

Conflict of Laws and Court Jurisdiction in Intellectual Property and Electronic Commerce

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Abstract

The rapid evolution of electronic commerce has transformed the traditional territorial foundations of intellectual property law, creating unprecedented challenges for conflict-of-laws analysis and the determination of court jurisdiction in cross-border digital disputes. Classical doctrines such as territoriality, *lex loci protectionis*, and *lex loci delicti* struggle to accommodate the ubiquity and simultaneity of online infringement, where a single digital act can generate legal consequences in multiple jurisdictions. Technological infrastructures—including cloud hosting, content delivery networks, algorithmic advertising systems, and geotargeting—further complicate the identification of the place of infringement, the location of harm, and the responsible actors. These conditions have produced significant difficulties for courts worldwide, resulting in fragmented jurisprudence and inconsistent enforcement outcomes. Through a comparative analysis of the European Union, the United States, international normative frameworks, and Iran, this narrative review highlights the divergent legal approaches to online intellectual property disputes. The EU's targeting-based doctrine, the U.S. system rooted in minimum contacts and effects analysis, the soft-law guidance offered by WIPO, and Iran's reliance on traditional territorial rules collectively illustrate both innovative developments and persistent gaps. The review demonstrates that no existing model fully resolves the jurisdictional complexities introduced by global digital markets and that traditional territorial assumptions collapse under the pressures of electronic commerce. It argues that harmonization efforts, doctrinal refinement, and modernization of national laws are essential to achieving coherent, predictable, and effective governance of online intellectual property rights. By integrating technological realities with legal principles, this study contributes to the development of frameworks better suited to regulating digital creative economies and facilitating cross-border enforcement in an increasingly interconnected world.

Keywords: Intellectual Property; Conflict of Laws; Jurisdiction; Electronic Commerce; Territoriality; Digital Infringement; Private International Law

Received: 05 August 2025

Revised: 15 December 2025

Accepted: 21 December 2025

Initial Publication 23 December 2025

Final Publication 01 June 2026



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Citation: Ghalijaei, L. (2026). Conflict of Laws and Court Jurisdiction in Intellectual Property and Electronic Commerce. *Legal Studies in Digital Age*, 5(2), 1-14.

1. Introduction

The accelerating rise of digital technologies and the unprecedented expansion of electronic commerce have reshaped the foundations of intellectual property law in ways that classical legal doctrines were never designed to accommodate. Intellectual

property rights developed historically within a territorial paradigm in which the protection of works, inventions, and distinctive signs was confined to the geographical boundaries of each state, a model deeply rooted in the structure of private international law and reaffirmed across decades of jurisprudence and scholarship (Şafāī, 2020). The emergence of a networked global environment, however, has rendered territoriality increasingly strained, as the instantaneous dissemination of digital content across borders dissolves the spatial constraints that once defined the scope of legal protection. The ubiquity of internet access means that an act of uploading, sharing, or distributing protected material is no longer localized but can produce simultaneous effects in multiple jurisdictions, thereby challenging courts and legislators to determine which laws should apply and which forums should adjudicate disputes arising from online infringement (Naşīrī, 2021). This tension between geographically bounded legal systems and the placeless nature of cyberspace constitutes one of the most significant conceptual disruptions facing contemporary intellectual property law.

The conflict-of-laws complexities emerging from digital interactions are not simply theoretical; they are reflected in the practical difficulties courts encounter when attempting to identify the applicable law and competent jurisdiction in cases involving cross-border online activity. Traditional connecting factors—such as the place of the tort, the defendant’s domicile, or the location where harm occurred—become ambiguous in cyberspace, where the harmful act, its technical execution, and its economic impact often occur in different locations (Fawcett & Torremans, 2016). For instance, a copyright-protected image uploaded onto a server located in one country may be accessed by users in dozens of others, and the economic consequences of such access may be felt in yet another jurisdiction. The conventional doctrine of *lex loci protectionis*, which mandates the application of the law of the state where protection is sought, confronts considerable friction in digital environments, as protection may be indirectly sought in every jurisdiction where the work is accessible (Ginsburg, 2017). Courts have consequently struggled to define what constitutes meaningful territorial contact in online infringement cases, particularly when the infringer’s actions are diffuse, automated, or mediated by digital platforms that operate transnationally. This rapidly evolving situation underscores the inadequacy of classical principles of territorial jurisdiction in the face of globalized information flows.

Parallel to the breakdown of territorial assumptions, the substantive nature of legal disputes related to online intellectual property infringement has undergone a profound transformation. Traditional copyright violations, once tied to geographically limited reproduction and distribution, have shifted into mass-scale digital piracy, peer-to-peer file sharing, unauthorized streaming, and algorithmically driven dissemination, each creating multifaceted questions about the locus of infringement and the scope of rights violated (Wipo, 2019). Trademark disputes have similarly evolved, as online marketplaces enable counterfeit goods to move seamlessly across borders, while keyword advertising, sponsored search results, and algorithmic targeting introduce new layers of complexity in determining whether a mark has been misused in a particular jurisdiction (Ginsburg, 2017). Domain name conflicts—often involving cybersquatting, typosquatting, or competing claims to brand identity in global digital markets—intensify the challenges faced by courts when resolving overlapping claims tied to domain registries, registrars, and users located in multiple states (Kono, 2012). The explosive growth of e-commerce platforms has also expanded the role of intermediaries, forcing courts to address the liability of hosting providers, online sellers, content-sharing platforms, and search engines under private international law frameworks (Amīnzādeh, 2019). Each of these developments illustrates how digital commercial activity generates multi-jurisdictional effects that destabilize conventional categories of legal analysis and require renewed doctrinal clarity.

Compounding these difficulties is the absence of globally harmonized standards for determining jurisdiction and applicable law in online intellectual property disputes. Although international agreements such as the TRIPS Agreement were designed to promote minimum standards of IP protection, they did not anticipate the challenges posed by borderless digital networks and therefore provide limited direction regarding the resolution of cross-border enforcement conflicts (World Trade Organization, 1994). Likewise, despite the emergence of influential soft-law recommendations—particularly those produced by WIPO—most states continue to apply domestic conflict-of-laws doctrines that vary widely in their approach to online conduct (Wipo, 2019). The European Union has attempted to address some of these challenges through the Brussels I Regulation (Recast), which establishes rules on jurisdiction in civil and commercial matters, including torts related to online activity; however, even the EU’s model has struggled to reconcile accessibility-based jurisdiction with economic targeting

criteria (European, 2012). In the United States, courts rely heavily on constitutional due process analysis and the “minimum contacts” doctrine, which requires either purposeful availment or foreseeable effects within the forum state, thereby producing jurisdictional outcomes that differ markedly from those in the EU (Born, 2021). These divergent frameworks highlight the lack of consensus across major legal systems on how to interpret territoriality in cyberspace and demonstrate why courts routinely arrive at inconsistent results when faced with similar factual scenarios.

At the national level, countries such as Iran face additional complications as domestic IP and private international law frameworks remain grounded in traditional territorial reasoning that predates the digital age. Iranian scholars have documented the challenges arising from cross-border online infringement, particularly in cases where the harmful conduct originates abroad or extends beyond Iranian territory (Moḥammadi, 2020). Courts often rely on general procedural rules to establish jurisdiction, but these rules provide little guidance for circumstances involving global digital dissemination, foreign defendants, or platform-mediated harms (Vā'eẓi, 2018). The absence of legislative reforms tailored to cyberspace exacerbates uncertainty, as judges must reconcile outdated statutory provisions with increasingly complex digital fact patterns. As Iranian digital markets continue to expand and as domestic creators participate more actively in global e-commerce environments, the pressure to modernize conflict-of-laws rules becomes increasingly urgent (Naṣīri, 2021). Comparable challenges have arisen in many developing jurisdictions, where the interplay between territorial statutes and transnational technologies remains unresolved.

The fragmentation of legal approaches among major jurisdictions contributes to a broader systemic problem: the proliferation of inconsistent judicial outcomes that undermine predictability, legal certainty, and the effectiveness of intellectual property protection in global markets. The EU's emphasis on the targeting criterion, the U.S. focus on minimum contacts and effects, and the diverse range of domestic doctrines applied elsewhere collectively produce a patchwork that benefits neither right holders nor digital entrepreneurs. Scholars have repeatedly stressed that without clearer conflict-of-laws rules, the enforcement of IP rights in cyberspace will continue to suffer from both overreach and under-reach, as overly expansive jurisdictional assertions risk infringing principles of sovereignty, while overly restrictive approaches fail to protect creators from transnational harms (Drexler, 2018). These concerns become especially acute when considering the role of intermediaries, whose involvement in digital infringement is often indirect but nonetheless highly consequential. The challenges associated with identifying the appropriate law to govern intermediary liability demonstrate that traditional connecting factors lack the conceptual sophistication required to manage digitally mediated legal relationships (Fawcett & Torremans, 2016). In this sense, cyberspace is not merely a new setting for old disputes; it is a qualitatively distinct environment that necessitates doctrinal innovation rather than incremental adjustment.

The contemporary digital ecosystem also highlights the limits of enforcement mechanisms traditionally used to resolve international intellectual property disputes. Even when a court successfully determines applicable law and asserts jurisdiction, the practical enforcement of judgments remains fraught with obstacles. Differences in national procedures for recognizing and enforcing foreign judgments, combined with variations in substantive IP law, create opportunities for strategic forum avoidance and inconsistent international protection (Ebrāhīmī, 2022). Right holders seeking global remedies must therefore navigate a complex landscape in which domestic rulings may have limited extraterritorial effect, especially in states that prioritize sovereignty or maintain restrictive recognition rules. International arbitration has emerged as a partial solution to these enforcement challenges, offering a neutral forum and more predictable enforcement outcomes under conventions such as the New York Convention; however, the scope of arbitrability in intellectual property matters remains contested in some jurisdictions (Morādī, 2023). The dynamic interplay between domestic court systems, arbitral tribunals, and digital actors highlights the need for more coherent transnational mechanisms that reflect the realities of electronic commerce.

The evolution of digital markets has also sharpened debates about the underlying purposes of intellectual property law and the appropriate balance between protection and innovation in an interconnected global economy. As online platforms enable instant communication, massive user engagement, and automated content distribution, right holders face unprecedented risks of unauthorized use that can significantly erode the economic value of their works. At the same time, courts must consider the implications of overly expansive jurisdictional claims, which may chill free expression, disrupt legitimate commerce, or impose undue burdens on actors with minimal connection to a particular state (Ginsburg, 2017). The delicate tension between ensuring adequate protection and maintaining open digital markets is further complicated by the lack of global norms governing data

flows, platform governance, and digital advertising, all of which influence how intellectual property rights are used and potentially misused online. As scholars and policymakers grapple with these competing concerns, the need for harmonized principles that can guide courts and legislatures becomes increasingly apparent (Kono, 2012).

Against this backdrop of jurisdictional uncertainty, substantive transformation, and legal fragmentation, the present narrative review aims to provide a comprehensive examination of the conflict-of-laws and jurisdictional issues that arise in intellectual property disputes within electronic commerce. By analyzing doctrinal foundations, comparing leading legal frameworks, and evaluating the challenges posed by global digital markets, this review seeks to clarify the conceptual and practical problems confronting courts and policymakers. The purpose is to illuminate the underlying tensions that shape contemporary debates, assess the adequacy of existing legal tools, and propose harmonization strategies capable of improving coherence, predictability, and fairness in transnational intellectual property enforcement.

2. Theoretical Foundations: Conflict of Laws and Jurisdiction in Intellectual Property

The theoretical foundations of conflict of laws and jurisdiction in intellectual property rest on legal doctrines that were developed for a world in which creative works, trademarks, and inventions were produced, distributed, and infringed within clearly demarcated territorial borders. At the center of this system stands the territoriality principle, which holds that intellectual property rights exist only within the jurisdiction that grants them and that each state independently determines the scope, duration, and enforcement of those rights (Şafā'ī, 2020). The classical view presumes a one-to-one correspondence between a sovereign territory and the legal protection afforded within that territory. For more than a century this principle was both logical and efficient, given that publishing, manufacturing, and commercial distribution took place through physical channels. Yet the rise of global electronic communications has profoundly undermined the assumptions on which territoriality depends. In the digital environment, acts such as uploading a file or streaming a video are not confined to the geographic space of the server or the location of the user but instantly generate effects across multiple jurisdictions (Naşīrī, 2021). This simultaneity and ubiquity fundamentally disrupt the notion that infringement can be pinned to a single location. The territoriality principle, though still embedded in national statutes and treaties, is therefore increasingly regarded as insufficient for resolving conflicts arising from online intellectual property violations.

Integral to the territorial structure of intellectual property law is the doctrine of *lex loci protectionis*, according to which the applicable law in infringement disputes is the law of the country where protection is sought (Fawcett & Torremans, 2016). This rule has historically provided certainty by creating a direct link between the right asserted and the legal system competent to adjudicate it. In a pre-digital environment, this approach functioned effectively because markets were localized, and unauthorized reproduction or distribution generally occurred within definable boundaries. However, *lex loci protectionis* becomes problematic in cyberspace because digital accessibility transforms the place “where protection is sought” into a potentially limitless set of jurisdictions. When a copyrighted work is accessible worldwide through a single act of online communication, courts are confronted with multiple potential *lex loci*, each of which may assert authority to apply its own substantive law. Scholars have noted that the proliferation of concurrent jurisdictions threatens to create excessive legal fragmentation and imposes disproportionate burdens on right holders and online actors (Ginsburg, 2017). As a result, the classical rule risks becoming unworkable, forcing courts and legislators to reconsider whether territorial protection can adequately address transnational digital dissemination.

Another long-established doctrinal principle, *lex loci delicti*, focuses on the law of the place where the tortious act occurred. In intellectual property disputes, this typically refers to the location of the infringing conduct or the place where damage was realized (Kono, 2012). Yet the seemingly straightforward inquiry into the “place” of the wrongful act collapses in a digital context. Online infringement may involve a server in one country, the infringer in another, the platform in a third, and affected consumers distributed across the globe. Courts tasked with identifying the *locus delicti* therefore face a conceptual paradox: digital acts are technically localized but legally omnipresent. As some commentators have noted, equating the physical location of a server with the place of infringement ignores the economic and social realities of online harm (Wipo, 2019). Similarly, tying the infringement to the user’s location risks granting every state universal jurisdiction over conduct occurring on the

internet. Because neither approach resolves the multi-jurisdictional nature of digital exploitation, *lex loci delicti* struggles to provide a viable solution for modern cross-border disputes.

In attempts to overcome the shortcomings of territoriality-based principles, courts have increasingly relied on the effects doctrine, which allows a state to assert jurisdiction if a foreign action produces substantial effects within its territory. The effects doctrine has gained prominence in the United States, where courts regularly evaluate whether the defendant's online conduct was purposefully directed toward the forum state or foreseeably produced harm there (Born, 2021). While this approach offers flexibility, it also raises concerns about overreach. In the intellectual property context, the effects of digital infringement can be felt in many jurisdictions, inviting expansive claims of authority that may conflict with international comity and principles of predictability. European jurisprudence has similarly struggled to articulate the boundaries of effects-based jurisdiction, particularly when assessing whether mere accessibility of a website suffices to establish a sufficient nexus for adjudication (European, 2012). As scholars have warned, overreliance on the effects doctrine may undermine territorial sovereignty while still failing to adequately protect right holders from diffuse global harm.

Given the inadequacies of classical doctrines, new theories have emerged that attempt to align jurisdictional analysis with the realities of cyberspace. One influential approach is the market-targeting theory, which focuses on whether the online content or commercial activity is intentionally directed toward a specific jurisdiction. This test considers factors such as language, currency, shipping terms, marketing strategies, and consumer engagement patterns to determine whether the defendant sought to exploit the forum's market (Drexler, 2018). By emphasizing intentionality rather than mere accessibility, market targeting seeks to prevent the assertion of jurisdiction by states that have no meaningful connection to the dispute while providing recourse in jurisdictions that the defendant actively pursued. Scholars argue that this criterion better reflects the commercial logic of digital marketplaces and reduces the likelihood of frivolous or excessively broad claims.

Another emerging perspective is the access-based test, which examines whether the allegedly infringing content is accessible within the forum. Although accessibility is straightforward to apply, its simplicity also invites potential abuse. Under a pure accessibility model, virtually every act of online infringement could fall within the jurisdiction of every state, an outcome that contradicts fundamental principles of reasonableness and proportionality (Vā'ezi, 2018). For this reason, many courts have treated accessibility as a threshold criterion rather than a sufficient basis for asserting jurisdiction. The challenge remains to articulate standards that prevent accessibility from becoming an all-encompassing hook for jurisdiction while still allowing states to address harm occurring within their markets.

A third conceptual development is the recognition of online infringement as inherently ubiquitous. Because digital content circulates simultaneously across borders, some scholars have proposed that the infringing act should be treated as occurring everywhere and nowhere at once. This notion challenges the territorially anchored logic of traditional conflict rules and has prompted discussions about whether alternative non-territorial frameworks, such as global licensing models or soft-law standards, may offer more coherent solutions (Ginsburg, 2017). While such proposals remain largely theoretical, they reflect a growing recognition that territorial doctrines may never fully accommodate the spatial indeterminacy of digital activity.

The application of tort-based conflict rules to online intellectual property violations also presents significant difficulties. Tort principles assume a world in which wrongful acts produce localized injuries, allowing courts to assess causation, foreseeability, and harm within a clear geographic framework. Digital infringement disrupts these assumptions by fragmenting the causal chain across multiple actors and jurisdictions. The infringing behavior may originate with the uploader, but platforms, hosts, algorithmic systems, and distributors each play a role in shaping the eventual harm. Moreover, the harm may be diffuse and cumulative, arising from thousands of individual downloads or views, making it difficult to identify a single place where the tort was committed or where the damage materialized (Amīnzādeh, 2019). As a result, tort-based doctrines that once offered reliable guidance now often yield inconsistent or unpredictable results when applied to digital disputes. This mismatch between doctrinal assumptions and digital realities underscores the need for a more nuanced theoretical framework.

A foundational conceptual distinction in conflict-of-laws theory involves differentiating between choice of law, choice of court, jurisdiction to prescribe, and jurisdiction to enforce. Although these concepts are often conflated in practice, they serve distinct functions. Choice of law determines which substantive legal rules govern the dispute. Choice of court, or adjudicatory jurisdiction, determines which tribunal may hear the case. Jurisdiction to prescribe refers to a state's authority to legislate with respect to certain conduct, while jurisdiction to enforce concerns the ability to implement rulings, such as through sanctions or

seizure of assets (Şafāī, 2020). In cross-border intellectual property disputes, misalignment among these forms of jurisdiction creates additional complexity. A state may have the authority to apply its law but lack personal jurisdiction over the defendant, or it may issue a judgment that cannot be enforced abroad because of formal or substantive incompatibilities. The divergence between prescriptive and enforcement jurisdiction is especially pronounced in cyberspace, where the global nature of the conduct is rarely matched by the global enforceability of remedies (Ebrāhīmī, 2022). As courts grapple with these distinctions, the need for coherent and interoperable jurisdictional frameworks becomes increasingly apparent.

The role of intermediaries in digital communication further complicates jurisdictional analysis. Platforms, internet service providers, search engines, online marketplaces, and content-sharing services often facilitate or contribute to the dissemination of infringing material, yet they function within complex transnational infrastructures that blur traditional categories of liability. Determining whether intermediaries should be subject to jurisdiction in a particular forum requires an examination of their operational footprint, the degree of control they exercise over the content, and the economic impact of their activities (Moḥammadī, 2020). Intermediaries may host servers in multiple locations, use distributed networks, or rely on algorithmic systems that autonomously promote or distribute infringing content. Courts must therefore assess whether intermediary conduct constitutes purposeful engagement with a jurisdiction or merely passive facilitation. Some legal systems impose strict liability or specific statutory obligations on intermediaries, while others emphasize safe harbor protections. These divergent approaches significantly influence the jurisdictional posture of cross-border disputes. The growing importance of intermediaries in the digital economy has drawn scholarly attention to the need for more harmonized standards of intermediary liability that correspond to the realities of global online networks (Drexler, 2018).

In sum, the theoretical foundations of conflict of laws and jurisdiction in intellectual property reveal deep structural tensions between territorially based doctrines and the non-territorial logic of cyberspace. As courts and scholars confront the challenges posed by digital dissemination, the traditional pillars of jurisdiction—*lex loci protectionis*, *lex loci delicti*, and effects-based reasoning—are increasingly supplemented or supplanted by new theories that better reflect contemporary commercial and technological practices. Understanding these foundational principles and their limitations is essential for developing equitable, predictable, and coherent legal frameworks capable of addressing the transnational nature of online intellectual property disputes.

3. The Impact of Electronic Commerce on Territoriality and Enforcement of IP Rights

The expansion of electronic commerce has profoundly altered the territorial assumptions that long underpinned intellectual property enforcement, transforming a system originally built on geographically bounded markets into one that must now contend with instantaneous, borderless distribution. In the traditional commercial environment, infringement was generally localized, as unauthorized reproduction or sale occurred within identifiable national or regional boundaries. Digital technologies, however, have collapsed these spatial limitations by enabling a single act of uploading, sharing, or distributing protected content to produce effects across multiple jurisdictions simultaneously. The moment a copyrighted work becomes available on a globally accessible website, it can be downloaded, streamed, copied, or redistributed in countless territories at once, thereby creating a multiplicity of infringement events without any physical movement of goods (Naşırī, 2021). This phenomenon challenges the classical assumption that infringement occurs in a definable location and exposes the inadequacy of territorial frameworks designed for physical markets. Scholars have emphasized that digital dissemination operates according to a fundamentally different logic, one in which the proliferation of content is both rapid and ubiquitous, and in which the locus of infringing acts is diffused across the very architecture of the internet (Wipo, 2019). As a result, courts attempting to apply territorial concepts to online activity frequently encounter conceptual barriers that make traditional legal doctrines increasingly difficult to sustain.

The collapse of geographic boundaries is further intensified by the technological infrastructures that support electronic commerce. Cloud hosting services allow content to be stored in distributed data centers located unpredictably across several countries, making it difficult to identify the physical location where protected works are stored or processed. Content delivery networks (CDNs) automatically route data through geographically dispersed servers to optimize speed and reliability, meaning that an infringing file may be cached, duplicated, and transmitted through numerous jurisdictions during a single user request

(Amīnzādeh, 2019). Algorithmic advertising systems add additional layers of complexity by personalizing content display based on user behavior, device characteristics, and geotargeted data, thereby creating highly individualized forms of digital interaction that complicate the evaluation of market targeting in jurisdictional analysis (Drexler, 2018). Geotargeting technologies, although often used to restrict access to certain jurisdictions, paradoxically underscore the fluidity of digital borders, as they demonstrate that the location of the user rather than the content provider often determines the boundaries of access. These technological features undermine attempts to apply traditional territorial tests, since they displace jurisdictionally relevant events—such as storage, transmission, and access—from a fixed location to a dynamic network of automated processes.

Identifying the place of infringement, place of damage, and locus of harmful effects becomes especially challenging in this technologically mediated environment. Under classical territorial doctrines, infringement is typically associated with either the location of the infringing act or the place where the resulting harm occurs. Yet in digital markets, these locations rarely coincide and, in many cases, are impossible to determine with certainty. For instance, a platform operator may be headquartered in one state, maintain servers in a second, outsource content moderation to a third, and direct advertisements to consumers in a fourth. A single online infringement may therefore produce economic damage to the right holder in multiple jurisdictions simultaneously, even when those jurisdictions bear no meaningful relationship to the infringer's conduct (Fawcett & Torremans, 2016). Courts attempting to apply the *lex loci delicti* principle thus struggle to pinpoint a coherent locus of the act or harm. The difficulty of determining where infringement “occurs” is particularly evident in cases involving peer-to-peer networks, where decentralized nodes allow users distributed globally to share and download protected content without coordinating through a central server. Such decentralized architectures render territorial analysis nearly impossible, as the infringing material may be simultaneously fragmented and replicated across hundreds of devices in different states (Ginsburg, 2017). These conditions fundamentally erode the viability of location-based jurisdictional doctrines and illustrate why traditional frameworks struggle to adapt to the realities of electronic commerce.

The evidentiary challenges accompanying digital infringement further complicate the enforcement landscape. Unlike physical intellectual property violations, which often involve tangible goods or identifiable production facilities, online infringement frequently occurs through anonymous or pseudonymous interactions. Digital platforms may require minimal user verification, allowing individuals to engage in unlawful reproduction or distribution without revealing their identity (Vā'ezī, 2018). Attribution becomes difficult when infrastructures such as VPNs, proxy servers, and distributed networks obscure the origin of traffic and mask identifying information. Even when an infringer's technical footprint can be traced, it is often unclear whether the individual uploader, the platform, or a third-party intermediary should be held legally responsible. Courts regularly encounter obstacles in establishing intent, knowledge, or control, particularly in cases involving automated systems that distribute or recommend content algorithmically. Gathering admissible evidence across borders also presents logistical barriers, as data may be stored in foreign jurisdictions subject to varying privacy, cybersecurity, and data protection laws (Ebrāhīmī, 2022). Requests for digital evidence frequently require cooperation from multinational intermediaries who may resist disclosure due to conflicting legal obligations. These evidentiary complexities weaken the ability of right holders to pursue infringement claims effectively and increase the likelihood of inconsistent judicial outcomes.

Challenges become even more pronounced at the enforcement stage, where cross-border recognition and execution of judgments remain heavily fragmented. Although some jurisdictions maintain formal procedures for recognizing foreign judgments, many intellectual property decisions cannot be easily enforced abroad due to concerns about territoriality, substantive divergence in IP laws, or procedural incompatibilities. States may refuse *exequatur* on grounds such as lack of jurisdiction, violation of public order, or incompatibility with domestic legal principles (Şafā'ī, 2020). This lack of harmonization forces right holders to litigate separately in multiple jurisdictions, a costly and burdensome process that undermines the effectiveness of judicial remedies. Even when enforcement is theoretically possible, digital infringers may relocate servers, change domain names, or migrate platforms to evade compliance. These enforcement barriers have stimulated growing interest in arbitration as a more flexible mechanism for resolving cross-border IP disputes, given that arbitral awards benefit from widely recognized enforcement frameworks such as the New York Convention (Morādī, 2023). Nonetheless, arbitration remains limited in its applicability, as many IP rights involve public policy considerations that restrict their

arbitrability or require judicial oversight. The uneven landscape of judgment enforcement therefore continues to be a major obstacle to effective governance of digital markets.

Practical disputes in the global digital ecosystem provide concrete illustrations of the theoretical challenges posed by electronic commerce. Online sales platforms, for example, routinely host vendors from various countries selling goods to consumers worldwide, raising complex questions about liability for trademark infringement and counterfeiting. A counterfeit handbag sold through an international e-commerce marketplace may involve a seller in one country, a warehouse in another, and a purchaser in a third, making it difficult to determine where the infringing transaction legally occurred (Amīnzādeh, 2019). The jurisdictional uncertainty becomes even more acute when platforms engage in algorithmic promotion of infringing goods, as courts must evaluate whether the platform's automated actions constitute active involvement or merely passive hosting. Digital copyright marketplaces such as video-sharing or music-streaming services confront similarly complex issues, particularly involving user-uploaded content. Unauthorized videos may be uploaded in one jurisdiction, processed in another, and streamed globally, rendering traditional doctrines of reproduction and communication to the public difficult to apply coherently (Ginsburg, 2017). Peer-to-peer file-sharing networks exemplify the extremes of digital ubiquity, as decentralized architectures allow users to exchange protected content without any central authority to regulate or monitor the flow of data. Such networks highlight the inadequacies of territorial enforcement approaches that assume a concentration of acts within a specific geographic location (Wipo, 2019).

Online counterfeiting provides another example of the collapse of territorial assumptions in intellectual property law. Counterfeit goods may be manufactured in one country, advertised on platforms targeting consumers in another, and shipped globally using sophisticated logistical networks that obscure the path of distribution. The digital marketing of counterfeit products often relies on search engine optimization, social media advertising, and targeted promotional tools that amplify the infringer's reach across borders (Drexler, 2018). Courts attempting to adjudicate such disputes must therefore analyze whether the infringer's commercial behavior was deliberately directed toward the forum, whether consumer confusion was likely to occur within that territory, and whether the platform or intermediaries facilitated access to infringing goods. These assessments require the integration of both legal and technological perspectives, demonstrating how deeply intertwined electronic commerce and intellectual property law have become.

The enforcement difficulties associated with digital infringement are further underscored by the divergent regulatory approaches taken by major jurisdictions. The European Union has adopted a relatively structured framework for determining jurisdiction and applicable law, relying heavily on the Brussels I Regulation (Recast) to establish rules for tort-related disputes in digital markets (European, 2012). However, even the EU model struggles with the tension between accessibility-based jurisdiction and market-targeting criteria, particularly in cases involving widespread dissemination of content. The United States, by contrast, emphasizes constitutional due process and minimum contacts, leading to jurisdictional rules that differ significantly from those applied in the EU (Born, 2021). These divergent approaches complicate enforcement, as judgments rendered in one jurisdiction may not satisfy the jurisdictional standards of another, thereby reducing the cross-border effectiveness of rulings. In countries such as Iran, where domestic IP laws continue to rely heavily on territorial principles, courts face additional challenges in applying traditional doctrines to disputes involving foreign platforms, international marketplaces, or global service providers (Mohammadi, 2020). This diversity in national legal frameworks contributes to a landscape in which digital infringement cases frequently produce inconsistent results across jurisdictions.

The collapse of traditional doctrines under digital conditions thus reflects the broader structural transformation of intellectual property enforcement in electronic commerce. The ubiquity of digital distribution, the decentralization of technological infrastructure, and the complexity of transnational commercial activity have collectively eroded the usefulness of geographically based legal tests. Problems of evidence, attribution, and enforcement further undermine the ability of courts to apply classical principles coherently. Practical disputes involving online marketplaces, peer-to-peer networks, online counterfeiting, and digital streaming platforms demonstrate that the doctrinal challenges are not merely theoretical but have significant implications for right holders, businesses, and consumers in global markets. By destabilizing traditional assumptions about territoriality, electronic commerce has exposed the need for a new conceptual framework capable of addressing the multifaceted realities of digital infringement and laying the foundation for more effective comparative analysis in subsequent sections of the study.

4. Comparative Analysis of Legal Approaches: EU, United States, WIPO Soft Law, and Iran

The comparative landscape of jurisdiction and conflict-of-laws rules in online intellectual property disputes reveals profound divergences among the European Union, the United States, international normative frameworks, and Iran. These variations reflect differing constitutional principles, market structures, and policy priorities, but they also expose structural weaknesses in global governance of digital infringement. By examining the doctrines and institutional approaches that shape each system, it becomes possible to understand both the successes and limitations of current models and to identify the challenges that arise when territorial legal frameworks confront the borderless character of electronic commerce.

Within the European Union, the primary instrument governing jurisdiction in civil and commercial matters is the Brussels I Regulation (Recast), which establishes a structured approach to determining the competent forum in cross-border disputes, including those involving online intellectual property infringement (European, 2012). The regulation permits plaintiffs to sue in the courts of the member state where the harmful event occurred, a rule that reflects the traditional separation between the place of the causal act and the place of damage. Yet the application of this provision to online contexts has been far from straightforward. Digital infringement challenges the assumption that harm is localized, since uploading content in one state can instantly cause damage throughout the EU. The Court of Justice of the European Union (CJEU) has accordingly played a pivotal role in interpreting the regulation to address digital realities, especially through its evolving jurisprudence on accessibility and market targeting. In early cases, the CJEU took a relatively permissive stance by allowing member-state courts to assert jurisdiction based on the mere accessibility of an infringing website, a position grounded in the idea that consumers in the forum could access the contested content. However, this approach soon proved problematic, as scholars noted that accessibility alone would allow virtually universal jurisdiction within the EU, thereby undermining predictability and fairness (Fawcett & Torremans, 2016). In response, the CJEU gradually moved toward a targeting analysis, focusing not on access alone but on whether the content or commercial practice was directed toward consumers in the forum state.

The case of *Google France SARL v. Louis Vuitton Malletier* represents a critical turning point in this doctrinal shift. In determining whether Google's AdWords service could be held liable for the display of keyword advertisements involving counterfeit trademarks, the CJEU emphasized that liability depended on whether the advertiser's activities targeted consumers in the relevant member state. This analysis distinguished between globally accessible content and content deliberately directed toward a particular market, thereby narrowing the scope of jurisdiction and aligning legal evaluation with the economic structure of digital advertising (Ginsburg, 2017). The targeting criterion has since become a central feature of EU jurisprudence, particularly in cases involving trademark infringement, online sales, and content distribution. While this approach has strengthened legal coherence, it also presents limitations. Determining whether a digital activity targets a particular jurisdiction requires courts to evaluate a constellation of indicators—such as language, currency, shipping practices, and platform design—which may evolve rapidly or be manipulated by sophisticated digital actors. The resulting uncertainty demonstrates that even the EU's refined approach struggles to keep pace with the complexities of online commercial behavior (Drexler, 2018). Nonetheless, the EU model remains one of the most developed frameworks for addressing jurisdictional issues in digital intellectual property disputes.

The United States adopts a fundamentally different approach rooted in constitutional due process principles. The cornerstone of U.S. jurisdictional doctrine is the requirement of "minimum contacts," which mandates that a defendant must have purposefully established meaningful connections with the forum state for jurisdiction to be proper. This principle, articulated in cases such as *International Shoe Co. v. Washington*, is further refined through the doctrine of "purposeful availment," which requires that defendants must have deliberately engaged with the forum state in ways that make litigation there foreseeable. In the digital context, courts analyze online conduct to determine whether a website or platform intentionally reached into the forum state or simply maintained passive global accessibility. The "effects test," established in *Calder v. Jones*, has also been adapted to cyberspace by focusing on whether the defendant's online actions were expressly aimed at the forum and produced foreseeable harm there (Born, 2021). This effects-based reasoning shares certain similarities with the EU's targeting criterion, but its constitutional grounding results in a narrower and more defendant-protective application.

One of the most instructive U.S. cases for understanding the limits of extraterritorial enforcement is *Yahoo! Inc. v. LICRA*, in which French authorities ordered Yahoo! to block access to Nazi-related memorabilia for French users. Yahoo! sought relief

in U.S. courts, arguing that enforcing the French judgment would violate U.S. constitutional protections. The Ninth Circuit declined to enforce the foreign order, emphasizing the tension between domestic constitutional norms and foreign regulatory authority (Fawcett & Torremans, 2016). This decision highlights a structural constraint in U.S. jurisdictional analysis: even when a foreign court asserts proper jurisdiction, enforcement within the United States may be barred due to constitutional or public policy considerations. These limitations resonate strongly in intellectual property disputes involving cross-border online activity, as global enforcement often depends on cooperation that U.S. courts may not provide. At the administrative level, the United States has been influenced by WIPO frameworks in developing domain name dispute mechanisms, particularly through the adoption of the Uniform Domain Name Dispute Resolution Policy (UDRP). These procedures offer a streamlined alternative to litigation and reflect the growing role of non-judicial governance systems in digital intellectual property enforcement.

Despite differences in legal philosophy, both the EU and the United States rely heavily on domestic judicial mechanisms that struggle to achieve consistency in a global digital environment. International normative frameworks aim to supplement these national systems by promoting harmonization and facilitating cross-border cooperation. One of the most significant instruments in this regard is the TRIPS Agreement, which establishes minimum standards for the protection and enforcement of intellectual property rights among World Trade Organization members (World Trade Organization, 1994). While TRIPS provides a baseline for substantive harmonization, it offers limited guidance on jurisdictional questions, leaving significant discretion to individual states. TRIPS does, however, require effective enforcement procedures and remedies, pressures that become difficult to implement when disputes involve online infringement dispersed across multiple jurisdictions. WIPO has taken a more proactive approach to digital challenges through studies and soft-law initiatives that analyze the impact of online dissemination on territoriality. The WIPO Study on the Territoriality of Copyright in the Digital Environment underscores the inadequacy of existing territorial frameworks and advocates for mechanisms that better reflect the cross-border nature of digital works (Wipo, 2019). Although WIPO soft law does not bind states, it plays a critical role in shaping policy debates, informing domestic legislation, and establishing shared conceptual understandings. Emerging discussions within WIPO and academic literature suggest growing interest in model provisions or optional protocols that could guide states in addressing conflict-of-laws problems associated with digital intellectual property (Kono, 2012). These efforts reflect a recognition that national frameworks alone cannot resolve the jurisdictional complexities inherent in electronic commerce.

Compared to the EU, the United States, and international mechanisms, Iran's legal framework for addressing cross-border intellectual property disputes in the digital context remains relatively underdeveloped. Iranian IP statutes, including the Law on the Protection of Authors, Composers, and Artists and the Patent and Trademark Registration Law, were drafted within a territorial paradigm and do not contemplate the complexities of digital dissemination or multi-jurisdictional infringement scenarios (Moḥammadi, 2020). The E-Commerce Law addresses certain aspects of digital transactions but provides limited guidance on jurisdictional questions, particularly concerning foreign defendants, international platforms, or extraterritorial effects. Civil Procedure rules similarly rely on traditional concepts of territorial jurisdiction, which become difficult to apply when infringing acts originate outside Iran or when harm is distributed globally (Vā'eẓi, 2018). One of the major gaps in Iran's framework is the absence of clear rules governing the recognition and enforcement of foreign intellectual property judgments. Iranian courts often apply strict public policy and sovereignty principles when evaluating foreign judgments, making enforcement uncertain and sometimes impossible in cases involving online infringement (Ebrāhīmī, 2022). This legal fragmentation hinders right holders seeking redress for transnational digital violations and contributes to inconsistencies in judicial outcomes.

Iran also faces significant challenges in regulating online intermediaries. Platforms operating within Iran or targeting Iranian consumers often lack explicit legal obligations concerning monitoring, content removal, or cooperation with judicial investigations. Foreign platforms, meanwhile, operate largely outside Iran's jurisdiction, creating enforcement gaps when infringing content is hosted or distributed through global intermediaries (Naṣīrī, 2021). Compared with the EU, which has developed platform liability rules through directives and CJEU jurisprudence, and the United States, which applies safe harbor provisions under the DMCA, Iran lacks a systematic framework to determine intermediary liability or to establish standards for jurisdiction over global digital actors. This absence leaves Iranian right holders dependent on foreign legal systems or

informal negotiation mechanisms when addressing infringement involving international platforms. The fragmentation between domestic statutes, procedural rules, and technological realities underscores the need for modernization.

International arbitration has emerged as a relevant supplementary mechanism within Iran's digital IP landscape. Scholars have argued that arbitration may provide a flexible forum for resolving cross-border disputes, particularly when foreign parties or non-state actors are involved (Morādi, 2023). However, arbitration cannot fully substitute for domestic judicial reforms, as many intellectual property matters involve public law considerations that may not be arbitrable. Furthermore, arbitration awards still require enforcement in Iranian courts, where territorial and sovereignty concerns may reintroduce uncertainty. Compared with the EU and the United States, Iran remains at a preliminary stage in adapting its legal structures to the realities of electronic commerce.

When compared across jurisdictions, certain patterns begin to emerge. The EU's targeting-based framework offers a more structured and predictable approach but still grapples with the complexities of distributed digital conduct. The United States emphasizes constitutional limitations that protect defendants but may restrict the enforcement of foreign judgments and complicate global cooperation. International organizations attempt to bridge these gaps through soft-law harmonization, though their recommendations lack binding authority. Iran, by contrast, illustrates the challenges faced by legal systems that have not fully integrated digital realities into their intellectual property and conflict-of-laws doctrines. The absence of specialized rules for online infringement, combined with limited mechanisms for recognizing foreign judgments, places Iran at a disadvantage when addressing transnational digital harm (Moḥammadi, 2020).

This comparative analysis reveals that no existing legal system has fully resolved the jurisdictional and conflict-of-laws problems posed by electronic commerce. Each model offers strengths but also reflects structural limitations. The divergence across jurisdictions underscores the necessity of developing more coherent international strategies for addressing digital IP infringement. The interplay between national law, regional frameworks, and international soft law will likely continue to shape the evolution of legal doctrine in this field. Understanding the respective strengths and shortcomings of the EU, United States, WIPO, and Iran provides an essential foundation for proposing harmonized solutions that better align territorial legal structures with the non-territorial nature of digital markets.

5. Conclusion

The transformation of intellectual property governance in the digital age has revealed fundamental tensions that traditional legal frameworks were never designed to resolve. As electronic commerce expands and technological infrastructures become more complex, the classical territorial assumptions underlying conflict of laws and jurisdiction prove increasingly inadequate for addressing the realities of online infringement. The global reach of digital platforms, decentralized distribution networks, and instantaneous cross-border communication have created a legal environment in which the boundaries of states no longer align with the boundaries of harm. This disconnect has produced persistent uncertainty for right holders, digital service providers, and judicial authorities attempting to determine which law should govern and which court should adjudicate disputes arising from transnational digital activity.

Across legal systems, the struggles appear in different forms but reflect a shared structural challenge. The European Union has taken significant steps toward adapting jurisdictional rules to digital realities, particularly through the development of the targeting doctrine and refined interpretations of the Brussels I Recast. Yet even within this relatively harmonized regional framework, courts continue to grapple with the complexity of online markets, as indicators of targeting shift rapidly alongside technological and commercial developments. The United States, grounded in constitutional principles of due process, applies the minimum contacts and effects doctrines to online conduct, balancing the need for fair jurisdictional reach with protections against excessive assertion of authority. While this approach offers a degree of predictability, it also limits the enforceability of foreign judgments and complicates international cooperation. International organizations, including WIPO and the WTO, have recognized the inadequacy of territorial doctrines and have begun to explore soft-law solutions and harmonization efforts. These initiatives aim to promote coherence, yet they lack binding force and thus depend on the willingness of states to align domestic laws with international recommendations.

In contrast, legal systems that have not modernized their frameworks, including Iran, face even greater challenges. Domestic statutes grounded in territorial reasoning cannot easily accommodate disputes involving foreign platforms, global marketplaces,

and decentralized digital systems. Without explicit rules governing online jurisdiction, intermediary liability, and the recognition of foreign judgments, courts must rely on general procedural principles that offer limited guidance in digital disputes. This creates a fragmented and unpredictable environment for right holders, who often lack effective recourse when infringement spans multiple jurisdictions or involves foreign actors. The contrast between more developed frameworks and those still anchored to pre-digital norms highlights the growing gap in states' ability to regulate and respond to online intellectual property violations.

A central insight emerging from this comparative study is that the problem is not merely legal but structural. Electronic commerce challenges the foundational logic of territoriality by distributing actions and effects across a global network rather than localizing them within a single jurisdiction. The resulting disjunction between territorial laws and non-territorial technologies produces enforcement gaps, overlapping claims of authority, and inconsistent outcomes. Courts attempting to apply traditional doctrines find that the physical location of servers, users, or intermediaries rarely corresponds to the locations where economic or reputational harm is experienced. The distributed architecture of digital systems ensures that no single territorial marker can accurately reflect the locus of infringement or the scope of its effects. As long as legal doctrines continue to rely on geographic assumptions that do not match technological realities, courts will struggle to provide coherent and predictable outcomes.

Another crucial insight is the growing centrality of intermediaries in the digital ecosystem. Platforms, search engines, hosting providers, and online marketplaces play critical roles in shaping how content circulates, how goods are advertised, and how consumers engage with information. Their involvement raises new questions about liability and jurisdiction, as intermediaries often operate across multiple states and may have limited control over the actions of users. Determining whether intermediaries should be subject to jurisdiction requires an analysis of economic and technological factors rather than traditional territorial or personal connections. This shift underscores the need for new doctrinal tools that can evaluate digital conduct holistically rather than attempting to force it into categories developed for physical interactions.

At the international level, the divergence among legal systems reveals a broader governance problem. When states apply incompatible doctrines to global disputes, right holders face inconsistent remedies and varying levels of protection depending on where they bring their claims. This inconsistency also creates opportunities for actors to exploit legal gaps by hosting content or conducting activities in jurisdictions with weaker enforcement mechanisms. Without greater harmonization, the global digital marketplace risks becoming fragmented, fostering inequities and inefficiencies that undermine innovation and discourage investment in creative industries. International cooperation, whether through binding treaties, soft-law frameworks, or coordinated reforms, will be essential to overcoming these structural obstacles.

Yet despite the challenges, this comparative analysis also reveals areas of convergence that could serve as foundations for future harmonization. Both the EU and the United States recognize the inadequacy of accessibility-based jurisdiction and increasingly emphasize intentionality, whether expressed through market targeting or purposeful availment. Both systems acknowledge the importance of minimizing unreasonable assertions of authority while ensuring that right holders have meaningful avenues for enforcement. International organizations similarly recognize the need for coherent and predictable frameworks and have begun articulating principles that could support harmonization efforts. These emerging points of alignment suggest that, while complete global unification may be unrealistic, greater coordination is achievable.

The complexities of electronic commerce demand an intellectual property governance model that transcends territorial assumptions and incorporates the technological, economic, and social dynamics of digital markets. Any effective reform must begin by recognizing that online infringement operates within a distributed, multi-jurisdictional environment that renders location-based tests insufficient. Doctrines must evolve to reflect the centrality of intermediaries, the ubiquity of digital harm, and the need for proportional jurisdictional assertions. They must also account for the practical realities of evidence collection, attribution of wrongdoing, and enforcement across borders. Without these conceptual and procedural adjustments, legal systems will continue to produce fragmented and unpredictable outcomes that fail to protect right holders or promote digital innovation.

Looking forward, the evolution of intellectual property jurisdiction in the digital age will depend on a combination of domestic reform, regional harmonization, and international cooperation. States must modernize statutes and procedural rules to reflect contemporary commercial practices, develop clear frameworks for intermediary liability, and establish mechanisms for recognizing and enforcing foreign judgments in digital contexts. Regional organizations should continue refining doctrines

such as targeting and effects-based analysis to ensure that courts have practical, technologically informed criteria for determining jurisdiction. International bodies must play a central role in articulating shared principles, promoting interoperability, and encouraging convergence across legal systems. Only through such coordinated efforts can the global community build a coherent legal structure capable of governing intellectual property in an interconnected digital environment.

In conclusion, the digital transformation of commerce has rendered traditional territorial doctrines of intellectual property jurisdiction increasingly untenable. The foundational assumptions that once guided courts and policymakers no longer align with the realities of online interaction, requiring a reconceptualization of conflict-of-laws and jurisdictional analysis. By examining the strengths and weaknesses of the EU, United States, international frameworks, and Iran, it becomes clear that no single system has fully addressed the challenges of the digital age. Nevertheless, the insights gained from this comparative analysis provide a foundation for the development of more coherent, adaptable, and technologically responsive legal frameworks. The future of intellectual property enforcement depends on our ability to bridge the gap between territorial law and non-territorial technologies and to design governance structures capable of supporting innovation while ensuring fairness and predictability in a global digital marketplace.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

Acknowledgments

Authors thank all who helped us through this study.

Conflict of Interest

The authors report no conflict of interest.

Funding/Financial Support

According to the authors, this article has no financial support.

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