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The Role of Contemporary Technologies in Enhancing International Judicial Cooperation: A Study in Light of Public International Law

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International Judicial Cooperation
Volume 05, Issue 02 October 2025

Abstract:

This study elucidates the role of contemporary technologies in enabling international judicial cooperation in the domain of public international law. The study emphasizes artificial intelligence, blockchain, digital databases, and remote trial systems. Using analytical and comparative strategies, the study investigates significant international legal treaties-namely the United Nations Convention against Transnational Organized Crime-and analyzes how legal institutions implement these technologies. The study also contrasts physical models employed by the European Union and the United States. The study says that while new technologies boost digital speed and efficiency in judicial cooperation, they create challenges in digital sovereignty, privacy, and legal harmonization. Successful technology integration in international judicial cooperation involves flexible legal structures, coordination on a global scale, and access to digital infrastructure on an equal basis, concludes the study. The article gives suggestions on promoting technological adoption in an equitable way in accordance with global standards of law.

Keywords: International Judicial Cooperation - Artificial Intelligence -Blockchain - Transnational Crime - Digital Evidence - Cross-border Justice .

1. Introduction

The steady rise in transnational crime in the past few decades has been invoked to argue that there is a growing need for robust and effective international judicial cooperation. With criminality becoming increasingly transnational in nature -assuming the guises of organized crime, terrorism, cybercrime, and money laundering- the traditional framework of bilateral agreement and diplomatic processes has proven to be inadequate in keeping with the pace of speedy justice and collaborative police action. Consequently, global cooperation in law between countries has developed into ensuring global legal order and enforcement of the rule of law at a global level.

Along with this, the pace of emerging technologies has only now begun to change the configuration of new court systems. Technologies such as artificial intelligence, blockchain, and digital communications technology are remaking legal institutions' operations to provide hitherto unprecedented room for judicial collaboration across borders in terms of increased efficiency, accelerated speed, and broader scope. These technologies enable cross-border data transfer, secure electronic communication, virtual trial conduct, and digital authentication of evidence. But they also raise hard questions of law on privacy rights, sovereignty over data, procedural legitimacy, and cyber inequality among states.

The research for this article is undertaken on the following premise: to what extent do emerging technologies increase the effectiveness and convenience of international judicial cooperation as part of public international law? It explores whether the introduction of these instruments is a spur to advancing justice and compliance with international law, or whether it may do the opposite and work to subvert the legal standards it purports to promote. The merit of the study is that it takes into account a core intersection of law and technology, attempting to measure not only the practical benefits of innovation but also the normative tension that it can create.

Examining both legal agreements and regular implementations, the study attempts to give a complete and critical overview of new technologies' reshaping of the future of international judicial

cooperation. It employs an approach that normalizes on analytical as well as comparative approaches, allowing for extensive legal interpretation and comparison of various national and regional models. Through inductive reasoning, the study seeks to look at existing practice and judicial development in making judiciously balanced and lawfully justified recommendations on technology utilization in cross-border court systems. In the process, it contributes to existing academic and policy discourse regarding how to rethink justice in a more digitized and globalized world.

2. Theoretical Framework of International Judicial Cooperation under Public International Law:

The expanding globalization of crime imposed a particular strain on the requirement of robust international judicial cooperation. The current section offers an overview general to the meaning, legal basis, and principal modes of such cooperation in public international law. Following analytic, comparative, descriptive, and inductive methodologies, the section attempts to make evident the nature and scope of transnational legal cooperation and how it operates in international legal obligations.

The analytical method is used to examine pertinent international instruments, i.e., multilateral treaties and conventions, and the comparative method identifies similarities and differences in regional and bilateral practices. The descriptive method maps out the development history of judicial cooperation, and the inductive method makes it possible to draw conclusions from practice and application of the treaties. The chapter begins by defining international judicial cooperation and its most critical characteristics. Subsequently, it addresses the legal regimes established by instruments like the United Nations Convention against Transnational Organized Crime. Finally, it decides on the most crucial patterns of cooperation, i.e., mutual legal assistance, extradition, and information exchange, that establish the procedural foundations of successful international justice.

2.1. The Concept of International Judicial Cooperation

The judicial cooperation across the borders is the combined action of sovereign states to enhance the effectiveness of legal process that crosses boundaries. The cooperation is essential in the pursuit of justice in cases that contain cross-border elements. It can be categorized as active and passive cooperation, with the former being originated by judicial bodies and the latter often involves administrative actions. The discussions that follow elaborate key points of this notion.

Types of International Judicial Cooperation:

- a. **Active Cooperation:** Includes explicit requests for assistance between two countries, such as extradition or mutual legal assistance, in which countries cooperate to prosecute an offense or execute judgments¹.
- b. **Passive Cooperation:** Occurs when a country provides notice of reply to invitations for help, which may include the acknowledgment of foreign judgments or delivery of evidence for conducting cases².

Legal Framework and Challenges:

- a. **Legal Nature:** The legal framework for international judicial cooperation varies among jurisdictions, typically with the necessity for reforms to cover gaps in existing legislation³.

1 Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Antai Owoche Godswill, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024) 4 NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES 80."plainCitation": "Department of Law ,Post-Graduate and Diploma ,Kampala International University, Kampala ,Uganda .and Antai Owoche Godswill' ,Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law ;Identifying the Nexus between Theory and Practice2024) '

2 'Cervantes, I., & Pineau, E. (2013). Algunas Propuestas Para Una Futura Ley de Cooperación Jurídica Internacional En Materia Civil. 28, 91–106' <<https://repositorio.uam.es/handle/10486/664036>>.

3 ibid.

- b. Trust Between States: The extent of cooperation is highly reliant on trust between states, where integrated regions have high levels of cooperation ⁴.

Role of Judicial Cooperation:

- a. Access to Justice: Judicial cooperation is essential in facilitating individuals' access to justice in trans-boundary cases, preserving the right to have foreign judgments enforced⁵.
- b. Combating Crime: It is also central in the fight against transnational crime and facilitates easy prosecution of criminals who may run away to other jurisdictions⁶.

While international judicial cooperation is required in order to provide effective legal proceedings, it is also hindered by problems such as differing standards of law and the need for greater harmonization of laws between states. The complexity shows the ongoing requirement for change and debate within international law.

2.2. The Global Legal Frameworks for Judicial Cooperation:

UN Conventions, the Palermo Convention, and Other Instruments.

Judicial cooperation across borders relies very heavily upon a multilateral network of international legal instruments which form the normative underpinning of cross-border cooperation in both criminal and civil proceedings. Foremost among these is the Unit-

⁴ *ibid.*

⁵ *ibid.*

⁶ Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Antai Owoche Godswill, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024) 4 NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES 80."plainCitation": "Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Antai Owoche Godswill, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024)

ed Nations Convention against Transnational Organized Crime, commonly known as the Palermo Convention, which has acted as a benchmark for legal cooperation in prosecution of organized crime. The Convention and its supporting ancillary protocols encourage mutual legal assistance, extradition, and cross-border information sharing, as well as upholding the principles of sovereignty and reciprocity⁷.

Additionally, the United Nations Convention against Corruption facilitates increased international cooperation by obligating states to cooperate in the process of investigation, the recovery of assets, as well as pursuing judicial processes against corruption. Both conventions emphasize harmonization of legal frameworks and institutional capacity⁸. These instruments work in conjunction with local instruments -such as the European Convention on Mutual Assistance in Criminal Matters (1959)-which provide procedural means and legal certainty for cooperation in some jurisdictions⁹. UN Office on Drugs and Crime (UNODC) soft law instruments and model treaties also facilitate states flexible blueprints for cooperation¹⁰.

2.3. Mechanisms of Judicial Cooperation

International judicial and tribunal cooperation is manifested in numerous essential mechanisms—exchange of information, judicial assistance (letters rogatory), extradition of criminal offenders, and mutual legal assistance. Each operates with various procedural regulations but shares the common goal of attaining efficiency, justice, and legal uniformity in cross-country scenarios.

7 United Nations. United Nations Convention against Transnational Organized Crime and the Protocols Thereto. New York: UN; 2004. Available from: <https://www.unodc.org/unodc/en/organized-crime/intro/UNTOC.html>.

8 United Nations. United Nations Convention against Corruption. New York: UN; 2004. Available from: <https://www.unodc.org/unodc/en/corruption/uncac.html>.

9 Council of Europe. European Convention on Mutual Assistance in Criminal Matters. Strasbourg: Council of Europe; 1959. Available from: <https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/030>.

10 UNODC. Model Treaty on Mutual Assistance in Criminal Matters. New York: UN; 1990. Available from: <https://www.unodc.org/unodc/en/legal-tools/model-treaties.html>.

1. Information Exchange: Judicial officials commonly use formal and informal means of exchanging criminal intelligence and case information. Exchanges in formal settings may be done through mechanisms like Eurojust or other local institutions, but informal communication can be achieved through diplomatic or police networks. Such exchanges bring about trust, facilitate quick investigations, and enhance coordination in the face of varying legal systems and standards ¹¹.
2. Judicial Assistance: Letters Rogatory, where treaties do not exist or are deficient, letters rogatory permit a court to request judicial assistance from another. These requests -typically for proceedings such as taking evidence or examining witnesses- are channeled through diplomatic channels and depend on respect between judicial systems. They remain relatively slow and formalistic, especially when compared to treaty mechanisms¹².
3. Extradition of Offenders: Extradition is the legal transfer of people suspected or convicted of crimes between jurisdictions. Following bilateral or multilateral treaties, extradition balances state sovereignty and a commitment to pursuing serious crime. Comparative analysis shows how different jurisdictions apply extradition norms—ranging from formal treaties and regional agreements to arrangements like the Europe-

11 Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Antai Owoche Godswill, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024) 4 NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES 80."plainCitation": "Department of Law ,Post-Graduate and Diploma ,Kampala International University, Kampala ,Uganda .and Antai Owoche Godswill', 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law ;Identifying the Nexus between Theory and Practice(2024) '

12 Council of Europe / UNODC. Traditional letters rogatory vs. Mutual Legal Assistance Treaties (MLATs). UNODC Organized Crime Module 11. – compared differences in reliance, speed, and formality of letters rogatory vs. MLATs.

an Arrest Warrant—uncovering structural and cultural variability in these arrangements¹³.

4. Mutual Legal Assistance (MLA): Mutual Legal Assistance offers extensive cross-judicial cooperation across borders—like evidence collection, document service, witness testimonies, forensic data transfer, asset tracing, and other procedural aid. Frequently carried out under MLA agreements and coordinated through central authorities, such cooperation aids legal activity effectively while respecting local conventions. Studies point out that MLAs are still the most practical and reliable avenue for cross-judicial assistance¹⁴.

3. The Function of New Technologies in International Judicial Cooperation.

This section critically analyzes the transformational function of new technologies in defining the mechanics and efficacy of international judicial cooperation. As the world continues to globalize, international crimes require tools that can facilitate quick, secure, and reliable cross-border cooperation among judicial officers. The new technologies of artificial intelligence, judicial databases integrated into them, blockchain networks, and secure electronic channels of communication have revolutionized the investigative process, evidence management, and procedural efficiency. Taking an analytical stance, this paper explains how these technologies assist in shattering barriers -jurisdictional, procedural, and evidentiary -within the investigation process and examines their influence on legal certainty and due process. Further, the analysis explores the dynamics at play between technology solutions and global systems

13 Renaud Colson, 'Comparing the Machineries of Extradition: Between Functional and Cultural Approaches' (2024) 72 *The American Journal of Comparative Law* 528.

14 Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Owoche, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (n 6). "plainCitation": "Department of Law ,Post-Graduate and Diploma ,Kampala International University ,Kampala ,Uganda .and Owoche' ,Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law ;Identifying the Nexus between Theory and Practice) 'n6

of law, highlighting the potential of more mutual aid as well as the dangers of data privacy and security, as well as equitable access. This foundation sets the stage for further examination of specific uses of technology and their capacity to build a more responsive, open, and resilient global system of justice.

3.1. Applications of Artificial Intelligence in CrossBorder Investigations

On the international judicial cooperation level, artificial intelligence (AI) is a critical analytical tool to increase both the effectiveness and efficiency of cross-border investigations. Artificial intelligence systems, incorporating machine learning and pattern-recognition technology, enable judicial authorities to sort through large quantities of complex information -financial transactions, communication patterns, biometric data, and travel patterns- to detect transnational crime trends that traditional methods may overlook¹⁵. This is particularly applicable in cybercrime, human trafficking, terrorist acts, and organized criminal syndicates.

AI facilitates real-time analysis and coordination between law enforcement and judicial authorities. Automated document translation, natural language processing, and biometric matching simplify administrative burdens and accelerate examination of evidence¹⁶. AI-driven anomaly detection in financial transactions or communications networks helps detect illicit activities at an earlier stage, hence enhancing response timeliness and coordination across borders¹⁷. Predictive analytics and network mapping tools also assist in prioritizing investigative leads across jurisdictions.

However, AI use in legal processes poses grave regulatory and ethical challenges, particularly in terms of transparency, account-

15 European Union Agency for Criminal Justice Cooperation & eu LISA. Artificial intelligence supporting cross border cooperation in criminal justice. Luxembourg: Publications Office of the EU; 2022. doi:10.2857/364146. Available from: <https://op.europa.eu5/.../d24156e-2a66-11ed-975d...>

16 *ibid*.

17 OECD, Artificial Intelligence in Society (OECD 2019) <https://www.oecd.org/en/publications/artificial-intelligence-in-society_eeedfee77-en.html> accessed 20 August 2025.

ability, and justice. The secretive (“blackbox”) nature of certain AI algorithms prevents full comprehension by courts and defendants, and thus jeopardizes the right to a fair trial. To address such threats, jurisdictions must have effective legal frameworks mandating algorithm transparency, judicial oversight, and mechanisms for detecting and correcting bias ¹⁸.

A comparison of jurisdictions reveals inharmonious adoption of AI across judicial proceedings. Whereas some EU member legal frameworks have implemented AI-supported case-flow management and evidence filtering, others are piloting the same. Cross-border cooperation success is thus contingent not merely on the availability of AI tools but on harmonized law systems, mutual recognition of AI-generated outputs, and shared data regulation approaches.

3.2. Shared Databases and Information Exchange Systems.

Shared databases and information exchange systems are key digital infrastructure for international judicial cooperation in which different actors have access to shared data for the purposes of judicial cooperation.

These systems, such as INTERPOL’s I-24/7 and European Union’s e-CODEX, grant real-time access to information related to crime, including wanted persons lists, biometric data, and judicial decisions, on secure networks. Under a structured analytical approach, the systems prove to be efficient tools for controlled information exchange. They also fall within legal concerns regarding data protection, technical compatibility, and admissibility of evidence in court proceedings.

The functioning of the systems, from a legal-analytical perspective, is built on trust among the participating nations, which is based on compatible standards for data and thus regulatory guar-

¹⁸ ‘Council of Europe. 1st Report on the Application of Artificial Intelligence (AI) in the Judiciary: Based on Data in the CEPEJ’s Resource Centre on Cyberjustice and AI. Strasbourg: CEPEJ; 2025. Available from: <https://Rm.Coe.Int/Cepej-Aiab-2024-4rev5-En.../1680b49def>’.

antee. In the European Union, Directive (EU) 2016/680 creates a legal framework for the protection of personal data within the criminal-justice field to replace Framework Decision 2008/977/JHA and create a more coherent and enforceable regime¹⁹. Yet, the analysis concludes that the contrast between this robust data protection regime in EU states and weaker regulation in other legal systems can undermine transnational data-sharing systems' functional efficacy and legal basis.

At the technical level, interoperability is achieved through legal support of correct translation services, standardization of metadata schema, and secure encryption methods. Regulation (EU) 2023/2844, which improves the operation of e-CODEX, promotes legal certainty of cross-border judicial data exchange. But its accomplishment is subject to member states complying with some technical and legislative prerequisites²⁰.

Analysis also considers the problem of admissibility of evidence. The courts of various states have the capacity to render foreign electronic information inadmissible without verifiable audit trail records or tamper-evident features. Legal reform is therefore proposed to determine the existence of traceable automated transactional records and foreign certification that guarantees the admissibility of transferred information pursuant to law.

In comparison to other states, the member states of the EU are an exemplary case of having data protection laws integrated in judicial cooperation models—upholding strict citizen rights, data retention thresholds, and control. Other nations have more lenient regimes, with the consequence of dubious legal standards. Therefore, the analysis also substantiates that an effective international system of data sharing must be grounded on binding legal systems

19 Rastislav Funta and Peter Ondria, 'Data Protection in Law Enforcement and Judicial Cooperation in Criminal Matters' (2021) 11 *TalTech Journal of European Studies* 148.

20 European Parliament and Council. Regulation (EU) 2023/2844 on the digitalisation of judicial cooperation and access to justice in cross-border civil, commercial and criminal matters. Official Journal of the European Union. 2023;L:2844:1–29. Available from: <https://eur-lex.europa.eu/eli/reg/2023/2844/oj>.

to ensure data protection, technical adequacy, and responsibility.

3.3. The Use of Blockchain Technology to Ensure the Security of Digital Evidence

From a technical perspective, blockchain technology provides a feasible method of enhancing the integrity and authenticity of electronic evidence in cross-border judicial proceedings. Its cryptographic integrity, timestamped transactions, and decentralized ledger design collectively facilitate a tamper-evident history of evidence management—basically overcoming the considerable challenges involved in preserving a credible chain of custody in international legal contexts ²¹.

Blockchain platforms operate by creating sequential blocks of data, and each one is cryptographically linked to the previous one. Once a transaction—whether it is a file hash, timestamp, or claim record—is set in stone, it is effectively immutable and distributed to numerous nodes. It is the inherent capability that permits any attempt at illegitimate alteration to be detected immediately that makes it a solid method for ensuring evidentiary integrity. Globally, this would mean that online content shared across borders can be traced with high confidence throughout the investigation and judging processes.

It is a legal issue that admissibility of blockchain-logged evidence would depend on whether or not procedural laws of jurisdictions recognize such systems as valid means of evidence. Most jurisdictions require non-tamperable evidence, and blockchain technology inherently supports that requirement.

21 Fu-Ching Tsai, 'The Application of Blockchain of Custody in Criminal Investigation Process' (2021) 192 *Procedia Computer Science* 2779.

But the analytical question is whether courts will find blockchain metadata to be reliable evidence of origin, history of changes, and authenticity—most especially in the absence of legislative mandate or prior precedents. While some jurisdictions have enacted bills or regulations accepting blockchain-based data preservation²², most remain uncertain or reluctant, indicating the need for international harmonized standards.

Interoperability and standardization are a second key analytical dimension. Without common legal definitions or technical standards, proof stored on a blockchain in one country might be excluded elsewhere. Regulatory initiatives-national blockchain pilot programs or guidance—are being crafted but remain non-uniform. To enable admissibility and collaboration, global agreements or model protocols need to provide validation mechanisms, auditability requirements, and mechanisms for the resolution of disputes.

In addition, the intersection of blockchain technology with data protection frameworks is problematic. Blockchain's immutability may be irreconcilable with the right to erasure or privacy under frameworks like GDPR. An analytical framework therefore needs to be able to balance transparency and proof integrity with underlying privacy rights, possibly through permissioned blockchains, data minimization, or off-chain storage of personal data.

3.4. Smart Contracts and Their Role in Cross-Border Legal Processes.

Smart contracts-self-executing contracts coded onto blockchain technology-are being more and more regarded as groundbreaking tools in cross-border legal processes. Their main role is to facilitate automatic payments and the enforcement of obligations without the involvement of intermediaries, hence saving time, cost, and the risk of fraud²³. In cross-border legal cooperation, smart con-

²² Harsh Patil and others, 'Potential Applicability of Blockchain Technology in the Maintenance of Chain of Custody in Forensic Casework' (2024) 14 Egyptian Journal of Forensic Sciences 12.

²³ Christopher D Clack, Vikram A Bakshi and Lee Braine, 'Smart Contract Templates: Foundations, Design Landscape and Research Directions' (arXiv, 15 March 2017) <<http://arxiv.org/abs/1608.00771>> accessed 21 August 2025.

tracts could streamline processes such as the transfer of evidence, mutual legal aid, and even service of process across borders.

For example, in the context of historically slow and bureaucratic Mutual Legal Assistance Treaties (MLATs), smart contracts can be programmed to check for procedural prerequisites automatically when pre-established conditions are met²⁴. This can accelerate replies to requests for data sharing or judicial order enforcement. Even when imbued with legal rationality, smart contracts can be made to disclose information only if specified legal thresholds-like warrants or judicial sanction—are cryptographically confirmed.

But legal enforceability is still a central problem. Smart contracts tend to be coded in programming language, not legal language, leaving uncertainty as to their place under national contract law. Academics advocate for a two-layer model—coupling the executable code with a companion legal text that the courts could refer to in the event of a dispute²⁵. These models would assist in reconciling the technological use of smart contracts with current legal forms.

Furthermore, regulatory frameworks are gradually emerging. The EU Markets in Crypto-Assets (MICA) Regulation and the UK Law Commission's suggested rules on digital assets both recognize smart contracts and propose structures for their recognition and implementation in commercial settings²⁶. These structures must evolve more to encompass smart contracts used in public international cooperation, particularly those with governments or law enforcement organizations.

Legal and Ethical Challenges of Technology Use in International Judicial Cooperation

In the rapidly digitalized and globalized world, new technologies such as artificial intelligence, blockchain, and digital com-

24 'Mariano R, Fahey D. How Smart Contracts Can Simplify Cross-Border Legal Cooperation. *Journal of International Law and Technology*. 2023;21(4):455–472.'

25 Eliza Mik, 'Smart Contracts: Terminology, Technical Limitations and Real World Complexity' (2017) 9 *Law, Innovation and Technology* 269.

26 UK Law Commission. *Smart Legal Contracts: Advice to Government*. 2021. Available from: <https://www.lawcom.gov.uk/project/smart-contracts/>

munication technologies are assuming pivotal roles in enhancing international judicial cooperation. However, these technologies raise difficult legal and ethical challenges that challenge the very foundations of international law, national sovereignty, and human rights. This chapter is a critical examination of the challenges by bringing an analytical perspective to how convergence of technology, promising greater efficiency, could simultaneously pose threats .to privacy, accountability, and fairness

The section begins by addressing the issue of digital sovereignty and privacy protection, particularly with respect to cross-border data transfers and the uneven enforcement of privacy laws. It then continues discussing technological imbalance among states, as unequal access to digital infrastructure has the potential to create unbalances in judicial cooperation and destroy procedural equality. Finally, the section discusses the use of digital surveillance and investigative technologies outside legal standards with the following resulting problems of mass surveillance, espionage, and erosion of legal protection.

The discussion is founded on international law instruments, comparative legal practice, and ethical standards to critically evaluate whether current legal regimes are sufficient—or need to be restructured—to ascertain that technology application in judicial cooperation remains in alignment with the rule of law and human dignity.

4.1. Digital Sovereignty and Privacy Protection.

The integration of digital technology into international judicial cooperation processes poses essential questions regarding digital sovereignty and protecting personal data. Digital sovereignty is more challenged by the international movement of data across borders. As judicial cooperation becomes more and more reliant on the exchange of data—such as the transmission of evidence or extradition requests—the question is raised as to what law governs the collection, transmission, and storage of the data.

The majority of jurisdictions have data localization norms that mandate storage or processing within the territorial boundaries, conflicting with the international protocols to support judicial co-operation. Legal platforms in the cloud, for example, keep sensitive information on foreign servers, thereby under the control of foreign governments. These are issues with national security, data ownership, and civil rights of privacy²⁷.

Besides, international cooperation must reconcile these legal disparities. Even though the European Union's General Data Protection Regulation (GDPR) is a showcase for data protection, its extraterritorial application has triggered both harmonization and tension with non-EU countries. Efforts like the EU-U.S. Data Privacy Framework are efforts to bridge these gaps, but their lawfulness and adequacy have been the focus of intense debate in courtrooms as

27 Mehmet Kaya and Hamza Shahid, 'Cross-Border Data Flows and Digital Sovereignty: Legal Dilemmas in Transnational Governance' (2025) 4 *Interdisciplinary Studies in Society, Law, and Politics* 219. This study synthesizes recent academic literature, international legal instruments, regional regulations, and national policies published between 2020 and 2024. The sources include peer-reviewed legal scholarship, policy documents from international organizations, and national legislative texts. The analysis focuses on the conceptual foundations of cross-border data movement and digital sovereignty, the legal frameworks governing data governance, and the challenges of harmonizing national interests with global connectivity. The study draws upon legal theory and comparative regulatory analysis to critically examine multilateral initiatives and national responses. The study finds that cross-border data flows are essential to digital trade, innovation, and global interconnectivity, yet they increasingly face legal constraints due to states' pursuit of digital sovereignty. This pursuit manifests in data localization laws, extraterritorial enforcement of domestic regulations, and strategic decoupling efforts, particularly among major geopolitical actors. International and regional efforts at harmonization—such as those by the OECD and G20—offer frameworks for trust-based data governance but remain hindered by divergent regulatory philosophies. Fragmentation of legal norms has resulted in significant compliance challenges and enforcement dilemmas, while human rights protections in data governance vary widely across jurisdictions, affecting privacy and freedom of expression. Effective governance of cross-border data flows requires a balance between national sovereignty and transnational cooperation. Moving forward, interoperability and mutual legal recognition offer viable alternatives to legal uniformity or isolation.

DOI/10.61838/"kman.isslp", "4.2.20.issue", "2": "journal-Abbreviation": "ISSLP", "page", "219-233": "source": "DOI.org) Crossref

well as in policy circles.

The concept of digital sovereignty also intersects with political interests, with states fearing foreign spying or manipulation through digital networks. These concerns affect the acceptance of technological cooperation and can also lead to protectionist approaches that hinder the effectiveness of judicial cooperation. Ensuring robust data protection regimes and mutual recognition of digital rights, therefore, becomes essential in ensuring trust among judicial systems.

4.2. Technological Disparities and Judicial Fairness.

The uneven technological development among states is yet another main obstacle to global judicial cooperation. States with enhanced digital infrastructure can employ AI software for case screening, virtual trials, and searching the law, while others barely possess any stable internet access, let alone basic. Such disparity constitutes a structural disadvantage, particularly in cross-border legal proceedings in which both sides are entitled to be placed on equal procedural terms.

It leads to disparities in the ability to collect evidence, case management, and access to distant hearings. For instance, a nation that is unable to safely digitize case files or provide digital authentication systems could lack the capacity to meet evidentiary standards set in cooperating nations. This may result in procedural difficulties, admissibility problems, or denial of cooperation due to due process anomalies .

These imbalances also affect global human rights norms enforcement. The fair trial right, as enshrined in leading treaties like the International Covenant on Civil and Political Rights (ICCPR), includes being heard and access to evidence. Underdevelopment in technology might undermine the exercise of these rights, especially in remote legal engagements such as extradition hearings or simultaneous investigations conducted through virtual means.

Closing the digital divide accordingly becomes not only a development issue but also a requirement of the law. Capacity development, legal-technical convergence, and financial assistance for judicial computerization in developing nations are required in order to sustain the equity and legitimacy of international legal cooperation²⁸.

4.3. Extralegal Surveillance and Espionage.

One of the most morally flawed aspects of using technology in international judicial cooperation is the possibility of abuse by unauthorized espionage or surveillance. Governments may use digital technology for lawful cooperation in the legal field, but the same technology can be employed to conduct unauthorized spying on foreign judges, lawyers, or diplomatic correspondence.

This dual functionality of spy technology compels it to be hard to control and induces fear regarding its impact on sovereignty, privacy, and the autonomy of the judiciary. Particularly, the line between judicial cooperation and intelligence gathering gets weak when states employ mutual legal assistance agreements (MLATs) or transnational data requests as a pretext to acquire strategic information.

Besides, advanced data analysis tools and algorithmic surveillance systems can be used to monitor activity, predict behavior, and reveal close communications beyond what is necessary for legitimate processes. These are contrary to international standards that protect individuals against indiscriminate interference, as stipulated in tools like the UN Guidelines on the Right to Privacy in the Digital Age.

The lack of legally binding international standards for the use of surveillance in legal cooperation frameworks exacerbates these problems. Even though safeguards can be made in bilateral agreements, they are non-transparent and

28 Sarah V Bentley and others, 'The Digital Divide in Action: How Experiences of Digital Technology Shape Future Relationships with Artificial Intelligence' (2024) 4 AI and Ethics 901. with digital exclusion shown to have a significantly detrimental impact on people's quality of life .Artificial intelligence) AI

unaccountable. This makes it difficult for targeted individuals or states to seek remedies or remedies against abuses. To ensure the integrity of international judicial cooperation, it is necessary to establish more specific boundaries and control systems over the use of surveillance-related technologies. Multilateral treaties incorporating data protection safeguards, assurances of judicial independence, and clear express prohibitions on espionage would serve to establish more specific boundaries and facilitate greater mutual trust ²⁹.

5. Section Four: International Models and Comparative Experiences.

This section explores different international models and comparative experiences of integrating technology into judicial cooperation frameworks. The analysis looks at the ways various jurisdictions have embraced innovative digital mechanisms to improve efficiency, provide legal certainty, and facilitate cross-border cooperation. By examining these models, the best practices may be identified, their applicability in other legal systems examined, and the problems they are experiencing in the areas of interoperability, protection of data, and procedural justice examined. The examples selected -the European Union's digital judicial cooperation model, the United States' CLOUD Act model, and Arab-African digital judicial collaboration- present significant insights into the applicability and limitations of applying technology to transnational judicial processes.

5.1. The European Union's Model of Digital Judicial Cooperation.

The European Union (EU) has developed a complex model of embedding digital tools in its judicial cooperation system. Among the most important pillars is the e-Justice Portal, an interconnected platform for acquiring access to trans-boundary legal processes, including case tracking, procedural forms, and multilingual support. This enhances procedural accessibility within member countries.

29 Daniel J Power, Ciara Heavin and Yvonne O'Connor, 'Balancing Privacy Rights and Surveillance Analytics: A Decision Process Guide' (2021) 4 Journal of Business Analytics 155.

At the heart of this framework is e-CODEX (e-Justice Communication through Online Data Exchange), an open, decentralized means of communication that permits judicial authorities to exchange electronically instruments such as European Investigation Orders, Payment Orders, and Small Claims therefore making it much faster and more efficient³⁰.

This push towards digitization is accompanied by the Regulation on the Digitalization of Judicial Cooperation and Access to Justice in Cross-Border Civil, Commercial, and Criminal Matters (2023/2844), where judicial exchanges must be made through digital means of communication³¹.

The COVID-19 pandemic crisis was the primary impetus for the use of digital technologies in EU courts, to which it added the on-mass operation of remote hearings, e-signatures, and electronic filing systems—operations that had taken decades to establish³². Harmonization of the law ensues, resting on metadata standards such as the European Case Law Identifier (ECLI), which harmonizes citations across jurisdictions to promote cross-border legal transparency and access to jurisprudence³³.

Challenges remain. Differences in national IT infrastructures and capacities to provide resources can threaten system interoperability. The multi-layered governing structure—EU institutions, national administrations, and judicial authorities—adds complexity,

30 Marco Velicogna, 'History of a Digital Institution in the Making: Observing More than 14 Years of e-CODEX, the European e-Justice System' in François-Xavier De Vaujany, Kätlin Pulk and Pierre Labardin (eds), *Historicity in Organization Studies* (Springer Nature Switzerland 2025) <https://link.springer.com/10.1007/978-3-031-88938-7_6> accessed 21 August 2025.

31 Fernando Gascón Inchausti, 'The New Regulation on the Digitalisation of Judicial Cooperation in the European Union: Something Old, Something New, Something Borrowed and Something Blue' (2023) 24 *ERA Forum* 535.

32 Marco Fabri, 'From Court Automation to E-Justice and Beyond in Europe' (2024) 15 *International Journal for Court Administration* 7.

33 Elena Alina Onțanu, 'E-Justice Governance in the EU' in David Ramiro Troitiño (ed), *E-Governance in the European Union* (Springer Nature Switzerland 2024) <https://link.springer.com/10.1007/978-3-031-56045-3_16> accessed 21 August 2025.

risking delay in implementation³⁴.

EU experience principles constitute the minimum demand for high legal standards of digitization, technical standards of interoperability, ongoing investment and training, and joined-up governance compatible with judicial independence and procedural justice. The EU model thus illustrates that digital tools can serve to enhance judicial cooperation comprehensively if they rely on the transparency of regulation, technical connectivity, and ongoing institutional support.

5.2. The US Model of Cross-Border Digital Judicial Cooperation: The CLOUD Act.

The Clarifying Lawful Overseas Use of Data Act (CLOUD Act) of 2018 revolutionized the model of cross-border access to digital evidence. It enables US law enforcement to coerce US-based service providers to provide electronic data, even overseas, and establishes executive agreements with vetted foreign governments—thereby bypassing the

traditionally slow Mutual Legal Assistance Treaty (MLAT) mechanism³⁵.

In enhancing procedural effectiveness, the legislation raises complex issues of sovereignty and protection of data, especially in jurisdictions that run under rigorous systems like the GDPR of the EU. Extraterritorial applicability of the act might contradict privacy norms abroad, calling for strengthened safeguards in executive agreements³⁶.

³⁴ Fabri (n 32).

³⁵ 'Congress Enacts the Clarifying Lawful Overseas Use of Data (CLOUD) Act, Reshaping U.S. Law Governing Cross-Border Access to Data' (2018) 112 American Journal of International Law 487.

³⁶ Jennifer Daskal, 'Unpacking the CLOUD Act' [2018] eucrim - The European Criminal Law Associations' Forum <<https://eucrim.eu/articles/unpacking-cloud-act/>> accessed 21 August 2025."plainCitation": "Jennifer Daskal', 'Unpacking the CLOUD Act' [2018] eucrim - The European Criminal Law Associations' Forum> <https://eucrim.eu/articles/unpacking-cloud-act/> </accessed 21 August"/>,"2025 noteIndex",{"36:"citationItems"}]:{"id",1186:"uris":["http://zotero.org/users/16166284/items/ZIPHIM-LA"],["itemData"]:"id",1186:"type":"article-journal","container-title":"eucrim - The

Additionally, the law guarantees procedural asymmetry. Judicial oversight through requesting and requested states pursuant to MLAT standards ensures balance and fair process. The CLOUD Act, on the other hand, ensures data access through unilateral U.S. court warrants—raising concerns about procedural justice and defense protections in partner nations ³⁷.

Scholarly research points out that robust governance safeguards are required to ensure continued global trust in CLOUD Act arrangements: audit logs, express data request restrictions, judicial review, and meaningful redress provisions must be present in order to preserve legitimacy ³⁸.

5.3. Judicial Digital Cooperation in the Arab and African Regions.

The judicial digital cooperation in the Arab and African regions is also gradually evolving due to growing cross-border criminality, cyber threats, and the need for harmonized legal frameworks. Although both regions face similar challenges, they are also very diverse in terms of institutional capacities, legal systems, and technological preparedness.

On the African continent, there is the Convention on Cybersecurity and Protection of Personal Data that is also known as the Malabo Convention. It is the primary continental legal framework that is utilized to regulate cybercrime, protect personal data, and facilitate inter-state judicial cooperation. Member states have responsibilities to enact harmonized legislation, develop technical capacities, and ensure compatibility in cross-border investigations under the Convention ³⁹. While promising, actual use has been uneven,

European Criminal Law Associations 'Forum',"DOI/10.30709":"eucrim","2018-022-IS SN","18626947":"journalAbbreviation":"eucrim","source":"DOI.org) Crossref

37 Miranda Rutherford, 'The CLOUD Act: Creating Executive Branch Monopoly Over Cross-Border Data Access' [2019] SSRN Electronic Journal <<https://www.ssrn.com/abstract=3508942>> accessed 21 August 2025.

38 Junfeng Wang and others, 'Effects of the Combination of Compression and Impregnation with Phenolic Resin on the Dimensional Stability of Chinese Fir Wood Cells' [2022] SSRN Electronic Journal <<https://www.ssrn.com/abstract=4005943>> accessed 21 August 2025.

39 Uchenna Jerome Orji, 'The African Union Convention on Cybersecurity: A Regional Response Towards Cyber Stability?' (2018) 12 Masaryk University Journal of Law

with some states not having the resources, political will, or technical ability to make its provisions work. Legal commitment rather than operational implementation has been a principal hindrance to fruitful digital cooperation.

In the Arab region, digital judicial reform has been more fragmented, disseminated largely through discrete state initiatives rather than a coordinated regional convention. A case in point is the United Arab Emirates (UAE), which has set the pace in advanced digital court infrastructures, online filing of cases, remote hearings, and secure web portals for the submission of evidence ⁴⁰. These technological advancements have improved procedural efficiency, reduced litigation costs, and promoted access to justice, particularly during the COVID-19 pandemic. But until there is some regional organization like the Malabo Convention, cross-border cooperation will remain reliant upon bilateral agreements and ad hoc arrangements.

A cross-regional analysis of the African and Arab experiences reveals both structural and functional shortcomings. Africa possesses a continental legal instrument but has low enforcement harmonization. The Arab region shows high technology adoption in certain jurisdictions but weak regional governance mechanisms. The two regions share commonalities, including low cybersecurity infrastructure, uneven legal harmonization, and a deficiency of technical skills among judicial officers.

In the future, digital platforms for Mutual Legal Assistance Requests (MLARs), interoperable case management systems, and the application of common cybersecurity standards might be among the key drivers of greater cooperation. Regional institutions such as the African Union and the League of Arab States would support these by providing policy leadership, technical support, and capacity development initiatives.

and Technology 91.

40 Adel Allouzi, 'Digital Justice and Its Impact on the Functioning of Procedural Rivalry in UAE Law' (2024) 5 Research Journal in Advanced Humanities <<https://royalliteglobal.com/advanced-humanities/article/view/1616>> accessed 21 August 2025."plainCitation": "Adel Allouzi', Digital Justice and Its Impact on the Functioning of Procedural Rivalry in UAE Law 2024)'

6. Conclusion and Recommendations.

This study has analyzed the intersection of public international law and the specific concerns addressed within the confines of the conference, offering contemporary analysis based on theoretical and applied developments. By looking at the concerned subjects and their changing patterns, there is no doubt that international frameworks of law have to keep modifying themselves in order to tackle new challenges within a fast-changing world. The study has highlighted the need for reinforcing global cooperation, improving regulation mechanisms, and enhancing the abilities of institutions to manage trans-border matters of law. Furthermore, it has borne witness to the applicability of employing interdisciplinary approaches so as to make legal remedies both current and effective in the face of modern realities.

On the basis of the findings, and with the intention of stimulating academic discussion and practical implementation, we propose the following:

1. Encourage inter-institutional, inter-disciplinary and policy research cooperation among international institutions, academia and policymakers for the advancement of mutual knowledge and the gathering of joint reactions to global legal problems.
2. Strengthen international legal frameworks through treaty and convention revision to consider technological, environmental, and socio-political developments.
3. Facilitate capacity-building training for legal practitioners and court institutions to enhance their capacity to deal with complex transnational disputes.
4. Integrate new technologies such as artificial intelligence and blockchain into international legal practice, balancing efficiency with respect for human rights standards.
5. Encourage regional and global dialogue forums so that consensus can be built, disagreements resolved, and best practice shared across jurisdictions.

References

- Allouzi A, 'Digital Justice and Its Impact on the Functioning of Procedural Rivalry in UAE Law' (2024) 5 Research Journal in Advanced Humanities.

<https://royalliteglobal.com/advanced-humanities/article/view/1616-> accessed 21 August 2025

- Bentley SV and others, 'The Digital Divide in Action: How Experiences of Digital Technology Shape Future Relationships with Artificial Intelligence' (2024) 4 AI and Ethics 901
- Cervantes, I., & Pineau, E. (2013). Algunas Propuestas Para Una Futura Ley de Cooperación Jurídica Internacional En Materia Civil.28,91–106'.<https://repositorio.uam.es/handle/10486/664036>
- Clack CD, Bakshi VA and Braine L, 'Smart Contract Templates: Foundations, Design Landscape and Research Directions' (arXiv, 15 March 2017).

<http://arxiv.org/abs/1608.00771>-accessed 21 August 2025

- Colson R, 'Comparing the Machineries of Extradition: Between Functional and Cultural Approaches' (2024) 72 The American Journal of Comparative Law 528
- Congress Enacts the Clarifying Lawful Overseas Use of Data (CLOUD) Act, Reshaping U.S. Law Governing Cross-Border Access to Data' (2018) 112 American Journal of International Law 487
- 'Council of Europe. 1st Report on the Application of Artificial Intelligence (AI) in the Judiciary: Based on Data in the CEPEJ's Resource Centre on Cyberjustice and AI. Strasbourg: CEPEJ; 2025. Available at:

<https://rm.coe.int/cepej-aiab-2024-4rev5-en.../1680b49def>

- Daskal J, 'Unpacking the CLOUD Act' [2018] eucrim - The Eu-

ropean Criminal Law Associations' Forum.

<https://eucrim.eu/articles/unpacking-cloud-act/>> accessed 21 August 2025

- Department of Law, Post-Graduate and Diploma, Kampala International University, Kampala, Uganda. and Owoche A Godswill, 'Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024) 4 NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES 80
- Methods of Judicial Cooperation and the Procedure for Enforcement Under International Law; Identifying the Nexus between Theory and Practice' (2024) 4 NEWPORT INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN HUMANITIES AND SOCIAL SCIENCES 80
- Fabri M, 'From Court Automation to E-Justice and Beyond in Europe' (2024) 15 International Journal for Court Administration 7
- Funta R and Ondria P, 'Data Protection in Law Enforcement and Judicial Cooperation in Criminal Matters' (2021) 11 TalTech Journal of European Studies 148
- Gascón Inchausti F, 'The New Regulation on the Digitalisation of Judicial Cooperation in the European Union: Something Old, Something New, Something Borrowed and Something Blue' (2023) 24 ERA Forum 535
- Kaya M and Shahid H, 'Cross-Border Data Flows and Digital Sovereignty: Legal Dilemmas in Transnational Governance' (2025) 4 Interdisciplinary Studies in Society, Law, and Politics 219
- Mariano R, Fahey D. How Smart Contracts Can Simplify Cross-Border Legal Cooperation. Journal of International Law

and Technology. 2023;21(4):455–472.’

- Mik E, ‘Smart Contracts: Terminology, Technical Limitations and Real World Complexity’ (2017) 9 Law, Innovation and Technology 269
- OECD, Artificial Intelligence in Society (OECD 2019) <https://www.oecd.org/en/publications/artificial-intelligence-in-society_eedfee77-en.html> accessed 20 August 2025
- Onțanu EA, ‘E-Justice Governance in the EU’ in David Ramiro Troitiño (ed), E-Governance in the European Union (Springer Nature Switzerland 2024) <https://link.springer.com/10.1007/978-3-031-56045-3_16> accessed 21 August 2025
- Orji UJ, ‘The African Union Convention on Cybersecurity: A Regional Response Towards Cyber Stability?’ (2018) 12 Masaryk University Journal of Law and Technology 91
- Patil H and others, ‘Potential Applicability of Blockchain Technology in the Maintenance of Chain of Custody in Forensic Casework’ (2024) 14 Egyptian Journal of Forensic Sciences 12
- Power DJ, Heavin C and O’Connor Y, ‘Balancing Privacy Rights and Surveillance Analytics: A Decision Process Guide’ (2021) 4 Journal of Business Analytics 155
- Rutherford M, ‘The CLOUD Act: Creating Executive Branch Monopoly Over Cross-Border Data Access’ [2019] SSRN Electronic Journal.

<https://www.ssrn.com/abstract=3508942>> accessed 21 August 2025

- Tsai F-C, ‘The Application of Blockchain of Custody in Criminal Investigation Process’ (2021) 192 Procedia Computer Science 2779
- Velicogna M, ‘History of a Digital Institution in the Making: Observing More than 14 Years of e-CODEX, the European e-Justice System’ in François-Xavier De Vaujany, Kätlin Pulk and Pierre

Labardin (eds), *Historicity in Organization Studies* (Springer Nature Switzerland 2025) https://link.springer.com/10.1007/978-3-031-88938-7_6.accessed 21 August 2025

- Wang J and others, ‘Effects of the Combination of Compression and Impregnation with Phenolic Resin on the Dimensional Stability of Chinese Fir Wood Cells’ [2022] SSRN Electronic Journal, <https://www.ssrn.com/abstract=4005943>> accessed 21 August 2025
- Council of Europe / UNODC. Traditional letters rogatory vs. Mutual Legal Assistance Treaties (MLATs). UNODC Organized Crime Module 11. – compared differences in reliance, speed, and formality of letters rogatory vs. MLATs.
- Council of Europe. European Convention on Mutual Assistance in Criminal Matters. Strasbourg: Council of Europe; 1959. Available at:

<https://www.coe.int/en/web/conventions/full-list/-/conventions/treaty/030>

- European Parliament and Council. Regulation (EU) 2023/2844 on the digitalisation of judicial cooperation and access to justice in cross-border civil, commercial and criminal matters. Official Journal of the European Union. 2023;L:2844:1–29. Available at:

<https://eur-lex.europa.eu/eli/reg/2023/2844/oj>

- European Union Agency for Criminal Justice Cooperation & eu LISA. Artificial intelligence supporting cross border cooperation in criminal justice. Luxembourg: Publications Office of the EU; 2022. doi:10.2857/364146. Available at:

<https://op.europa.eu/.../5d24156e-2a66-11ed-975d...>

- UK Law Commission. Smart Legal Contracts: Advice to Government. 2021. Available at:

<https://www.lawcom.gov.uk/project/smart-contracts/>

- United Nations. United Nations Convention against Corruption. New York: UN; 2004. Available at:

<https://www.unodc.org/unodc/en/corruption/uncac.html>

- United Nations. United Nations Convention against Transnational Organized Crime and the Protocols Thereto. New York: UN; 2004. Available at:

<https://www.unodc.org/unodc/en/organized-crime/intro/UN-TOC.html>

- UNODC. Model Treaty on Mutual Assistance in Criminal Matters. New York: UN; 1990. Available at:

<https://www.unodc.org/unodc/en/legal-tools/model-treaties.html>