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Article

Cross-Border Jurisdiction and IP Enforcement Challenges in Dark Web Distribution of Child Sexual Abuse Material

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Abstract: In this paper, the author discusses the complex issues of cross-border jurisdiction and enforcement of intellectual property laws as relates to the distribution of Child Sexual Abuse Material content within the Dark Web and specifically the legal and technological environment in India. It examines the complex trends of digital abuse and its resulting effects on the victimization of Indian women, in the narrower context of non-consensual image-based harassment, but it also contemplates a larger problem of online child sexual abuse and exploitation that is facilitated by the ubiquitous digital technologies. The paper also examines how the anonymity provided by the Dark Web, along with the advent of cryptocurrency markets, makes investigating and prosecuting hackers more difficult, providing a complicated sentencing ground on such crimes. Another factor that contributes to this challenge is the prevalence of child pornography on the internet that would require stringent legal systems and international collaboration to protect the children around the world. Coupled with the disastrous figures that show how every third internet user in the world is a child, it is possible to state that there is a high level of exposure of this demographic on the online market, to its exploitation.

Keywords: Child Sexual Abuse Material, Dark Web, Cross-Border Jurisdiction, Intellectual Property Enforcement, India, Cybercrime, Online Exploitation.

INTRODUCTION

Child Sexual Abuse Material proliferation on the dark web is a global problem unmatched by any other challenge that requires thorough analysis of cross-border jurisdictional issues and limitations on intellectual property enforcement especially in the Indian context (Ngo et al., 2023). Being enabled by encrypted networks and advanced evasion methods, this cyber threat highlights a serious disconnect between existing legal and technical frameworks created to protect children online (Sayyed & Paul, 2025) . The anonymity provided by the dark web and encryption technologies creates a favorable environment to distribute CSAM, and it is quite impossible to identify the perpetrators and break their network considering that law enforcement agencies need a substantial amount of time to identify them. This problem is further complicated by the

sheer amount of CSAM shared in these shadowy virtual realms that makes it a major social issue clogging hotline and law enforcement agencies. To make the situation even more problematic, battery-made CSAM, widely discussed in dark web forums, has marked a new aspect of this danger, with AI models being disseminated as open source and thus an accidental contributor to the development of advanced content creation and distribution techniques (Kokolaki and Fragopoulou, 2025). This should require a multisided and immediate response to strengthen the current legal frameworks, improve interstate collaboration, and come up with sophisticated technologies that could be utilized to counteract this variant of cybercrime that is taking new forms (Ngo et al., 2023). In the following paper, the author will look into the particular issues that obstruct the execution of the intellectual property law and self-assertion of jurisdiction by Indian officials over organizations that engage in the cross-border shipment of CSAM via the dark web, focusing on the complexity of the interplay between international legislation and domestic legislative weaknesses. More precisely, this discussion shall examine how the anonymity inherent in the dark web and how it will hinder the conventional IP enforcement systems and give rise to considerable evidentiary problems in prosecution under Indian law.

The Dark Web and Child Sexual Abuse Material (CSAM)

The dark web is an ambiguous online space that allows the creation, sharing, and communication of Child Sexual Abuse Material with a higher level of anonymity without being detected by the regular search engines and political regulation (Ngo et al., 2023). This dark corner of the internet uses encryption and decentralized systems to obscure user identities and locations, thus anti-authorized practices, such as the prodigal spread of CSAM (Sayyed and Paul, 2025). It is also supported by the specialized programs, such as Tor that redirects internet traffic and uses several relays to make it incredibly difficult to locate the source or the destination of data packets (Singh and Bhanu, 2025). Therefore, offenders use such technological protective measures to escape control measures, which make it hard to trace and arrest people that are engaging in the distribution of CSAM (Huikuri, 2023). The utilization of artificial intelligence to create extremely realistic, but totally fake material has been a boon to the proliferation of CSAM on the dark web, and has made the process of identifying victims and prosecuting them more difficult (Parti & Szabo, 2024)(Wolbers et al., 2025). This atmosphere creates some kind of an illusion of reality in which the lives of real victims may be subjected to distortion, making the identification of victims a pressing issue in society and investigations (Huikuri, 2023). Additionally, the intrinsic difficulties in assigning online actions to the definite individuals or groups concerning the anonymizing infrastructure of the dark web greatly hinder the legal process and the successful enforcement of the national and international laws on the topic of sexually participating in exploitation (Gallo-Serpillo and Valls-Prieto, 2024). The pornification of children, as it existed in ancient erotic works and images, has been further promoted by the digital era, where the information and technology revolution have made the creation and distribution of child pornography much easier and cheaper (Ahmed and Faujdar, 2022). The dark web serves to aggravate the problem; therefore, it also offers the location where not only the already-existing CSAM can be shared with communities that support and encourage the criminal behavior of the perpetrators without imposing any restrictions but also offers the learning models that allow the perpetrators to commit further abuse (Huikuri, 2023).

International Legal Frameworks for CSAM Enforcement

Although the efforts of the war on the distribution of CSAM in the dark web space are decentralized and encrypted, international laws and multilateral cooperation are the key tools in the process, although the jurisdictional issues and anonymity of these solutions frequently compromise their efficiency (Kareem, 2024).

United Nations Conventions and Protocols

The United Nations has developed established tools like the Convention on the Rights of the Child and its Optional Protocol on the Sale of Children, Child Prostitution and Child Pornography giving a complete international legal framework on how states can criminalize and prosecute crimes against CSAM. To provide a harmonised resolution on child protection, these protocols require signatory countries to domestically criminalise the production, distribution and possession of child pornography. Nevertheless, the enforcement of these international requirements in practice differs widely across jurisdictions, with numerous constraints on cross-border enforcement between countries, particularly against the anonymization nature of dark web transactions (Kloess and Bruggen, 2021).

Council of Europe's Budapest Convention

The Convention on Cybercrime (also known as the Budapest Convention) is the only binding international convention that regulates cybercrime, including crimes involving CSAM, and tries to harmonize the national laws, promote investigative efforts, and increase international cooperation. It

establishes a framework regulating signatory states to enforce substantive criminal law provisions in cybercrimes, such as child sexual exploitation, and specifies the process of international mutual assistance in investigations (Huikuri, 2023). But India is yet to ratify the Budapest Convention that can be quite a challenge to support the smooth international cooperation and international intelligence exchange in any incident of dark web CSAM across borders. This non-ratification poses a major barrier to Indian law enforcement agencies exploiting the international cooperation systems put in place by the Convention, thus making it difficult to effectively target the cross-boundary dark web criminal syndicates (Vendius, 2015).

Mutual Legal Assistance Treaties (MLATs)

Mutual Legal Assistance Treaties are bilateral or multilateral pacts diplomatic in the exchange of evidence and other legal aid amongst nations associated with criminal investigations and criminal charges, and especially important because a law-enforcement agency is usually unable to conduct its operations outside its national boundaries ("The Cambridge Handbook of Digital Evidence in Criminal Investigations," 2025). These agreements allow Indian authorities to request and receive important digital evidence, including user information or content of servers in other countries, which is typically crucial in prosecuting dark web CSAM cases (Sharma, 2020). Nevertheless, the slow diplomatic procedures, divergent legal frameworks and the degree of political goodwill may impede the effectiveness of MLATs and result in delays that undermine the timeliness and efficacy of investigations into emergent criminal networks on the dark web.

Indian Legal Framework for CSAM Enforcement

Information Technology Act, 2000 and its Amendments

Although this is a 40-year old primary legislation that was originally enacted to give that legal legitimacy to the electronic transactions, it has been later on amended to cover other cybercrimes in a more detailed manner incorporating into the provisions special provisions against the spread of obscene content and child pornography (Chakraborty and Tiwari, 2025). Particularly, under the amended versions of 67, 67A and 67B of the IT Act, 2000 publications, sexually explicit materials and child pornography respectively are criminalized, so the Indian commitment to fighting online child sexual abuse (Shetty, 2025). These regulations along with the Protection of Children from Sexual Offences Act of 2012 are designed to establish a solid legal framework of actions, yet they are significantly challenged by the anonymity and jurisdiction difficulties of the dark web activities (Manoj et al., 2024). Moreover, the amount of child sexual abuse content that is going through the Internet is quite overwhelming; therefore, the process of identification and intervention becomes severely problematic (Joleby et al., 2020). Additionally, the legal issues that emerge in the light of the Protection of Children Sexual Offences Act that criminalizes sexual activity under 18 years old intersect with the complexities of relationships between adolescents, making the judicial situation of offenses involving CSAM even more challenging (Shukla et al., 2024).

Protection of Children from Sexual Offences (POCSO) Act, 2012

The Protection of Children from Sexual Offences Act, 2012 was introduced with a special purpose of combating child sexual abuse and exploitation and created a legal framework that is friendly to children, where the punishments imposed on perpetrators are very strict (Shetty, 2025)(Mallick, 2024). The bill is central to the Indian struggle against CSA, making many types of victimization illegal, including the use of digital tools, but its extension to the complex field of the dark web distribution of CSAM has cannot be effectively implemented (Shinde, 2024). There is a major loophole in the legal framework, with India, as well as most other nations, not clearly criminalizing online grooming, without the intention of meeting in person, which is dangerous in the face of the profound psychological effects such abuses may have on children (Joleby et al., 2020). Moreover, the Act definition of child sexual abuse includes the actions that children might not result in understanding or informed agreement, which corresponds to the international standards, such as the World Health Organization (Tyagi and Karande, 2021)(Saini et al., 2022). The Act also provides mechanisms that are friendly to children regarding reporting, recording of evidence, investigation, and prompt trials by Special Courts reflecting a holistic treatment of children interest by the judicial system (Mohanty and Banerjee, 2021).

Challenges in Applying Indian Laws to Dark Web Activities

The nature and anonymity of the dark web makes it extremely difficult to identify the attackers and trace the digital footprint, complicating the task of collecting admissible evidence immensely because of the decentralized nature thereof and anonymity (Manoj et al., 2024). Also, the world-spanning nature of the dark web infrastructure further complicates investigations due to constraints by national borders and necessitates multinational collaboration. These obstacles are also increased by the fact that different legal norms of different countries may also hinder cross-national legal aid, and the free flow of essential

information required to prosecute and successfully bring charges against crimes committed in the dark web.

Cross-Border Jurisdiction Challenges

This is a fundamental conflict between the decentralized and anonymous nature of the dark web and the much more conventional jurisdictional concepts based on geography, and thus present substantial complexities with the ability to prosecute crimes such as CSAM distribution. In particular, it is extremely challenging to trace digital actions to individuals when the IP addresses are anonymized and information is sent through the many nodes across the world, which makes the traditional investigation techniques relatively ineffective when determining jurisdictions (Huikuri, 2023). Furthermore, the fact that encryption technologies are evolving rapidly, and advanced methods of anonymization used by dark web participants are regularly ahead of legislative and technological efforts to combat it leaves a significant enforcement gap that dilutes the perception of bringing offenders to justice (Joleby et al., 2020). This digital forensics imbalance between countries coupled with the varying legal systems across different countries further fuels the jurisdiction issues, impeding the collaborative international effort required to break up international dark web CSAM networks. Additionally, there is no internationally agreed manner of defining and prosecute cybercrimes on the dark web, and as a result, what would be considered a crime in one country would be a safe haven in another, thus making cybercriminals less vulnerable (Kareem, 2024). This ambiguity is most acute with cryptocurrencies transactions as the activities of different nation states complicate the application of national legislation, creating opportunities to be exploited by illegal activities (Uzougbo et al., 2024). The international character of the internet and the speed at which technological changes are being made continue to outpace the creation of legal frameworks, further weakening the preventive capacity of legal systems and the effectiveness of the law enforcement practices (Zhou et al., 2024)(Vendius, 2015). Transnationalism of cybercrime, especially the dissemination of CSAM through the dark web, implies improved cooperation of the countries, as the investigations often involve more than one country, and the exchange and collection of electronic evidence can be played (Casino et al., 2022). Hence, combating such compound technical issues would need consistent research and development of cybersecurity to be able to detect and prevent such rogue associations as effectively as possible (Kareem, 2024).

Intellectual Property (IP) Enforcement in the Context of CSAM

Although all people agreed on the issue of CSAM, the larger discussion surrounding the enforcement of intellectual property in the dark web creates intricate issues related to the process of enforcing conventional laws of intellectual property on digital illegal materials. This is quite difficult due to the anonymity of onion routing networks, which conceals the identity of content distributors and consumers, making it more difficult to establish ownership or authority over digital resources (Kareem, 2024). The natural challenges of tracing the origin and the spread of illegal sources on the dark web are that it is rather difficult to implement the traditional mechanisms of IP enforcement that have traditionally built on the basis of the clear ownership and distribution chains that can be verified (Jin et al., 2023). The CSAM spreads quickly due to the anonymity provided by the dark web, and due to the anonymity, it is almost impossible to tell the point of content origin or to trace further instances of its re-distribution, which is a stark difference to the usual infringement of IP violation cases where the content source is usually easy to determine (Ghanem et al., 2023)(Kareem, 2024). As a result, police departments face substantial challenges with the collection and attribution of evidences during the investigation of cybercrimes through those networks of anonymity, which once more indicates the problem with jurisdiction and the necessity of international cooperation (Kareem, 2024). Technology keeps evolving at an extremely quick rate compared to the legal system, which is why there is a strong discrepancy between the potential of cybercriminals and the tools law enforcement uses (Amoo et al., 2024). It requires sustained modification of both legal and investigation policies in order to be successful in fighting the recurrent menace presented by dark web activities (Kareem, 2024)(Davies, 2020). The adaptation can include the creation of the advanced methods of traffic analysis, the use of machine learning algorithms, and the establishment of the collaboration with other countries to respond to the changing situation in cybercrime (Kareem, 2024). This involves investigating new ways to conduct digital forensic examination in encrypted space and developing the uniformed procedures of data exchange across borders (Kareem, 2024).

CONCLUSION

To sum up, combating the distribution of CSAM on the dark web in India is a complex problem that requires an all-encompassing strategy which would resort to the use of advances in technology, international

collaboration of legal efforts, and effective policy frameworks. This includes both proactive steps to detect and disrupt the activities of the dark web as well as steps to gain insights into the changing criminal procedures and adjust the countermeasures (Kareem, 2024). Moreover, the two-way character of technologies, including Tor and I2P, is a cause of a serious dilemma, which requires a delicate effort to maintain privacy on the one hand and to fight criminal acts on the other (Ghanem et al., 2023). As such, the development of traffic analytics and blockchain-based forensics is paramount to identifying and addressing cybercrime in such anonymous networks, although the nature of this problem is difficult to tackle (Kareem, 2024) (Gjorgjev et al., 2025). Law enforcement agencies may greatly speed up the investigation process through the development of automated tools based on machine learning (Horan and Saiedian, 2021). In addition to that, judicial capacity should be strengthened by providing specialized training on cybercrime and work with digital evidence in order to achieve the effectiveness of prosecution and prevent further crimes in the future. Such an integrated approach should focus on the dynamism of cyber threats, constantly revising the legal framework and methods of investigations to keep up with the advancing tricks of the offenders (Gupta and Gupta, 2025). This involves the promotion of public-private collaborations in taking advantage of shared skills and resources in innovating solutions to detect, investigate, and prosecute dark web-related offenses, especially crimes related to CSAM (Kareem, 2024). In addition, the international cooperation used in intelligence sharing and the coordination of law enforcement activities cannot be continued without future international cooperation as these criminal networks are cross-border (Cilleruelo et al., 2020).

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