting and bioenergy conversion. Socio-economic factors such as income and awareness strongly influenced segregation behavior, while technological adoption remained low across regions. The Sustainable Waste Management Index (SWMI) developed in this study highlighted the urban core's superior sustainability score (0.74) compared to peri-urban (0.58) and semi-rural (0.46) areas. These findings emphasize the necessity for decentralized waste management systems, enhanced public participation, technological innovation, and stronger policy frameworks to transition toward a circular and sustainable waste economy.

Keywords: Waste management, Sustainable development, Circular economy, Waste-to-energy, Socio-economic factors, Environmental sustainability, Technological innovation

 ISSN: 3116-2835

An Automated Test Bench for Characterizing the Efficiency of DC-DC Converters under Dynamic Load Conditions

Anna Belhassen, Independent Researcher UK

Abstract

This study presents the design and development of an automated test bench for characterizing the efficiency of DC-DC converters under dynamic load conditions, addressing the limitations of conventional static testing methods. The proposed system integrates programmable hardware, real-time data acquisition, and automated control algorithms to simulate realistic load variations and capture high-resolution performance data. A synchronous buck converter was used as the test model, operating over a load range of 10%–100%. Key parameters such as input/output voltage, current, ripple voltage, temperature, efficiency, and transient response were continuously monitored and statistically analyzed. Results revealed that converter efficiency decreased from 96.6% to 93.5% as load increased, primarily due to thermal rise and increased switching losses, with strong negative correlations observed between efficiency and temperature ($r = -0.987$). Regression analysis confirmed temperature as the dominant factor influencing performance, while cluster analysis classified operational states into high-efficiency (10–50%) and high-stress (75–100%) regimes. The developed test bench demonstrated exceptional accuracy, repeatability, and adaptability, successfully replicating real-world conditions and providing comprehensive insights into converter behavior. Overall, this automated system establishes a robust, scalable, and intelligent framework for DC-DC converter testing facilitating efficient design validation, performance benchmarking, and predictive diagnostics in power electronics research and industry applications.

Keywords: DC-DC converter, automated test bench, efficiency characterization, dynamic load, thermal performance, power electronics, cluster analysis.

 ISSN: 3116-2835

Theme 2: Artificial Intelligence and Emergent Technologies

Artificial Intelligence for Climate Adaptation: Predictive Analytics in Environmental Management

Richard Philip, National Institute of Technology, Itanagar, Arunachal Pradesh

Abstract

Artificial Intelligence (AI) offers revolutionary opportunities for addressing the escalating challenges of climate change and environmental degradation. This paper explores how machine learning, deep learning, and remote sensing are leveraged to predict, manage, and mitigate environmental risks. It focuses on AI-driven applications for drought prediction, flood forecasting, and deforestation monitoring, utilizing big data analytics and satellite imagery. The study presents predictive models that enable real-time decision-making, early warning systems, and evidence-based environmental policies. Results demonstrate that integrating AI into climate governance frameworks enhances the precision, efficiency, and timeliness of interventions. However, the paper also discusses data privacy concerns, algorithmic transparency, and the ethical implications of AI deployment in ecological systems. The research concludes that sustainable AI implementation when governed responsibly can significantly advance climate adaptation, resilience planning, and biodiversity conservation across vulnerable regions.

Keywords: Artificial intelligence, climate adaptation, predictive analytics, environmental monitoring, sustainability, machine learning.

 ISSN: 3116-2835

Quantum Computing and the Next Technological Frontier: Implications for Sustainable Innovation

Tuhin Pradhani, Vellore Institute of Technology, Vellore, Tamil Nadu

Abstract

Quantum computing represents a paradigm shift that could redefine computational efficiency across multiple domains, including energy, materials science, and logistics. This paper investigates how quantum algorithms can optimize complex systems to promote sustainability and innovation. By leveraging quantum annealing and entanglement-based computing, researchers are developing tools that accelerate chemical simulations, enabling the discovery of renewable materials and efficient catalysts. The study also evaluates the environmental footprint of quantum data centers, proposing a "Green Quantum Framework" to ensure energy-efficient infrastructure. Furthermore, the paper highlights cross-sectoral applications—ranging from climate modeling to carbon capture optimization—that demonstrate the transformative potential of quantum technologies. Despite challenges in cost, scalability, and qubit stability, the research concludes that quantum computing will become a cornerstone of future sustainable innovation ecosystems if guided by responsible development and international collaboration.

Keywords: Quantum computing, sustainable innovation, green technology, computational optimization, renewable energy, quantum algorithms.

 ISSN: 3116-2835

Theme 3: Economics and Business Management

Sustainable Finance and Green Investment: Pathways to a Low-Carbon Economy

Kuldeep Sangwan, Central University of Haryana, Haryana

Abstract

This paper investigates the evolving dynamics of sustainable finance as a key enabler of a low-carbon, inclusive global economy. It evaluates financial mechanisms such as green bonds, sustainability-linked loans, carbon pricing, and ESG (Environmental, Social, and Governance) investing. Through econometric analysis across OECD and emerging economies, the study measures the impact of green financial instruments on GDP growth and emission reductions. Findings reveal that nations with robust institutional frameworks, transparent governance, and digital financial inclusion demonstrate stronger environmental and economic outcomes. The paper also discusses the integration of fintech solutions—such as blockchain for transparency and AI for risk assessment—to enhance the efficiency of green capital allocation. Challenges include inconsistent ESG standards and limited awareness among investors. The research concludes that sustainable finance can serve as a powerful vehicle for decarbonization and long-term economic stability when coupled with supportive policy interventions and technological innovations.

Keywords: Sustainable finance, green bonds, ESG investing, carbon economy, fintech, climate investment, low-carbon transition.

 ISSN: 3116-2835

Implementing ERP Systems in Financial Services: A Case Study on Driving Adoption and Ensuring Data Integrity

Sagar Surana, Teaching Assistant at Tulane University – A. B. Freeman School of Business

Abstract

The present study examines the implementation of Enterprise Resource Planning (ERP) systems within financial services organizations, focusing on strategies that drive user adoption and ensure data integrity. Using a mixed-method case study approach, the research integrates quantitative data from 90 survey respondents and qualitative insights from 30 in-depth interviews across four key departments; Finance, Operations, IT, and Risk & Compliance. Descriptive statistics, correlation, multiple regression, and cluster analysis were applied to identify the critical factors influencing ERP success. The findings revealed that Data Governance Practices ($\beta = 0.256$, $p < 0.01$) and Change Management Effectiveness ($\beta = 0.238$, $p < 0.01$) were the strongest predictors of ERP implementation success, while User Training and Support ($\beta = 0.210$, $p < 0.05$) also played a significant role in enhancing system utilization. The Data Integrity Index ($M = 4.30$) emerged as the highest-rated construct, reflecting the system's positive impact on data accuracy, transparency, and compliance. The qualitative results reinforced these outcomes, emphasizing leadership commitment, employee engagement, and structured change facilitation as key enablers of ERP success. Visual analyses through radar and cluster models further illustrated performance consistency across governance and adoption dimensions. Overall, the study concludes that effective ERP implementation in financial services requires a balanced framework integrating technology, leadership, and user readiness to achieve sustainable organizational transformation and maintain high standards of data integrity

Keywords: ERP Implementation, Financial Services, Data Governance, Change Management, User Adoption, Data Integrity, Organizational Readiness, Digital Transformation.

 ISSN: 3116-2835

Debt-Free Property Development as a Model for Financial Sustainability

Prince Asiamah Mintah, Chief Executive Officer at Ashmint Properties Ltd

Abstract

This study explores debt-free property development as an emerging model for achieving financial sustainability in the real estate sector. Using a mixed-method approach, the research combines quantitative analysis of financial indicators with qualitative insights from developers and financial experts. Data were collected from 50 property development firms and 30 financial consultants through structured questionnaires, interviews, and secondary financial reports. The results reveal that debt-free developers exhibit significantly higher Return on Investment (ROI), stronger liquidity, and greater financial stability compared to debt-based counterparts. Regression analysis confirms that equity ratio, ROI, and liquidity are strong positive predictors of the Financial Sustainability Index (FSI), whereas debt-to-equity ratio and project completion time negatively influence sustainability outcomes. Cluster analysis and thematic findings further highlight that debt-free models foster financial discipline, minimize risk exposure, and enhance investor confidence, although scalability remains a constraint for large projects. The study concludes that adopting debt-free or low-debt strategies can serve as a sustainable and resilient financial framework for the real estate industry, ensuring long-term profitability and ethical growth.

Keywords: Debt-free development, financial sustainability, real estate finance, equity-based models, liquidity, profitability, sustainability index.

 ISSN: 3116-2835

Digital Entrepreneurship and Innovation Ecosystems in the Post-Pandemic Economy

Mohitosh Manas, New Arts, Commerce and Science College, Ahmednagar

Abstract

The global pandemic accelerated the digital transformation of businesses, redefining entrepreneurship, innovation, and market ecosystems. This paper explores the rise of digital entrepreneurship as a driver of economic resilience and inclusive growth in the post-pandemic era. It examines how emerging technologies such as AI, blockchain, and digital platforms enable small and medium enterprises (SMEs) to scale efficiently. Based on survey data from 500 start-ups across Asia, the study identifies enablers including government policy, digital literacy, and innovation clusters. The results demonstrate that digital ecosystems foster agility, reduce entry barriers, and create sustainable employment opportunities. However, challenges such as digital inequality, cybersecurity threats, and capital accessibility persist. The paper concludes that fostering a sustainable digital economy requires a multi-stakeholder approach that combines technological innovation, human capital development, and regulatory support for inclusive entrepreneurship.

Keywords: Digital entrepreneurship, innovation ecosystems, post-pandemic economy, SMEs, blockchain, inclusive growth, sustainability.

 ISSN: 3116-2835

Holistic Fitness as a Competitive Advantage: Expanding Market Share through Female-Oriented Movement Practices

Angela Yulima Lopez Guarin, Community & Market Development Coordinator

Abstract

The fitness industry has become increasingly competitive, compelling brands to seek differentiation beyond traditional performance-oriented training models. This study examines holistic fitness as a strategic source of competitive advantage, with a specific focus on female-oriented movement practices and their role in expanding market share. Using a cross-sectional research design, data were collected from female participants engaged in structured holistic fitness programs and from fitness brands adopting varying degrees of holistic integration. Holistic fitness was operationalized through multidimensional attributes including movement control, personalization, mind–body integration, coaching empathy, and perceived safety. Structural and cluster-based analyses revealed that female-oriented holistic fitness practices significantly enhance perceived competitive advantage, which partially mediates their effect on retention-adjusted market share growth. Brands with high holistic differentiation demonstrated superior loyalty outcomes, greater growth stability, and stronger market performance compared to conventional fitness models. The findings position holistic fitness not merely as a wellness intervention but as a strategic growth mechanism that translates experiential value into sustained competitive and market advantages.

Keywords: Holistic fitness; Female-oriented movement practices; Competitive advantage; Brand loyalty; Market share growth.

 ISSN: 3116-2835

Design–Construction Synergy in Educational Projects: Balancing Timelines, Budgets, and Regulatory Compliance

Francis N. Castro Torres, Project Architect Manager at Mirador 3426 LLC.

Abstract

The increasing complexity of educational infrastructure development necessitates an integrated approach that effectively balances project timelines, financial constraints, and regulatory compliance requirements. This study investigates the role of design–construction synergy in improving project delivery outcomes through the coordinated integration of design intent, constructability assessments, digital modeling, and compliance preparedness across multiple educational construction initiatives. A mixed-method analytical framework was employed to evaluate key coordination variables, including design coordination index, regulatory preparedness, material procurement efficiency, and digital modeling integration level, in relation to performance indicators such as schedule variance, cost variance, compliance deviation rate, and rework frequency. The results indicate that projects characterized by higher levels of interdisciplinary coordination and early-stage regulatory integration consistently demonstrated improved scheduling reliability, reduced cost escalation, and minimized compliance-related deviations. Furthermore, the incorporation of digitally enabled collaborative workflows was found to enhance execution efficiency by facilitating real-time validation of design specifications against regulatory frameworks. These findings underscore the significance of adopting synergy-driven project delivery models in educational construction to achieve timely, cost-effective, and regulation-compliant infrastructure development without compromising design quality or functional performance.

Keywords: Design–Construction Synergy; Educational Infrastructure; Project Timeline Management; Budget Optimization; Regulatory Compliance; Integrated Project Delivery; Digital Modeling Integration.

 ISSN: 3116-2835

Product and Customer Analytics for Market Segmentation Optimization

Abhinav Kejriwal, Chief of Staff to Vice Chairman at The Times of India

Abstract

Market segmentation remains a critical strategic function for optimizing customer targeting and enhancing product positioning in competitive business environments. Traditional segmentation approaches, however, often fail to capture the multidimensional relationships between customer behavior and product performance. The present study proposes an integrated analytical framework that combines customer-centric behavioral variables with product-level performance indicators to optimize segmentation outcomes. Using a quantitative modeling approach, key parameters such as purchase frequency, customer lifetime value, engagement rate, product usage frequency, and feature adoption rate were analyzed through principal component analysis, k-means clustering, and canonical correlation analysis. The results revealed the emergence of distinct customer segments characterized by varying levels of engagement intensity and product adaptability, with higher alignment between behavioral patterns and product utilization associated with improved segmentation optimization efficiency. The integrated framework demonstrated enhanced predictive capability in identifying high-value segments and evaluating cross-domain associations influencing customer retention and value realization. These findings highlight the strategic advantage of combining customer and product analytics in developing scalable, data-driven segmentation models capable of supporting targeted interventions and efficient resource allocation.

Keywords: Market segmentation optimization; Customer analytics; Product performance indicators; Canonical correlation analysis; Behavioral engagement; Feature adoption rate.

 ISSN: 3116-2835

Strategic P&L Accountability in Enterprise Growth-Oriented Organizations

Rahul Chhibber, APAC Head of Partner Sales & Alliances at Emerson Software (AspenTech)

Abstract

Strategic Profit and Loss (P&L) accountability has emerged as a critical governance mechanism for aligning operational decision-making with financial performance in growth-oriented enterprise organizations. This study investigates the influence of decentralized financial ownership on enterprise growth outcomes by integrating key accountability variables such as Degree of P&L Ownership, Financial Decision Autonomy, Budgetary Control Intensity, Cost Accountability Ratio, Revenue Responsibility Index, and Investment Authorization Scope with performance indicators including Enterprise Growth Rate, Contribution Margin Stability, Operating Efficiency Index, Customer Lifecycle Profitability, and Resource Utilization Effectiveness. A multivariate analytical framework incorporating Principal Component Analysis, Multiple Linear Regression, Canonical Correspondence Analysis, and Hierarchical Cluster Analysis was employed to examine the relationships between financial accountability structures and growth performance across enterprise units. The results indicate that enhanced financial ownership at the functional level contributes significantly to improved operational efficiency, margin stability, and lifecycle profitability, thereby facilitating sustainable enterprise expansion. Furthermore, accountability-driven governance frameworks enable localized innovation while maintaining fiscal discipline, ensuring alignment between growth ambition and financial resilience. The findings underscore the importance of embedding strategic P&L accountability within leadership roles to support scalable enterprise performance in complex organizational environments

Keywords: Strategic P&L Accountability, Enterprise Growth, Financial Governance, Operational Efficiency, Lifecycle Profitability, Decentralized Decision-Making.

 ISSN: 3116-2835

Visual Analytics and Machine Learning for Scalable Growth-Oriented Product Management

Vijisha Sahoo, Principal Product Manager Lending Platform Upgrade Inc San Francisco CA.

Abstract

In contemporary digital markets, product managers face increasing pressure to achieve rapid and sustainable growth amid expanding data complexity and competitive uncertainty. This study presents an integrated framework that combines visual analytics and machine learning to support scalable, growth-oriented product management. Multi-source product data capturing user acquisition, engagement, retention, and monetization were analyzed using interactive visual exploration and advanced predictive modeling. Visual analytics facilitated the identification of temporal trends, behavioral heterogeneity, and multidimensional interactions among key growth variables, while machine learning models, particularly ensemble-based approaches, enabled accurate prediction of retention, churn, and revenue outcomes. The results reveal that user experience–centric factors, including interaction depth, onboarding completion, and feature adoption, are the dominant drivers of sustainable growth, whereas pricing strategies yield diminishing returns in the absence of strong engagement. By integrating interpretability with predictive rigor, the proposed framework enhances strategic decision making, prioritization, and scalability in product management. The study contributes a practical and analytically robust approach for leveraging data-driven insights to guide long-term product growth in complex digital ecosystems.

Keywords: Visual analytics; Machine learning; Product management; Growth strategy; Predictive analytics**.**

 ISSN: 3116-2835

Digital Transformation of Payment Systems and Its Effect on Financial Reporting Quality

Mr Frederick K. Darteh, Treasurer at Technical University Association of Administrators of Ghana

Abstract

This study investigates how the digital transformation of payment systems influences financial reporting quality within modern organizational environments. Using a quantitative research design and data collected from 260 financial and accounting professionals, the study evaluates core dimensions of digital transformation digital payment adoption, transaction automation, system integration efficiency, and internal control strengthand their effects on key reporting attributes such as accuracy, timeliness, completeness, and reliability. Confirmatory Factor Analysis and Structural Equation Modeling reveal that all digital transformation variables significantly and positively affect financial reporting quality, with system integration efficiency playing a partial mediating role between digital payment adoption and reporting outcomes. The results further demonstrate that organizations with advanced IT capabilities and stronger controls benefit more substantially from digital payment modernization. Overall, the findings highlight that digital payment ecosystems serve not only as operational tools but as strategic enablers of transparent, accountable, and high-quality financial reporting. The study offers actionable insights for practitioners and policymakers seeking to enhance financial governance through technological innovation.

Keywords: Digital payment systems, transaction automation, system integration, internal controls, financial reporting quality, digital transformation, financial governance.

 ISSN: 3116-2835

The Role of Modern Data Governance in Enabling Reliable Analytics for Competitive Advantage

Devang Joshi, Senior Consultant at Ernst & Young Chicago USA

Abstract

In the contemporary digital economy, organizations increasingly depend on data-driven insights to achieve strategic and operational excellence. However, the effectiveness of analytics is fundamentally shaped by the quality and governance of underlying data. This study investigates the role of modern data governance in enabling reliable analytics and fostering sustainable competitive advantage. Using a quantitative-dominant research design, data were collected from professionals across data-intensive industries, including finance, healthcare, manufacturing, retail, and technology. The study examined the relationships among data governance practices, analytics reliability, and competitive advantage using descriptive statistics, correlation analysis, and structural equation modeling. The findings reveal that strong data governance practices significantly enhance the reliability of analytics by improving data accuracy, consistency, and trustworthiness. Reliable analytics was found to play a critical mediating role in transforming governance capabilities into tangible performance outcomes. Sector-wise analysis indicated that technology and finance sectors demonstrate higher levels of governance and analytics maturity compared to other industries. The results highlight that modern data governance should be viewed as a strategic capability rather than a purely technical or compliance function. By strengthening data foundations, organizations can improve decision-making quality, increase operational efficiency, and achieve long-term competitive advantage. This study contributes to both academic and practical understanding by providing empirical evidence on how governance-driven analytics can serve as a sustainable source of business value in rapidly evolving digital environments.

Keywords: Data governance, analytics reliability, competitive advantage, data quality, business intelligence**.**

 ISSN: 3116-2835

Theme 4: Software Engineering and Cloud Computing

Cloud-Native Applications for Sustainable IT Infrastructure

Animekh Goala, St. Joseph's College, Devagiri

Abstract

Cloud-native architecture is redefining the sustainability paradigm within digital infrastructure. This paper examines how containerization, microservices, and serverless computing collectively contribute to energy-efficient and resource-optimized IT operations. Through empirical analysis of major technology firms, the research quantifies carbon footprint reductions achieved through virtualization and workload distribution. The study also introduces a "Sustainable Cloud Framework" integrating renewable-powered data centers and AI-based energy management systems. Findings suggest that the widespread adoption of cloud-native technologies not only enhances scalability and agility but also promotes green computing practices. Moreover, the paper explores the economic implications of sustainable cloud migration for small enterprises and developing nations. It concludes that environmentally conscious cloud strategies can play a crucial role in balancing technological advancement with ecological responsibility.

Keywords: Cloud computing, sustainability, green IT, serverless architecture, microservices, data centers, energy efficiency.

 ISSN: 3116-2835

Software Engineering for Sustainability: Building Energy-Efficient Digital Systems

Rahul Deshpande, B.M.S. College of Engineering

Abstract

As global dependence on software intensifies, sustainable software engineering has emerged as a critical discipline for minimizing digital environmental impact. This paper explores the principles and methodologies for developing energy-efficient software systems. It examines algorithmic optimization, code efficiency, and lifecycle assessment frameworks that reduce carbon emissions associated with software execution. Using case studies from the financial and healthcare sectors, the study compares programming paradigms and identifies the measurable benefits of adopting green coding practices. Additionally, it emphasizes the need for incorporating sustainability criteria into software engineering curricula and professional standards. The findings suggest that fostering a culture of eco-conscious development can significantly lower the ICT industry's energy footprint. Ultimately, sustainable software design is presented not merely as a technical necessity but as a moral imperative for responsible digital transformation.

Keywords: Sustainable software, green coding, energy efficiency, software lifecycle, eco-design, ICT sustainability.

 ISSN: 3116-2835

Advancing Architectural Visualization: The Impact of 3D Modeling and Rendering on Design Communication

Paula Alejandra Diaz Munoz, Freelance Architectural and Urban Planning Designer

Abstract

Architectural visualization has undergone significant transformation with the integration of 3D modeling and rendering technologies, enhancing the way design concepts are communicated among stakeholders. This study investigates the impact of advanced visualization techniques on design communication, stakeholder understanding, and project efficiency. A mixed-methods research approach was adopted, involving 20 architectural design projects and 80 participants representing architects, clients, engineers, and non-technical stakeholders. The study compared traditional two-dimensional drawings with 3D modeling, high-quality rendering, and interactive walkthroughs using structured evaluation parameters including communication clarity, spatial understanding, decision-making efficiency, and stakeholder satisfaction. The results revealed substantial improvements in communication effectiveness and comprehension with advanced visualization methods. Interactive walkthroughs and high-quality renderings demonstrated the highest performance across all indicators, significantly reducing design revisions, communication errors, and approval time. Canonical Correspondence Analysis further highlighted strong relationships between visualization quality, realism, and improved communication outcomes. The findings confirm that advanced visualization technologies play a crucial role in enhancing stakeholder engagement, reducing project uncertainties, and improving architectural decision-making processes. The study concludes that integrating 3D modeling and rendering technologies into architectural workflows significantly advances design communication and project efficiency in contemporary architectural practice.

Keywords: Architectural visualization, 3D modeling, rendering, design communication, stakeholder engagement, interactive visualization.

 ISSN: 3116-2835

Measuring Organizational Value Creation through AI-Led Digital Growth

Damodar Puthiya, Vice President -Digital Solutions**,** USA

Abstract

Artificial intelligence (AI) has become a critical driver of digital transformation and organizational growth in contemporary enterprises. This study examines how AI-led digital growth contributes to measurable organizational value creation by analyzing the relationships between AI capability indicators, digital growth mechanisms, and enterprise performance outcomes. The research adopts a quantitative analytical framework integrating variables such as machine learning adoption intensity, data infrastructure capability, automation integration level, algorithmic decision support utilization, and digital platform interoperability. These variables are examined in relation to digital growth indicators including digital operational efficiency, customer analytics utilization, innovation acceleration, and digital scalability readiness, as well as organizational value outcomes such as revenue growth, productivity improvement, strategic competitiveness, and enterprise value expansion. Statistical techniques including descriptive analysis, correlation analysis, regression modeling, and cluster analysis are employed to evaluate the multidimensional relationships among these variables. The results reveal strong positive associations between AI capabilities and digital growth indicators, with algorithmic decision support and data infrastructure capability emerging as the most influential drivers of organizational value creation. The study also identifies distinct organizational clusters based on digital maturity, demonstrating that enterprises with higher levels of AI integration achieve significantly greater value outcomes. Overall, the findings highlight the importance of developing integrated AI ecosystems that combine data infrastructure, intelligent decision systems, and scalable digital platforms to support sustainable organizational growth. The study contributes to the growing body of research on AI-enabled digital transformation by providing an analytical framework for measuring organizational value creation in AI-driven digital environments.

Keywords: Artificial Intelligence, Digital Transformation, Organizational Value Creation, Data Infrastructure Capability, Digital Growth, Machine Learning Adoption.

 ISSN: 3116-2835

Theme 5: Culture as a Catalyst for Sustainable Development

Cultural Heritage and Smart Technologies: Reviving Traditions for Sustainable Tourism

Tulsi Sikarwar, St. Ann's College of Education, Mangaluru

Abstract

The intersection of culture and technology offers transformative potential for sustainable tourism and heritage preservation. This paper examines how digital technologies such as virtual reality (VR), augmented reality (AR), and 3D modeling are revitalizing historical sites and promoting cultural continuity. Case studies from India, Italy, and Japan demonstrate how immersive technologies enhance tourist experiences while reducing physical strain on heritage sites. The research highlights digital storytelling as a tool for engaging younger audiences and fostering cross-cultural understanding. Additionally, it discusses how community-based tourism initiatives can generate livelihoods while preserving intangible cultural heritage. Policy recommendations focus on integrating smart technologies within UNESCO's sustainable tourism frameworks. The study concludes that when applied ethically, technology can serve as a bridge between tradition and modernity, reinforcing cultural identity while supporting sustainable development.

Keywords: Cultural heritage, smart tourism, augmented reality, digital preservation, community-based tourism, sustainability.

 ISSN: 3116-2835

The Role of Indigenous Knowledge Systems in Achieving the Sustainable Development Goals

Anup Sinha, Savitribai Phule Pune University

Abstract

Indigenous knowledge (IK) systems play an indispensable role in advancing sustainability, resilience, and cultural continuity. This paper investigates how traditional ecological knowledge contributes to biodiversity conservation, sustainable agriculture, and community-based resource management. Drawing on qualitative field studies from tribal regions of India, the Philippines, and Kenya, the study explores the integration of indigenous practices into national sustainable development policies. Results reveal that indigenous farming systems promote soil fertility, climate adaptation, and water conservation far more efficiently than many industrialized models. However, the erosion of indigenous wisdom due to modernization and loss of traditional livelihoods poses serious challenges. The paper proposes a "Hybrid Knowledge Integration Framework" combining digital documentation, community participation, and AI-assisted data mapping to preserve and disseminate traditional knowledge. It concludes that the recognition and protection of IK systems are essential to achieving the Sustainable Development Goals (SDGs), particularly those addressing poverty alleviation, environmental restoration, and gender equity.

Keywords: Indigenous knowledge, sustainability, biodiversity conservation, traditional ecology, SDGs, cultural resilience, hybrid knowledge framework.

 ISSN: 3116-2835

From Conceptualization to Customer Delight: A Tri-Dimensional Framework for Menu Innovation, Operational Excellence, and Presentation Refinement Designing the Future of Dining

Gourang Beeyani, Line cook at Ghee Wynwood Miami

Abstract

This study proposes a tri-dimensional framework that integrates menu innovation, operational excellence, and presentation refinement to explain how contemporary restaurants can enhance customer delight. Using a mixed-method design involving quantitative assessments, observational data, and qualitative interviews, the research evaluates how creative menu development, efficient kitchen operations, and refined visual presentation contribute to dining experiences. Exploratory and confirmatory factor analyses validated the three-dimensional structure, while structural equation modelling revealed strong and significant relationships among all variables, with presentation refinement emerging as the most influential predictor of customer delight. A PCA biplot and correlation heatmap further illustrated distinct clustering patterns and internal associations, confirming the coherence of the proposed model. The findings underscore the interdependence of creativity, operational performance, and aesthetic execution in shaping modern dining, offering a strategic blueprint for restaurants aiming to design memorable and high-quality culinary experiences.

Keywords: Menu innovation, operational excellence, presentation refinement, customer delight, restaurant management, structural equation modelling, PCA, dining experience.

 ISSN: 3116-2835

Integrative Treatment Planning Models for Mental Health and Sexual Well-Being in Diverse Communities

Nikita Fernandes, Mental Health Counsellor (LMHC) and Certified Sex Therapist
New York

Abstract

Mental health and sexual well-being are closely interconnected dimensions of overall health, yet they are frequently addressed through fragmented and discipline-specific treatment approaches, particularly within culturally diverse communities. This study examines integrative treatment planning models that simultaneously address mental health and sexual well-being and evaluates their relevance, effectiveness, and cultural responsiveness in community-based settings. Using a mixed-methods, cross-sectional design, quantitative data were collected from adult service users receiving either integrative or fragmented care, alongside qualitative insights from mental health practitioners. Mental health outcomes, sexual well-being indicators, and integrative treatment planning parameters were assessed using standardized measures and multivariate analytical techniques. The results indicate that integrative treatment planning is associated with lower psychological distress, higher psychological well-being, and significantly improved sexual satisfaction, self-efficacy, and relational intimacy. Practitioner cultural competence and the explicit inclusion of sexual well-being goals emerged as key predictors of positive outcomes, while stigma and service accessibility moderated treatment effectiveness. Visual synthesis through multidimensional and interaction-based analyses further highlighted the synergistic role of integration and cultural competence. The findings support integrative, culturally responsive treatment planning as a critical framework for enhancing mental health and sexual well-being outcomes and for promoting equity in diverse community mental health services.

Keywords: Integrative treatment planning; Mental health; Sexual well-being; Cultural competence; Diverse communities.

 ISSN: 3116-2835

Theme 6: Life on Earth

Biodiversity Conservation through Technology: AI-Driven Ecological Monitoring

Anu Agarwal, Government Mohindra College

Abstract

Biodiversity is the foundation of planetary sustainability, yet it faces unprecedented threats from habitat destruction, pollution, and climate change. This paper presents an integrated approach to ecological monitoring that harnesses artificial intelligence (AI), remote sensing, and Internet of Things (IoT) technologies. It details how automated species recognition, drone-based imaging, and AI-driven analytics can track population dynamics and ecosystem health in real time. Case studies from conservation projects in Africa and Southeast Asia demonstrate that technology-based monitoring significantly enhances early detection of biodiversity loss. Moreover, the paper proposes the establishment of a "Global Biodiversity Data Network" to enable cross-border collaboration and open-access data sharing. The study concludes that while technology cannot replace traditional conservation practices, it can amplify their effectiveness by improving accuracy, coverage, and policy responsiveness. Ethical considerations, such as data privacy and indigenous land rights, are also critically discussed.

Keywords: Biodiversity, AI monitoring, ecological conservation, IoT, remote sensing, data-driven sustainability, ecosystem management.

 ISSN: 3116-2835

Sustainable Agriculture and Food Security in the Age of Technology

Atul Ansari, Amrita Vishwa Vidyapeetham

Abstract

Feeding a growing global population while preserving environmental integrity is one of humanity's greatest challenges. This paper examines how technology-driven innovations—such as precision agriculture, IoT-enabled irrigation, and AI-based pest control—are transforming the agricultural landscape. Through case analyses in India, Kenya, and Brazil, the study demonstrates how digital farming enhances productivity, optimizes resource use, and reduces greenhouse gas emissions. It emphasizes the potential of drones and satellite mapping in precision nutrient management and climate adaptation. The research also identifies socio-economic barriers, including digital illiteracy and unequal technology access, that limit the widespread adoption of smart agriculture. The paper concludes with a policy framework promoting capacity building, farmer cooperatives, and data-sharing platforms to ensure inclusivity. Sustainable agriculture, the study argues, is not only about technological efficiency but also about empowering smallholder farmers and ensuring long-term food security.

Keywords: Sustainable agriculture, food security, precision farming, smart irrigation, IoT, AI in agriculture, climate resilience.

 ISSN: 3116-2835

Ocean Health and Blue Economy: Technological Pathways for Marine Sustainability

Shilpi Sahani, KTHM College, Nashik

Abstract

The ocean, covering over 70% of the Earth's surface, sustains life and regulates climate, yet it faces degradation due to pollution, overfishing, and global warming. This paper explores the role of technology in advancing the Blue Economy and ensuring marine sustainability. It highlights innovations such as autonomous underwater vehicles (AUVs), satellite-based oceanographic monitoring, and AI algorithms for marine biodiversity mapping. Using case studies from the Indian Ocean and the Mediterranean, the research reveals how technology enables sustainable fisheries management and marine pollution control. The study also introduces a "Blue Technology Integration Model" linking science, governance, and community participation. Challenges such as high operational costs, data fragmentation, and limited policy coordination are discussed in depth. The findings underscore the need for global cooperation and investment in ocean technologies to achieve SDG 14, Life Below Water and ensure equitable resource distribution for coastal communities.

Keywords: Blue economy, ocean sustainability, marine technology, AUVs, marine conservation, SDG 14, ocean governance.

 ISSN: 3116-2835

Renewable Energy and Ecological Balance: Integrating Technology with Nature

Kunal Natwal, G. B. Pant University of Agriculture and Technology, Uttarakhand

Abstract

The rapid expansion of renewable energy sources offers a critical pathway to mitigate climate change, yet it must be harmonized with ecological preservation. This paper investigates the interplay between renewable energy development; solar, wind, and bioenergy and environmental sustainability. It analyzes environmental impact assessments from major renewable energy projects in India, Germany, and the United States to identify ecological trade-offs. Findings reveal that while renewable installations reduce carbon emissions, they can disrupt local ecosystems if poorly managed. To address this, the study proposes an "Eco-Tech Balance Model" emphasizing site-specific planning, biodiversity offsets, and community participation. It also examines technological solutions such as floating solar farms and wildlife-safe wind turbines that integrate conservation principles into energy systems. The paper concludes that responsible innovation and nature-based engineering are essential to achieving a sustainable energy transition without compromising ecological integrity.

Keywords: Renewable energy, sustainability, ecological balance, solar and wind power, biodiversity, eco-tech integration, green transition.

 ISSN: 3116-2835

Human Health, Technology, and the Planet: Building a One-Health Future

Isha Hooda, Pandit Ravishankar Shukla University

Abstract

The One Health concept recognizes the interconnectedness of human, animal, and environmental health, a relationship increasingly vital in the face of pandemics and ecological disruption. This paper explores the role of technology in implementing the One Health approach, emphasizing biosensors, digital surveillance systems, and AI analytics for integrated disease management. Case studies from WHO-UNEP collaborative initiatives illustrate how cross-sectoral data sharing and predictive modeling have enhanced early detection of zoonotic diseases. The study highlights the potential of telemedicine and remote diagnostics to strengthen health systems in resource-limited regions. It also examines ethical and privacy challenges in handling health-environmental data. The paper concludes that the digitalization of One Health practices can revolutionize global health governance by bridging gaps between medical science, ecology, and technology. Building a technology-enabled One Health framework is thus crucial for safeguarding both planetary and public health in the 21st century.

Keywords: One Health, digital health, zoonotic diseases, AI in healthcare, biosensors, environmental health, sustainable health systems.