25th | February 2025

ICLT 2025

LAW AND TECHNOLOGY

MANUU LAW SCHOOL
MAULANA AZAD NATIONAL URDU UNIVERSITY
Hyderabad, India

मौलाना आज़ाद नेशनल उर्दू युनिवेर्सिटी

MAULANA AZAD NATIONAL URDU UNIVERSITY

Central University Under the Ministry of Education
Government of India

ICLT-2025
MANUU Law School
Proceedings of International Conference
on
Law and Technology
Held on 25th February, 2025

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Dean & HoD, MANUU Law School
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EDITORS

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Dean & HOD, MANUU Law School

Prior taking up the role of Dean, MANUU LAW School. He was the Sr. E.D at Chandigarh University and the Vice Chancellor of GD Goenka University. PhD in Cyberlaw. Adjunct Professor at the American University of Nigeria, President Technolex Foundation. Delivered Keynotes in more than 200 conferences. Authored 4 books and more than 100 papers. A blogger, YouTuber. Got Higher Education Excellence Award of 2024 & "Outstanding Academician" in the 25th WEC Dubai. Most Impactful VC by Edu Star 2022. "Top 50 IP Players" by IPRG USA. Best paper award at 22nd WMSCI 2018,USA. Promotes meritocracy for academic excellence.

Dr. Rashmi K S
Assistant Professor, MANUU Law School

Dr. Rashmi K S, holds LLB and LLM degrees from Kuvempu University Karnataka, holds a doctoral degree from the University of Mysore, Karnataka. Has post graduate specialization in Business law. She has 12 years of teaching experience for under graduate and post graduate students and presently guiding 3 Ph.D. scholars and her area of research is Corporate and Commercial Law, Banking and Insolvency Laws, Property Law, Law of contracts, Capital Market Regulations. Judged Several National Moot Court Competitions, published many research papers in various national and International reputed Journals and actively organizing International Conferences, FDPs, Workshops.

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Dr. Sudhanshu Chandra has Completed his B.A.LLB(Hons)-Dr. Ram Manohar Lohiya National Law University Lucknow (U.P) LLM-National Law University Jodhpur (Rajasthan), Cleared UGC-NET, Ph.D. in Law from Gautam Buddha University Greater Noida (U.P.). He Authored three Books and also taken Copyright of work Custodial Violence by Police in India: Analysis of Judicial Decisions 2010-2020 Registration No-L-124572/2023 Dated-09/06/2023.Judged Several Moor Court Competition. Published More than 20 Research Papers in International/National/Scopus/UGC-Care Listed Journals.

Dr. Sateesh Kumar
Assistant Professor, MANUU Law School

Dr. Sateesh Kumar has Completed his graduation in English (Hons) from Banaras Hindu University Varanasi, LLB (Hons)- Banaras Hindu University Varanasi, LLM in Human Rights Law from Babasaheb Bhimrao Ambedkar University, Lucknow and He also did his Ph.D. in Law from Babasaheb Bhimrao Ambedkar University, Lucknow on the Topic of Rights of Forest Dwellers in India: A Critical Legal Study. He was awarded by a national fellowship from Dr. Ambedkar International Center, New Delhi, sponsored by Ministry of Social Justice and Empowerment, Government of India. He has various publications in reputed journals like NHRC, Scopus, Indian Bar Review, UGC Care list, etc.

Dr.Tausif ur Rehman Md

Assistant Professor, MANUU Law School

Dr. Tausif ur Rehman Md has obtained masters in Law, Commerce and Management and holds a Doctorate in Management studies. He has three decades of experience that includes 12 years of industry experience. He had worked as chief finance officer in a multinational company. He has academic experience at national and international levels.

His areas of specialization include Corporate Finance, Corporate Law, Financial Management, Law of Taxation, and International Finance.

He believes that academic excellence can be attained only through 4As namely Academic expertise, Affiliations & Associations, Administrative acumen and Accountability.

Mr. Mohammad Tabish

Assistant Professor, MANUU Law School

Mr. Mohammad Tabish is Assistant Professor at MANUU Law School, Maulana Azad National Urdu University (A Central University), Hyderabad. He has completed his B.A.LL.B and LL.M and is currently pursuing Ph.D. in Intellectual Property Rights (IPR) from Aligarh Muslim University, Aligarh. Mr. Tabish is UGC-NET qualified & JRF (MANF) awardee, and has made significant contributions to his field through the publication of edited book, research papers and book chapters in various national and international journals and books. In admission, he has presented numerous papers at national and international seminars and conferences. His area of interest is Intellectual Property Rights (IPR).

Mr. Abdus Saboor Maaz
Head, Students Organizing Committee

Mr. Abdus Saboor Maaz holds a rich academic background, merging media, communication, and law. He has earned Master's degrees in both Mass Communication & Journalism and Legal Studies. Presently, he is pursuing a PhD in Law, specializing in Cyber Law and the regulation of Artificial Intelligence and Emerging Technologies. His research explores the complex legal dimensions of technology while contributing to academia and leadership as the Honorary Director of JNLB Karnataka. Driven by a passion for both law and technology, He is committed to shaping a future where innovation and legal integrity coexist seamlessly.

Mr. Mohd Muzammil

Mr. Mohd Muzammil holds a diverse academic background, bridging technology and law. He earned his undergraduate degree in electronics, followed by a master's in computer management, and later pursued an MA in Legal Studies. Currently, he is undertaking a Ph.D. in cyber law, delving into the intricate relationship between legal frameworks and technological advancements.

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Convener- Students Organising
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MESSAGE FROM
JUSTICE DR. SALEEM MARSOOF PC

"Laws alone cannot secure freedom of expression; in order that every man presents his views without penalty, there must be a spirit of tolerance in the entire population"

Albert Einstein

Technology has revolutionized society, thereby influencing human conduct, governance, commerce, and human rights at an extraordinary pace. While this process offers unparalleled opportunities for economic growth, social development, and access to justice, it also introduces legal dilemmas that challenge traditional judicial principles. The International Conference on Law and Technology (ICLT-2025) at Maulana Azad National Urdu University (MANUU) is a commendable initiative that seeks to bridge the gap between law and emerging technologies, and I am sure that this Conference would provide an opportunity for the participants to discuss some of the dilemmas and challenges that arise from the interplay of technologies with the law.

At a time when Artificial Intelligence (AI) is reshaping how cases are managed in judicial, arbitral and regulatory Proceedings by facilitating the conduct of hearings, the recording of testimony and simplifying the enforcement of judgments, awards and orders across national borders, the multipronged functioning of AI in legal Proceedings necessitates a reassessment of legal frameworks to ensure they remain fair, relevant, and robust. This conference provides a crucial forum for the participants to discuss cybersecurity, intellectual property rights, data governance, and the ethical dimensions of digital justice systems. It is through such collective discourse that we can shape laws that protect individual liberties while promoting responsible technological advancements. It is the responsibility of all stakeholders to uphold constitutional values and ensure that legal principles are interpreted in ways that uphold justice amidst technological shifts.

I extend my best wishes to all participants and organizers for a successful and impactful Conference. May ICLT-2025 encourage critical dialogue and pave the way for a future where law and technology coexist harmoniously in serving humanity.

14th February 2025

Justice Dr. Saleem Marsoof PC
LL.B (Cey), LL.M (Col), LL.M (San Diego) LL.D (Col)
Former Judge of the Supreme Court of Sri Lanka

R. Venkataramani
Attorney General for India

SE-127, Law Officers' Chambers, 2nd Floor
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Tel. : 23383254

MESSEGE FROM R. VENKATARAMANI, ATTORNEY GENERAL FOR INDIA

Dated: 21.02.2025

"Laws grind the poor, and rich men rule the law"

Oliver Goldsmith

In the evolving landscape of legal studies, the intersection of law and technology has emerged as a pivotal area of discourse. The rapid expansion of digital platforms, artificial intelligence, and data governance presents complex legal challenges that demand scholarly attention and informed policymaking. Law is not merely a static framework. It is a dynamic force that adapts to the needs of society while safeguarding justice, equity, and individual freedoms.

The International Conference on Law and Technology, hosted by MANUU Law School, is a commendable initiative that brings together legal scholars, researchers, and practitioners to deliberate on these crucial issues. This academic forum provides a platform to critically examine existing laws, propose reforms, and explore the ethical implications of technological advancements.

As law professors, our role extends beyond teaching legal principles—we are responsible for guiding the next generation of legal minds toward innovative and conscientious legal thought. This conference embodies our commitment to intellectual exploration, interdisciplinary collaboration, and the pursuit of legal excellence. We hope the discussions held within these walls contribute to meaningful legal evolution and inspire a deeper engagement with the ever- changing socio-legal landscape.

(R. VENKATARAMANI)

Justice B. Prakash Rao
Former Judge High Court of AP

Date: 20th February, 2025.

Dear Prof. (Dr.) Tabrez Ahmad.,

Greetings to you and all the concerned.,

It gives an me immense pleasure and honor to be part of the International Conference on Law & Technology - ICLT 2025 scheduled for 25.02.2025.

On perusal of the comprehensive brochure and the itinerary on the subject in the conference, at the outset, I congratulate you and the organizing committee along with the entire team at the esteemed MANUU Law School. You are certainly making an attempt by stepping into and go along with step by step in the enormous efforts being carried out by various stock holders, in trying to understand and keep pace with the very hot subject, in regard to the information technology. Apparently, from your side to make at least some dent is being made in aid of the progress of new emerging law. Looking back and considering the existing situation with the changes now and then being made in the law, the activities as ushering are far beyond reach.

In fact, I am sure your efforts will certainly go along with the and in aid to the steps laying down not only the foundation but also the advancement of jurisprudence in the artificial intelligence.

I wish all the success and hope it will be a guiding pinnacle and a torchbearer for all the time to come, not only nourishing the subject but a guide to all Law-men.

Thanking You.,

With Regards.,

Hon'ble Justice B. Prakash Rao

x

Alfredo M. Ronchi
Secretary General EC Medici
Framework of Cooperation -Chair of
JRC S2D2, Milan, Italy
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Message from Alfredo M. Ronchi

Digital transformation is reshaping society impacting lifestyles. Are we facing a significant turning point toward a "New normal"? Digital technology is intertwined with almost all the life sectors. Since its dawn the number of application and solutions based on such technology had a surprising rate of growth. The extended use of computers overlapped more and more any activity generating relevant impact on society. Considering the ontology point of view digital technology is a new entity, a new class of objects, immaterial, cloneable, sharable almost zero cost all-over the globe. These properties associated with some emerging or re-emerging technologies can pose some concerns and produce impacts on human rights, ethics and last but even jurisprudence and regulations.

The International Conference on Law and Technology, hosted by MANUU Law School, offers a timely opportunity to share ideas and activate fruitful cooperation among researchers and experts. The emerging "new normal" due to a pervasive digital transformation requires a multidisciplinary approach involving lawyers, technologists, humanists, civil society and more.

As a Computer Science Professor since a long term interested in the intersection between emerging technologies and humanities, I highly appreciate this initiative, and I am honoured to contribute thanking the scientific committee for the invitation. I wish a positive and fruitful outcome to this conference, hoping that the final document summarising the achievements of the event will have relevant diffusion among key actors and positive impact on socio-legal landscape.

With warm regards,
(Alfredo M. Ronchi)

Dr. Sarah Jane Fox
Associate Director,
Institute for Digital Culture
Leicester Law School
University of Leicester.
United Kingdom
Email: sarah.fox@le.ac.uk

Message from
Dr. Sarah Jane Fox

As this conference recognises, there remains a symbiotic connect between technology and the advancement of humankind. Revolution and evolution go hand-in-hand, and law and legislation has had, and most importantly, must continue to have, a key role in ensuring that technologies are used ethically and legitimately and to the benefit of humanity and the societies we live in. This must be undertaken with fairness and equity to all.

The themes of the Conference in 2025 echo the need to guarantee this safety system is in place across a vast number of areas, whilst echoing, only to clearly, the impact that technologies have to our existence. Virtually every area of our lives is affected by technology, many of them, being interconnected and showing the complexity of such advancements, which is only set to intensify over the next few decades. *Now remains the time to discuss the laws that we have and, importantly, need in place.* In summary, I welcome open discussions and engagement that recognise our diverse society in such conversations. There remains the need to ensure

that generations that are most likely to be impacted by any of our failures today are involved and take a key role in mitigating risks whilst maximising opportunities to use technologies in a positive way that benefits humankind tomorrow.

With warm regards,
(Sarah Jane Fox)

Dr. Pavan Duggal
Advocate, Supreme Court of India
Conference Director, International Conference on Cyberlaw,
Cybercrime & Cybersecurity
Chairman, International Commission on Cyber Security Law
Chief Executive, Artificial Intelligence Law Hub
Founder-cum-Chancellor, Cyberlaw University
Chief Mentor, Blockchain Law Epicentre
Head, Pavan Duggal Associates
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Message from
Dr. Pavan Duggal

It gives me immense pleasure to greet you on the occasion of the International Conference on Law and Technology. As we stand at the intersection of legal frameworks and technological advancement, this conference serves as a crucial platform for dialogue, innovation, and collaboration.

The rapid evolution of technology continues to present both unprecedented opportunities and complex challenges for legal systems worldwide. From artificial intelligence and block chain to data privacy and cyber security, the legal Profession must adapt and evolve to effectively Address these emerging paradigms while upholding the fundamental principles of justice and equity.

This conference brings together leading legal scholars, practitioners, technologists, and policymakers from across the globe. Through our collective expertise and diverse perspectives, we all must aim to explore innovative solutions to bridge the growing gap between technological advancement and legal frameworks.

The papers and presentations featured in these Proceedings represent cutting-edge research and thought leadership in areas such as digital governance, electronic evidence, and intellectual property in the digital age, and the regulation of emerging technologies. I am confident that the insights shared within these pages will contribute significantly to the ongoing discourse on technology law and policy.

I extend my heartfelt gratitude to all the contributors, reviewers, and organizing committee members who have worked tirelessly to make this conference a success. May these Proceedings serve as a valuable resource for scholars, practitioners, and policymakers in their endeavours to shape the future of law and technology.

Warm regards,
Pavan Duggal

Shri Mumtaz Ali
Chancellor,
Maulana Azad National Urdu University, Hyderabad

Message from Chancellor

"WHEREAS THE LAW IS PASSIONLESS, PASSION MUST EVER SWAY THE HEART OF MAN"

ARISTOTLE

In a world characterized by rapid globalization and complex legal challenges, the Conference Proceedings of International Conference on Law and Technology's role in disseminating complex research and understanding interdisciplinary collaboration is more important than ever. We believe that this book serves as a medium for scholarly discourse, intellectual exchange, and advancing the growth of legal knowledge, technology, and research.

Given the intricate relationship between law and technology, legal education plays a pivotal role in identifying and articulating the critical factors that catalyse necessary. The book brings together the insights of a distinguished ensemble of legal Professionals, including academicians, industry experts, students, and practitioners from various disciplines. Through their contributions, they provide a comprehensive exploration and understanding of the intricate issues that shape and sometimes distort the legal and social fabric.

This volume, a compilation of abstracts presented at the International Conference on Law and Technology (ICLT-2025), organized by MANUU Law School, Hyderabad, presents various viewpoints on today's pressing legal and technological issues. I commend the editors for their diligent efforts in curating this invaluable collection. This Conference Proceedings is poised to make a substantial contribution to the broader research landscape and to inspire those who are dedicated to the pursuit of social justice and progress.

With warm regards,

(Mumtaz Ali)

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Prof. Syed Ainul Hasan,
Vice Chancellor,
Maulana Azad National Urdu University, Hyderabad

Message from Vice Chancellor

"Development consists of the removal of various types of unfreedoms that leave people with little choice and little opportunity of exercising their reasoned agency. The removal of substantial unfreedoms, it is argued here, is constitutive of development."

Amartya Sen

As a dynamic collective authority, law operates to bring about transformative change in an equitable manner. It engages with communities and their individual members, influencing their mutual experiences and aspirations. Additionally, law is vital in incorporating nature into societal structure. This function has gained importance as economics, science, and technology evolve.

While contemporary educational frameworks often compartmentalize law, politics, and society into distinct academic disciplines, researchers working in these interdisciplinary fields frequently portray their insights. This interdependence reflects the reality of a modern society where these domains are so deeply intertwined that it is inconceivable to imagine one without the other. Law and technological inquiries can contribute to a more rigorous examination of existing legal framework and provide a platform for innovative policy formulation that drives the social changes.

Law in Technology establishes legal frameworks for the development and use technology. This ensures responsible innovation and protects users from potential harm. Key areas include cyber security law, intellectual property law, social media law, and emerging tech law.

The complex interplay of social structures and technology relationships in fact influences the various legislative reforms by aligning with the broader contours of human activities to enhance the ethical practices in society. The Conference Proceedings of International Conference on Law and Technology presents a comprehensive exploration of the complex issues at the intersection of law and technology. We are confident that the efforts of MANUU Law School in convening experts from diverse fields will undoubtedly provide a substantial impetus to the field of legal research.

With warm regards,

(Syed Ainul Hasan)

Prof. Sk. Ishtiaque Ahmed,
Registrar,
Maulana *Azad National Urdu University, Hyderabad*

Message from *Registrar*

"Injustice anywhere is a threat to justice everywhere." - Martin Luther King

The legal framework works as a powerful instrument of societal changes. This encompasses the legal structures that regulate technology development and usage, as well as the legal rights and duties of individuals and corporations. We can observe the progress in several areas, including democratic governance, technological advancements, financial intermediation, legal education, corporate structures, economic systems, political ideologies, and public order.

It is necessary to acknowledge that esteemed institutions like Maulana Azad National Urdu University, is always committed to serving the society by utilizing their resources to benefit humanity and promote legal and social progress. The judicial institutions are dedicated to continual development and endeavoring to establish an orderly society and effective governance within a democratic context, while also aiming to fulfill the primary goals of the Indian Constitution. The judicial establishment aims to uphold and enhance the strict goals of the Constitution.

A multitude of distinguished persons and institutions have, with their insightful knowledge, deep understanding, untainted qualities, and unmatched sacrifices, contributed significantly to society. I believe that their sacrifices and efforts devoted to advancing mankind's interests should always be remembered. This book contributes to this tradition by having similar perspectives.

The Conference Proceedings of International Conference on Law and Technology is a collective book that looks deeply into the way the legal framework for how technology is used. This book highlights the Judiciary's role in driving technology and advancing progress for the betterment of all.

With warm regards,

(Ishtiaque Ahmed)

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Prof. (Dr.) Tabrez Ahmad
Dean & HoD, MANUU Law School,
Maulan*a Azad National Urdu University, Hyderabad*

MESSAGE FROM THE DEAN

The wisdom of our sages and the blood of our heroes has been devoted to the attainment of trial by jury. It should be the creed of our political faith.

-Thomas Jefferson

At MANUU Law School, we are dedicated to give our students a Profound legal education that will enable them to engage in law with competence, compassion, and social responsibility. Learn the variety of academic programs, vibrant campus life, outstanding faculty, and innovative amenities that make the School of Law the preferred option for legal education as you investigate the opportunities available there. Our program is carefully crafted to give students the practical knowledge, critical thinking abilities, and solid foundation in legal ideas they need to succeed in the legal Profession The relationship of Law and Technology is always complex as they are intertwined in such a manner which creates dichotomy as whether law should follow technology, or the other way around. From the invention of the wheel to the modern marvels of artificial intelligence, technology has been a driving force behind our progress, innovation and evolution.

The Conference Proceedings of International Conference on Law and Technology provides insights into how different aspects of law have influenced changes within the social sphere as well as how these changes were received by the formal judicial system. The book contains wide-ranging abstracts covering fields of Law and Technology. This publication has established a platform for excellence in legal research, developed by the School of Law. Much credit goes to the dedicated committees who successfully established the Conference Proceedings of International Conference on Law and Technology through their unwavering commitment.

With warm regards,

*(*Tabrez Ahmad*)*

Dr. Rashmi K S
Assistant Professor, MANUU Law School,
Maulan*a Azad National Urdu University, Hyderabad*

MESSAGE FROM ORGANISING SECRETARY

"The rule of law is the foundation upon which society's progress, ensuring justice, equity, and harmony amidst change"

Lord Denning

Law has always been the foundation of a civilized society. It evolves with time, adapting to societal transformations and technological advancements while upholding fundamental rights and democratic values. In today's digital era, where artificial intelligence, blockchain, and cyber law are reshaping governance, business, and personal freedoms, the legal framework must be dynamic and responsive to these changes. The intersection of law, society, and technology presents both opportunities and challenges. While technology empowers individuals and fosters economic development, it also raises concerns about data privacy, cybersecurity, intellectual property, and digital rights. Addressing these complexities requires collaboration between legal experts, policymakers, academicians, and industry leaders to ensure that innovation aligns with justice and ethical governance.

In this context, I commend Maulana Azad National Urdu University (MANUU) for its unwavering commitment to academic excellence and legal research. The International Conference on Law and Technology (ICLT- 2025) is a significant initiative that will bring together scholars and experts to deliberate on pressing legal issues in the digital age. Such academic engagements are instrumental in shaping policies that safeguard rights, promote responsible technological use, and ensure that justice remains a guiding principle in our rapidly evolving world. I extend my best wishes to the organizers, scholars, and students participating in this prestigious conference.

With warm regards,

*(***Rashmi K S***)*

ACKNOWLEDGMENT

PREFACE

Proceedings of International Conference on Law and Technology presents a collection of scholarly articles exploring the nexus between law and technology. This Proceedings offers an in-depth analysis of contemporary dynamics, examining a plethora of topics including Artificial Intelligence, Cyber Security and Law, Digital Media and Law, Forensic Law and Technology, International Trade, Law and Technology, Law Governing Virtual Currency, Laws Relating to Robotics, Regulation of Block chain Technology, Big data and Law, IOT, Food processing Technology, Regulations of Fintech.

Through a rigorous examination of these issues, the volume highlights the pivotal role of law in catalyzing law and technology. It examines the complex interactions between legal systems and technology advancements, pointing out areas where current legislation can be insufficient or out dated. Through the presentation of a variety of viewpoints and creative solutions, the volume advances a more sophisticated comprehension of the opportunities and problems encountered in the modern era.

This publication serves as a valuable resource for legal scholars, policymakers, and anyone interested in the intersection of law and technology. It encourages critical thinking, stimulates academic discourse, and provides insights into the evolving legal landscape.

Editorial Committee,
Proceedings of
International Conference on
Law and Technology

INTRODUCTION

Proceedings of International Conference on Law and Technology serves as a preeminent platform for legal scholarship and discourse. We set out on an intellectual journey through the complicated field of law within these pages, where perceptive evaluations, innovative studies, and considerate comments combine to influence and enhance the legal environment. Our publication serves as a flashlight of knowledge in a time of changing jurisprudence and dynamic legal concerns, creating a forum for thought-provoking discussions between legal experts from all backgrounds.

Incorporating technology into legal practice is becoming increasingly important as firms and organizations turn to tech-driven solutions to improve their efficiency and capabilities. Proceedings of International Conference on Law and Technology will play a crucial role in strengthening the integration of law and technology within the Professional realm. By highlighting the importance of legal tech, the conference will encourage the adoption of tools like AI for legal research, block chain for contract management, and cyber security software to protect client data.

This Proceedings will be the promotion of ethical considerations in the development and deployment of new technologies. With technological advancements often outpacing legal regulation, ethical concerns around issues such as data privacy, algorithmic bias, and surveillance are becoming increasingly important. The Proceedings will provide a platform for discussing the ethical dilemmas posed by technologies.

Editorial Committee,
Proceedings of
International Conference on
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Artificial Intelligence & Law

LEGAL IRREGULARITIES AND BIAS IN DEEP SEEK AND CHATGPT AI: A COMPARATIVE ANALYSIS

Prof. (Dr.)Tabrez Ahmad[1]

Abdus Saboor Maaz[2]

The emergence of Deep Seek AI represents a transformative shift in artificial intelligence, marking a new era of deep data analysis, decision-making, and automation. As industries across the globe adopt this technology, it promises to reshape sectors ranging from healthcare and finance to legal services and government. However, alongside these advancements, the rapid rise of conversational AI systems like ChatGPT highlights the contrasting roles that AI plays in modern society. While Deep Seek excels in retrieving and processing vast datasets for highly specialized tasks, ChatGPT focuses on natural language processing and enabling human-like conversations. Despite their differing functions, both technologies present significant concerns regarding legal irregularities, algorithmic bias, and their potential impact on human rights.

This paper provides a comprehensive analysis of the legal challenges and regulatory gaps posed by Deep Seek AI, while also drawing comparisons to the ethical and legal concerns surrounding conversational AI systems like ChatGPT. The study delves into the potential risks of algorithmic bias, such as the reinforcement of societal stereotypes, discrimination, and the erosion of fairness in automated decision-making processes. Moreover, it examines the implications of these technologies on civil liberties, data privacy, and transparency,

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emphasizing the urgency for stronger regulatory oversight and accountability mechanisms.

By investigating the current legal frameworks that govern both Deep Seek and ChatGPT, this paper highlights the pressing need for reform in AI governance. As AI technologies continue to evolve, the legal system must adapt to ensure that these innovations are deployed responsibly and in ways that prioritize human rights and social justice. The paper advocates for the development of global ethical standards and policy reforms that can foster innovation while safeguarding the public interest.

Through this comparative analysis, the paper contributes to the broader discourse on AI ethics, governance, and the role of responsible AI development, offering valuable insights into how legal systems can address the unique challenges posed by these revolutionary technologies. It argues for a balanced approach, one that promotes innovation while ensuring transparency, accountability, and the preservation of societal trust in AI applications. By doing so, this research aims to advance the conversation on AI regulation, providing a critical framework for policymakers, legal experts, and technologists alike.

Regulating AI in Financial Markets:
Challenges and Opportunities in Algorithmic Trading

Dr. Saidalavi K[3]
Dr. Tausif Ur Rehman Md[4]

The increasing integration of Artificial Intelligence (AI) in financial markets has revolutionized algorithmic trading, enhancing efficiency, speed, and decision-making. However, the rapid adoption of AI in stock markets raises significant regulatory concerns related to transparency, fairness, market stability, and accountability. This study aims to analyze the regulatory frameworks governing AI-driven trading across major global economies, identifying key challenges and opportunities for effective oversight. This research adopts a descriptive approach based on secondary data sources, including regulatory reports, financial laws, policy papers, and academic literature. A comparative analysis is conducted to examine how different jurisdictions, including the United States, European Union, Chaina, Japan, and emerging markets, regulate AI applications in trading. The study evaluates existing legal structures, compliance requirements, and enforcement mechanisms while highlighting regulatory gaps. The study reveals significant disparities in AI trading regulations across jurisdictions, reflecting varying levels of oversight and enforcement. While developed economies have introduced regulatory measures to enhance algorithmic trading

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transparency and mitigate systemic risks, regulatory gaps persist in areas such as AI explain ability, liability assignment, and cross-border enforcement. This research provides valuable insights for policymakers, financial regulators, and market participants in designing robust AI governance frameworks. It highlights the need for adaptive regulatory mechanisms that balance innovation with risk mitigation, ensuring AI-driven trading enhances market efficiency without undermining investor protection and financial stability.

Artificial Intelligence: Risks to Privacy and Democracy

Dr. Masood Ahmad[5]

Mustafa Zameer[6]

The technocratic world rises to a crescendo anew; this time around with much passions running around the enigma of artificial intelligence, a phenomenon causing many to raise eyebrows. From the question of imitating human intelligence to ending the human supremacy in myriad fields, we are bereft of an intelligible answer when it comes to Artificial Intelligence. It would be otiose to spill out the already conspicuous influences AI. enjoys in our lives but to harness the too much dependence on its tools which in all probability could be a threat is essentially what we need to do to play safe. While the technological-savvy coterie perpetuates and experiments with AI., the vulnerabilities of this next revolution is what's of a greater concern. The impending questions on ethics, privacy and accountability of AI. systems really need to be drawn a final curtain and the roles of each stakeholder in this effort must be set accordingly. This paper strikes the right chord with those inquisitive of the future of AI. and it concerns particularly in the field of Democracy. The contours of AI umbrella is fairly traced and the imponderable questions on human rights and stifling of privacy is discussed with inputs from the experts on the subject. The paper tries to enunciate the regulation of AI. through various legislations and constraints already in place and also traces the path of new mechanisms that could be solicited in the laws of the nation states.

Keywords: AI., Technological Advancement, Privacy, Democracy, Human Rights

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THE MIRAGE OF AI REGULATION: NAVIGATING THE LEGAL CHALLENGES IN DEFINING ARTIFICIAL INTELLIGENCE

Mr. Aakash Satyadeo[7]

In the 21st century, we are entering an era of technium, with new technological developments occurring at every blink of an eye. From self-driving cars to robotic surgeries, sapiens have witnessed it all. The words that once belonged on the cover pages of fiction have been translated into the reality of a brave new world. One of the cornerstones of these technological developments is artificial intelligence. Any powerful technology can be powerful in both good and bad ways and, therefore, cannot be left unregulated. The European Union has already taken the lead, becoming a torchbearer for other countries by enacting the first-of-its-kind regulation for artificial intelligence. Other countries are synchronizing their national legislation with the stalwart, enigmatic codification of the European Union in Drafting AI regulations. AI regulation, especially through the articulation of a precise legal definition of artificial intelligence can be elusive or illusory, much like a mirage in the desert. It implies that while the goal of regulating AI may appear clear and attainable at first glance, the complexity and dynamic nature of AI technologies often render this pursuit challenging, ambiguous, and fraught with practical difficulties

This paper examines the challenges inherent in defining 'artificial intelligence' (AI) for regulatory purposes, arguing that the material scope of AI regulations should not rely solely

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on the term 'AI' itself. It proposes a framework of essential requirements for effective legal definitions and evaluates existing AI definitions against these criteria. The analysis seeks to determine whether current definitions satisfy critical legal requirements or prove inadequate within the regulatory framework. Furthermore, the paper explores a risk-based approach, shifting the focus from defining AI as a concept to addressing specific risks associated with its development and deployment.

CONTEMPORARY LEGAL ISSUES AND CHALLENGES OF ARTIFICIAL INTELLIGENCE IN HUMAN RIGHTS

Avinash Bhagwan Awaghade[8]

The Artificial Intelligence (AI) is innovation. It has relevance in all sectors. The information and technology has changed the world. AI moving one step ahead in ICT. The rapid advancement of artificial intelligence (AI) technology has involve the contemporary legal issues and challenges. The present law recognises the legal interest of individual and legal person as well. But AI has some different sort of personality that may come in to ambit of legal person i.e. artificial personality. AI technology has been provided the opportunity and platform for speech and expression. AI facilitate communication and extended the scope for freedom of speech. However, it has significant legal and ethical issues. The existing law and regulatory framework has vacuum when it comes in to fixation of liability, originality and aspect of infringement of privacy law. The paper will analyse the scope and extent of use of AI in context of freedom of speech and expression. Further present paper will analyse the challenges of Innovations in the scope of content generated by or with the help of AI technology. This paper will analyse the quantum of legal protection and the liability under the constitution of India.
Keywords- Artificial Intelligence, Freedom of speech, Human rights, Privacy, Justice.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN PREDICTIVE POLICING AND ITS LEGAL IMPLICATIONS

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The incorporation of Artificial Intelligence (AI) into predictive policing is rapidly reshaping law enforcement strategies, offering agencies the ability to foresee and avert criminal activity. By utilizing sophisticated algorithms, machine learning, and data analytics, predictive policing systems sift through vast quantities of information—ranging from historical crime data to demographic and socio-economic variables—to predict potential crime hotspots and identify individuals at higher risk of offending. While these AI-powered tools promise enhanced operational efficiency and optimized resource distribution, they also give rise to Profound legal and ethical dilemmas that warrant rigorous examination. This paper delves into the role of AI in predictive policing, highlighting both its prospective advantages for law enforcement and the intricate legal challenges it introduces.

The first section of the paper explores the operational benefits of predictive policing. By harnessing AI to process and interpret extensive datasets, law enforcement agencies can proactively allocate resources to high-risk areas, potentially preventing crimes before they transpire. However, the deployment of predictive technologies also presents critical concerns, including the reinforcement of biases entrenched in

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the criminal justice system. Since AI models are typically trained on historical crime data—often tainted by systemic inequalities—they may perpetuate discriminatory trends in both predictions and law enforcement practices. This raises urgent questions regarding racial Profiling, the disproportionate targeting of certain communities, and the exacerbation of existing societal inequalities.

Beyond these ethical challenges, the paper shall also examine the legal ramifications of utilizing AI in policing. Foremost among these concerns is the potential infringement upon constitutional rights, including the Fourth Amendment's safeguards against unreasonable searches and seizures, as well as the due process protections afforded by the Fourteenth Amendment. If predictive policing is misapplied or inadequately regulated, it could lead to unwarranted surveillance of individuals or entire communities, conducted without proper oversight or probable cause.

Additionally, the paper advocates for the establishment of robust regulatory measures to ensure that AI in predictive policing is used ethically and transparently. It calls for greater accountability, enhanced oversight, and active public participation in the development and application of these technologies, stressing the need to minimize bias and safeguard citizens' rights. To mitigate the risks associated with predictive policing, the paper proposes reforms such as independent audits of AI systems, transparency in algorithmic decision-making, and mechanisms for redress when rights violations occur.

In conclusion, the paper urges a measured and judicious approach to the deployment of AI in policing—one that maximizes the benefits of advanced technology while upholding core legal and ethical principles. As predictive policing continues to evolve, a thoughtful and deliberate framework must be established to ensure that these tools

contribute to public safety without compromising justice or equality.

REVOLUTIONIZING LEGAL SYSTEMS: THE IMPACT AND CHALLENGES OF ARTIFICIAL INTELLIGENCE IN LAW

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"Intelligence is the ability to adopt to change"
-Stephen Hawkins

Modern India's legal system combines statutory law, common law, and customary laws, with the Constitution of India serving as its foundation. It follows a hierarchical court structure, headed by the Supreme Court, followed by High Courts and lower courts. This system deeply rooted in the values of justice, equality, and fairness, it safeguards citizens' rights. The judiciary is independent, ensuring impartial enforcement of laws. Legal reforms and technological advancements continue to shape the evolving legal landscape in India.Artificial Intelligence (AI) is revolutionizing legal systems worldwide, including in India, by automating complex legal processes, enhancing decision-making, and improving access to justice. AI, defined as the simulation of human intelligence by machines, incorporates technologies such as machine learning, natural language processing, and predictive analytics. In the Indian legal framework, AI has the potential to address longstanding challenges like judicial backlog, efficient case management, and legal research.

Indian judicial systems, AI is being explored to expedite case management. For instance, India's Supreme Court launched the

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AI-Driven SUVAAS translation tool, which simplifies translating legal documents from English to vernacular languages, thereby increasing accessibility. Similarly, courts are adopting e-courts projects to digitize records and facilitate AI-driven data retrieval for efficient judicial functioning. These initiatives align with the Supreme Court's emphasis on leveraging AI to tackle the judicial backlog of over 40 million pending cases (Supreme Court of India, 2021).While AI provides substantial advantages, its adoption also brings forth important concerns regarding accountability, transparency, and the reliability of algorithmic results in high-stakes legal situations. This research highlights the necessity for a balanced approach that incorporates AI tools while maintaining a commitment to fundamental legal principles and ethical standards. The study concludes by presenting a comprehensive roadmap for the ethical and responsible integration of AI in the legal field, with the goal of maximizing its benefits while addressing the challenges it presents.

Keywords: Artificial Intelligence, Roadmap, Technology, accessibility, e-courts, legal system.

ARTIFICIAL INTELLIGENCE AND ACCESS TO JUSTICE: INTRUDER OR FACILITATOR

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ABSTARCT

As a democratic and civilized state our Constitution secures 'justice for all 'which is the primary and indispensable goal of every legal system. India is second largest in world population and even after seven decades of independence the target of securing access to justice for all is still a distant Dream. The Indian legal system has immense potential but faces a variety of systemic challenges, including delays, access issues, pendency and procedural complexities. All these factors collectively results in the failure of administration of justice and which in turn leads to dissatisfaction among the masses regarding the efficacy of the judicial system. However, law is a dynamic concept and required to be changed by remodeling and adapting itself to the needs and aspirations of the society with the passage of time. It is true that every system has certain flaws, and it continuously tries to device new techniques and methods to remove those defects and limitations with the introduction of modification and adaptation of new technologies. Reforming the system requires a multifaceted approach that incorporates technological innovation, better infrastructure, stronger accountability, and a focus on inclusivity and fairness. In this era of technological advancement, Artificial Intelligence is a compelling option in terms of providing access to Justice. Incorporating Artificial Intelligence into India's legal system has immense potential to

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make the justice system more accessible, efficient, and fair. Artificial Intelligence can help by democratizing legal services, providing access to legal information in rural and remote areas, doing predictive analysis, language support, case analysis and predictions, data analytics, drafting work but on the other hand, it has certain limitations in terms of privacy issues, absence of regulatory frame work, transparency, accountability and lack of human touch or empathy. This paper highlights the areas where Artificial Intelligence can be a facilitator and where inclusion of AI can act as a hurdle in access to justice. The main focus is on finding a balance between applications of Artificial Intelligence as a facilitator without intruding the human aspect of legal practice. Artificial Intelligence should be used as a tool only within the legal framework without compromising the ethics, guidelines and to avoid its misuses.

Keywords: Judicial System, Access to Justice, Legal Process, Artificial Intelligence (AI), Prospects, Challenges

ARTIFICIAL INTELLIGENCE AND LEGAL FRAME WORK: A CRITICAL ANALYSIS

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The intricate connection between artificial intelligence (AI) and the law is examined in this paper. The legal ramifications, difficulties, and prospects for AI development are covered in this article. why the new technology requires extensive regulation because of its uniqueness and ability to address long-standing ethical issues. In compliance with international law and customs laws, a report on the relationship between AI and law will be written and analysed. Artificial intelligence is becoming more and more common as science and technology advance, and its applications are evident in every aspect of people's lives. In recent years, the intersection between law and artificial intelligence has gained a lot of attention. Judges can hear cases more effectively if they have access to objective, factual, and statistical evidence from artificial intelligence technologies. The computer is capable of extracting features, creating a knowledge map, and achieving deep learning of the artificial neural network based on a multitude of factual civil judgement theories. The complexity of discretionary factors can be satisfied by tailoring the artificial neural network to different discretionary factors. Additionally, the artificial neural network may learn massive data using classification rules, realise knowledge transformation by setting matching rules, and choose the implicit maturity and number of neurones in the discretion variables. Artificial intelligence's benefits can

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aid in case evaluation. Our legal system can be enhanced as long as artificial intelligence technology is used appropriately. The integration of AI into society presents numerous legal challenges. A critical analysis reveals the gaps in existing legal frameworks, which are often ill-equipped to handle the complexities of AI. Lawmakers must collaborate with AI experts to develop regulations that balance innovation with ethical considerations, ensuring that AI serves society in a fair, transparent, and accountable manner. Without a solid legal framework, the risks associated with AI, from bias to privacy violations, may undermine public trust and hinder the full potential of this transformative technology.

AI REGULATION: STRIKING THE RIGHT BALANCE BETWEEN INNOVATION AND ACCOUNTABILITY

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Himanshu[17]

The advent of generative artificial intelligence (AI), epitomized by models like Chat GPT, heralds a new era of both immense possibilities and profound challenges. As these ground breaking technologies weave themselves into the fabric of modern society, the imperative for a well-orchestrated legal framework to mitigate their inherent risks becomes ever more pressing. This article embarks on a meticulous exploration of the transformative impact of generative AI, delving into the legal intricacies surrounding AI-generated content and the governance mechanisms essential for maintaining a delicate equilibrium between innovation and regulation. Grounded in a triadic research methodology—comprising an extensive literature review, doctrinal legal analysis, and in-depth case study evaluation—the study navigates the evolving legal terrain, distils scholarly perspectives on the technological, ethical, and socioeconomic ramifications of generative AI, and illuminates real-world complexities through tangible case studies. A critical assessment of the strengths and shortcomings of U.S. governance approaches to AI underscores the need for a harmonized legal framework centered on international cooperation, forward-thinking legislation, and the establishment of a dedicated regulatory authority. By fostering

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dialogue among a diverse spectrum of stakeholders and pinpointing crucial gaps in existing research, this study aspires to shape a legal paradigm that campaigns ethical integrity, safeguards individual rights, and cultivates responsible innovation in the dynamic age of generative AI.

Keywords: Artificial Intelligence, AI Tools, Algorithm, Data Protection, Data Privacy

Artificial Intelligence: A Modern Add-on to the Legal System

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Today, various aspects of our lives are driven by Artificial Intelligence (AI), ranging from regular smart assistants to sophisticated decision-making systems. AI has transformed the way we live, work and interact with one another. Currently, the implementation of Artificial Intelligence can be effectively seen across various sectors ranging from healthcare, telecommunication, finance to education, thus the revolutionary impact of AI on legal system should come as no surprise. AI is an intelligent machine capable of thinking, learning, understanding, reasoning, communicating and acting on its own, i.e., mimicking human intelligence. The advent of modern technology has the potential to resolve complicated tasks in legal practice. Each advancement in the legal Profession- from typewriters to computers, libraries to online research, fax to emails has been revolutionary. Now, AI significantly impact legal frameworks and resolve challenges faced by legal Professionals. The legal Profession is highly labour-intensive as majority of the work is done manually. Due to tonnes of work and tight schedules meeting deadlines is challenging; under such circumstances, one is prone to commit errors resulting in inefficacy. AI enhance judicial productivity, both qualitatively & quantitatively, making justice delivery system affordable, accessible, cost-effective, predictable, reliable and transparent. AI tools analyse case outcomes and make predictions based on previous decisions, helping judges and lawyers in their judicial decision-making processes. Due to

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its ability to analyse vast amount of data and detect patterns quickly, AI can expedite legal procedures. To enhance the lives of lawyers and law firms AI solutions ranging from E-Discovery tools, trademark search to contract automation and several legal tech start-ups have emerged. AI has digitalized legal research transforming the legal Profession by saving significant amount of time and efforts of legal Professionals. Today court hearings are gradually moving from physical hearing to virtual hearing. The aftermath of COVID-19 had a significant impact on people's lives. It has helped judges and lawyers appreciate the value of technology and the necessity of utilising AI and machine learning tools to accomplish their tasks. Despite this progress, various concerns regarding the ethical and legal implications of utilizing AI in the legal domain need to be addressed which itself is a long journey ahead.

Keywords: Artificial Intelligence, Human intelligence, Legal Profession, Data, Legal research, Court hearings

AI and the Law; Intersection in the Modern Times

Khadija Fatma[19]

In the times we are living in artificial intelligence (AI) is the extremely interesting and faster developing zone where the progression of technology is happening into varied areas of society. The use of artificial intelligence (AI) is seen all over the market some of them are healthcare, finance, transportation, industries and environment as day by day complexities are faced manually. There is also involvement of a number of legal issues and problems which invites the dire need for mindful invigilation and regulation, however at the same time technology is encroaching on all the aspects of life of human beings and other living beings. With the passage of time each day a variety of concerns relating to various aspect of law keeps coming up as AI technology develops, thrusting the limits of preexisting legal framework. The matter that is the product of AI and intellectual property rights puts into the picture another new legal concern. A lot of hurdles related to same, inclusive of concerns from the stream of intellectual property rights, data privacy, and the liability for faults done by AI.

The implementation of AI put forth varied widespread ethical aspect regarding justice, autonomy and privacy. The maintenance of public trust and confidence in the field of law requires AI systems to be unambigous and responsible. Over the past decade, the usage of AI in the area of law has increased immensely. Legal research, contract assessment and the result of case prediction are few of the legal tasks which have been lucrative from the implementation of AI technologies which involve machine learning, algorithms,

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natural language processing and computer vision. In the spite of the fact that the application of AI to the system of law could actually increase productivity and minimise the expenditure, it ponders upon the areas inclusive of accountability, bias and privacy. In the field of law AI has the potential to low costs, promote equitable justice reach and increase the caliber of legal services.

The upcoming outcome of AI integration in the field of law is excellence, inspite of the challenges and unknowns which are around it. AI has got the potential to increase the efficiency and efficacy of procedures related to law, and close the knowledge gap between the general public and legal professionals. A crucial area in the continuous development of the legal Profession is the nexus between artificial intelligence and the law. Although AI has the potential to bring about evolutionary change, it also poses difficulties which calls for mindful consideration and quick action. As a consequence successful AI deployment requires navigating the global landscape of AI legislation, resolving legal issues, putting ethical practices into place and cultivating an AI-ready culture. This can be taken advantage of AI's potential while maintaining compliance and reducing risks by being proactive and informed.

VALIDITY OF MARRIAGES PERFORMED VIRTUALLY WITH SPECIAL REFERENCE TO METAVERSE MARRIAGE

Mahima Kaushik[20]

COVID-19 has had a devastating effect on every sphere of the world, compelling humans to switch to alternate modes of working and living without getting caught by the virus.

One among them was switching to the cyber world for their day-to-day activities. The impact of COVID-19 has left countries with a degrading economy, which has switched offices to work from home and classes to online classrooms, finally opening the pathway for a "Virtual World." Companies like Meta, Walmart, and Nike took it as an opportunity to integrate the physical world with the virtual world by creating a diversified space such as the Metaverse. It helped netizens to discard reality easily and live life freely in a parallel virtual world.

Many companies are even buying trademarks on the virtual version of their products on the metaverse, as a result providing gateways/portals to the metaverse for public access. One such instance that took place in the virtual world was an e-marriage, where the bride and groom had made their own Avatars and took pheras around a sacred fire to solemnize marriage with all other guests on a platform called YUG Metaverse, becoming the first couple from India to perform such an e-ceremony. However, it was only a wedding reception that took place on the Metaverse platform, thus not impacting the legality of such marriage under Personal law or the Special Marriage Act. Soon there will be a case where the bride and groom will solemnize

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their marriage on such online platforms to avoid the unnecessary expenses of the physical world and will seek legality from the courts.

At present, India lacks provisions for dealing with the validity and legality of marriages performed virtually on such platforms. A beneficial interpretation of legislation could be done to include e-marriage as a form of marriage.

AI INNOVATIONS FOR TACKLING BACKLOGS AND LEGAL CHALLENGES IN INDIA

Mohammed Abdul Jaleel[21]

Mohatesham Pasha Quadri[22]

India's courts have an ever-growing number of cases filed in them. Is the Indian judicial system inefficient or delaying justice delivery? India's judiciary is generally considered competent. It respects constitutional values and resiliently functions under immense pressure. More so, it caters to enormous diversity and protects democracy. However, it is hardly a secret that there are consistently delays in the delivery of justice. India has one of the most elaborate legal systems in the world. Nonetheless, public faith in the justice system can be ensured only if justice is administered in time. To solve this issue, it is necessary to develop an innovative model that optimizes the efficiency of the judiciary using the latest technology. In the recent past, ample researchers are continually trying out AI-based solutions to rectify the challenges of delays and inefficiencies in the Indian legal system. Innovative tools like AI tool for e-Courts such as case management, predictive analytics for case prioritization, and automated legal research and document analysis show promising solutions. We can use AI based algorithms to

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identify inefficiencies and propose technology-Driven reforms. AI can quicken the pace of justice delivery, enhance transparency, and make the judicial framework more streamlined, accessible, and affordable for the people of India. The use of artificial intelligence in the judiciary will enhance timely delivery and transform how justice is offered in India. Artificial Intelligence will help in analyzing huge amount of data, identifying patterns and predicting outcomes of the case which will help in better utilization of resources by courts. Moving forward AI chatbots and virtual assistants can help litigants and make it easy to access legal information and procedures. An effective integration of AI will, however, have its challenges. Data Privacy, Algorithm Transparency and Digital Divide are a few of them. By encouraging workers of law, technology, policy and other stakeholders to work together, India can create a judicial system that is faster

ROLE OF ARTIFICIAL INTELLIGENCE AND INDIAN JUDICIAL SYSTEM

Mohammed Shamsuddin[23]

Dr. Sudhanshu Chandra[24]

Artificial Intelligence (AI) is transforming many sectors worldwide, and its potential in the judicial system is Profound. The Indian judicial system, known for its robust legal framework and dedication to justice, faces critical challenges such as case backlogs, delayed judgments, and administrative inefficiencies. The integration of AI into this system offers innovative solutions to improve efficiency, enhance access to justice, and ensure faster case resolutions.

AI technologies, such as machine learning and natural language processing (NLP), are already making their mark in various areas of the judiciary. Tools like predictive analytics help in forecasting case outcomes, allowing lawyers and judges to make informed decisions. Similarly, AI-Driven legal research platforms provide quick and accurate access to vast databases of laws, judgments, and precedents, saving valuable time. India's Supreme Court has also initiated the use of AI through its SUPACE (Supreme Court Portal for Assistance in Court Efficiency) project, which aims to streamline case handling and assist judges with data management.

One of the most significant contributions of AI is in e-courts and virtual hearings, particularly during emergencies like the COVID-19 pandemic. By enabling digital hearings and case

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management, AI has ensured that justice delivery continues uninterrupted. Furthermore, AI algorithms can be employed to analyse judicial data for insights, detect patterns in case decisions, and even assist in sentencing by providing unbiased recommendations.

However, the use of AI in the judicial system also raises concerns. Algorithmic bias is a critical issue, as AI systems can inadvertently inherit biases from the data they are trained on. This could lead to discriminatory outcomes, which is unacceptable in a judiciary committed to equality. Data security and privacy are also significant challenges, as judicial records often contain sensitive information. Transparency in AI decision-making processes is essential to ensure public trust, which can be achieved through explainable AI models and regular audits.

Ethical guidelines and robust legal frameworks are necessary to regulate the use of AI in the judiciary. It is crucial to align AI implementation with the constitutional principles of fairness, equality, and justice. AI should not replace human judges but serve as a tool to enhance their efficiency and accuracy. Training judges, lawyers, and court staff in the effective use of AI tools is also vital for a smooth transition to a technology-assisted judicial system.

In conclusion, AI has immense potential to address the longstanding issues of delays and inefficiencies in the Indian judicial system. By leveraging AI's capabilities responsibly, the judiciary can deliver faster, fairer, and more accessible justice to citizens. Striking a balance between technological innovation and human oversight is key to ensuring that AI becomes a valuable ally in the pursuit of justice.

Keywords: Artificial Intelligence, Indian Judiciary, Case Backlogs, E-Courts, Ethical Guidelines

NAVIGATING THE INTERSECTION: ROLE OF ARTIFICIAL INTELLIGENCE IN SHAPING MODERN LEGAL SYSTEMS AND POLITICAL FRAMEWORKS

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Dr. Kuldeep[26]

The swift evolution of Artificial Intelligence (AI) is profoundly reshaping diverse sectors, with law and politics among the most affected. As AI technologies increasingly infiltrate the realms of legal and political decision-making, they hold the promise of transforming traditional systems. Yet, this potential comes with pressing concerns about fairness, transparency, and accountability. This paper explores the dual influence of AI on modern legal and political structures, examining the ways in which AI is being incorporated into both domains and the intricate challenges this convergence creates.

Within legal frameworks, AI finds application in a broad spectrum of areas, from predictive analytics that forecast case outcomes to the automation of contract analysis and legal research. By harnessing machine learning algorithms, AI can substantially streamline legal processes, minimize human error, and possibly democratize access to legal services. However, the integration of AI into legal practice also raises significant issues, such as the risk of algorithmic bias, the opacity of decision-making processes, and the potential erosion of privacy and civil liberties. The paper probes the ethical and regulatory dilemmas surrounding AI's role in law, particularly regarding due process and the safeguarding of fundamental rights.

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In the political sphere, AI is equally transformative, as it reshapes political campaigns, governance, and policy-making through data-driven strategies and automated systems. AI's involvement in election monitoring, political messaging, and the analysis of public opinion is altering the fabric of democratic engagement, yet it also raises alarms about manipulation, surveillance, and the concentration of power in the hands of a select few. Moreover, the paper examines the governance of AI itself, highlighting the ways in which legal and political structures are either adapting to or struggling to keep pace with the rapid advancement of AI technologies. The challenges of regulating AI, ensuring accountability, and upholding democratic values in the face of such potent tools are also addressed.

Through a synthesis of legal and political theories, this paper offers a thorough analysis of how AI is reshaping the contemporary legal and political landscapes. It underscores the opportunities AI provides to enhance efficiency, accessibility, and transparency, while simultaneously confronting the ethical quandaries and regulatory voids that accompany its widespread adoption. Ultimately, the paper advocates for an integrated approach that fuses technological innovation with stringent legal and political safeguards, ensuring that AI's societal impact is both constructive and just.

ARTIFICIAL INTELLIGENCE AND JURISPRUDENCE IN INDIA

Mr. Mizanur Rahman[27]
Dr. Rishikesh Singh Faujdar[28]

Now a days the widely discussed term is "Artificial Intelligence" and is a fast-growing technology for which the misuse of this technology is also increasing. So, laws relating to AI is required in India to reduce its mishandling of data, invasion on privacy, taking undue advantage and other works which may affect the interest of persons. The formation of National Strategy by the planning commission of India on Artificial Intelligence (NSAI) to look over the regulation of AI and thereafter the introduction of "The Digital Personal Data Protection Act, 2023" and the establishment of AI Research Analytics and Knowledge Dissemination Platform (AIRAWAT) by the Niti-Ayog of India has brought some developments to confront with the impact of AI in India. Indian government has also set up the MeiTY (The Ministry of Electronics and Information Technology) in India to confront with the new digital challenges. In future, India shall have to come up with specific regulations relating to the challenges and threats from the AI. At this point in India, there are no specific provisions that deal with AI but the government is expressing concerns regarding the non-availability of these laws. The Indian cities of Hyderabad, Bengaluru and Pune are quickly rising to prominence as major information technology centers, and the country is now known as an AI superpower on a worldwide scale.

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The Indian government has stressed the need of a robust regulatory framework for artificial intelligence, as part of its initiatives. To guide the development and deployment of Artificial Intelligence (AI), the Union Minister stressed the need of a strong legal framework that takes ethical considerations into account. In India, the judiciary has referred the Artificial Intelligence by the various Courts of the Country. In the Jaswinder Singh @ Jassi vs. State of Punjab and Another, the Punjab and Haryana High Court sought the response of the artificial intelligence (AI) ChatGPT.[29] Likewise, deepfake technology was challenged in the case Chaitanya Rohilla Vs Union of India[30] before the Delhi High Court. Thus, there are series of cases where AI is discussed by the Indian judiciary.

Key Words: Artificial Intelligence, Technology, Digital, Deepfake, Judicial

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[29] 2023 Livelaw (PH) 48.

[30] W.P.(C) 677/2021, on 25 January, 2021 & CM Appl.1638/2021.

A COMPARATIVE ANALYSIS OF AI REGULATION: LESSONS FOR INDIA FROM THE EU AI ACT, CHINA AIDP AND U.S. SECTORAL APPROACHES

Ms. Ashmika Agrawal[31]

"the development of full artificial intelligence could spell the end of the human race". He further said that "it would take off on its own, and re-design itself at an ever-increasing rate" and "humans, who are limited by slow biological evolution, couldn't compete, and would be superseded".

- Prof. Stephen Hawking

The regulation of Artificial Intelligence (AI) has become a cornerstone of ensuring ethical, transparent, and safe implementation across global sectors. This paper explores the AI regulatory frameworks of the European Union (EU), the United States (USA), and China, offering a comparative analysis of their approaches in governing AI technologies. The European Union's Artificial Intelligence Act (EU AI Act) represents a pioneering effort to create a comprehensive legal framework, addressing the risks and challenges posed by AI across various sectors. In contrast, the United States follows a sectorial approach, introducing regulatory measures through various laws and guidelines, though it lacks a unified, AI-specific regulatory framework. Meanwhile, China's AI regulatory strategy, encapsulated in its **New Generation Artificial Intelligence Development Plan (AIDP)**, combines rapid technological development with a strong emphasis on national security, societal stability, and ethical guidelines governing AI applications, particularly in areas like surveillance.

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The paper further investigates the potential for adapting these regulatory models to India's legal and socio-economic landscape. By examining India's unique technological ecosystem, regulatory gaps, and socio-cultural factors, the study will propose a tailored approach to AI regulation that draws from the lessons of the EU, the USA, and China. The research will explore the role of Indian regulatory authorities, the necessity of a collaborative framework involving both international and national stakeholders, and the integration of AI ethics and human rights principles into policymaking.

This paper aims to offer a comprehensive understanding of AI regulations on a global scale and provide actionable insights for Indian policymakers to construct a forward-looking, effective regulatory framework that ensures safe and ethical AI development in the country.

AI CREATIONS AND COPYRIGHT: NAVIGATING THE LEGAL LANDSCAPE

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As artificial intelligence (AI) creates more and more original content, the line between machine and humans gets blurred. In doing so, the basic foundations of traditional intellectual property frameworks are challenged as work created by humans only are considered copyrightable. This is the approach adopted by the United States. Development of AI models has several implications on copyright law. The third-party use of the content may lead to copyright infringement. AI is also challenging the notions of originality, creativity and authorship under the copyright law. Can AI-generated works be considered for an intellectual property right? AI-generated works also fail in setting the boundaries of "derivative works" for the purpose of application of "fair use/fair dealing" exception. The subject-matter of copyright has been conceptualized in two principal ways. Some countries utilize the approach taken in Berne Convention for the protection of literary and artistic work, 1887, which speaks of 'literary and artistic works' as the subject-matter of copyright. Other countries enumerate specific types of subject-matter eligible for copyright protection. India has generally adopted the latter approach. It follows a closed-list system of copyright in respect of subject-matter. Over the years, the subject-matter of copyright has expanded and grown substantially. But the periphery of copyright law is not well settled. AI, as a

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copyrightable subject-matter rests on the same debate. The debate whether copyright law should be made more flexible? Do unconventional works such as AI-generated works, deserve protection? The debate on extending the existing boundaries of copyright protection to non-conventional forms of expression is a continuing one. After analyzing the centrality of the human author in the traditional conception of copyright, many scholars question whether copyright should be less strict in terms of 'human' authorship by allowing the protection of AI-generated works. Some scholars advocate protection of AI-generated work by a sui generis right thereby achieving the objective of law from protection of the author, towards the protection of the work. This legislative solution has been adopted by the United Kingdom. In India, there are no legal precedents for AI-generated works. Also, the existing legal framework is not capable enough to accommodate the evolving capabilities of AI. The present paper seeks to examine whether AI-generated works qualify as protectable subject-matter under the copyright law in India and focuses on the determination of authorship for AI-driven innovation.

ALGORITHMIC BIAS AND WOMEN'S PRIVACY: A COMPARATIVE STUDY OF AI-DRIVEN DATA COLLECTION PRACTICES IN THE USA, CHINA, AND THE UK

Ms.Ishika Gautam[34]

Dr. Rajeev Kumar Singh[35]

Artificial Intelligence is a vital component of the Fourth Industrial Revolution. It is undeniable that technology offers significant benefits to contemporary cultures, where data has emerged as the most valuable asset of our era. Furthermore, we observe how the application of artificial intelligence enhances women's rights, even inside the legal domain. Nonetheless, artificial intelligence also reveals a negative aspect: biases. These, along with other concerns associated with AI, can directly impact our human rights, particularly the rights of the most vulnerable populations, including women. Algorithmic bias poses significant problems with women's digital privacy, especially in nations with varying regulatory and cultural frameworks, such the United States, China, and the United Kingdom.

The expansion of artificial intelligence (AI) technology has generated significant apprehensions over algorithmic bias and its effects on women's digital privacy. As AI systems progressively impact daily life, its implementation frequently mirrors and exacerbates existing societal biases,

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disproportionately infringing upon women's private rights in domains such as targeted advertising, biometric data processing, and digital monitoring frameworks. The United States primarily market-oriented strategy for AI [36]innovation has created a landscape where corporate goals frequently supersede privacy concerns, resulting in algorithmic practices that unintentionally or intentionally undermine women's digital privacy. Data-Driven marketing techniques and automated decision-making systems often display gender biases, leading to discriminatory results and increased risk of privacy violations. Conversely, China's AI ecosystem, marked by significant governmental regulation and substantial data accumulation, poses intricate privacy dilemmas, particularly for women who encounter increased threats of surveillance and data misuse in a rigorously monitored digital sphere. Notwithstanding the UK's extensive regulatory frameworks, such as the General Data Protection Regulation (GDPR), deficiencies remain in tackling the complex and intersectional effects of AI on gendered privacy.

This paper examines the legislative ramifications and emerging difficulties related to AI-induced privacy risks in the USA, China, and the UK, emphasising their distinct socio-political contexts. In the United States, where corporate data methods prevail, algorithmic bias frequently leads to biased results in employment, healthcare, and social media, hence heightening privacy issues. Conversely, China's comprehensive surveillance framework intensifies gender-specific privacy threats, as artificial intelligence technologies integrate with governmental monitoring systems. Simultaneously, the UK, characterised by its rigorous GDPR legislation, exemplifies a

distinctive scenario of reconciling AI innovation with privacy safeguards; yet, obstacles persist in achieving gender-sensitive AI governance. This research seeks to underscore the pressing necessity for gender-inclusive AI regulations to protect women's digital privacy by examining legal frameworks, technological breakthroughs, and societal views in various countries.

NAVIGATING ARTIFICIAL INTELLIGENCE IN INDIA'S CRIMINAL JUSTICE SYSTEM: IMPLICATIONS FOR LIABILITY AND REGULATION

Prabha Tripathi[37]

Dr. Ik Singh [38]

Artificial Intelligence (AI) is revolutionizing industries globally, including the legal and criminal justice systems in India. As AI technologies become more widespread, they introduce complex challenges and opportunities, particularly in the context of criminal liability and justice. This paper explores the legal, ethical, and practical implications of AI in the Indian criminal justice system, focusing on its role in law enforcement, judiciary processes, and the broader challenges posed by AI-Driven crimes.

The autonomous nature of AI systems blurs the lines of accountability, raising pressing questions about the attribution of criminal liability. Determining responsibility for AI-Driven criminal acts involves examining whether legal personhood should be extended to AI systems and clarifying the roles and responsibilities of AI developers, operators, and users. To address these issues, India requires comprehensive legal frameworks that clearly delineate accountability for crimes involving or committed by AI systems.

AI's growing presence also poses significant risks to data privacy and security. Criminals are increasingly exploiting AI to harvest personal data, creating a need for robust data protection laws to safeguard individual privacy. Moreover, the proliferation of AI-generated content, such as deepfakes, threatens the integrity of evidence in legal Proceedings and increases the potential for manipulating trials. These developments highlight the urgent need for legal mechanisms to regulate the misuse of AI in criminal activities.

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In law enforcement, AI-powered tools like predictive policing and facial recognition are transforming crime prevention and investigation. Predictive models analyze historical crime data to identify potential hotspots, improving resource allocation and operational planning. However, these tools often inherit biases present in the data, potentially leading to discriminatory practices and reinforcing existing inequalities. Similarly, facial recognition technology has become a valuable tool for biometric identification and surveillance, but concerns about accuracy, misuse, and privacy violations call for stringent regulatory oversight.

AI has also influenced judicial processes by generating sentencing recommendations based on factors like prior convictions, offense severity, and demographic trends. While these tools aim to enhance consistency and efficiency, they raise concerns about fairness, accountability, and the perpetuation of systemic biases within the justice system.

The increasing reliance on AI in criminal justice underscores the importance of addressing ethical concerns, including transparency, bias mitigation, and safeguarding constitutional rights. To ensure justice and fairness, India must develop robust legislative frameworks that regulate the deployment of AI technologies while emphasizing ethical development and responsible use.

By balancing innovation with accountability, India can harness AI's potential to strengthen its criminal justice system while safeguarding the rights and interests of its citizens. This paper underscores the need for proactive measures to navigate the complexities of AI-Driven challenges in criminal liability and justice

PRIVACY AND DATA PROTECTION IN INDIAN JUDICIAL SYSTEM IN THE AGE OF ARTIFICIAL INTELLIGENCE

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S. Sathia[40]

In the era of artificial intelligence (AI), the legal sector is changing Dramatically across the globe. The surge in data availability has been a key Driver in the recent advancements of AI technologies. AI systems heavily rely on data for their training purposes. Data is frequently referred to as AI's lifeblood without which the development and functioning of AI system would not be possible but due to the rise of internet and advance technologies like big data led to rise of AI system.

Data privacy concerns the issue of authorized access to collect, process, distribute personal data and individuals control to refrain from data collection. While the data protection pertains to safeguarding personal information through a set of procedural rights, ensuring fair processing and collection based on the procedures of law. Data processors like AI companies are obliged to uphold individuals' essential data protection rights and privacy.

However, the AI companies like Open AI's ChatGpt and Google's Bard, Facebook's Meta, Clear view AI use the data that were scrapped at large from internet and used to train the

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AI systems but these companies were warned and banned for collecting personal data without authorization of the users as its violates their data privacy.

This article examines the issues surrounding data privacy and its related concerns stemming from the integration of AI systems in the Indian Judicial System along latest law like Digital Personal Data Protection Act, 2023 and International law like General Data Protection Regulation (GDPR). The utilization of current data protection frameworks in the context of data usage by AI could pose certain difficulties, and it may be necessary for the existing data protection frameworks to adapt in order to effectively tackle the privacy and data protection. This paper stress out the importance of strengthening regulatory frameworks by providing AI-specific guidelines, increasing public awareness and education, encouraging industry best practices and standards, Effective monitoring and supervision by regulatory bodies so India can improve the effectiveness of its data protection laws in regulating AI system that can helpful and effective use in Judicial system.

REGULATING GENERATIVE AI IN HEALTHCARE: LEGAL AND ETHICAL CHALLENGES

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The integration of generative artificial intelligence (AI) into healthcare has revolutionized medical practices, enabling advancements in precision diagnostics, Drug discovery, and personalized treatment protocols. However, the swift adoption of these technologies has outstripped the development of comprehensive regulatory frameworks, resulting in significant legal and ethical uncertainties. This paper investigates the multifaceted challenges of governing generative AI in patient care, focusing on legal ambiguities in liability, data privacy, and intellectual property (IP) rights, alongside ethical imperatives such as equity, transparency, and patient autonomy. Legal analysis reveals the inadequacy of traditional liability frameworks, such as product liability and Professional malpractice doctrines, in addressing AI-Driven errors. Ethical challenges are equally urgent. Empirical data from the American Medical Association (2023) indicates that 68% of patients are unaware of AI's role in their care, violating informed consent principles. In conclusion, the study advocates for agile, interdisciplinary governance that integrates legal, technical, and ethical expertise. By addressing accountability gaps, enhancing transparency, and prioritizing equity,

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policymakers can foster trust in AI-augmented healthcare while safeguarding patient rights.

THE IMPACT OF ARTIFICIAL INTELLIGENCE ON LEGAL DECISION MAKING: OPPORTUNITIES, CHALLENGES AND ETHICAL CONSIDERATIONS

Ms. Shaiwalini Singh[43]

With its impact on contract analysis, legal research, judicial decision-making, and regulatory compliance, artificial intelligence (AI) is Drastically changing the legal landscape. The use of AI-Driven tools in legal decision-making presents serious questions about accountability, transparency, and fairness even though they provide increased efficiency, cost savings, and prediction accuracy. The application of AI in legal decision-making is examined in this research along with its potential, difficulties, and moral implications.

Judges and attorneys can analyse an immense amount of case laws, spot trends, and make remarkably accurate predictions about case outcomes with the use of AI-powered legal analytics. By lowering human labour costs and avoiding mistakes, these tools increase the effectiveness of legal research and contract administration. Significant obstacles are presented, nevertheless, by worries about algorithmic bias, a lack of transparency, and the possible deterioration of judicial judgment. Unfair results could result from machine-learning models trained on biased datasets, which could exacerbate already-existing inequities in court rulings, especially in the areas of criminal justice and sentencing. Furthermore, it is challenging to evaluate the logic behind AI-generated legal advice due to the opaqueness of AI decision-making, which is sometimes referred to as the "black box" problem.

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Accountability is a significant ethical issue since it becomes difficult to determine liability if AI has an impact on a court ruling. Since AI lacks legal personality, it is unclear who should bear responsibility for its mistakes, in contrast to human judges or attorneys who are answerable for their rulings. Furthermore, when AI systems handle sensitive legal data, privacy and confidentiality concerns surface, calling for strong cybersecurity and data protection protocols.

The legal structures that regulate AI are continually developing. To guarantee AI's moral and legal use in legal practice, several jurisdictions have started putting policies into place. The AI Act of the European Union and other like laws throughout the world aim to establish regulations on the creation and application of AI in high-risk fields, such as law. A worldwide, consistent strategy is still elusive, though.

This paper argues that while AI can enhance judicial efficiency and legal practice, its integration must be guided by ethical principles, regulatory safeguards, and human oversight. A balanced approach—leveraging AI's strengths while mitigating risks—is essential to ensuring that AI-Driven legal decision-making upholds fairness, transparency, and justice. Addressing these challenges will be crucial in shaping a future where AI complements rather than undermines the legal system.

THE RESPONSIBILITY TO PROTECT IN THE AI ERA: EXAMINING IHL AND STATE OBLIGATIONS IN THE FACE OF AI-ENABLED WARFARE IN UKRAINE

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The advent of artificial intelligence (AI) in warfare is transforming the global security landscape, raising profound implications for the principles of International Humanitarian Law (IHL) and the doctrine of the Responsibility to Protect (R2P). This   explores the intersection of AI-enabled warfare and state obligations under IHL, focusing on the ongoing conflict in Ukraine. The conflict serves as a critical case study to examine how AI is being integrated into military strategies and how these developments challenge the enforcement of humanitarian norms and the protection of civilians.

AI technologies, such as autonomous weapon systems, and Drone, are reshaping military operations by enabling unprecedented precision, efficiency, and lethality. However, their deployment raises legal, ethical, and accountability concerns. The lack of clear international regulatory frameworks governing the use of AI in armed conflicts exacerbates the risks of indiscriminate harm, unlawful targeting, and erosion of the principle of distinction between combatants and civilians. In the Ukrainian conflict, reports of

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AI-Driven systems being employed underscore the urgent need to assess state responsibilities under IHL to prevent violations of fundamental principles such as proportionality and necessity.

This research situates AI-enabled warfare within the broader context of R2P, which obligates states to prevent mass atrocities and protect populations from war crimes, genocide, and crimes against humanity. It examines whether the use of AI in warfare undermines or enhances the capacity of states to fulfil their R2P obligations, particularly in conflict zones like Ukraine. The study evaluates the role of international bodies, such as the United Nations, in addressing the accountability gaps associated with AI systems and ensuring compliance with IHL.

Furthermore, the paper explores how the international legal community can adapt to the AI era by proposing reforms to existing legal frameworks. This includes establishing mechanisms for transparency in AI weapon deployment, creating accountability structures for unlawful actions by autonomous systems, and strengthening state and non-state actor compliance with IHL.

By analysing the Ukrainian conflict as a microcosm of broader challenges, this research aims to illuminate the pressing need for global cooperation to mitigate the humanitarian risks of AI-enabled warfare. It underscores the importance of balancing technological advancements with adherence to legal and ethical norms, ensuring that the core principles of IHL and R2P remain resilient in the face of evolving threats.

A COMPARATIVE STUDY OF A.I RELATED LEGISLATIVE ISSUES IN USA AND INDIA

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Fatima Banaqeeb[47]

Dr.Tausif ur Rehman Md[48]

This paper as the title suggests is a comparative study of the legal challenges arising with the advent of Artificial Intelligence. The purpose of this comparison is that India as well as the USA are vibrant democracies and illustrious systems of governance especially their judiciaries and legislatures. Artificial Intelligence has emerged as a pioneering new technology, which is increasingly used as a vital tool in the conduct of war. It has the potential to become an effective weapon for the execution of military operations and strategies. As the ability of AI is evolving at a very rapid rate, it becomes obvious that there should be a developed structure or organizational framework that is comprehensive enough to address and mitigate those major ethical, social, and environmental issues arising due to the use of AI. These challenges include serious ones like copyright infringement and the misuse of AI in warfare and its impact on job and the employment sector, and the healthcare system. Lacking rules that strictly govern technology, will turn out to aggravate the risks and potential for exploitation in the technology sphere, resulting in manifold dangers and damaging effects. This is why it is pretty clear that such a situation requires a governance

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framework that closely mirrors human rights and sustainability principles so that advancements in technology would be to the benefit of the society at large rather than harming it. While not specifically aimed at regulating AI, several legislations may have an impact on its advancement or application in India. Here is a non-exhaustive list of important examples: 1) The Information Technology Act 2000,4 together with the Information Technology (Reasonable security practices and procedures and sensitive personal data or information) Rules 2011.

2) The Digital Personal Data Protection Act 2023**.**

The ideas outlined in these rules are meant to be applicable regardless of the technologies being used, as they are intended to be technology-agnostic. The development and application of AI may be impacted by intellectual property regulations in some ways.

ARTIFICIAL INTELLIGENCE: THE NEXT STEP IN EVOLUTION

V.Swapna [49]

As far as we know, Homo sapiens remnants the most self-aware species on Earth. However, with the rapid evolution of technology, it is undeniable that machine learning is progressively taking over human capabilities. The term Artificial Intelligence (AI) was first coined by Arthur McCarthy in 1956. AI refers to the capacity of a digital system or a computer-controlled mechanism to execute functions that are traditionally linked to human intelligence.The integration of AI in the legal domain has expanded significantly due to globalization and technological advancements. Countries such as the United States and the United Kingdom, which are at the forefront of innovation, have embraced AI to support judicial processes. This technology is being developed to aid judges in analysing cases and formulating decisions with greater efficiency.

AI operates through sophisticated computational techniques, including machine learning, natural language processing, and predictive analytics. These mechanisms enhance legal research, contract analysis, and case management, making the justice system more efficient and accessible. However, as AI continues to influence various aspects of daily life, it raises critical ethical and regulatory concerns. To ensure that AI contributes positively to society, it is imperative to establish a

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well-defined legal and ethical framework that governs its application responsibly. The paper presents a succinct analysis of the intersection between law and artificial intelligence. Drawing from legal resources, it identifies key themes, systematically categorizes them, and provides a broad overview that transcends jurisdictional boundaries. It explores the application of artificial intelligence in legal practice, examines the regulatory frameworks governing AI, and delves into theoretical legal challenges arising from AI advancements. Advanced web search tools, recommendation algorithms (such as those used by YouTube, Amazon, and Netflix), voice recognition systems (like Siri or Alexa), autonomous vehicles (such as Tesla), and high-level competitive gaming programs are just a few instances of AI-Driven technologies. The "AI effect" refers to the phenomenon where tasks once considered to require "intelligence" are no longer classified as AI as technology becomes more advanced. Although still in its nascent phase, several countries, law firms, and judicial bodies are progressively integrating AI into the legal sector. By identifying legal inconsistencies in rulings, assisting in contract Drafting, conducting due diligence, facilitating legal analytics, and performing other functions, AI provides lawyers with efficient and cost-effective solutions.,

IMPACT OF ARTIFICAL INTELLIGENCE ON ENVIRONMENTAL LAW & POLICY

Dr. Lakshlata Prajapati[50]

Artificial intelligence is the idea that you can take tasks that were originally designed or done by machine. Artificial intelligence is the theory and development of computer systems capable of performing task that historically required human intelligence such as making decisions, recognizing speech and identifying patterns. In other words AI is an umbrella term that encompasses a wide variety of technologies, including natural language processing (NLP), machine learning and deep learning. AI could basically be defined as mimicry of human beings intelligence by a machine. Therefore, one might also define AI as a machine that has the ability to think and solve problems on its own.

AI in environmental law and policy:-Species and habitat protection-the task of identification of species is very difficult since the forest is usually thick and densely covered with vegetation.AI is useful in obtaining high resolution images and processing them to make them clear, Sustainable development-The sustainable development goals set of 17 goals ranging from zero poverty to climate action.AI may also revolutionize agriculture sensors place in the field help the AI to monitor the soil composition, master fertility and temperature. AI can also help the farmer by giving instruction regarding crop, seeding watering etc. AI can also reduce food wastage.AI can help in building entire smart cities.AI can help in preventing air pollution., Climate change. With AI weather forecasts have been made more accurate. The IPCC uses prediction models to forecast climate patterns.AI can also be used to reduce the

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amount of carbon emission through smart energy usages. Food production is one of the largest contributors to greenhouse gas emission (Methane gas) as well as soil and biodiversity degradation. This research paper will be very useful for policy making regarding environmental law. The object of the research paper to study the impact of AI on environmental law and policy.

IPR & Technology

NAVIGATING THE NEW AGE OF INNOVATION AND LEGAL CHALLENGES

Anjum Begum[51]

Intellectual Property Rights (IPR) are essential in safeguarding innovation in an increasingly technological world. With rapid advancements in digital technologies and artificial intelligence (AI), the landscape of IPR is undergoing significant transformation. This article explores recent updates to criminal laws addressing IPR violations, focusing on enhanced penalties for infringements, the growing prominence of cybercrimes, and the shift toward international cooperation. Additionally, it delves into the impact of AI on intellectual property, highlighting issues such as the ownership of AI-generated works, challenges in patenting AI-Driven inventions, and the role of AI in detecting and preventing IPR violations. The article concludes by emphasizing the need for evolving legal frameworks that balance protection and innovation in the face of emerging technological complexities. As technology continues to evolve, the future of IPR will require dynamic legal responses to ensure that intellectual property remains both safeguarded and conducive to further innovation.

The intersection of law and technology is reshaping the legal landscape, Driving unprecedented changes in how legal services are delivered and consumed. This explores the transformative role of technology in the legal field, emphasizing the current and future impact of Artificial Intelligence (AI).

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As AI continues to evolve, its applications in the legal domain are expanding, offering innovative solutions to longstanding challenges. AI-Driven tools are not only improving the speed and quality of legal services but also democratizing access to justice by making legal resources more accessible to a broader audience. This delves into the benefits, challenges, and ethical considerations associated with the integration of AI in the legal field, highlighting the need for legal Professionals to adapt to these technological advancements. By embracing AI, the legal industry can enhance its capabilities, ultimately leading to a more efficient, equitable, and forward-thinking legal system

3D PRINTING AND INTELLECTUAL PROPERTY: CHALLENGES, INNOVATIONS, AND LEGAL REFORMS

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The rapid proliferation of 3D printing technology has revolutionized manufacturing and product design, but it also poses significant challenges to intellectual property rights (IPR). The ease with which digital designs can be shared, replicated, and modified has led to risks such as counterfeiting, infringement and the erosion of market exclusivity for IP owners. Traditional IP enforcement methods often struggle to address these new threats, necessitating tailored strategies to safeguard intellectual property effectively.

This paper explores the intersection of 3D printing and IPR, emphasizing the need for a holistic approach that leverages multiple protections. It examines how patents, design rights, trademarks, and trade secrets can work synergistically to protect intellectual property in this evolving technological landscape. Additionally, it highlights innovative strategies such as blockchain-based authentication systems, digital rights management technologies, and policies for employee-generated innovations in 3D printing.

Emerging technologies like bioprinting, metal printing, and nanoprinting raise complex patentability questions, while AI integration and 4D printing introduce new challenges for IP ownership and enforcement. Blockchain technology, although promising for ensuring authenticity, faces obstacles related to scalability and adoption. The paper also explores the legal and

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ethical implications of 4D printing, where dynamic functional features and post-production alterations challenge conventional IP frameworks.

The study further evaluates the current IP enforcement system in India, identifying gaps in patent protection and enforcement, and compares it with best practices from other jurisdictions. Finally, the paper proposes a forward-looking approach, emphasizing reforms to existing laws, adoption of advanced technologies, and international cooperation to create a robust framework for protecting intellectual property in the era of 3D printing. This research offers valuable insights for policymakers, legal experts, and industry stakeholders in addressing the challenges posed by 3D printing technology on IPR.

INCLUSION OF INTELLECTUAL PROPERTY ISSUES UNDER GST VIS-A-VIS REAL ESTATE SECTOR

Dr. Mohammad Nizam Ashraf Khan[53]

If we discern the provisions of Goods and Services Tax (hereinafter referred as GST) Act, we bring into being one provision that is the mother provision of whole GST in the form of section 7 of Central Goods and Services Tax (hereinafter referred as CGST) Act, 2017 which talks about the scope of supply of goods or services for the levy of tax. With respect to the inclusion of supply of goods or services, it has been articulated under this provision that the activities mentioned in Schedule I of CGST Act 2017 i.e. supply of goods and services or both between related persons or between distinct persons, if made in the course or furtherance of business, would be subject of levy under GST. From the real estate sector point of view, we can say that it may raise intellectual property right (IPR) issues in the transactions while using the single logo or trademark of same group by many entities of that group even without consideration. Such transactions of IPR rights may come under the purview of GST in future by way of Schedule I of CGST Act 2017.

In the light of above scenario, the researcher would like to do detailed research on the real estate sector group company's supply of trademark or logo to its entities and whether it can be levied under GST or not. The most hammered area of the present research would be to do some empirical research by collecting the qualitative data through surveys about the working of real estate companies with respect to supply of its

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logo and trademark. Last but not the least, it would also be the focus area of the present research how tax on such transactions can be levied which would ultimately be benefitted to the Union Government to fulfill its promise to provide 'Housing for all' mission for urban areas under Pradhan Mantri Awas Yojna – Urban 2.0 (PMAY – U 2.0) in the form of affordable housing so that it will be implemented for 5 years from first September 2024 providing central assistance to one crore urban poor and middle class families to construct, purchase or rent a house at an affordable cost.

Keywords: Scope of supply, Levy of tax, Supply of trademark or logo, empirical research, qualitative data, Surveys

COMMUNITY RIGHTS AND BENEFIT SHARING OF FOLKLORE IN INDIA: A CRITICAL LEGAL STUDY

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The development of community identity in India, based on common geographic location, occupational affinities, and cultural habits, has given rise to rich systems of folklore and traditional knowledge transmission. With the growth of societies from kinship units to clans, tribes, and then larger groups, they established characteristic cultural expressions now in need of sensitive legal protection and fair benefit-sharing frameworks. This study considers the complex nexus between such traditional cultural expressions and modern legal protection frameworks within the changing intellectual property regime in India. The study particularly engages the inherent conflict between traditional knowledge preservation practices and modern formal legal regimes, exploring how this tension influences the rights and economic interests of indigenous peoples. Through detailed examination of legislative trends and case studies, this study further assesses the performance of India's legal system in striking a balance between preservation of cultural heritage and fair economic benefits to indigenous communities. The research critically analyzes several legislative tools, such as the Traditional Knowledge Digital Library program, the Protection of Traditional Knowledge Bill, and state-level laws on folklore protection. Particular emphasis is given to the systemic loopholes in existing benefit-sharing schemes, especially their

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inability to properly respond to the distinct features of communal ownership and intergenerational transmission of indigenous knowledge. The study suggests tangible reform to the legal framework, ranging from the establishment of specialized tribunals on folklore to people-centered documentation processes and open schemes for benefit sharing. These recommendations are aimed at filling the disconnect between policy design and grassroots realities, closing the gap between the legislative will and actual enforcement that exists today. The research goes on to investigate how increased protection of community rights through the law can at once advance the double goals of culture preservation and economic empowerment of the traditional communities. The central concern is examining the function of social bonding among homogeneous groups and its effect on the conservation and transmission of folklore. The research delves into how this aggregative character of society affects legal frameworks required for the protection of traditional knowledge. The research further examines the hurdles communities encounter when trying to maintain their cultural wholesomeness amid evolving times and contemporary legal frameworks. This study adds to the body of literature on intellectual property rights and cultural heritage protection in developing economies, providing insights for policymakers and practitioners at this nexus. The report emphasizes the necessity of a more complex approach to protecting folklore that takes into account both the communal nature of traditional knowledge and the economic rights of indigenous peoples in a rapidly globalizing world. In addition, the research underscores the necessity of building legal frameworks that balance respect for the dynamic character of cultural evolution with fair remuneration for traditional knowledge guardians.

DISCREPANCIES BETWEEN THE PROTECTION OF INTELLECTUAL PROPERTY RIGHTS WITH THE POWER OF FUTURE AI

Dr. Vikas Bhati [56]

Dr. Ravi Prakash Rahul[57]

Artificial Intelligence, whether as an enormous technological advancement or a severely creative threat, is going to change the world and how we see it. AI encompasses the entirety of our social media model, our work efficiency and to a great extent, our innovative mindset. Through it, any idea and somewhat, its creation, can be served on a platter and ready for use. But does it not harm our ability to comprehend any new original ideas, by reminiscing our own experiences, cultures, and values.

The original ideas and a creation or invention based on it, is what is vital in Copyright, Patent or any other intellectual property rights. The Intellectual Property and its protection flourish on the fact that a creation or invention was a result of a new, uncommon and a never thought before idea. Whereas, Artificial Intelligence, that uses Generative Adversarial Networks (GANs), used for an unsupervised learning, creates an artificial product based on data already available digitally. So, any prompt provided to generative AI will gather information scattered across the internet related to that prompt, and will revert back a result combining of all those information, making it look like an original creation. It is comprehensible

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that this violates the idea of innovation and creativity behind the Intellectual Property and its protection. So, the main question that arises is that how do we adapt to the new environment that surrounds and is governed by Artificial Intelligence, while at the same time ensure that the Intellectual Property Rights of the Creators and Inventors are well protected.

This article attempts to study, and understand the pros and cons involved with such creation through Artificial Intelligence, where the use and expression of original ideas is somewhat absent, and to present whether our laws protecting the intellectual property rights is at par with the use of Artificial Intelligence in India or will it be overpowered by what the future of AI holds. A further attempt will be made to provide with some workable suggestions that may help with the issues at hand.

CRAFTING IP LAW FOR THE WEB: ENFORCEMENT, DISPUTES, AND THE JUDICIARY'S ROLE

Dr. T.Mani Manjula [58]

This article explores the evolving landscape of intellectual property rights (IPR) in the digital age, highlighting their role in safeguarding innovations that Drive new business models, content, and technologies. It examines how robust IPR regimes, including patents, copyrights, trademarks, and trade secrets, foster innovation, ensure fair competition, and support economic growth. Special focus is given to the rise of digital media and the increasing need for strong enforcement against piracy, counterfeiting, and unauthorized use. Understanding and leveraging IPR is crucial as industries transition to digital platforms.

Growing copyright protection is a significant shift in India's IPR environment. Copyright was once only applicable to printed materials, but it is increasingly extended to software, digital media, and internet content. The Copyright Act of 1957 was modified twice, in 1994 and 2012, to conform to international norms. The Copyright Office of India reports that the number of copyright registrations in India has been slowly rising as digital content such as software, music, movies, and multimedia becomes more common in the business and creative sectors.

This paper examines the challenges and opportunities of enforcing IP rights in the digital age, focusing on the role of courts in resolving online infringement disputes. It evaluates the effectiveness of current enforcement mechanisms, such as

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the Digital Millennium Copyright Act (DMCA), and the role of internet service providers (ISPs) in notice-and-takedown procedures. The paper also explores jurisdictional complexities, cross-border disputes, and the evolving nature of IP law in the global internet context. Through case studies and legal precedents, it offers insights into balancing the protection of authors' rights with the promotion of innovation in a connected world.

COPYRIGHT PROTECTION IN THE DIGITAL ENVIRONMENT: INDIAN PERSPECTIVE AND INTERNATIONAL OBLIGATIONS

Faiza Heyat[59]

The advent of the digital age has significantly transformed the landscape of copyright protection, presenting both opportunities and challenges. This paper examines the intricacies of copyright protection in the digital environment from an Indian perspective, while also considering international obligations and frameworks.

The digital revolution has facilitated the rapid dissemination and accessibility of creative works, raising concerns over unauthorized use and copyright infringement. In India, the Copyright Act, 1957, amended several times to address emerging digital issues, serves as the cornerstone of copyright protection. This paper explores the amendments and their impact on digital copyright protection, including the introduction of provisions for digital rights management (DRM) and measures to combat online piracy.

India's commitment to international copyright protection is underscored by its adherence to key international treaties and agreements, such as the Berne Convention, the TRIPS Agreement, and the WIPO Copyright Treaty (WCT). These international frameworks mandate member countries to implement stringent copyright protection measures, including the recognition of digital rights and the protection of technological measures. This paper delves into India's compliance with these international obligations and assesses

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the effectiveness of its legislative and enforcement mechanisms.

The paper also explores the challenges faced by copyright holders in the digital environment, including the unauthorized reproduction and distribution of copyrighted works, the role of intermediaries, and the enforcement of copyright in the face of evolving digital technologies. The effectiveness of India's enforcement mechanisms, including judicial precedents, administrative measures, and cooperation with international bodies, is critically analyzed.

Furthermore, the paper examines the role of emerging technologies, such as blockchain, in enhancing copyright protection. Blockchain technology offers potential solutions for the registration and tracking of copyright ownership, thereby ensuring greater transparency and security. The implications of blockchain and other technological advancements for copyright protection in India are thoroughly explored.

The paper concludes by suggesting policy recommendations to strengthen copyright protection in India's digital environment. These include enhancing the legal framework to address new digital challenges, improving enforcement mechanisms, promoting public awareness of copyright issues, and fostering international cooperation. By addressing these areas, India can effectively balance the interests of copyright holders and users, ensuring robust copyright protection in the digital age.

IPR AND BRAND IMPERSONATION: A LEGAL ANALYSIS

K. Vittal Goud[60]

The interplay between Intellectual Property Rights (IPR) and brand protection is a cornerstone of modern legal frameworks designed to safeguard business reputation and consumer trust. This paper explores the nuanced relationship between IPR and brand impersonation, analyzing the challenges posed by counterfeit products, trademark infringement, and deceptive marketing practices. It begins by examining the interconnection between brand protection and IPR, highlighting how intellectual property laws serve as vital tools in preventing brand impersonation and ensuring the exclusivity of brand identities.

The legal framework surrounding brand protection and IPR is scrutinized, with a focus on key provisions under trademark, copyright, and patent laws. Special attention is given to the statutory and judicial mechanisms in India and other jurisdictions, showcasing their role in curbing brand impersonation. From an international perspective, the paper delves into multilateral agreements such as the TRIPS Agreement and the Madrid Protocol, as well as the role of international bodies like the World Intellectual Property Organization (WIPO) in harmonizing brand protection laws across borders.

The challenges in brand protection are multifaceted, encompassing technological advancements enabling

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counterfeit production, jurisdictional complexities in cross-border disputes, and the rise of online impersonation. These challenges are further compounded by the dynamic nature of global commerce, which necessitates continuous adaptation of legal strategies. To provide a practical dimension, the paper analyzes recent cases from India and abroad, illustrating the evolving judicial stance on brand impersonation and the effectiveness of current legal remedies. Notable cases, such as Tata Sons v. Hakunamatata Tata Founders (India) and Adidas AG v. Forever 21, Inc. (USA), are dissected to highlight judicial trends and their implications for brand owners.

Finally, the paper proposes a way forward, emphasizing the need for stronger international cooperation, technological solutions for brand authentication, and proactive policy measures to address emerging threats. The conclusion underscores the critical role of robust IPR frameworks in ensuring sustainable brand protection and fostering innovation in a competitive global marketplace. This comprehensive legal analysis aims to provide actionable insights for policymakers, practitioners, and scholars while contributing to the discourse on combating brand impersonation effectively.

ANALYSIS OF THE LEGAL FRAMEWORK AND GUIDELINES PROVIDED BY THE INDIAN PATENT OFFICE AND COURTS REGARDING AI-GENERATED INVENTIONS & ITS COMPARISON WITH INTERNATIONAL PRACTICES

Mohd IMr.an [61]

Prof. Javaid Talib[62]

Indeed, exponential growth has fundamentally changed in a very short period many spheres of the economy-including health care, manufacturing, and financial services-through artificial intelligence technologies. The modern AI systems are already capable of creating new inventions with minimal human effort that pose complex legal and ethical questions towards a conventional understanding of patent law, primarily defined by human creativity throughout history. In India, the Patent Act of 1970 mandates patents to be issued only to human inventors. This is leaving a vast legal lacuna with regards to whether inventions developed by AI should have patent protection or not.

The AI technologies development throws up very complex issues, which existing jurisprudence is often incapable of resolving. The more intelligent the AI systems are, the more innovative products and solutions surface, which in turn require

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a review of inventorship under patent law. The existing Indian legal framework in respect of patents over AI-generated inventions will be gone through in this paper. In this process, we will further analyse the weaknesses of the Indian patent law, specifically with regard to three areas: inventorship, the exclusions provided in Section 3(k) of the Patent Act, and the judicial interpretation regarding patentability concerning computer-related inventions. Section 3(k) of the Patent Act puts forth a clear exclusion where "a mathematical or business method or a computer program per se or algorithms" are not eligible for protection, thereby further raising questions about what lies at the scope of protection available for innovations from AI.

In addition, this paper will discuss the Indian approach to patenting inventions brought about by AI in comparison with international practices. Noting those differences will amplify the call for legislative reforms-to be in line with the fast-paced development of AI technology and resulting challenges-and for that matter, relevant standards. It attempts to raise the question of how Indian patent law can evolve further to appropriately consider such unique circumstances arising when AI-generated inventions surface in the picture, therefore, a strong yet flexible legal framework that will gradually evolve with the development of technology.

While exploring this, the paper also discusses the implications it would have to consider AI as a possible inventor, how it might affect innovation, and investment in AI technologies in India. In the end, it is hoped that some evidence will be provided to support the demands of the IP community, striving for a balance between innovation, and the ethical and legal parameters attached to this front.

Keywords: Artificial Intelligence, Parents. Intellectual property, Legal Framework, Guidelines

REDEFINING COPYRIGHT IN THE ERA OF ARTIFICIAL INTELLIGENCE: AN ETHICAL AND LEGAL PERSPECTIVES FROM INDIA AND THE UNITED STATES OF AMERICA

Mr.Shailendra Prasad Godiyal [63]

Dr. Ajay Raj Singh[64]

Artificial intelligence (AI) is rapidly transforming the way we live, work, and interact with each other. It has become an integral part of our daily lives, with applications ranging from self-Driving cars and chat-bots to advanced medical diagnosis and Dr.ug discovery. As the use of AI technology grows, intellectual property (IP) issues are increasingly emerging as a major concern for stakeholders. The current intellectual property regime has limitations in addressing the challenges posed by AI-Driven innovation, raising the need to explore the adaptation of intellectual property laws to address the emerging issues. With this rise in the use of AI, there has been a growing concern about how intellectual property (IP) rights intersect with AI. This has led to a need for a comparative study that explores this intersection and examines the various legal frameworks governing IP rights and AI in different countries. The intersection of intellectual property rights and artificial intelligence is a complex and multifaceted area that requires a thorough understanding of both IP law and AI technology. As AI continues to evolve and become more pervasive in different industries, there is a need to ensure that IP rights are protected and enforced in this context. The research paper adopted the comparative approach by analyzing the ethical and legal

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frameworks governing the intersection of IP rights and AI in India and United States of America. This approach enables to identify similarities and differences in the way these countries address the ethical and legal challenges and opportunities presented by AI. The research utilizes a mixed-methods approach that combines both qualitative and quantitative research methods. The qualitative aspect involved an in-depth analysis of relevant legal documents, case law, and academic literature, while the quantitative aspect involved surveys and interviews with legal Professionals, policymakers, and business leaders. The expected outcomes of this research includes a better understanding of the legal frameworks governing the intersection of IP rights and AI in different countries, the identification of best practices for managing IP rights in the context of AI, and an assessment of the potential impact of AI on the future of IP law and the legal Profession.

Keywords: Intellectual Property Rights, Copyright Laws, Artificial Intelligence, Authorship, Legal Implications, Ethical Implications.

PROTECTING PERSONAL IDENTITY: LEGAL AND ETHICAL CHALLENGES OF DEEPFAKE TECHNOLOGY IN INDIA

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Deepfake technology, which uses advanced AI to create highly realistic but entirely fake videos, audio, and images, has emerged as a significant challenge in today's digital age. While this technology offers exciting possibilities for creativity and entertainment, it also raises serious concerns about personal identity, privacy, and security. This paper examines the impact of deepfakes on personal identity, focusing on the legal and ethical challenges they present. Legally, deepfakes challenge traditional concepts of identity and privacy. Existing laws, created long before deepfakes became widespread, often fail to offer adequate protection to individuals whose images, voices, or likenesses are used without their permission. The paper reviews the limitations of current legal frameworks and discusses how different countries are responding to this emerging issue. It highlights the lack of specific legislation addressing deepfakes and the difficulty of applying traditional laws to digital media, suggesting potential legal reforms that could offer stronger protections for personal identity in the face of this new technology. Ethically, deepfakes present significant

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challenges related to consent, privacy, and the potential for malicious use. The ability to create hyper-realistic fake media means that someone's likeness can be used to create content that misrepresents them or damages their reputation. This can lead to privacy violations, harm to personal and Professional reputations, and even the spread of misinformation. The paper explores how deepfakes can be used for harmful purposes such as identity theft, fraud, blackmail, or cyberbullying, and stresses the need for ethical guidelines to govern the creation and distribution of deepfake content. It also discusses the responsibility of creators, platforms, and lawmakers to ensure that deepfake technology is used in ways that do not harm individuals or the public. To address these issues, the paper offers several recommendations. It advocates for updating existing laws to provide stronger protections against the misuse of deepfakes, such as creating new regulations for digital media and privacy rights. It also suggests developing industry-wide ethical standards for those involved in creating and sharing deepfake content, to ensure responsible use of the technology. Additionally, the paper highlights the importance of public education, helping people understand the risks of deepfakes, how to recognize them, and how to protect themselves from potential harm. In conclusion, while deepfake technology holds great potential for entertainment, education, and creativity, it also presents serious risks to personal identity. By strengthening legal protections, creating clear ethical guidelines, and promoting public awareness, society can better navigate the challenges posed by deepfakes, ensuring that individuals' digital identities remain secure and respected in an increasingly media-Driven world.

Understanding the Intellectual Property protection issues surrounding rapid technological advancements like generative AI

Ms. Nikita Chaudhary[67]

Prof. (Dr.) Anurag Kumar Srivastava[68]

Humanity is entering into the realm of Artificial Intelligence in full speed. Everyday several groundbreaking technologies are taking shape. A variety of questions arise with such meteoric rise of AI. First and foremost is – who owns AI generated content? Is it the one who made the algorithms, or the one providing platform and data storage facility in order to run it? Or else, a whole new cohort of AI robotic ownership. For some it might be a far-fetched reality, yet one cannot rule out the possibility of it. Imagine a robot registering for patent grant of a novel deep learning tool created by (robot) itself. Interestingly, it is not only the ownership issue but the unfair usage of copyrighted data to train AI models. The irony is, world is well aware of the fact that Intellectual Property owners are sidelined in the name of technological advancements, yet nobody wants to talk about it, especially the tech-giants.

In this paper we cater to such hard questions and try to find a way out. Firstly, we have carefully demystified several IP protection measures adopted by EU, USA, UK and other developed nations under their AI governance policy. How far

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have they reached in figuring out IP issues in congruence with generative AI models? A comparative study goes a long way in comprehending the underlying nuances, so as to provide a vision for policy making in India. Although at this point no country has been able to come up with a single comprehensive IP policy over AI. And there is uncertainty of variations every now and then. For instance, nowadays we are witnessing a major shift in USA under Trump administration, where he is revoking existing AI policies through executive orders, effective immediately.

In addition to it, case studies across several jurisdictions, in which judiciary has taken a clear stance, has been discussed in detail. These days courts have to take a tough call on, whether to keep technology based innovations and artistic creations within the existing IP laws, or else, devising a whole new category of Intellectual Property exclusively for AI.

In the end, after knowing every aspect of AI, one can easily term it as a dynamic field to study. And devising a framework for a comprehensive (or universal) legislature over AI might seem too much too soon. Keeping that in mind, we have come up with a list of suggestions for policymakers and Professionals who work at crossroads of AI and IP law.

Keywords – Intellectual Property, Artificial Intelligence, IP Law, AI governance

THE INTERSECTION OF INTERMEDIARY LIABILITY AND COPYRIGHT LITIGATION IN INDIA: AN EVOLVING DISCOURSE

Nehal Ahmad[69]

The large-scale online copyright infringement through electronic divces has left no option for copyright owners except to sue software and service providers as facilitators under the doctrine of secondary liability under copyright law. The unprecedented lawsuits have been filed against sellers of peer-to-peer file sharing software such as 'Napster', 'Aimster', and 'Grokster'. These are the prominent judicial doctrines of vicarious liability and contributory infringement for copyright violations committed by their users or consumers. Nonethiless, we have been witnessing a massive challenge to demystify the conundrums of intermediary liability and copyright law for the last couple of years. The copyright act neither explicitly defines internet intermediaries, intermediary liability nor any special protection except that mentioned under Section 52 of the Copyright Act. In addition to this, no distinction is provided in the Act pertaining to virtual space and actual physical space. Rather, the expression "intermediary" is defined under section 2(1)(w) the Information Technology Act, 2000. The Act gives a broader definition to the expression 'intermediary'. This not only encapsulates social media companies such as Facebook and Meta but also a large number of players in the internet ecosystem including search engines such Google Inc., Yahoo Inc, online payment sites such as Paypal, Phonepe, Google

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pay: online-market place such as Amazon, Flipkart, Myntra, etc. Over the past two decades India tried to address the issue of intermediary liability. Such issue is an integral part of discussion in many jurisdictions. However, The 'Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules 2021 has questioned the scope of Intermediary liability in India. It also raises many questions for contributory copyright infringement. For instance, it raises the questions pertaining to free speech and right to privacy. Whether and to what extent India is moving away from secondary liability jurisprudence? This chapter will reflect the scope of intermediary liability in India and its impact on secondary liability jurisprudence. It will explore the uncertainty of the intermediary guidelines and the Copyright Act while addressing the existing challenges. Further, it will provide recommendations to address the ambiguities of intermediary liability. Moreover, it will comprehensively analyse the role of the court in developing the intermediary liability jurisprudence.

Keywords: Intermediary Liability Guidelines, Information Technology Act, Secondary Liability, Copyright Law, Contributory Infringement.

IPR AND 3D PRINTING: LEGAL AND TECHNOLOGICAL IMPACTS

P.Sandhya Rani [70]

The emergence of 3D printing technology has fundamentally transformed manufacturing, offering unprecedented flexibility in producing customized, complex, and on-demand products. However, this technological advancement also presents significant challenges to Intellectual Property Rights (IPR). The ability to easily replicate and distribute patented products, copyrighted works, and trademarked designs raises concerns about unauthorized use and enforcement. This paper explores the legal and technological implications of 3D printing on IPR. It highlights key issues such as the role of digital design files, the decentralization of production, and the inadequacies of current legal frameworks. The paper also examines emerging solutions, including blockchain for digital rights management and watermarking technologies, while proposing a balanced approach to foster innovation and protect intellectual property in the 3D printing era.

The advent of 3D printing, also known as additive manufacturing, has ushered in a new era of innovation across industries. From healthcare and automotive to consumer goods, 3D printing enables rapid prototyping, mass customization, and decentralized manufacturing. However, the technology's ability to reproduce intricate designs also poses substantial threats to Intellectual Property Rights (IPR). Traditional legal

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frameworks, designed for physical goods, struggle to address the challenges posed by digital design files and the global accessibility of 3D printing. This paper investigates the intersection of 3D printing and IPR, identifying key challenges and exploring technological and legal solutions.

Three-dimensional (3D) printing technologies differ from traditional manufacturing methods, such as molding and casting, by creating 3D objects layer by layer through the successive addition of materials. Originating from manufacturing research in the 1980s, 3D printing has since evolved into a diverse set of technologies with the potential to revolutionize production processes across various industries. This article explores the development of 3D printing technologies over the past few decades, the role of intellectual property rights (IPR) in shaping this transformative innovation, and the challenges that 3D printing poses to the current intellectual property system.

Patent protection has been instrumental in advancing industrial 3D printing technologies, safeguarding innovation and fostering growth in the sector. However, the rise of personal 3D printing has introduced unique challenges for the intellectual property system. Developers of personal 3D printing platforms and services face widespread infringement by end-users, a scenario reminiscent of challenges seen in digital content industries. Simultaneously, the expiration of key patents in 3D printing has spurred the growth of an open-source ecosystem for 3D printer hardware and software, Driving innovation in unexpected ways.

The interplay between intellectual property and innovation in 3D printing is multifaceted. In some cases, intellectual property protections have positively influenced the industry, either by design or as an unintended consequence. In other cases, these protections have been neutral or even counterproductive to innovation. Examining the evolution of 3D printing

technologies provides valuable insights into the complex relationship between intellectual property systems and technological advancement, highlighting the need for nuanced innovation policies that balance protection with openness.

Cyber Security & Law

Cyberworld and Jurisprudence:
Looking for a golden balance

Alfredo M. Ronchi[71]

This paper provides an overview on the "new normal" or "near future society" starting from the most significant events that characterised the evolution and pervasiveness of cyber technology. It is not under question the added value and the achievements due to cyber technology (societal, intellectual, etc.); we look at cyber technology from the humanities side. Posing our focus on processes that have led to governance agreements. Starting from internet governance, ongoing digital transformation to reach AI Governance Ethics and a selection of experiences carried out by international organisations, nations and single states. Digital transformation is reshaping society impacting lifestyles. The desire of decision makers to go digital, sometimes forgetting some wise principles. The goal to digitise as much as possible reaching a cyber-based society relaying on "digital", this pillar is quite fragile, potentially subject to attacks and suitable for top-down discrimination. Additional potential drawbacks due to lives spent in cyber-bubbles, cyber-mediation of human relations, citizens experience the world thanks to a cyber device mediated approach, mainstream influence on opinion dynamics and nudging. Here it comes the potential role of the Metaverse. Cyber-loneliness, one of the foreseeable risks is a kind of addiction to this "parallel life" training users to shift from real to Meta-life blurring the border between them.

Keywords: Digital Transformation. E-Services, Human Rights, Laws, Regulations, Privacy, Cyber Ethics, Artificial Intelligence, Machine Learning.

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THE ETHICAL IMPERATIVES OF CYBER SECURITY PRACTICES WITHIN LEGAL BOUNDARIES

Dr. Indra Kumar Singh[72]

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"A secure cyberspace is the marriage of technological might and legal foresight - where digital guardians meet the lawmakers' pen."

Cyber security has become a critical concern in the modern digital age, as the increasing reliance on technology and the interconnectedness of systems have created vast opportunities for malicious actors to exploit vulnerabilities and cause significant harm. This chapter explores the ethical obligations that should direct cyber security practices, while taking into account the legal framework within which these practices must function. The chapter begins by highlighting the importance of ethical considerations in cyber security strategies, which often focus primarily on technical, procedural, and institutional measures. This chapter highlights the importance of a comprehensive approach that incorporates not only technical and procedural measures, but also criminal justice considerations and a set of fundamental principles governing ethical conduct, accountability, and transparency. Recognizing that effective cyber security cannot be achieved in isolation, the chapter examines the underlying legal principles and international standards that should guide and inform these practices, underscoring the need for a collaborative effort among all stakeholders in the information industry to uphold

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the ethical and legal imperatives of cyber security. The chapter then delves into the specific ethical considerations that must be addressed, such as the protection of individual privacy, the responsible collection and use of personal data, and the balancing of security measures with the preservation of fundamental human rights. By Drawing on contemporary literature and analyses of the cybersecurity landscape in various contexts, this chapter provides a nuanced understanding of the ethical dilemmas and the processes that should be in place to ensure that cyber security practices are aligned with moral and legal principles. This includes exploring the appropriate safeguards and oversight mechanisms required to uphold individual privacy and civil liberties, while also enabling lawful and necessary cyber security measures. The chapter examines the ethical challenges inherent in data collection, storage, and usage, and how to strike an appropriate balance between security needs and the protection of personal information. Additionally, the chapter discusses the ethical principles and frameworks that should guide decision-making in the implementation of cyber security practices, to ensure alignment with relevant legal statutes and international standards. Overall, this chapter aims to provide a comprehensive understanding of the ethical considerations that must underpin cyber security practices within the broader legal and regulatory landscape.

KeyWords: *C*yber security, Privacy, Data protection, Incident response, Surveillance.

A CRITICAL ANALYSIS OF CYBER LAW'S FUNCTION IN CYBER SECURITY

Dr.M.Sridevi[74]

Global security has changed dramatically in the current digital era due to the internet's explosive growth and our increasing reliance on technology. As cyberattacks, data breaches, identity theft, and other online threats have become more common, countries have been forced to create and put into place strong legal frameworks to deal with these issues. A relatively recent addition to the legal system, cyber law is essential for protecting cybersecurity, outlining roles, and offering a legal path for cybercrime punishment. This essay examines the extent, constraints, and efficacy of cyber law in mitigating modern digital dangers in order to critically assess its role in improving cybersecurity.

Cyber law, sometimes referred to as Internet law or digital law, covers a wide range of legal topics, such as online privacy, data protection, cybercrimes, and intellectual property rights. It is believed that incorporating cyber law into national and international frameworks is crucial to protecting digital infrastructure and creating a safe space for online activity. Cyber law's main purpose in cybersecurity is to provide precise guidelines and limits for online conduct so that people and organizations are aware of their rights, responsibilities, and liabilities. Additionally, it establishes the protocols for dealing with cybercrimes, guaranteeing that those who commit them can be found, brought to justice, and held legally responsible.

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One key aspect of cyber law's role in cybersecurity is its emphasis on data protection and privacy. With the advent of big data, cloud computing, and Internet of Things (IoT) devices, the protection of personal and sensitive data has become paramount. Cyber laws such as the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in the United States have set global standards for data protection and created a legal framework for enforcing privacy rights. These laws not only regulate how organizations collect, store, and process personal data but also empower individuals with the right to control their data, enhancing trust in digital platforms and promoting a safer online environment.

Nevertheless, despite its significance, cyber law has a number of obstacles in its path. Technology's constant evolution frequently surpasses the creation of legal frameworks, resulting in legal coverage gaps. Furthermore, because cybercriminals can operate from multiple nations with differing legal norms, the global nature of the internet makes it more difficult to police cyber laws across jurisdictions. This makes it harder to coordinate and cooperate internationally, which makes it harder to combat cybercrime globally. Furthermore, companies' and the general public's inability to comprehend and apply cyber rules restricts their ability to effectively secure cyberspace.

cyber law is essential for improving cybersecurity, it is not a cure-all. To properly handle the difficulties of cybersecurity, a comprehensive strategy integrating legal, technical, and policy measures is needed. Establishing a safe and robust digital environment will require ongoing revisions to cyber legislation, international cooperation, public awareness initiatives, and technology advancements. Cyber law can only genuinely improve cybersecurity by addressing the shortcomings of current legal frameworks and promoting

international collaboration. This study comes to the conclusion that although cyber law is essential for improving cybersecurity, it is not a cure-all. To properly handle the difficulties of cybersecurity, a comprehensive strategy integrating legal, technical, and policy measures is needed. Constant

VICTIM-BLAMING IN CYBERCRIMES: A SOCIO-LEGAL PERSPECTIVE WITH SPECIAL REFERENCE TO WOMEN AS VICTIMS

Ekata Mukherjee [75]

Throughout history, women have been subjected to various forms of victimization, including domestic violence, dowry deaths, sexual assault, and acid attacks. As society has evolved into the digital era, women have become increasingly vulnerable to cybercrimes such as cyber stalking, online harassment, sextortion, deepfake pornography, and identity theft. Despite legal advancements and awareness campaigns, deeply ingrained patriarchal attitudes continue to shape societal responses to such crimes, often resulting in victim-blaming rather than holding perpetrators accountable.

Victim-blaming in cybercrimes involving women manifests in various ways. Women are frequently held responsible for their victimisation due to their online activities, including sharing personal information, engaging in conversations with strangers, or merely maintaining a social media presence. This tendency is exacerbated by cultural and moralistic narratives that judge women's behavior more harshly than men's, reinforcing restrictive norms around female agency in digital spaces. Such attitudes discourage women from reporting cybercrimes, fearing further humiliation, social stigma, or even familial repercussions. In many cases, law enforcement and judicial responses also reflect these biases, making access to justice a challenge.

This paper aims to explore the socio-legal dimensions of victim-blaming in cybercrimes, with a specific focus on women

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as victims. An empirical survey will be conducted across selected districts in West Bengal to assess the prevalence and extent of victim-blaming in such cases. The study will analyze social perceptions, legal responses, and the psychological impact of victim-blaming on women who experience cybercrimes. Additionally, it will examine whether existing legal frameworks, such as the Information Technology Act, 2000, relevant provisions of the Bhartiya Nyaya Sanhita, and relevant provisions of Bhartiya Nagarik Suraksha Sanhita effectively address the issue or require further reforms.

By analyzing the findings, this research seeks to understand the cultural and social factors that perpetuate victim-blaming and evaluate its impact on women's willingness to report cybercrimes and seek justice. The study aims to contribute to policy recommendations that foster a more victim-centric approach in cybercrime investigations and legal Proceedings, ultimately promoting safer digital spaces for women.

AN ANALYSIS OF CYBERCRIME AND INDIA'S LEGAL SYSTEM ON CYBERSPACE

Md Ahmad Raza [76]

Abdul Rehman [77]

Cybercrime refers to criminal activities that exploit computers and the internet to obtain an individual's private information and publish it online without consent. Such offenses are often carried out with malicious intent, aiming to harm a person's reputation, cause psychological distress, or inflict physical harm. With rapid advancements in technology and growing digital dependence, the rate of cybercrime has increased significantly, presenting serious challenges to personal security and privacy. As the Internet has become an integral part of daily life, cybercrimes targeting women have also escalated. A major reason for this surge is the lack of awareness, digital literacy, and cyber-security education among Internet users. Many individuals, especially women, are unaware of the risks associated with online platforms and of how to protect themselves from cyber threats. This vulnerability makes them easy targets for cyber-stalking, impersonation, cyber pornography, and other online offenses. The anonymity of the internet further emboldens perpetrators, making it challenging for authorities to track and apprehend them.

Women and children are particularly vulnerable to cyber-exploitation, with online predators using social media and digital platforms for harassment, blackmail, and voyeuristic gratification. Victims often experience severe emotional distress, reputational damage, and in some cases, physical harm

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due to the misuse of their personal data. Law enforcement agencies worldwide face immense difficulties in curbing these crimes owing to the constantly evolving nature of cyber threats and the jurisdictional limitations of digital offenses.

To combat cybercrime, India enacted the Information Technology (IT) Act of 2000, which provides a legal framework for addressing cyber offenses and protecting individuals from digital exploitation. While this law was a significant step in regulating cyber activities, it does not comprehensively address the growing threats women face in the cyberspace. Cases of cyberbullying, digital sexual harassment, and non-consensual content sharing continue to increase, underscoring the need for stronger legal provisions and more effective implementation.

A multifaceted approach is required to address cybercrime among women. Thus, increasing digital literacy, enforcing stricter content regulations on social media, and improving law enforcement mechanisms are crucial. Strengthening legal frameworks and leveraging advanced technology to track cybercriminals can help create a safer digital environment, ensuring better protection of women from cyber exploitation and harassment.

CYBER CRIME AND THE EVOLUTION OF DIGITAL ARREST IN INDIA

MD Taher Hussain Sheeraz [78]

Cybercrime has emerged as a significant threat in the digital age, with its global financial impact expected to reach $10.5 trillion annually by 2025. In India, the cyber fraud is distressing, with losses totalling to ₹10,319 Crore in 2023, and approximately ₹11,333 Crore lost to cyber scams by September 2024. Telangana alone accounted for ₹707 Crore in losses in 2023, with the first half of 2024 seeing losses exceed ₹800 Crore, more than the previous year's figures. As cybercrime continues to rise with the growth of internet usage, the concept of digital arrest has become a pressing issue in India.

Unlike traditional arrests where the police take the accused in remand and present accused in front of the magistrate, the digital arrest refers to the custody of the victim virtually through real time video call in which victims behavior is controlled by these impersonating law enforcement officials who ask the victims to remain on the video call and be visible to them. The impersonating law enforcement officials inform that an FIR is registered against them stating reasons like some illegal substance was found in their courier package, or their family member is arrested and there are various fraud cases against them and then interrogate and pressure the victim to transfer funds for closing the criminal cases against them.

This paper explores the legal complexities related to digital arrest in India, focusing on the challenges in adapting existing laws to address the unique nature of this cybercrime Digital

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Arrest. It examines the present legal framework governing cyber offenses, including provisions under the Information Technology Act, 2000 and its amendments, and the role of law enforcement agencies in addressing cyber-criminal activities. Furthermore, the paper explores into the impact of misuse of data and data protection. Through a case study approach it investigates the cases of digital arrests analyzing legal and societal impact.

By adopting a doctrinal research approach, the paper defines digital arrest, examines its legal standing in India. The paper further addresses the challenges faced by law enforcement in tackling cybercrime and proposes recommendations to strengthen digital security and legal protections for internet users. In conclusion, the paper provides a comprehensive overview of digital arrest in India, identifying the legal, technological, and societal challenges it poses, while suggesting potential solutions to enhance legal responses to the growing threat of cybercrime.

CYBER SECURITY AND DATA PROTECTION: LIABILITY AND ACCOUNTABILITY FOR AI CYBER ATTACK

Mohd Furkan[79]

As Artificial Intelligence (AI) becomes integral to cybersecurity, it enhances defense mechanisms but also introduces unprecedented risks. The ability of AI is to autonomously learn, adapt, and execute sophisticated cyberattacks raises pressing legal and ethical concerns. When AI-Driven cyber incidents occur, determining liability becomes a challenge—should responsibility lie with developers, organizations deploying AI, end-users, or even the AI itself? The absence of clear legal frameworks complicates accountability, potentially allowing malicious actors to exploit AI systems with impunity.

This research explores the evolving landscape of AI cybercrime, from AI-powered phishing scams and automated hacking to deepfake fraud and adversarial AI attacks. It critically examines whether existing cybersecurity laws sufficiently address these emerging threats. Regulations such as the GDPR (General Data Protection Regulation) and many Acts made on AI which focus on data privacy and AI governance but lack explicit provisions for AI-Driven cyberattacks, creating gaps in enforcement. This research evaluates potential solutions, including stricter AI governance policies, liability models, and ethical safeguards to ensure accountability in AI security breaches.

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Beyond legal concerns, the study underscores the necessity of proactive cybersecurity strategies. Secure-by-design principles, encryption, threat intelligence, and continuous monitoring can mitigate AI-Driven threats, yet without strong regulatory structures, these measures remain reactive rather than preventive. Addressing AI's vulnerabilities requires a shift toward more adaptive security frameworks that evolve alongside AI technologies.

Lastly, this research advocates for a multidisciplinary approach to AI security governance. By addressing liability concerns, reinforcing AI security, and closing regulatory gaps, this study contributes to the ongoing discourse on AI regulation, ensuring a safer and more resilient digital landscape in an AI-Driven world.

Keywords: AI cybersecurity, liability, accountability, AI cybercrime, digital forensics, AI regulation.

REGULATORY CHALLENGES OF CYBERSECURITY AND PRIVACY: A THREAT TO DIGITAL ECONOMY

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Privacy and Cybersecurity issues are becoming an important roadblock for dependable and trusted global digital society development. Cyber-criminals are erratically shifting their cyber-attacks specially against, influential persons, cyber-physical systems and IoT, since they present additional vulnerabilities due to their constrained capabilities, their unattended nature and the usage of potential untrustworthiness components. Therefore, innovative cyber-crimes are continuously evolving, causing important damages and privacy problems for netizens in both virtual and physical scenarios. Due to that the various offenses have become very common in cyberspace like! Phishing, Hacking, Identity Theft, Ransomware, Online Scams, Potentially Unwanted Programs (PUPs), Denial of Service (DoS) Attacks, Cyberstalking. Thereby Worldwide cybercrime costs are estimated to hit $10.5 trillion annually by 2025, emphasizing the need for enhanced cybersecurity measures.

Cyberlaw plays a crucial role in managing the complex challenges posed by the widespread use of technology. It provides a framework for safeguarding individuals and businesses against cyber threats, ensuring the confidentiality and security of online transactions. By addressing critical

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issues such as data privacy, cyber laws build trust in online interactions by mandating the appropriate handling of personal information, protect intellectual property by prohibiting the unauthorized use and distribution of digital content, thereby encouraging innovation and creativity. Overall, cyber law acts as the foundation for the ethical and legal use of digital resources in the evolving digital landscape.

This paper explores the intersection of cybersecurity and law, highlighting the critical role of legal frameworks in addressing cyber threats, safeguarding data privacy, and regulating online activities. It examines how cyber laws deter cybercrimes, protect intellectual property, and establish standards for e-commerce and cybersecurity practices, fostering a secure and ethical digital environment.

As of today, India's cybersecurity legal landscape is primarily governed by the Information Technology (IT) Act of 2000, with recent additions like the Digital Personal Data Protection (DPDP) Act providing stricter regulations around data privacy, and various sectoral guidelines from bodies like SEBI, RBI, and DoT adding further complexity to the legal framework; companies are expected to comply with multiple regulations depending on their industry, leading to challenges in navigating the varying requirements across different sectors. The Indian Computer Emergency Response Team (CERT-In) oversees cybersecurity by issuing guidelines and coordinating responses to incidents. Laws like the Aadhaar Act, 2016, secure biometric data, while provisions in the BNS 2023, e National Cyber Security Policy and Digital India further enhance digital infrastructure, protect online transactions, and promote e-governance, creating a comprehensive system to address cybersecurity challenges.

We require new holistic approaches, techniques, tools, methodologies, innovative regulations to cope with the said issues, and mitigate cyberattacks, by employing novel cyber-

situational awareness frameworks, risk analysis and modeling, threat intelligent systems, cyber-threat information sharing methods, advanced big-data analysis techniques as well as exploiting the benefits from latest technologies and crypto-privacy mechanisms, identity and eID management systems.

AN ANALYSIS OF CYBERSECURITY AND THE PROTECTION OF DIGITAL INFORMATION FROM A LEGAL PERSPECTIVE

R C Ramya Sree[82]

Cybersecurity has become a cornerstone of protecting personal, corporate, and governmental digital assets in an increasingly interconnected world. The rapid evolution of sophisticated cyber threats, such as ransomware attacks, phishing schemes, and data breaches, continues to outpace existing legal and regulatory frameworks. It is because of this ever-changing landscape that there is an urgent need for robust, adaptable cybersecurity laws that can effectively address emerging threats.

Several laws, including the General Data Protection Regulation (GDPR) in the European Union and the California Consumer Privacy Act (CCPA) in the United States, have established important precedents by requiring organizations to implement strong data security practices and establishing rigorous standards for the protection of personal information. At the same time, international treaties such as the Budapest Convention on Cybercrime aim to establish a global framework for combating cybercrime. While these efforts have been made, enforcement remains a significant challenge due to

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jurisdictional complexities, varying legal standards, and the borderless nature of cyberspace.

Balancing privacy and security is one of the most pressing legal issues. The government advocates the expansion of surveillance powers in order to combat cyber threats, however privacy advocates warn against the erosion of civil liberties and the potential for governmental overreach. With the advent of new technologies such as artificial intelligence (AI), the Internet of Things (IoT), and quantum computing, this debate has become more heated. Although these innovations have tremendous benefits, they also introduce new vulnerabilities that require proactive and carefully crafted regulatory approaches.

The exploitation of artificial intelligence systems and attacks on critical infrastructure have exposed both the strengths and limitations of existing legal frameworks. These incidents highlight the need for flexible, forward-thinking solutions that can evolve alongside technological advancements. Effective regulation must not only address immediate threats but also anticipate future challenges to ensure comprehensive protection.

To safeguard the digital future, governments and organizations must work together to strengthen legal frameworks, prioritize privacy rights, and promote international cooperation. This includes harmonizing laws across jurisdictions, fostering public-private partnerships, and encouraging information sharing about cyber threats and vulnerabilities. In an increasingly digital world, establishing effective and adaptable cybersecurity laws is essential for protecting digital assets, ensuring public trust, and supporting the continued growth of the global digital economy.

LEGAL RESPONSE TO CYBER SECURITY IN INDIA

E. Radhika[83]

Technology has improved the pace of the human being and also increases efficiency, speed, and precision. One of the major obstacles in the nation progress is the cyber-crime. The growing tendency of the cyber-crime makes the cyber security indispensable aspect of our life. The losses caused by cybercrime are predicted to rise to $10.5 trillion by 2025, by 2031, ransom ware damages surpass $325 billion worldwide. As information technology advances at an exponential rate, altering the regulatory framework that governs it becoming difficult. Even though it is impossible for the law to keep up with technological advancements, there are still some aspects of present-day technology legislation that require improvement. Conventional encryption techniques that are frequently employed to protect data may become susceptible to quantum attacks, as a result it will make cyber security problems worse in the future. In the era of internet services and information technology, cyber security is crucial. To control criminal activity related to cyberspace and to improve the administration of justice for victims of cybercrime, the cyberspace authority needed to enact a rigorous legislation. Regulating cybercrimes is crucial in the current era of cyber technology, and laws pertaining to hackers and cyber terrorism should be strengthened. The issue of internet security is becoming worse, and cybercrime is still thriving. Information Technology devices have insufficient security features, making them open to hacker attack. As technology advances, new ways of committing crimes are becoming more visible. Due to their inventiveness, criminals and antisocial elements are able to

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take advantage of technical advancements for illegal financial gain which causes innocent persons to suffer both financial loss and mental distress. To safeguard the fundamental rights of law-abiding citizens, the state must inevitably step in, regulate human behaviour, enact laws on a range of matters, and use the police to enforce the laws in letter and spirit. To overcome the challenges posed by the cyber security the Indian government has been taking numerous measures to solve the issues. Indian Computer Emergency Response Team and the National Cyber Coordination Centre gather Information and mitigate on cyber security issues. The upcoming Digital India Act may lead to more advancements in India's cyber security regulatory framework. This article emphasizes the legal response to cyber security and highlights the significance of laws against cybercrime.

GOING DARK OR STAYING SECURE? ANALYSING THE FEASIBILITY OF BACKDOORS IN END-TO-END ENCRYPTED MESSAGING

Shivangi Tripathi[84]

"I love strong encryption. It protects us in so many ways from bad people. But it takes us to a place - absolute privacy - that we have not been to before."

-James Comey

With the evolution of internet, communication among the masses has also evolved. We have come a long way from letters to telephones and now to internet-based text messaging that is instant and convenient. But this new means of communication comes with its own set of privacy constraints. To solve these privacy issues, giants like WhatsApp and Telegram employ a technology called end-to-end encryption making sure that no one apart from the recipient can have access to the information transmitted on these apps. This solution in turn has raised concerns over access to the said data for legitimate state purposes, since even after being asked to divulge prospectively implicating data, these applications are unable to do so due to technical inability. This is referred to as the 'Going Dark Problem'.

In this context, there has been an ongoing debate about compelling these applications to create 'backdoors' to their technology in order to give access to designated data to the law enforcement agencies for legitimate state purposes. However, the advocates of progressive encryption technologies have continuously argued against the creation of backdoors. This paper delves into the techno-legal feasibility of creating backdoors to end-to-end encryption from a constitutional

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standpoint. It examines whether the companies owning these applications can stymie legitimate state action claiming to be a victim of their own technology furthering their commercial interest. The researcher critically analyses the disclosure provisions in the USA, EU and Australia and explores the possible legislative action that could regulate the introduction of such technology in order to authenticate as well as legitimise any use and prevent abuse of these backdoors.

The ideological aim of this paper is to find out a constructive solution to the Going Dark problem in a manner that is least invasive into the fundamental and constitutional rights of the masses and most efficacious in effectuating legitimate governmental access to concerned digital data for well-established and legitimate state uses.

CYBER LAW AND ITS EFFECT ON NATIONAL SECURITY

Shreesh Pandey[85]

Dr. Satish Chandra[86]

The   aims to ponder the relationship between cyber law and national security, its relevance, problems, and what bearing it has in the contemporary world. Regulating different activities in cyberspace, from data protection to digital privacy, from cybercrime prevention to the governance of emerging technologies, is the legal ambit of cyber law. It provides a framework for criminalizing international cybercrimes, adopting and enforcing cybersecurity laws, and international collaboration for fighting global cybercrime. In other words, cyber law is national security's first line of defence when it comes to the protection of critical infrastructure, sensitive data, and the hostile actions of state and non-state actors in cyberspace. In addition, it strengthens international and private sector cooperation in the fight against cyber crooks since most of them operate from the private sector.

For national security, cyber law is crucial in safeguarding critical infrastructure such as energy grids, financial institutions, and defence systems from cyber threats. It also enables cooperation between the public and private sectors because a significant portion of the country's infrastructure is owned and operated by the private sector. In this way, cyber law helps to bolster collective defences to deal with evolving

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threats through the establishment of clear roles, information sharing, and the obligation to adhere to cybersecurity measures. In the international sphere, cyber law serves to harmonize the legal frameworks of many countries to effectively deal with the realities of cybercrime that span jurisdictions. For example, treaties, conventions, and agreements such as the Budapest Convention on Cybercrime set parameters for international collaboration, which allows countries to effectively combat cyber criminality that crosses borders. Nevertheless, the differences in legal systems, varying priorities in regulation, and political factors are what undermine these initiatives through jurisdictional and enforcement gaps. The attempt to achieve national security goals versus the infringement of fundamental civilian rights such as character privacy and expression is what further undermines the formulation and enforcement of these cyber laws. Cyber law is key to modern national security, tackling the many dangers of cyber threats. It gives us the legal means to safeguard important infrastructure, catch cybercriminals, and work together globally. Yet, its success relies on keeping up with new tech, solving legal boundaries, and matching laws with human rights. As we move forward in the digital era, having strong, flexible, and united cyber laws becomes more crucial. This ensures our safety and stability in a world where everything is connected.

Keywords: Privacy, Protection, Cybercrime, Data Theft, Hacking,

Forensic Law & Technology

FORENSIC LAW AND TECHNOLOGY IN CRIMINAL JUSTICE SYSTEM

Adv. Syed Yameen Hussain[87]

Md Layaq Ali Khan [88]

The integration of forensic law and technology into the criminal justice system represents a transformative shift in the way legal processes are conducted and justice is administered. This evolution is Driven by the need to enhance the accuracy, efficiency, and fairness of criminal investigations and trials. Forensic technologies, such as DNA analysis, digital forensics, and biometric identification, have become indispensable tools in solving crimes, identifying perpetrators, and exonerating the innocent. These advancements have significantly improved the ability of law enforcement agencies to gather and analyze evidence, leading to more reliable outcomes in criminal cases. However, the rapid advancement of these technologies also raises critical legal and ethical questions regarding privacy, data security, and the potential for misuse.

This research examines the role of forensic law and technology in the criminal justice system, evaluating their impact on the investigation process, evidence admissibility, and the overall integrity of legal Proceedings. It highlights the importance of establishing robust legal frameworks to govern the use of forensic technologies, ensuring that they are applied consistently and fairly across different jurisdictions. The study also explores the challenges posed by technological

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advancements, including the need for updated legal standards and the training of legal Professionals to effectively utilize these tools. This study aims to provide a comprehensive understanding of how forensic law and technology can be harmonized with the principles of justice. It discusses the potential benefits of these technologies, such as reducing wrongful convictions and enhancing the efficiency of criminal investigations, while also addressing the risks associated with their misuse, such as violations of privacy and due process. The research underscores the importance of balancing technological innovation with legal safeguards to ensure that forensic tools serve as a boon rather than a bane to the criminal justice system. Ultimately, this study seeks to contribute to the ongoing discourse on the role of technology in law, offering insights into how forensic advancements can be leveraged to promote justice, protect individual rights, and uphold the rule of law in an increasingly digital world.

THERAPY OR ENHANCEMENT: SOME ETHICAL AND LEGAL ISSUES RELATED TO GENOME SCIENCE

Dr. Arabinda Sahoo[89]

Genome editing is carried out for therapeutic purpose. It is done by modifying the DNA of the organism to treat debilitating diseases. Philosophers hardly question this use of genetic technology. But the moment it is used for the enhancement of an organism especially human being, philosophers raise various concerns. Their predicament is using genome technology to enhance human being i.e., to enhance muscle, memories and moods, to choose sex, height etc. to manipulate their own nature. In this paper, I would deal with some of the ethical concerns and legal implications of the use of genome science for the enhancement purpose. Then I would be arguing against the idea of using genome science to enhance the human being. The first argument is rapid advancement in genome editing has not only enhance our ability as a human being but also affects our social structures. It opens up too many possibilities which can easily beat our capacity for making wise and far-sighted use of our skill. As a result, we as a society lose control over the consequences. This is the real danger the present human society is facing. The danger is unavoidable for two main reasons. First, taking human nature into account it is very difficult to say that the enhancement would be used to make an ideal society and not for the fulfilment of individual ego. In the age of consumerism, where things are governed by

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market especially scientific research, everything would be valued in terms of money. The second argument is that our liberal vocabularies viz., autonomy, fairness and individual right will not help us to address our uneasiness towards cloning, designer children and genetic engineering. To address these issues, we need to look into the moral status and proper stance of human beings toward the given world. These issues would force us to go back to our religious root which modern liberal and political philosophers avoid. Issues related to genome editing of human beings could not be resolved without going back to the roots of theology.

Key Words: Enhancement, Therapy, Giftedness, Fairness, Liberalism, Theology

HARNESSING FORENSIC SCIENCE TO PROTECT ENDANGERED SPECIES: STRATEGIES AGAINST POACHING AND ILLEGAL TRADE

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Dr. Vijaishree Dubey Pandey[91]

Dr. Rituraj Sinha[92]

Wildlife crime deals with illegal trade and pouching, it is an emerging form of crime that poses a significant threat to conservation and biodiversity efforts. The poaching of endangered species and illegal trading of their body parts are becoming lucrative traits that threaten the very existence of the various endangered animals. The legal trade and poaching of Endangered Species can lead to the decline of their population, disruption of the ecosystem, and can fuel organized crime. The statistics which define are very crucial, that over 20,000 African elephants are being killed every year for their ivory, whereas the rhino horns are sold in the black market for monetary gains. The forensic science stream which is traditionally assigned to the human crime scene, is being harnessed to combat the crime with the wildlife. The cutting-edge technology, such as DNA, through digital forensics scientists may be able to track down the poachers, they can identify the origin of the seized specimens, and stop the illicit trade network. Forensic science has already proved as a game changer concerning the fight against poaching. Technological advancement helps expand the capability of forensic science in

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wildlife crime investigations. Sensing technologies that can be remotely used, for example, satellite imagery and drones can be used to monitor the population of the wildlife, activities that led to the illegal trading can be deducted and the movement of the wildlife attackers can be tracked. Developing new analytical techniques for example metabolomics and proteomics supports the potential for speedy and accurate species identification and provides a source of tracking. Through technological innovations supported by interdisciplinary collaboration among scientists, the law-making and enforcement agencies organizations working for the conservation of wildlife can come together to combat the illegal trade of wildlife and poaching effectively. The application of forensic science in the investigation of wildlife crime helps in the identification of the animal product and establishing a balance and link between the poacher and the illegal activities. Forensic techniques may also help in verifying the origin of the wildlife product, ensuring compliance with the International Regulations like Convention on International Trade in dangerous species that address issues such as illegal fishing and logging. Across the globe, many countries are developing wildlife forensic laboratories for the sake of enhancing their investigation capabilities with wildlife crimes. Across Africa and Asia, many biodiversity labs are established which help in generating evidence to investigate wildlife crimes. The objective of this paper is to deal with the scope and scale of the crimes committed against wildlife, which include poaching and illegal trading, and their effect on the injured species. and to recommend enhancing the application of forensic science to combat wildlife crime investigation, which includes the development of new technologies, and training.

ADVANCEMENTS IN DIGITAL FORENSICS: ENHANCING THE RELIABILITY OF DIGITAL EVIDENCE IN LEGAL PROCEEDINGS

Dr. Anita Yadav[93]

Digital evidence is 'information of probative value that is stored or transmitted in binary form'. Evidence is not only limited to that found on computers but may also extend to include evidence on digital devices such as telecommunication or electronic multimedia devices. The proliferation of digital devices and online activities has made digital evidence an important component of modern legal Proceedings. However, the dynamic and often volatile nature of digital data presents significant challenges to its reliability and admissibility in court. This explores recent advances in digital forensics aimed at increasing the reliability and potential value of digital evidence. We examine key areas including improved data acquisition techniques, robust forensic analysis methods and advanced chain of custody documentation. Traditional data acquisition methods are evolving to address the increasing complexity of digital storage and encryption. We discuss advances in live forensics, allowing the capture of volatile data without compromising its integrity. In addition, we explore the development of specialized tools to recover deleted or obscured data, which is critical to uncovering hidden or intentionally concealed evidence. The also highlights the growing importance of cloud forensics, addressing the unique challenges of data acquisition and analysis in cloud environments.

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Forensic analysis techniques are constantly being refined to ensure the accuracy and reliability of interpretations. We discuss advances in malware analysis, network forensics, and data mining that help investigators reconstruct digital events and attribute actions to specific individuals. The development of automated forensic tools and machine learning algorithms is also being explored, providing the ability to efficiently process large amounts of data and identify patterns indicative of illicit activity. Finally, maintaining a strong chain of custody is paramount to ensuring the admissibility of digital evidence. We examine advances in secure storage solutions, time stamping mechanisms, and detailed documentation practices. The emphasizes the importance of standardized forensic procedures and validation programs to increase the reliability and acceptance of digital evidence in legal Proceedings. These advances collectively contribute to a more robust and reliable framework for the use of digital evidence, ultimately strengthening the pursuit of justice in the digital age.

Keywords: Digital, Evidence, Forensic, Mechanism, Procedure

INDIA'S FIGHT AGAINST ONLINE CHILD PREDATION: CHALLENGES AND POLICY RECOMMENDATIONS

Faiz Ayat Ansari[94]

Anasua Das[95]

With the rise in technology and convenience at the tip of the hands, the use of technology has become unavoidable. Virtual life is a new normal for youngsters in this technological era. Due to technical advances, internet availability for youngsters has been made even easier. The advancement of technology has provided numerous benefits to society. However, they also proved to yield negative consequences, such as the increase in criminal activities, including online sexual offences against children which adversely impact children around the world. More and more children have access to smartphones and tablets, which makes them susceptible to being cyber victims because of a lack of parental supervision. The constant use of social media platforms, online gaming sites, dating websites, chat rooms, and the like has made children of a young age vulnerable to the ill effects of cyber platforms. The radicalisation of the minds of youngsters, challenging and suicidal games, online abuse and exploitation, spreading of violence, extremism and fake news and misuse of data are some of the ill effects of digitalisation. The lack of digital literacy, the exemptions provided to intermediaries for the acts of third parties and unawareness about online safety measures make children of young age vulnerable to exploitation and

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harassment at the hands of sexual predators and exploiters via the use of information and communication technology. The rapid advancement in technology is outpacing the law behind it. While the law acts as a regulator of human behaviour and actions, there is still a significant lack of keeping pace with the cyber world and persists making children prey to the clutches of technology. Therefore, the paper seeks to identify loopholes in legal and technological structure with special reference to the liability of intermediaries. Data for the present research were collected from secondary sources. The paper will examine the legal framework with respect to the protection of children from online abuse while underlining the role of intermediaries in advancing and curbing such issues being passive transmitters. The laws though ancillary addressing the issue of child online abuse need amendments as they often predate technological advancements thus failing the objective. The solution lies in making intermediaries more accountable, spreading mass awareness, digital literacy and coordinated efforts on the part of government institutions, NGOs, corporations, international organizations etc.. This paper further addresses the issue of child protection rights and laws which are used across the globe to keep a check on the security of children in the digital world.
Keywords: Technology, Cyber victims, Cyber platforms, Digitalisation, Intermediaries

FORENSIC EVOLUTION: BREAKING THE MIND'S VAULT-THE NEW AGE OF FORENSIC INVESTIGATION

Ms. Radhika Shukla[96]

Dr. Rajeev Kumar Singh[97]

As soon as the crime scene is taken over by the police and experts and a deeper investigation is done, truth unveils itself with all the credibility. At times you are not safe from your own self, it is fascinating how a blood sample can bring down an entire criminal empire by just one test. That is the power of forensics today, and with the evolving technologies in the world at present forensic tools can crumble criminals standing in the witness stand. In courtrooms across the world, forensic evidence speaks louder than words. In a world of darkness and progressive minds truth often eludes traditional investigative methods. Narco Analysis, DNA, and Brain Finger Printing tests stand out as ground breaking tools in the pursuit of justice. This article delves into the compelling need for these neuropsychological techniques, exploring their potential to revolutionize criminal investigations and their legal challenges. The article explores the intersection of advanced forensic technologies, criminal investigation, and constitutional rights in India, focusing on the tension between individual privacy and the pursuit of justice. It examines several scientific investigation techniques including Brain Fingerprinting, DNA analysis, and Narco Analysis and their compatibility with constitutional protections against self-incrimination under Article 20(3) of the Indian Constitution. The research delves

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into how modern scientific methods challenge traditional legal frameworks, particularly the right to privacy and protection against self-incrimination. It analyses key judicial precedents that have shaped the understanding of these rights, highlighting the evolving interpretation of constitutional safeguards in light of technological advancements. The research argues that these advanced forensic technologies should not be reflexively rejected but carefully integrated into the criminal justice system. The techniques offer significant advantages: minimizing investigative bias, preserving evidence beyond deteriorating memories, and potentially preventing wrongful convictions.

By peering into the depths of the human mind, these tests offer a window into concealed memories and suppressed information, potentially cracking cold cases and preventing future crimes. However, their implementation walks a tightrope between ethical concerns and public safety. We examine how these cutting-edge methods could reshape our understanding of truth-seeking in legal contexts, potentially tipping the scales in favour of victims and the innocent.

REVOLUTIONISING FORENSIC LAWS WITH THE LATEST TECHNOLOGIES & EXPLORING THECARREFOUR BETWEEN FORENSIC SCIENCE AND CRIMINAL LAWS (A STUDY ON ACCLIMATIZATION OF FORENSIC LAWS IN DIGITAL ERA)

ZAMNikhat Sultana Mazharuddin Farooqui[98]

This paper provides an over view of the latest shift in the forensic laws in the Indian legal scenario, technologies and digital development in the field of forensic science has great impact on criminal laws. Forensic science is the branch of science that focuses on criminal investigations. Recently there has been the tremendous change in criminal major acts viz Indian Penal Code-1860, Criminal Procedure Code – 1973 and, Evidence Act – 1872. The BNSS which replaces the erstwhile Cr.P.C has brought the use of technology and forensic science in the administration of criminal justice, this move probably will reform the criminal justice system by adopting the latest techniques of collecting and preserving the medical evidence from crime scenes. Medical jurisprudence that has been known as the legal medicine is associated with the studies of scientific and medical knowledge to the various legal issues. The contemporary medico-legal disputes involving a list of crimes require a medico-legal evidence and testimony from experts as a result of which it becomes mandatory to acclimatize laws pertaining to forensics. The new procedural criminal law has incorporated latest technologies and the forensic testing is mandatory for certain offences. This has exerted enormous

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emphasis on the use of modern techniques in forensic law for the investigation, ultimately this has prioritized the establishment of forensic laboratories.

This paper further focuses on the adoption and application of various latest methods, techniques and forensic scientific principles used in the criminal investigation for the purpose of legal Proceedings and in the areas of legal concerns. This will help in capacity building of forensics and forensic laws.

Keywords: Forensic laws, Criminal laws, Medical Jurisprudence, Latest Technologies, Investigation, Crimes and Offences, Forensic Laboratories.

THE INTERSECTION OF LAW AND TECHNOLOGY IN SHAPING CAPITAL PUNISHMENT POLICIES: A COMPARATIVE STUDY OF INDIA AND THE USA

Swikriti Mahajan[99]

This study investigates the interplay between law and technology in shaping capital punishment policies through a comparative analysis of India and the USA. The ever-evolving landscape of capital punishment policies in these countries presents a complex web of legal, ethical, and technological challenges and opportunities. With the rapid advancements in forensic science, digital evidence, and legal research tools, significant transformations have occurred in the legislative and judicial approaches towards mandatory capital punishment in both India and the USA. This research aims to dissect how these technological advancements have influenced and reshaped capital punishment laws and their implementation.

Over the past few decades, DNA testing has become a pivotal tool in forensic science, offering a higher degree of accuracy and reliability in identifying perpetrators. This study delves into the role of DNA testing in capital punishment cases, underscoring its potential to prevent wrongful convictions and ensure that justice is accurately served. Moreover, the integration of digital forensics has revolutionized the collection and analysis of electronic evidence, enabling the reconstruction of crime scenes and the establishment of timelines with unprecedented precision. The burgeoning field of data analytics has also found its place in the legal domain,

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presenting new methodologies for analysing case histories, identifying patterns, and predicting outcomes. This research examines how data analytics is leveraged to enhance the fairness and efficiency of the justice system in capital punishment cases. By comparing legal frameworks and case studies from India and the USA, the study highlights the critical role of technology in addressing the challenges posed by mandatory capital punishment, including the risks of wrongful convictions and the ethical dilemmas surrounding the death penalty.

A focal point of this study is the ethical implications of employing technology in capital punishment cases. The research emphasizes the necessity of balancing technological advancements with legal and ethical standards to ensure the justice system remains fair and humane. The study explores the human rights perspectives associated with the use of technology in capital punishment, arguing that while technology can enhance the accuracy and efficiency of the justice system, it must not compromise fundamental principles of human rights and dignity.

Through a comparative analysis of India and the USA, this paper aims to provide a comprehensive overview of how technology has influenced the development and implementation of capital punishment laws in these countries. The study identifies differences and similarities in their approaches, offering insights into how each country navigates the complexities of integrating technology into their legal systems. The research also considers the potential for international collaboration and the sharing of best practices to improve capital punishment policies globally.

In conclusion, this study underscores the transformative impact of technology on capital punishment policies in India and the USA. It calls for a balanced approach that leverages technological advancements while upholding the highest

standards of legal and ethical conduct. By doing so, the justice system can be enhanced to be more accurate, efficient, and fair, ultimately ensuring the preservation of the rights and dignity of individuals.

Digital Media & Law

DIGITAL MEDIA IN INDIA, UNITED KINGDOM, UNITED STATES OF AMERICA:A COMPARATIVE STUDY

Anya Behera[100]

Dr. Vedashree A[101]

The swift advancement of digital media has profoundly altered the realm of Intellectual Property (IP) law, presenting both new challenges and opportunities for the safeguarding of creative works. This   explores the current status of Intellectual Property Rights (IPR) within the framework of digital media, offering a comparative analysis of the legal systems in the United States, the United Kingdom, and India. Nations have adopted unique strategies for addressing copyright, trademarks, patents, and other IP forms in the digital landscape, shaped by their individual legal traditions, economic factors, and cultural environments.

In the United States, the Digital Millennium Copyright Act enacted in 1998 has been instrumental in governing copyright violations online, establishing a safe harbor provision for internet service providers and platforms that host user-generated content. This legal structure has come under increasing scrutiny for its inadequacy in tackling the surge of digital piracy, the emergence of streaming services, and the changing dynamics of content creation and distribution in the digital era. Key challenges include the interpretation of fair use, the enforcement of international copyright commitments, and the need to balance the interests of rights holders with the

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principles of free expression and equitable access to information.

The United Kingdom's regulatory framework is primarily shaped by the Copyright, Designs and Patents Act 1988, which has undergone modifications to address the complexities introduced by digital technology, including various amendments and adherence to European Union directives prior to Brexit. The UK has encountered difficulties in enforcing digital rights, particularly concerning online piracy, user data protection, and the increasing influence of online platforms in content distribution. Following Brexit, the divergence of the UK's intellectual property law from EU standards has prompted discussions regarding future harmonization and the necessity for a unified approach to digital media rights in the global marketplace. Additionally, the UK's legal system faces challenges related to the definition of digital originals, digital ownership, and the intersection of copyright with emerging technologies such as artificial intelligence (AI) and blockchain.

In India, the legal framework that governs digital media and intellectual property is still evolving, with the Copyright Act of 1957 serving as the foundational legislation for the protection of creative works, including those in digital formats. India's digital intellectual property landscape is beset by challenges, such as high levels of digital piracy, insufficient awareness of intellectual property laws, and obstacles in enforcing intellectual property rights in the online environment. The country has made progress with the enactment of the Information Technology Act and its subsequent amendments; however, issues such as cross-border enforcement, the safeguarding of software and digital content, and the exploitation of digital platforms for intellectual property infringement continue to pose significant challenges. Furthermore, India's relatively low internet availablity in rural regions, coupled with a rapidly expanding digital economy,

complicates the effective implementation of intellectual property protections. In this paper we will see how each country encounters distinct challenges concerning the safeguarding of copyrights and other intellectual property rights amid technological advancements.

DIGITAL DEFAMATION: ANALYZING LEGAL PROTECTIONS AND LIABILITIES IN THE AGE OF SOCIAL MEDIA

Dr. Mohammed Shamiulla Arab[102]
Siddhi Mundra[103]

The widespread use of social media has revolutionized communication but has also amplified the risks associated with defamation. Digital defamation has emerged as a significant concern in the age of social media, where the rapid dissemination of information can lead to severe reputational harm. This phenomenon refers to the act of publishing of false statements about an individual or organization that damages their reputation, primarily occurring through platforms such as Facebook, Twitter, and Instagram. Defamation, which encompasses both written (libel) and spoken (slander) statements, is governed by the Bharatiya Nyaya Sanhita (BNS), particularly under Section 356, alongside existing provisions in the Indian Penal Code (IPC) such as Sections 499 and 500. This paper explores how traditional defamation laws apply to social media contexts, focusing on jurisdictional complexities, the role of intermediaries, and the challenges posed by the anonymity of users.

The paper delves into the unique features of social media defamation, such as viral content, user-generated posts, and the permanence of online statements and critically examines the

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evolving legal landscape, highlighting significant case laws and statutory frameworks that address digital defamation in various jurisdictions. Moreover, the quashing of Section 66A of the Information Technology Act by the Supreme Court in 2015 emphasizes the need for clarity in regulating online speech while protecting freedom of expression. By analyzing landmark and recent and case laws, the paper underscores the need for clear guidelines on platform responsibility and content moderation practices. Additionally, it addresses the tension between protecting individuals from harm and upholding freedom of expression, a fundamental right often invoked in defamation disputes.

To bridge the gaps in current frameworks, the paper proposes reforms aimed at balancing accountability with free speech. These include adopting uniform standards for platform liability, enhancing access to legal remedies for victims, and utilizing technological solutions such as AI-powered content monitoring. The study also advocates for public awareness for a responsible online behavior. By addressing the multifaceted challenges of digital defamation, this paper seeks to contribute to a more equitable and effective legal environment that protects reputations while respecting the principles of free expression.

Keywords: Digital Defamation, Social Media Liability, Freedom of Expression, Content Moderation, Reputation Harm, Cyber Defamation, Legal Frameworks

NAVIGATING THE LEGAL LANDSCAPE OF DIGITAL MEDIA REGULATION: CHALLENGES AND SOLUTIONS

Dr. Sunil Dutt Chaturvedi[104]

 The landscape of digital media has changed in ways never seen before, creating intricate regulatory issues that are difficult for existing governance frameworks to handle. This in-depth study explores the complex issues surrounding the regulation of digital media, highlighting major obstacles, suggesting creative fixes, and detailing implementation plans for efficient supervision in a changing digital environment. Several significant obstacles to regulating digital media are noted in the study. Scaling content moderation poses enormous challenges, as platforms must handle millions of postings every day while upholding uniform standards across many legal and cultural settings. Due to differing privacy regulations and cross-border data transfers, the extensive gathering and processing of user data across jurisdictions presents data protection problems. While market competition problems are rooted in network effects and data advantages that provide inherent monopolistic inclinations in digital markets, platform accountability brings up difficult issues with algorithmic transparency and content curation obligations. Technical solutions for content screening and compliance monitoring make use of cutting-edge technology like artificial intelligence and machine learning. These tools are supplemented by automated systems for regulatory reporting and blockchain technology for content authentication. Policy frameworks provide tiered response systems and risk-based regulation, guaranteeing appropriate

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supervision while preserving adaptability for technology advancement. Strategies for implementation are customised for various stakeholder groups. Regulators need to acquire technical knowledge inside their organisations and create technology-neutral frameworks with frequent review processes. With the help of open procedures and unambiguous user rules, platform operators must put in place strong content moderation systems that combine automatic technologies with human control. Platform-specific constraints and Professional standards for content production must be thoroughly understood by content providers. In three main areas, social media platforms, streaming services, and digital news media, the report looks at sector-specific legislation. Because every industry has different problems, different regulation strategies are needed. Social media networks demand algorithmic transparency and complex content management procedures. Concerns about content categorisation and cultural protection must be addressed by streaming providers. For digital news media to uphold journalistic standards in the online setting, certain frameworks are necessary.

Regulatory needs are greatly impacted by emerging trends. The emergence of decentralised media systems, virtual and augmented reality platforms, and AI-generated content presents additional difficulties for supervision and responsibility. New business models and content formats are examples of market shifts that need for flexible regulatory strategies. For digital media regulation to be effective, international collaboration becomes essential. Addressing global issues while upholding national sovereignty requires cross-border collaboration channels and regulatory harmonisation initiatives. This thorough analysis comes to the conclusion that effective regulation of digital media necessitates well-rounded strategies that safeguard the public interest while encouraging innovation and expansion. The

results highlight the value of technology advancements in regulatory tools, stakeholder participation, and flexible frameworks that may be adjusted to meet new difficulties. Sustained dedication to creating workable solutions, sustaining global discourse, and enhancing regulatory ability to handle changing issues in the digital media ecosystem are essential for the future of digital media regulation.

THE IMPACT OF SOCIAL MEDIA ON YOUTH AND CORRESPONDING LEGAL RESPONSES

Mohammad Tabish[105]
Mariya Hasan Suri[106]

The developments in technology have brought about a revolution on a scale that was beyond imagination a couple of decades ago. At the same time, there is another, perhaps darker side to this development. These technologies have been misused through intrusion into the privacy, immoral and illegal use of personal data, hacking of sensitive personal and financial data, being used as a tool for sexual harassment, blackmail, pornography, dissemination of harmful messages, and a variety of other cyber-crimes. Children and youth are the biggest beneficiaries as well as victims of these developments in information technology. They are exposed to an enormous wealth of knowledge at an unprecedented rate but are also exposed to a great deal of unnecessary, unauthenticated, and even harmful information. The kind of impressions that digital media leaves on children and youth, has certainly made it an area of major concern for parents, teachers, and society at large. There is compelling evidence that the devices we've placed in young people's hands Profoundly affect their lives. The existing research shows that unnecessary and excessive social media use by our young ones is a major cause of increased anxiety, depression, and reduced attention spans among them, which raises concerns about its long-term impact on overall

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society. So to respond to these challenges, governments and regulatory bodies, all over the world, have introduced legal frameworks to mitigate the harm which it causes and to ensure the responsible use of social media. Despite the Laws addressing Cyber security, cybercrimes, data protection, privacy protection, child safety, and platform accountability that have been enacted throughout the world, their enforcement remains inconsistent across different jurisdictions.

Therefore, this paper seeks to establish the impact of social media which has transformed the lifestyle of youth in various ways, positive and negative. The study also tries to examine the challenges that youth face these days while browsing online on social media and, at the same time tries to assess the effectiveness of the existing legal responses in addressing these associated challenges and consequently mitigating the risk that they pose. The study also advocates for enhanced digital literacy and further discusses the need for stronger regulatory mechanisms and collaborative efforts among policymakers, technology companies, and civil society to create a safer digital environment for young users.

EVALUATING THE ROLE OF MEDIA LITERACY IN COMBATING DISINFORMATION IN INDIA: CHALLENGES AND STRATEGIES

Biranchi Naryan Sarangi[107]

Rahul Jain[108]

Shubham Sharma[109]

The current challenges of India's Body of Persuasion, particularly the propagation of false information, are targeted mostly towards fragmentation of the community and democratic development. Media literacy is now seen as a weapon against such enterprises, molding individuals with an ear to evaluate information sources conscientiously and represent, information elicitation. According to studies carried out in the region, high media literacy is directly associated with the propensity to self-deceive e. g. through engaging in fake news since too self-deceiving individuals are more strategic in negotiating away such platforms. The function of media literacy is not just to judge information; it is also about the ability to think, to change, to affect formal decisions, to speak and to practice engagement. However, the theory of media literacy is in practice underdeveloped in the country because of the education infrastructure, poverty, and the general apathy towards the education of the masses in media literacy. There is an against hope that community media will enhance media literacy but it has been observed that these

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media stations have legal and economic constraints which hinder their development. There is even less uniformity in the inclusion of media education into curriculums throughout the country where many teachers are ill equipped to teach such topics. Therefore, it is very essential that the media literacy interventions in India are planned properly with a strategy that includes educational activities, sociopolitical actions and attempts to attract broad public interests as well as e-campaigning. Those strategies should target all different demographic groups and since each one of these groups have their own challenges it is even more important for most all of these initiatives to involve all those three groups in order to be successful. Finally, if the Indian society is to learn how to consume critically the different types of media, the above will manage to alleviate this situation and encourage the victims definitely in the current information setup of it. The present investigation sets out to critically evaluate media literacy as a tool in the campaign against disinformation with the main focus on the specific ways in which various interventions have been applied in the various States of India as discussed below.

An ANALYSIS OF DIGITAL MEDIA AND LAW

Ms. Naaz Afzal[110]

The rapid proliferation of digital media has fundamentally transformed how information is created, shared, and consumed, presenting unprecedented challenges and opportunities for legal systems worldwide. This presentation delves into the intricate relationship between digital media and law, examining how legal frameworks are evolving to address the complexities of the digital age. Key areas of focus include intellectual property rights, which are increasingly tested by the ease of content reproduction and distribution online, and privacy concerns, as personal data becomes a valuable commodity in the digital economy. The discussion will also explore the role of content regulation in combating misinformation, hate speech, and illegal activities, while balancing the principles of free expression and innovation.

Emerging technologies such as artificial intelligence (AI) and blockchain further complicate the legal landscape. AI-Driven content creation raises questions about authorship and liability, while blockchain technology offers new possibilities for securing digital rights and ensuring transparency. These advancements necessitate a rethinking of traditional legal principles to ensure they remain relevant in a rapidly changing environment. Through an analysis of recent case studies and legislative developments, this presentation highlights the challenges of applying national laws to a global digital ecosystem. Cross-border issues, such as jurisdictional conflicts and the enforcement of international regulations, underscore

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the need for harmonized legal standards to address the transnational nature of digital media.

The presentation also considers the ethical implications of digital media practices, particularly in relation to data collection, surveillance, and algorithmic bias. It argues that legal frameworks must not only adapt to technological advancements but also prioritize accountability, transparency, and the protection of fundamental rights. Ultimately, this talk aims to provide a comprehensive overview of the dynamic interplay between digital media and law, offering insights into how legal systems can foster innovation while safeguarding public interests. By exploring current trends and future directions, the presentation seeks to stimulate dialogue on creating a balanced and equitable legal framework for the digital age.

National Security & Law

Balancing Privacy and Accountability: Legal Perspectives on GPS Monitoring for Accused Persons

Dr. Sateesh Kumar[111]

Amit Kumar Singh[112]

The intersection of technology and law has redefined the contours of privacy and liberty, particularly in the realm of criminal justice. One of the most debated innovations in this field is the use of GPS monitoring as a pre-trial condition for granting bail. This article deals with the implications of employing GPS anklet monitoring for accused persons, focusing on its alignment with the principle of "innocent until proven guilty" and the right to privacy. By examining the U.S. legal framework, which has extensively integrated GPS technology into its criminal justice system, this study aims to uncover lessons that India can adopt to balance privacy rights and public safety effectively. The United States has witnessed a rise in GPS tracking as a tool to ensure compliance with bail conditions while minimizing pre-trial incarceration. This article explores the legal and constitutional framework governing GPS monitoring in the U.S., analysing relevant case laws, state policies, and judicial precedents. The paper highlights how U.S. courts have addressed the potential infringement on privacy rights posed by real-time location tracking, juxtaposing it with the need for public safety and victim protection. In the Indian context, the use of GPS monitoring remains largely unexplored, presenting a unique opportunity to evaluate its feasibility. While India's criminal

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justice system continues to grapple with issues of prolonged pre-trial detention and overburdened prisons, the integration of such technology could offer an alternative to incarceration. However, it raises critical questions about the adequacy of India's legal framework in safeguarding privacy rights under Article 21 of the Constitution. This article scrutinizes these concerns, emphasizing the need for robust legislative and procedural safeguards to prevent misuse. The broader implications of GPS monitoring are also explored through ethical and philosophical lenses. The tension between the right to privacy and the state's obligation to protect public safety forms the core of this debate. GPS monitoring offers a practical solution to overcrowding and ensures accountability, it risks normalizing surveillance and eroding the fundamental liberties of individuals presumed innocent until proven guilty. By examining these critical issues, this article contributes to the broader discourse on integrating technology into criminal justice systems in a manner that aligns with democratic values and human rights. It serves as a vital resource for policymakers, legal scholars, and practitioners seeking to navigate the complexities of privacy, surveillance, and public safety.

BALANCING NATIONAL SECURITY AND CIVIL LIBERTIES: A CRITICAL ANALYSIS OF INDIA'S NATIONAL SECURITY LAWS

DR. SHOWKAT AHMAD WANI[113]

DR. SHEIKH INAM UL MANSOOR[114]

"Liberty itself is the law gift and may be by law forfeited or abridged". India is the largest democratic country in the world which guaranteed to its citizen and non-citizen personal liberty under article 21 and preventive detention under article 22 of the constitution. India is one of the few countries in the world whose constitution allows for preventive detention without safeguards during the peacetimes and that are understood elsewhere to be basic requirement for protecting fundamental human rights.

National security laws are very important, it protects sovereignty of nation and its citizens which is paramount for any state. However, such laws have been grossly misused by the state authorities to undermine the constitutional guaranteed rights of the citizens. The balance between civil liberties and national security laws is highly contentious and it must be adhered within the ambit of constitutional values.

This paper critically evaluates the legal frameworks that govern national security, analyzing how certain provisions have been wrongly invoked in different jurisdictions. This research through case studies highlights instances in which national security laws have been used to justify mass surveillance, arbitrary detention and curtailment of press freedom. The criticism and dissent make democracy more vibrant, but the

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suppression of fundamental rights and targeting critical views e government becomes easy targets for agencies. The paper investigates further the role judicial oversight, legislative safeguards, and international human rights norms play in mitigating such abuses. This paper presents policy recommendations that national security laws must meet so that state interests are balanced against democratic principles by comparing best practices from across the globe. The findings show an imperative for urgent legal reforms that would not let the overreach of enforcement agencies but also uphold the imperatives of national security.

THE RIGHT TO PRIVACY IN THE AGE OF MASS SURVEILLANCE BY THE STATE

Dr. Tausif ur Rehman Md[115]

Ikram Ul Haque[116]

The intersection of surveillance and the right to privacy has become a critical issue in contemporary society, especially with the rapid advancement of digital technologies. This paper delves into the historical and modern dimensions of state surveillance, examining its implications for individual freedoms and democratic principles. While surveillance is often justified on grounds of national security, its unchecked growth in india raises concerns about the erosion of privacy and fundamental rights. The amount of time citizens spend on social sites is tremendously increased over the years. The role of media, particularly social media, has evolved significantly in recent years, shaping modern culture and behaviour in unprecedented ways. The emergence of platforms like instagram and its "reels" feature exemplifies this transformation, where short-form video content dominates how individuals consume and engage with media. This essay explores the multifaceted effects of instagram reels on society, highlighting its dual nature as a source of creativity, entertainment, as well as a potential disruptor of mental well-being, consumer behaviour, critical thinking and the surveillance of citizens through these platforms.

Instagram reels, akin to its predecessor tiktok, has become a platform for users to showcase their creativity through trends,

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challenges, and storytelling. It democratizes content creation by providing an accessible platform for individuals, including budding artists, comedians, and influencers, to gain recognition and circumvent traditional barriers to entry in entertainment industries. Reels have also emerged as a powerful marketing tool for brands and influencers, integrating shoppable tags and advertisements, thereby merging entertainment with commercial objectives. This dynamic has influenced consumer behaviour, often encouraging impulsive spending and the pursuit of an influencer-curated lifestyle. Now a days, india has emerged as a global leader in digital surveillance, with cities like delhi, hyderabad and chennai ranking among the most surveilled globally. Tools such as cctvs, facial recognition systems, and targeted digital monitoring are extensively deployed. However, the lack of robust data protection laws and oversight mechanisms exacerbates the risks of misuse. The supreme court's landmark judgment in k.s. Puttaswamy v. Union of india (2017) recognized privacy as a fundamental right under articles 14, 19, and 21 of the constitution, mandating proportionality and necessity in privacy intrusions. Despite this, incidents like the pegasus spyware scandal and opaque surveillance practices highlight persistent regulatory gaps. The paper analysis the absence of adequate legal safeguards, including the failure of india's proposed data protection bills to address privacy concerns comprehensively. It underscores how surveillance not only infringes on privacy but also threatens freedoms of speech, the press, and dissent. To balance privacy and security, the paper advocates judicial oversight of surveillance, transparent accountability mechanisms, and robust data protection laws. These reforms are essential to uphold democratic values and safeguard citizens' rights in an increasingly digitized world.

Keywords: social media, surveillance, right to privacy, laws, society, state, digital world.

MEANING AND DIMENSIONS OF NATIONAL SECURITY

Mr.s. M. Razia Begum[117]

National Security law is a set of laws that define how a country responds to threats to its government, values and existence. National Security refers to the protection of a country's citizens, economy and institutions. The Official Secrets Act of 1923 is India's anti-espionage Act held over from the British Colonial period and it states clearly that actions which involve helping an enemy state against India are strongly condemned. National Security, or National Defense is the security and defense of a sovereign state, including its citizens, economy and institutions which is regarded as a duty of government.

Under Article 29 of National Security of Law it is described as an offence if a person steals, spies, obtains with payment or unlawfully provides states secrets or intelligence concerning National Security for a Foreign country or an external element. The main purpose of National Security is originally conceived as protection against military attack, National Security is wildly understood to include non-military dimensions. Two of the key responsibility of National Security are the detection of prospective threats and the planning of the proper response.

A "security objective" refers to high level goal in computer security that aims to counter the identifies threats and identified organization, security policies and assumptions which involves even preserving the integrity, availability and confidentiality of information resources. National security is a concept that a government along with its parliaments, should protect the state and its citizens against all kinds of national crisis through a verity of power projections, such as political power, diplomacy,

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economic power, Military etc. Even crimes affect such as pipeline vandalization, drug trafficking, Human trafficking, Illegal bunkering, Terrorism, Arson, Importation of expired foods and drugs etc. too affect national Security.

Un authorized discloser of foreign government information, the identity of a confidential foreign source, or intelligence sources or methods is presumed to caused damaged to the national security. The Five basic security principles are confidentiality, integrity, Availability, authentication and non-repudiation are the foundations of effective cyber security. The national security concept is a document based on the Analysis of Threats to the states that includes basic strategic principles and priorities for the prevention of threats to the states that have to be considered while developing new documents policy planning.

SURVEILLANCE, SECURITY, AND HUMAN RIGHTS: THE ROLE OF TECHNOLOGY IN UAPA PROSECUTIONS

S. M. Marjina Sultana[118]

In an age where technical progress consistently influences national security strategies, the convergence of technology, surveillance, and human rights has emerged as a significant issue within counterterrorism initiatives. The Unlawful Activities (Prevention) Act (UAPA), a fundamental component of India's legal structure addressing terrorism, has adapted in conjunction with technical advancements, especially in cyber surveillance, digital forensics, and countering cyber terrorism. Terrorist organisations are progressively utilising digital platforms for radicalisation, recruitment, and encrypted communications; thus, UAPA has been employed to combat these threats via AI-Driven analytics, big data surveillance, and cyber intelligence technologies. Nevertheless, whereas these technologies bolster national security, they simultaneously provoke significant ethical and legal dilemmas, especially concerning their effects on fundamental human rights.

This study centres on the conflict between state security requirements and the safeguarding of individual liberties, especially privacy rights. The implementation of surveillance technologies, including social media monitoring and data extraction from digital devices, prompts apprehensions over privacy infringements, possible power abuses, and the deterioration of civil rights. This paper rigorously analyses these issues by emphasising pertinent case studies, including the Kerala Gold Smuggling case, where digital evidence was crucial, and the Bhima Koregaon case, in which forensic

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investigations by Arsenal Consulting revealed unethical surveillance and the purported fabrication of evidence on activist Rona Wilson's computer. Digital forensics specialists contend that this case highlights the dangers linked to the improper use of technology in law enforcement, especially in instances involving sensitive allegations under UAPA.

Furthermore, the paper digs into the ethical quandaries presented by the growing reliance on surveillance and AI capabilities. The potential for bias in AI-Driven surveillance systems, the overuse of digital Profiling in counterterrorism activities, and a lack of adequate judicial oversight in the use of such technologies are all serious concerns that jeopardise the fairness and integrity of legal procedures. The paper assesses the lessons India may learn from foreign frameworks such as the United States' PATRIOT Act and the United Kingdom's Investigatory Powers Act, using a comparative analysis of security imperatives with privacy and human rights protection. In light of these challenges, the paper suggests substantial modifications to the UAPA and associated regulations, including incorporating privacy provisions from the Digital Personal Data Protection Act (DPDP). Strengthening judicial oversight, increasing openness in AI-powered counterterrorism operations, and improving legal safeguards against erroneous prosecutions are all important ideas for aligning national security initiatives with constitutional rights. This paper provides a balanced view of the expanding importance of technology in UAPA prosecutions, particularly in the battle against cyber terrorism, and advocates for a framework that protects both national security and individual liberties.

Keywords: Artificial Intelligence, Surveillance Technology, UAPA Prosecution, National Security, Privacy Rights, Human Rights.

NATIONAL SECURITY AND LAW: A MULTIDIMENSIONAL APPROACH

SAURABH SHUBHAM[119]

It is a very important fact that the national security of any country depends upon its Laws and legal system. In India, the parliament, which is the chief law-making body at the central level is elected after every five years. This paper attempts to study the educational qualification, the character and the overall fitness or eligibility of the present Lok Sabha members, to frame Laws for national security. Also, the rise and growth of new technological innovations like Artificial intelligence need a detailed study and how capable the current parliament of India and other legislatures are to tackle the related challenges. We need to adopt a region wise demographic approach as to how the multifaceted challenges related to national security and artificial intelligence can be tackled by the present Lok Sabha, where nearly half of its members have serious criminal charges against themselves. Law making is an intellectually demanding task and this process needs the detailed considerations of the specific demands of time and space, especially in the post Covid world where more carefulness in every aspect is needed.

This paper will also consider as to how national and world security has been redefined due to Covid -19 and the immediate and also the long-term challenges created by it. The readiness of the parliament of India to face such challenges and the laws at the provincial levels during the Covid period will be studied with relation to regional security, as national security is ensured by the security of different regions of India in a collective manner.

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To get a comprehensive idea of national security, we need to understand the colonial background of the security laws during the British period and get their contemporary and present relevance. With changing times, new aspects of national and international security have emerged and there have been many fugitives' economic offences, causing heavy losses to the Indian Economy, which may necessarily be interpreted as a grave threat to national security. The Indian Legal system needs to address this effectively. The rise and growth of digital currencies and the preparedness of the Indian Legal System to deal with it will also be evaluated comprehensively.

There will be a consideration as to how the legal or the law-making machinery of India can meet the present and future multidimensional challenges related to national security.

Law Governing Virtual Currency

International Trade Law & Technology

EXTENDED MINIMUM CREW OPERATIONS IN AVIATION: REGULATORY AND SAFETY CHALLENGES

Dr. Mohammad Owais Farooqui [120]

The implementation of Extended Minimum Crew Operations (eMCO) represents a transformative shift in commercial aviation through automation technology which lowers flight crew requirements while keeping operations safe. eMCO implements an innovative system which uses modern aircraft automation to allow one pilot to handle specific flight operations during cruise phase while the second pilot takes rest thus solving pilot shortage problems and cutting down operational expenses. The implementation of eMCO in commercial aviation requires significant adjustments to aviation laws at an international level particularly through the regulatory frameworks of ICAO together with FAA and EASA. This analysis examines three fundamental safety and regulatory issues created by eMCO namely the evaluation of automated system reliability during co-piloting duties and the effects on single-pilot flight operations through fatigue patterns and mental workload requirements as well as the necessity for global regulatory alignment to support safe inter-border practices. The aviation regulations currently operate under dual-pilots as a safety redundancy system although automation exists to support pilots but not to substitute their independent decision-making authority. Evaluating eMCO deployment requires certification standards that confirm automated systems become reliable in addition to ensuring fail-safes operate correctly and match predefined safety requirements.

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A doctrinal analysis of ICAO Annex 6 and Annex 8, along with FAA and EASA regulatory frameworks, highlights substantial gaps in automation certification protocols. Flight automation systems that integrate eMCO need to match human pilots in their level of situational awareness and their adaptive decision-making abilities and their ability to react in real time. The existing certification procedures lack thorough evaluation regarding automation's role as the primary decision-making authority during important flight circumstances. Testing of eMCO requires a comprehensive three-stage evaluation process including simulation tests and flight trial evaluations followed by autonomous operational tests to establish automation reliability and prevent system failures.

The research examines fatigue risks during eMCO by showing that two-pilot designed duty-rest cycles fail to fulfill the demands of single-pilot operations. The length of time flying alone creates elevated fatigue problems which degrade both situational alertness and strategic decision-making capabilities. An adaptive Fatigue Risk Management System (FRMS) developed in this research combines pilot alertness assessments in real-time together with predictive measure and dynamic adjustments of flight scheduling to increase safety while enhancing pilot performance.

Implementing eMCO faces substantial difficulties because regulations differ internationally between countries. EASA supports progressive eMCO implementations through automation, but the FAA maintains its adherence to human-controlled systems and system back-ups. Different regulatory standards among regions prevent full adoption of eMCO systems and cause problems with performing operations between areas. The study suggests that ICAO should take leadership to create global aviation safety requirements and certification protocols and fail-safe automation requirements because Article 33 of the Chicago Convention demands

aviation certification reciprocity. Standardized procedures between jurisdictions enable quick eMCO procedures at minimum safety requirements and maximum operational effectiveness.

The research integrates policy guidelines for commercial eMCO implementation by resolving regulatory frameworks and safety standards as well as legal issues. The integration process requires updated aviation laws and stronger standards for automation certification together with effective fatigue reduction programs which ensure eMCO fulfills aviation's basic safety principles. The research results enhance ongoing discussions about aviation automation advances by revealing important details regarding technological development against existing regulatory frameworks.

Regulatory Challenges of Cryptocurrency (Bitcoin) in India: Legal and Financial Perspectives

Prof. (Dr.) Tabrez Ahmad[121]
Mohd Muzammil M Tajammul [122]

Cryptocurrency, particularly Bitcoin, has gained global significance as a decentralized digital asset, disrupting traditional financial systems. However, its regulation remains a contentious issue, especially in India, where policymakers grapple with legal uncertainties, financial risks, and technological complexities. While several countries have adopted regulatory frameworks to integrate cryptocurrencies into their economies, India has taken a cautious approach, oscillating between restrictive policies and the need for innovation in the financial sector.

This paper examines the key regulatory challenges associated with Bitcoin in India, focusing on legal ambiguities, financial crime risks, taxation complexities, and the Reserve Bank of India's (RBI) policy stance. The 2018 RBI circular prohibiting banks from dealing with cryptocurrency-related businesses significantly impacted the industry, forcing exchanges and investors into uncertainty. However, the Supreme Court of India overturned this ban in March 2020, citing the disproportionate restriction on businesses under Article 19(1)(g) of the Indian Constitution. Despite this judicial relief, the absence of a dedicated cryptocurrency law continues to pose significant challenges.

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One of the primary concerns for regulators is the potential misuse of Bitcoin for money laundering, tax evasion, and illicit transactions due to its pseudonymous nature. The Financial Action Task Force (FATF) has emphasized the need for robust KYC (Know Your Customer) and AML (Anti-Money Laundering) measures, prompting Indian regulators to impose stricter compliance requirements. Additionally, the introduction of a 30% tax on crypto income and a 1% TDS on transactions in 2022 has created further challenges for traders and investors, raising concerns about the long-term viability of the sector.

India's regulatory dilemma is influenced by the RBI's push for a Central Bank Digital Currency (CBDC) as a state-backed alternative to decentralized cryptocurrencies. While CBDCs offer financial stability and government control, they do not provide the same level of decentralization and privacy as Bitcoin. This study analyzes global regulatory approaches, such as those in the United States, European Union, and Singapore, to suggest a balanced framework for India.

The paper argues that instead of imposing stringent restrictions, India should adopt a well-defined, technology-Driven regulatory framework that fosters innovation while ensuring financial security. Establishing clear legal definitions, enforcing consumer protection measures, and encouraging responsible innovation will help India leverage blockchain technology without compromising economic stability.

Keywords: Bitcoin, Cryptocurrency Regulation, RBI, Supreme Court, India, Financial Law, Taxation, CBDC, Blockchain.

LAW RELATING TO VIRTUAL CURRENCY- A FOCUS ON EXISTING REGULATORY FRAME WORK

Dr.D.Srujana[123]

The popularity of digital currency and virtual digital assets are on the rise in India. As per the United Nations Conference on Trade and Development's report in 2022, India ranked 7th on the list of countries ranked as per digital currency adoption with 7.3% of India's population owning digital currency in 2021. However, the regulations in this sector are still in their nascent stages, with no law currently in place, dedicated to regulation of crypto assets in India.

While there is no law explicitly prohibiting the use and trade of virtual digital assets ("**VDAs**") in India, currently, all forms of VDAs, including cryptocurrencies are unregulated in India and hence, currently, trading in the same is at the asset holder's own risk. A high-level Inter-Ministerial Committee was constituted in November 2017 to study the issues related to virtual currencies and propose actions to be taken. The Committee submitted its report on February 28, 2019 and the report was released in public domain on July 22, 2019. The mandate of the Committee included examining the policy and legal framework for regulation of virtual currencies. Key observations and recommendations of the Committee include:

Virtual currencies: Virtual currency is a digitally tradable form of value, which can be used as a medium of exchange or acts as a store of value or a unit of account. It does not have the status of a legal tender. A legal tender is guaranteed by the

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central government and all parties are legally bound to accept it as a mode of payment.

Cryptocurrency is a specific type of virtual currency, which is decentralised and protected by cryptographic encryption techniques. Decentralisation implies that there is no central authority where records of transactions are maintained. Instead, transaction data is recorded and shared across multiple distributor networks, through independent computers. This technology is known as Distributed Ledger Technology.

The Reserve Bank of India – Insights: The Reserve Bank of India has today cautioned the users, holders and traders of Virtual currencies (VCs), including Bitcoins, about the potential financial, operational, legal, customer protection and security related risks that they are exposing themselves. The Reserve Bank has mentioned that it has been looking at the developments relating to certain electronic records claimed to be "Decentralized Digital Currency" or "Virtual Currency" (VCs), such as, Bitcoins, lite coins, BBQ coins, dogecoins etc., their usage or trading in the country and the various media reports in this regard. The creation, trading or usage of VCs including Bitcoins, as a medium for payment are not authorized by any central bank or monetary authority. No regulatory approvals, registration or authorization is stated to have been obtained by the entities concerned for carrying on such activities.

Keywords: Virtual digital, Phishing, Cyberattacks, Ponzi schemes, VDAs

LEGAL ISSUES AND CHALLENGES IN CRYPTOCURRENCY FRAUDS AND SCAMS IN INDIA

Dr. Srinivas Katkuri[124]

The rapid expansion of cryptocurrencies, powered by blockchain technology, has ushered in a new era of financial innovation. However, the rise of virtual currencies has also given way to sophisticated fraud and scams, posing significant challenges for regulators and law enforcement agencies. This research paper delves into the legal complexities and investigative difficulties associated with cryptocurrency fraud in India, exploring the evolving landscape of cybercrime in the digital financial ecosystem. The study categorizes various types of cryptocurrency fraud, including Ponzi schemes, phishing attacks, rug pulls, and pump-and-dump schemes, among others. It also examines the psychological and technological tactics employed by fraudsters, particularly their reliance on social engineering to manipulate victims. By analyzing prominent case studies, the research sheds light on the extent and intricacy of these illicit activities, demonstrating how unsuspecting investors and traders fall prey to fraudulent schemes. A crucial aspect of this research is the reporting and redressal mechanism for crypto currency fraud in India. The paper highlights the existing procedures for victims to report scams, exposing the loopholes and inefficiencies within the current system. It discusses the jurisdictional ambiguity surrounding digital assets, the lack of a comprehensive regulatory framework, and the enforcement challenges that hinder effective legal action against perpetrators. Given the global nature of cryptocurrency fraud, the study underscores

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the necessity of international collaboration in combating such financial crimes. Fraudulent activities often transcend national borders, making it essential for India to strengthen cross-border cooperation, intelligence sharing, and legal harmonization with international financial watchdogs. To address the rising threat of cryptocurrency fraud, the paper proposes strategic legal and policy recommendations aimed at fortifying India's regulatory and investigative framework. These include public awareness campaigns to educate users about digital asset risks, enhancing the technical capacity of law enforcement agencies, fostering global cooperation, and introducing comprehensive legal reforms tailored to the complexities of virtual currencies. The research concludes by emphasizing the urgent need for a more robust and adaptable legal system in India to effectively combat cryptocurrency fraud. Strengthening legislative measures, coupled with proactive law enforcement strategies, is essential to protect investors and ensure the integrity of India's financial landscape in the digital age.

Keywords: Cryptocurrency, Bitcoin, Legal issues, Challenges, Investigation

VIRTUAL CURRENCY LAWS IN INDIA – A LEGAL STUDY

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B. James Jaya Raj[126]

The advent of virtual currencies has revolutionized traditional industries and business practices, significantly reshaping the "Digital World." These digital assets, often underpinned by blockchain technology, represent a novel paradigm that demands critical examination from legal and regulatory perspectives. As virtual currencies proliferate globally, they have catalyzed debates on their classification, regulation, and impact on existing financial systems. In India, where the digital economy is rapidly expanding, the legal treatment of virtual currencies remains a pivotal issue, necessitating a comprehensive and nuanced understanding.

This paper presents a detailed legal study of the evolving regulatory framework for virtual currencies in India. It begins by examining the current legal landscape, addressing crucial aspects such as securities and investment laws. The study investigates whether virtual currencies should be classified as securities, deposits, or commodities and analyzes the implications of these classifications for foreign direct investment (FDI) in businesses that rely on virtual currencies. The study also delves into banking regulations, exploring the

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applicability of money transmission laws, the Reserve Bank of India's (RBI) directives, and the Payment and Settlement Systems Act, 2007. Particular attention is given to the prohibition on dealing in virtual currencies imposed by regulatory authorities and its far-reaching consequences on businesses and stakeholders.

Critical issues surrounding anti-money laundering (AML) obligations form another key focus of this research. The paper scrutinizes the regulatory measures governing virtual currency exchanges, miners, issuers, and sponsors, as well as the mechanisms for addressing criminal and civil fraud in this domain. It evaluates the effectiveness of existing AML frameworks in mitigating risks associated with virtual currencies and highlights the need for stronger oversight mechanisms. Furthermore, the study addresses taxation challenges, analyzing the classification of virtual currencies under Indian tax laws and their implications for income tax, goods and services tax (GST), and international tax treaties.

The paper also explores the impact of foreign exchange controls on virtual currency transactions, particularly in light of the Foreign Exchange Management Act, 1999 (FEMA). These controls pose significant challenges to cross-border transactions involving virtual currencies, raising compliance concerns for both individuals and businesses.

In its final section, the paper offers a roadmap for the future, emphasizing the importance of a balanced regulatory approach. Policymakers are urged to foster innovation in the virtual currency ecosystem while addressing risks such as fraud, money laundering, and financial instability. The study advocates for the adoption of a comprehensive legal framework that harmonizes India's regulatory environment with global standards, ensuring both economic growth and investor protection.

By examining the multifaceted legal dimensions of virtual currencies, this paper seeks to provide policymakers, practitioners, and researchers with actionable insights into navigating the complexities of this emerging sector. It underscores the urgency of establishing a robust regulatory framework that aligns with India's broader economic and technological aspirations while safeguarding against potential threats.

LEGAL ISSUES IN THE CRYPTOCURRENCY SPACE: FRAUD, TAX, CONSUMER PROTECTION

Saumyaa Pandey[127]
Dr. Pamarthi Satyanarayana[128]

Legal issues of crypto in a post-pandemic world First of all, the advent of cryptocurrency has changed the dynamics of perspective from financial sectors, but the momentous rise of cryptocurrency has also posed serious legal challenges. This article discusses some of the fundamental legal issues surrounding cryptocurrencies, focusing in particular on three significant categories: fraud, taxation, and consumer protection. First, due to the much decentralized nature of cryptocurrencies, there are unique challenges for fraud detection and enforcement and scams such as Ponzi schemes, phishing attacks, and pump-and-dump schemes are on the rise. Second, many jurisdictions have the tax treatment of cryptocurrencies as a long-standing controversial issue. Governments find it difficult to classify and tax digital assets, creating complicated reporting obligations for individuals and businesses. The problem is compounded by inconsistent regulation. Lastly, consumer protection within crypto is becoming a pressing issue. With little regulation and no conventional financial protectors in place, consumers risk losing their investment to bad actors or technological failures. This article explores these issues as they relate to existing legal frameworks, including various government agencies, financial

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regulators, and the role blockchain technologies play in protecting users and keeping the market environment stable. Through the examination of these pivotal legal challenges, the paper underscores the necessity for regulatory clarity that can accommodate the changing nature of cryptocurrency while providing proper safeguards for all parties involved.

ADAPTING INTERNATIONAL TRADE LAW AND CROSS-BORDER INSOLVENCY TO TECHNOLOGICAL ADVANCEMENTS: THE NEED FOR UPDATED POLICIES AND REGULATIONS

Neelanjan Barat[129]

The rapid evolution of technology has profoundly transformed the landscape of international trade and cross-border insolvency, necessitating a recalibration of existing legal frameworks to address emerging challenges and opportunities. The proliferation of digital trade, blockchain technology, and artificial intelligence has introduced complexities that traditional legal instruments were not designed to accommodate. This paper critically examines the pressing need for updated policies and regulations that align with the technological advancements reshaping global commerce and insolvency practices.

In international trade, the digitization of transactions and the rise of e-commerce platforms have significantly altered the nature of cross-border exchanges, posing novel legal and regulatory challenges. Issues such as data privacy, cybersecurity, electronic contracts, and jurisdictional conflicts require robust legal solutions to ensure a seamless and secure trading environment. The absence of uniform regulations governing digital trade exacerbates compliance risks and hinders market access, calling for a harmonized legal approach that fosters trust and facilitates global economic integration.

Similarly, cross-border insolvency frameworks face substantial challenges in adapting to the digital economy. The advent of intangible assets, cryptocurrency holdings, and decentralized finance complicates asset tracing, valuation, and distribution in

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insolvency Proceedings. Existing legal mechanisms, such as the UNCITRAL Model Law on Cross-Border Insolvency, must be re-evaluated to incorporate provisions that address the unique attributes of digital assets and emerging financial technologies. The increasing frequency of multinational corporate insolvencies involving digital components underscores the urgency for jurisdictions to adopt agile, technology-inclusive legislative frameworks that enhance predictability and efficiency in insolvency resolution.

This paper argues for a proactive and dynamic legislative approach to international trade and insolvency laws, advocating for the integration of technology-Driven regulatory mechanisms. Key recommendations include the development of standardized digital trade agreements, cross-border data governance frameworks, and insolvency protocols that recognize and address digital asset complexities. International cooperation and stakeholder engagement are paramount in crafting regulatory solutions that balance innovation with legal certainty and economic stability.

By analysing contemporary legal developments, case studies, and comparative legal frameworks, this paper contributes to the discourse on modernizing international trade and insolvency laws to reflect the realities of a digitally interconnected world. The findings underscore the imperative for policymakers, legal practitioners, and international institutions to embrace technological advancements and recalibrate legal regimes to support sustainable economic growth and global financial stability.

ANALYSIS OF DIGITAL TRADE FOCUSING ON PAYMENT BANKS

Dr. Rashmi K S[130]

Shabana Parveen[131]

The rise of digital technology, improved internet access, and modern financial systems have transformed global trade, facilitating seamless online transactions of goods, services, and data. This shift has opened opportunities for economic growth but also introduced regulatory and governance challenges. Payment banks have emerged as key enablers of digital banking, providing financial services to unbanked populations and enhancing the efficiency, security, and affordability of digital transactions.

Payment banks play a crucial role in financial inclusion, particularly in developing economies, by streamlining business-to-customer transactions. Their significance is evident in models such as Kenya's M-Pesa and India's Paytm Payments Bank, which showcase successful digital financial integration. However, legal and regulatory complexities impact their global expansion. Variations in data privacy laws, compliance requirements, and government policies present challenges that hinder uniform growth.

The study employs an analytical framework to evaluate the legal landscape of digital trade and payment banks, focusing on statutory regulations, administrative directives, and sectoral innovations. It explores how local trade laws influence global commerce and the necessity of international partnerships to

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navigate regulatory barriers. The Kenyan mobile payment regulatory framework and India's Unified Payments Interface (UPI) highlight the interaction between technology and legal frameworks in driving digital trade.

A key concern is the lack of cohesive international legal frameworks governing digital transactions. Regulatory inconsistencies, data security issues, and privacy protection challenges persist. The World Trade Organization's Trade Facilitation Agreement aims to reduce trade barriers, while the European Union's GDPR sets strict data privacy standards. However, existing policies require modernization to align with the complexities of electronic payments.

To foster secure and inclusive digital trade, the study advocates for enhanced international collaboration and harmonized legal frameworks. It proposes standardized data protection laws, financial system development programs, and agreements endorsing digital payment networks across nations. These recommendations benefit policymakers, legal experts, and industry Professionals by promoting transparency, security, and equitable access to the digital economy. By integrating technological, financial, and legal expertise, the research provides actionable strategies to overcome regulatory obstacles and enhance global digital trade governance.

E-COMMERCE IN CROSS-BORDER TRADE: RECONCILING INTERNATIONAL TRADE LAW WITH EMERGING TECHNOLOGIES

Sunil Kumar[132]

IP Singh[133]

E-commerce has become an integral part of global trade revolutionizing the way goods and services are bought and sold across borders. This rapid growth brings about several challenges particularly in reconciling international trade law with the emergence of new technologies. The shift from traditional brick-and-mortar commerce to online platforms has raised questions about how existing trade laws apply to the digital economy, especially when goods and services cross borders without physical movement. This paper explores the intersection of e-commerce, international trade law, and emerging technologies, with a focus on how legal frameworks can evolve to meet the demands of a highly digital world. The rise of technologies such as blockchain, artificial intelligence, and cloud computing has significantly altered the way e-commerce operates, creating both opportunities and risks. On one hand, these technologies facilitate faster, more efficient transactions across borders, reducing barriers to entry for businesses and fostering greater market competition. On the other hand, they raise concerns regarding data privacy, intellectual property protection, and the enforcement of contracts in a borderless digital space. These issues challenge the existing structures of international trade law, which was

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designed primarily for traditional goods and services. One of the key challenges in this area is how countries can agree on common rules for cross-border e-commerce transactions. With differing laws and regulations across jurisdictions, businesses and consumers often face uncertainty when navigating the international market. The lack of harmonized rules on issues like taxation, consumer protection, and dispute resolution further complicates the legal landscape. This paper examines the role of international agreements, such as the World Trade Organization's (WTO) e-commerce negotiations, in promoting a more unified approach to these challenges. The paper also discusses the need for technological adaptation within trade law. While technology can offer solutions to many of these challenges, it can also create new legal dilemmas. For example, the rise of cryptocurrency and digital payments introduces questions about currency regulation and the taxation of digital transactions. Similarly, the use of artificial intelligence in contract formation and dispute resolution presents the question of how legal systems can address the role of non-human entities in cross-border trade.

Laws Relating to Robotics

Bigdata and Law

Regulation of Blockchain Technology

Regulatory framework for Fintech

REGULATING ROBOTICS: ETHICAL AND LEGAL DILEMMAS IN THE AGE OF AUTOMATION

Deepak Gaur[134]

Dr. Ajay Kumar Bhatt[135]

The rapid advancement of robotics has transformed industries and everyday life, bringing efficiency, precision, and convenience. From self-Driving cars and robotic surgeons to automated manufacturing systems, robots are now integrated into critical areas of society. This technological revolution also brings with it a series of ethical and legal challenges. These challenges arise because robots can act autonomously and make decisions which raises questions about accountability, safety, and fairness. One of the primary concerns is liability. When a robot causes harm or makes an error, determining who is responsible can be complex. Should the blame fall on the manufacturer, the programmer, or the user? Current legal frameworks struggle to address this issue, leaving gaps in justice and accountability. Another critical challenge is the ethical dilemma of replacing human labor with robots. While automation increases efficiency, it also raises fears of mass unemployment, particularly in labor-intensive industries. This shift has far-reaching social and economic consequences, particularly for vulnerable populations. Privacy and surveillance are additional concerns. Robots equipped with cameras and sensors can collect vast amounts of data which may be misused or lead to breaches of personal privacy. There

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is an urgent need for regulations that limit such risks while enabling innovation. Furthermore, the development of robots with artificial intelligence raises ethical questions about programming values and biases. For example, how should robots prioritize decisions in situations where harm to humans is unavoidable? Another pressing issue is ensuring fairness and accessibility. Robotics technology is expensive, which means that its benefits might only reach a small section of society. Regulations must focus on making this technology equitable and ensuring that no one is left behind. The paper will explore these dilemmas and suggest practical solutions to create a balanced regulatory framework. Key recommendations include updating laws to clarify liability, implementing ethical guidelines for robotics design and use, promoting workforce reskilling to address job displacement, and ensuring transparency in data collection. It is crucial to strike a balance between innovation and protecting fundamental human rights to create a future where robotics technology benefits everyone while minimizing harm.

LAWS RELATING TO ROBOTICS: CHALLENGES AND PROSPECTS

khan Nazia Mohd Nawab[136]

The rapid advancement of robotics and artificial intelligence (AI) is transforming industries such as manufacturing, healthcare, transportation, and entertainment, reshaping society while presenting legal and ethical challenges. As these technologies integrate into daily life, existing legal frameworks struggle to keep pace, leaving policymakers to address issues like liability in autonomous decision-making, privacy concerns in robotic systems, and ethical dilemmas tied to AI's influence. This lecture explores the evolving legal landscape governing robotics, focusing on four key areas: 1. Liability for Autonomous Actions Examining accountability in self-Driving car accidents, medical robot errors, and other cases where AI systems make independent decisions. 2. Intellectual Property (IP) for AI-Generated Creations Analyzing challenges in ownership and authorship of AI-generated content, questioning whether rights belong to developers, users, or AI itself. 3. Data Protection and Privacy in Robotics Addressing AI-Driven surveillance, data vulnerabilities, and algorithmic bias, which impact privacy rights and regulatory policies. 4. Socioeconomic Implications of Automation Investigating AI's impact on employment, labor law reforms, and balancing innovation with workforce security. Traditional legal doctrines reveal critical gaps. Tort law, for example, relies on human-centric fault principles unsuitable for

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AI-Driven incidents. Contract law fails to address AI-to-AI interactions, and consumer protection laws often overlook the opacity of AI decision-making. A key issue is liability when autonomous systems cause harm such as an AI-operated drone damaging property raising accountability questions between developers, operators, and AI algorithms. International efforts, including the European Union's Ethics Guidelines for Trustworthy AI and United Nations' discussions on autonomous weapons, aim to establish ethical robotics governance. However, harmonization remains difficult due to differing national priorities. India, for instance, promotes AI for economic growth while safeguarding citizens' rights through digital privacy laws.

This lecture underscores the need to balance innovation with accountability. Emerging economies like India must encourage AI-Driven advancements without compromising legal safeguards. While the EU emphasizes transparency and human oversight, enforcement remains weak, raising concerns about practical implementation.

A multidisciplinary approach is essential for adaptive legal frameworks incorporating ethical, societal, and technological considerations. Proactive measures such as dynamic liability insurance, standardized IP protocols for AI-generated content, and robust cross-border data governance help mitigate risks. Public awareness campaigns to demystify AI and international collaboration to prevent regulatory fragmentation are equally crucial. By balancing technological progress with accountability, societies can fully leverage robotics' transformative potential while ensuring human rights and dignity in an increasingly automated world.

Keywords: Robotics, Law of AI, Liabilities, Ethics, Data Protection

HARNESSING BIG DATA FOR ENVIRONMENTAL SUSTAINABILITY: LEGAL AND ETHICAL FRAMEWORKS FOR DATA-DRIVEN CONSERVATION

Prof. (Dr.) Sanjeev Kumar Chadha[137],

Deepak Jaisal[138]

The proliferation of big data technologies has introduced transformative capabilities in addressing critical environmental challenges, including climate change mitigation, biodiversity preservation, and sustainable resource management. By leveraging large-scale data analytics, remote sensing, and machine learning, these technologies enable real-time monitoring, predictive modeling, and evidence-based policymaking, thus facilitating more efficient and informed approaches to environmental governance. However, the deployment of big data in this domain also raises Profound legal and ethical concerns. Issues such as data ownership, privacy, consent, algorithmic transparency, accountability, and the equitable distribution of technological benefits pose significant challenges to existing regulatory frameworks.

This study seeks to critically examine the role of big data in advancing environmental sustainability through a legal and ethical lens. It explores the interplay between technological innovation and governance frameworks, identifying gaps in current national and international regulations that fail to adequately address the complexities of big data applications. Drawing upon interdisciplinary insights and case studies from

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diverse contexts, this research evaluates the implications of big data use in environmental conservation and proposes a structured governance model grounded in principles of fairness, transparency, accountability, and environmental justice.

This study provides a comprehensive analysis using interdisciplinary insights and diverse case studies that demonstrate both effective and problematic applications of big data in environmental sustainability. Evaluating these examples highlights the implications and risks associated with big data use in conservation without proper oversight.

To address these challenges, the research proposes a governance model grounded in fairness, transparency, accountability, and environmental justice. This framework aims to promote responsible data practices that support sustainable efforts while protecting the rights of all stakeholders involved.

The paper further emphasizes the need for international cooperation to establish standardized regulatory mechanisms capable of addressing cross-border environmental issues and data-sharing complexities. It advocates for the adoption of ethical frameworks that align with the broader goals of sustainability and inclusivity, ensuring that the benefits of big data-Driven conservation are equitably distributed and do not exacerbate existing inequities. By advancing a comprehensive understanding of the legal and ethical dimensions of big data in environmental sustainability, this study contributes to the development of a robust and globally harmonized framework that integrates technological potential with principles of responsible governance and environmental stewardship.

Keywords: Big data, environmental sustainability, data governance, legal frameworks, ethical frameworks, climate change, transparency, accountability, environmental justice.

GOVERNING FRAMEWORK IN THE DIGITAL AGE: AN OVERVIEW

PVS Sailaja[139]

Contemporary civilizations are increasingly shaped by the omnipresence and universality of digital media. The widespread adoption of personal computers, smartphones, tablets, and other mobile technologies, coupled with near-ubiquitous connectivity, has deeply integrated digital media into the daily lives of individuals. Over the past two decades, India's media and communication landscape has undergone a Profound transformation, Driven in part by liberalization, deregulation, and privatization of media and cultural industries. The Information Technology (IT) Act, 2000, along with its subsequent amendments, serves as the primary legal framework regulating digital media and related activities in India. However, significant technological advancements since the enactment of the IT Act, including the rise of smartphones, app networks, the Internet of Things (IoT), amplified mobile internet penetration, cloud computing, and big data analytics, have outpaced many of the Act's original safeguards. These developments have created new regulatory challenges, necessitating a reconsideration of the existing legal structure. Over the past two decades, the expansion of Internet network structure, followed by the emergence of communication technology products such as smart mobile phones and support

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programs that can connect directly to the Internet, has led to significant developments in information or communication systems. Users of social media have increasingly become creators of media content, leading to an overwhelming flow of information, often interwoven with fabricated facts and misleading narratives. In this context, evaluating ethical concerns becomes crucial. Moreover, the fundamental right to freedom of expression appears to be significantly compromised, as manipulated ideas and opinions are strategically disseminated to influence public perception.

This paper explores the evolving regulatory landscape of digital media in India. It begins by defining digital media and key associated concepts before examining the framework governing public and private use. Finally, it critically assesses the gaps in the current regulatory system, highlighting areas where policy reforms are needed to address emerging digital realities. The present study mainly focuses on the law and ethics related to digital media content and its significance in the present scenario. The research methodology used in the present study is mainly based on primary data. Some secondary data has also been used to support the analysis of media content.

Sectorial Legislation to Comprehensive Protection: Evaluating the Digital Personal Data Protection Act, 2023 against Data Breaches

Trisha Lesley[140]

The Digital Personal Data Protection Act, 2023 which was passed in the year 2023, post series of public consultations, legislative debates and multiple rounds of Parliamentary sessions has finally received its Rules for desired enactment and is now open for public consultation. The Rules have created much buzz midst the data privacy community, garnering applause and an equal amount of criticism. Hence, it is necessary to study the impact of the new legislations in the country which will squarely fall under the theme of the Conference- Law & Technology, and the sub theme will be under, National Security and Law.

The researcher deems it necessary to assess and thereby analyse the Act in hand along with its rules, hence the study will majorly focus on the evolution of privacy as a concept in India, existing privacy landscape and a brief analysis of the Act & Rules, enumerating the various pitfalls of the legislation and a parallel analysis of the applicability of the act vis-à-vis nation wide data breaches. The Article will also aim at providing a critical analysis of the Rules, in correlation with sections provided in the Act. The Article will include, enactments which hold key to the formulation of the legislation in hand, vis a vis an analysis of the Judicial pronouncements which have been key to evolution of Data Privacy in India.

The researcher also aims to carry out a comparative analysis of the Data privacy regimes of other commensurate countries

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alongside India's Digital Personal Data Protection Act, 2023 application. Data Protection regimes such as the European Union General Data Protection Regulation, California Consumer Protection Act, China's Personal Information Protection Law, South Korea's Personal Information Protection Act and Japan's The Act on Protection of the Personal Information will also be studied to analyse and identify if there are any cork holes in our country's data protection regime.

The Article falls under the ambit of impact study with a corollary representation of the timeline of judicial decisions and legislations that have coined the terminology of "right to privacy". The paper will mainly utilise qualitative research technique perusing the available literature including primary data from necessary statutes and legislations pertaining to the study.

Keywords: Data Protection, Data Privacy, Digitalisation, Cyber Laws, Personal Data

COMPARATIVE ANALYSIS OF BLOCKCHAIN REGULATORY FRAMEWORKS IN HEALTHCARE: INDIA VS. GLOBAL COUNTERPARTS

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The integration of blockchain technology in healthcare has revolutionized the management of patient records, supply chain logistics, and data security. The decentralized nature of blockchain ensures transparency, enhances data integrity, and prevents unauthorized access. However, regulatory challenges pose significant barriers to its widespread adoption. This paper provides a comparative analysis of the regulatory landscape governing blockchain implementation in healthcare, focusing on India, the USA, China, and the UK. India faces challenges in aligning its regulatory policies, such as the Information Technology Act, 2000, and the Personal Data Protection Bill, 2019, with global standards like the US Health Insurance Portability and Accountability Act (HIPAA), China's Data Security Law (DSL), and the UK's General Data Protection Regulation (GDPR). While the USA emphasizes stringent data privacy standards and China enforces state-Driven compliance mechanisms, the UK adopts a balanced approach that aligns with EU directives.

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Recent advancements in healthcare, particularly the integration of Artificial Intelligence (AI) and Internet of Things (IoT), have further complicated regulatory compliance. AI-Driven healthcare solutions, including diagnostic tools and patient monitoring systems, generate vast amounts of sensitive data, necessitating stricter data protection laws. India's Digital Health Mission aims to digitize healthcare records but lacks robust regulations to accommodate emerging technologies like AI and blockchain. Furthermore, evolving cyber laws across jurisdictions, such as India's revised Information Technology Rules, 2021, and the UK's evolving post-Brexit data regulations, add complexity to blockchain adoption.

In contrast, the USA's HIPAA regulations are being updated to accommodate digital health solutions, including AI-powered patient care and blockchain-based record-keeping. China, with its stringent Cybersecurity Law and Data Security Law, emphasizes national data sovereignty and requires localization of health data, posing challenges for international collaborations. The UK's GDPR remains a gold standard in ensuring patient data privacy while promoting innovation through regulatory sandboxes that allow blockchain experiments under strict supervision.

The paper discusses India's regulatory gaps and the need for an updated legal framework to facilitate blockchain adoption in healthcare without compromising data security and patient privacy. The lack of interoperability between existing health data systems and blockchain platforms is another critical challenge faced by Indian healthcare institutions. A strategic roadmap for regulatory convergence and policy recommendations are proposed to ensure compliance with international standards while addressing India's unique challenges. Proposed solutions include the establishment of a dedicated regulatory body for blockchain oversight,

enhancement of cybersecurity frameworks, and fostering cross-border data sharing agreements with appropriate safeguards.

In conclusion, India's healthcare regulatory framework must evolve to embrace blockchain technology while ensuring compliance with global standards and addressing challenges posed by AI and cybersecurity threats. The adoption of a collaborative approach involving policymakers, healthcare stakeholders, and technology providers is essential to harness blockchain's full potential in transforming healthcare delivery.

A UNIFIED LEGAL FRAMEWORK FOR BLOCKCHAIN TECHNOLOGY: NAVIGATING GLOBAL COMPLIANCE AND INNOVATION

MD Ilyas Hussain[143]

Blockchain technology has emerged as a transformative force across industries, revolutionizing finance, supply chain management, healthcare, and public administration. Its decentralized and borderless nature enables transparency, efficiency, and innovation, but simultaneously poses significant challenges to existing legal frameworks. The absence of a unified global approach to regulating blockchain has resulted in fragmented compliance requirements, legal uncertainties, and risks related to fraud, money laundering, and consumer protection. These challenges hinder technology's broader adoption and undermine its potential to Drive sustainable innovation.

This paper proposes a comprehensive unified legal framework to address the regulatory challenges associated with blockchain technology. Unlike existing fragmented approaches, the proposed framework emphasizes harmonization across jurisdictions, ensuring that both compliance and innovation challenges are systematically addressed. It explores critical issues such as:

1. Enforceability of Smart Contracts: Establishing their legal validity and dispute resolution mechanisms for automated agreements.

2. Cross-Border Cryptocurrency Regulation: Harmonizing global standards to address fraud, tax

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evasion, financial instability, and ensuring regulatory consistency.

3. Governance of Decentralized Finance (DeFi): Creating safeguards for transparency, accountability, and consumer protection within DeFi ecosystems.

Through comparative analyses of existing regulations, such as the European Union's Markets in Crypto-Assets Regulation (MiCA), U.S. SEC guidelines, and blockchain initiatives in Asia-Pacific regions, the framework integrates international best practices. Furthermore, it proposes a collaborative model involving governments, developers, businesses, and regulators to build trust and accountability across blockchain ecosystems. By aligning principles of innovation and compliance, the framework not only fosters trust and transparency but also provides legal clarity to global stakeholders. The paper contributes to the evolving discourse on blockchain regulation by presenting a scalable and adaptable legal model capable of Driving blockchain adoption while safeguarding societal and economic interests. By addressing critical legal gaps, this unified framework positions blockchain technology as a cornerstone of global economic and technological progress in the digital age.

THE SILENT RISKS OF FIN-TECH: UNVEILING INDIA'S REGULATORY BLIND SPOTS

B.Shirisha Reddy[144]

The Indian financial technology (Fin-tech) sector has emerged as a transformative force in the global financial landscape, propelled by innovations such as digital lending, Unified Payments Interface (UPI), and AI-powered financial services. However, this rapid evolution has unveiled critical regulatory gaps that require immediate attention. Current frameworks, primarily governed by the Information Technology Act, 2000 (IT Act), and supplemented by sectoral guidelines from authorities like the Reserve Bank of India (RBI) and the Securities and Exchange Board of India (SEBI), lack the coherence and adaptability needed for an increasingly complex and dynamic ecosystem.

This article critically evaluates the efficacy of existing regulatory measures in addressing challenges such as cyber-dispute resolution, AI-Driven biases, consumer protection in digital transactions, and cross-border payment mechanisms. It identifies systemic shortcomings, including fragmented regulatory oversight, inadequate provisions for emerging technologies, and insufficient capacity for handling cyber grievances.

To address these issues, the paper proposes a comprehensive, multi-pronged approach: integrating flexible, outcome-oriented regulatory standards, creating centralized databases for dispute resolution, and fostering inter-agency coordination to reduce jurisdictional overlaps. By balancing innovation with

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robust compliance mechanisms, this framework aims to strengthen consumer trust, enhance regulatory clarity, and position India as a global leader in FinTech governance. These recommendations are critical to ensuring that India's burgeoning digital financial ecosystem continues to thrive responsibly and inclusively.

Keywords: Ffinancial technology (Fin-tech), Rregulatory measures, Information Technology Act, 2000 (IT Act), Ccyber-dispute resolution, Ddigital financial ecosystem.

FINTECH REGULATION IN INDIA: PROGRESS AND CHALLENGES

Dr.Aman Deep Singh[145]
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FinTech, which has been spotted, has many challenges associated with it, and its development is related to its emerging and developmental state. For example, there needs to be more consensus regarding the definition of even basic concepts and the regulatory framework. It still needs to be unambiguously clear which companies fall within the domain of FinTech and, therefore, should be regulated accordingly.

FinTech development has to be believed that the growing dependence on regulation is a potential risk for their development. The responses show that regulation is still one of the most pressing issues for the FinTech ecosystem, even though it is not necessarily regulation per se that causes concerns but the lack of a regulatory framework that would be suitable for the particular situation of the FinTech sector.

FinTech companies are increasingly using data to persuade customers, highlighting the need for robust data security measures to protect against unauthorised access, cyber threats, and online fraud, which aims to mislead and deceive individuals to act against their legal interests.

When fraud is performed digitally with misrepresentation and other components of fraud with technology, or when a person meets a fraudster through technology.

To a similar extent, the term "Online Fraud" is a comprehensive label encompassing both the fraudulent acquisition of financial resources and the theft of personal identity when the same has

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been done with means of using technology, or we can also say when there is misrepresentation conclusively done by any medium of financial inclusion with the virtue of technological interference.

Digital contracts, as per the Indian Contract Act, are legally valid and enforceable in various business contexts, including employment, leasing, and sales. They reduce costs and environmental impact by eliminating paper documents. E-commerce and digital contracts are interconnected, enhancing efficiency in online business activities.

Money laundering, a concept attributed to Al Capone, involves legalizing unlawful funds and concealing their origins. During Prohibition, Capone used launderettes to hide his illegal wine sales, a practice known as Hawala transactions. As technology advances, money laundering can now be communicated digitally.

The government and the regulatory bodies have recognised the changes that are taking place in the fintech space and have constantly kept pace with the rapidly changing environment in terms of technology and customer expectations.

These FinTech applications were earlier found to assist you in your payment system. Still, with changing times, from considering the above-discussed cases, the researcher has seen that there needs to be more equipped and technologically advanced to tackle these highly digital crimes.

India has addressed online fraud. These include cybercrime cells, cybersecurity awareness activities, and cybercrime legislation and regulations. Indians must be knowledgeable, vigilant, and practice good cybersecurity to avoid online scams.

Lastly, the article would discuss the Indian Judiciary system's vision for addressing FinTech industries and startups, aiming to foster a FinTech-friendly environment through development and innovation.

REGULATING THE FINTECH REVOLUTION: LEGAL CHALLENGES, INNOVATIONS & THE PATH FORWARD

Govind Rajulu[147]

Mohan Chandran[148]

The financial technology (fintech) industry has revolutionized the global financial landscape, integrating cutting-edge digital solutions into banking, payments, lending, and investments. This rapid evolution has posed unprecedented regulatory challenges, necessitating a robust legal framework to balance innovation with consumer protection, financial stability, and regulatory compliance. As fintech continues to disrupt traditional financial models, regulators across the globe are striving to establish legal frameworks that safeguard consumers while fostering technological advancements. This paper critically examines the regulatory framework governing fintech from a legal perspective, analyzing the regulatory models in major jurisdictions, including the United States, European Union, United Kingdom, China, India, and Singapore.

A fundamental challenge in fintech regulation is navigating the dichotomy between fostering innovation and ensuring compliance with legal mandates such as consumer protection, anti-money laundering (AML), data privacy, and cybersecurity laws. The rapid growth of fintech firms has led to concerns

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about regulatory arbitrage, where companies exploit gaps between jurisdictions to avoid stringent regulations. The paper delves into key fintech regulations such as the Payment Services Directive 2 (PSD2) in the EU, the Reserve Bank of India's guidelines on digital lending, and the US Securities and Exchange Commission's (SEC) oversight of fintech investments. A comparative analysis of regulatory sandboxes — such as those in Singapore and the UK — demonstrates how structured testing environments can promote regulatory flexibility without compromising legal safeguards.

The study also explores the emerging trends in fintech regulation, including the legal implications of artificial intelligence (AI) in financial decision-making, the rise of decentralized finance (DeFi), the adoption of central bank digital currencies (CBDCs), and the deployment of regulatory technology (RegTech). These innovations pose complex legal and ethical challenges, particularly concerning financial accountability, algorithmic bias, fraud detection, and risk assessment. The discussion highlights how courts and policymakers are addressing critical legal issues, such as cybersecurity threats, fraud prevention, and the classification of cryptocurrencies as securities or commodities. The growing interest in blockchain-based financial services has also led to increased scrutiny regarding regulatory oversight of smart contracts and digital assets.

Through case studies such as *FTC v. Equifax* (2019) on data breaches, *Loomis v. Wisconsin* (2016) on AI bias in financial risk assessment, and China's Digital Yuan initiative, the paper underscores the importance of dynamic, adaptive regulation in the fintech space. In addition, the research examines the challenges posed by cross-border compliance difficulties, conflicting regulatory frameworks, and the complexities of enforcing fintech laws in a rapidly evolving technological environment.

The paper concludes with policy recommendations for harmonizing fintech regulations at an international level. Key proposals include strengthening AML and KYC measures, enhancing cybersecurity frameworks, refining regulatory sandboxes, and promoting greater cooperation between global financial regulators. Achieving a balanced regulatory approach will require ongoing dialogue between fintech innovators, legal experts, and regulatory authorities to ensure sustainable financial innovation while safeguarding legal and ethical standards. A proactive, adaptive, and technology-Driven legal framework will be critical in fostering trust in digital financial services while mitigating risks associated with financial fraud, money laundering, and data breaches.

Keywords: Fintech Regulation, Legal Compliance, Digital Banking, Cryptocurrency Laws, Regulatory Sandboxes.

Digital Medicines and Law

Food Processing Technology and Law

Law and Internet of Things

DIGITAL MEDICINE AND THE LEGAL FRAMEWORK IN INDIA: ENSURING PRIVACY AND ACCESS IN A DIGITAL HEALTH ERA

Ayesha Rehman[149]

The technological advancements have brought about significant changes in healthcare. The computers are capable of not only storing information but they also are effective in generation of medical knowledge. Digital tools have transformed the way healthcare is accessed and delivered in current times. Digital healthcare and digital medicine, often used interchangeably, involves the use of tools and technologies to access and deliver healthcare. While digital health is a broader term which encompasses all the technologies to optimise healthcare, digital medicine is a subset of digital health which combines technology with traditional medical practices to enhance human health. The key difference lies in the fact that digital health focuses more on general wellness and digital medicine, on the other hand, focuses more on people with diseases and existing health conditions. Digital medicine uses Artificial Intelligence to diagnose, treat and prevent diseases among people. It supports clinical care by focusing more on monitoring and managing diseases and health conditions of people by the use of digital therapeutics, remote monitoring devices, telemedicine, etc.

In recent years, there has been emphasis on everything going digital, probably for a reason that it brings ease in recording of data, maintaining and accessing it. Digital healthcare, however, gained an influx of attention with the COVID-19 pandemic. The lockdown gave way to accessing healthcare via telemedicine. There has been growing use of telemedicine ever

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since. This has made self-care easier in times where people are hardly able to schedule physical appointments with doctors. The use of Artificial Intelligence like robotic surgeries has also developed overtime. The digitisation of data records of patients has helped in retrieving the patient information at just one click without having to rummaging through files.

However, laws in India are insufficient to deal with problems encountered with the use of digital medicine. There are several barriers to implementation and the digital medicine poses a challenge in terms of accuracy, reliability and accountability, regulation, lack of infrastructure, privacy concerns and lack of training in healthcare personnel. Though digital medicine has the potential of improving accessibility to healthcare, there is a need for a comprehensive regulatory framework in India. Improving infrastructure including access to internet and technology, ensuring data protection can go a long way in enhancing healthcare of our citizens. We must also be well-equipped before we find ourselves hit by another pandemic. This paper shall attempt to highlight the significance of digital medicine in the present era along with the challenges it poses. It shall discuss how digital healthcare can be ensured without infringing the privacy of individuals. It shall also give suggestions to overcome the drawbacks.

Keywords: Digital medicine, Digital Health, Artificial Intelligence in Healthcare, Privacy, Digital Therapeutics.

THE IMPACT OF COVID-19 ON DIGITAL EDUCATION: A SOCIO-LEGAL AND HUMAN RIGHTS PERSPECTIVE

Dr. Aparna Singh[150]

Tanya Singh[151]

The COVID-19 pandemic has transformed education globally, accelerating the shift to digital platforms to ensure continuity during extended lockdowns. This study examines the surge in digital education through a socio-legal lens, exploring the legal, social, and human rights implications of this transition. As educational institutions swiftly moved online, the digital divide emerged as a critical issue, with marginalized communities, rural students, and low-income families facing barriers such as lack of access to devices, reliable internet, and technological literacy.

The study evaluates the adequacy of existing legal frameworks that guarantee the right to education, including constitutional provisions, international conventions like the Universal Declaration of Human Rights, and national policies on education. It identifies gaps in these frameworks, particularly concerning equitable access to digital learning, highlighting how the pandemic exposed the systemic inequities in educational access and infrastructure.

From a human rights perspective, the study focuses on the impact of digital education on the right to education (Article 21A of the Indian Constitution), non-discrimination, and the principle of equality. It also examines the psychological and

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social consequences of remote learning, including isolation, mental health challenges, and the erosion of holistic educational experiences that in-person education provides.

Additionally, the paper investigates the role of state and non-state actors in addressing these issues, examining policies implemented to bridge the digital divide, such as government programs and non-Profit initiatives. The study concludes with policy recommendations to ensure that digital education is inclusive and accessible, urging the development of universal access to technology, comprehensive teacher training, and equitable infrastructure. This will help uphold the right to education and ensure that all students have equal opportunities to succeed in an increasingly digital world.

Keywords: COVID-19 Pandemic, Digital Education, Socio-Legal Implications, Human Rights Perspective, Right to education

REGULATIONS OF DIGITAL THERAPEUTIC AND MEDICAL APPS IN INDIA

Dr. Pratima Choubey [152]

The growing field of off digital therapeutics and medical apps both come with plethora of opportunities and pertinent challenges for healthcare mechanism globally. the proliferation and expansion of digital landscape in India is facing substantial unmet healthcare needs primarily benefits from digital innovations. However, confronted by the lack of a cohesive and harmonized regulatory framework face's a significant roadblock to the safe and effective growth and development of digital therapeutics and medical apps.

the paper examines the current regulatory framework in India presently governing the digital therapeutics and medical apps in identifying key gaps and inconsistencies. The paper also explores the pertinent regulations present legal framework relevant provisions of the Drugs and Cosmetics Act, 1940 the Information and Technology Act, 2000, Torts and nexus to medical jurisprudence.

The paper further explores challenges of defining relevant regulatory frameworks, case laws, assuring data privacy and securing confidentiality further establishing setting standards for efficacy. International practices that can be applied to the Indian regulatory framework. The objective is to nurture an encourage innovation protecting public health and patient safeguard. The paper explores a way forward to harmonize and achieve balance with rapid growth of tele-medicine, digital therapeutic medical apps and regulatory frameworks.

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Keywords: Digital therapeutics, Medical apps, Data privacy, Data protection, Torts

DIGITAL MEDICINE AND LAW: SAFEGUARDING THE RIGHTS OF CHILDREN WITH IDD IN THE AI ERA

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The integration of AI into healthcare has revolutionized diagnosis, treatment, and patient care, but it also presents complex challenges, especially for vulnerable populations like children with intellectual and developmental disabilities (IDD). The convergence of digital health, law, and AI necessitates a comprehensive strategy to preserve these children's rights and well-being., balancing the promise of technology with potential risks. Digital medicine involves using technology, such as AI and machine learning, in healthcare practices, which can improve medical outcomes by enabling more accurate diagnoses, personalized treatment plans, and remote healthcare services. AI technologies may evaluate large volumes of data to find trends and forecast health concerns, providing individualized solutions for individuals with complicated demands. For children with IDD, such advancements hold immense potential for better care, as AI can help identify early signs of developmental delays, monitor progress, and facilitate therapeutic interventions.

However, the use of AI in healthcare presents several legal and ethical concerns, particularly regarding protecting children's rights. Children with IDD are already a marginalized group, and the rapid development of AI technologies may

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inadvertently exacerbate existing disparities or violate their rights. AI systems used in healthcare often involve collecting sensitive personal health data, raising concerns about data security and informed consent. The law must ensure that AI technologies are used in ways that uphold the rights of children with IDD, including the right to equal access to healthcare, the right to non-discrimination, and the right to privacy. Policies and regulations should be crafted to ensure that AI systems are designed, tested, and implemented in ways that respect these rights.

Keywords: Artificial Intelligence, Digital Medicine, Intellectual and developmental disabilities children, Health care , Challenges

Legal and Technological Aspects of Food Processing

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Mr. P V B Uday Sen Rao[155]

Human societies have always grappled with complex challenges related to sustenance, and our approach to food has dramatically transformed over time. From basic survival strategies to sophisticated global networks, food production and distribution reflect our collective progress. The journey begins with understanding core survival needs. While food was once simply gathered or hunted, modern realities demand intricate systems of production, processing, and regulation. Population growth, technological innovations, and shifting consumer expectations have fundamentally reshaped our food landscapes. Key areas of transformation include: Technological Innovations Modern food technologies go far beyond traditional preservation methods. Advanced thermal and non-thermal processing techniques—like pasteurization, high-pressure processing, and cold plasma applications— ensure safer, longer-lasting food products. Biotechnology and nanotechnology have further revolutionized manufacturing, enabling precise nutrient management and improved packaging solutions. Regulatory Frameworks Food safety isn't just about technology—it's about establishing trust. Regulatory bodies like the FDA, EFSA, and international organizations such as the Codex Alimentarius play critical roles in standardizing practices, protecting consumer health, and facilitating global trade. These frameworks balance innovation with rigorous

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safety protocols. Sustainability Considerations Contemporary food systems increasingly prioritize environmental responsibility. Waste reduction, energy efficiency, and ethical production have become central considerations, reflecting a holistic approach that considers technological capability, consumer welfare, and planetary health. Emerging Technologies Blockchain and similar tracking technologies are transforming supply chain transparency. These tools offer unprecedented visibility, helping prevent fraud and quickly identify potential contamination risks. The intersection of technological innovation and regulatory oversight represents a dynamic, continuously evolving landscape. Success requires adaptive strategies that promote innovation while maintaining stringent safety standards. Integration of Law and Food Technology: A Synergistic Approach: Legal frameworks and food technology are increasingly interconnected, addressing complex challenges through collaborative strategies: Regulatory Mechanisms : Govern technological innovations, Establish safety standards, Define permissible processing techniques, Ensure consumer protection, Monitor technological advancements: Legal Dimensions: Intellectual Property, Patent protection for food technologies, Safeguarding innovative processing methods, Regulating genetic modification techniques. Compliance Frameworks: Define technological boundaries, Create standardized testing protocols, Establish risk assessment methodologies, Mandate transparent reporting mechanisms, Ethical Considerations, Balance technological innovation with human safety, Address potential environmental impacts, Ensure equitable access to technological advancements. Technological Integration Points: Blockchain for supply chain transparency, AI-Driven quality control systems, Automated regulatory compliance tracking, Real-time contamination detection technologies, Genetic modification oversight mechanisms, Global Coordination

Challenges, Harmonizing international food technology standards, Creating adaptable regulatory frameworks, Promoting cross-border technological collaboration, Developing responsive legal infrastructures. Emerging Trends: Nanotechnology regulation, Digital traceability requirements, Sustainable technology development guidelines, Ethical genetic engineering protocols. The intersection of law and food technology represents a dynamic, evolving landscape requiring continuous adaptation and strategic collaboration.

LEGAL IMPLICATIONS OF THE INTERNET OF THINGS: PROTECTING PRIVACY AND SECURITY

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Adv Naveen Kumar Gautam[158]

The Internet of Things (IoT) is rapidly transforming how we interact with technology by enabling everyday objects, from household appliances to wearable devices, to communicate and share data over the internet. This network of interconnected devices offers a new level of convenience, efficiency, and automation in our personal and Professional lives. However, the increasing proliferation of IoT devices brings with it significant legal challenges, particularly concerning privacy and security.

As more devices become interconnected, the risks to personal data and security increase exponentially. IoT devices collect vast amounts of personal information, including location, usage habits, and even health-related data. This raises critical concerns about how this data is stored, accessed, and shared. The potential for data breaches, unauthorized access, and surveillance becomes a growing issue, as these devices are often not designed with robust security measures in place. The mishandling of such sensitive data could lead to severe consequences, including identity theft, financial fraud, and privacy violations.

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This article explores the legal implications of IoT, focusing on the challenges of safeguarding privacy and ensuring the security of interconnected systems. A primary concern is the inadequacy of current privacy and data protection laws in addressing the complexities of IoT. Many existing laws were not designed with IoT in mind, leaving gaps in regulation and enforcement. The General Data Protection Regulation (GDPR) and other data protection frameworks provide some guidance, but they often fall short when applied to the unique issues posed by IoT devices.

Moreover, cybersecurity regulations, while crucial, are still struggling to keep pace with the rapid expansion of IoT. These devices often lack standardized security protocols, making them vulnerable to cyberattacks that could compromise both individual users and larger network infrastructures. The article examines the role of legal frameworks in mitigating these risks, focusing on the need for updated regulations that account for the specific challenges of IoT.

Finally, it considers the role of policymakers in shaping future legislation to protect privacy and security without stifling innovation. Effective legal frameworks should not only safeguard individuals' rights but also foster technological development. The article concludes by stressing the importance of creating a balanced approach that addresses the privacy and security risks of IoT while encouraging continued progress in the industry. As IoT continues to expand, robust legal measures will be crucial in ensuring that both users and creators of IoT devices can benefit from this interconnected world safely and responsibly.

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