



AICTE Sponsored Two Days National conference

On

**Indigenous Knowledge System and Recent
Advances in Science, Management,
Engineering & Technology for Sustainable
Development**

Organized by

**Centre for Professional Development (CPD)
NIILM University, Kaithal, Haryana, India
Oct 30-31, 2025**

SOUVENIR

**“Indigenous Knowledge System and Recent
Advances in Science, Management, Engineering &
Technology for Sustainable Development”**

A Book of Conference Proceedings

Editor(s):

Dr. Geetanjali

Dr. Neetu Dhanda

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Organized by

Centre for Professional Development (CPD)

NIILM University, Kaithal, Haryana, India

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Governor, Haryana



प्रो० असीम कुमार घोष
राज्यपाल, हरियाणा

No. HRB/PRO/MSG/2025/140/7372
Date: 30 October, 2025

MESSAGE

I am delighted to learn that NIILM University, Kaithal, Haryana, is organizing a two-day AICTE-sponsored national conference on the theme "Indigenous Knowledge System and Recent Advances in Science, Management, Engineering and Technology for Sustainable Development" on October 30th and 31st, 2025.

In today's rapidly evolving world, it is essential to recognize and integrate our rich indigenous knowledge systems—rooted in centuries of experience, culture and sustainable practices—with contemporary developments in science, technology, and management. Such a fusion not only preserves our heritage but also provides new directions for solving complex challenges related to environmental sustainability, resource management and equitable growth.

By bringing together academicians, researchers, industry experts and students from diverse disciplines, this conference will provide a valuable platform for knowledge exchange and collaborative learning. Discussions and presentations during the event will undoubtedly generate new ideas and encourage interdisciplinary research.

I extend my heartfelt congratulations to the organizers for taking this commendable initiative. I am confident that the deliberations held during these two days will be enriching and impactful, leading to meaningful outcomes for academia, industry and society at large. I wish the conference grand success.

(Prof Ashim Kumar Ghosh)
Governor, Haryana



Prof. (Dr.) Shamim Ahmed
Vice Chancellor,
NIILM University, Kaithal, India

Message

The conference is a commendable initiative aimed at broadening and enriching the perspectives of all participants. It serves as an excellent platform for showcasing research innovations and developments across diverse domains of science, management, engineering, and technology. I am confident that the discussions and exchanges during this event will lead to meaningful insights and the creation of new knowledge.

I sincerely appreciate the dedicated efforts, commitment, and hard work of the organizing committee in making this conference possible. My heartfelt best wishes go to all individuals associated, directly or indirectly, with ensuring the grand success of this event.

A handwritten signature in blue ink, appearing to read 'Shamim Ahmed', written over a horizontal line.

Prof. (Dr.) Shamim Ahmed



Prof. (Dr.) Rajiv Dahiya
Registrar,
NIILM University, Kaithal, India

Message

I am delighted to learn that **NIILM University, Kaithal** is organizing the **International Conference on “Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development”**, to be held on **October 30–31, 2025**.

This conference is a commendable initiative that brings together scholars, researchers, academicians, and industry professionals from diverse disciplines on a common platform. It offers a unique opportunity to explore the synergy between traditional wisdom and modern scientific advancements, fostering a deeper understanding of sustainable development in its truest sense.

The theme of the conference beautifully captures the essence of integrating indigenous knowledge systems with contemporary innovations in science, management, engineering, and technology. Such integration is vital in addressing the global challenges of the 21st century and in paving the way toward a balanced, inclusive, and sustainable future.

I am confident that the vibrant exchange of ideas, meaningful deliberations, and collaborative discussions during the conference will inspire new thoughts, encourage innovation, and open new avenues for impactful research and practical solutions.

I wholeheartedly appreciate the efforts of the organizing committee for their dedication and hard work in bringing this event to fruition. My best wishes to all participants and contributors for the grand success of this intellectual endeavor.

A handwritten signature in green ink, appearing to read 'Rajiv Dahiya'.

Prof. (Dr.) Rajiv Dahiya



Prof. (Dr.) Sandeep Kumar
Conference Coordinator & Director
Centre for Professional Development (CPD)
NIILM University, Kaithal, India

Message

It gives me great pleasure to welcome you to the AICTE-sponsored International Conference on “Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development,” organized by NIILM University, Kaithal on October 30–31, 2025.

As the Director of the Centre for Professional Development (CPD), I am proud to see such a relevant and forward-looking theme being addressed through a multidisciplinary approach. The integration of indigenous wisdom with modern advancements is vital for achieving a balanced and sustainable future.

This conference seeks to foster collaboration among researchers, academicians, industry experts, and policymakers to exchange ideas and develop strategies that harmonize traditional knowledge with scientific innovation. Such interactions will undoubtedly strengthen our understanding of sustainability from both cultural and technological perspectives.

At **CPD**, our mission is to empower individuals to meet global challenges with skill and insight. This event perfectly reflects that goal by providing opportunities for learning, collaboration, and professional growth. I am confident that the deliberations will inspire new ideas and contribute meaningfully to sustainable development.

I sincerely thank the **AICTE** for their valuable sponsorship and the organizing committee for their tireless efforts. I encourage all participants to engage actively and make this conference a milestone in our collective pursuit of a sustainable and knowledge-driven world.

A handwritten signature in black ink, appearing to read 'Sandeep Kumar', with a long horizontal flourish extending to the right.

Prof. (Dr.) Sandeep Kumar



Dr. Kamalpreet Kaur
Convenor
NIILM University, Kaithal, India

Message

It is with immense pleasure that I welcome all distinguished delegates, researchers, academicians, and industry experts to the AICTE Sponsored Two-Days AICTE-ISTE Induction/Refresher Program on “Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development.” This program, organized by NIILM University, Kaithal, provides a vital platform for exploring the synergy between our ancestral wisdom and contemporary innovation.

The theme of integrating Indigenous Knowledge Systems (IKS) with modern scientific and technological advancements is both timely and critical. As we strive for sustainable solutions to global challenges, it is imperative to draw upon the holistic, time-tested knowledge embedded in our traditions. This program aims to bridge the gap between ancient practices and modern applications, fostering a dialogue that can lead to resilient and culturally-rooted development.

This intellectual gathering will bring together diverse perspectives to foster innovative thinking and collaborative research. We aim to create actionable strategies that leverage indigenous wisdom for advancements in science, management, and technology. I am confident that the deliberations over these two days will not only enrich our collective understanding but also contribute meaningfully to the national and global pursuit of sustainability.

I extend my heartfelt gratitude to our sponsors, the All India Council for Technical Education (AICTE) and the Indian Society for Technical Education (ISTE), for their generous support. My sincere thanks also go to our esteemed speakers, contributors, and all the participants for their enthusiastic engagement.

A handwritten signature in dark ink, appearing to read 'Kamalpreet Kaur'.

Dr. Kamalpreet Kaur



Dr. Renu Bala
Co-Convenor
NIILM University, Kaithal, India

Message

It is a matter of immense pleasure and pride to welcome all the distinguished guests, academicians, researchers, and participants to the AICTE Sponsored Two-Day National Conference on “Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development,” being organized by NIILM University, Kaithal, on October 30–31, 2025.

The theme of this conference beautifully blends the essence of our rich traditional wisdom with the spirit of modern innovation. In an era where the world is striving for sustainable progress, the need to revisit and integrate indigenous knowledge with contemporary advancements has become more relevant than ever. This confluence of age-old insights and emerging technologies holds the potential to create pathways for a balanced and inclusive future.

This conference provides an excellent opportunity for scholars and practitioners from diverse fields to share their ideas, research findings, and experiences. I believe that the meaningful discussions and academic exchanges during these two days will not only enhance understanding but also inspire collaborative initiatives aimed at sustainability and innovation.

I extend my heartfelt gratitude to the All India Council for Technical Education (AICTE) for its generous support, and to the entire organizing team for their tireless efforts and commitment in making this event possible.

I wish the conference grand success and hope it becomes a memorable experience for all participants enriching minds and inspiring future research endeavors.

A handwritten signature in blue ink, appearing to read 'Renu Bala'.

Dr. Renu Bala

ACKNOWLEDGEMENT

NIILM University, Kaithal, extends its profound gratitude to all distinguished participants, eminent speakers, academicians, researchers, and delegates for their invaluable contribution to the AICTE Sponsored National Conference on “Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development” held on October 30–31, 2025, organized by the Centre for Professional Development, NIILM University, Kaithal.

We sincerely acknowledge the support of the All India Council for Technical Education (AICTE) under the Grants for Organizing Conference (GOC) Scheme 2025–26, Scholarship & Grant Bureau (SAG), for their generous financial assistance (PID: 1-44133106889), which made this national event possible.

Our heartfelt appreciation goes to the honourable guests and keynote speakers for sharing their profound insights, expertise, and visionary perspectives that enriched the deliberations and inspired meaningful discussions on sustainable development through indigenous wisdom and modern innovation.

We extend special thanks to the organizing committee, faculty members, research scholars, and staff of NIILM University for their dedication, teamwork, and meticulous efforts in ensuring the successful conduct of this conference.

We are equally grateful to our sponsors, collaborators, and media partners for their continued encouragement and invaluable support in promoting academic excellence and knowledge exchange.

Finally, we thank the entire NIILM University community for their cooperation and active participation. Your collective enthusiasm and commitment have played a vital role in making this conference a grand success and a step forward in fostering sustainable development through the fusion of traditional knowledge and contemporary advancements.

Thank you all for your unwavering support and contribution. We look forward to your continued association in our future academic endeavours.

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ABOUT THE CONFERENCE

Centre for Professional Development, NIILM University, Kaithal, Haryana, is organizing Two Days AICTE Sponsored National Conference on "Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development" on Oct 30-31, 2025.

Introduction:

In an era of growing environmental crises, social inequalities, and rapidly increasing technological advancements, the need for sustainable development has never been more urgent. The International Conference on "Indigenous Knowledge Systems and Recent Advances in Science, Management, Engineering and Technology for Sustainable Development" serves as an important platform to bridge traditional knowledge with modern innovation. This multi-disciplinary platform unites indigenous knowledge holders, researchers, policy makers, scientists, engineers, and industry leaders to explore how indigenous knowledge systems (IKS) can complement cutting-edge advances in science, management, engineering, and technology to achieve the United Nations Sustainable Development Goals (SDGs). By promoting respectful collaboration, the conference aims to create equitable, resilient, and sustainable solutions to global challenges such as climate change, biodiversity loss, and social inequality.

Objectives:

The conference is driven by a clear set of objectives designed to promote synergies between Indigenous and modern knowledge systems:

1. Integration of knowledge systems: Facilitate the convergence of IKS with advances in science, management, engineering, and technology to develop holistic, sustainable solutions.
2. Alignment with the SDGs: Ensure that discussions and outcomes contribute to global sustainability goals, particularly relating to climate action, clean energy, sustainable communities, and equitable education.
3. Amplification of Indigenous voices: Provide a platform for Indigenous communities to share their knowledge, practices, and perspectives, ensuring that their contributions are respected and recognised.
4. Promoting collaborative research: Encourage interdisciplinary and cross-cultural research to translate IKS into practical applications for sustainable development.
5. Ethical engagement: Advocate for research and development practices that respect Indigenous intellectual property, cultural sovereignty, and community priorities
6. Innovate for resilience: Explore how Indigenous knowledge, combined with technologies such as artificial intelligence (AI), biotechnology, and renewable energy, can enhance resilience in areas such as climate adaptation, resource management, and health care.

Sub-Themes:

1. Role of Indigenous Knowledge in Climate Resilience
2. Traditional Agricultural Practices for Food Security
3. Water Conservation Techniques
4. Ethnomedicine and Herbal Healing Systems
5. Tribal Innovations in Natural Resource Management
6. Forestry and Biodiversity Conservation
7. Sustainable Rural Livelihoods through Traditional Skills
8. Role of Local Knowledge in Disaster Management
9. Architecture and Eco-Friendly Housing
10. Sustainable energy solutions for off-grid communities.
11. Community-Based Waste Management Practices
12. Traditional Knowledge and Circular Economy Models
13. Ethnobotany and Sustainable Use of Plant Resources
14. Fusion of Tribal Architecture with Green Building Technologies
15. Preservation of Traditional Knowledge through Digital Tools
16. Role of Women in Sustaining Indigenous Knowledge
17. Traditional rainwater harvesting systems and their scalability.
18. Traditional Irrigation Systems and Modern Applications
19. Robotics and automation in traditional crafts.
20. Smart cities incorporating cultural heritage.
21. Cross-Cultural Knowledge Exchange for Sustainability
22. Role of NGOs in Preserving Indigenous Heritage
23. Bio-prospecting and Indigenous Ecological Wisdom
24. Traditional Festivals and Sustainable Community Practices
25. Meteorological Forecasting Techniques
26. Microfinance models based on traditional lending practices.
27. Traditional Craftsmanship and Modern Market Linkages
28. Livestock Management for Agroecology.
29. Policy Frameworks for Promoting Indigenous Knowledge
30. Traditional Music, Dance, and Sustainable Social Fabric
31. Nanotechnology applications in traditional medicine.

32. Blockchain for Protecting Traditional Knowledge
33. Green Energy Innovations from Tribal Communities
34. Energy-efficient traditional housing designs.
35. Traditional Conflict Resolution and Environmental Ethics
36. Water Body Restoration through Indigenous Wisdom
37. Digital Documentation of Tribal Science Practices
38. Tribal Entrepreneurship for Sustainable Development
39. Culinary tourism based on traditional food practices.
40. Multidisciplinary Approaches to Indigenous Knowledge
41. Role of Indigenous Food Systems in Nutrition Security
42. Languages and their role in knowledge transmission.
43. Geo-Spatial Mapping of Indigenous Resource Use
44. Integration of Indigenous Ethics in AI Development
45. Engineering Sustainable Futures with Design Principles
46. Integrating Indigenous Water Harvesting Techniques into Modern Hydrology
47. Traditional Soil Enrichment Methods for Sustainable Agriculture
45. Management strategies for sustainable tourism.
48. Digital Archiving of Oral Histories and Cultural Heritage
50. Traditional Weaving Patterns in Smart Textile Engineering
51. Folk Music Data Analytics for Cultural Preservation
52. AI-Driven Analysis of Ancient Agricultural Calendars
53. Traditional Conflict-Resolution Mechanisms in Project Management
54. Cross-Generational Knowledge Transfer through E-Learning
55. Traditional Saltpan Restoration Techniques for Coastal Resilience
56. Community-based healthcare models combining traditional and modern practices.
57. Traditional energy sources and their modern applications for sustainability.
58. Traditional architectural designs for climate-responsive buildings.
59. Supply chain management using local knowledge for sustainability.
60. Festivals and their role in sustainable community development.
61. Traditional healing practices and their convergence with contemporary

- medical and biotechnological advancements.
62. Ethno-botany and sustainable resource management: Bridging ancestral wisdom with modern conservation strategies.
 63. Indigenous engineering and architectural principles informing sustainable infrastructure development.
 64. Leveraging Indigenous knowledge for ethical AI and data governance in technological innovation.
 65. Preserving and revitalizing Indigenous languages as a conduit for knowledge transmission in STEM fields.
 66. Exploring the intersection of Indigenous astronomy and contemporary space science for holistic understanding.
 67. Indigenous philosophies of well-being guiding sustainable business models and ethical entrepreneurship.
 68. Decolonizing STEM education and research methodologies through Indigenous epistemologies.
 69. Biocultural restoration: Blending Indigenous land stewardship with ecological engineering.
 70. Cybersecurity and digital well-being from an Indigenous perspective.
 71. Protecting Indigenous intellectual property rights in technological advancements and traditional knowledge commercialization.
 72. Satellite technology and geospatial analysis for Indigenous land monitoring and climate adaptation.
 73. Neuro-Indigenous Interface Technologies
 74. Ethical Robotics and Indigenous Care Systems
 75. Indigenous-inspired Biomimicry and Advanced Materials Science

Conference Fee:

Participation Fee: Rs. 500

Participation & Presentation Fee: Rs. 1000 (Rs. 500 for each co-author; co-author need not register separately, mention the details of the co-author in the registration form)

Conference Schedule

Date: October 30-31, 2025

Venue: NIILM University, Kaithal, Haryana

Last date of registration: October 05, 2025

Last date of abstract/ full paper submission: October 18, 2025

Registration link: <https://forms.gle/HY4W7cU2JsG6kYCY7>

SOP:

Step 1: Submit the fee

Step 2: Register online at the **given link:**

Step 3: Send abstract/ full paper to seminar@niilmuniversity.ac.in

Step 4: You will get an acceptance in reply to the email.

Fee Submission Details:

Account Holder Name- NIILM University

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Call for Research Papers: Well-researched papers from multiple disciplines are invited from academicians, research scholars, students, and professionals from different institutions for presentation at the Conference. A proceeding book of the Conference, including all abstracts (all presenters) with ISBN, papers presented during the Conference, and full papers as per choice to publish with ISBN, soft copy will be provided to all research presenters.

Paper Publication: Authors who will present their research papers at the Conference will be eligible to send their research paper (same as presented) for publication in the NIILM University International Multidisciplinary Journals, peer-reviewed academic/ scholarly, open-access journals with DOI

Submission Guidelines: For publication

- Full-length papers should not exceed 6000 words; don't add endnotes or footnotes.
- For English, the full paper should be typed in Microsoft Word. The font should be "Times New Roman with "12" sizes for matter, 16 sizes in bold for the title, 14 sizes in bold for main headings & 12 sizes in bold for the sub-headings, having a line spacing of 1.5 inches and a one-inch custom margin on all sides & A4 Size Paper.
- For Hindi Full paper: It should be typed in Microsoft Word in "Unicode" with font size 14 for content, 16 bold for the title & 14 bold for headings, having a line spacing of 1.5 inches and a one-inch custom margin on all sides.
- A Uniform Style for citations should be strictly adhered to while submitting full length papers.
- All in-text citations must be hyperlinked with the references (cross-reference). Use the word reference tab for cross-referencing and hyperlinking. We also recommend you use Mendeley or other referencing tools.
- Submit a brief profile of the author on the Word file/ doc file, which should not exceed more than one page, and try to keep it as brief as possible.
- Each article must be submitted with an impact statement of not more than 150 words.
- References/ bibliography must be serialized as 1, 2,
- Provide your ORCID, and include your ORCID in your article just below your name.
- Must check grammar under the review tab of MS Word.
- Full-length papers shall be emailed to seminar@niilmuniversity.ac.in

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NIILM University, Kaithal, Haryana

AICTE Sponsored National Conference Oct. 30-31, 2025

"Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development"

Conference Schedule

Day 1: Thursday, Oct. 30, 2025

| | |
|---|---|
| 09:30 am to 10:30 am | Registration |
| Inaugural & Keynote Session: 11:00 am to 1:30 pm | |
| Convener(s): | Dr Kamalpreet Kaur, Associate Professor, Department of Commerce, NIILM University, Kaithal, Haryana Dr Renu Bala, Associate Professor, Department of Library & Information Sciences, NIILM University, Kaithal |
| Coordinator | Dr Sandeep Kumar, Director , CPD and R&D Cell, NIILM University, Kaithal, Haryana Prof. (Dr) Rekha Gupta, Dean, School of Commerce & Management, NIILM University, Kaithal, Haryana |
| Facilitator/ Moderator | Dr Neeta Kaushik, Assistant Professor, Department of Food Technology, NIILM University, Kaithal, Haryana Mr. Rahul Nain, Assistant Professor, Department of Economics, NIILM University, Kaithal, Haryana |
| Chief Guest: | Prof. (Dr) H.L. Verma, Vice Chancellor, Baba Mastnath University, Rohtak |

| | |
|--|--|
| <p>Inaugural: 11:00 am to 11:30 am</p> <p>Keynote Session</p> <p>11:30 am to 01:30 pm</p> | <p>Welcome address by Prof. (Dr) Rekha Gupta, Dean, School of Commerce & Management, NIILM University, Kaithal, Haryana</p> <p>Presidential address by the Honourable Vice Chancellor, Prof. (Dr) Shamim Ahmed, NIILM University</p> <p>Special/ Inaugural address by Chief Guest, Prof. (Dr) H.L. Verma, Vice Chancellor, Baba Mastnath University, Rohtak</p> <p>Guest of Honor Address by Prof. (Dr) Aruna Anchal, Dean and Faculty of Education, Baba Mastnath University Rohtak, Haryana</p> <p>Keynote address by Dr Vijay Kumar Garg, Associate Professor, Department of Electrical Engineering, UIET, Kurukshetra University, Kurukshetra, Haryana</p> |
| | <p>Vote of thanks by Dr Ekta Chahal, Dean, School of Social Sciences and Humanities, NIILM University, Kaithal, Haryana</p> |
| | <p>Release of Souvenir</p> <p>Felicitation of Guests</p> |
| | <p>Lunch Break: 01:30 pm to 02:00 pm</p> |
| <p>Plenary Sessions: 02:00 pm to 03:30 pm</p> | |
| <p>Session 1</p> | <p>Seminar Hall</p> |
| <p>Session Chair</p> | <p>Prof. (Dr) Anuj, Professor, Department of Commerce, DAV College Pehowa, Kurukshetra</p> |
| <p>Session Coordinator</p> | <p>Dr Geetanjali, Assistant Professor, Department of Chemistry, NIILM University Kaithal</p> |
| <p>Session 2</p> | <p>Room No. 4, Block A</p> |
| <p>Session Chair</p> <p>Session Co-Chair</p> | <p>Prof. (Dr) Simran, Professor, Department of Commerce, NIILM University Kaithal Haryana</p> <p>Dr Prerna, Assistant Professor, Babu Anant Ram Janta College, Dhand, Kurukshetra</p> |
| <p>Session Coordinator</p> | <p>Dr Preeti Kundu, Assistant Professor, Department of Botany, NIILM University, Kaithal</p> |
| | <p>National Anthem</p> |



NIILM University, Kaithal, Haryana

AICTE Sponsored National Conference Oct. 30-31, 2025

"Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development"

Conference Schedule

Day 2: Friday, Oct. 31, 2025

| Inaugural & Keynote Session: 11:00 am to 1:30 pm | |
|---|---|
| Convener(s): | Dr Kamalpreet Kaur, Associate Professor, Department of Commerce, NIILM University, Kaithal, Haryana Dr Renu Bala, Associate Professor, Department of Library & Information Sciences, NIILM University, Kaithal |
| Coordinator | Dr Sandeep Kumar, Director , CPD and R&D Cell, NIILM University, Kaithal, Haryana Prof. (Dr) Rekha Gupta, Dean, School of Commerce & Management, NIILM University, Kaithal, Haryana |
| Facilitator/ Moderator | Dr. Shweta, Assistant Professor, Dept. of Commerce, NIILM University Mr. Rahul Nain, Assistant Professor, Department of Economics, NIILM University, Kaithal, Haryana |
| Chief Guest | Prof. (Dr) Avinash Kumar Chawla, Former Vice Chancellor, Kurukshetra University, Kurukshetra |

| | |
|---|---|
| Inaugural: 11:00 am to 11:30 am | Welcome address by Prof. (Dr) R.K. Gupta, Dean, Academic Affairs, NIILM University, Kaithal, Haryana |
| | Presidential address by the Pro Vice Chancellor, Prof. (Dr) Rajesh Malhotra, NIILM University |
| Keynote Session | Special/ Inaugural address by Chief Guest Prof. (Dr) Avinash Kumar Chawla, Former Vice Chancellor, Kurukshetra University, Kurukshetra |
| | Guest of Honor Address by Dr Pankaj Mishra, Chairperson & Associate Professor, Department of Hotel Management, BPS Mahila Vishwavidyalaya, Khanpur Kalan, Sonapat |
| 11:30 am to 01:30 pm | Keynote address by Dr Ramesh Chander, Professor, University School of Management Kurukshetra University, Kurukshetra |
| | Vote of thanks by Dr Surender Kalyan, Dean, School of Law, NIILM University, Kaithal |
| | Felicitation of Guests |
| | Lunch Break: 01:30 pm to 02:00 pm |
| Plenary Sessions: 02:00 pm to 03:30 pm | |
| Session 1 | Seminar Hall |
| Session Chair | Prof. (Dr) Rajiv Kumar, Dean, School of Pharmaceutical Sciences, NIILM University, Kaithal, Haryana |
| Session Co-Chair | Dr. Matish Garg, Assistant Professor & Head, Department of Computer Science, RKSD College, Kaithal, Haryana |
| Session Coordinator | Dr Komal Garg, Assistant Professor, Department of Computer Science, NIILM University, Kaithal |
| Session 2 | Room No. 4, Block A |
| Session Chair | Prof. (Dr) Divya Sahu, Professor, Department of Management, NIILM University Kaithal, Haryana |
| Session Co-Chair | Dr Mahipal Dhanda, Assistant Professor, Department of Management & Commerce, Baba Mastnath University, Rohtak |
| Session Coordinator | Dr Amrita Soni, Assistant Professor, Department of Paramedical Sciences, NIILM University, Kaithal |
| National Anthem | |
| Certification | |

Invited Talks/Guest



Chief Guest
Dr. H.L. Verma, Vice Chancellor, Baba
Mastnath University, Rohtak

Chief Guest
Prof. (Dr) Avinash Kumar Chawla, Former
Vice Chancellor, Kurukshetra University,
Kurukshetra



Guest Of Honour
Prof. (Dr) Aruna Anchal, Dean, Faculty of
Education, Baba Mastnath University, Rohtak

Guest of Honour
Dr Sanjeev Kumar, Professor, Institute of Hotel
and Tourism Management, Maharishi Dayanand
University, Rohtak



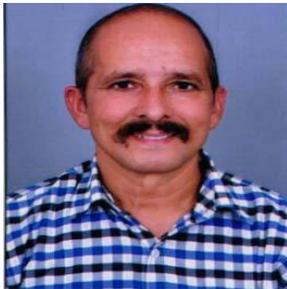


Keynote Speaker

*Dr Vijay Kumar Garg, Associate Professor,
Department of Electrical Engineering, U.F.T.,
Kurukshetra University, Kurukshetra,*

Keynote Speaker

*Dr Ramesh Chander, Professor, University
School of Management Kurukshetra University,
Kurukshetra*



Session Chair

*Prof. (Dr) Anuj, Professor; Department of
Commerce, DAV College Pehowa,
Kurukshetra*

Session Co-Chair

*Dr Prerna, Assistant professor, Babu Anant
Ram Janta College, Dhand, Kuruksheta*



Session Co-Chair

*Prof. (Dr.) Anupam Bhatia, Associate
Professor; Deptt. Of Computer Science and
Applications, CRU, Jind*

Session Co-Chair
Dr. Matish Garg, Assistant Professor & Head,
Department of Computer Science, RKSD
College Kaithal (Haryana)



Session Co-Chair
Dr. Mahipal Dhanda, Assistant Professor,
Department of Management & Commerce,
Baba Mastnath University, Rohtak

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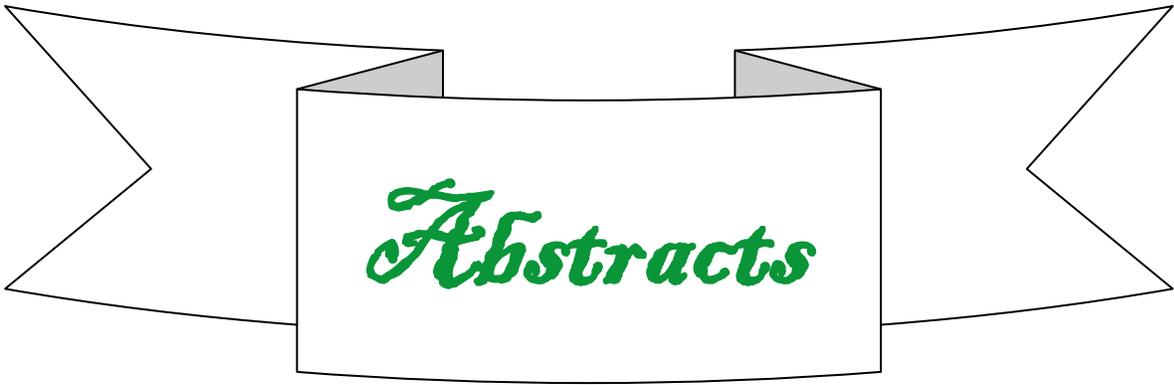
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Protecting Indigenous Intellectual Property Rights in Technological Advancements And Traditional Knowledge Commercialization

Abhimanyu Panghal

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Abstract

IPRs are crucial for promoting innovation and creativity. A vast array of ancient knowledge systems, encompassing literature, arts, crafts, and medicine, are part of India's rich cultural and intellectual legacy. The maintenance and improvement of these knowledge systems, as well as additional innovation within them, would be substantially aided by the effective promotion and protection of IPR. India's IPR laws have undoubtedly improved over time, however issues like counterfeiting, piracy, and ignorance still exist. Included is a thorough examination of intellectual property rights (IPR) in India, including its kinds, history, and significance as well as its function in preserving and advancing Indian knowledge systems. The paper goes on to describe the difficulties in putting IPR into practice and offer some tactical solutions to bolster IPR's contribution to economic growth and creativity. The article then examines a few successful IPR cases in India and offers legislative recommendations to enhance the system even more.

One of the most contentious topics on the agendas of several international organizations is the connection between genetic resources, Traditional Knowledge (TK), and Intellectual Property Rights (IPRs). Indigenous and local populations may be significantly impacted by international discussions over genetic resources and traditional knowledge. However, local communities have had relatively little involvement in the WTO and WIPO. TK is under severe deterioration more than ever before. The knowledge that TK-holding peoples and societies possess is likewise eroding as they confront a variety of challenges, ranging from complete destruction to "assimilation" into "mainstream" civilization. The Protection of Indigenous Knowledge via Intellectual Policy aims to use the current Intellectual Property (IP) system to support the protection of traditional knowledge. Without any advantage to the knowledge holders, the IP has so far been utilized to usurp TK rather than to defend it.

Keywords: Intellectual Property Rights, Indian Knowledge Systems, Innovation, Cultural Heritage, Economic Growth, Policy Recommendations.

हरियाणा में सिन्धु घाटी सभ्यता और स्थानीय ज्ञान: बहुविषयक एवं समेकित विश्लेषण

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सारांश

हरियाणा में सिन्धु घाटी सभ्यता के स्थलों से संबंधित स्थानीय ज्ञान और अनुभव सामाजिक, सांस्कृतिक और ऐतिहासिक दृष्टिकोण से अत्यंत महत्वपूर्ण हैं। यह अध्ययन बहुविषयक दृष्टिकोण अपना कर इन स्थलों पर संचित ज्ञान, परंपरागत तकनीक, स्थानीय संस्कृति, और मीडिया तथा सरकारी संरक्षण की भूमिका का विश्लेषण करता है। शोध में हिसार जिले के राखीगढ़ी स्थल पर विशेष ध्यान दिया गया है। प्राथमिक डेटा संग्रह हेतु उद्देश्य मूलक नमूना (Purposive Sampling) के माध्यम से 150 उत्तरदाताओं (75 पुरुष और 75 महिलाएँ) को लिया गया। अध्ययन के निष्कर्षों से पता चलता है कि स्थानीय समुदाय में जागरूकता सीमित है, मीडिया कवरेज असमान है और सरकार की संरक्षण नीतियाँ पूर्णतः प्रभावी नहीं हैं। शोध यह सुझाव देता है कि बहुविषयक दृष्टिकोण अपना कर स्थानीय ज्ञान, मीडिया और सरकार के सहयोग से सिन्धु घाटी स्थलों की संरक्षण और प्रचार-प्रसार रणनीतियाँ प्रभावी बनाई जा सकती हैं।

मुख्य शब्द: सिन्धु घाटी सभ्यता, स्थानीय ज्ञान, बहुविषयक दृष्टिकोण, हरियाणा, राखीगढ़ी

Study of Ketonic Aldehyde (KAR) and Chlorinated Polyolefin (CPO) Resin System for Conductive Primers on Various Polymeric Substrates

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Abstract

The increasing demand for advanced coatings on plastic substrates, particularly in the automotive, electronics, and consumer goods industries, has driven the evolution of conductive pigments in paint systems. This research explores the progressive development of conductive pigments integrated with advanced resin systems, focusing on the synergy between ketonic aldehyde resins and chlorinated polyolefins (CPOs). These resins play a pivotal role in improving adhesion, mechanical strength, and overall conductivity of paint films applied to non-conductive plastic surfaces. Plastics such as polypropylene (PP), acrylonitrile butadiene styrene (ABS), and polyethylene (PE) present significant challenges due to their inert and low-surface-energy nature. To overcome these limitations, the combination of ketonic aldehyde resins—offering superior cross-linking capabilities—and CPOs—known for their high affinity toward polyolefin surfaces—has been engineered to optimize pigment dispersion and improve electrostatic charge acceptance. The study investigates the structural compatibility of these resins with common conductive pigments such as carbon black, graphite, antimony-doped tin oxide (ATO), and metallic powders, along with additives like titanium dioxide (TiO₂) and silica for performance enhancement. Advanced characterization methods, including SEM, FTIR, and four-point probe conductivity testing, were employed to analyze film morphology, pigment distribution, and electrical resistivity. The research also evaluates weathering resistance, thermal stability, and mechanical performance, providing a comprehensive insight into long-term durability. This work demonstrates that the strategic incorporation of ketonic aldehyde and CPO resins in conductive paint formulations significantly enhances the functional coating's adherence, conductivity, and durability on plastic substrates. The findings underscore a promising route toward more efficient, eco-friendly, and application-specific electrostatic coating systems, paving the way for innovation in smart coatings and electromagnetic shielding applications.

Protecting Indigenous Intellectual Property Rights in Technological Advancements and the Commercialization of Traditional Knowledge

Anamika Dua

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Abstract

Indigenous and local communities have been the long-term custodians of traditional knowledge (TK) and genetic resources, which form the basis for many technological innovations and commercial products. However, the prevailing intellectual property (IP) systems, designed primarily for individual inventions and creative works within market-based economies, often fail to recognize the collective and intergenerational nature of TK. This mismatch has frequently resulted in the misappropriation of knowledge and the unequal or unfair distribution of benefits, leaving communities without proper recognition, control, or compensation for the use of their heritage. This paper reviews international and national instruments, examines illustrative case studies (including India’s Traditional Knowledge Digital Library), identifies gaps, and proposes an integrated set of legal, institutional, and community-led measures to protect indigenous IP rights while enabling equitable commercialization.

Keywords: traditional knowledge, indigenous rights, intellectual property, Nagoya Protocol, disclosure of origin, TKDL, benefit-sharing, sui generis protection

From Memory to Menu: Nostalgia Marketing and Its Influence on Culinary Tourism Focused on Haryanvi Food Traditions

Arvind Sheoran

Research Scholar, NIILM University, Kaithal, Haryana, India

Abstract

The importance of traditional eating practices in forming cultural identities and consumer behaviour has been brought to light by the growing interest in culinary tourism. With an emphasis on Haryanvi food customs and their effects on Indian customers' eating choices, this study investigates the impact of nostalgia marketing on culinary tourism. Nostalgia marketing uses sentimental attachments to the past to market traditional foods by bringing back memories of ancestry and family customs. Nostalgia is a potent tool for drawing tourists and influencing dietary preferences in the context of Haryanvi cuisine, which is distinguished by its rustic simplicity, healthful ingredients, and regional authenticity. This study explores how nostalgic narratives can improve the allure of Haryanvi culinary heritage in tourism contexts through storytelling, branding, and sensory experiences. Using a mixed-methods approach that includes surveys, culinary tourist interviews, and campaign analysis, the study looks at how nostalgia-driven tactics affect people's perceptions and preferences for traditional Haryanvi foods like kheer, lassi, and bajra roti. The results show that nostalgia marketing increases demand for real Haryanvi food experiences in culinary tourism by strengthening cultural pride and encouraging emotional engagement. The study emphasizes how nostalgia may be used strategically to promote regional cuisines, preserve culinary heritage, and increase India's attraction to tourists. Additionally, it highlights issues like striking a balance between authenticity and commercialization and provides information to help those involved in the food and tourist sectors develop successful marketing plans.

Keywords: Nostalgia Marketing, Culinary Tourism, Haryanvi Cuisine, Traditional Food Practices, Indian Consumer Behavior, Cultural Heritage, Food Preferences, Regional Authenticity, Emotional Engagement, Tourism Marketing

Examining Work Life Balance Amongst BPO employees in IT Sector - A Study of Chandigarh

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Punjab

²Assistant Professor (Department of Management), University School of Management
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Abstract

In the contemporary service industry, work-life balance (WLB) is becoming more and more significant, particularly in fields like business process outsourcing (BPO), where long hours, shift work, and stringent performance standards are typical. This study explores the degree of work-life balance among BPO workers in Chandigarh's IT industry, pinpoints important determinants of it, and looks at the relationship between perceived balance and occupational and demographic parameters.

People on this planet are required to work for unavoidable reasons. Due to the country's rapidly expanding population and the rise in the number of persons earning advanced degrees, people move to their nearest cities for employment purposes or may displace to far-off locations. However, there are fewer opportunities for employment every day. Because of this, the job market is now entirely employee-driven. By all means, employees will demand a lot of work from employees, when job markets become employee-driven. As a result, they will spend a smaller amount of time with their families and more time at work. This will cause a disparity between job and family life. An analysis of work-life balance in the IT BPO industry indicates issues with rigorous work schedules and hours, which result in less time spent with family, less social engagement, and more stress. These challenges are caused by a number of factors, including night shifts, an overwhelming workload, and upholding service quality. Work-life balance can be enhanced and talent retention can be aided by putting methods like flexible scheduling, work-from-home choices, and employee wellness programs into practice.

This study aims to provide numerous insights into work-life balance, with a focus on big BPO employees in Chandigarh.

Keywords: Unavoidable, employment, displace and employee-driven, BPO

Cybersecurity and Digital Well-being from an Indigenous Perspective

Chirag Mittal

Assistant Professor, School of Law, NIILM University, Kaithal, India

Abstract

In the present time of rapid technological transformation, cybersecurity and digital well-being have appeared as crucial aspects of human development and safety. The digital world connects individuals and communities globally, enabling access to information, communication, and innovation. However, it also introduces new vulnerabilities such as data theft, cyberbullying, misinformation, and privacy invasion. For indigenous communities, the issue of cybersecurity and digital well-being carries a unique significance. It not only relates to the protection of personal data but also involves safeguarding cultural heritage, traditional knowledge, and collective identity in the digital domain. From an indigenous perspective, the digital world is not separate from the physical, cultural, and spiritual worlds. Indigenous philosophies often emphasize balance, interconnectedness, and respect for all forms of life. When applied to the digital context, these values encourage a holistic approach to cybersecurity—one that protects not only data and systems but also the well-being of individuals and communities. This perspective contrasts with the mainstream view of cybersecurity, which often focuses narrowly on technical defenses such as encryption, firewalls, and software protection. Indigenous worldviews instead remind us that security must include emotional, cultural, and spiritual safety as well.

In conclusion, cybersecurity and digital well-being from an indigenous perspective call for a shift from a purely technical model to a more human-centered and culturally grounded approach. Indigenous knowledge systems, with their emphasis on community care, respect, and balance, offer valuable insights into how societies can protect both digital and cultural worlds. Recognizing and incorporating these perspectives into policy-making, education, and technological design can lead to more inclusive and ethical digital futures. True cybersecurity, therefore, is not only about defending data—it is about protecting people, cultures, and the relationships that sustain them in an interconnected digital world.

Keywords: Cyber Security, Cyber Bullying, Cyber Law, Digital Well being

Digital Marketing Literacy among Service Providers in Haryana: A Case Study Approach

Divya Gupta

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Abstract

For service-based businesses to expand and remain competitive in the digital age, social media and internet marketing have become essential tools. On the other hand, it is still important to investigate how well-equipped service providers in India's semi-urban and rural areas—especially Haryana—are to use digital platforms. This study investigates the degree of digital marketing literacy among Haryana's service providers, concentrating on their knowledge, adoption trends, and skill in utilising digital platforms for customer engagement and business development. Using a case study methodology, the study looks at a few service industries, including personal care, healthcare, education, and hospitality, to find differences in digital literacy and how it affects marketing efficacy. Secondary data from government and industry sources is used to supplement the primary data, which is gathered through structured interviews and surveys of small service providers and local business owners. The results show notable differences in digital marketing literacy depending on the size of the company, the region, and the age of the business owners. The use of social media and online advertising by urban service providers is moderate to highly proficient, whereas their rural counterparts frequently lack formal training and strategic awareness of digital marketing techniques. In order to close the literacy gap and improve the competitiveness of Haryana's service industry, the report emphasises the necessity of government-backed projects, capacity-building programs, and training in digital skills. The study adds to the growing body of knowledge regarding digital inclusion and sustainable service marketing strategies in developing nations.

Keywords: Digital Marketing, Literacy, Digital, Haryana

From Perception to Participation: The Role of Residents’ Attitudes in Shaping Tourism Development

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Abstract

This study aims to examine non-financial factors influencing local residents’ support for tourism, independent of any perceived impacts of the tourism system. Grounded in the Theory of Reasoned Action (TRA), the proposed model includes four constructs: tourist perception, tourism perception, hospitality, and pro-tourism behaviour. Data were collected from 508 stakeholders. The dataset was analysed through Partial Least Squares Structural Equation Modelling (PLS-SEM). The results indicate that both tourism perception and tourist perception have a positive effect on hospitality tendency, which subsequently enhances pro-tourism behaviour. In turn, pro-tourism behaviour positively influences support for tourism development. Among the identified relationships, the impact of hospitality on pro-tourism behaviour emerged as the strongest.

The study advances the tourism perception literature by validating a model that underscores the pivotal role of tourist perception, beyond general tourism perception, in explaining residents’ support for tourism development. The finding that hospitality perception exerts the most substantial influence on tourism support in the Indian context offers a novel contribution to international scholarship, particularly concerning emerging destinations.

Keywords: Pro-Tourism Behaviour; Tourist; Tourism Perception; Tourism

The Impact of Cloud-Based Educational Platforms on Student Engagement and Academic Outcomes: A Comparative Study

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Abstract

This study investigates the effects of cloud-based educational platforms—such as Google Classroom, Microsoft Teams, Canvas, and Moodle—on student engagement and academic achievement across global K–12 and higher education contexts. A comprehensive mixed-methods approach integrates publicly sourced quantitative metrics of platform adoption and student outcomes with qualitative insights from teacher interviews and case studies. Data collected from 212,000 institutions and 450,000 students spanning four continents, along with 45 qualitative studies comprising over 500 educators and administrators. Findings indicate that cloud platforms substantially enhance engagement and academic performance, particularly when interactive components (forums, live collaboration, and asynchronous modules) are used and teacher support is strong. While K–12 institutions favoured Google Classroom for its accessibility, higher education leaned toward Canvas and Moodle for sophisticated analytics and management features. The study underscores the importance of blended learning, digital equity, and ongoing teacher training to sustain the gains of educational cloud adoption. Limitations and implications for future design and policy are discussed.

Keywords: Cloud-Based Educational Platforms, Student Engagement, Digital Learning Systems

संस्कृत भाषा के संरक्षण में सङ्गणक की उपयोगिता

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सारांश

संस्कृत भाषा भारतीय सांस्कृतिक, दार्शनिक एवं वैज्ञानिक धरोहर की आधारशिला रही है। यह न केवल भारत की प्राचीनतम भाषाओं में से एक है, अपितु इसकी संरचना, व्याकरण एवं उच्चारण पद्धति वैज्ञानिक दृष्टिकोण से अत्यंत उन्नत मानी जाती है। यद्यपि आधुनिक युग में संस्कृत का प्रयोग सीमित हो गया है, तथापि इस भाषा के संरक्षण एवं पुनरुत्थान के लिए आधुनिक प्रौद्योगिकी, विशेषतः सङ्गणक (कंप्यूटर) की भूमिका अत्यंत महत्वपूर्ण सिद्ध हो रही है। सङ्गणक तकनीक ने संस्कृत भाषा के संरक्षण, अध्ययन एवं प्रसार को एक नई दिशा प्रदान की है। विभिन्न डिजिटल प्लेटफॉर्म, सॉफ्टवेयर, एप्लिकेशन एवं ऑनलाइन संसाधनों के माध्यम से संस्कृत साहित्य, शब्दकोश, व्याकरण ग्रंथ, श्लोकसंग्रह, एवं शैक्षणिक सामग्री को डिजिटल स्वरूप में संरक्षित किया जा रहा है। इससे न केवल शैक्षिक संस्थानों में अध्ययन की सुविधा बढी है, अपितु वैश्विक स्तर पर संस्कृत सीखने वालों के लिए भी संसाधनों की उपलब्धता संभव हुई है। संस्कृत भाषा के लिए विशेष रूप से विकसित किए गए सॉफ्टवेयर जैसे "Sanskrit Heritage Reader", "Digital Sanskrit Buddhist Canon", "Girvanapratishtha", एवं अन्य OCR (Optical Character Recognition) उपकरण, संस्कृत ग्रंथों की डिजिटलीकरण प्रक्रिया को सरल बनाते हैं। कृत्रिम बुद्धिमत्ता (AI), मशीन लर्निंग, एवं नैसर्गिक भाषा प्रसंस्करण (NLP) के क्षेत्र में भी संस्कृत के लिए मॉडल विकसित किए जा रहे हैं, जो संस्कृत के स्वचालित अनुवाद, पाठ विश्लेषण एवं उच्चारण सुधार आदि में सहायक सिद्ध हो रहे हैं। इसके अतिरिक्त, सोशल मीडिया, यूट्यूब चैनल, पॉडकास्ट आदि के माध्यम से संस्कृत को लोकप्रिय बनाया जा रहा है। विभिन्न ऑनलाइन पाठ्यक्रम, जैसे MOOCs (Massive Open Online Courses), संस्कृत भाषा को विश्वभर में उपलब्ध करा रहे हैं। इस प्रकार, सङ्गणक तकनीक संस्कृत भाषा के संरक्षण, संवर्धन एवं प्रसार में एक सेतु के रूप में कार्य कर रही है। यदि इस दिशा में निरंतर अनुसंधान एवं नवाचार होता रहा, तो संस्कृत भाषा न केवल एक के रूप में रहेगी "संरक्षित धरोहर", अपितु आधुनिक युग में एक के रूप में पुनः स्थापित हो सकेगी। "जीवंत एवं प्रासंगिक भाषा"

प्रमुख बिन्दु:- सांस्कृतिक, दार्शनिक, वैज्ञानिक, सोशल मीडिया, सङ्गणक

A Study on Villages – Villagers in the Region and Need For Refined Modern Knowledge

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Abstract

The Rural-Development remained a favourite arena of vested political-games of the Developing-Economies in the region. After more than 75 years of independence, India is still concerned about widened disparities in growth and development. The underdeveloped and backward regions are getting more and more marginalized. These regions are Rural-Areas, and, these Areas are comprised of Villages – Villagers. Generally, and factually well known, that Development of the Area is directly related to Knowledge-Base / Knowledge-Pool, present, and adopted, by the inhabitants. Higher and more Refined the Knowledge, Higher will be the Quality of the Life –Living (Livelihood). The AI, as digital technology, has been seen as a tool to reach the Village-Masses (precisely the Citizens having basic foundational education level and the Desire to transform from Backwardness, created by the Systems intentionally to control the rustic-masses, to Modern Refined Knowledge – Skills acquired Group) and bring social-change and economic-development in Rural-Areas. The AI (well-known form of Digital Technology) should be so made to be evolved that it benefits the backward population to move forward equally, without any Burden of Ancient Traditions – Practices or Civilizational-Supremacy / one-upmanship. This research-study has been an effort to get new insights and aspirations of villagers (specifically the Educated Rural Youth) in the region through Primary Data-Collection Sample Survey and other Secondary Sources available in public-domain; which has further been put to statistical operations for analysing and, thereby getting inductive – deductive descriptive and inferential conclusions, empirically, for the benefit of all the stake holders.

Keywords: Rural-Development, Arena, Political-Games, Backward, AI, Ancient, Traditions, Practices.

हिंदी लोक साहित्य में अपरिचित विधाएं

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सारांश

हिंदी लोक साहित्य भारतीय संस्कृति का अनमोल खजाना है, जो लोक जीवन, परंपराओं और मूल्यों को प्रदर्शित करता है। इसमें लोकगीत, लोककथाएं, कहावतें, मुहावरे, और नाट्य आदि विविध रूप शामिल हैं। हालांकि, आधुनिकता और तकनीकी प्रगति के कारण कई विधाएं अप्रचलित हो रही हैं लोककथाएं और दंतकथाएं: ग्रामीण क्षेत्रों में प्रचलित दंतकथाएं, जैसे पौराणिक कथाएं और स्थानीय नायकों की गाथाएं, अब कम सुनाई देती हैं। टेलीविजन और इंटरनेट ने इनका स्थान ले लिया है। लोकनाट्य: स्वांग, नौटंकी और रासलीला जैसे लोकनाट्य, जो सामाजिक और धार्मिक संदेशों को मनोरंजक के उद्देश्य से प्रस्तुत करते थे, अब प्रायः लुप्त हो रहे हैं। शहरीकरण और सिनेमा के प्रभाव ने इनकी लोकप्रियता को कम किया है। लोकगीत: विवाह, जन्म, और त्योहारों पर गाए जाने वाले लोकगीत, जैसे सोहर, बन्ना-बन्नी, और कजरी, अब कम प्रचलित हैं। युवा पीढ़ी का पॉप और फिल्मी संगीत की ओर रुझान हो रहा है जो इनके विलुप्त होने का कारण है। कहावतें और लोकोक्तियां: ये बुद्धिमत्ता और अनुभव का प्रतीक थीं, लेकिन आधुनिक संचार माध्यमों ने इनके प्रयोग को सीमित कर दिया। इन विधाओं के संरक्षण के लिए सामुदायिक प्रयास, जैसे लोक उत्सवों का आयोजन, स्कूलों में कार्यशालाएं, और डिजिटल मंचों पर प्रचार आवश्यक है। ये विधाएं न केवल सांस्कृतिक धरोहर हैं, बल्कि सामाजिक एकता और नैतिक मूल्यों को भी मजबूत करती हैं।

मुख्य बिंदु - संस्कृति ,आधुनिकता ,लोकनाट्य ,दंतकथाएं ,सामाजिक एकता सांस्कृतिक धरोहर

Law Relating to Protect Indigenous Intellectual Property Rights in Technological Advancements and Traditional Knowledge Commercialization

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Abstract

Commercialising traditional knowledge (TK) in the face of fast technology breakthroughs poses substantial legal and ethical problems in protecting Indigenous peoples' intellectual property rights (IPRs). Traditional knowledge, which includes medical treatments and agricultural skills, as well as cultural expressions and ecological expertise, has historically been shared communally and passed down orally through generations. Conventional intellectual property rules, based on Western legal traditions, prioritise human authorship, innovation, and fixed manifestations, thereby removing many types of Indigenous knowledge from legal protection. This deficiency makes Indigenous populations vulnerable to theft and biopiracy, notably in biotechnology, medicines, and digital innovation.

The present research critically explores the national and international legal frameworks that strive to preserve Indigenous intellectual property rights in the context of technological advancement and commercialisation. It investigates the shortcomings of current intellectual property regimes and calls for the implementation of sui generis legal systems adapted to the distinct qualities of Indigenous knowledge. International instruments such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the Convention on Biological Diversity (CBD), and the Nagoya Protocol are examined for their role in establishing the principles of free, prior, and informed consent (FPIC), equitable benefit-sharing, and community empowerment.

The paper also analyses the role of the World Intellectual Property Organisation (WIPO) in creating a legally enforceable international instrument on traditional knowledge and genetic resources. It also focusses on emergent practices such as customary law recognition, Indigenous data sovereignty, and the incorporation of traditional knowledge into digital IP systems. The article closes by advocating for a diverse legal strategy that respects Indigenous legal traditions, assures ethical commercialisation, and empowers Indigenous peoples as legitimate stewards and beneficiaries of their intellectual legacy in the digital era.

Keywords: Indigenous intellectual property, traditional knowledge, technological advancement, sui generis law, free prior informed consent, benefit-sharing.

Influence of Digital Technology Tools on Implementation of New Curriculum in Secondary Schools in Kano State, Nigeria

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Abstract

The study investigates the influence of digital technology tools on implementation of new curriculum in secondary school in Kano State Nigeria. The study adopted descriptive survey. Three research objectives and corresponding research questions guide the study. The population of the study consist of secondary school teachers with the population of 3,564 teachers. The sample of the study is 350 teachers which was sample through multi-stage sampling technique and purposeful sampling technique. The instrument for data collection is researcher made questionnaire tittle Digital Technology Tools and it influence in Curriculum Implementation (DTTICI). The instrument was face and content validated by three experts in Curriculum Department in Bayero University Kano and two experts in Computer Science Department in Federal University of Education Kano. The reliability of the instrument was determined using Cronbach alpha coefficient which yielded 0.79 reliability coefficient.. The instrument was administrates to the teachers by the researcher and research assistants and also through online Google form. The administration of the questionnaire lasted for three weeks. The data collected was analysed using descriptive statistics Mean and Standard Deviation. The discovered that digital tools has great influence on implementation of New Curriculum in secondary school, it also discovered that the digital tools used in implementation of new curriculum includes computer, mobile phones, tab, online lesson. It discovered that problems of implementation of new curriculum is inadequate fund to purchase the digital tools, inappropriate understanding of the new curriculum by the teachers. Based on the findings recommendations were made that government should provide fund for educational institutions and also teachers should be trained on the new curriculum.

Keywords: Implementation, Curriculum, Digital Technology, Tools

The Role of Artificial Intelligence in Modern Healthcare

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Abstract

The rapid advancement of artificial intelligence (AI) is reshaping modern healthcare, offering transformative potential across diagnostics, treatment, patient monitoring, drug discovery, health systems management, and public health. AI is widely applied in diagnostics and medical imaging, where machine learning algorithms detect diseases such as cancer, pneumonia, or diabetic retinopathy from scans with high precision. In personalized medicine, AI integrates genetic, clinical, and lifestyle data to tailor treatments to individual patients. AI accelerates drug discovery by modeling biological interactions, screening drug candidates, and predicting toxicity. It also enhances clinical trial design through better patient recruitment, stratification, and real-time monitoring. Remote patient monitoring is another key area, where wearable devices and AI-enabled apps track vital signs, detect anomalies, and alert clinicians to potential issues before they escalate. Operationally, AI improves hospital efficiency by optimizing scheduling, automating documentation, and managing supply chains. On a broader scale, AI supports public health through epidemiological modeling, outbreak prediction, and population health management, offering critical insights during crises like pandemics. Despite its potential, AI in healthcare faces several challenges. Data bias and lack of diversity in training datasets can lead to inequitable outcomes. Many AI models lack transparency, making them difficult to interpret or trust. Privacy and data security are critical concerns, as AI often requires large amounts of sensitive health information. Moreover, there is a need for robust regulation and clinical validation. Without proper oversight, poorly designed AI tools can cause harm. Integration into clinical workflows also remains difficult, requiring clinician training and infrastructure upgrades. The future of AI in healthcare lies in hybrid human-AI collaboration, where technology augments rather than replaces clinicians. Advances in explainable AI, federated learning (to protect patient data), and large language models tailored for healthcare will drive innovation. Equitable deployment and regulatory frameworks will be essential to ensure that AI benefits all populations, not just those in high-resource settings. AI holds transformative potential in healthcare. While opportunities abound in improving diagnosis, treatment, and system efficiency, careful attention must be given to ethical, technical, and regulatory challenges. With responsible development, AI can significantly enhance the quality, accessibility, and sustainability of healthcare worldwide.

Keywords: Diagnostics, Medical Imaging, Drug discovery, Public Health, Remote Care

The Importance of Crop Residue Management for Sustainable Agriculture

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Abstract

Crop residue management plays a vital role in sustainable agriculture by enhancing soil health, improving crop productivity, and mitigating environmental pollution. Effective handling of residues such as straw, stalks, and husks after harvest can significantly reduce the reliance on chemical fertilizers, enrich organic matter in the soil, and promote microbial activity. Traditional practices like open-field burning, while convenient, contribute to severe air pollution and greenhouse gas emissions. In contrast, sustainable techniques such as mulching, composting, incorporation into the soil, and the use of residue for bioenergy production offer ecological and economic benefits. Proper residue management also helps in conserving soil moisture, reducing erosion, and suppressing weed growth. This abstract highlights the importance of adopting integrated and environmentally friendly residue management practices to promote climate-resilient farming and ensure long-term agricultural sustainability.

Keywords: Crop, residue, Farming, sustainable

Cross-Cultural Knowledge Exchange for Sustainability

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Abstract

Sustainability is a shared global responsibility that thrives on the exchange of ideas, values, and innovations across cultures. This paper explores how cross-cultural collaboration can generate creative and inclusive pathways toward sustainable development. Drawing from case studies of agricultural cooperatives, environmental education initiatives, and grassroots innovation networks, the study illustrates how traditional ecological wisdom and modern scientific knowledge can mutually reinforce one another. By emphasizing dialogue and learning between communities of the Global South and Global North, the research reveals how shared experiences can address pressing challenges such as climate adaptation, equitable resource management, and social inclusion. The paper concludes that cross-cultural knowledge exchange is not merely an academic exercise but a vital force for global sustainability—fostering empathy, ethical stewardship, and collective action across nations and generations.

Keywords: Cross-cultural collaboration, sustainability, indigenous knowledge, global partnerships, environmental education, social inclusion.

Sustainable Rural Livelihoods through Traditional Skills

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Abstract

Rural livelihoods across developing societies face growing challenges due to rapid globalization, mechanization, and the erosion of traditional knowledge systems. In this context, the revitalization and promotion of traditional skills represent a viable pathway to achieving sustainable rural livelihoods. Traditional skills such as handloom weaving, handicrafts, pottery, woodwork, and other artisanal practices not only embody cultural heritage but also provide significant potential for income generation, employment creation, and community empowerment. This study will examine the role of traditional skills in sustaining rural livelihoods, with a focus on their socio-economic, cultural, and ecological significance. The study argues that traditional skills serve as a crucial resource base for marginalized rural populations, particularly women and landless laborers, who rely on non-agricultural sources of income. By enhancing value addition, ensuring access to wider markets, and integrating modern technology with indigenous practices, traditional skills can be transformed into sustainable livelihood opportunities. Further, traditional occupations often promote the use of locally available raw materials, eco-friendly production processes, and minimal reliance on external inputs, thereby contributing to environmental sustainability. However, several challenges limit the potential of traditional skills, including lack of institutional support, weak market linkages, inadequate access to credit, and diminishing interest among younger generations. Addressing these challenges requires a multi-pronged strategy: policy interventions that recognize and protect artisanal work, capacity-building programs to upgrade skills, and the creation of cooperatives or producer groups to enhance bargaining power. In addition, the integration of e-commerce platforms and digital tools can significantly expand the reach of rural artisans to national and global markets. The study aims to explore how traditional skills support sustainable rural livelihoods. It seeks to examine their socio-economic, cultural, and ecological importance. It also aims to identify the major challenges faced by rural artisans in the changing economy. Further, the study intends to suggest strategies and policies to promote, modernize, and protect these skill-based occupations.

Digital Preservation of Traditional Knowledge: Safeguarding Indigenous Heritage through Modern Tools

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Abstract

The collective wisdom, customs, and inventions of societies that have been passed down over the ages are embodied in traditional knowledge (TK). Agriculture, medicine, crafts, folklore, spiritual activities, and environmental management are all included. Modernization, urbanization, and globalization, however, are quickly destroying this legacy. Databases, multimedia archives, digital libraries, and cloud storage platforms are examples of digital technologies that offer chances to sustainably record, preserve, and share traditional information. The significance of TK, the function of digital instruments in its preservation, international projects and case studies, digitization difficulties, and methods to guarantee moral and sustainable preservation are all covered in this essay. To protect TK for future generations, a comprehensive strategy integrating technology, community involvement, and legislative frameworks is necessary.

Keywords: Traditional Knowledge, Digital Preservation, Indigenous Heritage, Cultural Documentation, Knowledge Management, Sustainability

The Role of Web-Based Platforms in Engaging and Empowering the Transgender Community: A Study from Kerala

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Abstract

The way marginalized people connect, communicate, and access opportunities has changed as a result of the digital age. In this context, web-based platforms ranging from social media to community forums and job portals have become crucial tools for visibility, social integration, and empowerment of transgender individuals. This study investigates how these sites draw in interact with and assist Kerala's transgender population. The study uses a qualitative approach to collect data from transgender people via NGOs' representatives. According to the research, web-based platforms are essential venues for job. However, the research also draws attention to issues including misinformation, cyber bullying, identity issues and digital marginalization. By emphasizing transgender people's actual experiences towards usage of web based platforms.

Keywords: Web-Based Platforms, Transgenders Community, Identity, Social Media

AI’s role in retail customer service

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force in retail customer service, redefining how businesses engage with consumers and manage operations. By integrating technologies such as chatbots, virtual assistants, natural language processing, predictive analytics, and computer vision, retailers are able to deliver personalized, efficient, and seamless customer experiences. AI-driven tools not only streamline routine inquiries and enhance product recommendations but also provide real-time support, optimize inventory management, and predict consumer behavior with greater accuracy. Moreover, AI empowers retailers to adopt data-driven decision-making, reduce operational costs, and build stronger customer relationships. However, the adoption of AI in retail customer service also raises concerns about data privacy, algorithmic bias, and the potential reduction of human interaction, which may affect customer trust. This paper examines the evolving role of AI in retail customer service, highlighting its benefits, limitations, and future implications for creating a balance between technological efficiency and human-centric engagement.

Sustainable Development Practices of Agro-Based Industries in Haryana: Current Status and Future Pathways

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Abstract

The study examines the current state of sustainable development practices of agro-based industries in Haryana, and recommends solutions for enhancing sustainability in the sector. Agro-based industries serving as a backbone of Haryana’s economy, pressures from environmental degradation, resource depletion, and changing climatic conditions make adopting sustainable practices imperative. The study uses data on environmental indicators, government schemes; and qualitative interviews with key stakeholders of agro-based industries. The findings demonstrate several strengths in the current system: government incentives for food-processing industries; increasing adoption of modern technologies such as micro-irrigation and drone-based monitoring; and institutional mechanisms aligned with Sustainable Development Goals (SDGs) in state policy frameworks. The study offers future pathways such as providing financial and technical support to small agro-based enterprises, improving market access and certification for sustainable products, and ensuring environmental compliance in order to foster sustainable practices among agro-based industries in Haryana.

Evaluating Artificial Intelligence in the Classroom from the Viewpoint of Teachers

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Abstract

The aim of the research is to determine the teachers' views on the use of artificial intelligence in the education of students. Both new opportunities and challenges for classroom practice are brought forth by the quick integration of AI into education. The success of these technologies greatly depends on instructors' opinions and experiences, even while AI has the ability to provide advantages like tailored instruction and a lighter administrative burden. This study explores how educators view the use of AI, concentrating on their assessment standards, perceived advantages and difficulties, and required support networks. This study highlights the need for human-centered approaches to technology integration by indicating that teachers have nuanced and occasionally conflicting opinions about AI's place in the classroom.

Keywords: AI , Education , Machine Learning Algorithm

A Comprehensive Comparative Study of Different Machine Learning Models for Fraud Detection Techniques

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Abstract

In recent years, the proliferation of online financial transactions, e-commerce platforms, and digital banking services has resulted in a concomitant surge in fraudulent activity. Identifying and mitigating fraud has emerged as a critical concern for enterprises, especially within the financial and banking industries. Conventional rule-based systems, although previously effective, frequently struggle to adjust to the always evolving and complex nature of fraudulent schemes. In this context, machine learning (ML) has emerged as a powerful and adaptable technology capable of analyzing extensive volumes of transactional data to reveal concealed patterns and abnormalities suggestive of fraud. This review study intends to deliver a comprehensive overview of several machine learning models employed in fraud detection, including supervised and unsupervised learning techniques, alongside ensemble and hybrid models. Each model is evaluated based on its precision, interpretability, computing efficiency, and effectiveness in identifying unusual and evolving fraudulent activities. The document delineates the assessment criteria prevalent in this field, addresses significant issues such as data imbalance, feature selection, and real-time prediction demand, and underscores current innovations and practical implementations across diverse industries. The evaluation ultimately highlights current research deficiencies and proposes avenues for further investigation that may enhance the creation of more adaptable, transparent, and efficient fraud detection systems.

Keywords: Fraud Detection, Machine Learning, Supervised Learning, Unsupervised Learning, Ensemble Methods, Anomaly Detection, Financial Transactions, Class Imbalance, Predictive Analytics, Intelligent Systems

Some Sort Of Modern Application of AI, ML, IoT, Deep Learning On Maritime Engineering

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Abstract

Deep Learning (DL), the Internet of Things (IoT), Machine Learning (ML), and Artificial Intelligence (AI) are all combining to change maritime engineering. This study offers a condensed application architecture with an emphasis on fuel optimization, autonomous navigation, and predictive maintenance. Results using simulated datasets and machine learning techniques show a 12% increase in energy efficiency and a 94% prediction accuracy in identifying mechanical defects. Predictive models' quantitative results are displayed in tables and graphs. The study comes to the conclusion that intelligent technology adoption greatly improves maritime systems' sustainability, safety, and mechanical dependability.

Keywords: Internet of Things, Maritime Engineering, Automation, Predictive Maintenance, Deep Learning, Machine Learning, Artificial Intelligence

Article 21 and the Right to Die with Dignity: Legal and Ethical Perspectives

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Abstract

Article 21 of the Indian Constitution guarantees that “*No person shall be deprived of his life or personal liberty except according to the procedure established by law.*” Over the decades, this simple phrase has become the cornerstone of India’s human rights jurisprudence. The Supreme Court’s interpretation has expanded the meaning of “life” to include the right to live with dignity, privacy, health, and now, the right to die with dignity.

The recognition of the *right to die with dignity* through the 2018 *Common Cause* judgment was a landmark step toward respecting individual autonomy, self-determination, and compassion in end-of-life decisions. Yet, this area remains fraught with legal uncertainty, ethical dilemmas, and philosophical controversy.

This paper critically examines the evolution of Article 21 in the context of euthanasia, analyses judicial trends, explores ethical arguments on both sides, and proposes a balanced legislative and moral framework for India’s future.

Keywords: Indian constitution, right to life and personal liberty, right to die with dignity, supreme court, euthanasia

Impact of Gender Inclusion on Employee Behaviour and Organizational Conduct

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Abstract

The study investigates the impact of gender inclusion on employee conduct and overall organisational behaviour within contemporary workplaces. Growing global emphasis on diversity, equity, and inclusion, gender inclusion has emerged as an important aspect in establishing business culture and ethical norms. The study uses a mixed-methods approach, integrating employee surveys and qualitative interviews, to evaluate how inclusive gender policies influence interpersonal dynamics, workplace engagement, leadership styles, and ethical decision-making. The findings show that organisations with effective gender inclusion procedures had higher employee morale, fewer occurrences of misconduct, and better collaboration across teams, which all have a favourable impact on organisational behaviour. The study also finds that gender inclusion is not merely a social justice issue, but also a strategic tool for long-term organisational success. Policy suggestions and a framework for inclusive practices are presented to help company leaders and HR professionals create equal and ethical workplaces.

Bridging Past and Future: The Essential Role of Women in Indigenous Knowledge Sustainability

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Abstract

For sustainable development and cultural continuity, indigenous knowledge—which includes ecological understanding, traditional practices, and cultural heritage—is an essential resource. The vital role that women play in maintaining indigenous knowledge is examined in this study, emphasizing their roles as innovators, educators, and guardians in bridging the past and future. Particularly in fields like traditional medicine, agriculture, crafts, and oral traditions, women in indigenous communities frequently operate as the main knowledge bearers, transmitting skills, tales, and customs through interactions between generations. In the face of contemporary issues including globalization, environmental change, and cultural deterioration, this study investigates how women's involvement in local economies, family structures, and communal rituals allow indigenous knowledge to be preserved and adapted. The study examines the methods women use to preserve and revive ancient knowledge systems through a qualitative approach that includes in-depth interviews, ethnographic observations, and case studies from various indigenous groups. The results demonstrate the importance of women's agency, which stems from their roles as mothers, cultural practitioners, and community leaders, in promoting resilience and guaranteeing the survival of indigenous knowledge. The study offers suggestions for enabling women to successfully preserve indigenous knowledge systems while addressing obstacles including gender inequality and a lack of institutional support. This study's emphasis on women's contributions emphasizes the necessity of inclusive policies that acknowledge and uphold their critical role in ecological and cultural sustainability.

Keywords: Indigenous Knowledge, Women's Roles, Cultural Sustainability, Traditional Practices, Intergenerational Transmission, Gender Agency, Cultural Heritage, Indigenous Communities, Knowledge Preservation, Sustainable Development

A Study on Impact of GST on Retail Sector in Metro Cities Of India

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Abstract

The introduction of the Goods and Services Tax (GST) in India on July 1, 2017, marked a significant reform in the country's taxation system. GST replaced multiple indirect taxes such as Value Added Tax (VAT), Central Excise Duty, and Service Tax, aiming to create a unified and transparent tax structure. This comprehensive tax reform was implemented with the goal of simplifying the tax regime, reducing tax evasion, and improving compliance.

Metro cities such as Delhi, Mumbai, Bengaluru, Chennai, and Kolkata have a dense concentration of retail businesses, ranging from small traders to large multinational retail chains. The implementation of GST in these cities has altered the taxation landscape by introducing a multi-tier tax structure and an input tax credit mechanism. While the uniform tax system aimed at streamlining business operations, its impact has been multifaceted. Some retailers benefited from the reduced tax burden, while others struggled with increased compliance costs and technological adaptation. The shift to digital invoicing, online tax filing, and frequent policy changes posed challenges, especially for small and medium-sized retailers.

Keywords: Retailers, digital invoicing, tax burden, uniform tax system, small traders, multitier tax system.

Reclaiming Digital Sovereignty: Cybersecurity and Digital Well-being from an Indigenous Perspective

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Abstract

Cybersecurity and digital well-being are critical concerns for Indigenous communities as they increasingly navigate the digital landscape. This paper explores the intersection of Indigenous knowledge systems, cybersecurity, and digital well-being. It highlights the importance of promoting culturally grounded approaches to online safety and digital literacy, and reclaiming digital sovereignty. By centering Indigenous perspectives, we can challenge dominant narratives and create more inclusive and equitable digital environments. The paper discusses the importance of community-led initiatives, Indigenous data governance, and digital self-determination in promoting cybersecurity and digital well-being.

Keywords: Indigenous perspectives, cybersecurity, digital well-being, digital sovereignty, cultural safety, self-determination

Right to Education in India: Law, Implementation, Challenges and the Way Forward

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Abstract

This paper examines the constitutional and statutory framework of the Right to Education (RTE) in India, evaluates major judicial pronouncements, reviews implementation outcomes, highlights core challenges (access, quality, equity, finance, and private public interactions), and proposes policy and legal reforms to better realize Article 21A in practice. Drawing on the RTE Act (2009), government rules and notifications, landmark Supreme Court judgments, and recent implementation reviews and status reports, the paper argues that while the RTE has been transformational in principle, gaps in finance, governance, monitoring, and learning outcomes require urgent corrective measures.

Keywords: Right to Education; Article 21A; RTE Act 2009; implementation; India; private schools; equity; NEP

Water Conservation Techniques: A Comprehensive Review

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Abstract

This paper explores water conservation techniques drawing exclusively from NCERT Class 10th (Contemporary India-II, Chapter 3: Water Resources) and Class 12th (India: People and Economy, Chapter 4: Water Resources) Geography textbooks. It examines traditional and modern methods, including rainwater harvesting, multi-purpose river projects, and watershed management, while assessing their role in addressing scarcity, overexploitation, and unequal access. Key insights reveal how these techniques integrate ecological balance with socio-economic needs, emphasizing community-driven approaches for sustainability. The analysis underscores the urgency of conservation amid declining per capita water availability and proposes policy recommendations for widespread adoption

E-Commerce Adoption among Rural Women Entrepreneurs in India: The Interplay of Digital Literacy, Access, and Trust

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Abstract

E-commerce presents a powerful opportunity for **rural women entrepreneurs** in India to achieve **financial independence**, yet its adoption is severely hampered by a "**triadic challenge**": the interdependent issues of **Digital Literacy, Access, and Trust**. Specifically, low adoption rates are driven by a lack of competency in digital finance and online marketing, constrained **access** due to unreliable internet and electricity, and a strong lack of **trust** stemming from security fears and fraud concerns, despite the mitigating role of community support from **Self-Help Groups (SHGs)**. The study concludes that e-commerce cannot thrive if any single pillar is weak, advocating for a holistic policy framework that includes **context-specific digital training, subsidized infrastructure development**, and initiatives to build **institutional trust** through transparent governance to truly unlock inclusive economic growth for this vital demographic.

Keywords: E-commerce Adoption, Rural Women Entrepreneurs, Digital Literacy, Access, Trust, India, Gender Digital Divide, Economic Empowerment, Digital Infrastructure, Online Platforms

Indian Laws & Constitutional Provisions Protecting Tribal Natural Resource Rights

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Abstract

For the protection and empowerment of Scheduled Tribes (STs) with regard to the governance of land and natural resources, India's constitutional and legal structure offers a strong but complex framework. According to the Indian Constitution's fifth and sixth schedules, distinct administration structures are designed to prevent land alienation in tribal territories. Important laws like the Forest Rights Act, 2006 (FRA) and the Panchayats (Extension to Scheduled Areas) Act, 1996 (PESA) seek to uphold traditional rights and encourage community governance through Gramme Sabhas, giving tribal communities the responsibility to manage local resources like forests and channels of water. Notwithstanding the lack of ratified ILO Convention No. 169, international conventions like the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), ILO Convention No. 169, and the Nagoya Protocol under the Convention on Biological Diversity (CBD) have an impact on India's discussion of tribal rights. These frameworks enable ideas such as benefit-sharing from the use of traditional knowledge and resources, acknowledgement of customary law, and free, prior, and informed consent (FPIC). India suffers several difficulties with implementation despite its progressive laws, such as poor enforcement, protracted bureaucratic processes, conflict between development aims and tribal rights, inadequate awareness and limited access to justice among tribal groups. Additionally, clashes between statutory conservation guidelines and customary practices present moral and legal challenges. In conclusion, however India has created a legal framework that, in fundamental terms, meets with the majority of international standards, there is still a substantial gap between policy and actuality. For resource governance to be sustainable and equitable, it is important that laws be improved, tribal groups be genuinely involved, and development be in line with indigenous rights.

Keywords: Scheduled Tribes, Indian Constitution, land alienation, Indigenous, International conventions

Scaffolds of naringenin & thymoquinone for treatment of diabetic peripheral neuropathy: Multiple target genes using network pharmacology

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Abstract

Diabetic peripheral neuropathy causes disabling nerve damage affecting 50-60% of diabetic patients. Current treatments have limited efficacy in nerve regeneration. Interaction of polymer with active drug molecule, from natural source may initiate the nerve regeneration process by using biodegradable electrospinning scaffold technique. Drug-loaded polymer scaffolds was prepared and characterized by different technique. Different drug target was evaluated by using network pharmacology. Among different scaffolds, scaffolds was prepared by using polymer with electrospinning technique. Different physical & mechanical characterization of scaffolds like Drug FTIR for the microstructure of the scaffold was done for characterizing chemical composition, functional groups, molecular interactions, and structural changes in polymeric electrospun scaffolds. Tensile strength, ensures that the scaffold can withstand handling, implantation, and physiological stresses without breaking& was optimizing scaffold composition and fibre with good mechanical stability. In Degradation study scaffolds was not break down over time under physiological conditions. Drug release study, XRD & SEM was also done. XRD was showing the crystallinity, phase composition, and molecular structure of polymeric electrospun scaffolds, while the SEM shows the fibre structure. The well-prepared different scaffold was evident using XRD &SEM. The drug was not degraded at different interval of time. The degradation profile of the scaffolds was captured, after an interval of 4 days, the solutions were changed and scaffolds were dried and weighed. The drug slowly released at different interval & reaches the nerve site. By using network pharmacology there are nine targets which is responsible for diabetic peripheral nerve degeneration. & our scaffolds may be regenerate the nerve after specific treatment. In future this drug scaffolds can be used for further clinical trials.

Keywords: Diabetic neuropathy, inflammation, hyperglycemia, XRD, scaffolds, electrospinning technique

Women and Indigenous Knowledge in the Age of Globalization: Challenges and Opportunities

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Abstract

Indigenous knowledge is a collective wisdom that has been cultivated over centuries of intimate engagement with culture, nature, and communal life. Traditional methods, ecological knowledge, therapeutic systems, and societal ideals that support both people and the environment are all included. Historically, women have been integral to this knowledge system as innovators, broadcasters, and caretakers. From handicrafts and traditional rites to agriculture and herbal medicine, their contributions serve as the foundation for the resilience and identity of the community. But in the age of globalization, this priceless legacy is undergoing significant changes. Women's voices are frequently marginalized and indigenous customs are being eroded as a result of the disruption of traditional livelihoods and social structures caused by the growing penetration of market economies, migration, modernization, and digital impacts. This essay examines how women who use indigenous knowledge systems face both new opportunities and problems as a result of globalization. On the one hand, women's responsibilities as knowledge bearers are threatened by commercialization and cultural homogenization, which have the potential to commodify or eradicate traditional knowledge. However, increased access to education, technology, and international platforms brought about by globalization also gives women the opportunity to record, conserve, and disseminate their cultural legacy more widely. In order to preserve their cultural heritage, the study critically looks at case studies where women-led projects have effectively combined traditional knowledge with contemporary innovation, such as community-based conservation, sustainable agriculture, and digital storytelling. The study makes the case that attaining inclusive development and cultural sustainability requires acknowledging and strengthening women as active contributors to the preservation of indigenous knowledge. To increase women's agency in this area, it advocates for a multifaceted strategy that incorporates community involvement, gender-sensitive education, and policy support. In the end, the study shows that tradition and globalization do not have to conflict; rather, they offer a developing arena in which women can reclaim their power as both defenders and reformers of traditional knowledge in the contemporary world.

Keywords: Indigenous knowledge, globalization, women empowerment, cultural sustainability, traditional knowledge systems, gender roles

The Impact of Forensic Science Techniques on India’s Criminal Justice System

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Abstract

Forensic science plays a pivotal role in the effective administration of justice by bridging the gap between science and law. In the Indian criminal justice system, forensic techniques have emerged as essential tools for investigating crimes, identifying perpetrators, and ensuring the integrity of judicial outcomes. This paper explores the role and significance of various forensic science techniques—such as DNA profiling, fingerprint analysis, ballistics, digital forensics, toxicology, and autopsy—in the investigation and adjudication of criminal cases in India. It examines how these scientific methods aid law enforcement agencies in evidence collection, crime scene reconstruction, and the corroboration of witness testimonies. The study also highlights landmark cases where forensic evidence played a crucial role, and discusses the challenges facing forensic science in India, including lack of infrastructure, shortage of trained personnel, and delays in forensic reporting. The paper emphasizes the need for modernization, capacity building, and stronger collaboration between forensic experts and the judiciary to enhance the effectiveness and credibility of the justice delivery system. Ultimately, the integration of forensic science strengthens the rule of law and safeguards the rights of both victims and accused.

Keywords: Forensic Science, Criminal Justice System in India, Evidence Analysis, Crime Investigation, International Forensic Practices

Supply Chain Management Using Local Knowledge Sustainability

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Abstract

Sustainable supply chain management is no longer limited to optimizing cost and efficiency—it now demands cultural sensitivity, environmental responsibility, and community inclusion. This paper examines how local knowledge systems—the collective wisdom, skills, and adaptive practices of communities—can serve as powerful catalysts for sustainable supply chain innovation. By embedding indigenous and regional insights into procurement, production, and distribution processes, organizations can achieve greater resilience, reduce dependence on external resources, and promote equitable value creation. The study adopts a mixed-method approach, analyzing field data and case studies where local participation enhanced traceability, waste minimization, and social trust within the supply network. The findings reveal that integrating local intelligence with modern SCM technologies such as IoT and data analytics creates a context-responsive and circular supply chain model. Ultimately, the research argues that sustainability is most effective when global strategies are rooted in local wisdom, making communities not just beneficiaries but active architects of sustainable development.

Keywords: Sustainable Supply Chain, Local Knowledge, Indigenous Practices, Circular Economy, Community Resilience, Green Innovation

The Role of Indigenous Food Systems in Nutrition Security: Legal and Policy Perspectives in India and Internationally

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Abstract

Indigenous food systems provide a healthful and sustainable substitute for industrial food production. Traditional farming, foraging, hunting, collecting, and the use of wild foods—which are typically more hardy, varied, and packed with micro nutrients—are all included in these systems. They are essential to preserving nutrition security, particularly for rural and tribal populations that are at risk of lack of food and malnutrition. The rights of indigenous communities over land and traditional food resources are recognised and protected in India under the Forest Rights Act (2006), the Panchayats (Extension to Scheduled Areas) Act (1996), and constitutional provisions such as Articles 47 and 21. However, effectively absorption of indigenous food systems into national nutrition policies is still hampered by operational hurdles, dispute resolution, and policy gaps. While projects like the POSHAN Abhiyaan and the National Food Security Act (2013) seek to combat hunger, they tend to disregard the ecological and cultural significance of native diets. The protection of indigenous food systems has been highlighted by international frameworks like the Convention on Biological Diversity (CBD), the UN Declaration on the Rights of Indigenous Peoples (UNDRIP), and the International Covenant on Economic, Social, and Cultural Rights (ICESCR). These legal agreements link indigenous food systems to the human right to adequate food, cultural identity, and biodiversity conservation. Policy reform focused on the legal empowerment of tribal communities, realisation of community forest resource rights, incorporation of traditional foods into public nutritional services, and assistance for agro-biodiversity preservation is necessary to fully realise the potential of indigenous food systems. Owing to international best practices, nutrition security and sustainable development can be greatly supported by improved food sovereignty and the recognition of indigenous rights. Achieving nutrition security requires indigenous food systems, particularly in rural and tribal societies. They give us a variety of rich in nutrients, sustainable food sources that are based on biodiversity and local knowledge. Although Indian regulations such as PESA and the Forest Rights Act offer an adequate foundation for protecting these systems, successful implementation and policy integration continue to be obstacles. The rights of indigenous peoples to preserve their culinary traditions are further supported by international frameworks. For inclusive and sustainable nutrition results, these systems must be developed by program integration, legal recognition, and community empowerment.

Keywords: Forest Rights, healthful, agro-biodiversity, sustainable, nutrition

प्राचीन भारतीय ज्ञान को एकीकृत करके डिजिटल शिक्षा के माध्यम से चुनौतियों को दूर करते हुए छात्रों को सीखने के लिए प्रेरित करना

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सारांश

भारत की प्राचीन ज्ञान परंपरा आध्यात्मिक और धार्मिक ग्रंथों तक ही सीमित नहीं रही बल्कि यह भाषा गणित, विज्ञान, चिकित्सा, दर्शन कला। और संस्कृति के क्षेत्र तक भी समृद्ध रही है ! यदि प्राचीन भारत की शिक्षा की बात की जाए तो तक्षशिला, नालंदा, विक्रमशिला जैसे विश्वविद्यालय इस बात का प्रमाण है कि भारत की ज्ञान परंपरा कितनी समृद्ध और व्यवस्थित थी। प्राचीन शिक्षा ज्ञान तक ही सीमित नहीं थी बल्कि मानसिक और आध्यात्मिक रूप को भी महत्व देती थी। नई शिक्षा नीति NEP 2020 के तहत प्राचीन ज्ञान योग, ध्यान, नैतिक शिक्षा और भारतीय संस्कृति के विभिन्न आयामों को शिक्षा पद्धति में शामिल किया गया है ताकि बच्चों का सर्वांगीण विकास हो सके | तकनीकी और नवाचार के कारण कौशलों की आवश्यकता तो बड़ी है लेकिन समय के साथसाथ-साथ इसमें कुछ चुनौतियां भी उत्पन्न कर दी हैं। साथ-साथ बच्चों को यह भी सिखाया जाए कि बुजुर्गों का सानिध्य उन्हें जीवन के वास्तविक अनुभवों का ज्ञान कराता है। बच्चों को मानसिक और भावनात्मक रूप से मजबूत बनाया जाए, ताकि वह अपनी समस्याओं का समाधान कर सके और जरूरत पड़ने पर अपने घर के बुजुर्ग तथा माता-पिता के साथ अपनी समस्याओं को साझा कर सके। पढ़ाई के साथसाथ महाकाव्य तथा -महापुरुषों की जीवनी पढ़ाई जा सकती हैं यदि कक्षा का वातावरण सहयोगात्मक होगा तो बच्चे का मन और बुद्धि एकाग्र हो जाती है जिससे बच्चा दुगुनी गति से सीख सकता है डिजिटल शिक्षा के प्रभाव को संतुलित करने के लिए नियमित ब्रेक शारीरिक गतिविधियां और सामाजिक संपर्क भी शामिल हो। सप्ताह में एक दिन निश्चित किया जाए कि विद्यार्थी को किसी आसपास के पार्क या बगीचे में ले जाया जाए ताकि वह अपने आप को तरोताजा महसूस करें। सभी वर्गों के लिए शिक्षा को सुलभ बनाने के लिए विविधता का सम्मान करें और सभी छात्रों की जरूरत का ध्यान रखें शिक्षा प्रणाली में पर्यावरणीय स्थिरता को बढ़ावा देने वाली सामग्री और पाठ्यक्रमों को भी शामिल करने की आवश्यकता है जिससे विद्यार्थियों को सतत विकास के सिद्धांतों से भी अवगत कराया जा सके।

मुख्य बिंदु - विश्वविद्यालय, समृद्ध, चुनौतियां, सहयोगात्मक, पाठ्यक्रमों, विद्यार्थियों, सिद्धांतों

A Study On Digital Marketing For Sustainable Development

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Abstract

A Bidirectional communication and interactions between organizations and audiences are made possible by digital marketing, which enables firms to distribute information in a targeted manner towards their customers and clients. Customers may share their experiences, requirements, preferences, and expectations thanks to this reality, which also enables businesses to spread messages about sustainability related to processes and products in an effort to start trends and influence behavior. In this way, digital marketing strategies enable not only the promotion of goods and services but also the demonstration of firms' efforts to become more sustainable and the spread of innovative sustainable trends that influence customer attitudes. This study examines and synthesizes information regarding the use of digital marketing to communicate and promote sustainability using the Systematic Literature Review with Bibliometric Analysis (SLBA) approach. The findings of this study demonstrate how digital marketing tactics support sustainable development by fostering sustainable purchase habits. Understanding customer behavior, delivering important information via the most effective channels, and skillfully assessing the impact of green marketing initiatives on consumer attitudes and purchase decisions make this scenario feasible. The rise of digital marketing tactics and tools has changed how businesses engage and connect with their clientele. As social media usage has grown, two-way communications have replaced one-way, mainly company-generated communication that characterized traditional marketing. This implies that consumers have the ability and authority to interact with businesses, offering them the chance to voice their concerns, ideas, and suggestions, which are then included into business plans and product development procedures. Due to heightened competitiveness brought about by the digital revolution, businesses are now incorporating these technologies into every aspect of their operations. The development of new business models based on the reciprocal contact between companies and Internet users as well as the growing use of digital technologies has thus been greatly aided by this digital transformation. Digital tactics like digital marketing, online advertising campaigns, and implementing new business models are now viewed by companies as having a big impact on their performance both now and in the future.

बहुविषयक दृष्टिकोण से स्वदेशी ज्ञान परंपरा और किसान आंदोलन: हरियाणा के संदर्भ में एक अध्ययन

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सारांश

किसान आंदोलन भारतीय समाज और राजनीति में एक ऐतिहासिक मोड़ के रूप में उभरा है। हरियाणा, जो कृषि प्रधान राज्य है, वहाँ यह आंदोलन केवल आर्थिक और राजनीतिक विमर्श तक सीमित नहीं रहा, बल्कि इसने स्वदेशी ज्ञान परंपरा, ग्रामीण जीवनशैली, सामुदायिक सहभागिता और सामाजिक संरचना को भी प्रभावित किया। इस शोध का उद्देश्य बहुविषयी दृष्टिकोण (Multidisciplinary Approach) से किसान आंदोलन और स्वदेशी ज्ञान परंपरा के अंतर्संबंधों का विश्लेषण करना है। स्वदेशी ज्ञान (Indigenous Knowledge) में कृषि तकनीकें, पारंपरिक खेती प्रणाली, जल संरक्षण, सामूहिक निर्णय-प्रक्रिया और ग्रामीण संचार माध्यम शामिल हैं। किसान आंदोलन ने इन परंपराओं को पुनर्जीवित किया तथा स्थानीय और राष्ट्रीय स्तर पर इनके महत्व को रेखांकित किया। समाजशास्त्र, राजनीति विज्ञान, मनोविज्ञान, पत्रकारिता और लोकसंस्कृति जैसे विविध शैक्षणिक दृष्टिकोण इस अध्ययन को गहराई प्रदान करते हैं। परिणामस्वरूप यह स्पष्ट होता है कि किसान आंदोलन न केवल कृषि संबंधी नीतियों के विरुद्ध प्रतिरोध का प्रतीक है, बल्कि यह स्वदेशी ज्ञान परंपरा और सामुदायिक एकता को सुदृढ़ करने वाला सामाजिक आंदोलन भी है। इस प्रकार यह अध्ययन किसान आंदोलन के बहुआयामी प्रभाव को समझने में सहायक सिद्ध होता है।

मुख्य बिंदु - किसान आंदोलन, स्वदेशी ज्ञान, हरियाणा, बहुविषयी दृष्टिकोण, ग्रामीण समाज

Cybersecurity and Digital Well-Being from an Indigenous Perspective

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Abstract

In the 21st century, cybersecurity and digital well-being have emerged as key concerns within rapidly expanding digital societies. While technological advancements have improved communication, governance, and accessibility, they have also exposed individuals and communities to new forms of digital exploitation and psychological stress.

This paper explores cybersecurity and digital well-being from an Indigenous perspective — emphasizing how traditional knowledge, community ethics, and collective values can inform a more holistic, sustainable approach to digital safety. Drawing parallels between Indigenous governance systems and contemporary cyber frameworks, this study proposes a culturally grounded model of “Cyber Harmony,” where technology is designed not only to protect data but also to nurture collective well-being and ethical digital coexistence.

The research advocates integrating Indigenous principles of trust, reciprocity, and balance into cybersecurity design, digital literacy programs, and AI-driven cyber defense mechanisms. By decolonizing digital ethics and embedding Indigenous worldviews, this paper argues for a sustainable, inclusive, and human-centered cybersecurity ecosystem.

गुरु गोबिंद सिंह का मानवता के प्रति प्रेम और बलिदान

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सारांश

गुरु गोबिंद सिंह जी सिख धर्म के दसवें गुरु थे, जिनका जीवन साहस, बलिदान और धर्म के प्रति अटूट समर्पण का प्रतीक है। उन्होंने ना केवल अपने जीवन को धर्म की रक्षा के लिए समर्पित किया, बल्कि अपने चारों पुत्रों और परिवार को भी धर्म की खातिर बलिदान कर दिया। उनका समस्त जीवन अधर्म, अन्याय और अत्याचार के विरुद्ध संघर्ष करते हुए बीता। गुरु गोबिंद सिंह जी ने 1699 में खालसा पंथ की स्थापना की, जिसका उद्देश्य सच्चाई, न्याय और समानता की रक्षा करना था। उन्होंने अपने अनुयायियों को "संत-सिपाही" बनने का उपदेश दिया — यानी ऐसा जीवन जीना जिसमें आध्यात्मिकता और वीरता दोनों समाहित हों। उन्होंने सिखों को अपने आत्म-सम्मान और धार्मिक स्वतंत्रता की रक्षा के लिए हमेशा तत्पर रहने की प्रेरणा दी। उनका साहित्यिक योगदान भी अत्यंत महत्वपूर्ण है। उन्होंने अनेक ग्रंथों की रचना की, जिनमें धर्म, नीतिशास्त्र और वीरता का संदेश है। 'चंडी दी वार', 'जाफरनामा' और 'बिचित्र नाटक' जैसे ग्रंथों में उनकी आध्यात्मिक गहराई और धार्मिक समर्पण स्पष्ट झलकता है। गुरु गोबिंद सिंह जी ने अपने जीवन के अंतिम समय में सिखों को श्री गुरु ग्रंथ साहिब जी को ही "अगला गुरु" घोषित किया, जिससे यह सिद्ध होता है कि उनका धर्म के प्रति समर्पण किसी व्यक्ति की पूजा तक सीमित नहीं था, बल्कि सिद्धांतों और सत्य की भक्ति थी। संक्षेप में, गुरु गोबिंद सिंह जी का सम्पूर्ण जीवन धर्म के लिए त्याग, वीरता और निष्ठा का प्रतीक है। उनका समर्पण आज भी लाखों लोगों को सत्य, साहस और धर्म के मार्ग पर चलने की प्रेरणा देता है। गुरु गोबिंद सिंह जी सिख धर्म के दसवें गुरु थे, जिनका जीवन साहस, बलिदान और धर्म के प्रति अटूट समर्पण का प्रतीक है। उन्होंने ना केवल अपने जीवन को धर्म की रक्षा के लिए समर्पित किया, बल्कि अपने चारों पुत्रों और परिवार को भी धर्म की खातिर बलिदान कर दिया। उनका समस्त जीवन अधर्म, अन्याय और अत्याचार के विरुद्ध संघर्ष करते हुए बीता। गुरु गोबिंद सिंह जी ने 1699 में खालसा पंथ की स्थापना की, जिसका उद्देश्य सच्चाई, न्याय और समानता की रक्षा करना था। उन्होंने अपने अनुयायियों को "संत-सिपाही" बनने का उपदेश दिया — यानी ऐसा जीवन जीना जिसमें आध्यात्मिकता और वीरता दोनों समाहित हों। उन्होंने सिखों को अपने आत्म-सम्मान और धार्मिक स्वतंत्रता की रक्षा के लिए हमेशा तत्पर रहने की प्रेरणा दी। उनका साहित्यिक योगदान भी अत्यंत महत्वपूर्ण है। उन्होंने अनेक ग्रंथों की रचना की, जिनमें उनकी आध्यात्मिक गहराई और धार्मिक समर्पण स्पष्ट झलकता है। गुरु गोबिंद सिंह जी ने अपने जीवन के उनका धर्म के प्रति समर्पण किसी व्यक्ति की पूजा तक सीमित नहीं था, बल्कि सिद्धांतों और सत्य की भक्ति थी। संक्षेप में, गुरु गोबिंद सिंह जी का सम्पूर्ण जीवन धर्म के लिए त्याग, वीरता और निष्ठा का प्रतीक है। उनका समर्पण आज भी लाखों लोगों को सत्य, साहस और धर्म के मार्ग पर चलने की प्रेरणा देता है।

मुख्य बींदु: अधर्म, अन्याय, अत्याचार, आत्म-सम्मान, आध्यात्मिकता, समर्पण, निष्ठा

A Comparative Study on the Role of Artificial Intelligence in Enhancing Cybersecurity Systems

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Abstract

As digital transformation continues to reshape modern infrastructure, cybersecurity threats have become increasingly sophisticated and frequent. Traditional rule-based mechanisms are insufficient to handle dynamic and large-scale attacks. Artificial Intelligence (AI) has emerged as a transformative approach for enhancing cybersecurity by enabling predictive analytics, anomaly detection, and automated incident response. This study provides a detailed comparative analysis of AI techniques Machine Learning (ML), Deep Learning (DL), Natural Language Processing (NLP), and Expert Systems applied to cybersecurity. The paper synthesizes findings from existing literature, presents performance analyses with graphical representations, and explores key limitations and future prospects. Results indicate that AI-based systems enhance threat detection accuracy by 20–40% compared to conventional methods. However, challenges such as explainability, ethical misuse, and adversarial robustness remain critical research areas.

Keywords: Artificial Intelligence, Cybersecurity, Machine Learning, Deep Learning, Anomaly Detection, Threat Prediction, Adversarial Attacks

Management Tools for Agro Ecological Livestock Systems: Economic and Decision-Making

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Abstract

For agroecological livestock systems to be resilient and sustainable, effective management methods are essential. In order to balance productivity, environmental health, and socioeconomic well-being, agroecology places a strong emphasis on incorporating ecological principles into agricultural management. In this context, cattle are essential to energy flow, nutrient cycling, and farm variety. But in order to maximise their contribution, farmers need methodical economic and decision-making tools that promote sustainable resource usage and enhance their ability to make decisions.

Tools for economic and decision-making management are intended to assist farmers in assessing and organising livestock operations in a way that balances financial viability with ecological sustainability. Producers can evaluate the profitability of different livestock management techniques while taking social and environmental effects into account by using tools like enterprise budgeting, cost-benefit analysis, and participatory budgeting. Producers can examine situations, such as alternate feed sources, grazing schedules, or waste management options, by incorporating these tools into farm planning. This allows them to ascertain which strategies offer the best balance between financial gain and environmental advantages.

To sum up, livestock managers need to be guided towards sustainable agroecological practices via economic and decision-making management tools. These tools help farmers make well-informed, fact-based decisions that enhance resource efficiency, environmental integrity, and livelihood security by balancing economic performance with ecological principles. Expanding access to these resources, particularly through digital and participatory methods, can hasten the world's shift to resilient and profitable agroecological livestock systems.

Keywords: resource efficiency, nutrient cycling, sustainable farming, economic analysis, agroecology, livestock management, decision-support technologies, and participatory management resilience to climate change, Farm profitability

A Novel Approach for Solving Nonlinear Delay Differential Equations Using Differential Transform Method and Ring Polynomials

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Abstract

Public management plays a pivotal role in achieving sustainable development objectives by coordinating resources, policies, and stakeholders toward long-term environmental, social, and economic goals. Effective public management ensures the integration of sustainability principles into government planning and operations, promoting accountability, transparency, and participation. Through strategic policy formulation, implementation, and evaluation, public managers facilitate the alignment of development initiatives with sustainable outcomes, balancing growth with resource conservation and social equity. Moreover, public management fosters collaboration across sectors and levels of government, enabling holistic approaches to complex sustainability challenges such as climate change, poverty reduction, and biodiversity preservation. The adoption of innovative governance models, capacity building, and performance measurement strengthens the ability of public institutions to address emerging sustainability issues dynamically. This approach not only enhances public trust but also drives inclusive development that meets present needs without compromising future generations' ability to thrive. Hence, public management is indispensable in operationalizing sustainable development goals (SDGs) by transforming policy commitments into measurable, impactful actions that integrate economic viability, environmental stewardship, and social well-being.

Keywords: Public Management, Sustainable Development, Policy Implementation, Environmental Sustainability, Social Equity, Economic Growth, Sustainable Development Goals (SDGs)

Microfinance Models Based On Traditional Lending Practices

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Abstract

The paper discusses how conventional lending frameworks can be applied to the modern microfinance models to enhance the financial inclusion of the underserved communities. There was the mixed methods approach, which included 200 rural and semi-urban borrowers. Findings revealed that rotating savings and credit associations (ROSCAs) represent the most widespread traditional lending system, and hybrid microfinance models have a major positive effect on the rate of repayment, financial literacy, and customer satisfaction. Nevertheless, such issues as regulatory bottlenecks, urban scalability and dependence on social networks must be overcome to implement it sustainably.

Keywords: Microfinance, Traditional Lending, ROSCAs, Financial Inclusion, Borrower Satisfaction, Hybrid Models

Empowering Women Entrepreneurs in MSMEs: A Study of Growth, Finance, and Government Initiatives in Haryana

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Abstract

This paper examines the growth and performance of MSMEs with a focus on women entrepreneurs in Haryana. Using current authorities reviews and scholarly studies, it summarizes key central and state schemes that concentrate women (e.g., Mudra/PMMY, Women Entrepreneurship Platform and Haryana’s Matrushakti/Matrushakti Udyamita initiatives), highlights chronic financial obstacles confronted by using women business owners (limited collateral, informational asymmetry, limited access to formal credit and low awareness of schemes), and proposes centered measures (financial literacy, tailored credit products, credit guarantee expansion, simplified registration, and linked incubation/mentoring). The paper concludes with policy recommendations aimed at enhancing access to finance and growing the overall performance and sustainability of women-led MSMEs in Haryana.

Keywords: MSMEs, Women Entrepreneurs, Government Policies.

The Role of Traditional Agricultural Practices in Enhancing Food Security

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Abstract

This paper examines the role of traditional agricultural practices in enhancing food security, particularly in rural communities across developing regions. Despite the rapid adoption of modern agricultural technologies, traditional farming techniques remain a cornerstone for sustaining food security, especially in regions facing challenges such as climate change, soil degradation, and limited access to external inputs. Traditional practices such as agroecology, crop rotation, organic farming, and water management systems contribute to sustainable agricultural production by promoting biodiversity, soil fertility, and resilience to environmental stressors. These practices, which have been passed down through generations, often exhibit a high degree of adaptability to local environmental conditions. This paper also explores the socio-cultural significance of traditional agriculture, highlighting the role of indigenous knowledge and community-based farming systems in enhancing food security and social cohesion. The study concludes that integrating traditional practices with modern agricultural technologies could offer a more resilient and sustainable approach to ensuring long-term food security.

Keywords: Traditional agriculture, food security, agroecology, sustainability, indigenous knowledge, crop rotation, climate resilience, soil fertility, organic farming, rural communities.

Indian Legal Framework on Forestry and Biodiversity

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Abstract

In order to maintain ecological balance, protect livelihoods, and prevent climate change, forests and biodiversity are essential. India has created a thorough legal framework to safeguard these natural resources because of its large and varied ecosystems. Major legislation that govern forest usage, conserve endangered species, recognise the rights of indigenous tribes include the Indian Forest Act (1927), Forest (Conservation) Act (1980), Wildlife (Protection) Act (1972), Biological Diversity Act (2002), and the Forest Rights Act (2006). Environmental protection continues to be strengthened by legal rulings and constitutional duties. Effective implementation is however hampered by issues like lax enforcement, overlapping jurisdictions, limited legislation, and low community empowerment. India is in accordance with international frameworks which govern national policy and support inclusive and sustainable conservation policies, such as the Convention on Biological Diversity (CBD), the Nagoya Protocol, the UNFCCC's REDD+ system, and CITES. Analysis shows that although India's legal system is strong, it is deficient in areas like funding biodiversity, community-led conservation, and enforcement ability. In the future, it will be crucial to adapt technology, integrate climate goals into forest management, simplify laws, and engage in participatory governance. By linking domestic efforts with worldwide commitments, India may expand its role in global biodiversity security. India has a strong institutional and legal commitment to protecting its rich natural heritage, which is seen in its framework for forestry and biodiversity protection. The nation has established an environment for sustainable environmental governance through a combination of past laws, constitutional clauses, and pledges made in international treaties. However, the efficacy of these frameworks continues to be questioned due to implementation gaps, legal difficulties, and competing objectives. For India to achieve substantial conservation outcomes, it must step beyond legislative purpose to assure on-ground impact. This involves enhancing institutional authority, empowering local communities, securing sustainable finance sources, and using modern technology for monitoring. It will be essential to respect traditional knowledge systems while adopting international best practices.

Keywords: Biodiversity, constitution, sustainable environmental, legal difficulties

Enhancing Yield and Seed Quality of Mustard (*Brassica juncea L.*) through Agronomic Interventions

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Abstract

Mustard (*Brassica juncea L.*) is a key rabi oilseed crop, cultivated extensively for its edible oil, protein-rich meal, and industrial applications. Despite its economic importance, mustard productivity is often limited by nutrient deficiency, suboptimal agronomic practices, pest and disease pressures, and adverse climatic conditions. Improving yield and seed quality requires integrated agronomic management, including the use of fertilizers, growth regulators, and improved varieties.

Recent research has shown that balanced nutrient management, particularly the application of nitrogen, phosphorus, and sulfur, significantly enhances plant growth, branching, pod number, seeds per pod, 100-seed weight, and overall grain yield. Foliar application of growth regulators, such as Gibberellic Acid (GA₃) and Cytokinins, has been reported to promote flowering, pod setting, and seed filling, thereby improving both yield and seed quality. Other practices, including optimum sowing dates, recommended plant spacing, irrigation scheduling, and integrated pest and weed management, further contribute to maximizing productivity and resource-use efficiency.

Field trials integrating organic amendments with chemical fertilizers have demonstrated improvements in soil health, seed oil content, and overall crop performance, while adoption of high-yielding, disease-resistant cultivars ensures stability under variable agro-climatic conditions. These findings emphasize that a holistic agronomic approach, combining nutrient, water, pest, and growth regulator management, is essential for achieving high productivity and quality in mustard cultivation. Such strategies are crucial to meet the rising domestic and global demand for edible oil while promoting sustainable and eco-friendly production systems.

Keywords: Mustard, yield enhancement, seed quality, growth regulators, nutrient management, sustainable agriculture

Efficient and Accurate Solutions to Nonlinear Differential-Algebraic Equations Using Differential Transform Method and Bell Polynomials

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Abstract

This paper presents an efficient and accurate method for solving nonlinear differential-algebraic equations (DAEs) using the Differential Transform Method (DTM) combined with Faa di Bruno's formula and Bell polynomials. Nonlinear DAEs are frequently encountered in diverse fields such as engineering, control systems, biology, and economics. These equations involve both differential and algebraic components, creating significant challenges in solving them, especially when nonlinearities and singularities are present. The proposed method utilizes DTM, which transforms the equation into a recursive relation, and employs Faa di Bruno's formula to expand composite nonlinear functions, making them more manageable. Additionally, Bell polynomials are used to handle higher-order nonlinear terms, providing a structured and systematic approach. The results demonstrate the effectiveness of the method in terms of both accuracy and computational efficiency. Compared with traditional numerical methods, the proposed method yields highly accurate solutions with reduced computational effort. Several examples illustrate the method's ability to solve complex nonlinear DAEs, and the obtained solutions are compared with exact solutions and those from existing solvers. The method's ability to handle nonlinearities and its computational efficiency make it a valuable tool for solving real-world nonlinear DAE systems.

Wavelet Techniques for Solving Complex Physical Models: A Hybrid Approach to Science and Engineering Challenges

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Abstract

The increasing complexity of modern scientific and engineering challenges necessitates advanced computational techniques for modeling and problem-solving. Wavelet techniques, known for their ability to analyze data across multiple scales and resolutions, have emerged as powerful tools for addressing these challenges. Their applications span diverse fields. This study presents a novel hybrid LSTM-XGBoost model enhanced with wavelet techniques, focusing on the COVID-19 pandemic as a case study for modeling irregular fluctuations in energy demand. The proposed model employs wavelet decomposition to extract frequency components from the data, isolating both short-term variations and long-term trends. These components are integrated as features to enhance the model's sensitivity to anomalies and improve forecasting accuracy over extended periods without frequent retraining. The hybrid approach leverages LSTM's strength in capturing temporal dependencies and employs XGBoost to correct residual errors. Experimental evaluations demonstrate that the model delivers high-precision forecasts on regular weekdays and maintains robustness during unpredictable anomalies. This methodology highlights the potential of wavelet-enhanced hybrid models in improving the reliability of energy forecasting systems. The findings suggest significant implications for smart grid management, sustainable energy planning, and handling challenges posed by unexpected events in energy systems

Traditional Medicine and Nanotechnology Integration: A Review

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Abstract

Traditional Drug practices gauge centuries and appear in colorful societies. Systems like Ayurveda, Traditional Chinese Medicine, Unani, and Siddha calculate on phrasings from sauces, minerals, and beast sources. These remedies show some remedial pledge. Yet challenges persist. Issues include poor solubility, low bioavailability, inconsistent standardization, and uneven safety. Similar factors limit wider global use. Nanotechnology way in with nanoformulation styles. It provides ways to address these problems. This field blends old knowledge with current wisdom. Approaches involve liposomes, polymeric nanoparticles, nanoemulsions, nanogels, and solid lipid nanoparticles. Substantiation suggests they ameliorate solubility, stability, and targeted delivery for factory composites. Exemplifications include curcumin, quercetin, and artemisinin. Mineral medications from tradition, similar as bhasmas, admit fresh aesthetics through ultramodern tools. Analysis reveals nanoscale patches. These structures likely explain their goods. Essence nanoparticles come from gold, tableware, and zinc. They hold implicit for crack care, fighting microbes, and boosting impunity. This overview looks at where nanotechnology meets traditional drug. It covers treatment uses, new individual tools, and hurdles in moving forward. Ancient perceptivity brace with advanced nanoscience. The result points toward integrated styles. These could yield safer, better curatives backed by data. Looking ahead, studies need strong checks on toxin. Clinical tests matter too. brigades from different fields should work together. Only also can nano- enhanced traditional options fit responsibly into worldwide health care.

Keywords: Nanotechnology; Traditional medicine; Herbal nanoformulations; Bhasma; Nano-delivery

Cross-Cultural Knowledge Exchange for Sustainability: A Political Science Perspective

Gayatri

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Abstract

Environmental challenges such as climate change, desertification, pollution, and loss of biodiversity are no longer confined to national boundaries. These issues demand governance strategies that integrate not only scientific solutions but also cultural wisdom, especially from communities that have coexisted sustainably with nature for centuries. Yet, global governance has historically been dominated by powerful states and Western scientific institutions, resulting in the exclusion or marginalization of indigenous knowledge systems. This paper explores the relationship between political systems, cross-cultural knowledge exchange, and global sustainability. It analyzes how power imbalances limit meaningful knowledge sharing, examines real-world examples where traditional and scientific systems collaborate, and highlights theoretical frameworks from political science that explain global governance dynamics. Ultimately, the study argues for a more democratic, equitable, and culturally grounded approach to sustainability policymaking, where local knowledge enriches global environmental strategies and fosters fairness, resilience, and cooperation worldwide.

Keywords: political science, governance, sustainability, indigenous knowledge, global cooperation, equity, environmental policy

Biomimetic Design of Biodegradable Polymer Films for Sustainable Food Packaging: Integrating Indigenous Material Wisdom with Modern Chemistry

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Abstract

The increasing environmental burden from petroleum-based plastics necessitates the exploration of sustainable alternatives inspired by nature and traditional material practices. This study presents the development of biodegradable food packaging films derived from indigenous biopolymers such as sodium alginate, chitosan, and poly(γ -glutamic acid), integrated with natural additives including lignin nanoparticles and jackfruit seed extract. Guided by the principles of biomimicry and indigenous ecological wisdom, the formulation aims to emulate the functional resilience and biodegradability of natural plant cuticles. Physicochemical, mechanical, and barrier properties of the films were characterised to assess their potential as eco-friendly packaging materials. The findings highlight the role of traditional knowledge systems in guiding sustainable material innovation and promoting circular economy practices. This work bridges indigenous wisdom and modern polymer chemistry, contributing to the advancement of green technologies aligned with the United Nations Sustainable Development Goals (SDGs 12 and 13).

Keywords: Biomimicry, Biodegradable polymers, Indigenous knowledge, Sustainable packaging, Chitosan, γ -PGA, Circular economy.

Food Chemistry: Smartphone-Based Analytical Platform for Real-Time and Reversible Detection of Co²⁺, Ni²⁺, Cu²⁺, and Zn²⁺ Ions

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Abstract

The rapid and portable detection of transition metal ions such as cobalt (Co²⁺), nickel (Ni²⁺), copper (Cu²⁺), and zinc (Zn²⁺) is essential for environmental, industrial, and biological monitoring. Conventional laboratory-based analytical methods, though sensitive, are time-consuming, expensive, and unsuitable for on-site analysis. In this study, we propose the development of a **smart phone-based analytical platform** capable of **real-time, reversible detection** of Co²⁺, Ni²⁺, Cu²⁺, and Zn²⁺ ions using a **colorimetric/fluorometric sensing film** integrated with a smartphone camera and data-processing application.

Reversibility is achieved through regeneration of the sensing film using mild chelating agents (e.g., EDTA or citrate buffer), allowing multiple detection cycles without significant loss of sensitivity. The proposed platform offers a **detection limit in the micromolar range, response time under two minutes, and reusability across several cycles**, enabling **low-cost, real-time, and portable quantification** of these metal ions in environmental and biological samples.

This work provides a sustainable alternative to traditional analytical instruments, demonstrating the integration of **smartphone optics, reversible sensing chemistry, and digital analytics** into a single user-friendly platform for field-deployable heavy metal ion monitoring.

Keywords: Smartphone sensor, Colorimetric detection, Metal ions, Co²⁺, Ni²⁺, Cu²⁺, Zn²⁺, Reversible sensing, Portable analytic

Polymeric nanoparticles for controlled release of herbal actives: A Review

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Abstract

Polymeric nanoparticles (PNPs) are an increasingly important platform to deliver bioactive phytochemicals from traditional and herbal medicines. Nanosizing and polymeric encapsulation improve the aqueous solubility, chemical stability, and oral or topical bioavailability of poorly soluble natural products while enabling sustained and stimulus-responsive release profiles. This review summarizes fabrication strategies for herbal-actives-loaded PNPs (emulsion–diffusion, nanoprecipitation, ionic gelation, polyelectrolyte complexation), highlights commonly used synthetic and natural polymers (PLGA, PLA, PCL, chitosan, alginate), and compares design choices for oral, topical, and parenteral delivery. We synthesize recent *in vitro* and *in vivo* evidence for improved pharmacokinetics and therapeutic outcomes — with curcumin, berberine, and other phytoconstituents as paradigmatic examples — and examine applications in wound healing, anti-inflammatory therapy, cancer adjuvant therapy, and antimicrobial uses. Critical issues — scalable manufacturing, reproducibility, batch-to-batch variability of herbal extracts, toxicity, and regulatory pathways — are discussed. Finally, we propose best-practice guidelines for characterization (size, zeta potential, release kinetics), preclinical testing, and a translational roadmap to clinic. The review concludes by identifying knowledge gaps and future directions where PNPs can responsibly modernize herbal therapeutics.

Economic Perspectives on Energy Security and Sustainability (Financial Viability of Renewable Energy Projects, Economic Incentives, Green Finance, and Carbon Pricing)

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Abstract

As the world’s need for energy grows, we must find cleaner and safer ways to produce it. Traditional energy sources like coal and oil pollute the environment and are not sustainable for the long term. This paper looks at how we can use economic strategies to support energy security and sustainability. We will explore how renewable energy can be financially practical, how governments offer incentives for clean energy, the role of green finance, and how carbon pricing can help reduce pollution. Together, these ideas can help us move towards a greener and more secure energy future.

Exploring Ruskin Bond’s story “Dust on the Mountain” with respect to Indigenous Knowledge System and scientific advancement to ensure Sustainable Development

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Abstract

The 21st century world is a world of science and technology where we tend to give little or no value to Indigenous Knowledge System (IKS). We often show our disregard for the traditional knowledge that seem to be dwarfed by new scientific discoveries. What we fail to comprehend is that indigenous knowledge represents generations of traditional wisdom and creative thought. Literature can sensitize human beings. It can help in the realization of the value of Indigenous Knowledge System and raise a global awareness about the concept of Sustainable Development. Ruskin Bond plays a major role in the world of literature. His writings make us ponder on the importance of Indigenous Knowledge System that advocates for a balanced relationship with Nature and to take an active role in conserving her for the welfare of mankind in order to achieve Sustainable Development. The paper presented here thus aims to explore Ruskin Bond’s story “Dust on the Mountain” and also justifies the selection of the literary text with respect to Indigenous Knowledge System and scientific advancement to ensure Sustainable Development.

Keywords: Indigenous Knowledge System, Sustainable Development, Scientific advancement, Role of literature, Raising global awareness

Sustainable Agricultural Practices in Haryana: Challenges and Opportunities for Environmental and Economic Resilience

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Abstract

Sustainable agriculture has emerged as a critical necessity in Haryana, a state known as the "Granary of India." Despite remarkable achievements in agricultural productivity since the Green Revolution, Haryana faces serious environmental challenges, including soil degradation, groundwater depletion, and declining biodiversity. This research paper examines the current state of agriculture in Haryana, identifies key sustainable agricultural practices being adopted, and evaluates their environmental and socio-economic implications. The study highlights the potential of integrated farming systems, organic agriculture, crop diversification, water-efficient technologies, and government-supported initiatives such as Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) and Mera Pani Meri Virasat. The findings suggest that a transition toward sustainability requires not only technological innovation but also behavioral change, policy support, and community participation.

Keywords: Sustainable agriculture, Haryana, water management, crop diversification, organic farming, environmental sustainability

Impact of Social Media on Human Communication and Relationships (Behavioural Change And Social Unity)

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Abstract

Using behavioural change and social unity as case studies, this research examines how social media affects human communication and relationships. This study takes a mixed-method approach, combining quantitative and qualitative methods, to look at how social media affects various demographics in terms of their interaction patterns, emotional expressiveness, and social cohesiveness. A total of 135 participants, consisting of college students, professionals in the domains of communication and sociology, as well as educators and researchers, were surveyed using a standardized questionnaire. The study takes a descriptive cross-sectional approach, which allows for a complete picture of social media use and its perceived impacts at a particular moment in time. There has been a noticeable trend toward impulsive communication, less in-person encounters, and a greater dependence on digital expressions like GIFs and emojis, although the effects have differed among demographic groups, according to the results. All things considered, the research shows that social media may bring people together as well as cause behavioral disruptions; therefore, it's important to use it in a balanced and reflective way while interacting with modern humans

Keywords: Social media, human communication, behavioural change, social unity, emotional expression, digital relationships.

Exploring the Tunable Properties of Tellurene van der Waals Heterostructures for Nanoelectronic Applications

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Abstract

Two-dimensional (2D) materials and their heterostructures have attracted immense attention for next-generation nanoelectronic devices due to their remarkable tunability and atomically sharp interfaces. Among them, tellurene, a recently discovered 2D allotrope of tellurium, stands out for its high carrier mobility, intrinsic anisotropy, and robust environmental stability. In this study, we explore the structural, electronic, and interfacial properties of tellurene-based van der Waals heterostructures using first-principles density functional theory (DFT). The investigation focuses on how interlayer coupling, stacking orientation, and interface charge redistribution influence the overall band structure and transport characteristics. The results reveal that the band gap and alignment of the heterostructures can be effectively tuned by selecting suitable partner materials, leading to transitions between direct and indirect band gaps and formation of type-II interfaces—highly desirable for charge separation in nanoelectronic and optoelectronic devices. The study highlights the potential of tellurene-based heterostructures as a versatile platform for designing high-performance, low-dimensional electronic systems with tailored properties.

Sustainable Energy Solutions for Off-Grid Communities

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Abstract

Millions of people in remote and rural areas still lack access to stable electricity, depending on costly and polluting energy sources. This study explores sustainable and innovative approaches to provide reliable power for off-grid communities. It evaluates renewable technologies such as solar, wind, micro-hydro, and biomass systems that can deliver clean and affordable energy. The research further examines the use of hybrid renewable systems and energy storage solutions to ensure consistent supply and reduce dependence on fossil fuels. Emphasis is placed on the role of community participation, policy frameworks, and financial mechanisms that support long-term sustainability. Drawing on global case studies, the paper concludes that decentralized renewable energy systems can significantly improve living conditions, reduce emissions, and promote inclusive growth aligned with global sustainable energy goals.

Keywords: Off-grid communities, renewable energy, hybrid systems, sustainable development, energy access, decentralization, clean technology.

Robotics and Automation in Traditional Crafts

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Abstract

The fusion of robotics with traditional craftsmanship offers a promising pathway toward sustainable and innovative cultural preservation. This paper explores how automation technologies—such as robotic arms, computer-aided design, and sensor-based fabrication—can support artisans in enhancing precision, efficiency, and scalability without compromising the authenticity of indigenous techniques. The research examines mathematical and algorithmic models used in robotic motion control, pattern replication, and material optimization to replicate human artistry. Case studies of automated weaving, pottery, and wood-carving processes are analyzed to assess their socio-economic and environmental impact. The study emphasizes human–machine collaboration, proposing that robotics should augment rather than replace artisanal skills. By integrating traditional creativity with technological precision, the paper envisions a sustainable framework for revitalizing heritage crafts in the modern era.

Keywords: Robotics, Automation, Traditional crafts, Sustainable technology, Algorithmic modeling, Human–machine collaboration.

Geo-Spatial Mapping of Indigenous Resource Use

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Abstract

This study presents a mathematical approach to geospatial analysis for understanding patterns of Indigenous resource utilization. The research employs concepts from coordinate geometry, linear algebra, and differential calculus to develop spatial models that represent land-use dynamics quantitatively. Using Geographic Information Systems (GIS) and remote sensing data, spatial interpolation techniques and regression-based prediction models are applied to measure correlations between environmental parameters and community-driven resource practices. Optimization algorithms are further used to estimate sustainable resource allocation and minimize ecological imbalance. The work demonstrates how mathematical abstraction—through equations governing distance metrics, transformation matrices, and spatial statistics—can be effectively integrated with Indigenous ecological insights. The study concludes that mathematical modeling not only enhances the precision of geospatial mapping but also supports evidence-based decision-making in environmental management and sustainable development.

Keywords: Geospatial mathematics, Coordinate geometry, Spatial statistics, Optimization modeling, GIS analytics, Mathematical ecology.

Eco-Friendly Fingerprint Development Techniques Inspired by Indigenous Plant Extracts

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Abstract

The increasing demand for sustainable and non-toxic forensic techniques has driven the exploration of eco-friendly alternatives to conventional chemical reagents. This study investigates the potential of indigenous plant extracts as natural, biodegradable reagents for latent fingerprint development on porous surfaces. Selected plants with traditional dyeing and staining properties—such as *Curcuma longa* (turmeric), *Lawsonia inermis* (henna), and *Acacia catechu* (catechu)—were extracted using aqueous and alcoholic solvents. The extracts were applied on various substrates including paper, cardboard, and currency notes using spray and dipping methods. Developed fingerprints were examined under visible and ultraviolet light to assess ridge clarity, contrast, and background interference. Results revealed that several indigenous plant extracts produced clear, stable ridge patterns comparable to conventional reagents like ninhydrin, while being safer and environmentally benign. This study highlights the integration of indigenous knowledge and modern forensic science as a sustainable approach toward green forensic practices, reducing chemical hazards and promoting local bio-resources for scientific innovation.

Keywords: Forensic Science, Latent Fingerprint, Indigenous Plants, Eco-friendly Reagents, Sustainable Development.

Integrating Algebraic Graph Theory and Topological Optimization for Enhancing Cybersecurity and Smart Infrastructure: A Comprehensive Review of Current Trends and Challenges

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Abstract

Improving the dependability, robustness, and safety of contemporary digital ecosystems becomes a central focus of algebraic graph theory and topological optimisation. The need for mathematically rigorous methods to control vulnerabilities and optimise performance is becoming more and more essential due to the fast rise of smart infrastructure, which includes things like smart cities, healthcare networks, transportation grids, and Industry 4.0 technologies. At the same time, united mathematical techniques that integrate structure and connection are in high demand due to the increasing severity of cybersecurity threats such as healthcare ransomware and energy grid systemic concerns. In this research, we survey the multidisciplinary use of topological optimisation and algebraic graph theory to smart infrastructure management and cybersecurity modelling. Using a qualitative review-based technique, this study draws entirely from secondary sources such as scholarly journal articles, white papers on technical topics, reports from both the government and business, and case studies published up to 2023. By using a theme analysis to the literature, we may better understand the potential benefits, drawbacks, and possibilities associated with integrating different frameworks. Several important findings are uncovered by the investigation. Anomaly detection and vulnerability assessment in complex networks are both improved by algebraic models using methods like Laplacians, adjacency matrices, and eigenvalue analysis. Infrastructures like smart cities and energy distribution systems can benefit from topological optimisation, which uses methods like minimum spanning tree logic and persistent homology, to improve operational efficiency and fault tolerance. Together, these methods provide a powerful set of tools that can handle adaptive routing, real-time anomaly detection, and cascading failures. The study does highlight some ongoing issues, though, such as the lack of standardised protocols, difficulties with computing scalability, and limited integration across domains. The paper concludes that the future of digital resilience lies in the development of scalable, interoperable, and interpretable mathematical models. Recommendations are provided for researchers, industry stakeholders, policymakers, and academia to accelerate integration and foster collaboration.

Keywords: Algebraic graph theory, topological optimization, cybersecurity, smart infrastructure, mathematical modeling

Reviving Water Bodies through Indigenous Knowledge Systems: Integrating Traditional Wisdom with Modern Restoration Practices

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Abstract

Water body restoration has become a critical environmental priority in the face of escalating degradation caused by urbanization, industrialization, and unsustainable agricultural practices. While modern technologies offer scientific frameworks for rejuvenation, indigenous wisdom presents a complementary, time-tested approach grounded in ecological balance, community participation, and cultural continuity. This paper explores the role of indigenous knowledge systems in restoring degraded water bodies—lakes, ponds, and rivers—through sustainable, low-cost, and locally adapted practices. Drawing from case studies across India and other regions with strong traditional water management systems, such as the *johads* of Rajasthan, *ahars-pynes* of Bihar, and *tankas* of Gujarat, the study highlights how community-driven interventions based on traditional hydrological understanding have revived ecosystems and enhanced groundwater recharge. The integration of traditional ecological knowledge (TEK) with modern scientific methods can create resilient and inclusive restoration models. The research emphasizes the socio-cultural dimensions of water stewardship, where rituals, taboos, and collective governance reinforce conservation ethics. Methodologically, the study combines ethnographic inquiry, field observation, and participatory mapping to document local practices and evaluate their ecological efficacy. The findings suggest that recognizing and institutionalizing indigenous wisdom not only restores physical water bodies but also revitalizes community identity and environmental ethics. Ultimately, this paper argues that sustainable water body restoration lies in harmonizing indigenous and scientific knowledge systems to foster long-term ecological resilience and water security.

Investigating the Influence of Personalization and Context Awareness on User Experience in AI-Driven Customer Support Chatbots

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Abstract

The fast development of Artificial Intelligence (AI) and Natural Language Processing (NLP) has altered the process of customer service by introducing conversational agents. Although the technology is improved, the user satisfaction and interaction levels will mostly rely on whether the chatbot can deliver the personalized and contextual interaction. The study explores the role of personalization and context awareness that can improve user experience in customer service chatbots. By means of a mixed-method empirical design, the paper will examine user perception, satisfaction, and behavioral intent among different chatbot interfaces. Findings suggest that, in a combination of personalization and contextual continuity, trust, efficiency, and emotional involvement can be highly enhanced, thus creating an excellent customer experience in service.

Keywords: Artificial Intelligence (AI), Natural Language Processing (NLP), Human-Computer Interaction (HCI), Adaptive Dialogue Systems, User Satisfaction (UEx).

Artificial Intelligence in Education: Exploring Opportunities, Challenges, and Ethical Implications in a Rapidly Evolving Landscape

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Abstract

Artificial Intelligence (AI) has become one of the most transformative technologies of the 21st century, influencing diverse fields such as education, healthcare, and agriculture in India and across the world. AI has the capacity to accelerate economic development, encourage social advancement, and enhance overall safety and quality of life. However, its rapid adoption has also introduced complex challenges, including a lack of transparency, algorithmic bias, privacy concerns, data security risks, and ethical dilemmas that affect individuals, organizations, and societies globally.

As AI continues to evolve, its ethical and moral implications demand careful consideration. Although the concept of “Machine Ethics” first appeared around 2006, the study of AI ethics remains in a developing phase. In our daily lives, we interact with AI systems constantly — from virtual assistants such as Alexa, Siri, Bixby, Gemini, and Google Assistant, to writing aids like Jasper, WriteSonic, and Grammarly. These tools assist with everyday activities such as scheduling, answering questions, and managing smart devices. Additionally, AI provides personalized recommendations on platforms like Netflix, Amazon, and Spotify.

Despite its vast benefits, the misuse of AI can lead to dependency, misinformation, and reduced human interaction. It has already begun to reshape the way people communicate, learn, and make decisions. AI also influences economies by automating labor-intensive tasks, thereby changing employment patterns. If its use remains unchecked, AI could replace many human roles in future workplaces, raising critical questions about economic stability and ethical responsibility.

Keywords: Introduction, Types and Tools of AI in Education, Impact of AI on Education, Literature Review, Digitalization in Education

Nanotechnology From Historical Advancements to Future Prospects: A Review

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Abstract

Recent advances in nanotechnology have resulted in significant breakthroughs across several fields. Nobel laureate Richard Feynman introduced the concept of nanotechnology in his well-known presentation at the California Institute of Technology on December 29, 1959. In his paper, "There is plenty of room at the bottom," he also covered the concept of nanoparticles. He emphasized that new physical and chemical features need to emerge from this nanoscale. Nanotechnology is a rapidly growing area of study that includes systems, gadgets, and structures with unique characteristics and capabilities because of the way their atoms are arranged on the 1–100 nm scale. This field could lead to significant changes in electronics, medicine, energy, and materials research. In this article, we aim to cover the history and recent advanced applications of nanotechnology, focusing on advancements in material science and technology that may occur in the future. Nanotechnology is evidently a very promising technology that has achieved significant advancements in a variety of disciplines, including environmental protection, medical, and energy equipment.

Keywords: Nanotechnology, agriculture, medicine, environment, automobiles, cosmetics industry

A Conceptual Note on Assessing the Role of Mathematics in Shaping Sustainable future

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Abstract

Sustainability commonly defined as meeting the needs of the present without hindering future generations from meeting theirs stands as one of the most pressing global challenges of the 21st century. While often explored through environmental, economic, and social frameworks, mathematics serves a vital function by offering the tools necessary to analyze, model, and optimize sustainable systems. This paper examines the relationship between mathematics and sustainability, highlighting how mathematical modeling, statistical analysis, and optimization techniques drive progress in sustainable development across areas such as energy efficiency, climate modeling, resource management, and waste reduction.

Keywords: Sustainability, statistical regression, mathematical models, optimization, resource management.

Benefits and Drawbacks of AI in Education: A Conceptual Note

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Abstract

Artificial Intelligence (AI) results in the shifting the way of thinking and doing things by human beings. Many sectors directly or indirectly have been influenced by the use of AI. Under this study, an attempt is made to know about the benefits and drawbacks of AI in education. This study is descriptive in nature and it was found that integrating AI in education promotes personalized learning, automates grading and attendance, facilitates efficiency in administration and improves accessibility. But its use also leads to privacy and ethical concerns, access barriers, loss of human interaction and over-dependence. However, various initiatives have been taken by the Government for the implication of AI in education. But still, there is a need to ensure the effective use of AI technologies in education while safeguarding the privacy of students. There should be a balanced and human centered approach to integrate AI in education.

Keywords: Education, Artificial Intelligence, Chatbots, Students, and Learning.

Quantum Cryptography: Securing the Digital Future

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Abstract

In the modern digital era, where cyberattacks, data breaches, and digital spying threaten global security, conventional cryptographic systems face increasing challenges. The rapid development of quantum computing has amplified these threats by undermining the security foundations of classical encryption algorithms such as RSA (Rivest–Shamir–Adleman) and ECC (Elliptic Curve Cryptography), both of which depend on the computational hardness of factorization and discrete logarithmic problems. Quantum cryptography, rooted in the principles of quantum mechanics, introduces a transformative approach that ensures theoretically unbreakable security. This paper explores the theoretical foundations, current technological developments, challenges, and future prospects of quantum cryptography. It emphasizes the transition from mathematical security to physical security, highlighting quantum key distribution (QKD), quantum random number generation, and post-quantum cryptographic frameworks. The study concludes that quantum cryptography is not merely a futuristic ideal but a necessary evolution for safeguarding the digital future in a quantum-enabled world.

Keywords: Quantum Cryptography, Quantum Key Distribution, QKD, Cybersecurity, Post-Quantum Cryptography, Quantum Communication, Quantum Computing.

Indigenous Knowledge System and Recent Advances in Science, Management, Engineering & Technology for Sustainable Development

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Abstract

The integration of Indigenous Knowledge Systems (IKS) with modern advancements in science, management, engineering, and technology presents a transformative approach to achieving sustainable development. Rooted in centuries of observation, cultural experience, and environmental adaptation, indigenous knowledge offers practical and ethical insights into resource management, ecological preservation, and community well-being. When effectively aligned with modern innovation, it supports inclusive growth, environmental conservation, and cultural continuity. This paper explores the significance of IKS, its relationship with contemporary disciplines, and the strategies for harmonizing both systems to foster sustainability.

Keywords: Indigenous Knowledge, Sustainable Development, Innovation, Management, Technology, Interdisciplinary Approach