Proceedings of the

SECOND INTERNATIONAL CONFERENCE

ON

RECENT TRENDS IN MULTI-DISCIPLINARY RESEARCH AND INNOVATION

ICRTMRI' 25

19th September 2025

in Association with

BRITTS IMPERIAL UNIVERSITY COLLEGE
United Arab Emirates

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Organized by

RESEARCH - INNOVATION - PROSPERITY

A.V.P. (Autonomous)
COLLEGE OF ARTS AND SCIENCE
Affiliated to Bharathiar University, Coimbatore
Accredited with 'A' Grade by NAAC (Cycle I)
Recognized under Section 2(f) of the UGC Act 1956
An ISO 9001:2015 Certified Institution, T.M. Poondi, Tirupur.

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This is the proceeding of the Second International Conference on Recent Trends in Multidisciplinary Research and Innovation (ICRTMRI -2025) organized by A.V.P. College of Arts and Science, Tirupur, Tamilnadu, India held on 19th September 2025.

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For an article to be considered for publication it is a pre-condition that it is not submitted for publication elsewhere in the section of Literature, Computing Sciences, Commerce, Management, Bioscience and Textiles. The contents of the papers are the sole responsibility of the authors and publication shall not imply the concurrence of the editors or publisher.

ABOUT

A.V.P. COLLEGE OF ARTS & SCIENCE

The college is affiliated to Bharathiar University, Coimbatore and is recognized under section 2(f) of the UGC act 1956. Recently the college is conferred to be autonomous by UGC. The college is accredited with 'A' grade by NAAC in its first cycle. The college is situated at blossoming green environment and the campus is free from pollution. It has splendid infrastructure with modernized furniture which complements vibrant academic domain. It renders an effective curriculum which unveils the standards and core competencies of the students like analytical abilities, creative thinking and problem-solving skills of the students. The college strives to create a suitable arena for all round developments which enable the students to serve the country with great vigor and enthusiasm and also to face challenges.

The highly qualified and experienced faculty members are committed to serve the students community to enrich the knowledge of the students. At present, the college offers 14 UG, 4 PG and 4 Research Programmes with the staunch motive of developing research skills. Co-curricular and Extra-curricular activities are conducted in the college at regular intervals and the students are given opportunities to empower themselves and engage in socially useful and productive works through various Cells and Clubs like NSS, Rotaract, Social Awareness Cell, and Women Empowerment Cell and so on.

ABOUT THE CONFERENCE

Second International Conference on Recent Trends in Multidisciplinary Research and Innovation (ICRTMRI -2025) is an event that will provide a tremendous opportunity for the authors, participants, and intellectuals to communicate effectively with one another and express their skills and understanding the recent trends in the research and technical innovations. Potential Attendees at ICRTMRI-2025 will have a great opportunity to speak with experienced professionals about the recent challenges in scientific research and related fields. The International Conference on Multidisciplinary Research and Innovation brings forth a venue for the various key players to connect and collaborate among themselves. This International Conference fosters research presentation, journal publication and professional development.

CONFERENCE OBJECTIVE

The primary goal of this Second International Conference on Recent Trends Multidisciplinary Research and Innovation (ICRTMRI -2025) is to bring Literature, Science, Commerce, Management and Life Science areas of research together on the same unified platform. The sessions will bring the researchers from various fields to share their new research findings and innovations.

CONFERENCE THEMES

Track 1: Literature

English Literature in the Age of Artificial Intelligence, Posthumanism and the Future of Humanity in English Literature, Climate Crisis and Eco literature, Queer Ecologies and Gender Fluidity in Contemporary Fiction, Communication and Community in the Modern World.

சங்க இலக்கியங்களில் விழுமியங்கள், தமிழ் இலக்கியங்களில் சமூகம், தமிழ் இலக்கிய வளர்ச்சி நிலையில் இதழ்களின் பங்கு, இலக்கியங்களில் மருத்Fவம், இலக்கியங்கள் காட்டும் பபண்ணியம்

Track 2: Computing Sciences

Cyber Security, Big Data Analytics, Computer Vision, Artificial Intelligence, Machine Learning and Deep Learning, Databases and Data mining, Robotics and Automations, Cloud Computing, Web Intelligence and Web Technologies, Block Chain, IOT, Optimization, Algebra, Graph Theory, Scientific Computing, Number Theory, Quantum Theory.

Track 3: Commerce and Management

Digital Marketing trends and strategies, AI for Business Innovation, Sustainable Business and Marketing, Block-Chain in Accounting, Auditing, Banking and Insurance, Monetary and Fiscal policy, Social Media Marketing and influence, Corporate Social Responsibility, Global Business and Cross-Cultural Management.

Track 4: Bioscience and Textiles

Bioinformatics and Computational Biology, Drug Designing and Discovery, Food Technology, Environmental Sustainability, Nanoscience and Technology, AI in Fashion Illustration and Portfolio Presentation, Textile in Everyday life, Recent Innovation in Technical Textiles, Conventional and Non-conventional Textiles, Role of Acoustic Textiles in Modern Era.

Keynote Speakers

Dr. Subramani Senthil Kumar
Head and Associate Professor
Department of Management
Skyline University, Nigeria

Topic: "Navigating the Digital revolution: Embracing technology for Business Growth in Global Perspectives"

Mr. Vidyagar Manoharan
Risk Manager (Asia Pacific)
BNP Paribas, Hong Kong
People's Republic of China

Topic: "Evolution of Risk Management in Public Sectors"

Dr. R. Sridevi
Associate Professor
Department of Computer Science
Christ (Deemed to be University)
Bengaluru

Topic: "The Future of Human–Machine Collaboration"

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Head, School of Management
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Dr. Lavanyasri Rathinavel	Adjunct Faculty Centre for Global Health Research, Saveetha Medical College, Kerala

Awards and Recognitions

Best Paper Award
Under each track a best research paper will be recognized with an award based on significant contributions with innovative ideas, novelty of work, methodology and clear presentation.

Best Presenter Award
Under each track a best presenter will be recognized with an award based on presentation style, quality of the paper and overall impact.

ICRTMRI 2025
PROGRAMME SCHEDULE

19.09.2025

Prayer Song	: Students Choir
Lighting the Lamp	**:** Dignitaries
Welcome Address	: **Dr. S. ASHOK KUMAR** Dean Administration and Research Convener-ICRTMRI
Presidential Address	: **Rtn. MD. PDG. A. KARTHIKEYAN** Chairman, A.V.P. Institutions
Felicitation	: **Dr. V. KATHIRESAN** Principal, A.V.P. CAS
Release of the Proceedings	**:** Dignitaries
	Technical Session I
Introduction to the Speaker	**Dr. S. Sindhubairavi,** Head, School of Management
Keynote Address	**Dr. SUBRAMANI SENTHIL KUMAR** Head & Associate Professor, Department of Management, Skyline University, Nigeria
	Technical Session II
Introduction to the Speaker	**Dr. Catherine Mary Sharmila,** School of Fashion
Keynote Address	**Mr. Vidyagar Mahoharan** Risk Manager (Asia Pacific, BNP Paribas, Hong Kong People's Republic of China
	Technical Session III
Introduction to the Speaker	**Dr. A. Mallika,** Head, School of Commerce
Keynote Address	**Dr. R. Sridevi** Associate Professor, Department of Computer Science Christ (Deemed to be University), Bengaluru
Vote of Thanks	**Ms. R.S. Cindu,** Head, School of Biotechnology
National Anthem	

Chairman Message

Rtn. PDG. MD. A. KARTHIKEYAN
Chairman
A.V.P. Institutions

Dear Participants,

I am immensely pleased to welcome all to the Second International Conference on Recent Trends In Multi-Disciplinary Research and Innovation - ICRTMRI 2025, organized by A.V.P. College of Arts and Science in association with Britts Imperial University College, UAE.

AVPCAS always strives to create a suitable arena for all round developments of students and faculty members which enable them to serve the country with great vigor and enthusiasm and face challenges. The college aims to increase the scope and diversification of knowledge in research and innovation. This conference is a testament to our commitment in inculcating the innovation and problem solving culture among the students.

I extend my gratitude to the keynote speakers, organizing committee and the participants for their support to this conference.

Wishing you a productive, fruitful and inspiring conference

Principal Message

Dr. V. KATHIRESAN
Principal
A.V.P. College of Arts and Science

Dear Participants,

Greetings. With immense pleasure I welcome each one of you to the Second International Conference on Recent Trends In Multi-Disciplinary Research and Innovation - ICRTMRI 2025, organized by A.V.P. College of Arts and Science in association with Britts Imperial University College, United Arab Emirates. As the principal of the college, I am extremely glad to bring the college Second International Conference to the limelight.

A multidisciplinary approach in education is essential because it allows the researchers and students to understand the subjects comprehensively by incorporating knowledge and perspectives from various disciplines. Thus this conference provides a platform for the academicians, industrialist, research scholars and students to collaborate and exchange ideas from diverse fields.

I wholeheartedly appreciate the hard work and dedication of the Convenor, Coordinators and organizing committee members for making this event a grand success.

Wishing the team, all the best

Foreword

Dr. S. ASHOK KUMAR
Convenor – ICRTMRI 2025
Dean-Administration and Research
AVPCAS

Dr. A. Mallika
Head-Commerce
Coordinator

Dr. S. Sindhubairavi
Head-Management
Coordinator

Ms. R.S. Cindhu
Head-Biotechnology
Coordinator

Dear Participants,

Greetings! With warmth and affection, we welcome all to the Second International Conference on Recent Trends in Multi-Disciplinary Research and Innovation, organized by AVPCAS in association with Britts Imperial University College, United Arab Emirates. The goal of organizing this conference is to provide an opportunity for the authors, participants, and intellectuals to communicate effectively with one another and express their skills and understandings in the multi-disciplinary research and technical innovations.

We extend my sincere gratitude to the Management and Principal for providing an opportunity for organizing the conference. We express my thanks to the advisory committee members, conference coordinators and organizing committee members for extending their support and time in organizing this conference. We thank and wish all the participants and presenters who contributed significantly in sharing their knowledge on the advancements in the areas of multidisciplinary research.

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CLOUD BASED ONLINE SOCIAL NETWORK FOR GROUP COMMUNICATION

Samritha.K
II MSc CS, School of Computer Studies
A.V.P. College of Arts and Science (Co-Education), Tirupur

Abstract
The paper cloud based online social network for group communication is a web site for like-minded professional to exchange ideas, post articles, offer answers, offer helps on relevant subjects and post source codes for relevant topics also. This system also provides ways of archiving and searching for previous exchanges.
The user registered with this social media can interact and interfere with their co-workers. If anybody is not registered can also able to view the posted topics and articles. The main objective of this paper is to share the ideas and materials of their interest. This enhances the knowledge and enriches the communication in their area of interest.
The discussion system in here, organizes every activity into Text Based Communication. It helps students to communicate with their friends, staffs and subject experts to accomplish their tasks and improve their skills in relevant area. The present discussion social medias have a lot of drawbacks. The major drawback of the present system is to facility the discussion within the registered groups only. This social media is open for Discussion. So, everyone can share their knowledge with the likeminded persons, and they can get the relationship of their own technical people. It accomplishes the job to be done in time, simultaneously develops the Team of single Objective.
Keywords: Cloud, Text Based communication, Discussion forums

RESEARCH ON MODERNIZING IT INFRASTRUCTURE AND SERVICE DELIVERY WITH CLOUD COMPUTING

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Abstract

In today's fast-paced digital landscape, organizations face unprecedented pressure to innovate, scale rapidly, and deliver seamless IT services that meet evolving business demands. Modernizing IT infrastructure is no longer optional but a critical imperative to sustain competitiveness and drive growth. Cloud computing has emerged as a groundbreaking technology that fundamentally redefines how IT resources are provisioned, managed, and delivered. By shifting from traditional on-premises systems to highly flexible and scalable cloud environments, enterprises unlock new levels of agility, cost efficiency, and operational resilience. This research delves into the transformative power of cloud computing in modernizing IT infrastructure and revolutionizing service delivery models, providing organizations with the tools necessary to thrive in the digital era.

Adopting cloud solutions enables organizations to enhance operational agility, reduce capital expenditures, and scale IT resources efficiently. Cloud computing also accelerates service deployment, fosters innovation, and supports remote work models. However, it introduces challenges such as data security, regulatory compliance, and vendor lock-in. This research proposes strategic frameworks to address these issues while maximizing cloud benefits.

Keywords: IT Infrastructure Modernization**,** Digital Transformation**,** Innovation, Cost Efficiency, Technology Adoption Challenges.

AN OVERVIEW OF QUANTUM CRYPTOGRAPHY IN FUTURE SECURITY PROTOCOLS

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Abstract
The emergence of quantum computing introduces both opportunities and threats to modern network security. While quantum systems offer groundbreaking advancements in data processing and problem-solving, they also undermine traditional cryptographic techniques, leaving current security frameworks vulnerable. To address these risks, quantum cryptography—particularly Quantum Key Distribution (QKD)—provides a secure alternative by leveraging quantum mechanics, where any attempt at interception alters the quantum state and exposes eavesdropping.

This paper explores the role of quantum cryptography in creating quantum-resilient security protocols. It discusses real-world applications such as satellite-based QKD and fiber-optic networks, alongside challenges including cost, technical complexity, and integration with classical systems. By advancing research and fostering collaboration among policymakers, industry, and technology developers, quantum cryptography can establish the foundation for secure communication in the face of evolving cyber threats.

Keywords: Quantum Cryptography, Quantum Key Distribution (QKD), Network Security, Quantum Computing Threats, Cybersecurity, Future Cryptographic Solutions

SUSTAINABLE PRACTICES IN DIGITAL VISUAL COMMUNICATION: REDUCING ENVIRONMENTAL IMPACT

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Abstract

The rise of digital media has transformed how information is communicated, with visual content playing a primary role in websites, applications, and online campaigns. However, the rising challenges and scale of digital media have led to higher energy consumption, contributing to environmental concerns such as carbon emissions from data centres and digital infrastructure. This paper analyses approaches to sustainable visual communication, emphasizing methods that reduce environmental impact while maintaining design quality and usability. Main approaches include optimized coding practices, streamlined media assets, responsive and minimalistic design, and adoption of eco-friendly computing solutions.

Several organizations have successfully implemented sustainable digital practices, demonstrating practical measures to reduce energy usage without compromising user experience. It also discusses the key role of integrating environmental considerations into the process of designers and developers, reinforcing sustainability as both a professional responsibility and a strategic priority. These suggest that adopting sustainable practices in visual communication is important for fostering innovation that is both effective and environmentally responsible. By aligning technological efficiency with ecological awareness, digital media can evolve in a way that supports sustainable growth while delivering highquality experiences to users.

Keywords: Digital Media (DM), Visual Communication (VC), Sustainable Design (SD), Energy Efficiency (EE).

HOW API WORKS IN TODAYS WORLD: BRIDGING SYSTEMS AND ENHANCING INNOVATION

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Abstract
Application Programming Interfaces (APIs) play a vital role in modern software development by acting as intermediaries that enable seamless communication between different applications, systems, or platforms. They provide a standardized way for applications to request and exchange data without requiring developers to understand the internal logic of the other system. This presentation focuses on the fundamental structure of APIs, including requests, responses, and commonly used data formats like JSON and XML. It also categorizes the major types of APIs-Open, Internal, Partner, and Composite-highlighting how each supports specific business and technical needs. Furthermore, various protocols such as REST, SOAP, GraphQL, and gRPC are discussed to demonstrate their practical use cases in industries ranging from banking to social media. The benefits of APIs extend to faster application development, scalability, flexibility, and effortless integration with third-party services, making them essential in cloud computing and microservices architecture. Real-life examples, such as weather applications, online food delivery, and social media logins, illustrate their widespread adoption in daily life. Overall, APIs drive innovation, ensure interoperability, and significantly improve user experiences by connecting digital ecosystems in an efficient and secure manner.

Keywords: Application Programming Interface, Data Exchange, Request & Response, XML, Cloud Computing, Microservices Architecture

BREAST CANCER DETECTION USING MACHINE LEARNING

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Abstract

Breast cancer continues to be a leading cause of death among women worldwide, and early diagnosis remains the most effective way to increase survival rates. Conventional diagnostic techniques such as mammography and biopsy, although widely used, are often costly, time-consuming, and may lead to misinterpretation due to human error. With recent progress in artificial intelligence, machine learning has emerged as a powerful tool for improving the speed and accuracy of medical diagnosis. In this study, several supervised machine learning algorithms—including Logistic Regression, Support Vector Machine (SVM), Decision Tree, Random Forest, and K-Nearest Neighbor (KNN)—are applied to a benchmark breast cancer dataset for classification of tumors into benign and malignant categories. The models are evaluated using performance metrics such as accuracy, precision, recall, and F1 -score to ensure a comprehensive comparison. Experimental results reveal that ensemble-based methods, particularly the Random Forest algorithm, outperform single classifiers in terms of predictive accuracy. The findings highlight that machine learning can provide reliable decision support for healthcare professionals, assisting them in early detection and reducing the chances of misdiagnosis. Future research may explore deep learning models, hybrid approaches, and larger clinical datasets to further enhance the reliability and adaptability of automated breast cancer detection systems.

Keywords : Breast cancer, support vector machine, Predictive Modeling

CYBER SECURITY

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Abstract
The rapid advancement of technology has made cybersecurity an essential aspect of safeguarding our digital lives. This study explores the significance of cybersecurity, the diverse threats it encompasses, and the measures necessary to mitigate them. With cybercrime costs projected to reach $10 trillion annually by 2025, threats such as phishing, malware, ransomware, and DDoS attacks pose serious risks to individuals, businesses, and governments alike. Real-life cases, including the Colonial Pipeline and Equifax breaches, highlight the devastating consequences of inadequate security. Cybersecurity functions through multiple layers of defense—firewalls, antivirus, encryption, and user awareness—emphasizing the crucial role of human responsibility alongside technology. Best practices, such as using strong passwords, enabling two-factor authentication, updating devices, and safe mobile usage, serve as key strategies in prevention. Looking ahead, advancements like AI-powered security, Zero Trust Architecture, and evolving privacy laws will define the future of digital protection. Ultimately, cybersecurity is a shared responsibility where awareness, technology, and collaboration ensure resilience against ever-growing cyber threats.

Keywords: Cybersecurity, Cyber threats, Data protection, Ransomware, Digital safety

A COGNITIVE AI FRAMEWORK EMPLOYING SWARM INTELLIGENCE TO DETECT NETWORK TRAFFIC ANOMALIES

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Abstract
This paper provides an in-depth review of recent advancements and research in network anomaly detection, with a particular focus on integrating swarm intelligence and machine learning techniques. As cybersecurity threats grow increasingly sophisticated, traditional detection methods face challenges in maintaining effectiveness. Swarm intelligence, inspired by the collective behaviors of organisms such as ants, bees, and birds, presents promising approaches to enhance adaptability, robustness, and accuracy in identifying network anomalies. The study begins by covering the basics of network traffic analysis, common detection strategies, and the primary challenges within this field. It offers a thorough analysis of existing anomaly detection methods, including statistical techniques, traditional machine learning algorithms, deep learning models, and behavior-based approaches. Each method is evaluated based on its working principles, performance, benefits, and drawbacks. Special attention is given to hybrid detection frameworks that merge swarm intelligence algorithms—like Particle Swarm Optimization (PSO)—with machine learning to boost detection performance. These hybrid systems demonstrate improved accuracy, lower false positive rates, and better adaptability to changing network conditions. Quantitative comparisons of selected techniques are presented in tabular form to facilitate clear evaluation. The paper also discusses emerging trends such as automation, federated learning, and explainable AI, which are influencing the evolution of anomaly detection. Key challenges explored include data heterogeneity, evolving threat landscapes, interpretability, robustness, and privacy issues. The paper concludes by emphasizing the need for interdisciplinary approaches and a shift toward proactive, intelligent, and immune-inspired security frameworks that can effectively counter modern cyber threats.

Keywords: Pre-processing, Feature Extraction, Feature Selection, Classification, Swarm Intelligence, Particle Swarm Optimization, Machine Learning Algorithms.

APPLICATIONS OF FUZZY GRAPH THEORY TO SOCIAL NETWORK ANALYSIS

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Abstract
Social network analysis (SNA) is an interdisciplinary field that explores the structure and dynamics of social relationships. Traditional graph theory has been extensively applied to model such networks, but real-world social interactions often involve uncertainty, vagueness, and partial information that crisp graphs cannot effectively capture. Fuzzy graph theory, an extension of classical graph theory that incorporates fuzzy set concepts, provides a robust framework to model these uncertainties. This paper discusses the applications of fuzzy graph theory in social network analysis, focusing on relationship strength modeling, community detection, influence and trust analysis, decision-making, fake account detection, and information diffusion. By integrating fuzziness into network modeling, researchers and practitioners can gain more realistic and accurate insights into the behavior of complex social systems

Key words: Fuzzy graph theory, social network analysis, uncertainty modeling, community detection, information diffusion.

IMPACT OF AUGMENTED AND VIRTUAL REALITY ON CONSUMERBEHAVIOUR AND EXPERIENTIAL MARKETING

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Abstract
Augmented Reality (AR) and Virtual Reality (VR) are rapidly transforming consumer behaviour because it reshapes the way the consumers perceive, evaluate, and engage with products and services.AR and VR create an immersive and personalized experiences that influence both psychological and behavioural aspects of consumers impacting their decisions. The impacts of Augmented Reality (AR) in consumer behaviour includes the enhancement of pre-purchase confidenceby enabling virtual try-ons and real-world product visualization which reduces uncertainty and risk perception.VR, in contrast, delivers deeply engaging brand experiencessuch astest drives, virtual showroomsandtravel simulations. This fosters deeper consumer engagement.Combined, AR and VR support efficient product evaluation, lower cognitive effort, and elevate overall satisfaction.
Industry oriented applications like IKEA's AR-based furniture visualization, Sephora's AR try-on tools, Nike's VR showrooms, and Marriott's VR travel experiencesillustrate these impacts. These cases demonstrate measurable improvements in consumer trust, satisfaction, and long-term advocacy.AR and VR face challenges like high device costs, limited accessibility, user discomfort, and privacy concerns, requiring careful ethical regulation.
According to the study's findings, AR and VR are strategic facilitators of consumer engagement rather than auxiliary technologies that have the potential to change marketing from passive communication to participatory ecosystems.
Keywords: Augmented Reality (AR), Virtual Reality (VR), Consumer Behaviour (CB), Experiential Marketing (EM), Immersive Technologies (IT), Purchase Intention (PI), Artificial Intelligence (AI), Internet of Things (IoT), etc.,

QUANTUM CRYPTOGRAPHY IN IoT: THE ROLE OF QUANTUM KEY DISTRIBUTION

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Abstract
The exponential proliferation of Internet of Things (IoT) devices has introduced unprecedented security vulnerabilities in interconnected ecosystems. Conventional cryptographic mechanisms demonstrate significant limitations when confronting sophisticated multi-vector attacks and the emerging threat landscape posed by quantum computing capabilities. This comprehensive survey examines the integration of Quantum Key Distribution (QKD) protocols within IoT infrastructures, presenting a systematic analysis of current research trajectories, practical implementations, operational challenges, and future technological developments. Through rigorous examination of over 150 peer-reviewed publications spanning 2018-2025, we categorize existing QKD-enabled IoT frameworks and identify critical knowledge gaps in the field. Our findings reveal that hybrid QKD-classical cryptographic architectures demonstrate significant potential for real-world IoT deployments, while quantum-enabled edge computing gateways emerge as a promising architectural paradigm for achieving scalable, secure implementations across diverse IoT applications.

Keywords: Quantum Key Distribution (QKD), Internet of Things (IoT), Cybersecurity, Quantum Cryptography, Post-Quantum Security, Edge Computing, Quantum Networks

PARALLELIZED HEURISTIC APPROACHES TO MULTIPLE SEQUENCE ALIGNMENT OF LARGE-SCALE SEQUENCES

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Abstract
Multiple Sequence Alignment (MSA) is a basictechnique in bioinformatics, widely applied in evolutionary analysis, structural prediction and functional genomics. However, aligning large-scale biological sequences remains computationally intensive due to the exponential increase in data volume and complexity. This paper presents parallelized heuristic approaches to optimize MSA for large-scale datasets. By integrating progressive alignment with heuristic strategies and leveraging parallel computing frameworks, the proposed method significantly reduces execution time while maintaining high alignment accuracy. Performance evaluations on benchmark datasets demonstrate notable improvements in scalability, efficiency, and resource utilization compared to conventional algorithms. The results highlight the potential of parallelized heuristics to enable faster and more reliable MSA, thereby supporting advanced genomic and proteomic research in the big data era.
Keywords: Multiple Sequence Alignment (MSA), Parallel Computing, Heuristic Algorithms, Large-Scale Datasets, Bioinformatics, Scalability

OPTIMIZING ANFIS USING SIMULATED ANNEALING ALGORITHM FOR CLASSIFICATION OF MICROARRAY GENE EXPRESSION CANCER DATA

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Abstract

In the medical field, successful classification of microarray gene expression data is of major importance for cancer diagnosis. However, due to the profusion of genes number, the performance of classifying DNA microarray gene expression data using statistical algorithms is often limited. Recently, there has been an important increase in the studies on the utilization of artificial intelligence methods, for the purpose of classifying large-scale data. In this context, a hybrid approach based on the adaptive neuro-fuzzy inference system (ANFIS), the fuzzy c-means clustering (FCM), and the simulated annealing (SA) algorithm is proposed in this study. The proposed method is applied to classify five different cancer datasets (i.e., lung cancer, central nervous system cancer, brain cancer, endometrial cancer, and prostate cancer). The backpropagation algorithm, hybrid algorithm, genetic algorithm, and the other statistical methods such as Bayesian network, support vector machine, and J48 decision tree are used to compare the proposed approach's performance to other algorithms. The results show that the performance of training FCM-based ANFIS using SA algorithm for classifying all the cancer datasets becomes more successful with the average accuracy rate of 96.28% and the results of the other methods are also satisfactory. The proposed method gives more effective results than the others for classifying DNA microarray cancer gene expression data.
Keywords Fuzzy neural networks . Simulated annealing . Machine learning . Optimization . Gene expression

GENERATIVE AI IN HEALTHCARE: A COMPREHENSIVE ANALYSIS OF PRIVACY AND SECURITY IMPLICATIONS

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Abstract
As AI continues to revolutionize healthcare, understanding its applications becomes increasingly important. Generative AI models, such as GANs and LLMs, hold great potential for improving diagnostics, drug discovery, treatment plans, and patient care. However, their reliance on vast amounts of data raises concerns about the privacy and security of sensitive health information. This paper examines the role of generative AI in areas like medical diagnostics, drug development, virtual health assistants, and clinical decision support, while addressing the security and privacy risks throughout the AI lifecycle—data collection, model training, and implementation. The goal is to evaluate the current landscape of AI in healthcare, identify key challenges, and suggest ways to manage security and privacy concerns. The findings stress the importance of safeguarding these technologies to ensure their safe, effective use in healthcare settings. The study offers practical insights for organizations adopting generative AI and contributes to ongoing discussions about AI ethics, data privacy, and security challenges.

Keywords: Generative AI, GAN, LLM

HUMAN AGE AND GENDER PREDICTION USING DEEP NEURAL NETWORK ALGORITHM

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Abstract

The Project is about the prediction of gender and age of the human in real time. Natural differences vary in gender, as are the terms used to identify people by their age. Despite the importance of these factors in our daily lives, the machine's capability to measure facial pictures reliably and effectively comes as part of what is required for industrial applications. The use of a Deep Neural Networks (DNN) to predict gender and age is suggested for this paper. The growing call for of clever safety structures has stronger the call for the right identity and verification of a person. In this context, accurate estimation of age as well as proper identification of gender is highly significant. Therefore, in this work, we have implemented two separate methods with satisfactory runtime and efficiency to estimate both human age and gender using facial images. The upgrading of image pictures taken from the camera sources, from satellites, Aeroplan's, and the images caught in everyday lives is called picture processing. Processing of the image based on analysis undergoes many different techniques and calculations. Digital formed pictures need to be carefully imagined and studies. Our image processing-based method involves comparison of some features extracted from the post-processed facial snap shots of humans of numerous age stages accompanied through a few edge-detection procedures. After this process are completed, we used deep learning method for classification process. Our observe might offer similarly perception into the selection of suitable functions for the green and correct estimation of the age and the gender of a person.

BLOCKCHAIN AS A FRAMEWORK FOR TRUST, TRANSPARENCY, AND CYBER DEFENSE

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Abstract

The rapid expansion of digital infrastructures has increased the surface for cyberattacks, exposing vulnerabilities in centralized security models. Conventional mechanisms for data protection, identity verification, and intrusion detection often fail against advanced persistent threats, zero-day exploits, and insider attacks. Blockchain technology, originally designed for decentralized cryptocurrencies, has emerged as a transformative approach to cybersecurity due to its core properties of decentralization, immutability, transparency, and cryptographic trust. Leveraging distributed ledger technology (DLT), blockchain eliminates single points of failure, enforces consensus-driven data validation, and ensures tamper-resistance through cryptographic hashing and public–private key mechanisms. Applications of blockchain in cybersecurity are diverse: (i) Identity and Access Management (IAM), where decentralized identifiers enhance authentication without relying on vulnerable centralized databases; (ii) Data Integrity and Confidentiality, where blockchain ensures verifiable, immutable audit trails for sensitive records such as healthcare or financial data; (iii) Intrusion and Malware Detection, where blockchain-based collaborative threat intelligence sharing improves resilience against evolving attacks; and (iv) IoT Security, where lightweight blockchain protocols enable secure communication and device authentication in resource-constrained environments.

Keywords-Blockchain, Cybersecurity, Distributed Ledger Technology (DLT), Data Integrity, Identity and Access Management (IAM).

COGNITIVE ANOMALY PROFILING: A BIO-BEHAVIORAL DEFENSE SYSTEM FOR DIGITAL INTEGRITY

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Abstract
Artificial intelligence (AI) has become an essential tool for preventing identity theft and fraud on digital platforms by moving beyond traditional rule-based systems to dynamic, real-time threat detection. AI, particularly machine learning (ML), analyzes vast streams of data to build a baseline of "normal" user behavior, encompassing login patterns, transaction history, location data, and even behavioral biometrics like typing speed and mouse movements. Any significant deviation from this baseline triggers an alert, enabling systems to flag and block suspicious activity instantly, thus preventing fraudulent account takeovers, unauthorized transactions, and new account fraud. This AI-driven approach is highly effective at identifying sophisticated and previously unseen fraud schemes, including zero-day attacks and synthetic identity fraud, that static rules would miss. Techniques such as real-time anomaly detection and predictive analytics allow AI models to assess risk scores for each transaction in milliseconds, enabling platforms to request additional verification or block a fraudulent action before it can be completed. By continuously learning from new data and adating to emerging threats, AI provides a proactive, scalable, and highly accurate defense against a constantly evolving landscape of digital fraud.

Keywords: Artificial intelligence, Machine Learning, Real-Time Anomaly Detection, Synthetic Identity Fraud, Predictive Analytics.

AI BASED FRAUD DETECTION SYSTEM

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Abstract

Fraud has become a significant threat across various industries, including banking, e-commerce, insurance, and telecommunications. As digital transactions and online financial services expand, fraudsters continue to adopt more sophisticated methods to exploit system vulnerabilities. Traditional rule-based fraud detection systems, though previously effective, often struggle to adapt to new and evolving fraudulent patterns. Consequently, there is a growing demand for intelligent, adaptive systems capable of identifying and mitigating fraud in real-time. This paper proposes an Artificial Intelligence (AI)-based fraud detection system that leverages machine learning (ML) and deep learning (DL) techniques to detect suspicious activities with higher accuracy and reduced false positives. The proposed system integrates supervised and unsupervised machine learning models to analyze vast datasets comprising historical transaction records, user behavior patterns, and real-time activity streams. Algorithms such as Decision Trees, Random Forest, Support Vector Machines (SVM), and Neural Networks are utilized for classification tasks, while techniques like K-Means clustering and Autoencoders are applied for anomaly detection. These models are trained on labeled datasets containing known instances of fraudulent and legitimate transactions to learn the underlying patterns of deceitful behavior. One of the system's key features is its ability to continuously learn and adapt to new types of fraud through incremental learning and model retraining. The inclusion of Natural Language Processing (NLP) techniques also allows for the detection of fraud in textual data, such as customer reviews or support tickets. Additionally, a feedback mechanism is integrated into the system, enabling it to evolve based on user-reported cases of undetected fraud, thereby improving its predictive performance over time. The system architecture consists of a data ingestion layer, a pre-processing module for feature extraction and normalization, followed by model training and prediction components. A dashboard interface provides analysts with visual insights into detected anomalies, risk scores, and fraud trends. Real-time fraud detection is achieved using stream processing frameworks that allow for low-latency analysis and decision-making. Extensive evaluation of the AI-based system was conducted using benchmark datasets such as the IEEE-CIS Fraud Detection dataset and the European Credit Card dataset. The experimental results demonstrate a significant improvement in fraud detection rates and a notable reduction in false alarms compared to conventional systems. Performance metrics such as Precision, Recall, F1-score, and ROC-AUC are used to validate model efficacy. The AI-based fraud detection system presents a comprehensive and scalable solution to the challenges posed by modern fraudulent activities. By combining multiple AI techniques, the system enhances the reliability, adaptability, and efficiency of fraud detection mechanisms. Future work may include integration with block chain technology for immutable logging and the deployment of federated learning to ensure decentralized data privacy.

Keywords: Stream Processing, Predictive modelling, Anomaly detection, Model Adaptation, Explainable AI

SECURITY USING BIO-INSPIRED AND DEEP LEARNING TECHNIQUES

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Abstract

Intrusion Detection Systems (IDS) are designed to monitor and alert users about potential security threats, while Intrusion Prevention Systems (IPS) actively block such threats in real-time. The dynamic and distributed nature of cloud computing resources makes them particularly vulnerable to sophisticated cyber-attacks, necessitating advanced Intrusion Detection and Prevention Systems (IDPS). Conventional IDPS approaches often face challenges such as technical constraints, slow processing speeds, and limited adaptability to new and evolving attack techniques. This survey investigates the integration of bio-inspired algorithms and deep learning methods to improve the performance of IDPS in cloud environments. Bio-inspired techniques—like ant colony optimization and artificial immune systems—utilize natural processes such as swarm intelligence and genetic evolution to create adaptive and efficient detection models. When combined with deep learning architectures, including convolutional neural networks (CNNs) and recurrent neural networks (RNNs), these hybrid systems demonstrate strong capabilities in identifying complex patterns and anomalies within large-scale data. The study categorizes various bio-inspired and deep learning techniques and assesses their effectiveness in detecting advanced threats, including zero-day attacks. Key performance metrics such as detection accuracy, adaptability, and scalability are analyzed. The survey also discusses practical challenges and limitations encountered when implementing these methods in real-world cloud infrastructures. Overall, this research highlights the promising potential of combining bio-inspired intelligence with deep learning to build robust, intelligent IDPS frameworks that address the evolving security needs of contemporary cloud computing environments.

Keywords: CNN, RNN, Intrusion Detection, Neural Networks, Bio Inspired

THE RISING NEED FOR CYBERSECURITY IN AN INTERCONNECTED WORLD

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Abstract
In the modern digital era, cybersecurity has become a fundamental necessity for protecting individuals, organizations, and critical infrastructures from a growing array of cyber threats. As reliance on digital platforms such as online banking, e-commerce, cloud computing, and social media increases, so does the attack surface for malicious actors. Threats including ransomware, phishing, denial-of-service (DoS) attacks, and insider breaches have become more frequent and sophisticated, impacting sectors like finance, healthcare, and government. While traditional security measures such as firewalls and antivirus software provide basic protection, they are no longer adequate in isolation. Advanced technologies, including artificial intelligence (AI), machine learning (ML), blockchain, and quantum cryptography, are being leveraged to enhance threat detection and data protection. At the same time, encryption and multi-factor authentication (MFA) remain essential components of modern security architectures. Despite these advancements, challenges persist—such as the shortage of skilled cybersecurity professionals, the vulnerability of Internet of Things (IoT) devices, and the ongoing tension between privacy and security. This paper emphasizes that cybersecurity is not merely a technical issue but a complex social, legal, and ethical challenge. The adoption of Zero Trust models, strengthened international cooperation, and widespread public education are essential to ensuring a secure and resilient digital future.
Keywords Cybersecurity, artificial intelligence (AI), machine learning (ML), ransomware, Zero Trust architecture, blockchain, quantum cryptography, Internet of Things (IoT), data privacy, cybercrime.

PARTICLE SWARM OPTIMIZATION FOR BRAIN TUMOR TISSUE SEGMENTATION

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Abstract
Automatic Detection of brain tumor accurately is a difficult task due to the variance and the complexity of the tumor .because high degree intensity and textural similarity arise between normal and tumor area. MR has become a particularly useful medical diagnostic tool for cases involving soft tissues, such as in brain imaging. The aim of our research is to develop an effective algorithm for the segmentation of the MRI images. In this study particle swarm optimization is proposed to automatically detect tumor in 3D magnetic resonance images. The proposed system consists of two steps. In the first step preprocessing and enhancement is performed using tracking algorithms. These are used to preprocessing to suppress artifacts, remove unwanted skull portions from brain MRI and these images are enhanced using weighted median filter. In the Second stage, PSO is applied to segment tumor areas from the magnetic resonance image. The performance of the PSO algorithm is compared with the existing methods. The proposed algorithms are tested with real patients MRI. Results obtained with a brain MRI indicate that this method can improve the sensitivity and reliability of the systems for automated detection of brain tumors .The algorithms are tested on 21 pairs of MRI from real patient's brain database and evaluate the performance of the proposed method.

Keywords*:* Brain Tumor, Magnetic Resonance Image (MRI), Segmentation, Meta heuristic algorithm, ParticleSwarm Optimization (PSO).

CONSUMER ATTITUDE TOWARDS SUSTAINABLE BUSINESS AND MARKETING

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Abstract
Sustainable business and marketing practices have become essential in addressing environmental and social challenges while ensuring long-term profitability. This research explores how businesses integrate sustainability into their marketing strategies to attract conscious consumers and build brand loyalty. It highlights the role of eco-friendly production, ethical branding, and responsible consumption in shaping market trends. The study also examines consumer awareness and willingness to pay for sustainable products. By linking corporate responsibility with competitive advantage, the paper emphasizes the need for innovative, transparent, and value-driven approaches in sustainable marketing.
Keywords: Sustainability, Green Marketing, Consumer Awareness, Ethical Branding, Corporate Responsibility

BANKING AND INSURANCE

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Abstract
Banking and insurance are two foundational pillars of the modern financial system that significantly contribute to the economic growth and development of a country. Banks primarily function as financial intermediaries, mobilizing public savings and channeling them into productive investments through loans and advances. They offer various services such as accepting deposits, issuing credit, facilitating fund transfers, and supporting trade and commerce. Insurance, on the other hand, provides financial protection against risks such as death, illness, accidents, or property damage. It ensures stability by compensating for losses and encourages individuals and businesses to take calculated risks. Both sectors work towards increasing financial inclusion, supporting small and large enterprises, and ensuring long-term economic stability. While banking focuses on wealth creation and financial transactions, insurance centers around risk management and security. Their services are regulated by specific authorities to ensure transparency, trust, and stability in the financial markets. The synergy between banking and insurance has given rise to new models like banc assurance. This abstract explores their individual roles, differences, and how they collectively support the financial well-being of society.

Key Words: Financial System, Risk Management, Economic Development, Savings and Investment.

BLOCK CHAIN IN ACCOUNTING

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Abstract
Block chain technology is revolutionizing the accounting industry by providing a secure, transparent, and decentralized method for recording financial transactions. Unlike traditional accounting systems, block chain offers an immutable ledger where every transaction is recorded chronologically and cannot be altered or deleted. This ensures higher accuracy and reduces the risk of fraud and errors. By using block chain, accountants can verify transactions in real-time, improving the efficiency of audits and compliance processes. Smart contracts automate routine accounting tasks, reducing manual intervention and enhancing productivity. Block chain also promotes transparency between parties, fostering greater trust in financial reporting. Despite its advantages, the adoption of block chain faces challenges such as regulatory uncertainties, technical complexity, and scalability issues. However, as technology matures, blockchain is expected to become an integral part of accounting practices, transforming how financial data is recorded, verified, and reported. This paper explores the impact of block chain on accounting, highlighting both opportunities and challenges in its implementation

Key Words: Block chain, Accounting, Transparency, Smart Contracts, Audit ability

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
Social media marketing has become a powerful tool for businesses to connect with their target audiences, build brand awareness, and drive sales. Platforms like Instagram, Facebook, Twitter, and TikTok enable companies to reach millions of users instantly through engaging content and targeted advertising. Influencers—individuals with large and loyal followings—play a crucial role by endorsing products and services, which can significantly impact consumer behavior and purchase decisions. This form of marketing leverages the trust and authenticity that influencers hold with their audience, making promotions more effective than traditional advertising. Social media marketing also allows for real-time feedback and interaction, fostering a two-way communication channel between brands and consumers. However, challenges like influencer fraud, changing algorithms, and content saturation require marketers to stay innovative. This paper explores the strategies, benefits, and challenges of social media marketing and the influential role of social media personalities in shaping consumer preferences.

Key Words: Social Media Marketing, Influencers, Brand Awareness, Consumer Behavior, Digital Advertising

DIGITAL MARKETING TRENDS AND STRATEGIES

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Abstract
In today's hyper-connected world, digital marketing has emerged as the cornerstone of business growth and customer engagement. This presentation explores the latest trends shaping the digital marketing landscape and the strategies organizations must adopt to remain competitive. Key areas include the rise of artificial intelligence in content personalization, the increasing dominance of short-form video, the role of data-driven insights in consumer behavior analysis, and the growing importance of ethical and sustainable branding. By examining real-world examples and emerging tools, this session highlights how businesses can integrate innovative approaches such as influencer collaborations and search engine optimization to maximize impact. Attendees will gain actionable insights into designing adaptable, consumer-centric marketing strategies that align with evolving digital ecosystems and future market demand. Digital marketing is no longer just about visibility-it about creating experiences that inspire loyalty, spark conversations, and drive measurable impact. This presentation delves into the evolving trends and strategies shaping the future of digital engagement. It examines how storytelling and brand communities are becoming as powerful as algorithms, how micro-moments influence consumer decisions, and why personalization at scale is now the benchmark for success.
Keywords: Emerging digital trends like AI, Short -form video, voice search, while authenticity, personalization.

AI FOR BUSINESS INNOVATION

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Abstract
Artificial Intelligence (AI) is transforming how businesses create value, streamline operations, and engage with customers. From predictive analytics to natural language processing, AI driven technologies empower organizations to make faster, data-based decisions and respond quickly to changing market conditions. Beyond operational efficiency, AI fuels innovation in product development, customer experience, and service delivery. Intelligent automation, chat bots, and personalized recommendations open new opportunities for competitive advantage and customer satisfaction. Real-world case studies reveal how these applications drive measurable business growth. However, adopting AI also raises ethical and strategic considerations. Responsible implementation requires strong data governance, transparency, and continuous workforce up skilling. By addressing these challenges, businesses can leverage AI to achieve sustainable growth, enhance productivity, and reimagine traditional models for the digital era.

Key Words: AI, Business Innovation, Machine Learning, Automation, Digital Transformation

BANKING AND INSURANCE

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Abstract
Banking and Insurance are more than financial systems; they are part of our everyday lives and the foundation of a stable economy. Whether it is a simple savings account, a loan to start a small business, or an insurance policy that protects a family during difficult times, these services influence how people plan, live, and grow. Banks provide opportunities by channeling savings into investments, creating access to credit, and supporting both personal and business needs. Insurance, on the other hand, gives people confidence to face uncertainties, offering security during illness, accidents, or unexpected losses. When combined, these sectors create trust, stability, and opportunities for sustainable progress. In today's world, technology is transforming the way people use banking and insurance. Mobile banking, cashless transactions, and digital insurance services are making access easier, faster, and more convenient. Yet, these changes also bring new challenges. Cybersecurity risks, digital illiteracy, and gaps in regulation often limit the benefits, especially in rural and underserved areas where awareness and access remain low. At the same time, customers expect more personalized, transparent, and reliable services, pushing banks and insurers to adapt quickly. This paper looks at how banking and insurance are growing together, how digital innovation is reshaping customer experiences, and why financial inclusion is still a pressing need. It highlights opportunities such as integrated services, sustainable financing, and policy support that can make financial systems more resilient. Ultimately, the study argues that the true strength of banking and insurance lies not only in numbers or profits, but in their ability to empower people, reduce vulnerabilities, and build a more secure and Inclusive Future.

Keywords: Banking, Insurance, Financial Inclusion, Digital Transformation, Risk Management, Sustainable Development

SOCIAL MEDIA MARKETING

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Abstract
This paper explores the transformative shifts in social media marketing and influence as of 2025, highlighting strategies for brands to thrive in an increasingly complex digital landscape. With over two-thirds of the global population actively engaged on multiple platforms, social media has become the primary channel for discovery, engagement, and commerce. The study emphasizes the growing importance of authenticity, transparency, and trust in overcoming misinformation and user fatigue. It also underscores the evolution of influencer marketing, where engagement and credibility outweigh follower count, and AI tools facilitate precision in content creation and influencer alignment. The dominance of short-form video, the rise of AI-driven personalization, and the seamless integration of social commerce redefine how brands connect with consumers. Furthermore, the shift toward social SEO, private messaging channels, and serialized content reflects emerging user behaviours. Ultimately, brands that adopt data-driven strategies, foster authentic storytelling, and integrate AI with commerce will gain lasting influence and measurable business impact in the new digital frontier.

Keywords: Authenticity**,** Influencer Marketing, AI-Driven Personalization**,** Social Commerce, Digital Engagement.

AI FOR BUSINESS INNOVATION

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Abstract
Artificial Intelligence (AI) is redefining the landscape of business innovation by enabling organizations to reimagine processes, create smarter products, and develop agile strategies in competitive markets. Unlike traditional technologies, AI integrates learning and adaptability, allowing businesses to continuously optimize performance while anticipating future trends. From intelligent automation in supply chains to data-driven insights in strategic planning, AI fosters efficiency, scalability, and personalized customer engagement. Its role in product design and service delivery enhances innovation cycles, enabling firms to move rapidly from ideation to market deployment. However, the integration of AI also raises critical questions about ethics, transparency, and the evolving role of human expertise. This paper explores the dual nature of AI as both a technological enabler and a disruptive force, analyzing how businesses can leverage AI responsibly to drive sustainable innovation and long-term growth in a digitally transforming economy.

Keywords: AI, Innovation, Automation, Data-Driven Strategy, Digital Transformation

CORPORATE SOCIAL RESPONSIBILITY (CSR)

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Abstract
Corporate Social Responsibility (CSR) has emerged as a vital strategic approach in contemporary business, emphasizing the integration of ethical practices, social welfare, and environmental sustainability into organizational operations. Beyond profit-making, companies are increasingly expected to contribute positively to society by addressing issues such as climate change, labor rights, and community development. CSR not only strengthens corporate reputation but also fosters stakeholder trust, employee engagement, and long-term competitiveness. With growing global awareness, regulatory pressures, and consumer activism, CSR has shifted from being a voluntary philanthropic activity to a fundamental component of business strategy. Effective CSR initiatives encompass environmental protection through sustainable resource management, ethical labor practices, responsible supply chains, and investments in education and healthcare for underprivileged communities. While the benefits are significant, challenges persist in ensuring transparency, avoiding "greenwashing," and balancing shareholder expectations with societal demands. Moreover, the impact of CSR is often evaluated not only in financial terms but also through social and environmental outcomes, making measurement complex yet crucial. This paper explores the evolving role of CSR in business, analyzing its benefits, challenges, and future potential as a driver of responsible growth in a globalized and sustainability-driven marketplace.
Keywords: Corporate Social Responsibility (CSR), Sustainability, Stakeholder Trust, Ethical Practices, Community Development, Green washing

AI FOR BUSINESS INNOVATION

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Abstract
Artificial Intelligence (AI) has emerged as a transformative force, driving innovation across diverse business sectors. By leveraging machine learning, natural language processing, robotics, and predictive analytics, organizations are reshaping traditional business models and creating new value propositions. AI enables businesses to enhance decision-making, streamline operations, personalize customer experiences, and develop data-driven strategies for growth. Furthermore, it fosters innovation by enabling predictive insights, automation of complex processes, and the design of intelligent products and services. However, challenges such as ethical considerations, data privacy, and skill gaps remain critical to sustainable adoption. This paper explores the role of AI in business innovation, its applications across industries, potential benefits, and the barriers that organizations must overcome to maximize its impact in the evolving digital economy.
Keywords: Artificial Intelligence, Business Innovation, Machine Learning, Predictive Analytics, Digital Transformation, Automation, Customer Experience, Business Strategy.

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
Social media has become a dominant force in the contemporary digital economy, redefining marketing practices and consumer engagement. Social media marketing (SMM) refers to the strategic use of platforms such as Facebook, Instagram, LinkedIn, and YouTube to disseminate promotional content, foster interaction, and enhance brand equity. Unlike traditional one-way communication models, SMM emphasizes interactivity, immediacy, and personalization, thereby facilitating stronger consumer–brand relationships. Central to this discourse is the concept of social influence, wherein individuals—particularly influencers and opinion leaders-play a pivotal role in shaping consumer attitudes, behaviours, and purchase intentions. The rise of influencer marketing demonstrates a paradigm shift from corporate-controlled messaging to peer-driven credibility, with trust, authenticity, and relatability emerging as critical determinants of persuasion. Furthermore, algorithmic targeting and big data analytics have amplified the precision and effectiveness of campaigns, enabling organizations to reach segmented audiences with greater accuracy. Despite these opportunities, challenges persist, including content oversaturation, ethical concerns related to transparency, and the potential for consumer scepticism. This paper argues that social media marketing and influence represent an evolving field at the intersection of communication, technology, and consumer psychology, demanding continuous scholarly exploration to assess its long-term implications for businesses and society.

Keywords: Social Media Marketing, Brand Engagement, Online Communication, Marketing Strategy, Consumer Psychology.

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
In the contemporary digital landscape, social media has transformed from a platform for social interaction into a powerful marketing tool. This paper investigates the multifaceted impact of social media marketing (SMM) on consumer behavior and its influence on purchase decisions. With billions of users worldwide, social media platforms provide an unprecedented opportunity for brands to connect with their target audience, build brand awareness, and drive engagement. The research examines how brand-consumer interactions on social media, such as comments, likes, and shares, contribute to brand loyalty and trust. Furthermore, it analyzes the credibility and impact of social media influencers as a form of social proof, and how their endorsements shape consumer perceptions and purchase intentions. The paper also addresses the challenges and ethical considerations of SMM, such as data privacy concerns, the constant evolution of platform algorithms, and the need for authenticity in marketing communications.The findings of this paper contribute to a deeper understanding of the dynamics between social media marketing and consumer psychology. The insights are valuable for marketers seeking to develop effective and ethical SMM strategies and for businesses aiming to thrive in the competitive digital era.
Keywords: Social Media Marketing - Consumer Behavior - Influencer Marketing Digital Marketing -Purchase Intention -Brand Loyalty -User-Generated Content.

GLOBAL BUSINESS AND CROSS - CULTURAL MANAGEMENT

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Abstract
Globalization has fostered an interconnected business environment where success is increasingly contingent upon the strategic integration of cross-cultural management. This paper examines the critical interplay between global business imperatives and cultural dynamics, arguing that cultural intelligence is a strategic imperative for achieving organizational effectiveness and competitive advantage in international markets. It synthesizes key theoretical frameworks, such as Hofstede's cultural dimensions and theories on intercultural communication, to analyze how cultural variations influence workplace dynamics, leadership styles, and business practices within multinational corporations. The analysis identifies common challenges, including communication barriers and conflicting business ethics, while highlighting effective strategies for leveraging cultural diversity as a source of innovation and organizational resilience. Based on contemporary research and case studies, the findings demonstrate that proactive cross-cultural management not only mitigates risks but also enhances team cohesion, communication efficiency, and overall performance. This study provides valuable insights for organizations seeking to thrive and build a sustainable global presence in an increasingly multicultural world.

Keywords: Global Business, Cross Culture Management, Cultural Intelligence, Intercultural Communication, Multinational Corporations (Mncs), Global Strategy, International Expansion.

DIGITAL MARKETING TRENDS AND STRATERGIES

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Abstract
In today's fast-paced digital environment, businesses must continuously adapt to emerging marketing trends and technologies to remain competitive and effectively engage their target audiences. Digital marketing has evolved beyond traditional methods, incorporating advanced tools such as artificial intelligence (AI), machine learning, big data analytics, and automation to personalize customer experiences. This paper explores key digital marketing trends, including the growth of influencer marketing, short-form video content, voice search optimization, and the increasing emphasis on privacy and data protection. Additionally, it highlights the significance of omni channel strategies, mobile-first marketing, and content-driven engagement in reaching consumers across diverse platforms.

With consumer behaviour shifting rapidly, data-driven insights are crucial in crafting targeted campaigns that resonate with specific audiences. The paper also examines strategi c approaches to building brand loyalty, improving conversion rates, and enhancing customer retention through tailored messaging and real-time interaction. Case studies and industry examples are used to illustrate how leading brands successfully leverage digital channels to achieve measurable outcomes. The research underscores the importance of staying agile and innovative in a dynamic digital landscape and offers practical recommendations for marketers to navigate challenges and seize new opportunities in the ever-evolving digital marketing ecosystem.

Keywords: Consumer behaviour, Brand loyalty, channel strategies

BLOCK CHAIN ACCOUNTING

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Abstract
This paper explores the evolving landscape of accounting standards and their impact on financial reporting accuracy and transparency. With increasing complexity in global business transactions, the role of frameworks such as IFRS and GAAP has become more critical than ever. The study examines how recent updates in accounting principles affect the recognition, measurement, and disclosure of financial information. Through a comparative analysis of corporate financial statements and expert interviews, the paper highlights the challenges faced by practitioners in implementing new standards, and the implications for stakeholders' decision-making. The findings suggest that while advanced standards improve comparability and reliability, they also necessitate enhanced training and system upgrades. The paper concludes with recommendations for improving compliance and suggests policy-level changes to bridge the gap between theoretical frameworks and practical applications in financial reporting.

Keywords: Financial Reporting - Accounting Standards – IFRS – GAAP – Transparency – Compliance - Financial Statements - Corporate Governance - Stakeholder Decision-Making - Regulatory Framework.

BANKING AND INSURANCE SECTOR CURRENT TRENDS

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Abstract

The insurance and banking sector jointly drive the engine of modern economies by facilitating capital formation, risk management, and resource allocation. Banking institutions provide the structural foundation for channeling savings into productive investments, enabling entrepreneurs, industries, and consumers to access a diverse array of financial services.. The interplay between these sectors significantly impacts economic resilience, development, and the achievement of broader financial inclusion goals.Advancements in technology, regulatory reforms, and the proliferation of innovative products have fueled rapid expansion and diversification within both industries. The emergence of digital banking, fintech companies, and the integration of online insurance products have widened access, especially among underserved populations, supporting the drive for inclusive economic growth. New models such as bancassurance demonstrate how collaborative partnerships between banks and insurers can create more comprehensive solutions and increase market outreach. Both sectors, however, face persistent challenges—ranging from cyber risks, increased regulatory scrutiny, and complex compliance demands to evolving client expectations and global market volatility.

Research highlights the strong relationship between sectoral development and overall economic growth, with banking and insurance moving in tandem to fortify financial stability and act as conduits for social welfare initiatives. Sector trends indicate a growing emphasis on transformative leadership, customer-centric innovation, and robust governance frameworks to tackle emerging risks and maintain competitiveness. In conclusion, the insurance and banking sector stands as a cornerstone for economic progress, social protection, and the democratization of financial opportunities. Their continued evolution and strategic integration are vital to safeguarding financial well-being and enabling the achievement of development objectives in a complex and fast-changing global environment

ARTIFICIAL INTELLIGENCE AS A DRIVEN OF BUSINESS INNOVATION

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Abstract
Artificial Intelligence is widely recognized as the most significant technological development of the 21st century. From self-driving cars to voice-activated assistants, AI is no longer a futuristic concept but an active component of daily life and business strategy. Its role in innovation is particularly important because businesses operate in an environment marked by uncertainty, competition, and rapid technological shifts.The ability to adapt and innovate has become a critical determinant of survival. AI contributes to this adaptability by enabling businesses to analyze data, forecast market changes, and develop products and services aligned with evolving consumer needs. Yet, the impact of AI is not uniform. While global corporations like Google, Amazon, and Tesla exploit AI to build entire ecosystems of innovation, small and medium-sized enterprises often find themselves constrained by financial and technological limitations. This paper elaborates on AI's impact on business innovation by moving beyond descriptive accounts. It evaluates its real contribution, discusses the challenges it introduces, and critically explores whether AI is a sustainable enabler of long-term competitiveness.

Keywords: AI, Virtual Assistant, Data Analysis

BIOSCIENCE TEXTILE

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Abstract
The integration of bioscience and textile technology has led to the emergence of bioscience textiles an innovative interdisciplinary field focused on the development of sustainable, functional, and health-promoting textile materials. These textiles utilize biological principles, natural fibers, and biocompatible materials to address challenges in healthcare, environmental sustainability, and advanced material performance. Recent advancements include the use of microbial cellulose, enzymatic processing, biodegradable polymers, and smart textiles embedded with biosensors for medical diagnostics and monitoring. This paper explores current innovations in bioscience textiles, emphasizing their potential in reducing environmental impact, enhancing human health, and creating next-generation functional fabrics. The growing intersection of biotechnology and textile engineering is poised to transform the textile industry, offering eco-friendly and intelligent solutions tailored for modern global needs.

Key Words: Biotechnology, Sustainability, Biological Processes, Materials Science, And Applications, Such As: Enzymes Biotechnology, Sustainability, Biological Processes, Materials Science, And Applications, Such As: Enzymes, Bio fabrication, Bio-Based Materials

BANKING AND INSURANCE:BUILDING TRUST, ENSURING SECURITYAND EMPOWERING LIVES

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Abstract

The banking and insurance sectors are thet win pillars of financial stability in any economy, driving growth, security, and trust. Banking provides the foundation for capital mobilization, credit creation, and digital financial inclusion, while insurance safeguards individuals and businesses against risks, ensuring resilience in times of uncertainty. Together, they not only support economic development but also empower individuals with financial confidence and security. In today's rapidly evolving landscape, technological advancements such as digital banking, fintech innovations, and insurance tech are reshaping the customer experience, making financial services more accessible, transparent, and efficient. At the same time, regulatory frameworks and risk management practices are becoming crucial in balancing growth with stability. This paper explores the dynamic interrelationship between banking and insurance, highlighting their role in strengthening financial literacy, promoting inclusive growth, and fostering trust in the economy. By analyzing emerging trends, opportunities, and challenges, the study emphasizes the importance of innovation, integration, and customer-centric approaches for the future of these industries. Ultimately, the synergy between banking and insurance is not just about financial services it is about building a secure, sustainable, and inclusive economic ecosystem for all.

Keywords: Banking, Insurance, Financial Inclusion, Risk Management, Digital Transformation, FinTech, Economic Growth, Sustainability.

REDEFINING DIGITAL TRANSFORMATION, SUSTAINABILITY, AND GLOBAL INTEGRATION

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Abstract
Commerce and management are integral disciplines that contribute significantly to business growth and economic development. Commerce focuses on the systematic exchange of goods and services, covering vital areas such as trade, finance, banking, accounting, marketing, and e-commerce. It helps in understanding market trends, consumer needs, and efficient resource utilization. Management, on the other hand, involves planning, organizing, leading, and controlling resources to achieve organizational objectives effectively. It emphasizes decision-making, strategic planning, leadership, and human resource management, ensuring smooth business operations and long-term sustainability. Together, commerce and management provide a holistic approach to running businesses successfully in competitive markets. They promote innovation, enhance productivity, and create value for stakeholders, making them essential for entrepreneurship, corporate success, and economic growth. These disciplines equip individuals with critical knowledge and skills needed for effective decision-making and business excellence in a globalized economy.

Keywords: Commerce, Management, Trade, Finance, Marketing, Leadership, Strategy, Economy, Entrepreneurship, Growth

GLOBAL BUSINESS AND CROSS CULTURAL MANAGEMENT

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Abstract

In an era of globalization, businesses increasingly operate across diverse cultural, social, and economic environments. Global business success depends not only on financial strategies but also on the ability to understand, respect, and manage cultural differences. This paper explores the significance of cross-cultural management in shaping effective global business practices. It emphasizes how cultural values, communication styles, negotiation patterns, and leadership approaches vary across countries and directly influence organizational performance. The study highlights challenges such as cultural misunderstandings, conflicts, and adaptation issues, while also identifying strategies for building cultural intelligence, fostering inclusivity, and promoting global teamwork. Case examples from multinational corporations demonstrate how cross-cultural competence contributes to innovation, stronger partnerships, and sustainable competitive advantage. The paper concludes that effective cross-cultural management is no longer optional but essential for organizations seeking growth and resilience in the global marketplace.

Keywords: Global Business, Cross-Cultural Management, Cultural Intelligence, International Trade, Multinational Corporations, Communication, Leadership, Globalization, Diversity, Competitive Advantage.

IMPORTANCE OF CORPORATE IN SOCIAL RESPONSIBILITY

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Abstract
Corporate social responsibility (CSR) is a self-regulating business model that helps a company be socially accountable to itself, its stakeholders, and the public. By practicing CSR, also called corporate citizenship, companies are aware of how they impact , economic, social, and environmental ones in the society. Engaging in CSR also means a company operates in ways that enhance society and the environment instead of contributing negatively to society. CSR can help improve society and promote a positive brand image for companies.
Keywords: Impacts in environment, ethical management, responsibilities and financial management, Benefits of CSR

AI FOR BUSINESS INNOVATION

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Abstract
The accelerating pace of digital transformation has intensified the demand for innovation in global business ecosystems. Traditional innovation models often fall short in addressing the complexity, data intensity, and unpredictability of contemporary markets. In this environment, Artificial Intelligence (AI) has emerged as a transformative enabler of business innovation, extending beyond automation to strategic value creation.
Through advanced techniques such as machine learning, natural language processing, computer vision, and generative algorithms, AI enables organizations to extract actionable insights from big data, anticipate market trends, personalize consumer experiences, and optimize value chains. These capabilities drive the creation of adaptive strategies, data-driven products, and novel business models that strengthen competitiveness on a global scale.However, widespread AI adoption introduces challenges involving ethical governance, transparency, workforce reskilling, privacy, and regulatory compliance. Addressing these concerns requires a responsible innovation framework that balances technological progress with human-centric values. This paper examines AI's evolving role as both an enhancer of efficiency and a disruptor of traditional business paradigms. Through cross-industry case studies and trend analysis, it highlights how AI can reshape competitive landscapes, unlock sustainable growth opportunities, and advance the development of intelligent enterprises.
Keywords: Artificial Intelligence, Business Innovation, Digital Transformation, Machine Learning, Predictive Analytics, Automation, Ethical AI, Global Competitiveness

REDEFINING DIGITAL TRANSFORMATION, SUSTAINABILITY, AND GLOBAL INTEGRATION

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Abstract

Commerce and management are essential disciplines that contribute to the growth and development of businesses and economies worldwide. Commerce primarily deals with the exchange of goods and services, covering important areas such as trade, finance, banking, marketing, accounting, and e-commerce. It focuses on understanding how businesses operate within markets and how resources are utilized to meet consumer demand efficiently. Management involves planning, organizing, directing, and controlling resources to achieve organizational goals. It emphasizes leadership, decision-making, strategic management, and human resource development to improve productivity and ensure sustainability. Together, commerce and management provide a comprehensive framework for understanding economic activities, formulating effective business strategies, and adapting to the challenges of globalization and technological advancement. These fields also prepare individuals for careers in entrepreneurship, corporate management, and public administration, enabling them to contribute to economic growth, innovation, and social development. In an increasingly competitive world, the integration of commerce and management education equips students with analytical, managerial, and problem-solving skills required to face dynamic business environments.

Keywords: Commerce, Management, Trade, Finance, Marketing, Planning, Leadership, Decision-Making, Globalization, Entrepreneurship, Economic Growth.

REDEFINING COMMERCE AND MANAGEMENT: DIGITAL TRANSFORMATION, SUSTAINABILITY, AND GLOBAL INTEGRATION

S. Kanika
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Abstract
Commerce and Management are evolving rapidly with the integration of technology, sustainability, and global strategies. Digital marketing trends and social media influence are reshaping customer engagement, while Artificial Intelligence drives business innovation through data-driven insights and automation. Block chain applications in accounting, auditing, banking, and insurance enhance transparency and trust in financial systems. At the same time, sustainable business practices and corporate social responsibility (CSR) emphasize ethical growth and environmental responsibility. Economic stability continues to depend on effective monetary and fiscal policies. With globalization, cross-cultural management has become vital for managing diverse teams and international markets. Together, these developments highlight how digital transformation, ethical practices, and global integration are redefining modern commerce and management.
Key Words: Digital Marketing AI, Block chain & Finance, Sustainable Business CSR, Monetary Fiscal Policy, Globalization Cross-Cultural Management, Digital Transformation Innovation.

THE ROLE OF SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
Social media has become one of the most effective tools for modern marketing. It allows businesses and individuals to promote products, services, and ideas directly to a wide audience through platforms like Facebook, Instagram, Twitter, and YouTube. Social media marketing helps brands increase awareness, build customer relationships, and create two-way communication with users. At the same time, influencers-people with strong online followings-play a key role in shaping opinions and encouraging consumer choices. This project studies how social media marketing and influence work together to impact audience behavior, brand popularity, and business growth. It also highlights the opportunities, challenges, and future possibilities of using social media for promotion.
Keywords: Social Media, Marketing, Influence, Brand Awareness, Consumers, Business Growth, Online Platforms.

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
Social media marketing and influence represent a dynamic and evolving paradigm in modern business, fundamentally reshaping how brands connect with their audiences. At its core, this approach leverages the vast reach and interactive nature of social platforms to build brand awareness, foster community, and drive conversions. The abstract concept revolves around the strategic utilization of digital channels, content creation, and data analytic to craft targeted campaigns. A key component is the rise of influence marketing, where individuals with established credibility and a dedicated following are leveraged to promote products or services. This relies on the psychological principle of social proof, as consumers trust recommendations from people they admire or relate to. The effectiveness of these strategies is not just in reach, but in the ability to create authentic engagement and build long-term customer loyalty. The shift from traditional one-way advertising to a more conversational, two-way dialogue is central, necessitating a deep understanding of audience behavior and the ability to adapt to a rapidly changing digital landscape. Ultimately, social media marketing and influence are about more than just selling; they are about building relationships, shaping perceptions, and creating a powerful, interconnected brand narrative.
Keywords: Social Media Strategy, Content calendar, Audience Targeting, Buyer Persona, Content pillars, Brand voice, Social Listening.

BANKING AND INSURANCE

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Abstract

Banking and insurance are integral components of the financial sector, playing a crucial role in ensuring economic stability and growth. Banks facilitate savings, investments, and credit distribution, thereby supporting business expansion and individual financial needs. Insurance, on the other hand, provides protection against risks and uncertainties, promoting financial security and confidence among individuals and institutions. Together, these sectors not only mobilize resources but also enhance financial inclusion, enabling access to essential services for all sections of society. In recent years, rapid technological advancements such as digital banking, online insurance platforms, and fintech innovations have transformed the way services are delivered, making them more efficient and customer-centric. However, challenges remain in terms of regulatory compliance, cybersecurity, and financial literacy. This paper highlights the importance of banking and insurance, their interrelationship, emerging trends, and the need for integrated strategies to build a resilient and inclusive financial ecosystem.

DIGITAL MARKETING TRENDS AND STRATEGIES

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Abstract
Digital marketing has become an essential component of modern business operations, enabling organizations to connect with global audiences, build brand identity, and drive customer engagement in real time. In today's fast-changing technological environment, digital marketing trends continue to evolve, shaped by innovations, consumer behavior, and data-driven insights. The most prominent trends include artificial intelligence (AI) integration, voice search optimization, video-based marketing, personalized content strategies, and the rise of influencer marketing. Additionally, social commerce and interactive content are transforming customer journeys by making online experiences more immersive and engaging. Effective strategies now focus on creating value-driven content, utilizing search engine optimization (SEO) and search engine marketing (SEM) for visibility, leveraging social media platforms for community building, and adopting automation tools for targeted campaigns. Furthermore, the use of data analytics and customer relationship management (CRM) systems ensures precision in segmenting markets and delivering personalized experiences. Sustainability and ethical marketing are also gaining importance, as consumers increasingly prefer brands that align with social responsibility. Overall, digital marketing strategies must remain adaptive, customer-centric, and data-informed to stay relevant in an environment influenced by emerging technologies and shifting consumer expectations. Businesses that effectively combine these trends with strategic planning are more likely to achieve brand loyalty, competitive advantage, and long-term growth in the digital economy

KeyWords : Digital Marketing, Online Marketing, Marketing Strategies

SOCIAL MEDIA MARKETING & INFLUENCE

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Abstract

Social media marketing has emerged as a powerful tool in the digital age, revolutionizing the way businesses connect with consumers. Through platforms like Instagram, Facebook, X (formerly Twitter), TikTok, and YouTube, brands can reach targeted audiences, build communities, and drive engagement in real-time. A key component of this strategy is influencer marketing, where individuals with large or niche followings promote products or services, leveraging their credibility and personal connection with their audience. This combination of content creation, data-driven advertising, and influencer partnerships has significantly impacted consumer behavior and brand perception. As algorithms evolve and user expectations shift, businesses must continuously adapt their strategies to maintain relevance and trust. This abstract explores the role of social media in modern marketing, emphasizing the growing influence of digital creators in shaping purchasing decisions and brand loyalty.

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract

Social media marketing has become a vital strategy for businesses to reach and influence consumers in the digital era. Platforms such as Facebook, Instagram, Twitter, and Tik Tok enable organizations to share content, run targeted campaigns, and collaborate with influencers to strengthen brand presence. Unlike traditional marketing, social media allows two-way interaction, fostering real-time engagement and deeper customer relationships. The rise of influencer marketing has further transformed the landscape, as audiences increasingly trust recommendations from relatable individuals rather than conventional advertisements. This digital influence significantly impacts consumer behavior, shaping perceptions, preferences, and purchasing decisions. By integrating creativity, authenticity, and data-driven approaches, social media marketing not only enhances brand awareness but also builds loyalty and long-term connections with consumers. This study highlights the role of social media and influencers as powerful drivers of engagement, trust, and business growth in today's competitive environment.

Keywords: Social Media Marketing, Digital Influence, Consumer Behavior, Brand Awareness, Influencer Marketing, Online Engagement, Brand Loyalty, Customer Relationships, Purchase Decisions, Business Growth.

THE ROLE OF BANKING AND INSURANCE IN ECONOMIC GROWTH AND FINANCIAL STABILITY

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Abstract

Banking and insurance are two essential components of the Financial system that signiicantly contribute to the stability and growth of the economy. The banking sector plays a vital role in mobilizing savings, providing credit to individuals and businesses, and facilitating day-to-day Financial transactions. Similarly, the insurance sector reduces uncertainty by providing risk coverage and Financial protection against unforeseen events such as accidents, illness, or business losses. Together, they not only provide Financial support but also build conFidence among individuals, investors, and entrepreneurs.The main objective of this paper is to study the importance of banking and insurance in the present economic environment. The paper highlights how banking institutions act as a backbone for Financial development by promoting Financial inclusion, ensuring liquidity, and strengthening business activities. On the other hand, insurance companies help reduce risks and encourage investment by providing safety to individuals and organizations. Another important aspect of this study is the growing trend of bancassurance, where banks and insurance companies collaborate to provide combined services. This integration helps customers get both banking and insurance facilities under one roof, thereby saving time and ensuring better inancial planning.The methodology of this study is descriptive in nature, relying on secondary data sources such as journals, research papers, inancial reports, and government publications. Various case studies and statistics have been reviewed to analyze the contribution of banking and insurance to the economy.The indings of this paper reveal that countries with strong banking and insurance sectors show higher levels of inancial stability, investment growth, and poverty reduction.

AI IN AUDITING

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Abstract
Auditing is a systematic and independent examination of financial records, statements, and related operations of an organization to ensure accuracy, transparency, and compliance with legal and accounting standards. The primary objective of auditing is to provide an unbiased opinion on whether financial statements present a true and fair view of the financial position of the entity. This paper explores the types of audits are (internal, external, statutory, tax audit, cost and performance audits), the principles and procedures involved, and the importance of internal control systems in ensuring is the reliability. The role of auditors in detecting errors, fraud, and misstatements is also emphasized. In the modern of business environment, auditing has expanded beyond financial verification to include risk assessment, corporate governance, and ethical accountability. The integration technology in auditing (like automated tools and data analytics) is reshaping traditional practices and increasing efficiency.
Keywords: Auditing, Financial Records, Internal Control, Assurance, Fraud Detection, Compliance, Modern Techniques

BANKING AND INSURANCE

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Abstract
The banking and insurance industries are undergoing a revolution driven by technological advancements and shifting consumer expectations. The banking and insurance sectors are transforming rapidly due to technological advancements and changing consumer needs. In today's fast-paced digital economy, banks and insurance companies are leveraging technologies like artificial intelligence, block chain, and the Internet of Things (IoT) to enhance customer experience, improve operational efficiency, and mitigate risks. However, these innovations also pose new challenges, such as cyber security threats, data privacy concerns, and regulatory compliance issues. Moreover, the growing importance of sustainability and environmental, social, and governance (ESG) considerations is redefining the way financial institutions operate and interact with their customers.

Key Words: Banking, Insurance, Digital Transformation, Risk Management, Innovation, Sustainability Financial Technology (Fintech), Artificial Intelligence (AI), Block chain, Internet of Things (IoT), Cyber security.

THE ROLE OF SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
Social media has become a powerful tool for businesses and individuals to connect, engage, and influence global audiences. Social media marketing leverages platforms like Facebook, Instagram, TikTok, X (Twitter), and LinkedIn to promote brands, build trust, and drive consumer behavior. With the rise of influencers, marketing strategies have shifted from traditional advertising to personalized, interactive, and authentic content. This paper explores the role of social media marketing and influence, highlighting its objectives, benefits, challenges, and possible solutions.

A STUDY ON CORPORATE SOCIAL RESPONSIBILITY (CSR)

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Abstract
This study examines the concept and impact of Corporate Social Responsibility (CSR) on businesses and society. CSR refers to a company's commitment to operate in an economically, socially, and environmentally sustainable manner. The research explores how CSR initiatives influence brand image, customer loyalty, employee satisfaction, and overall corporate performance. It also analyzes the challenges organizations face while implementing CSR practices and evaluates the effectiveness of various CSR activities in different sectors. The study concludes that a well-structured CSR strategy not only fulfills ethical obligations but also enhances long-term business value and stakeholder trust.
Keywords: Corporate Social Responsibility, CSR, Sustainability, Ethical Business, Stakeholder Engagement, Social Impact, Environmental Responsibility, Business Ethics, Community Development, Corporate Governance.

AI FOR BUSINESS INNOVATION

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Abstract
Artificial Intelligence (AI) has emerged as a transformative force in driving business innovation across industries. By enabling organizations to analyze vast datasets, predict market trends, automate processes, and enhance decision-making, AI is reshaping traditional business models and creating new opportunities for growth. From personalized customer experiences and intelligent supply chain management to fraud detection and predictive analytics, AI-powered solutions are fostering efficiency, agility, and competitiveness. Moreover, AI promotes innovation by supporting the development of new products, services, and business strategies that align with evolving consumer needs.

Key words: Opportunities, personalized, AI-powered, business strategies, agility,
Moreover, consumer needs.

COMMERCE AND MANAGEMENT

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Abstract

The fields of commerce and management play a pivotal role in shaping modern economies by facilitating efficient trade, organizational operations, and strategic decision-making. This study explores the interrelationship between commerce—encompassing trade, finance, and economic systems—and management, which involves planning, organizing, leading, and controlling business resources. With the rapid globalization of markets and advancements in digital technologies, traditional business models are being reshaped, demanding innovative management practices and adaptive commercial strategies. This paper examines key trends such as e-commerce growth, supply chain digitization, consumer behavior analytics, and sustainable business practices. It also highlights the importance of leadership, human resource development, and ethical governance in enhancing organizational effectiveness. By integrating theoretical perspectives with practical case studies, the research provides insights into how commerce and management jointly contribute to business sustainability, competitiveness, and socio-economic development.

SOCIAL MEDIA MARKETING AND INFLUENCE

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Abstract
In the digital age, social media has emerged as a powerful platform for marketing and consumer engagement. This paper explores the dynamic intersection of social media marketing and influence, analyzing how brands leverage platforms like Instagram, TikTok, Facebook, andX (formerly Twitter) to shape consumer behavior and build brand loyalty. The study examines the role of influencers, content strategies, algorithms, and user engagement metrics in driving marketing success. Through a mixed-methods approach combining qualitative case studies and quantitative data analysis, this paper highlights best practices in influencer marketing, the psychological mechanisms behind digital persuasion, and the ethical implications of sponsored content. The findings reveal that authenticity, audience targeting, and data-driven strategy are key determinants of effective social media influence. This research contributes to a deeper understanding of how digital influence reshapes marketing paradigms and offers practical insights for businesses, marketers, and content creators operating in the increasingly competitive online landscape.

Keywords: Social Media Marketing, Influencer Marketing, Digital Influence, Consumer Behavior, Brand Engagement, Content Strategy, Social Media Platforms, Online Marketing, Audience Targeting, Digital Persuasion, Sponsored Content, Marketing Ethics, Algorithmic Reach, User Engagement, Digital Branding

AI BUSINESS FOR INNOVATION

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Abstract
Artificial Intelligence (AI) is transforming business innovation by enabling smarter decision-making, optimizing operations, and enhancing customer experiences. Through machine learning, data analytics, and automation, AI empowers companies to develop new products, services, and business models with increased efficiency and agility. It drives innovation in areas such as supply chain management, marketing personalization, and predictive maintenance. As organizations integrate AI into their core strategies, they gain a competitive edge and unlock new growth opportunities. However, successful adoption requires ethical considerations, data governance, and workforce adaptation. AI is not just a tool—it is a catalyst for continuous innovation in the digital age.
Keywords: Business Innovation, Data Governance, Supply Chain Management

RECENT TRENDS IN MULTI DISCIPLINARY RESEARCH AND INNOVATION CORPORATE SOCIAL RESPONSIBILITY

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Abstract

Recent trends in multidisciplinary research and innovation are significantly reshaping the understanding and implementation of Corporate Social Responsibility (CSR). As global challenges such as climate change, social inequality, and ethical governance become increasingly complex, CSR has evolved beyond traditional philanthropic activities into a strategic, research-driven approach integrated across various disciplines. Innovations in data science, environmental studies, economics, and behavioral psychology are converging to develop more effective CSR models that are measurable, impactful, and sustainable. Companies are now leveraging interdisciplinary research to address stakeholder expectations, assess environmental impacts, and create socially responsible business practices that align with global sustainability goals. The integration of artificial intelligence, big data analytics, and circular economy principles further enhances transparency and accountability in CSR initiatives. Moreover, collaboration between academia, industry, and policy-makers is fostering inclusive innovation, ensuring that CSR strategies are both economically viable and socially beneficial. This shift reflects a growing recognition that long-term corporate success is inseparable from ethical responsibility and societal well-being. As a result, CSR is increasingly seen not just as a compliance requirement but as a core driver of innovation, competitive advantage, and sustainable development. Multidisciplinary research continues to play a pivotal role in shaping the future of responsible business practices.

BUSINESS AND INSURANCE

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Abstract

The intersection of business and insurance plays a critical role in managing risk, ensuring financial stability, and supporting sustainable economic growth. In today's dynamic and uncertain environment, the insurance industry is evolving rapidly to meet the changing needs of businesses. Innovations in technology, such as artificial intelligence, blockchain, and big data analytics, are transforming traditional insurance models—enabling personalized coverage, faster claims processing, and enhanced risk assessment. Businesses are increasingly leveraging insurance as a strategic tool not only for protection against financial losses but also for resilience planning, supply chain continuity, and regulatory compliance. The rise of cyber insurance, parametric insurance, and embedded insurance solutions demonstrates the sector's shift toward customer-centric, data-driven approaches. Moreover, Environmental, Social, and Governance (ESG) considerations are influencing underwriting processes and product development, promoting sustainable business practices. Collaboration between insurers, businesses, and regulators is crucial for addressing emerging risks and building adaptive, future-ready frameworks. As global challenges such as climate change and geopolitical instability intensify, the synergy between business strategy and innovative insurance solutions will be vital in fostering long-term value, competitiveness, and resilience.

Keywords: Business, Insurance, Risk Management, Financial Stability, Innovation, Artificial Intelligence, ESG, Cyber Insurance, Big Data, Sustainability, Resilience, Blockchain.

A STUDY ON CORPORATE SOCIAL RESPONSIBILITY IN INDIA.

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Abstract

Corporate Social Responsibility (CSR) has emerged as a significant dimension of corporate governance and sustainable development in India, particularly after the enactment of the Companies Act, 2013, which made CSR expenditure mandatory for certain firms. This paper explores the evolution, implementation, and impact of CSR practices in India, analyzing both the regulatory framework and the socio-economic factors shaping corporate engagement with communities. It highlights how CSR has transitioned from being a voluntary philanthropic activity to a strategic obligation aligned with national development goals, such as poverty alleviation, education, healthcare, and environmental sustainability. Drawing on secondary data, case studies, and policy reviews, the study examines the effectiveness of CSR in addressing developmental challenges, the role of corporate accountability, and the tensions between compliance-driven initiatives and genuine social impact. The paper concludes that while India's CSR mandate has spurred greater corporate participation in social development, challenges remain in ensuring inclusivity, transparency, and long-term sustainability of outcomes.

Keywords: Corporate Social Responsibility, CSR Initiatives, CSR Challenges.

ISOLATION, CHARACTERIZATION AND DUAL APPLICATION ASSESSMENT OF BIOSURFACTANTS FROM *Bacillus siamensis* AND *Rosellomorea vietnamensis* FOR FOOD SAFETY

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Abstract

This study investigated the isolation, characterization, and biosurfactant production capabilities of bacterial strains from contaminated soil collected from the Noyyal River basin, Tirupur. Two bacterial strains were successfully isolated and identified through 16S rDNA sequencing as Bacillus siamensis and Rosellomorea vietnamensis. Biosurfactant production was evaluated using various carbon sources including sodium citrate, sodium acetate, glycerol, fructose, tryptone, sucrose, lactose, and paraffin in Bushnell-Haas medium supplemented with cooking oil. Among the tested substrates, sodium citrate demonstrated the highest biosurfactant activity, with Rosellomorea vietnamensis showing superior performance (56.25% emulsification index) compared to Bacillus siamensis (42.5%). Drop collapse assays, oil displacement tests, and surface tension measurements confirmed strong biosurfactant activity for both strains. Thin Layer Chromatography revealed lipid-based biosurfactants with average Rf values of 0.72 and 0.75 for B. siamensis and Rosellomorea sp., respectively. FTIR analysis confirmed the presence of hydroxyl, carbonyl, and carboxylate functional groups characteristic of biosurfactants, with Rosellomorea sp. showing glycoprotein or lipopeptide structures. GC-MS analysis identified major components including n-hexadecanoic acid and 9-octadecenoic acid. The biosurfactants demonstrated significant anti-adhesive properties against foodborne pathogens including E. coli, Klebsiella, Proteus vulgaris, Staphylococcus aureus, and Salmonella typhimurium, effectively inhibiting biofilm formation. Finally, Cr (VI) removal from sweet potatoes, elephant yam, carrot and beetroot using both surfactants were analyzed, and the findings highlighted their potential in food safety, biofilm control strategies and prospects in remediation as well.

Key words: Noyyal, Bacillus, Biofilm, Surfactants, Cr removal

BIOTECHNOLOGY AND BEYOND: CROSS-DISCIPLINARY PATHWAYS TO SUSTAINABLE INNOVATION

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Abstract

Biotechnology has rapidly emerged as one of the most interdisciplinary fields, integrating advances from life sciences, engineering, data science, nanotechnology, and environmental sciences to address global challenges. This paper examines recent trends in multidisciplinary research and innovation, emphasizing how cross-field collaborations accelerate discovery and transform outcomes into societal benefits.Key developments include the application of artificial intelligence and machine learning in drug discovery, bioinformatics-driven genomics for precision insights, nanobiotechnology for targeted drug delivery, and synthetic biology for sustainable bioprocessing. The convergence of biotechnology with environmental sciences is yielding breakthroughs in waste reuse, biofuels, and carbon capture, while integration with information technology is advancing personalized medicine and precision agriculture.Despite remarkable progress, significant challenges remain. Ethical considerations, biosafety concerns, regulatory frameworks, and equitable access to technology are critical issues that must be addressed. Strengthening innovation at the intersections of disciplines not only enhances scientific impact but also ensures biotechnology's alignment with the United Nations Sustainable Development Goals (SDGs).Byconsolidating emerging research directions, this paper offers insights for scientists, educators, and policymakers. It underscores the importance of fostering multidisciplinary collaborations to build a resilient global innovation ecosystem capable of addressing pressing health, environmental, and societal needs.

Keywords: Biotechnology, Multidisciplinary Research, ArtificialIntelligence, Synthetic Biology, Nanobiotechnology

A MULTI-DISCIPLINARY APPROACH TO DRUG DISCOVERY: LEVERAGING DATABASES FOR TARGET IDENTIFICATION

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Abstract

Many diseases still affect people because effective synthetic drugs are not always available. This happens when scientists haven't yet discovered the right biological targets or when diseases become resistant to the treatments that are already in use. Because of these challenges, researchers often turn to natural sources like plants and microorganisms to find new compounds that might help in treating diseases. To make this process faster and more efficient, several useful databases have been created that give easy access to important information on chemicals, genes, diseases, and natural products. These databases are designed to answer specific research questions and help scientists from different fields work together in finding new solutions. Some of the commonly used databases include PubChem, which offers chemical information; MeSH, which helps organize medical knowledge; BIMP and IMPPAT, which contain data on plant-based molecules; GEO, a collection of gene expression studies; and the Open Targets Platform, which integrates genetic and disease-related information to help identify and prioritize biological targets for drug discovery. The use of these resources has greatly reduced the time and effort needed for developing new drugs. A good example of how combining different areas of knowledge can lead to breakthroughs is AlphaFold, an artificial intelligence system developed by Google's DeepMind that accurately predicted protein structures. This shows how a multi-disciplinary approach, supported by data from these databases, is transforming drug discovery.

Keywords: Drug Discovery, Natural sources, Biological Targets,Open Target Platform, Multi-disciplinary approach

BIO-INSPIRED TRANSPARENT SOLAR WINDOWS

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Abstract

Transparent solar windows inspired by nature represent a new innovation utilizing biotechnology, materials science, and renewable energy principles to produce multifunctional building systems. Highly efficient light harvesting is achieved through the use of bio-inspired, biodegradable natural materials and coatings for solar windows; conventional transparent photovoltaics often struggle with diminished efficiency and sustainability due to synthetic nondegradable materials. Bio-inspired materials, such as pigments from plants (chlorophyll), algae, and photosynthetic bacteria, serve to selectively absorb particular wavelengths of sunlight while allowing light penetration and minimize energy loss, while maintaining transparency. In addition, biomimetic strategies based on nanostructures such as the micro-patterns of leaves (e.g. the structure and color of butterfly wings) can further capture sun energy and increase photovoltaic efficiency. Additionally, biodegradable polymers made of cellulose, chitosan, or perhaps other plant based materials might step in and replace petroleum-based plastic substrates. Therefore, these combined materials mean that windows can offer transparent glazing features all while also functioning as renewable energy harvesters. This design serves the future vision of a net zero energy building or smart cities by minimizing our dependence on fossil fuels and lowering carbon emissions into the atmosphere. Altogether, bio-inspired transparent solar windows offer a net zero energy buildings to reduce carbon footprint in smart cities.

KEYWORDS:
Bio-inspired photovoltaics, Transparent solar windows, Algal pigments, Light-harvesting proteins, Biopolymer substrates.

NEUROAI: BRIDGING NEUROSCIENCE, ARTIFICIAL INTELLIGENCE AND MENTAL HEALTHCARE

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Abstract:
Neuro AI integrates principles of neuroscience with artificial intelligence to create brain-inspired computational models for advanced problem-solving. The intersection of neuroscience and artificial intelligence (AI) has opened new opportunities for transforming mental health care. NeuroAI, an emerging interdisciplinary platform, aims to integrate neural data, computational neuroscience, and machine learning techniques to better understand brain function and improve clinical outcomes. This paper include how AI algorithms, including deep learning and neuro-symbolic models, can analyse large-scale neuroimaging, electrophysiological, and behavioural datasets to detect early signs of psychiatric disorders, predict treatment response, and enable precision psychiatry. In addition, NeuroAI offers tools for simulating neural circuits, generating hypotheses about cognitive processes, and informing brain-computer interfaces for therapeutic interventions. Despite these promises, key challenges remain—such as interpretability of models, ethical considerations regarding patient data, and the risk of algorithmic bias. It also highlights the need for collaborative frameworks between neuroscientists, clinicians, AI researchers, and ethicists to ensure that NeuroAI evolves as a trustworthy, explainable, and patient-centric technology. The NeuroAI has the potential to revolutionize mental health research and clinical practice by shifting from symptom-based diagnosis to data-driven, individualized care.

Keywords: NeuroAI, Computational Neuroscience, Artificial Intelligence, Mental Health, Precision Psychiatry, Brain-Computer Interface, Ethical AI, AI Algorithms.

BIODEGRADABLE AND SELF-HEALING POLYMER BASED ELECTRONICS

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Abstract

The rapid growth of electronic devices has amplified the need for sustainable alternatives to reduce electronic waste, driving the development of biodegradable and self-healing electronics. This work presents a comprehensive strategy Photocurable encapsulation of biodegradable polymers, such as poly-hydroxybutyrate (PHB) and polyvinyl acetate (PVAC), enables eco-friendly architectures with inherent degradability. Advanced melt spinning techniques further support scalable processing and provide flexible substrates well suited for wearable applications. Durability and resilience are achieved through a dual-layer configuration of synthetic elastomers and conductive composites, where dynamic disulfide bonds and hydrogen bonding allow rapid recovery of conductivity and stretchability under repetitive damage. Ionogels reinforced via ionophobic coordination reinforcement (ICR) exhibit superior stability, benefitting from ionic liquid-phobic microphase separation and lithium-ion crosslinking. For energy harvesting, fabric-based triboelectric nanogenerators (TENGs) are introduced as sustainable alternatives, employing waterborne polyurethane as a water-resistant friction layer and polypyrrole as both a conductive and triboelectric material. Electrical performance is further enhanced by incorporating poly(3,4-ethylenedioxythiophene)-polystyrene sulfonate and silver nanowires, while replacing glycerol with agarose improves flexibility and stretchability. Interpenetrated polymer networks strengthen adhesion even under extreme stress, ensuring long-term reliability.Despite these advances, challenges such as nonuniform irradiation and incomplete cross-linking due to limited light penetration during photocuring remain significant hurdles. This research outlines a holistic pathway toward biodegradable, self-healing, and high-performance electronic systems, paving the way for sustainable and environmentally responsible wearable technologies.

Keywords: Biodegradable electronics, Self-healing polymers, Photocurable encapsulation, Ionogels, Triboelectric nanogenerators (TENGs)

NATURAL EXTRACELLULAR VESICLES:A GREEN NANOMEDICINEFOR CANCER TREATMENT

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Abstract
Extracellular vesicle (EVs) are lipid bound vesicles in Nanoscale secreted into extracellular space, Extracellular vehicles (EVs) are Nanoscale vesicles secreted into extracellular space. It can further be classified as natural or synthetic based on their modification. In natural derived extracellular vesicles particularly Plant-derived extracellular vesicles are effective green nanomedicine for cancer treatment and personalized medicine due to their low immunogenicity, minimal cytotoxicity, and lack of tumorigenicity, specific therapeutic agents and which cannot harbour zoonotic like mammals. Plant derived extracellular vesicles contain bio-active compounds such as antioxidants, RNA, lipids that have inherent therapeutic effects from their source plants. They produce high yield and cost effective natural drug carriers that hold a promising field in clinical translation.This study highlights extracellular vesicles for their therapeutic agents, drug delivery and biomarkers especially in cancer treatment and personalized medicines. While plant derived extracellular vesicles enhanced the biocompatibility, efficient cargo delivery, and the capability to traverse biological barriers. The ability to load many biomolecules and enable site-specific delivery of hydrophobic and hydrophilic therapeutics. However, despite these benefits, plant derived extracellular vesicles still face some limitations such as poor homogeneity and lack of standardized methods. This causes quality inconsistencies and lower drug loading efficiency compared to animal-derived extracellular vesicles.

Keywords: Extracellular vesicles, Plant derived extracellular vesicles, drug delivery, immunogenicity, green nanomedicine, therapeutic agents, and cargo delivery.

GREEN SYNTHESIS OF CERIUM OXIDE NANOPARTICLES USING *Senna auriculata* LEAF EXTRACT AND THEIR ANTIBACTERIAL EVALUATION

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Abstract

Cerium oxide nanoparticles (CeO_2 NPs) have attracted considerable attention for their exceptional biomedical and environmental applications. This study investigates the eco-friendly synthesis of CeO_2 NPs using Senna auriculata leaf extract as a natural reducing and stabilizing agent. The phytochemicals in the leaf extract play a crucial role in reducing cerium ions, facilitating the formation of stable nanoparticles. The synthesized CeO_2 NPs were thoroughly characterized using various techniques, including UV-Vis spectroscopy, X-ray diffraction (XRD), Fourier-transform infrared spectroscopy (FTIR), and scanning electron microscopy (SEM), to confirm their structural, functional and morphological properties. To evaluate their antibacterial potential, the antibacterial activity of the CeO_2 NPs was tested against both gram positive and gram negative bacteria using the agar well diffusion method. The results showed significant antibacterial activity, highlighting the potential of these nanoparticles as effective antibacterial agents. This green synthesis approach offers a sustainable and biocompatible alternative to traditional chemical methods, positioning Senna auriculata mediated CeO_2 NPs as a promising candidate for biomedical and environmental applications, particularly in the field of antibacterial therapy.

Keywords: Cerium oxide nanoparticles, Green synthesis, Senna auriculata, Antibacterial activity

THE SILENT ARCHITECTS: MEDIA AND HORMONES SHAPING PLANT BIOTECHNOLOGY

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Abstract

Plant biotechnology has revolutionized the way researchers approach crop improvement, conservation, and sustainable agriculture. This review presents a detailed examination of the culture media and in vitro practices that underpin plant tissue culture and developmental biology. Central to this discussion are the formulations and applications of key basal media—Murashige and Skoog (MS), modified MS (MMS), Gamborg's B5, Woody Plant Medium (WPM), and Driver and Kuniyuki Woody Plant Medium (DKW)—each tailored to support specific physiological and developmental responses across diverse plant species. The paper explores how strategic manipulation of media components, particularly macronutrients and micronutrients, influences morphogenic outcomes. It also delves into the role of plant growth regulators (PGRs), emphasizing their synergistic and antagonistic interactions in guiding organogenesis and somatic embryogenesis. Classical hormone-based models are revisited to illustrate the dynamic regulation of cell fate and tissue differentiation. A stepwise analysis of developmental pathways highlights the complexity of in vitro regeneration, including the need for sequential media adjustments and the identification of responsive cell types within heterogeneous cultures. These insights are critical for refining protocols aimed at clonal propagation, genetic transformation, and conservation of rare or recalcitrant species. By integrating foundational knowledge with practical strategies, this review serves as a valuable resource for researchers and practitioners in plant biotechnology. It provides a framework for customizing culture conditions to meet specific experimental goals, ultimately advancing the precision and efficiency of plant tissue culture systems.

Keywords: Plant tissue culture, Somatic embryogenesis, Basal media formulations, Plant growth regulators (PGRs)

DETECTION OF ANTMICROBIAL ACTIVITY OF COMPARATIVE STUDIES OF MEDICINAL PLANTS AGAINST MRSA ISOLATES IN CLINICAL SAMPLES

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Abstract:

Methicillin resistant staphylococcus aureus (MRSA) has become increasingly wide spread as a major cause of both nosocomial and community infections. The different clinical samples were collected and isolated using Catalase test, Gram's staining and Biochemical test. The isolated organism was detected by mannitol agar plates using oxacillin and it was undergone for the antibacterial sensitivity test using eight different medicinal plants, and these plants act against the MRSA pathogen. The study of eight medicinal plants as therapeutic agents is of importance in addressing health problems of traditional communities. The wealth of tribals knowledge on medicinal plants have a great potential for research and the discovery of new drugs including these medicinal plants have more antibacterial activity against MRSA.

Key words: Methicillin resistant staphylococcus aureus, medicinal plants, drugs,

GREEN SYNTHESIS AND CHARACTERIZATION OF ZINC OXIDE NANOPARTICLES USING *Glycyrrhiza glabra* ROOT

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Abstract

Nanotechnology enables precise manipulation of matter at the molecular level, with nanoparticles offering diverse applications in medicine and beyond. Zinc oxide (ZnO) nanoparticles are recognized for their ability to combat microbes and reduce inflammation, which holds promise for biomedical applications. Glycyrrhiza glabra renowned for its medicinal properties warrants further exploration in oral health management due to its anti-inflammatory and antioxidant attributes. Liquorice (Glycyrrhiza glabra) is one of the most valuable and promising source of bioactive compounds. The green synthesis of zinc oxide nanoparticles (ZnO NPs) using various concentrations (25µg/ ml, 50µg/ ml and 100µg/ ml) of the roots has been reported. The present investigation was characterization of zinc oxide nanoparticles by using the medicinal plant Liquorice (Glycyrrhiza glabra). The synthesized ZnO-NPs were characterized by utilizing the UV–Vis spectroscopy, Fourier transform infrared spectroscopy (FTIR) and Scanning Electron Microscopy (FE-SEM). The nanoparticles formation was confirmed by the UV–Vis sharp absorption spectra at 318.5nm, 334.5nm and 677 nm. The synthesized ZnO-NPs size and shape was revealed by the SEM. The nanoparticle crystallite size was found 78.99nm, 20.72nm and 27.64nm with spherical shape. The bioactive functional groups that are in charge of capping and stabilizing the ZnO-NPs were assured by the FTIR data. FTIR analysis revealed characteristic peaks indicative of functional groups including O-H, N-H, N-O, C-O, C=C, and C≡C-H. The obtained results demonstrated that the biosynthesized ZnO NPs reveal interesting characteristics for various potential applications in the future. Glycyrrhiza glabra ZnO NPs hold promise in diverse biomedical applications, including wound healing, cancer therapy, targeted drug delivery, antimicrobial coatings, and Alzheimer's treatment.

Keywords: green synthesis, Glycyrizza glabra, ZnO NPs, characterization, SEM, FTIR, Spectroscopy, Alzheimer's disease

REPROCESSING FRUIT WASTE FOR HEALTHCARE APPLICATIONS: A STUDY ON NATURAL MOUTHWASH FOR ORAL ULCER TREATMENT

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Abstract

Mouth ulcers are a common oral health issue, often causing discomfort and pain, and are typically managed with over-the-counter medications or home remedies. This study investigates the potential of Citrus sinensis and Punica granatum peel extracts as natural treatments for mouth ulcers. The extracts were obtained by macerating the peels in a suitable solvent and formulated into a mouthwash. The efficacy of these extracts was evaluated using both in vitro and in silico approaches. In vitro studies demonstrated that the ethanolic extract of Citrus sinensis peel exhibited strong antioxidant activity, with a 93.4% inhibition in the DPPH assay at 0.6 ml. The Punica granatum peel extract showed significant anti-inflammatory properties, with a 89% inhibition in the bovine serum albumin denaturation assay at 0.8 ml. These results suggest the extracts possess bioactive compounds capable of mitigating inflammation and oxidative stress, common factors in mouth ulcers. In silico molecular docking analyses further supported these findings, revealing that the bioactive compounds from the ethanolic extracts had higher binding affinity to target receptors associated with mouth ulcers than those from methanolic or aqueous extracts. Overall, the study highlights the therapeutic potential of Citrus sinensis and Punica granatum peel extracts as effective, natural alternatives for treating mouth ulcers, offering a promising and safer solution compared to conventional treatments.

Keywords: Mouth ulcer, Citrus sinensis, Punica granatum, Antioxidant, Mouthwash

PRODUCTION OF BIOENZYME FROM FRUITS PEELS AMD NEEM LEAVES WASTE AND FORMULATION OF HAND WASH

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Abstract

The transformative potential of Eco-enzyme derived from fruit and vegetable peels through fermentation and analysis of pH, viscosity, color, odor, total dissolved solids (TDS), flammability, and solubility. These parameters provide the quality and properties of the bioenzymes, The hand wash formulation incorporates bioenzymes derived from various sources. the development of a herbal hand wash formulation enriched with bioenzymes from Neem, Kaffir, Red Banana, Lady Finger, and Mountain Banana, combined with natural ingredients and formulated the Bioenzyme Hand wash. Physical evaluations, including color, texture, odor, and spreadability tests, were conducted to assess the formulation's quality. The study emphasizes the potential of the herbal hand wash as an effective and safe alternative to synthetic products, catering to the growing demand for natural and eco-friendly personal care solutions. By incorporating bioenzymes and natural ingredients, the formulation aligns with sustainable practices and offers a promising option for consumers seeking environmentally conscious hygiene products.

Key words: Bioenzyme, Hand wash , Hygienic, Eco-friendly

FORMULATION AND IN-SILICO BIOAVAILABILITY ENHANCEMENT OF A CALCIUM-BASED SAUCE DERIVED FROM EGGSHELLS: COMPUTATIONAL AND DATA-DRIVEN ANALYSIS

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Abstract

Calcium deficiency is a major nutritional concern, particularly among individuals at risk of osteoporosis and bone-related disorders. Eggshells, a rich source of calcium carbonate, offer a sustainable and bioavailable alternative to conventional calcium supplements. This study focuses on the formulation of a calcium-based sauce derived from Gallus gallus domesticus (chicken) eggshells and explores strategies for enhancing its bioavailability through in-silico analysis. The eggshell-derived calcium was processed, incorporated into sauce formulation, and subjected to physicochemical characterization. Computational docking and molecular dynamics simulations were employed to assess the interaction of potential compounds with key transport proteins involved in intestinal absorption. The results indicate the potential of eggshell-derived calcium as a functional food ingredient, and provide insights into improving its bioavailability through formulation and molecular optimization. This study contributes to the development of innovative dietary supplements aimed at addressing calcium deficiency in a sustainable and effective manner.

Keywords: Eggshell calcium, bioavailability, in-silico analysis, calcium supplement, functional food

OPTIMIZING FERMENTATION PROCESS FOR HIGH YIELD BIOETHANOL PRODUCTION FROM BANANA BRACT

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Abstract

Bioethanol is an environmentally friendly and renewable energy source that has gained significant attention as a sustainable alternative to fossil fuels. Agricultural waste, such as banana bract, presents a viable raw material for bioethanol production due to its rich lignocellulosic composition. This study focuses on optimizing the fermentation process to maximize bioethanol yield from banana bract by employing a series of pretreatment and enzymatic hydrolysis steps to enhance sugar availability for fermentation. The methodology includes acid and alkaline pretreatment to break down the complex lignocellulosic structure, followed by enzymatic hydrolysis to convert cellulose and hemicellulose into fermentable sugars. The hydrolysed mixture undergoes fermentation using Saccharomyces cerevisiae, a yeast strain known for its high ethanol-producing capability. Optimized incubation conditions, enzyme inactivation, and efficient separation techniques are employed to ensure maximum ethanol yield. After fermentation, the produced ethanol is extracted through distillation, and analytical techniques are used to assess the concentration and purity of the final bioethanol product. This research aims to develop a cost-effective and efficient method for bioethanol production from banana bract, contributing to sustainable biofuel technology and agricultural waste valorization. By optimizing each stage of the process, this study seeks to enhance ethanol yield, reduce process inefficiencies, and promote the utilization of renewable biomass resources for cleaner energy production.

Keywords: Bioethanol, Banana Bract, Lignocellulosic Biomass, Fermentation, Saccharomyces Cerevisiae, Pretreatment, Enzymatic Hydrolysis, Distillation

ROSELLE LEAF DISHWASH TABLET: A GREEN APPROACH TO TACKLE MINERAL DEPOSITS

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Abstract

Roselle (Hibiscus sabdariffa) leaves have been identified as a potential natural alternative for dishwashing formulations due to their inherent surfactant properties, organic acids, and antimicrobial compounds. This study aims to develop and evaluate dishwashing tablets made from roselle leaf extracts, focusing on their ability to tackle mineral deposits while maintaining high cleaning efficiency. Coconut oil plays a crucial role in cleansing and grease cutting properties in a dishwash tablet. The research investigates key physicochemical and functional parameters, including pH, free alkalinity, total fatty acids analysis helps determine its emulsification potential. Cleaning efficiency and foamability assessments evaluate grease and stain removal capabilities, whereas rinsing capability tests ensure minimal residue remains on surfaces. The antimicrobial activity of the formulation is tested against common kitchen bacteria to confirm its hygiene-enhancing properties.

Keywords: Roselle leaves, coconut oil, biodegradable cleaner, free fatty acid, pH test, foaming test, rinsing capability tests.

ISOLATION OF MICROBIAL COMMUNITIES FROM DECAYING LEAVES AND OPTIMIZATION OF CULTURE CONDITIONS FOR INDUSTRIAL ENZYME PRODUCTION

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Abstract
Decaying plant litter represents a rich ecological niche harboring diverse microbial communities capable of producing enzymes essential for the degradation of lignocellulosic biomass. Harnessing these natural consortia offers significant potential for industrial applications, particularly in sectors such as biofuels, paper and pulp, textiles, and food processing. The present study aimed to explore microbial populations from decaying leaves as a source of industrially relevant enzymes and to evaluate strategies for optimizing their culture conditions for enhanced yield. Leaf litter samples collected from varied sites were subjected to microbial enrichment and screened for key enzymatic activities, including cellulase, amylase and protease. Preliminary qualitative assays identified multiple active isolates, followed by quantitative evaluations to determine enzyme activity profiles. Molecular identification of representative strains highlighted the presence of bacterial taxa with known biotechnological relevance. Optimization experiments were conceptually designed using statistical approaches such as one-factor-at-a-time analysis and response surface methodology to assess the influence of pH, temperature, and substrate concentration on enzyme production. The findings emphasize the potential of leaf litter microbial communities as sustainable reservoirs for enzyme discovery and industrial bioprocess development. This study further underscores the importance of ecological biodiversity in supporting innovations for green technologies and value-added product generation.

Keywords: Decaying Leaves, Microbial Poulation, Enzymes, Optimization

IN-SILICO INVESTIGATION OF ASHWAGANDHA (*Withania somnifera*) BIOACTIVES TARGETING SKIN MICROBIOME- ASSOCIATED PROTEINS IN PSORIASIS

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Abstract

Psoriasis is a chronic immune-mediated skin disorder characterized by IL-23/IL-17 axis activation, TNF-α signaling, and NF-κB-driven inflammation, with growing evidence linking skin microbiome dysbiosis, particularly Staphylococcus aureus and Malassezia species, to disease severity. In this study, molecular docking and bioinformatics tools were employed to evaluate the interaction of Withania somnifera (Ashwagandha) bioactives—including triterpenes (withaferin A, withanolide A, withanolide D) and seed fatty acids (oleic, linoleic, linolenic acids) - with microbial virulence proteins such as S. aureus enterotoxin B and Malassezia lipase. Docking studies performed using PyRx (AutoDock Vina) followed by interaction analysis in Biovia Discovery Studio, and molecular dynamics simulations in GROMACS, revealed that withaferin A and withanolide D displayed strong binding affinities (–9.2 and –8.6 kcal/mol respectively), forming stable hydrogen bonds and hydrophobic interactions within functional domains of microbial proteins. Seed fatty acids also demonstrated moderate inhibitory potential. These findings suggest that Ashwagandha bioactives may exert a dual anti-psoriatic role by modulating host immune receptors and microbiome-associated virulence factors, thereby offering a promising natural, multi-target therapeutic approach.

Keywords: Psoriasis; Ashwagandha; Withania somnifera; Skin microbiome; Triterpenes; Molecular docking; Bioinformatics; Staphylococcus aureus; Malassezia; NF-κB

PHYSIOLOGY AND PHYTOCHEMICAL CHARACTERISTICS OF *Drynaria quercifolia* LEAF AND RHIZOME- A COMPARATIVE STUDY

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Abstract

Drynaria quercifolia (L.) J. Sm is commonly known as Oakleaf fern and belongs to the Polypodiaceae family. This high value medicinal fern is native to India, Australia and many south-east Asian countries such Indonesia, Malaysisa, Philippines and widely distributed in the habitats of wet tropical and subtropical regions around the rocky areas. This fern and its rhizome have vast inherent medicinal and pharmacological properties and thus utilized in folklore medicine. Ethnobotanical uses includes treating arthritis, jaundice, heart disorders, typhoid, syphilis, diarrhoea, and migraines while the rhizome has been extremely reported for its antimicrobial, anti-inflammatory, anticancer, antioxidant, antidiabetic properties. The constituents of its rich phytochemistry and secondary metabolites owes to its medicinal characteristics. The commonly reported metabolites include sterols, alkaloids, flavonoids, terpenoids, saponins and volatile oils. Most specifically β-amyrin, β-sitosterol, lupeol, naringin, friedelin are produced in rhizome. This study depicts the physiological aspect of the fern and comparative analysis of the leaves and rhizome metabolites and their activities to additionally reveal the significance and improve its applications in major fields.

Keywords: Drynaria quercifolia, rhizome, physiology, phytochemicals, pharmacology

ISOLATION, CHARACTERIZATION AND PROBIOTIC ACTIVITY OF LACTOBACILLUS SP. FROM HUMAN BREAST MILK, BUFFALO AND COW MILK- A COMPARATIVE STUDY

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Abstract

Probiotic microbes are major supporters in reduction of gastrointestinal disorders such as ulcer, irritable bowel syndrome, infectious diarrhea and enhances immune response within the system. Lactobacillus sp. are most common probiotic organisms hence this study has been concentrated to isolate and characterize Lactobacillus sp. with highest probiotic activity from 3 milk samples sourced from human, buffalo and cow. A total of 9 Lactobacillus sp. were identified and among them 6 isolates were characterized as excellent probiotics. The isolates subjected to morphological, biochemical characterization were analyzed for antibiotic susceptibility, antimicrobial activity and haemolytic assay for further confirmation. Their probiotic effects were evaluated on gastric juice tolerance, bile salt and pH. As a result the isolates BRM2 (67.25%) and BM4 (60.84%) showed good resistance to bile salts. Resistance to antibiotics was found in BM3, CM2 (Ampicillin), and BRM1, BRM2, CM2 (Chloramphenicol, Tetracycline). No isolates showed haemolytic activity and all showed inhibition towards Staphylococcus sp., Klebsiella sp. and E. coli. The maximum zone of inhibition was exerted by BRM1 and BRM2 from huma breast milk against Staphylococcus (19 and 21 mm respectively) and Klebsiella (14 and 22 mm respectively). Thus Lactobacillus from human milk has greater potential for probiotic application for its stability and can be further developed into a probiotic supplement.

Keywords: Probiotics, Lactobacillus, Human breast milk, buffalo milk, cow milk

SUSTAINABLE AND SMART ACOUSTIC TEXTILES: FUTURE PROSPECTS

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Abstract

The role of acoustics in textiles has gained significant importance with the growing demand for noise reduction, sound absorption, and improved acoustic comfort in various environments. Textiles, due to their porous structures and flexible configurations, act as effective materials for controlling sound transmission and reverberation. Acoustic textiles are widely used in building interiors, auditoriums, automotive cabins, aircrafts, and household applications to enhance speech clarity and reduce unwanted noise. The efficiency of a textile in sound absorption depends on fiber type, yarn structure, fabric density, thickness, and surface treatments. Nonwoven, knitted, and composite fabrics are especially effective due to their high porosity and surface area, which allow greater dissipation of acoustic energy. Recent innovations integrate nanofibers, multilayered constructions, and smart materials to improve acoustic performance without compromising aesthetics or weight. Additionally, sustainable fibers and recyclable materials are being explored for eco-friendly acoustic applications. Acoustic textiles not only provide functional benefits but also combine design flexibility, enabling architects, designers, and engineers to merge performance with visual appeal. Thus, the role of acoustics in textiles is expanding from traditional soundproofing to advanced smart and sustainable solutions, addressing the growing needs of modern living and industrial sectors.

ECOFRIENDLYPRESERVATION OFFRUITSAND VEGETABLESUSINGCOCONUT SHELL POWDER AS A NATURALANTIMICROBIALAGENT

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Abstract
The modern consumer demands every day foods with higher content of nutrition and functionally active compounds (FAC) that favor their health; however, many of these are affected during processing and storage. The aim of the research was to evaluate the stability of the quality attributes to spray dried coconut powder fortified with Ca and vitamins C, D3 during storage. The storage conditions were: temperature (15°C, 25°C and 35°C) Time: (0,30,60,90,120,150 and 180 days) coconut shell powder has emerged as a natural and sustainable preservation agent for fruits and vegetables. Coconut shells are rich in lignocellulosic materials, contributing to their unique chemical composition. Which can be exploited for its intrinsic antimicro properties. Growing concern over synthetic preservation has driven research into sustainable alternatives dried from agricultural waste, such as coconut shells. This study presents the development and application of coconut shell-based derivatives for post harvest preservation of fruits and vegetables.

Keywords: Coconut shell powder, Natural Presentation, Functional Compounds, Nutritional Stability, Post-Harvest Storage.

About the College

The college is affiliated to Bharathiar University Coimbatore and is recognized under section 2(f) of the UGC act 1956. The college was accredited with A grade by NAAC in its first cycle. The college is currently conferred for Autonomy by UGC for 10 years. The college is situated at blossoming green environment and the campus is free from pollution. It has splendid infrastructure with modernized furniture which complements vibrant academic domain. It renders an effective curriculum which unveils the standards and core competencies of the students like analytical abilities, creative thinking and problem solving skills of the students. The college strives to create a suitable arena for all round developments which enable the students to serve the country with great vigor and enthusiasm and also to face challenges. The highly qualified and experienced faculty members are committed to serve the students community to enrich the knowledge of the students. At present, the college offers 14 UG, 4 PG and 4 Research Programmes with the staunch motive of developing research skills. Co-curricular and Extra-curricular activities are conducted in the college at regular intervals and the students are given opportunities to empower themselves and engage in socially useful and productive works through various Cells and Clubs like NSS, Rotaract, Social Awareness Cell, and Women Empowerment Cell and so on.

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